



P A R K S & R E C R E A T I O N D E P A R T M E N T
323 CHURCH STREET, SANTA CRUZ, CA 95060

April 4, 2005

Roger W. Briggs, Executive Officer
California Regional Water Quality Control Board
Central Coast Region
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

San Luis Obispo County

05 APR - 5 11:11 AM

DELAVEAGA GOLF COURSE, SANTA CRUZ; WDID #344C330064

Dear Mr. Briggs,

This correspondence is in response to your letter dated March 14, 2005. I was out of the office from March 14 through March 27 and was unable to read your letter until March 28, 2005. The City has been working diligently to prepare this response and packet since I became aware of your letter.

The City made a sincere effort to fully respond to the Notice of Violation letter dated December 12, 2004 and to remedy the problems identified by Regional Water Quality Control Board staff. It appears, however, that some of the items were misunderstood by City staff. We apologize for this misunderstanding and hope that this letter and attachments fully provide the needed information.

The City understood that a copy of the *Storm Water Pollution Prevention Plan and Monitoring Program for the DeLaveaga Golf Course Remodel and Improvements (dated August 8, 2004)* had previously been submitted to the Regional Board. Thus, the City submitted only the amendments as an attachment to our January 24, 2005 letter. The City now understands that the Regional Board wished to receive the amended document in its entirety. We have enclosed a copy of the complete amended Storm Water Pollution Prevention Plan and Monitoring Program (Attachment 1) with this letter. This document also includes the Monitoring and Reporting Program (please see Section X1 of the document). If this submittal does not fully provide the information expected by the Regional Board, please let us know promptly and we will forward it immediately. Again, we recognize there was a misunderstanding about which documents the Regional Board had previously received and the information needed per your December 12, 2004 letter.

In regard to the site problems identified by Regional Board staff during the inspections and shown in the photographs, a list of correction actions and clean up efforts is enclosed. We have included the corrective actions taken based on the January 12, 2005 inspection as well as copies of the previously submitted corrective actions for the December 8, 2004 inspection (Attachments 2 and 3). In addition we have attached an updated Monitoring

and Reporting Log (Attachment 4) and a complete set of all inspection records (Attachment 5). It is our hope that this information and the corrective actions taken will demonstrate to the Regional Board that the City of Santa Cruz understands its responsibilities under the permit.

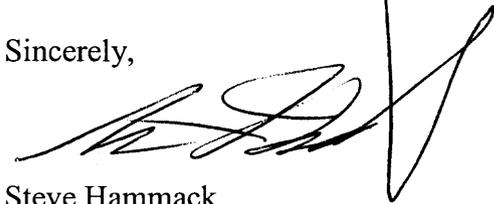
Also, in your letter dated March 14, 2005, questions were raised about the level of training received by Miles Hicks, the Golf Course Superintendent. Mr. Hicks received training regarding storm water management, erosion and sediment control from Mr. Steve Halsey, the consultant contracted by the City to prepare the *Storm Water Pollution Prevention Plan and Monitoring Program*. Mr. Hicks has prepared a summary of this training, which is included at Attachment 6 to this letter.

The DeLaveaga Golf Course Remodel and Improvements project is approximately 80 per cent complete as of April 4, 2005. The completed improvements, erosion and sediment control measures as of April 1, 2005 are shown on the enclosed Site Plan (Attachment 7). All three of the greens complexes are now covered with either sod or straw mulch. The straw mulched areas have already been seeded and are germinating with new grass. All of the tee tops have been sodded and the contractor is in the process of straw mulching and seeding the areas surrounding the tees. The use of erosion and sediment control measures, such as fiber rolls, straw mulch, silt fences, and sand bags, are also depicted on the attached Site Plan. In addition all of the storm drain inlets shown on the Site Plan have been protected with filter fabric and sand bags.

In closing, the City recognizes and apologizes for misunderstanding the information requested by the Regional Board. Our staff and the contractor have worked diligently to prevent storm water pollution and provide the needed documents. We recognize there have been some site problems, but we have dedicated substantial time and funding to remedy these concerns.

If the information provided with this submittal does not fully meet the Regional Board's requests, please contact me at (831) 420-5366 as soon as possible. It is the City's intent to fully comply with your requests.

Sincerely,



Steve Hammack
Superintendent of Parks

Attachments:

- 1) *Storm Water Pollution Prevention Plan and Monitoring Program for the DeLaveaga Golf Course Remodel and Improvements* (dated August 8, 2004)
- 2) Correction Action and Cleanup Efforts In Response to Inspection of January 12, 2005 (includes photographs taken April 4, 2005)

- 3) Correction Action and Cleanup Efforts In Response to Inspection of December 8, 2004 (includes photographs taken January 10, 2005)
- 4) Monitoring and Reporting Log (October 8, 2004 through March 29, 2005)
- 5) Inspection Log (October 8, 2004 through March 29, 2005)
- 6) Summary of training for Miles Hicks, Golf Course Superintendent
- 7) Site Improvements Map updated as of April 1, 2005

Cc: Richard Wilson, City Manager (without attachments)
Dannettee Shoemaker, Director of Parks and Recreation (without attachments)
Miles Hicks, DeLaveaga Golf Course Superintendent

**STORM WATER
POLLUTION PREVENTION PLAN
AND MONITORING PROGRAM**

ADDENDUM NO. 2

**FOR
DELAVEAGA GOLF COURSE
Remodel and Improvements
August 8, 2004**

**SANTA CRUZ COUNTY,
CALIFORNIA**

05 APR -5 AM 11:40
SANTA CRUZ COUNTY, CA 95001

Prepared for Compliance with the National Pollutant Discharge
Elimination System (NPDES) General Permit for Storm Water
Discharges Associated with Construction Activity and City of Santa
Cruz Chapter 6 Best Management Practices Manual

Prepared by
Halsey Daray Golf, Inc.
5185 Commanhe, Suite C.
La Mesa, CA 91941
619.463.9285

AMENDED : January 14, 2005

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APPENDIX 'A' SWPPP PROJECT AMENDMENTS

Amendments Attached

Revisions	Date
Site Plan/Report	1/14/05

NOI Attached?

Yes
 No

Waste Discharge Identification Number: 344C330064

**Storm Water Pollution Prevention Plan (SWPPP)
 California Construction General Permit**

I. Project Information

1. Project Name: Delaveaga Golf Course Remodel and Improvements

Project Location: Street Address (or equivalent): 401 Upper Park Road
 County: Sanata Cruz Zip Code: 95060

2. Project Owner: City of Santa Cruz
 Contact Person: Steve Hammack, Director of Parks and Recreation.
 Phone Number: (831) 420-5366
 Owner's Mailing: Street Address (or equivalent): 323 Church Street
 Address: City: Santa Cruz State: California Zip Code: 95060

Responsible Personnel:

Implementing and revising the SWPPP: Miles Hicks, Golf Course Supt.

Inspecting equipment: Miles Hicks

Regular inspections of BMPs: Miles Hicks

Training employees about BMPs affecting their job: Miles Hicks and General Contractor's
 Project Field Supervisor

Contractors and Subcontractors responsible for implementing SWPPP for the Project:

Project Prime Contractor: Golf Corse Builders Int'l

Contact Person: Lee Bilberry Phone Number: (360) 303-7770
 Mailing Address: Street Address (or equivalent): 1109 N. Palmetto Circo
 City: Evsas, Fla. County: _____ Zip Code 32727

Estimated Start Date: September 2004

Estimated End Date; Golf Course: June 30, 2005

Subcontractors

Name	Contact Person	Date Work Begins	Date Work Ends
<i>Soltis Golf</i>	Barry Jones	9/04	4/05
Richards Const.	Richard Muiz	9/04	4/05

APPENDIX 'A'
DELAVEAGA GOLF COURSE,
CITY OF SANTA CRUZ
***STORMWATER POLLUTION PREVENTION PROGRAM**
AUGUST 8, 2004

I. PROJECT DESCRIPTION

The DeLaveaga Golf Course is laid out along ridgelines of the Coastal Range, just above the City of Santa Cruz. It is lined by dense groves of trees—mostly native Oak, Pine, Redwood, Madrone, and Bay, and introduced Cypress and groves of Eucalyptus—that blanket the perimeter slopes and buffer it from urban development. Built in 1970, the course is showing evidence of over 30 years of accumulated wear.

The construction project consists of remodeling (demo, regrading, and returfing) of all Eighteen Tees, and three greens of the existing course. The old asphalt concrete cart path is to be removed and replaced with a concrete path, generally along the same alignment—although a few adjustments to improve flow of players through the course will be made. The existing badly degraded parking lot will be rebuilt (existing asphalt concrete and base removed, and new asphalt and recycled base installed), but not expanded. Two freestanding restrooms will be installed: one near the 4th Green, and one near the 14th Tee.

Depending upon budget, the driving range landing area may be reconstructed: cleared, regraded, and covered in natural or artificial turf. Also, an existing outdoor gathering/barbeque area may be upgraded, with new paving, retaining walls, and lighting, and a new concession building with restrooms installed. While these items are identified as bid alternates in the construction documents, they are included in the Project Scope for the purposes of this SWPPP.

The existing irrigation system will be largely unmodified, though some repiping and head adjustments will be necessary within the “envelopes” for remodeling of the tees and greens, and driving range if reconstructed. Most of the old isolation and gate valves along the existing mainline (approximately 280 valves) are to be replaced.

Because of its location up on the ridgelines, and the lack of trunk line connections to the municipal storm drain network, the great majority of storm runoff sheets across the course and into the perimeter woodland. The few existing drain inlet structures daylight in the finger canyons intercutting the uplift terrace. This pattern will remain unchanged by this Project. Consequently, management practices will focus on construction-period activities, particularly erosion and sedimentation control through silt fences and straw wattling, and protection of storm drain inlets. All disturbance areas are to be permanently stabilized: other than the three small buildings, and paving for cart paths, parking lot, and possible barbeque area patio, the remainder of the project will be replaced with turf.

II. PROJECT SITE

A. **Location and Vicinity Maps:** The following maps identify the Site Location Map (Figure 1) and the Vicinity Map provides an overview of the vicinity, including topography, within one-quarter mile of the site (Figure 2).

B. **Site Map (Figure 3):** Construction Documents and Specifications under separate cover, delineate the on-site topography, and locations of primary erosion and sediment controls of the construction project. The following controls are identified:

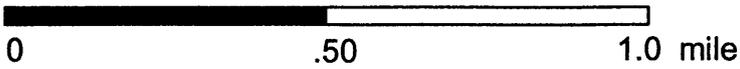
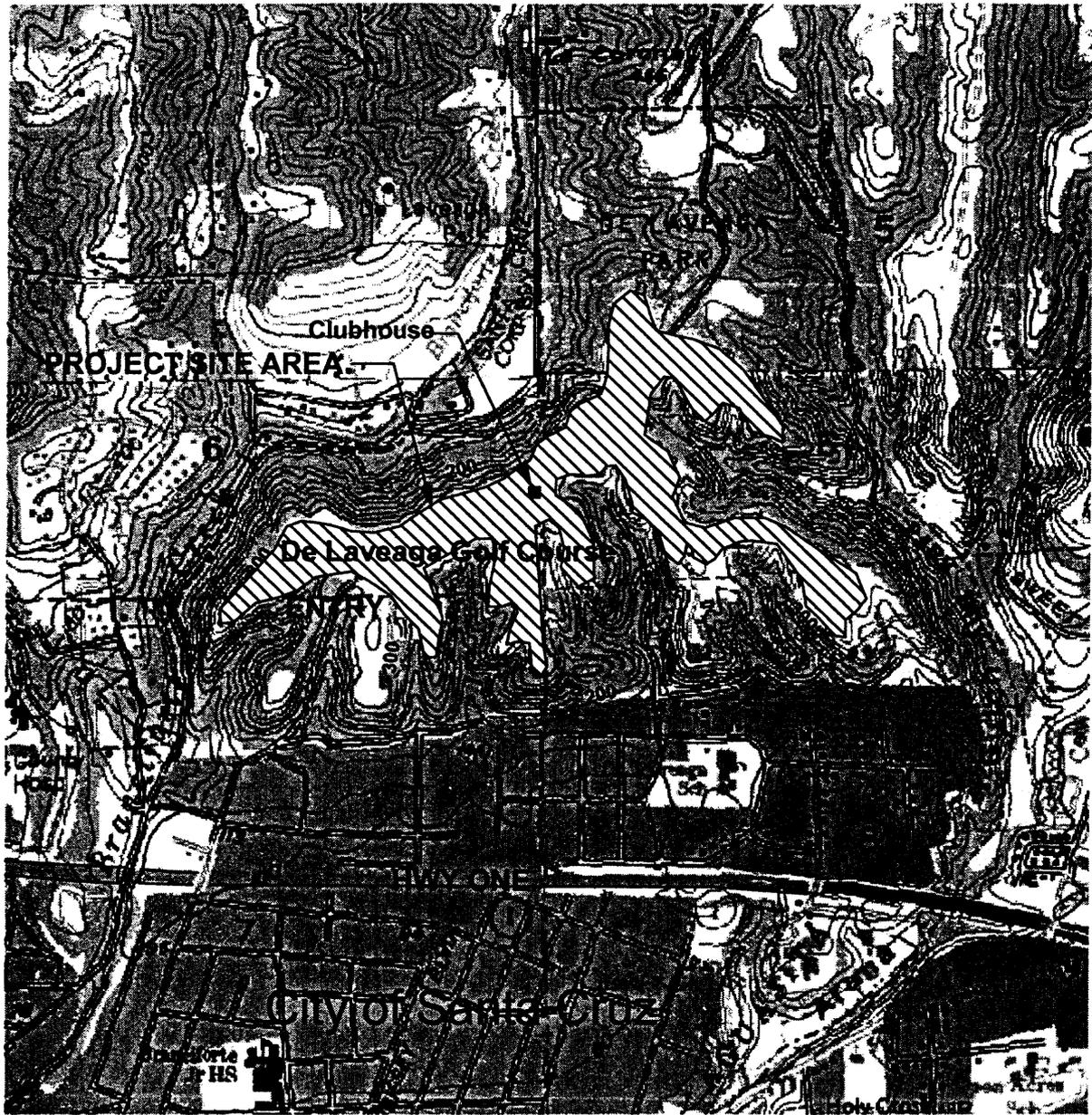
1. **Location of Control Practices:** Temporary control practices during construction include silt fences, sand bags & plastic covers, and straw wattles, etc.
2. **Areas Used to Store Soils, Wastes and Materials:**
Waste Storage: The waste storage area is located within the Contractor storage area, away from waterways. Measures for housekeeping practices detailed herein. Contractor will cover each storage area at least 48 hours before rain.
Materials Storage: The Contractor's storage yard is located as shown on the plan and/or as approved by City of Santa Cruz.
3. **Areas of Grading Cut & Fill:** The general areas of disturbance (site map Figure 3). At the end of the construction process, these areas will be landscaped by the Contractor as permanent erosion control.
4. **Drainage Patterns and Slopes Anticipated after Grading Activities are Completed:** The existing drainage patterns within the site will not be materially changed, except for installation of sub-drainage system, Golf Course, Driving Range, and repaving the Parking Lot. The Parking Lot will have a catch basin and "Stormceptor" oil and grease trap catch basin, installed to control post-construction run-off.
5. **Areas of Soil Disturbance:** Areas of soil disturbance are shown on the Site Map (Figure 3). These include excavation for the Barbecue area, Restrooms, Driving Range, and Restrooms. The Golf Course disturbance areas are individual isolated areas through out the golf course as shown on the Site Map.
6. **Areas of Potential Soil Erosion Where Control Practices Will be Needed During Construction:** Throughout construction, all exposed soils will be stabilized, except where active construction is in progress. These areas include any exposed soil that is subject to erosion either by rainfall striking the ground, runoff flowing over the soil, wind blowing across the soil, and vehicles driving on the soil. Drainage tributaries about the project site at various locations. Where they occur, soil stabilization practices required will include BMP's identified herein.
7. **Existing and Planned Paved Areas and Buildings:** The project includes following:
 1. Two (2) new restrooms at 139 s.f. each (total 278 s.f.)
 2. Repaving Existing Parking Lot: 62,335 s.f.
 3. Replacement of existing cart paths with concrete paving 142,424.s.f.

4. New barbeque area 7,989 s.f. (3,300 s.f. previously existing)
5. Three (3) remodeled Greens, and 18 remodeled Tees.
6. Remodel of existing grass Driving Range.
7. One (1) New Restroom/Concession Building at 300 s.f. replacing existing (+/- 300 s.f.) of a similar size.

These existing paved areas are shown on the Site Plan. The comparison of undisturbed vs. disturbed areas is as follows:

	Project Disturbance Area
Greens	3.17 acres
Cart Paths	3.27 acres
Tees	2.13 acres
Driving Range	3.34 acres
Parking Lot	1.43 acres
Barbecue area	.18 acres
TOTAL DISTURBED AREA	<u>13.5 ACRES</u>

8. **Locations of Post Construction Control Practices:** All permanent control measures to control pollutants in stormwater discharges are shown on Site Map and Construction Plans. These measures include landscape areas, sub-drainage systems and oil and grease trap catch basin, located in the Parking Lot.
9. **Vehicle and Equipment Storage and Service Areas:** The Vehicle and Construction Equipment Storage and Service Area shown on the Site Plan is located next to the 18th Green. The location meets the following criteria:
 - a. Minimize the risks associated with equipment leaks impacting receiving waters
 - b. Contain equipment wastes within a specific area
 - c. Allow for easy cleanup or servicing of equipment
 - d. Prevent run-on/run-off from passing through the area
10. **Areas of Existing Vegetation:** The total Eighteen Hole Golf Course (not including Building, Parking Lot, and Maintenance Building) equals approximately 106 acres of turf, with numerous trees lining and back dropping most holes.



De Laveaga Golf Course
 City of Santa Cruz, California

FIGURE 2

VICINITY MAP
 HDG 122.2



De Laveaga Golf Course
City of Santa Cruz, California

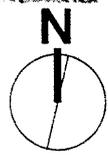


FIGURE 1

LOCATION MAP
HDG 122.2

LEGEND

NEW CONCRETE CARTPATH:

ALIGNMENT TO COINCIDE W/
EXISTING CARTPATH, EXCEPT
WHERE SHOWN.



EXISTING CARTPATH:

PORTIONS TO BE REMOVED,
BROUGHT TO GRADE, &
PLANTED IN TURF.



REBUILD (18) TEE COMPLEXES

(3 TEE PADS, TYPICAL;
MORE WHERE SHOWN)



REBUILD/CONSTRUCT

(3) GREEN COMPLEXES,
W/ NEW BUNKERS



CONSTRUCTION ENVELOPE

GRADING DISTURBANCE FOR:
TEES, GREENS, DRIVING RANGE,
PARKING LOT, BBQ AREA.



HIGH POINT @ ROADWAY



SILT FENCE



SURFACE STORM FLOWS



FIBER ROLLS



STORM DRAIN INLET PROTECTION

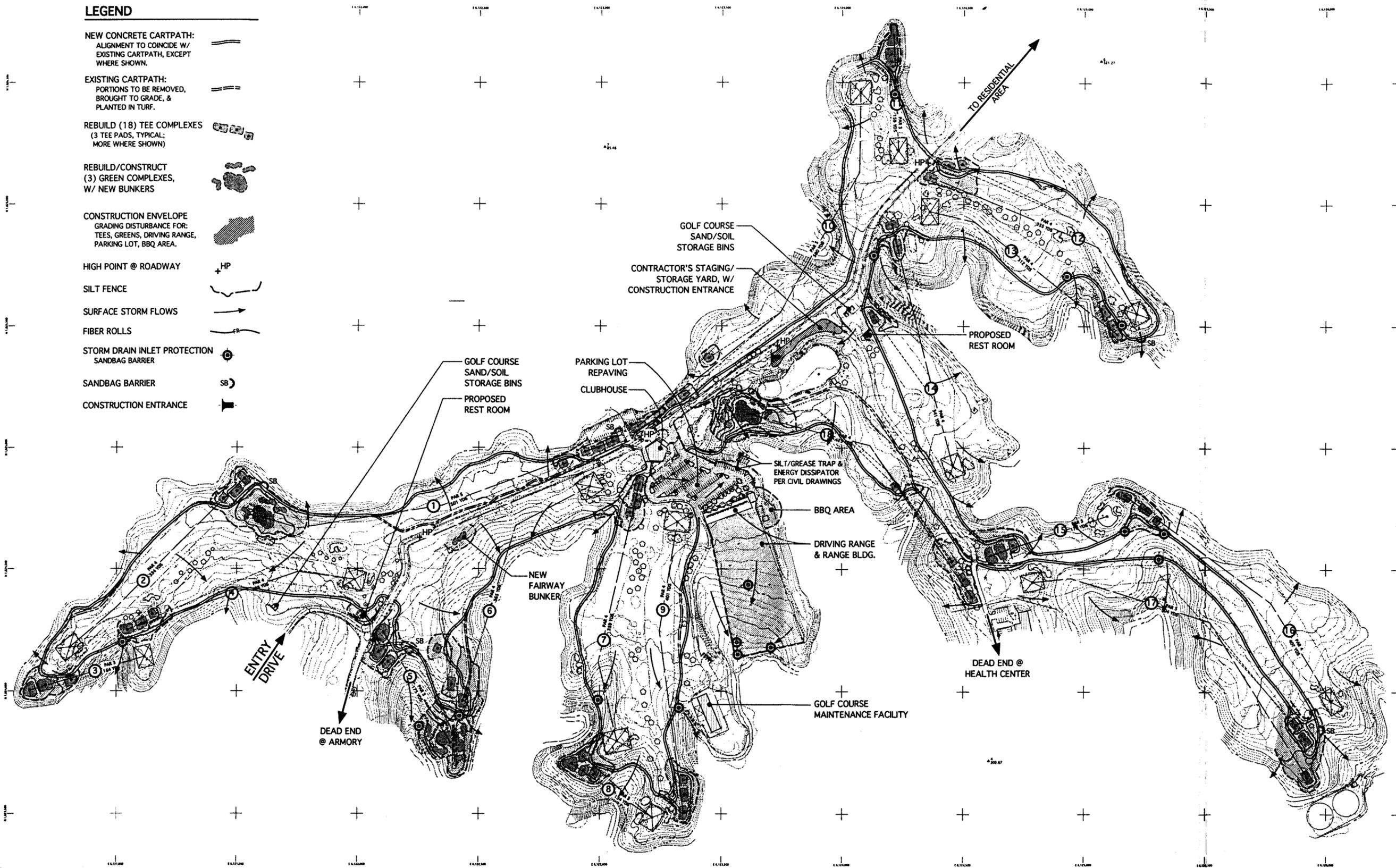
SANDBAG BARRIER



SANDBAG BARRIER



CONSTRUCTION ENTRANCE



CONSULTANT:
HALSEY DARAY GOLF
5185 COMANCHE DRIVE, SUITE C
LA MESA, CA 91941
PHONE: (619) 463-9285
FAX: (619) 463-4985
GOLF COURSE ARCHITECTURE
SITE PLANNING
LANDSCAPE ARCHITECTURE



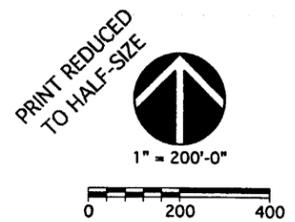
GOLF IMPROVEMENTS PROJECT
DE LAVEAGA GOLF COURSE
SANTA CRUZ, CALIFORNIA
401 UPPER PARK ROAD

CITY CONTACT:
STEVE HAMMACK,
SUPERINTENDENT OF PARKS
& RECREATION DEPARTMENT
323 CHURCH STREET
SANTA CRUZ, CA 95060
831-420-5366

REVIEWED	DATE
REVIEWED	DATE
REVISIONS	DATE

SHEET NAME: SWPPP
DATE: 08/06/04

SWPPP SITE MAP	
DRAWING NO.	JOB NO. 122.2
FILE NO.	SHEET FIGURE 3



III. INVENTORY OF CONTRACTOR'S ACTIVITIES

BMP's for Contractor Activities

A. Toxic Materials:

Existing Toxic Materials

No known toxic materials have been stored, disposed, spilled or leaked in significant quantities onto the construction site to the best of our knowledge.

Anticipated Toxic Materials:

During the construction project it is anticipated to have the following toxic materials present at the site:

- petroleum products
- solvents
- asphalt
- wood treated products
- curing compounds
- metal
- paint products
- masonry and concrete
- cleaners
- wash water

All of these toxic materials will be handled in accordance with Federal, State, Regional, and Local Laws and Regulations, and disposed of as a hazardous waste.

The following conditions also apply:

- Contractor will use all of the product before disposing of the container. All containers will have original product label prior to disposal, including safety and disposal information (such as Hazardous Substance Communication Program and Material Safety Data Sheets (MSDS)).
- Contractor will not clean out brushes or paint containers on dirt or into streets, gutters, storm drains, or streams. Specified practices require "painting-out" brushes as much as practical. Water-based paints will be rinsed into the sanitary sewer. Thinners and solvents will be filtered and re-used or disposed of as hazardous waste.
- All hazardous wastes will be stored in designated areas with secondary containment and protected from vandalism. Contractor will not mix wastes. Recycling and disposals of wastes will be allowed only at City-designated legal disposal facilities. Contractor will arrange for waste collection before containers overflow. Contractor will have stockpiled spill clean-up materials readily accessible.

B. Practices to Minimize Contact with Storm Water

1. Construction Materials: Construction activities have the highest potential to have an impact on stormwater (e.g. grading and construction of the remodeled Greens, Parking Lot, Driving Range, and Restroom). Erosion and sediment transport control mechanisms will be put in place prior to the onset of the first major winter storms to avoid discharge from the construction sites into the drainage ways.

An accurate and up-to-date list and inventory of materials delivered and stored on-site, will be maintained by the Contractor. The Contractor will minimize the amount of materials stored at the site. During rainy periods, the Contractor will store materials in covered areas and within secondary containment (such as earthen dikes,

horse troughs or spill blanket, with surrounding berms.) All chemicals stored on the site will be stored in a lockable storage shed, in their original container, and well labeled. Storage of chemicals is to meet all Federal, State, and Local requirements. Materials that have the potential to react, are to be stored separately. Any paving and seal coating will not be performed in wet weather, or when any rain is forecast. Any accidental spills or leaks that occur as a result of any construction activities are to be cleaned up immediately by the Contractor, using "dry methods" (with absorbent materials and/or rags) or dug up, and the contaminated soil properly disposed as hazardous wastes.

2. Construction Equipment and Vehicles: The following methods are required to prevent and control pollution from construction equipment and vehicles:
 3. Maintenance:
 - Contractor required to maintain all construction equipment to prevent oil or other fluid leaks. All major equipment maintenance and repair jobs will take place off-site.
 - Keep vehicles and equipment clean without excessive build-up of oil and grease. All equipment washing will take place off-site.
 4. Fueling:
 - Construction vehicles will be refueled in a designated refueling location where spill can be contained. No mobile fueling of mobile construction equipment will be permitted.
 - No fuel storage tanks will be on-site.
 - Contractor will stockpile spill clean-up materials where they will be readily accessible.
 5. Equipment Washing: All equipment washing will take place off-site. and maintenance materials, in the designated area delineated on the Site Storage: Contractor will store vehicles and equipment, and cleaning Map. All cleaning and maintenance activities are to occur only in such designated areas. The existing drainage system directs concentrated storm water run-on/run-off around this storage and service area. Contractor will minimize contact of storm water with stored equipment on pallets or other similar devices.
 6. Construction Material Loading, Unloading and Access Areas: Materials are to be located outside of the drip-line of existing trees to be protected. Construction debris and refuse must be removed from the site and disposed of in an approved manner. Materials that are being transported to, or around the site by any equipment are to be adequately secured. Loose materials, such as dirt, are to be covered with tarps or plastic sheeting during transport, as well as when stored to protect materials from rainfall, runoff and wind. To assist the Contractor in meeting these requirements, a "field check" with the Engineer and Contractor, will take place at the onset of construction to review these sites so there will be no confusion once construction begins.
 7. Pre-construction Control Practices: Prior to issuing the Contractor a "Notice to Proceed" for the construction of this project, there will be a Pre-Construction Meeting. At this meeting, the Engineer will review the best management practices to reduce sediment or other pollutants from entering storm water discharge points as set forth in the construction specifications and SWPPP. Before any grading

takes place, the Engineer will walk the site with the Contractor to: tag and/or fence vegetation that is to be protected; and to clarify the limits of grading and limits of work.

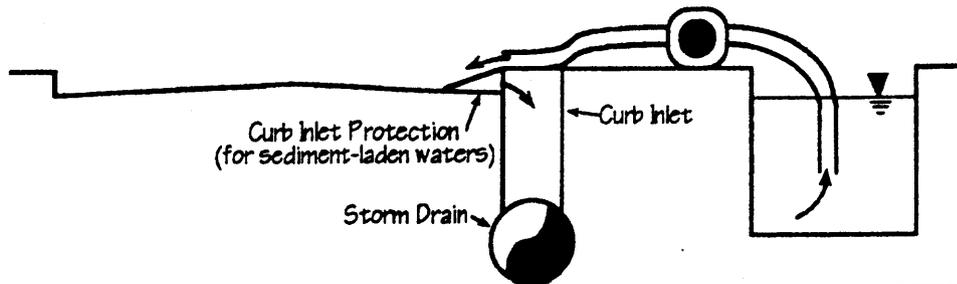
8. **Methods of On-site Storage and Disposal of Construction Materials:** Good housekeeping practices and best management practices (BMPS) are identified in the attached chart "BMPS for Contractor Activities" to reduce risks associated with storm water pollution, injury to workers or visitors, ground water pollution and soil contamination from on-site storage, and disposal of construction materials.

Delaveaga Golf Course
Golf Course Remodel and Improvements
Santa Cruz, CA

SWPPP Best Management Practices Matrix
Contractor Activities

Contractor Activities	Construction Practices			Materials Management			Waste Management					Vehicle & Equipment Management			Training	Primary Pollutant(s) of Concern
	CA1	CA2	CA3	CA10	CA11	CA12	CA20	CA21	CA22	CA23	CA24	CA30	CA31	CA32	CA40	
1. Toxic Materials	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	petroleum products, herbicides, masonry, concrete, cleaners, curing compounds, wood treatment products, paint products
2a. Practices to Minimize construction material equipment and vehicles contact with storm water	✓	✓	✓		✓										✓	fuels, oils, grease, hydraulic fluids
2b. Construction equipment and vehicles maintenance, fueling, washing & storage												✓	✓	✓	✓	fuels, oils, grease, hydraulic fluids
3. Construction Material Loading, Unloading and Access Areas				✓		✓									✓	building materials
4. Preconstruction Control Practices	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓	see activity #1 above
5. Methods of On-site Storage and Disposal of Construction Materials							✓	✓	✓	✓	✓				✓	building materials

ACTIVITY: DEWATERING OPERATIONS



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from dewatering operations by using sediment controls and by testing the groundwater for pollution.

APPROACH

There are two general classes of pollutants that may result from dewatering operations; sediment, and toxics and petroleum products. A high sediment content in dewatering discharges is common because of the nature of the operation. On the other hand, toxics and petroleum products are not commonly found in dewatering discharges unless, the site or surrounding area has been used for light or heavy industrial activities, or the area has a history of groundwater contamination. The following steps will help reduce storm water pollution from dewatering discharges:

Sediment

- Use sediment controls to remove sediment from water generated by dewatering (See Sediment Trap (ESC 55) and Sediment Basin (ESC 56) in Chapter 5).
- Use filtration to remove sediment from a sediment trap or basin. Filtration can be achieved with:
 - Sump pit and a perforated or slit standpipe with holes and wrapped in filter fabric. The standpipe is surrounded by stones which filters the water as it collects in the pit before being pumped out. Wrapping the standpipe in filter fabric may require an increased suction inlet area to avoid clogging and unacceptable pump operation.
 - Floating suction hose to allow cleaner surface water to be pumped out.

Toxics and Petroleum Products

- In areas suspected of having groundwater pollution, sample the groundwater near the excavation site and have the water tested for known or suspected pollutants at a certified laboratory. Check with the Regional Water Quality Control Board and the local wastewater treatment plant for their requirements for dewatering, additional water quality tests, and disposal options.
- With a permit from the Regional Water Quality Control Board, you may be able to recycle/reuse pumped groundwater for landscape irrigation, or discharge to the storm sewer. With a permit from the local agency, you may be able to treat pumped groundwater and discharge it to the municipal wastewater treatment plant via the sanitary sewer.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA1



CONTRACTOR ACTIVITY: DEWATERING OPERATIONS (Continue)

REQUIREMENTS

- Costs (Capital, O&M)
 - Sediment controls are low cost measures.
 - Treatment and/or discharge of polluted groundwater can be quite expensive.
- Maintenance
 - Maintain sediment controls and filters in good working order. (See Chapter 5 for details)
 - Inspect excavated areas daily for signs of contaminated water as evidenced by discoloration, oily sheen, or odors.

LIMITATIONS

- The presence of contaminated water may indicate contaminated soil as well. See CA22 (Contaminated Soil Management) in this chapter for more information.

REFERENCES

Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

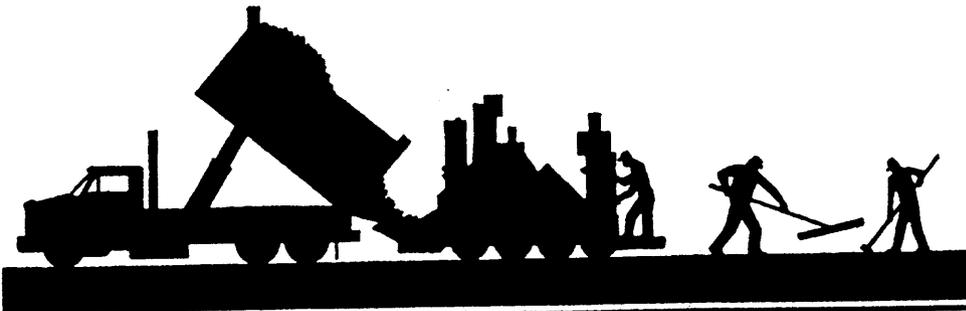
Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

CA1



ACTIVITY: PAVING OPERATIONS

Graphic: North Central Texas COG, 1993



DESCRIPTION

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runoff and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

APPROACH

- Avoid paving during wet weather.
- Store materials away from drainage courses to prevent storm water runoff (see CA10 Material Delivery and Storage).
- Protect drainage courses, particularly in areas with a grade, by employing BMPs to divert runoff or trap/filter sediment (see Chapter 5).
- Leaks and spills from paving equipment can contain toxic levels of heavy metals and oil and grease. Place drip pans or absorbent materials under paving equipment when not in use. Clean up spills with absorbent materials rather than burying. See CA32 (Vehicle and Equipment Maintenance) and CA12 (Spill Prevention and Control) in this chapter.
- Cover catch basins and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
- Shovel or vacuum saw-cut slurry and remove from site. Cover or barricade storm drains during saw cutting to contain slurry.
- If paving involves portland cement concrete, see CA23 (Concrete Waste Management) in this chapter.
- If paving involves asphaltic concrete, follow these steps:
 - Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks by sweeping. Properly dispose of this waste by referring to CA20 (Solid Waste Management) in this chapter.
 - Old asphalt must be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.
 - If paving involves on-site mixing plant, follow the storm water permitting requirements for industrial activities.
- Train employees and subcontractors.

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Inspect employees and subcontractors to ensure that measures are being followed.
 - Keep ample supplies of drip pans or absorbent materials on-site.

LIMITATIONS

- There are no major limitations to this best management practice.

Objectives

Housekeeping Practices

- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA2



CONTRACTOR ACTIVITY: PAVING OPERATIONS (Continue)

REFERENCES

Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

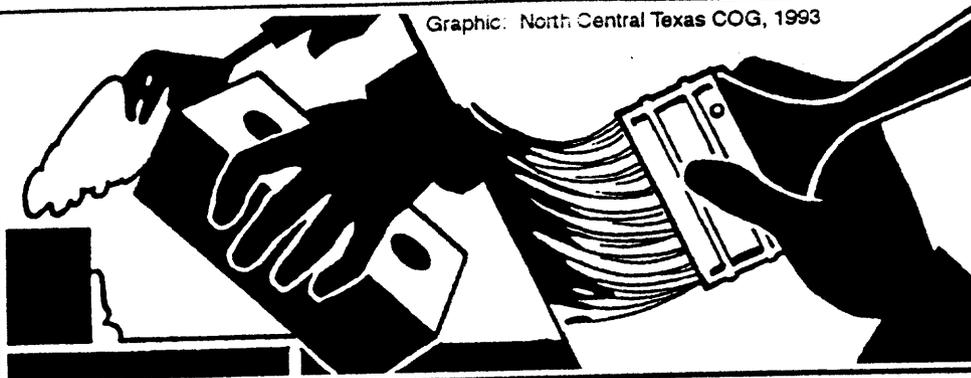
Hot-mix Asphalt Paving Handbook, U.S. Army Corps of Engineers, AC 150/5370-14, Appendix I, July 1991.

CA2



ACTIVITY: STRUCTURE CONSTRUCTION AND PAINTING

Graphic: North Central Texas COG, 1993



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from structure construction and painting by enclosing or covering or berming building material storage areas, using good housekeeping practices, using safer alternative products, and training employees and subcontractors.

APPROACH

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Use soil erosion control techniques if bare ground is exposed (See Chapter 5).
- Buy recycled or less hazardous products to the maximum extent practicable.
- Conduct painting operations consistent with local air quality and OSHA regulations.
- Properly store paints and solvents. See CA10 (Material Delivery and Storage) in this chapter.
- Properly store and dispose waste materials generated from the activity. See the waste management BMPs (CA20 to CA24) in this chapter.
- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable.
- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.
- Clean the storm drain system in the immediate construction area after construction is completed.
- Educate employees who are doing the work.
- Inform subcontractors of company policy on these matters and include appropriate provisions in their contract to make certain proper housekeeping and disposal practices are implemented.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
 - These BMPs are generally of low to moderate cost.
- Maintenance
 - Maintenance should be minimal.

LIMITATIONS

- Safer alternative products may not be available, suitable, or effective in every case.
- Hazardous waste that cannot be re-used or recycled must be disposed of by a licensed hazardous waste hauler.

Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA3



ACTIVITY: STRUCTURE CONSTRUCTION AND PAINTING (Continue)

- Be certain that actions to help storm water quality are consistent with Cal- and Fed-OSHA and air quality regulations.

Construction and painting activities can generate pollutants that can reach storm water if proper care is not taken. The sources of these contaminants may be solvents, paints, paint and varnish removers, finishing residues, spent thinners, soap cleaners, kerosene, asphalt and concrete materials, adhesive residues, and old asbestos insulation. For specific information on some of these wastes see the following BMPs in this chapter:

CA20 Solid Waste,
CA21 Hazardous Waste, and
CA23 Concrete Waste.

More specific information on structure construction practices is listed below.

Erosion and Sediment Control

If the work involves exposing large areas of soil or if old buildings are being torn down and not replaced in the near future, employ the appropriate soil erosion and control techniques described in Chapter 5.

Storm/Sanitary Sewer Connections

Carefully install all plumbing and drainage systems. Cross connections between the sanitary and storm drain systems, as well as any other connections into the drainage system from inside a building, are illegal. Color code or flag pipelines on the project site to prevent such connections, and train construction personnel.

Painting

Local air pollution regulations may, in many areas of the state, specify painting procedures which if properly carried out are usually sufficient to protect storm water quality. These regulations may require that painting operations be properly enclosed or covered to avoid drift. Use temporary scaffolding to hang drop cloths or draperies to prevent drift. Application equipment that minimizes overspray also helps. When using sealants on wood, pavement, roofs, etc, quickly clean up spills. Remove excess liquid with absorbent material or rags.

If painting requires scraping or sand blasting of the existing surface, use a drop cloth to collect most of the chips. Dispose the residue properly. If the paint contains lead or tributyl tin, it is considered a hazardous waste. Refer to the waste management BMPs in this chapter for more information.

Mix paint indoors, in a containment area, or in a flat unpaved area not subject to significant erosion. Do so even during dry weather because cleanup of a spill will never be 100% effective. Dried paint will erode from sloped surfaces and be washed away by storms. If using water based paints, clean the application equipment in a sink that is connected to the sanitary sewer or in a containment area where the dried paint can be readily removed. Properly store leftover paints if they are to be kept for the next job, or dispose of properly.

Roof work

When working on roofs, if small particles have accumulated in the gutter, either sweep out the gutter or wash the gutter and trap the particles at the outlet of the downspout. A sock or geofabric placed over the outlet may effectively trap the materials. If the downspout is lined tight, place a temporary plug at the first convenient point in the storm drain and pump out the water with a vacor truck, and clean the catch basin sump where you placed the plug.

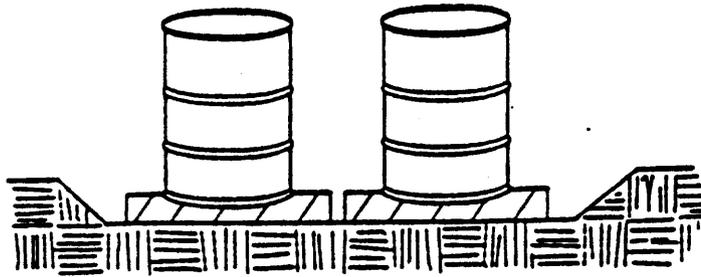
REFERENCES

Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

CA3



ACTIVITY: MATERIAL DELIVERY AND STORAGE



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from material delivery and storage by minimizing the storage of hazardous materials on-site, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see CA11 (Material Use), or CA12 (Spill Prevention and Control). For information on wastes, see the waste management BMPs in this chapter.

APPROACH

The following materials are commonly stored on construction sites:

- Soil,
- Pesticides and herbicides,
- Fertilizers,
- Detergents,
- Plaster or other products,
- Petroleum products such as fuel, oil, and grease, and
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

Storage of these materials on-site can pose the following risks:

- Storm water pollution,
- Injury to workers or visitors,
- Groundwater pollution, and
- Soil contamination.

Therefore, the following steps should be taken to minimize your risk:

- Designate areas of the construction site for material delivery and storage.
 - Place near the construction entrances, away from waterways
 - Avoid transport near drainage paths or waterways
 - Surround with earth berms (see ESC30, Earth Dike.)
 - Place in an area which will be paved
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.
- Keep an accurate, up-to-date inventory of materials delivered and stored on-site.
- Keep your inventory down.

Objectives

Housekeeping Practices

- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA10



ACTIVITY: MATERIAL DELIVERY AND STORAGE (Continue)

- Minimize hazardous materials on-site storage.
- Handle hazardous materials as infrequently as possible.
- During the rainy season, consider storing materials in a covered area. Store materials in secondary containments such as an earthen dike, horse trough; or even a children's wading pool for non-reactive materials such as detergents, oil, grease, and paints. Small amounts of material may be secondarily contained in "bus boy" trays or concrete mixing trays.
- Do not store chemicals, drums, or bagged materials directly on the ground. Place these items on a pallet and, when possible, in secondary containment.
- If drums must be kept uncovered, store them at a slight angle to reduce ponding of rainwater on the lids and to reduce corrosion.
- Try to keep chemicals in their original containers, and keep them well labeled.
- Train employees and subcontractors.
- Employees trained in emergency spill cleanup procedures should be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove materials and any contaminated soil (See CA22). If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

REQUIREMENTS

- Cost (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Keep the designated storage area clean and well organized.
 - Conduct routine weekly inspections and check for external corrosion of material containers.
 - Keep an ample supply of spill cleanup materials near the storage area.

LIMITATIONS

- Storage sheds often must meet building and fire code requirements.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites; Flood Control District of Maricopa County, AZ, September 1992.

Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Storm Water Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

CA10



ACTIVITY: MATERIAL USE

Graphic: North Central Texas COG, 1993



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from material use by using alternative products, minimizing hazardous material use on-site, and training employees and subcontractors.

APPROACH

The following materials are commonly used on construction sites:

- Pesticides and herbicides,
- Fertilizers,
- Detergents,
- Plaster and other products,
- Petroleum products such as fuel, oil, and grease, and
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

Use of these materials on-site can pose the following risks:

- Storm water pollution,
- Injury to workers or visitors,
- Groundwater pollution, and
- Soil contamination.

Therefore, the following steps should be taken to minimize your risk:

- Use less hazardous, alternative materials as much as possible.
- Minimize use of hazardous materials on-site.
- Use materials only where and when needed to complete the construction activity.
- Follow manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Personnel who use pesticides should be trained in their use. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct on-site inspections.
- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydroseeding. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains.
- Train employees and subcontractors in proper material use.

Objectives

Housekeeping Practices

- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA11

Best Management Practices

ACTIVITY: MATERIAL USE (Continue)

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Maintenance of this best management practice is minimal.

LIMITATIONS

- Alternative materials may not be available, suitable, or effective in every case.

REFERENCES

Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

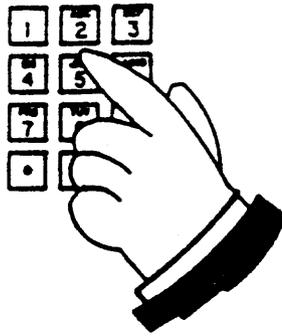
Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Storm Water Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

CA11



ACTIVITY: SPILL PREVENTION AND CONTROL



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, CA10 (Material Delivery and Storage) and CA11 (Material Use), also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this chapter.

APPROACH

The following steps will help reduce the storm water impacts of leaks and spills:

Define "Significant Spill"

- Different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.

General Measures

- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals.

Cleanup

- Clean up leaks and spills immediately.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this chapter for specific information.

Reporting

- Report significant spills to local agencies, such as the Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).

Objectives

Housekeeping Practices

- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA12



Best
Management
Practices

ACTIVITY: SPILL PREVENTION AND CONTROL (Continue)

Use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- If maintenance must occur on-site, use a designated area and/or a secondary containment, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.
- Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trash cans or dumpsters can leak oil and pollute storm water. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.
- Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/leaks.

REQUIREMENTS

- Costs (Capital, O&M)
 - Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.
- Maintenance
 - Keep ample supplies of spill control and cleanup materials on-site, near storage, unloading, and maintenance areas.
 - Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals on-site.

LIMITATIONS

- If necessary, use a private spill cleanup company.

REFERENCES

Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

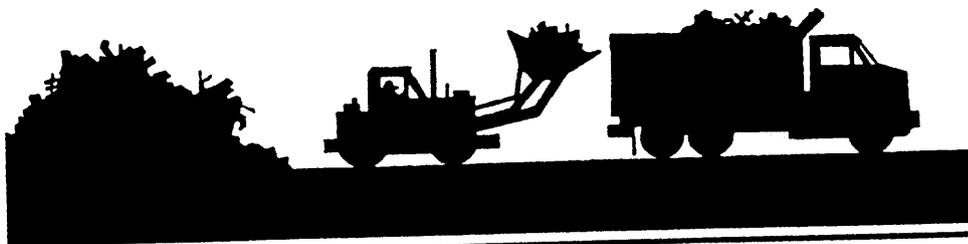
Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

CA12



ACTIVITY: SOLID WASTE MANAGEMENT

Graphic: North Central Texas COG, 1990



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

APPROACH

Solid waste is one of the major pollutants resulting from construction. Construction debris includes:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction;
- Packaging materials including wood, paper and plastic;
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products; and
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, and plastic wrappers, and cigarettes.

The following steps will help keep a clean site and reduce storm water pollution:

- Select designated waste collection areas on-site.
- Inform trash hauling contractors that you will accept only water-tight dumpsters for on-site use. Inspect dumpsters for leaks and repair any dumpster that is not water tight.
- Locate containers in a covered area and/or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it's windy.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Erosion and sediment control devices tend to collect litter. Remove this solid waste promptly.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Salvage or recycle any useful material. For example, trees and shrubs from land clearing can be used as a brush barrier (see ESC53), or converted into wood chips, then used as mulch on graded areas (see ESC11).
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to trash hauling contractor.
- Arrange for regular waste collection before containers overflow.

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA20



ACTIVITY: SOLID WASTE MANAGEMENT (Continue)

- If a container does spill, clean up immediately.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.
- Train employees and subcontractors in proper solid waste management.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Collect site trash daily.
 - Inspect construction waste area regularly.
 - Arrange for regular waste collection.

LIMITATIONS

- There are no major limitations to this best management practice.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites; Flood Control District of Maricopa County, AZ, September 1992.

Processes, Procedures, and Methods to Control Pollution Resulting from all Construction Activity; USEPA, 430/9-73-007, 1973.

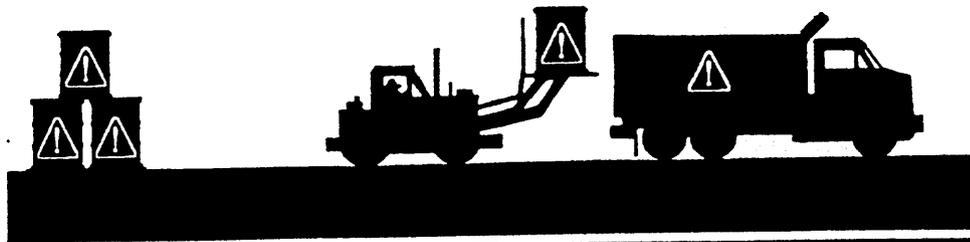
Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

CA20



ACTIVITY: HAZARDOUS WASTE MANAGEMENT

Graphic: North Central Texas COG, 1993



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

APPROACH

Many of the chemicals used on-site can be hazardous materials which become hazardous waste upon disposal. These wastes may include:

- Paints and solvents;
- Petroleum products such as oils, fuels, and grease;
- Herbicides and pesticides;
- Acids for cleaning masonry; and
- Concrete curing compounds.

In addition, sites with existing structures may contain wastes which must be disposed of in accordance with Federal, State, and local regulations. These wastes include:

- Sandblasting grit mixed with lead-, cadmium-, or chromium-based paints;
- Asbestos; and
- PCBs (particularly in older transformers).

The following steps will help reduce storm water pollution from hazardous wastes:

Material Use

- Use all of the product before disposing of the container.
- Do not remove the original product label, it contains important safety and disposal information.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with Federal and State regulations.
- Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. "Paint out" brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and re-use thinners and solvents. Dispose of excess oil-based paints and sludge as hazardous waste.

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA21



ACTIVITY: HAZARDOUS WASTE MANAGEMENT (Continue)

Waste Recycling/Disposal

- Select designated hazardous waste collection areas on-site.
- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place hazardous waste containers in secondary containment.
- Do not mix wastes, this can cause chemical reactions, make recycling impossible, and complicate disposal.
- Recycle any useful material such as used oil or water-based paint.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Arrange for regular waste collection before containers overflow.
- Make sure that hazardous waste (e.g. excess oil-based paint and sludges) is collected, removed, and disposed of only at authorized disposal areas.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

Training

- Train employees and subcontractors in proper hazardous waste management.
- Warning signs should be placed in areas recently treated with chemicals.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- If a container does spill, clean up immediately.

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Inspect hazardous waste receptacles and area regularly.
 - Arrange for regular hazardous waste collection.

LIMITATIONS

- Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.

REFERENCES

Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

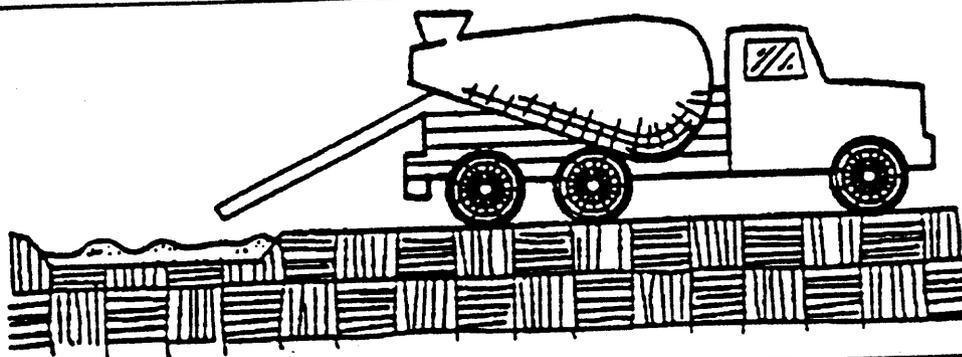
Processes, Procedures, and Methods to Control Pollution Resulting from all Construction Activity; USEPA, 430/9-73-007, 1973.

Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

CA21



ACTIVITY: CONCRETE WASTE MANAGEMENT



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

APPROACH

The following steps will help reduce storm water pollution from concrete wastes:

- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete or cement on-site.
- Perform washout of concrete trucks off site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- For on-site washout:
 - locate washout area at least 50 feet from storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste;
 - wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed of properly.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water to a bermed or level area.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stock pile, or dispose in the trash.
- Train employees and subcontractors in proper concrete waste management.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Inspect subcontractors to ensure that concrete wastes are being properly managed.
 - If using a temporary pit, dispose hardened concrete on a regular basis.

LIMITATIONS

- Off-site washout of concrete wastes may not always be possible.

Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA23



ACTIVITY: CONCRETE WASTE MANAGEMENT (Continue)

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites; Flood Control District of Maricopa County, AZ, July 1992.

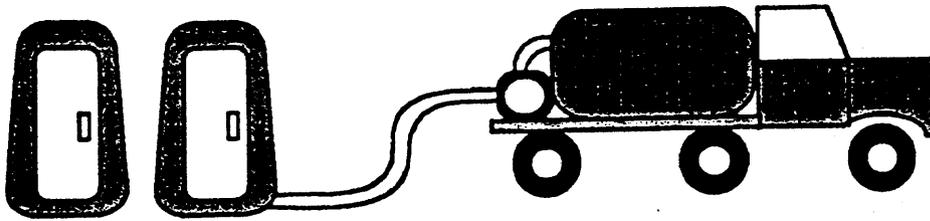
Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

CA23



ACTIVITY: SANITARY/SEPTIC WASTE MANAGEMENT



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from sanitary/septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

APPROACH

Sanitary or septic wastes should be treated or disposed of in accordance with State and local requirements. These requirements may include:

- Locate sanitary facilities in a convenient location.
- Untreated raw wastewater should never be discharged or buried.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- If using an on-site disposal system (OSDS), such as a septic system, comply with local health agency requirements.
- Temporary sanitary facilities that discharge to the sanitary sewer system should be properly connected to avoid illicit discharges.
- If discharging to the sanitary sewer, contact the local wastewater treatment plant for their requirements.
- Sanitary/septic facilities should be maintained in good working order by a licensed service.
- Arrange for regular waste collection by a licensed hauler before facilities overflow.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Inspect facilities regularly.
 - Arrange for regular waste collection.

LIMITATIONS

- There are no major limitations to this best management practice.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites; Flood Control District of Maricopa County, AZ, September 1992.

Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

Likely to Have Significant Impact

Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

High Low

CA24



Best Management Practices

ACTIVITY: VEHICLE AND EQUIPMENT CLEANING

Graphic: North Central Texas COG, 1993



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment cleaning by using off-site facilities, washing in designated, contained areas only, eliminating discharges to the storm drain by infiltrating or recycling the wash water, and/or training employees and subcontractors.

APPROACH

- Use off-site commercial washing businesses as much as possible. Washing vehicles and equipment outdoors or in areas where wash water flows onto paved surfaces or into drainage pathways can pollute storm water. If you wash a large number of vehicles or pieces of equipment, consider conducting this work at an off-site commercial business. These businesses are better equipped to handle and dispose of the wash waters properly. Performing this work off-site can also be economical by eliminating the need for a separate washing operation at your site.
- If washing must occur on-site, use designated, bermed wash areas to prevent wash water contact with storm water, creeks, rivers, and other water bodies. The wash area can be sloped for wash water collection and subsequent infiltration into the ground.
- Use as little water as possible to avoid having to install erosion and sediment controls for the wash area.
- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning on-site. Steam cleaning can generate significant pollutant concentrations.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Minimal, some berm repair may be necessary.

LIMITATIONS

- Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades.
- Sending vehicles/equipment off-site should be done in conjunction with ESC24 (Stabilized Construction Entrance).

REFERENCE

Swisher, R.D., 1987. Surfactant Biodegradation, Marcel Decker Corporation

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

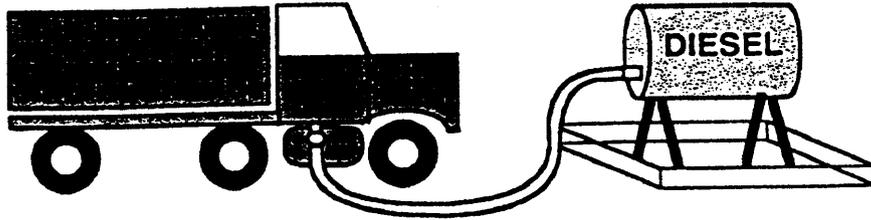
- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA30



ACTIVITY: VEHICLE AND EQUIPMENT FUELING



DESCRIPTION

Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

APPROACH

- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These businesses are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.
- Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above measures are low cost, except for the capital costs of above ground tanks that meet all local environmental, zoning, and fire codes.
- Maintenance
 - Keep ample supplies of spill cleanup materials on-site.
 - Inspect fueling areas and storage tanks on a regular schedule.

LIMITATIONS

- Sending vehicles/equipment off-site should be done in conjunction with ESC24 (Stabilized Construction Entrance).

Objectives

Housekeeping Practices

- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA31



ACTIVITY: VEHICLE AND EQUIPMENT MAINTENANCE

Graphic: North Central Texas COG, 1995



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment maintenance by running a "dry site". This involves using off-site facilities, performing work in designated areas only, providing cover for materials stored outside, checking for leaks and spills, containing and cleaning up spills immediately, and training employees and subcontractors.

APPROACH

- Keep vehicles and equipment clean, don't allow excessive build-up of oil and grease.
- Use off-site repair shops as much as possible. Maintaining vehicles and equipment outdoors or in areas where vehicle or equipment fluids may spill or leak onto the ground can pollute storm water. If you maintain a large number of vehicles or pieces of equipment, consider using an off-site repair shop. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur on-site, use designated areas, located away from drainage courses, to prevent the runoff of storm water and the runoff of spills.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
 - All of the above are low cost measures.
- Maintenance
 - Keep ample supplies of spill cleanup materials on-site.
 - Inspect maintenance areas on a regular schedule.

Objectives

Housekeeping Practices

- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

CA32



ACTIVITY: VEHICLE AND EQUIPMENT MAINTENANCE (Continue)

LIMITATIONS

- Sending vehicles/equipment off-site should be done in conjunction with ESC24 (Stabilized Construction Entrance).

Outdoor vehicle or equipment maintenance is a potentially significant source of storm water pollution. Activities that can contaminate storm water include engine repair and service, particularly changing or replacement of fluids, and outdoor equipment storage and parking (dripping engines). For further information on vehicle or equipment servicing, see CA30, Vehicle and Equipment Cleaning, and CA31, Vehicle and Equipment Fueling.

Listed below is further information if you must perform vehicle or equipment maintenance on-site.

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, 1,1,1-trichloroethane, or methylene chloride. Many of these parts cleaners are harmful and must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents (1,1,1-trichloroethane, methylene chloride, etc.) with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check list of active ingredients to see whether it contains chlorinated solvents. The "chlor" term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

Recycling/Disposal

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents (like 1,1,1-trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits). Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

Oil filters disposed of in trash cans or dumpsters can leak oil and contaminate storm water. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.

Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Do not bury used tires.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites; Flood Control District of Maricopa County, AZ, September 1992.

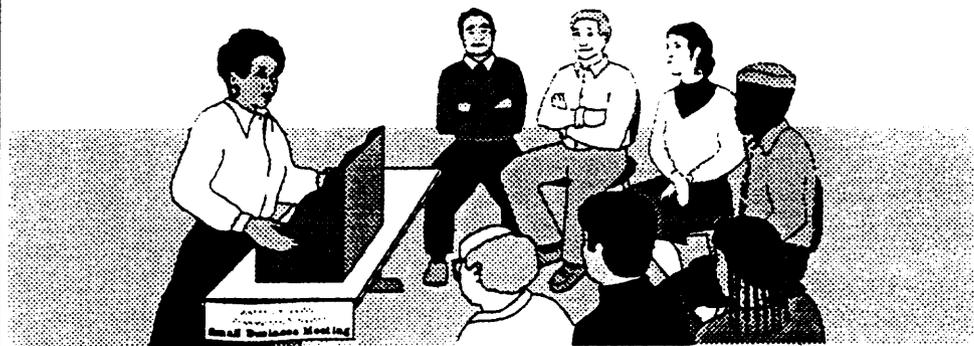
Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

CA32



ACTIVITY: EMPLOYEE/SUBCONTRACTOR TRAINING



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

DESCRIPTION

Employee/subcontractor training, like maintenance or a piece of equipment, is not so much a best management practice as it is a method by which to implement BMPs. This fact sheet highlights the importance of training and of integrating the elements of employee/subcontractor training from the individual source controls into a comprehensive training program as part of a company's Storm Water Pollution Prevention Plan (SWPPP).

The specific employee/subcontractor training aspects of each of the source controls are highlighted in the individual fact sheets. The focus of this fact sheet is more general, and includes the overall objectives and approach for assuring employee/subcontractor training in storm water pollution prevention. Accordingly, the organization of this fact sheet differs somewhat from the other fact sheets in this chapter.

OBJECTIVES

Employee/subcontractor training should be based on four objectives:

- Promote a clear identification and understanding of the problem, including activities with the potential to pollute storm water;
- Identify solutions (BMPs);
- Promote employee/subcontractor ownership of the problems and the solutions; and
- Integrate employee/subcontractor feedback into training and BMP implementation.

APPROACH

- Integrate training regarding storm water quality management with existing training programs that may be required for your business by other regulations such as: the Illness and Injury Prevention Program (IIPP) (SB 198) (California Code of Regulations Title 8, Section 3203), the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard (29 CFR 1910.120), the Spill Prevention Control and Countermeasure (SPCC) Plan (40 CFR 112), and the Hazardous Materials Management Plan (Business Plan) (California Health and Safety Code, Section 6.95).
- Businesses, particularly smaller ones that may not be regulated by Federal, State, or local regulations, may use the information in this Handbook to develop a training program to reduce their potential to pollute storm water.
- Use the quick reference on disposal alternatives (Table 4.2) to train employee/subcontractors in proper and consistent methods for disposal.

CA40



ACTIVITY: EMPLOYEE/SUBCONTRACTOR TRAINING (Continue)

- Consider posting the quick reference table around the job site or in the on-site office trailer to reinforce training.
- Train employee/subcontractors in standard operating procedures and spill cleanup techniques described in the fact sheets. Employee/subcontractors trained in spill containment and cleanup should be present during the loading/unloading and handling of materials.
- Personnel who use pesticides should be trained in their use. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct on-site inspections.
- Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employee/subcontractors can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do on-site.

CA40



IV. EROSION and SEDIMENT CONTROL

A. Soils Stabilization Practices: Soil stabilization practices required will include the following BMPs:

1. Scheduling the project to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff and vehicle tacking (ESC1): Major grading of the project is scheduled to be completed November 15, 2004, before the rainy season. The remainder of the project to be completed April 2005.
2. Preservation of Existing Vegetation: Existing vegetation will be protected where possible throughout the site (ESC2), especially maximizing protection of existing golf course turf within and without the construction envelope – disturbance is to be limited to cut and fill envelopes, and haul routes, only.
3. Permanent Seeding and Planting: After completion of the grading and construction activities, all disturbed areas not protected by permanent improvements (e.g. pavement, lake) will be seeded by the Owner (ESC10).
4. Mulching: Slopes will be kept at less than 3:1, and seeded no mulching (ESC11) will be necessary.
5. Much of the construction traffic on the golf course renovation project can be dispersed to prevent erosion and control dust. But traffic into and out of the construction yard, and along established construction routes, may require some type of physical or chemical stabilization (ESC23), in addition to frequent watering for dust suppression.
6. Stabilization Construction Entrance (ESC24): Not required; no direct access from unpaved roads to public right-of-way.
7. Trenching: Stabilizing open trenches and closing them within 24 hours.
8. De-watering controls to reduce soil erosion and water contamination.

B. Control Practices to Prevent a Net Increase of Sediment Load in Storm Water Discharges: Erosion control practices to prevent increase sediment load include the following practices:

1. The soils exposed during grading operations will typically be seeded as soon as each area is finished (ESC10). Temporary sedimentation measures such as silt fences, sand bags and fiber rolls (ESC50, ESC52, SC8) will be installed along the limits of grading to prevent increased sediment load to drainage areas, where appropriate to the small construction envelopes.
2. The graded slopes on the project are to be gentle in nature – an overall design maximum at 4:1, with some variation up to 3:1 – and all disturbed areas to be seeded; BMP's for runoff diversion or velocity reduction (ESC30 to ESC 32, and ESC 40 to ESC 42) will not be needed.
3. Existing storm drain inlets occur within the construction site, and construction disturbance will occur upstream of the inlet above the site, so barricades (SC10) sediment catchments are planned.

The selected BMP's will be implemented by the Contractor and maintained throughout construction.

C. Control Practices to Reduce Wind Erosion

1. **Dust Control:** The Construction Specifications include dust control measures during construction activities such as clearing and grading, construction vehicle traffic on unpaved haul roads, sediment tracking onto paved road, soil and debris storage piles, areas of unstabilized soil. Dust control measures include:

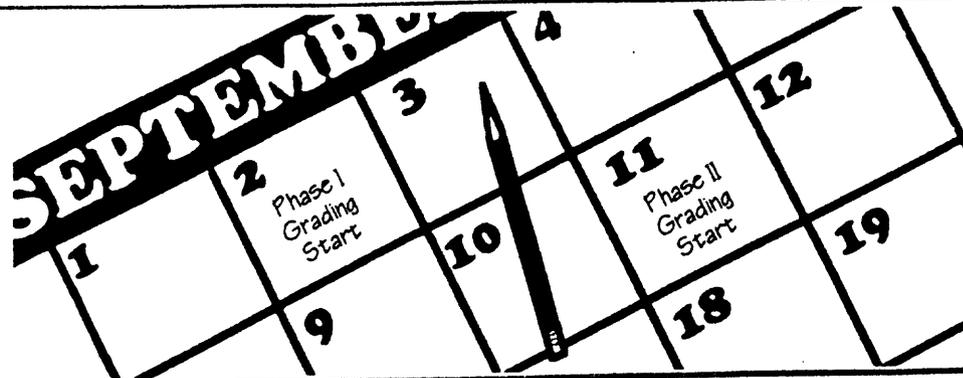
- watering
- physical coverings
- permanent vegetation
- on-site vehicle speed limits (15 mph)
- stabilized unpaved haul roads, parking and staging areas

Delaveaga Golf Course
 Golf Course Remodel and Improvements
 Santa Cruz, California

SWPPP Best Management Practices Matrix
Erosion, Sediment and Dust Control for Given Sites

Site Condition	Site Planning		Vegetation Stabilization		Physical Stabilization						Diversion of Runoff			Velocity Reduction			Sediment Trapping/ Filtering								
	ESC1	ESC2	ESC 10	ESC 11	ESC 20	Dust Control (ESC21)				ESC 22	ESC 23	TC-1	ESC 30	ESC 31	ESC 32	ESC 40	ESC 41	ESC 42	ESC 50	SC-5	SC-8	SC-10	ESC 54	ESC 55	ESC 56
						Watering	Chemical	Haul Truck Covers	Min. Extent of Disturbed Area									Surface Roughening							
1. Disturbed Areas not Subject to Traffic	✓	✓	✓			✓			✓										✓	✓	✓	✓			
2. Disturbed Areas Subject to Traffic	✓					✓	✓		✓																
3. Material Stock Pile Stabilization	✓					✓	✓		✓																
4. Demolition	✓					✓		✓	✓																
5. Clearing and Excavation	✓	✓				✓													✓	✓					
6. Truck Traffic on Unpaved Roads	✓					✓		✓				✓													
7. Protect Slopes and Channels	✓	✓	✓			✓													✓	✓					
8. Mud/Dirt Carry Out	✓																								

BMP: SCHEDULING



DESCRIPTION

Sequencing the construction project to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

SUITABLE APPLICATIONS

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project. Use of other, more costly yet less effective, erosion and sedimentation controls, may often be reduced through proper construction sequencing.

APPROACH

- Project design considerations: Design project to integrate into existing land contours. Significant regrading of a site will require more costly erosion and sedimentation control measures and may require that on-site drainage facilities be installed.
- Incorporate existing, natural areas: Inventory and evaluate the existing site terrain and vegetation. Disturbance of highly erosive natural areas (e.g., steep, unstable slope areas, watercourses) should be minimized, while protecting other areas may enhance site aesthetics. Construction should not disturb these areas (see ESC2).
- Avoid rainy periods: Schedule major grading operations during dry months. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means (see ESC 10 to 24) or to install temporary sediment trapping devices (see ESC 50 to 56).
- Practice erosion and sediment control year round: Erosion may be caused during dry seasons by "freak" rainfall, wind and vehicle tracking. Therefore, keep the site stabilized year-round, and retain wet season sediment trapping devices.
- Minimize soil exposed at one time: Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding—revegetate cut and fill slopes as the work progresses.
- Trenching: Close and stabilize open trenches as soon as possible. Sequence trenching projects so that most open portions of the trench are closed before new trenching is begun.

REQUIREMENTS

- Cost
 - Construction scheduling to reduce erosion may increase other construction costs due to reduced economies of scale in performing site grading. The cost-effectiveness of scheduling techniques should be compared with the other, less effective erosion and sedimentation controls to achieve a cost-effective balance.

Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

Targeted Pollutants

Sediment

Nutrients

Toxic Materials

Oil & Grease

Floatable Materials

Other Construction Waste

Likely to Have Significant Impact

Probable Low or Unknown Impact

Implementation Requirements

Capital Costs

O&M Costs

Maintenance

Training

Suitability for Slopes >5%

High Low

ESC1



BMP: SCHEDULING (Continue)

LIMITATIONS

There are no significant limitations to the use of this BMP.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona - 1992.

Erosion and Sediment Control Guidelines for Developing Areas in Texas, U.S. Department of Agriculture, Soil Conservation Service, Fort Worth, Texas - 1976.

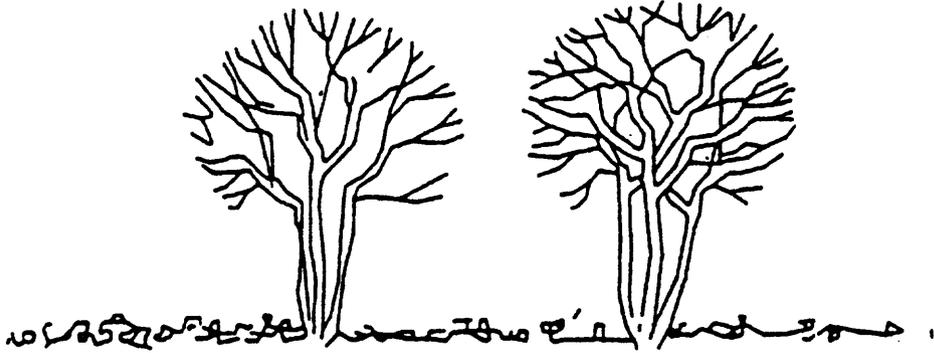
Storm Water Management for Construction Activities. Developing Pollution Prevention Plans and Best Management Practices, U.S. Environmental Protection Agency, Office of Water (EPA 832-R-92-005) - September, 1992.

Virginia Erosion and Sediment Control Handbook, Third Edition, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation - 1992.

ESC1



BMP: PRESERVATION OF EXISTING VEGETATION



GENERAL DESCRIPTION

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs and/or grasses that serve as erosion controls.

SUITABLE APPLICATIONS

- Areas within site where no construction activity occurs, or occurs at a later date.
- Sensitive areas where natural vegetation exist and should be preserved, such as: steep slopes, watercourses, and building sites in wooded areas.
- Areas where local, state and federal government requires preservation, such as: vernal pools, wetlands, marshes, certain oak trees, etc.

INSTALLATION/APPLICATION CRITERIA

- Clearly mark, flag or fence vegetation or areas where vegetation should be preserved.
- Prepare landscaping plans which include as much existing vegetation as possible and state proper care of this vegetation both during and after construction.
- Define and protect with berms, fencing, signs, etc., a setback area from vegetation to be preserved. Setback area size should be based on the location, species, size, age and potential impact of adjacent construction activities or permanent improvements.
- Proposed landscaping plans which do not include plant species that compete with the existing vegetation.
- Do not locate construction traffic routes, spoil piles, etc., where significant adverse impact on existing vegetation may occur.

REQUIREMENTS

- Maintenance
 - Inspection and maintenance requirements for protection of vegetation are low.
 - During construction the limits of grading or disturbance should be clearly marked at all times.
 - Irrigation or maintenance of native trees or vegetation should conform to specifications on the Landscape Plan.
- Cost
 - There is little cost associated with preserving existing vegetation if properly planned during the project design, and may yield aesthetic benefits which enhance property values.

LIMITATIONS

- Requires forward planning by the owner/developer, contractor and design staff.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactorily for the planned development.

Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

ESC2



Additional Information — Preservation of Existing Vegetation

The best way to prevent excessive erosion is to not disturb the land. On a construction site, where extensive land disturbance is necessary, a reasonable BMP would be to not disturb land in sensitive areas of the site which need not be altered for the project to be viable (e.g., natural watercourses, steep slopes), and to design the site to incorporate particularly unique or desirable existing vegetation into the site landscaping plan. Clearly marking and leaving a buffer area around these unique areas will both help to preserve these areas as well as take advantage of natural erosion prevention and sediment trapping in naturally vegetated areas.

Existing vegetation to be preserved on the site must be protected from mechanical and other injury while the land is being developed. The purpose of protecting existing vegetation is to insure the survival of desirable vegetation for shade, beautification, and erosion protection. Mature vegetation has extensive root systems that help to hold soil in place, thus reducing erosion. Also, vegetation helps to keep soil from drying rapidly and becoming susceptible to erosion. To effectively save existing vegetation, no disturbances of any kind should be allowed within a defined area around the vegetation. For trees, no construction activity should occur within the drip line of the tree.

The following criteria may be used for deciding which vegetation will remain on the site:

- Aesthetic values: Consideration should be given to foliage, flowering habits, bark and crown characteristics (for trees).
- Freedom from disease and rot.
- Life span of trees: Short-lived trees need not be preserved.
- Environmental values: Habitat; screening; and buffers.
- Sudden exposure: Save vegetation which grows in direct sunlight and is able to withstand radiated heat from proposed buildings and pavement.
- Space needed: Sufficient space must be provided between the vegetation and any structures, electric and telephone lines, water and sewer lines, driveways and streets. Mark trees and shrubs with bright paint or ribbon so there is no doubt as to which trees and shrubs are to be left and protected from damage during construction.

Saving existing vegetation and mature trees on-site, beautifies the area and may save money by reducing new landscaping requirements. Mature trees also increase property values and satisfy consumer aesthetic needs.

Preserving and protecting existing vegetation can often result in more stable soil conditions during construction. Careful site planning and identification of plantings to preserve can provide erosion and sedimentation controls during construction, and contribute to the aesthetics of the development. For example, in Sacramento County a tree ordinance has been adopted that protects the native California Oak tree. Provisions to protect the tree and its root system during construction must be specified in the project plans, and an area must be provided where the soil stability may not be disturbed. No grading or construction storage within the tree dripline is allowed.

Installation/Application

Building sites may be planned to integrate existing vegetation and trees. Construction impacts must be considered. Trench width for pipe construction projects and the location of permanent structures, such as buildings, needs to be considered when preserving existing vegetation, including mature trees and their root system. Native vegetation should be preserved since it is able to adapt to the climate. The USDA Soil Conservation Service should be contacted about existing vegetation for sites throughout California. Mature trees are generally preferable to newly planted trees because of the greater soil stabilization provided by the extensive root system of a mature tree.

ESC2



Additional Information — Preservation of Existing Vegetation

Methods for protecting existing vegetation and trees:

- Stake off root system limits (drip line of tree). Some counties limit construction within 5 feet of the tree drip line.
- Fence off the area to be preserved or along the tree drip line.
- Flag or mark trees to remain in place.
- Tree wells and retaining walls (permanent) help preserve existing vegetation, but must be large enough to protect the root system (see below).
- For the California Oak tree, no trenching or irrigation should be allowed within the driplines of the tree, since both these activities are detrimental to the preservation of the tree.
- Where grading under trees is necessary, excavation and fill should be limited to 1 foot within the driplines.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

County of Sacramento Tree Preservation Ordinance - September 1981.

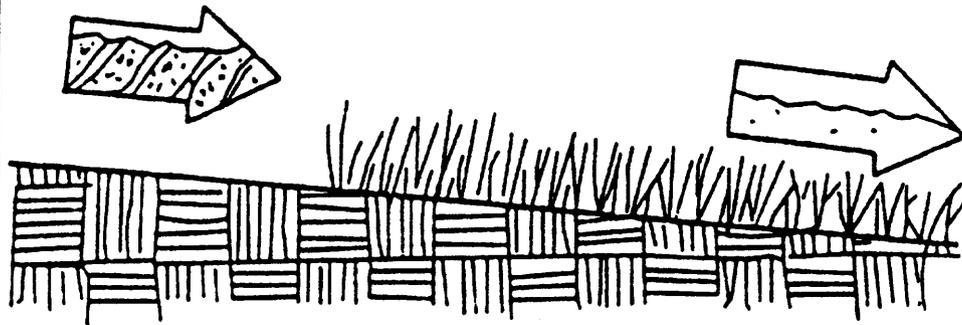
Stormwater Management Water for the Puget Sound Basin, Washington State Department of Ecology, The Technical Manual - February 1992, Publication # 91-75.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency - November 1988.

ESC2



BMP: SEEDING AND PLANTING



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

GENERAL DESCRIPTION

Seeding of grasses and plantings of trees, shrubs, vines and ground covers provide long-term stabilization of soil. In some areas, with suitable climates, grasses can be planted for temporary stabilization.

SUITABLE APPLICATIONS

- Appropriate for site stabilization both during construction and post-construction.
- Any graded/cleared areas where construction activities have ceased.
- Open space cut and fill areas.
- Steep slopes.
- Spoil piles.
- Vegetated swales.
- Landscape corridors.
- Stream banks.

INSTALLATION/APPLICATION CRITERIA

Type of vegetation, site and seedbed preparation, planting time, fertilization and water requirements should be considered for each application.

Grasses:

- Ground preparation: fertilize and mechanically stabilize the soil.
- Tolerant of short-term temperature extremes and waterlogged soil conditions.
- Appropriate soil conditions: shallow soil base, good drainage, slope 2:1 or flatter.
- Develop well and quickly from seeds.
- Mowing, irrigating, and fertilizing are vital for promoting vigorous grass growth.

Trees and Shrubs:

- Selection Criteria: vigor, species, size, shape & wildlife food source.
- Soil conditions: select species appropriate for soil, drainage & acidity.
- Other Factors: wind/exposure, temperature extremes, and irrigation needs.

Vines and Ground Covers:

- Ground preparation: lime and fertilizer preparation.
- Use proper seeding rates.
- Appropriate soil conditions: drainage, acidity, slopes.
- Generally avoid species requiring irrigation.

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

ESC10



Best Management Practices

BMP: SEEDING AND PLANTING (Continue)

REQUIREMENTS

- Maintenance
 - Shrubs and trees must be adequately watered and fertilized and if needed pruned.
 - Grasses may need to be watered and mowed.
- Cost: Average annual cost for installation and maintenance (2-year useful life, source: EPA, 1992)
 - Seeding: \$300 per acre, appropriate for flat slopes and stable soils.
 - Seeding with Mulching: \$1,100 per acre, appropriate for moderate to steep slopes and/or erosive soils.
 - Trees, shrubs, vines, and ground cover: Cost, applicability based on species used and terrain features.

LIMITATIONS

- Permanent and temporary vegetation may not be appropriate in dry periods without irrigation.
- Fertilizer requirements may have potential to create storm water pollution if improperly applied.

ESC10



Additional Information — Seeding and Planting

Permanent seeding of grasses, sodding, and planting of trees, shrubs, vines and ground covers can provide long-term stabilization of soil. Permanent seeding and planting contributes to long-term site aesthetics and helps reduce erosion by reducing the velocity of runoff, allowing infiltration to occur, filtering sediments, and by holding soil particles in place.

Seeding and planting should be applied as soon as final grading is done to all graded and cleared areas of the construction site where plant cover is ultimately desired. For example, vegetation may be established along landscaped corridors and buffer zones where they may act as filter strips (see TC6 in Chapter 5 of the Municipal Handbook). Additionally, vegetated swales, steep and/or rocky slopes and stream banks can also serve as appropriate areas for seeding and plantings.

Installation/Application Criteria

Application of appropriate vegetation must consider: the seedbed or plantbed, proper seasonal planting times, water requirements fertilizer requirements and availability of the selected vegetation within the project's region. Permanent plantings during the construction stage of projects require careful coordination between the local agency inspectors, project managers, construction managers, and landscape contractor. Protocols for coordination and implementation procedures regarding site access, construction staging, and short- and long-term planting areas should be developed prior to the construction bid process. Where possible, these protocols should be established by and remain the responsibility of the site owner.

Because of the many available types of plants and ground covers and because site conditions and land use vary so widely within California, a set of general guidelines is included for installation/application of grasses, trees and shrubs, vines and ground covers. However, your local municipality, Soil Conservation Service, agricultural extension, or other resources should be consulted on appropriate species, planting requirements, and maintenance needs for your climate and soils.

Grasses

Grasses, depending on the type, provide short-term soil stabilization during construction or can serve as long-term/permanent soil stabilization for disturbed areas. In general, grasses provide low maintenance to areas that have been cleared, graded and mechanically stabilized.

Selection:

The selection of the grass type is determined by the climate, irrigation, mowing frequency, maintenance effort and soil-bed conditions. Although grasses provide quick germination and rapid growth, they also have a shallow root system and are not as effective in stabilizing deep soils, where trees, shrubs and deep rooted ground covers may be more appropriate. Several grasses are adaptable to the various California climates. The figure at the end of these fact sheets shows appropriate grasses for regions within California. Blue grass is well adapted throughout California except for in the valley regions. The blue grass is found on dry, sandy soils that have good drainage. Bermuda grass, on the other hand is well adapted in the valley region where soils are dry, coarse and heavier. Specific seed mix and/or varieties for each site should be provided by an approved/qualified plant materials specialist.

ESC10



Additional Information — Seeding and Planting

Planting:

The following steps should be followed to ensure established growth:

1. Select the proper grass for the site.
2. Prepare the seedbed; soil should be fertilized and contain good topsoil or soil at least a 2:1 or flatter slope.
3. Broadcast the seedings in the late fall or early spring. In the late fall, seedings should be planted by mid- September to have established grass by the October rainy season.
4. Initial irrigation will be required often for most grasses, with follow-up irrigation and fertilization as needed. Mulching may be required in dry climates or during drought years.

Trees & Shrubs

Selection:

Trees and shrubs, when properly selected, are low maintenance plantings that stabilize adjacent soils, moderate the adjacent temperatures, filter air pollutants, and serve as a barrier to wind. Some desirable characteristics to consider in selecting trees and shrubs include: vigor, species, age, size and shape, and use as a wildlife food source and habitat.

Trees and shrubs to be saved should be clearly marked so that no construction activity will take place within the dripline of the plant. The sites for new plantings should be evaluated. Consider the prior use of the land: adverse soil conditions such as poor drainage or acidity; exposure to wind; temperature extremes; location of utilities, paved areas, and security lighting and traffic problems.

Transplanting:

Time of Year - Late fall through winter (November to February) is the preferred time for transplanting in most of California.

Preparation - Proper digging of a tree/shrub includes the conservation of as much of the root system as possible. Soil adhering to the roots should be damp when the tree is dug, and kept moist until re-planting. The soil ball should be 12 inches in diameter for each inch of diameter of the trunk.

Site preparation - Refer to landscape plans and specifications for site and soil preparation, and for ability to coordinate construction strategy with permanent vegetation.

Supporting the trunk - Many newly planted trees/shrubs need artificial support to prevent excessive swaying.

Watering - Soil around the tree should be thoroughly watered after the tree is set in place. When the soil becomes dry, the tree should be watered deeply, but not often. Mulching around the base of the tree is helpful in preventing roots from drying out.

Vines & Ground Covers

Selection:

Vines, ground covers, and low growing plants, that can quickly spread, come in many types, colors, and growth habits. Some are suitable only as part of a small maintained landscape area, while some can stabilize large areas with little maintenance. Flowers, which provide little long-term erosion control may be planted to add color and varietal appearances.

ESC10



Additional Information — Seeding and Planting

Caution should be exercised in the non-native vegetation because of impacts to native vegetation on adjacent lands. For example, species that may be planted at the construction site can quickly spread and compete with originally undisturbed vegetation such as the California Poppy and California buckwheat, both of which complete poorly with introduced grasses (e.g., planting wild oats is illegal in California). In addition to stabilizing disturbed soil, vines and ground covers can perform the following functions:

1. Provide attractive cover that does not need mowing.
2. Help to define traffic areas and control pedestrian movement.

Site Preparation:

Ground covers are plants that naturally grow very close together, causing severe competition for space nutrients and water. Soil for ground covers should be well prepared. The entire area should be spaded, disced, or rototilled to a depth of six to eight inches. Two to three inches of organic material, such as good topsoil or peat, should be spread over the entire area.

Planting:

The following steps will help ensure good plant growth.

1. Make the plantings following the contours of the land.
2. Dig the holes 1/3 larger than the plant root ball.
3. Know what depth to place the plants.
4. Use good topsoil or soil mixture with a lot of organic matter.
5. Fill hole 1/3 to 1/2 full, shake plants to settle soil among roots, then water.
6. Leave saucer-shaped depression around the plant to hold water.
7. Water thoroughly and regularly.
8. Space plants according to the type of plant and the extent of covering desired.

Materials:

There are many different species of vines and ground covers from which to choose, but care must be taken in their selection. It is essential to select planting materials suited to both the intended use and specific site characteristics. The plants discussed in this handbook are those which are known to be adapted to California, and commonly available from commercial nurseries. Additional information can be obtained from local nurserymen, landscape architects, and extension agents. An approved low water use plant list may be obtained from the State Department of Water Resources or the Soils Conservation Service.

Requirements Maintenance

General requirements include:

- Grass maintenance should be minimal to none. Irrigation and regular fertilizing may be required for some types of grasses. Mowing is only required in areas where aesthetics or fire hazards are a concern.
- Young trees should receive an inch of water each week for the first two years after planting. The tree should be watered deeply, but not more often than once per week.
- Transplanted trees should be fertilized on an annual basis.
- Proper pruning, watering, and application of fertilizer is necessary to maintain healthy and vigorous shrubs. A heavy layer of mulch applied around the shrubs reduces weeds and retains moisture.
- Trim old growth as needed to improve the appearance of ground covers. Most covers need once-a-year trimming to promote growth.

ESC10



Additional Information — Seeding and Planting

Limitations

- Construction activities are likely to injure or kill trees unless adequate protective measures are taken. Direct contact by equipment is the most obvious problem, but damage is also caused by root stress from filling, excavation, or compacting too close to trees.
- Temporary seeding can only be viable when adequate time is available for plants to grow and establish.
- Over fertilizing of plants may cause pollution of storm water runoff.
- Irrigation source and supply may be limiting.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, September 1992.

"Draft - Sedimentation and Erosion Control, An Inventory of Current Practices", U.S.E.P.A., April, 1990.

Guides for Erosion and Sediment Controls in California, USDA Soils Conservation Service - January 1991.

Kiowa Engineering, Interim Erosion and Sedimentation Control for Construction Activities, Urban Drainage and Flood Control District, Denver, Colorado.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, Jun 1981.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April, 1992.

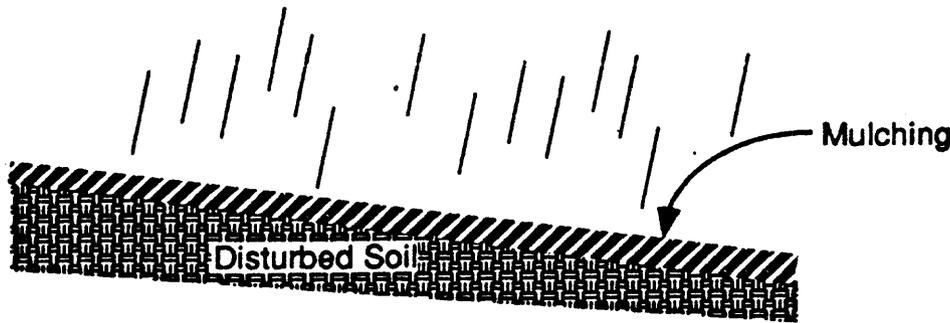
Stormwater Management Water for the Puget Sound Basin, Washington State Department of Ecology, The Technical Manual - February 1992, Publication # 91-75.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency - November 1988.

ESC10



BMP: MULCHING



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

GENERAL DESCRIPTION

Mulching is used to temporarily and permanently stabilize cleared or freshly seeded areas. Types of mulches include organic materials, straw, wood chips, bark or other wood fibers, decomposed granite, and gravel.

SUITABLE APPLICATIONS

- Temporary stabilization of freshly seeded and planted areas.
- Temporary stabilization during periods unsuitable for growing vegetation.
- Temporary stabilization of areas that cannot be seeded or planted (e.g., insufficient rain, steep slope).
- Mulches such as gravel and decomposed soils may be used as post-construction BMPs, particularly in arid regions.

INSTALLATION/APPLICATION CRITERIA

Mulch prevents erosion by protecting the soil surface and fostering growth of new seedlings that do not stabilize by themselves.

- May be used with netting to supplement soil stabilization.
- Apply to planting areas where slopes are 2:1 or greater.
- Binders may be required for steep areas, or if wind and runoff is a problem.
- Type of mulch, binders, and application rates should be recommended by manufacturer/contractor.

REQUIREMENTS

- Maintenance
 - Must be inspected weekly and after rain for damage or deterioration.
- Cost: Average annual cost for installation and maintenance (3-4 month useful life, source: EPA, 1992)
 - Straw Mulch: \$7,500 per acre.
 - Wood Fiber Mulch: \$3,500 per acre.
 - Jute Netting: \$12,500 per acre.

LIMITATIONS

- Wood fiber mulches should be used only in areas with over 20 inches annual precipitation.
- Organic mulches are not permanent erosion control measures.
- Mulches tend to lower the soil surface temperature, and may delay germination of some seeds.
- Permanent mulches for arid regions should include gravel and decomposed soils.

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

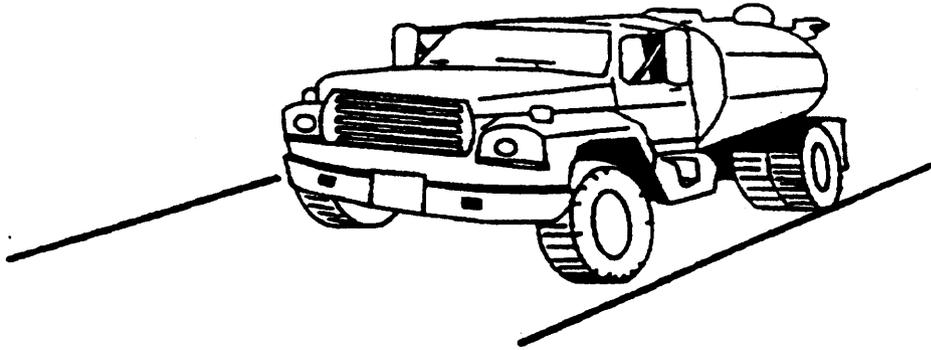
- High
- Low

ESC11



Best Management Practices

BMP: DUST CONTROLS



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

GENERAL DESCRIPTION

Dust control measures are used to stabilize soil from wind erosion, and reduce dust generated by construction activities.

SUITABLE APPLICATIONS

- Clearing and grading activities.
- Construction vehicle traffic on unpaved roads.
- Drilling and blasting activities.
- Sediment tracking onto paved roads.
- Soil and debris storage piles.
- Batch drop from front end loaders.
- Areas with unstabilized soil.
- Final grading/site stabilization usually is sufficient to control post-construction dust sources.

INSTALLATION/APPLICATION CRITERIA

- Schedule construction activities to minimize exposed area (See ESC 1).
- Quickly stabilize exposed soils using vegetation, mulching, spray-on adhesives, calcium chloride, sprinkling, and stone/gravel layering (See ESC 10 and 11).
- Identify and stabilize key access points prior to commencement of construction (See ESC 24).
- Minimizing the impact of dust by anticipating the direction of prevailing winds.
- Direct most construction traffic to stabilized roadways within the project site (See ESC 23).

REQUIREMENTS

- Maintenance
 - Most dust control measures require frequent, often daily, attention.
- Cost
 - Installation costs for water/chemical dust suppression are low, but annual costs may be quite high since these measures are effective for only a few hours to a few days.

LIMITATIONS

- Watering prevents dust only for a short period and should be applied daily (or more often) to be effective.
- Overwatering may cause erosion.
- Oil should not be used for dust control because the oil may migrate into drainageway and/or seep into the soil.
- Certain chemically-treated subgrades may make soil water repellant, increasing runoff.

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High
- Low

ESC21



Best Management Practices

Additional Information — Dust Controls

California's mediterranean climate, with short wet seasons and long hot dry seasons, allow the soils to thoroughly dry out. During these dry seasons, construction activities are at their peak, and disturbance and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment.

Dust control, as a BMP, is a practice that is already in place for many construction activities. Los Angeles, the North Coast and Sacramento, among others have enacted dust control ordinances for construction activities that cause dust to be transported beyond the construction project property line. Recently, the State Air Resources Control Board has, under the authority of the Clean Air Act, started to address air quality in relation to inhalable particulate matter less than 10 microns (PM-10). 90% of these small particles are considered to be dust. Existing dust control regulations by local agencies, municipal departments, public works department, and/or public health departments are in place in some regions within California. For jurisdictions that have no formal dust control regulations and/or standards, Sections 10, 17 and 18 of CalTrans' Standard Specifications provide detailed provisions for dust control practices.

Many local agencies require dust control in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. The following are measures that local agencies may have already implemented as requirements for dust control from contractors:

- Construction & Grading Permits: Require provisions for dust control plans;
- Opacity Emission Limits: Enforce compliance with California air pollution control laws;
- Increase overall enforcement activities: Priority given to cases involving citizen complaints;
- Maintain Field Application Records: Require records of dust control measures from contractor;
- Stormwater Pollution Prevention Plan: (SWPPP): Integrate dust control measures into SWPPP.

Dust Control Practices

Dust control BMP's generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. Table ESC21.1 shows which Dust Control BMPs apply to site conditions which cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel or asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching and sand fences can be employed for areas of occasional or no construction traffic. Preventive measures would include minimizing surface areas to be disturbed, limiting on-site vehicle traffic to 15 miles per hour, and controlling the number and activity of vehicles on a site at any given time.

Many of the reasonably available control measures for controlling dust from construction sites can also be implemented as BMPs for storm water pollution prevention. Those BMPs include:

- Pave, vegetate, or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.
- Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for wet suppression or chemical stabilization of exposed soils.
- Provide for rapid clean-up of sediments deposited on paved roads. Furnish stabilized construction road entrances and vehicle wash down areas.
- Stabilize unpaved haul roads, parking and staging areas. Reduce speed and trips on unpaved roads.
- Implement dust control measures for material stockpiles.
- Prevent drainage of sediment laden storm water onto paved surfaces.
- Stabilize abandoned construction sites using vegetation or chemical stabilization methods.
- Limit the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.

For the chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. The types of chemicals available and recommendations for their use are tabulated in Table ESC 21.2, Commonly Used Chemicals for Dust Control.

ESC21



Additional Information — Dust Controls

In addition, there are many other BMPs identified in this handbook that provide dust control including:

- Seeding and Plantings (ESC 10)
- Mulching (ESC 11)
- Construction Road Stabilization (ESC 23)
- Stabilized Construction Entrances (ESC 24)

Limitations

- Oil treated subgrades should not be used because the oil may migrate into drainageways and/or seep into the soil.
- Chemically treated subgrades may make the soil water repellent, interfering with long-term infiltration, and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- Asphalt, as a mulch tack or chemical mulch, requires a 24 hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

California Air Pollution Control Laws, California Air Resources Board, 1992.

CalTrans, Standard Specifications, Sections 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative".

Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Sacramento County, Winterization Ordinance & Dust Control Ordinance (example).

USDA Soil Conservation Service, "Guides for Erosion and Sediment Control".

ESC21



TABLE ESC 21.1 DUST CONTROL BMPs FOR GIVEN SITE CONDITIONS

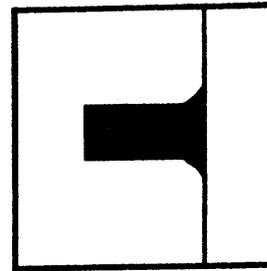
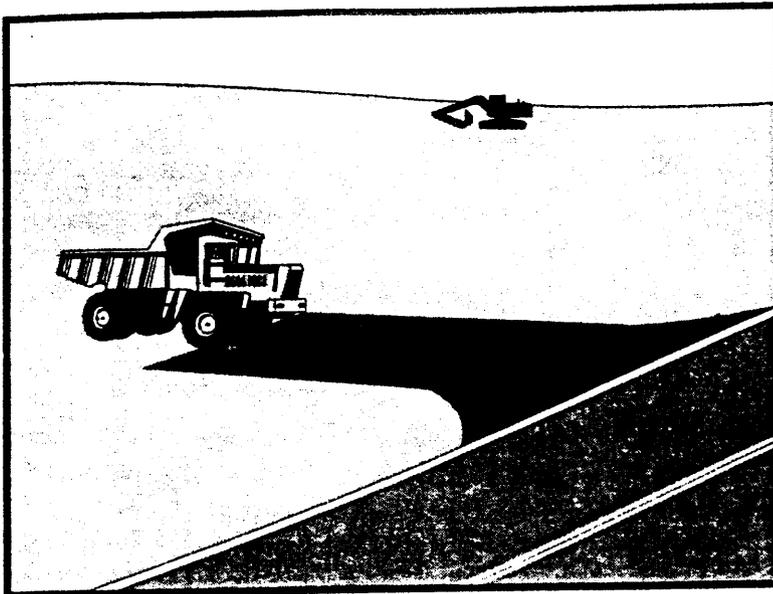
SITE CONDITION	DUST CONTROL BMPs								
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt Surfacing	Sand Fences	Temporary Gravel Construction Entrances/Equipment Wash Down	Haul Truck Covers	Minimize Extent of Area Disturbed
Disturbed Areas not Subject to Traffic	X	X	X	X	X				X
Disturbed Areas Subject to Traffic			X	X	X				X
Material Stock Pile Stabilization			X	X		X			X
Demolition			X				X	X	
Clearing/Excavation			X	X					X
Truck Traffic on Unpaved Roads			X	X	X			X	
Mud/Dirt Carry-Out					X		X		

TABLE ESC 21.2 COMMONLY USED CHEMICALS FOR DUST CONTROL

	SALTS	ORGANIC, NON PETROLEUM-BASED	PETROLEUM BASED PRODUCTS ¹
CHEMICAL TYPES	<ul style="list-style-type: none"> • Calcium Chloride² • Magnesium Chloride • Natural Brines 	<ul style="list-style-type: none"> • Calcium Lignosulfonate • Sodium Lignosulfonate • Ammonium Lignosulfonate 	<ul style="list-style-type: none"> • Bunker Oil • Asphalt Primer • Emulsified Asphalt
LIMITATIONS	<p>Can lose effectiveness in dry periods with low humidity. Leaches from road in heavy rain</p> <p>Not recommended for gravel road surfaces with low fines. Recommended 10-20% fines.</p>	<p>Not affected by dry weather and low humidity. Leached from road in heavy rain if not sufficiently cured.</p> <p>Best performance on gravel roads with high surface fines (10-30%) and dense compact surface with loose gravel.</p>	<p>Generally effective regardless of climatic conditions may pothole in wet weather.</p> <p>Best performance on gravel roads with 5-10% fines.</p>
COMMENTS	<p>Calcium Chloride is popular. May become slippery when wet on gravel surfaces with high fines.</p>	<p>Ineffective on gravel surfaces low in fines. May become slippery when wet on gravel surfaces with high fines content.</p>	<p>Creates a hardened crust.</p>

¹ Motor oils and oil treatments are not recommended due to adverse effects on plant life and groundwater.

² Not recommended due to adverse effects on plant life.



- BMP Objectives**
- Soil Stabilization
 - Sediment Control
 - Tracking Control
 - Wind Erosion Control
 - Non-Storm Water Management
 - Materials and Waste Management

Definition and Purpose

A stabilized construction access is a defined point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Appropriate Applications

- Use at construction sites:
 - where dirt or mud is tracked onto public roads
 - adjacent to water bodies
 - where poor soils are encountered
 - where dust is a problem during dry weather conditions.
- This BMP may be implemented on a project-by-project basis in addition to other BMPs when determined necessary and feasible by the Resident Engineer (RE).

Limitations

- Site conditions will dictate design and need.

Standards and Specifications

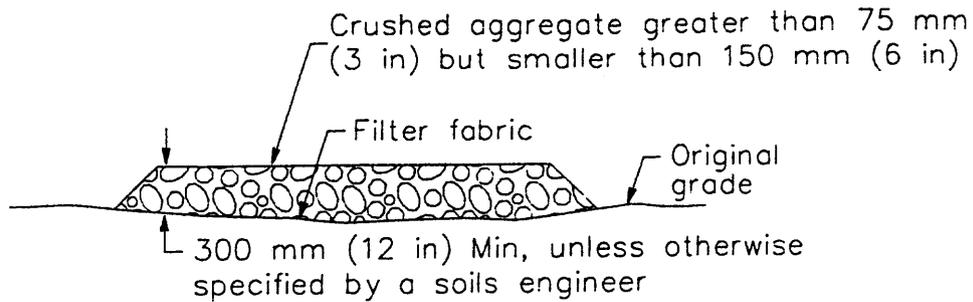
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment-trapping device before discharge.

- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. The use of asphalt concrete (AC) grindings for stabilized construction access/roadway is not allowed.
- Use of constructed or constructed/manufactured steel plates with ribs for entrance/exit access is allowed with written approval of the RE.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 300 mm (12 in) depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 75 mm (3 inches) but smaller than 150 mm (6 inches) shall be used.
- Designate combination or single purpose entrances and exits to the construction site. Require all employees, subcontractors and others to use them.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Inspect routinely for damage and assess effectiveness of the BMP. Repair if access is clogged with sediment or as directed by the RE.
- Keep all temporary roadway ditches clear.

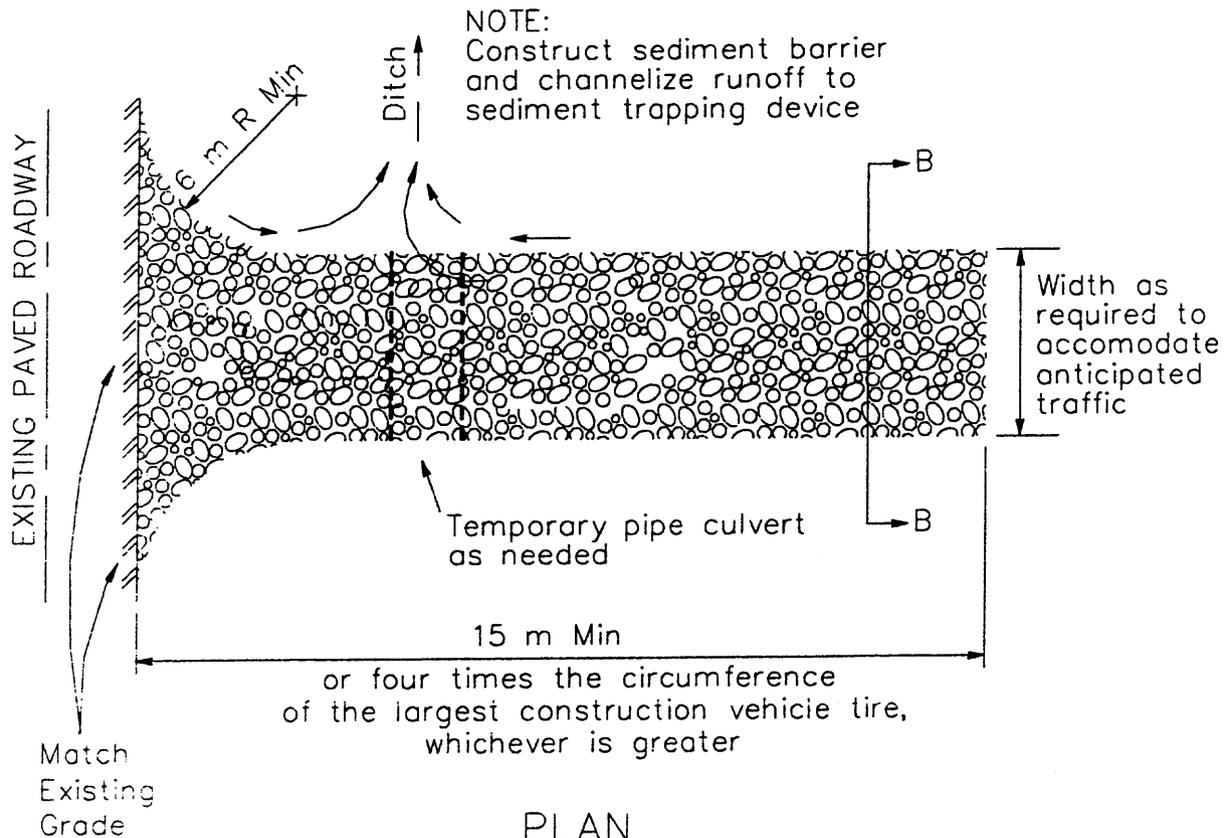
Maintenance and Inspection

Stabilized Construction Entrance/Exit

TC-1



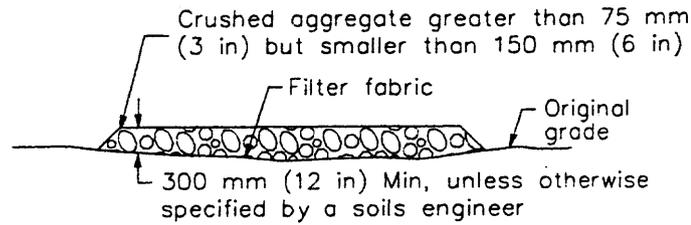
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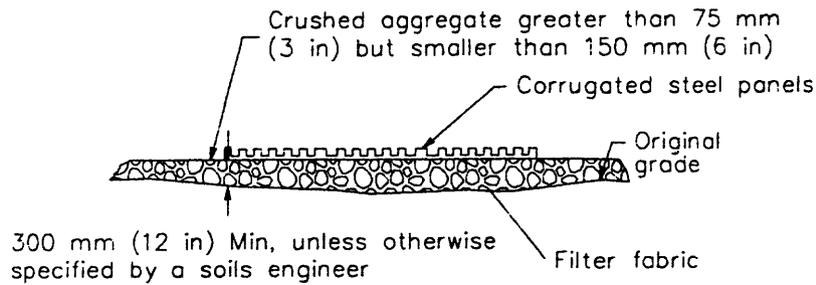
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NTS

Stabilized Construction Entrance/Exit (Type 1)





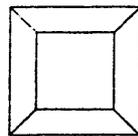
SECTION B-B
NTS



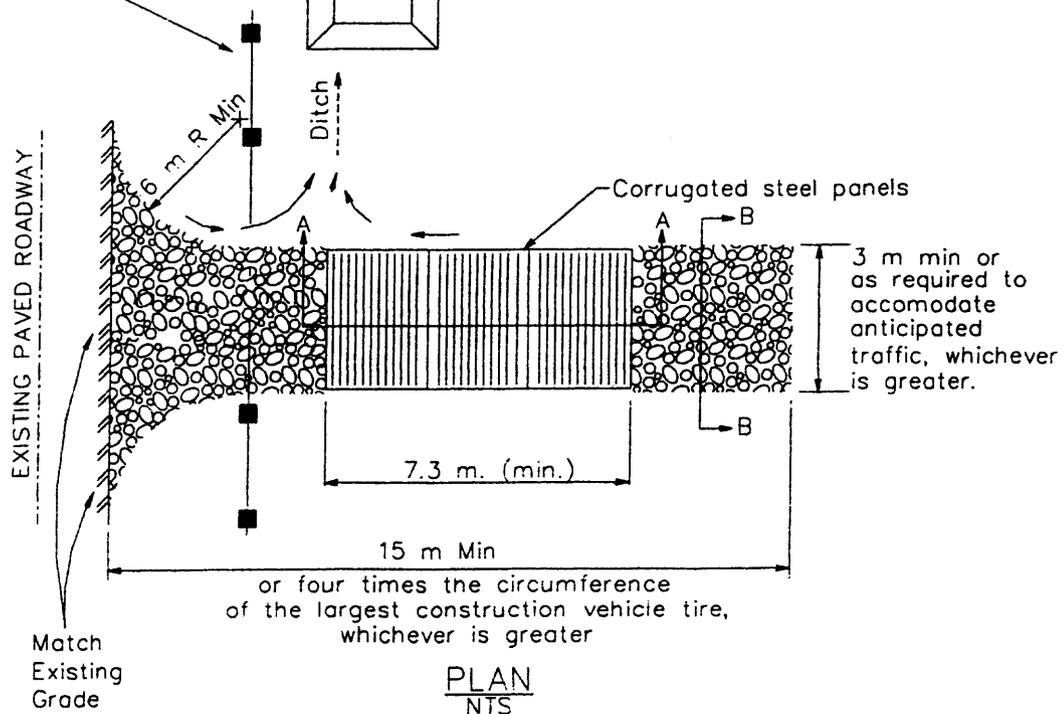
SECTION A-A
NOT TO SCALE

NOTE:

Construct sediment barrier and channelize runoff to sediment trapping device



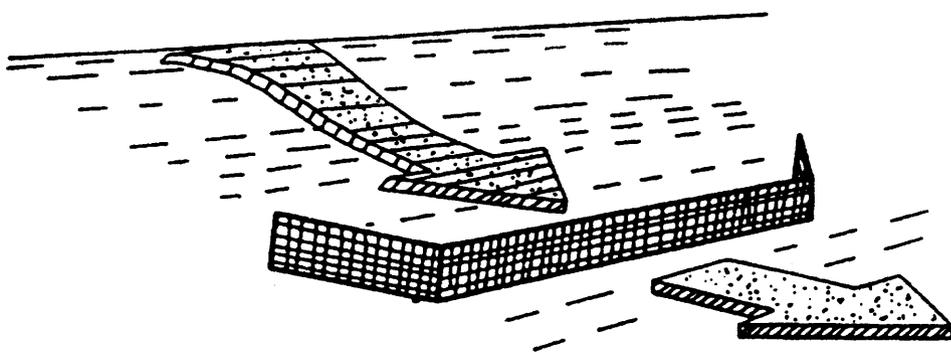
Sediment trapping device



PLAN
NTS

Stabilized Construction Entrance/Exit (Type 2)

BMP: SILT FENCE



GENERAL DESCRIPTION

A silt fence is made of a filter fabric which has been entrenched, attached to supporting poles, and sometimes backed by a wire fence for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

SUITABLE APPLICATIONS

- Along the perimeter of the site.
- Below the top of a cleared slope.
- Along streams and channels.
- Around temporary spoil areas.
- Across swales with catchments less than 1 acre.
- Below other small cleared areas.

INSTALLATION/APPLICATION

- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 feet at any point.
- No more than 1 acre, 100 ft., or 0.5 cfs of concentrated flow should drain to any point along the silt fence.
- Turn ends of fence uphill.
- Provide area behind the fence for runoff to pond and sediment to settle (approx. 1200 sq. ft. per acre draining to the silt fence).
- Select filter fabric which retains 85% of the soil, by weight, based on sieve analysis, but is not finer than an equivalent opening size of 70.

REQUIREMENTS

- Maintenance
 - Inspect weekly and after each rainfall.
 - Repair wherever fence is damaged.
 - Remove sediment when it reaches 1/3 the height of the fence.
- Cost (source: EPA, 1992)
 - Average annual cost for installation and maintenance (assumes 6 month useful life): \$7 per lineal foot (\$850 per drainage acre)

LIMITATIONS

- Do not use where 85% of the soil, by weight, passes through a No. 200 sieve because the filter fabric will clog.
- Do not place fence on a slope, or across any contour line.
- Do not use in streams, channels, or anywhere flow has concentrated.
- Do not use in locations where ponded water may cause flooding.

Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

Targeted Pollutants

- Sediment
- Nutrients
- Toxic Materials
- Oil & Grease
- Floatable Materials
- Other Construction Waste

- Likely to Have Significant Impact
- Probable Low or Unknown Impact

Implementation Requirements

- Capital Costs
- O&M Costs
- Maintenance
- Training
- Suitability for Slopes >5%

- High Low

ESC50



Additional Information — Silt Fence

A silt fence is a temporary sediment barrier consisting of filter fabric stretched across and attached to supporting posts, entrenched, and, depending upon the strength of the fabric used, supported with wire fence. Silt fences trap sediment in two ways: (1) by intercepting and detaining **small amounts** of sediment from disturbed areas during construction operations in order to promote sedimentation behind the fence; and (2) by decreasing the velocity of low flows (up to 0.5 cfs) in swales.

Silt fences may be used for perimeter control, placed upstream of the point(s) of discharge of sheet flow from a site. They may also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion, and perpendicular to minor swales or ditch lines for up to one acre contributing drainage areas. Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows.

Installation/Application

Planning:

Silt fences are generally most effective when the following placement criteria are followed:

- Limit the upstream drainage area to 1 acre or less when used alone or in combination with sediment basin in a larger site.
- The maximum slope perpendicular to the fence line should be 1:1.
- Limit the maximum sheet or overland flow path length to any point along the fence to 100 feet.
- Limit the concentrated flows reaching the fence to 0.5 cfs.

Silt fences are preferable to straw barriers in many cases. Laboratory work at the Virginia Highway and Transportation Research Council has shown that silt fences can trap a much higher percentage of suspended sediments than can straw bales. While the failure rate of silt fences is lower than that of straw barriers, there are many instances where silt fences have been improperly installed. The following installation methods can improve performance and should be followed:

- Construct the silt fence along a level contour.
- Silt fences should remain in place until the disturbed area is permanently stabilized.
- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 sq. ft. of ponding area should be provided for every acre draining to the fence.
- Turn the ends of the filter fence uphill to prevent storm water from flowing around the fence.
- Leave an undisturbed or stabilized area immediately downslope from the fence.
- Do not place in live streams or intermittently flowing channels.

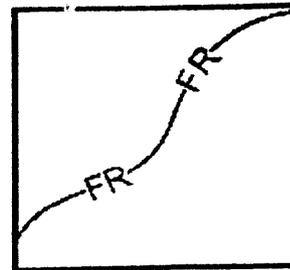
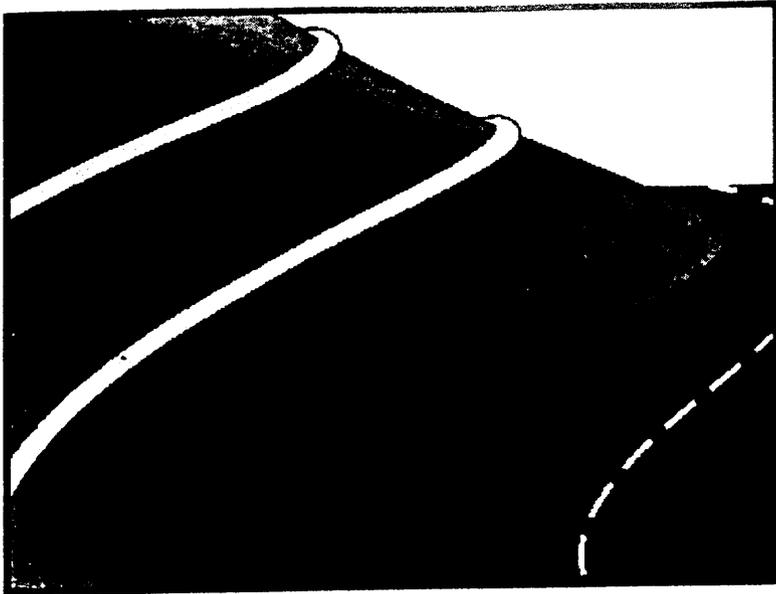
Design:

Selection of a filter fabric is based on soil conditions at the construction site (which affect the equivalent opening size (EOS) fabric specification) and characteristics of the support fence (which affect the choice of tensile strength). The designer should specify a filter fabric that retains the soil found on the construction site yet will have openings large enough to permit drainage and prevent clogging. The following criteria is recommended for selection of the equivalent opening size:

1. If 50 percent or less of the soil, by weight, will pass the U.S. standard sieve No. 200, select the EOS to retain 85 percent of the soil. The EOS should not be finer than EOS 70.
2. For all other soil types, the EOS should be no larger than the openings in the U.S. Standard Sieve No. 70 [0.0083 in. (0.21 mm.)] except where direct discharge to a stream, lake, or wetland will occur, then the EOS should be no larger than Standard Sieve No. 100.

ESC50





- BMP Objectives**
- Soil Stabilization
 - Sediment Control
 - Tracking Control
 - Wind Erosion Control
 - Non-Storm Water Management
 - Materials and Waste Management

Definition and Purpose

A fiber roll consists of straw, flax, or other similar materials that are rolled and bound into a tight tubular roll and placed on the face of slopes at regular intervals to intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide some removal of sediment from the runoff.

Appropriate Applications

- May be used along the top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- Fiber rolls may be used as check dams if approved by the Resident Engineer (RE).
- This BMP may be implemented on a project-by-project basis with other BMPs when determined necessary and feasible by the RE.

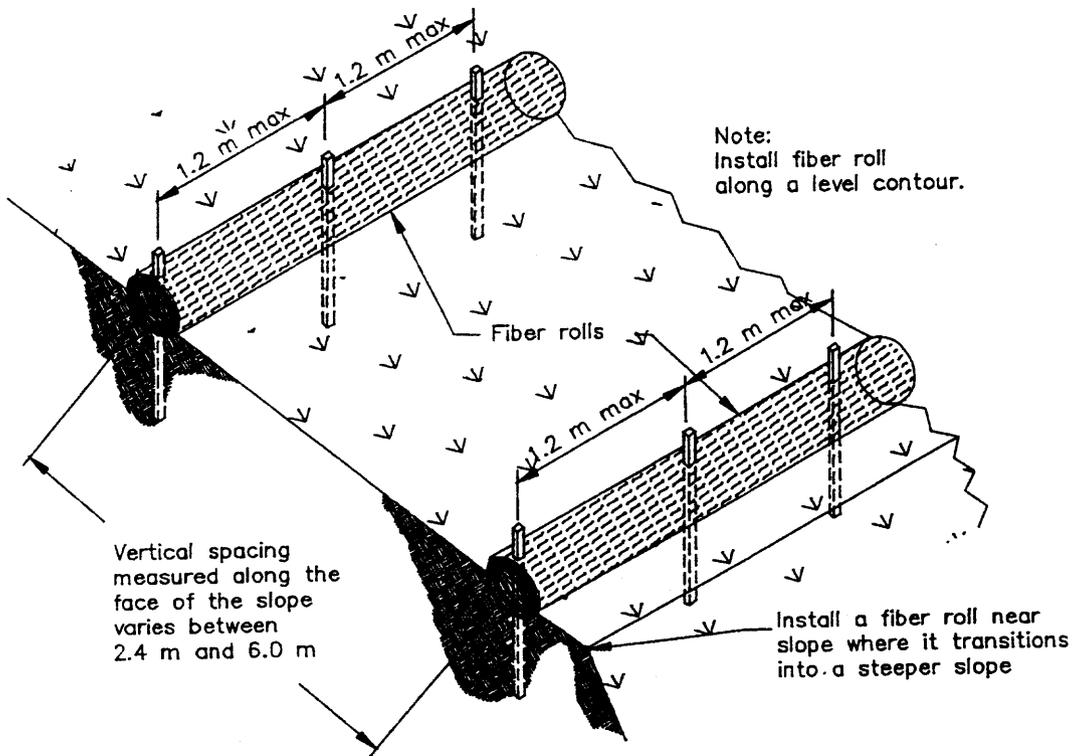
Limitations

- Is a relatively new sediment control/soil stabilization technology. Effectiveness and capabilities in the field are not completely known.
- Although fiber rolls provide some sediment removal, this BMP is not to be used in place of a linear sediment barrier (i.e., a silt fence, sandbag barrier, or straw bale barrier).

Standards and Specifications

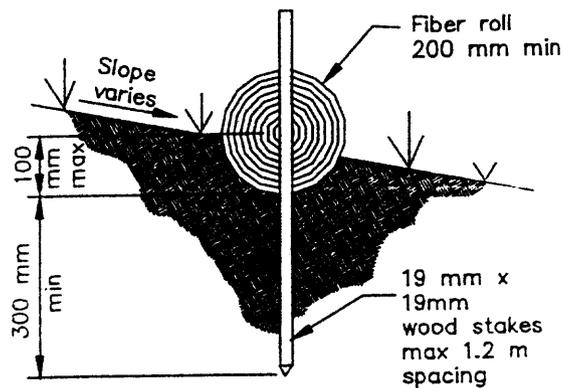
Fiber Roll Materials

- Fiber rolls shall be either:
 - (1) prefabricated rolls; or,
 - (2) rolled tubes of erosion control blanket.



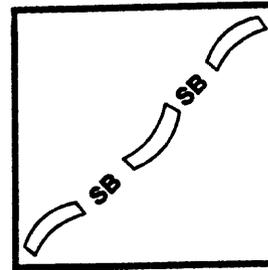
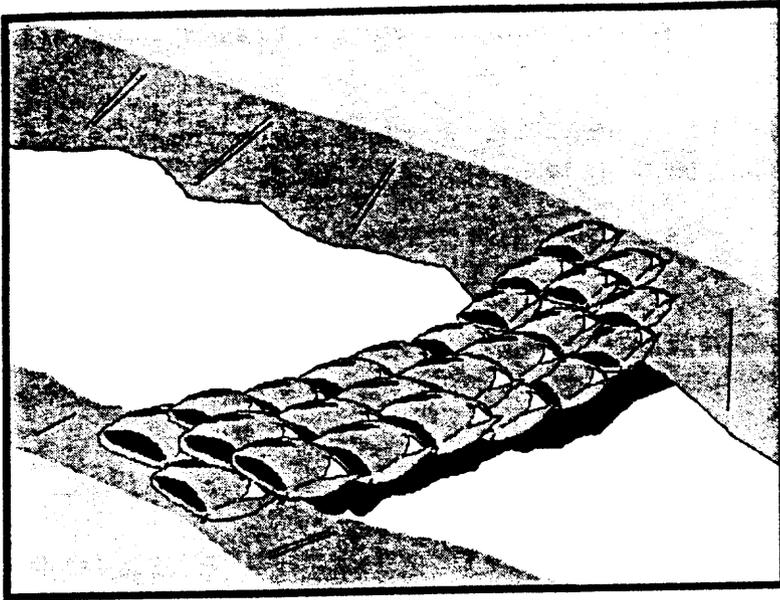
TYPICAL FIBER ROLL INSTALLATION

N.T.S.



ENTRENCHMENT DETAIL

N.T.S.



BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

A sandbag barrier is a temporary linear sediment barrier consisting of stacked sandbags, designed to intercept and slow the flow of sediment-laden sheet flow runoff. Sandbag barriers allow sediment to settle from runoff before water leaves the construction site. Sandbags can also be used where flows are moderately concentrated, such as ditches, swales, and storm drain inlets (see BMP SC-10, Storm Drain Inlet Protection) to divert and/or detain flows.

Appropriate Applications

- Along the perimeter of a site.
- Along streams and channels.
- Below the toe of exposed and erodible slopes.
- Down slope of exposed soil areas.
- Around stockpiles.
- Across channels to serve as a barrier for utility trenches or provide a temporary channel crossing for construction equipment, to reduce stream impacts.
- Parallel to a roadway to keep sediment off paved areas.
- At the top of slopes to divert roadway runoff away from disturbed slopes.
- To divert or direct flow or create a temporary sediment basin.
- During construction activities in stream beds when the contributing drainage area is less than 2 ha (5 ac).

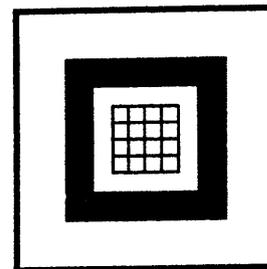
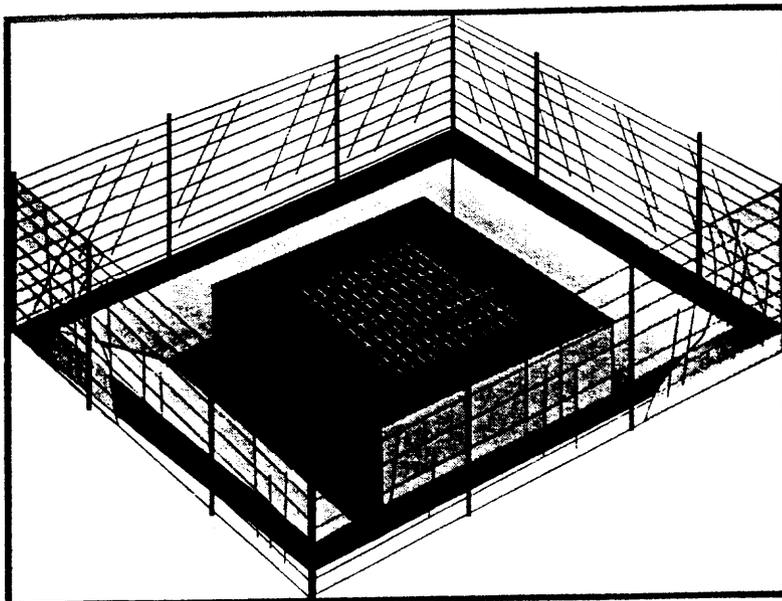
the Standard Specifications. The requirements for the Durability Index and Sand Equivalent do not apply. Fill material is subject to approval by the RE.

Installation

- When used as a linear control for sediment removal:
 - Install along a level contour.
 - Turn ends of sandbag row up slope to prevent flow around the ends.
 - Generally, sandbag barriers shall be used in conjunction with temporary soil stabilization controls up slope to provide effective control.
 - Install as shown in Page 4 of this BMP.
- When used for concentrated flows:
 - Stack sandbags to required height using a pyramid approach as shown in Page 4 of this BMP.
 - Upper rows of sandbags shall overlap joints in lower rows.
- Construct sandbag barriers with a set-back of at least 1m from the toe of a slope. Where it is determined to be not practicable due to specific site conditions, the sandbag barrier may be constructed at the toe of the slope, but shall be constructed as far from the toe of the slope as practicable.

Maintenance and Inspection

- Inspect sandbag barriers before and after each rainfall event, and weekly throughout the rainy season.
- Reshape or replace sandbags as needed, or as directed by the RE.
- Repair washouts or other damages as needed, or as directed by the RE.
- Inspect sandbag barriers for sediment accumulations and remove sediments when accumulation reaches one-third the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.
- Remove sandbags when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilized the area.



BMP Objectives

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-Storm Water Management
- Materials and Waste Management

Definition and Purpose

Devices used at storm drain inlets that are subject to runoff from construction activities to detain and/or to filter sediment-laden runoff to allow sediment to settle and/or to filter sediment prior to discharge of storm water into storm water drainage systems or watercourses.

Appropriate Applications

- Where ponding will not encroach into highway traffic.
- Where sediment laden surface runoff may enter an inlet.
- Where disturbed drainage areas have not yet been permanently stabilized.
- Where the drainage area is 0.4 ha (1 ac) or less.
- Appropriate during wet and snow-melt seasons.

Limitations

- Use only when ponding will not encroach into highway traffic or onto erodible surfaces and slopes. If safety is a concern, use other methods of temporary protection to prevent sediment-laden storm water and non-storm water discharges to enter the storm drain system.
- Sediment removal may be difficult in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are expected, use other on-site sediment trapping techniques in conjunction with inlet protection.
- Frequent maintenance is required.
- For drainage areas larger than 0.4 ha (1ac), runoff shall be routed to a sediment trapping device designed for larger flows. See BMPs SC-2, "Desilting Basin", and SC-3 "Sediment Traps".

- Bring the disturbed area to final grade and smooth and compact it. Appropriately stabilize all bare areas around the inlet.
- Clean and re-grade area around the inlet and clean the inside of the storm drain inlet as it must be free of sediment and debris at the time of final inspection.

Requirements by Method

■ ***Type 1 - Filter Fabric Fence***

- Make sure the stakes are securely driven in the ground and are in good shape (i.e., not bent, cracked, or splintered, and are reasonably perpendicular to the ground). Replace damaged stakes.
- Replace or clean the fabric when the fabric becomes clogged with sediment. Make sure the fabric does not have any holes or tears. Repair or replace fabric as needed or as directed by the Resident Engineer (RE).
- At a minimum, remove the sediment behind the fabric fence when accumulation reaches one-third the height of the fence or barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.

■ ***Type 2 - Excavated Drop Inlet Sediment Trap***

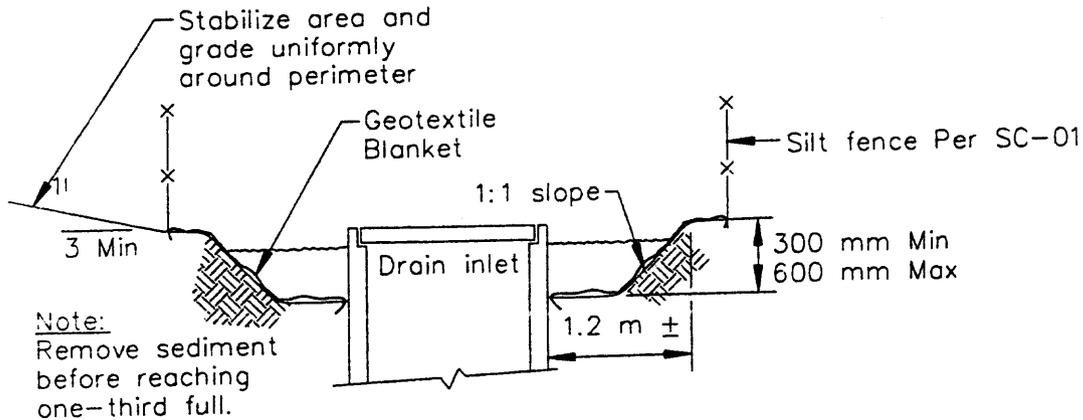
- Remove sediment from basin when the volume of the basin has been reduced by one-half.

■ ***Type 3 - Sandbag Barrier***

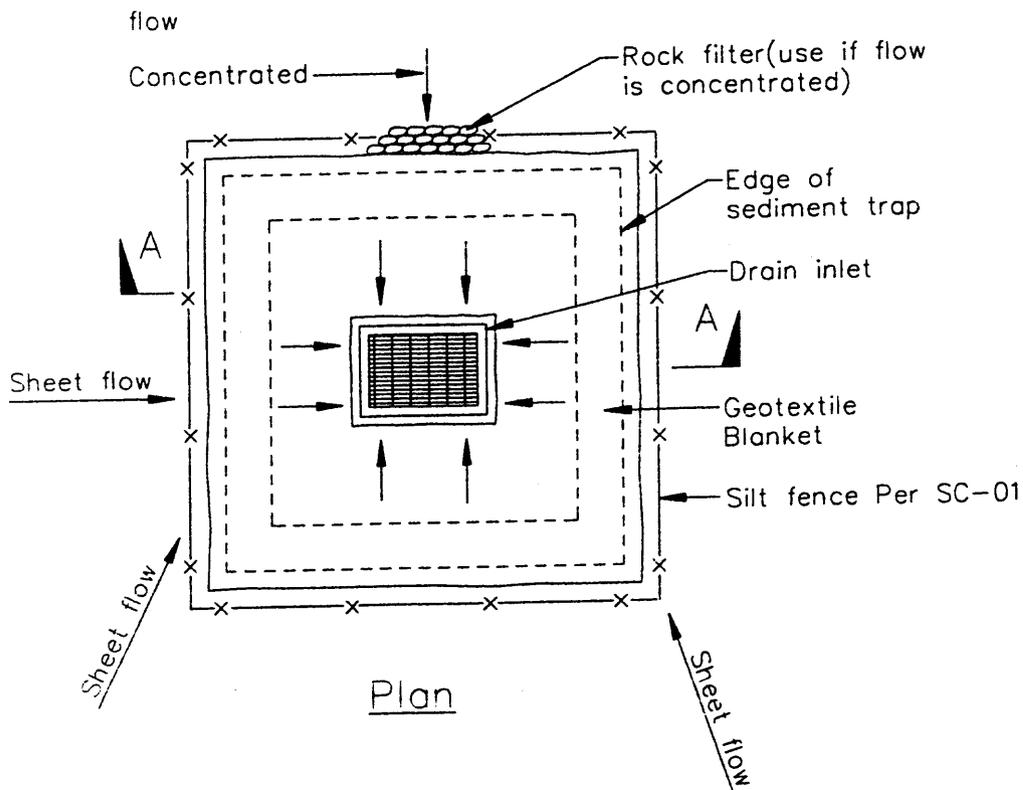
- Inspect bags for holes, gashes, and snags.
- Check sandbags for proper arrangement and displacement. Remove the sediment behind the barrier when it reaches one-third the height of the barrier. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the highway right-of-way in conformance with the Standard Specifications.

Storm Drain Inlet Protection

SC-10



Section A-A



Plan

DI PROTECTION TYPE 2
NOT TO SCALE

Notes

1. For use in cleared and grubbed and in graded areas.
2. Shape basin so that longest inflow area faces longest length of trap.
3. For concentrated flows, shape basin in 2:1 ratio with length oriented towards direction of flow.



V. NON STORM WATER MANAGEMENT

Discharges of waste and liquids other than stormwater and those associated with construction activities are prohibited. Permitted discharges include:

- water sprayed for dust control
- irrigation runoff during construction
- unpolluted groundwater and other discharges from excavated dewatering
- wash waters used for aesthetic purposes (no soaps or other cleaning agents)

BMP's require Contractor to avoid or minimize the use of water that may result in a discharge. Discharge of concrete washout and wash water used to clean equipment and vehicles is prohibited.

VI. ACCIDENTAL DISCHARGES

The Contractor is responsible for prevention of leaks and spills, by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees. Contractor is required to have adequate quantities of stockpiled spill clean-up materials readily accessible. Only "dry" clean-up methods will be permitted.

- A. **Minor Spills:** Minor spills, such as small quantities of oil, gasoline and paint, will be contained, recovered, cleaned and contaminated materials properly disposed of. Minor spills are those that can be controlled by the first responder at the discovery of the spill.
- B. **Semi-significant Spills:** Semi-significant spills can be contained by the first responder along with aid of their personnel, and may require cessation of all other construction activities. The spill control measures are consistent with those of minor spills.
- C. **Significant/Hazardous Spills:** Significant or hazardous spills cannot be completely controlled by on-site personnel. The Contractor will contact both local emergency response agency (911) and the Governor's Office of Emergency Services Warning Center (805) 852-7550. If the spill is of federal reportable quantities, the Contractor will also notify the National Response Center (800) 424-8802. A written report, following the telephone notification, is required.

VII. POST CONSTRUCTION STORM WATER MANAGEMENT

Existing Golf Course Source Control Best Management Practices include housekeeping practices, material storage control, illegal dumping control, and catch basin and storm drain maintenance. Treatment Control BMP's include infiltration and permanent detention basins.

The existing maintenance program for the course already utilizes Best Management Practices for the whole property, and will incorporate management of these new improvements. The oil and grease trap catch basin at the parking lot will be maintained by the golf course maintenance.

VIII. WASTE MANAGEMENT AND DISPOSAL

A. **General:** The Contractor is required to handle and dispose of all wastes according to the BMPs. These include:

- designating waste collection areas on-site
- providing watertight, covered dumpsters and inspecting them regularly for leaks
- cleaning dumpsters off-site
- arranging for frequent pickup during demolition phases
- properly disposing of all wastes

B **Concrete Washout:** Concrete washout of trucks will occur off-site at proper washout facilities. On-site washout of tools and equipment will be at designated washout location within the Contractor's Construction Yard only. Wastes are to be washed into temporary pits where concrete can set, be broken up, and then disposed of properly. No excess concrete is to be dumped on-site.

C. **Concrete Debris/Asphalt Debris:** Contractor will dispose of all concrete and asphalt debris separately, and recycle as practical. New concrete will be applied only during dry weather.

D. **Litter Control:** Contractor will conduct weekly pickup of litter around construction site.

IX. TRAINING

Contractor will be responsible for employees and subcontractors training that meets the following objectives:

- Identification and understanding of activities with potential to pollute storm water
- Best Management Practices to solve problems
- Promotion of employee/subcontractor ownership of problems and solutions
- Integration of employee/subcontractor feedback into training and BMP implementation

Superintendent and all foremen will have an awareness of the SWPPP and trained in its contents and implementation requirements.

X. OTHER PLANS

To our knowledge, no other agencies have jurisdiction over improvement projects and may impose certain conditions. These include: *Permit Agency*

XI. MONITORING PROGRAM, REPORTS AND RECORDS

A. **General:** The General Contractor will provide a representative to perform weekly inspections of the installed Best Management Practice Improvements. The inspections will be documented in writing with the attached inspection form. Site inspections are also required before and after a storm event of 0.5" or greater.

- B. Site Inspections:** On days before a predicted rainfall, a walk-through inspection will be conducted to check for any potential damage. The Contractor's Representative will direct the Contractor's Crew to immediately prevent such damage. Each BMP will be closely inspected within 24 hours after each rainfall of 0.5" or more. Each BMP will be checked for functionality and sediment accumulation. Contractor will check for evidence of excessive sedimentation and construction materials outside of the construction activity areas. A log of inspections will be kept with this report.

SWPPP will be updated as needed to identify the Contractor and the Contractor's Representative responsible for monitoring, inspection, and maintenance of the SWPPP.

- C. Compliance Certification:** By July 1 of each year, the Owner will prepare an annual certification that the project is in compliance with the requirements of the General Permit and its Storm Water Pollution Prevention Plan. This certification will be based on the site inspections' log (see B above).
- D. Non-compliance Reporting:** Contractor will be responsible for immediately reporting to the Regional Board all instance of non-compliance with the requirements of the General Permit and its Storm Water Pollution Prevention Plan. The notification will identify the type(s) of non-compliance, describe the actions undertaken and/or necessary to achieve compliance, and a time schedule, subject to modification by the Regional Board, indicating when compliance will be achieved.
- E. Monitoring Records:** All inspection reports, compliance certifications and non-compliance reporting will be retained as a part of the Storm Water Pollution Prevention Plan for a period of at least three years.

XII. CERTIFICATION:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations.

CITY OF SANTA CRUZ, CALIFORNIA

Steve Hammack

Signature

Superintendent of Parks
Title
8/6/04
Date of Preparation

This SWPPP was prepared by:
HALSEY DARAY GOLF, INC.

Stephen L. Halsey RLA# 1300
Name

Signature

Principal
Title
8/6/04
Date of Preparation
8/6/04

*** End of Report ***

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

Inspected by: _____

Date: _____

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
			Are all operation storm drain inlets protected from sediment inflow?
			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
			Are locations of temporary soil stock piles or construction materials in approved areas
			Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
			Is there any evidence that sediment is leaving the site?
			Is there any evidence of erosion on cut or fill slopes?
			Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
			Does the SWPPP require revision? If yes, explain:



Winston H. Hickox
*Secretary for
Environmental
Protection*

State Water Resources Control Board

Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5537
Mailing Address: P.O. Box 1977 • Sacramento, California • 95812-1977
FAX (916) 341-5543 • Internet Address: <http://www.swrcb.ca.gov>



Gray Davis
Governor

To: Storm Water Permit Holder

RE: NOTICE OF TERMINATION OF COVERAGE UNDER THE GENERAL
CONSTRUCTION STORM WATER PERMIT (GENERAL PERMIT)

In order for us to terminate your coverage under the General Permit, please complete and submit the enclosed Notice of Termination (NOT) your local Regional Water Quality Control Board (RWQCB). Refer to the last page of the NOT packet for RWQCB locations.

Please note that you are subject to the annual fee until you file a NOT and the RWQCB approves your NOT.

Should you have any questions regarding this matter, please contact your local RWQCB at the number listed on the back page of the NOT package, or the Storm Water Unit at (916) 341-5537.

Sincerely,

Storm Water Unit
Division of Water Quality

Enclosure

**INSTRUCTIONS FOR COMPLETING
NOTICE OF TERMINATION
FOR CONSTRUCTION ACTIVITY**

Who May File

Dischargers who are presently covered under NPDES General Permit No. CAS000002 for discharge of storm water associated with construction activity may submit a Notice of Termination when they meet one of the following criteria.

1. The construction project has been completed and the following conditions have been met: all elements of the Stormwater Pollution Prevention Plan have been completed; construction materials and equipment maintenance waste have been disposed of properly; the site is in compliance with all local storm water management requirements including erosion/sediment control requirements and the appropriate use permits have been obtained; and a post-construction storm water operation and management plan is in place.
2. Construction activities have been suspended, either temporarily or indefinitely and the following conditions have been: all elements of the Stormwater Pollution Prevention Plan have been completed; construction materials and equipment maintenance waste have been disposed of properly; all denuded areas and other areas of potential erosion are stabilized; an operation and maintenance plan for erosion and sediment control is in place; and the site is in compliance with all local storm water management requirements including erosion/sediment control requirements. The date construction activities were suspended, and the expected date construction activities will start up again should be provided.
3. Construction site can not discharge storm water to waters of the United States. Please indicate if all storm water is retained on site or if storm water is collected offsite.
4. Discharge of construction storm water from the site is now subject to another NPDES general permit or an individual NPDES permit. The general permit or individual permit NPDES number and date coverage began should be provided.
5. There is a new owner of the identified site. If ownership or operation of the facility has been transferred then the previous owner must submit a Notice of Termination and the new owner must submit a Notice of Intent for coverage under the general permit. The date of transfer and information on the new owner should be provided. Note that the previous owner may be liable for discharge from the site until the new owner files a Notice of Intent for coverage under the general permit.

Where to File

The Notice of Termination should be submitted to the Executive Officer of the Regional Water Board responsible for the area in which the facility is located. See attached. If the Executive Officer, or his designated staff, agrees with the basis of termination, the Notice of Termination will be transmitted to the State Water Board for processing. If the Executive Officer, or his designated staff, does not agree with the basis of termination, the Notice of Termination will be returned. The Regional Water Board may also inspect your site prior to accepting the basis of termination.

LINE-BY-LINE INSTRUCTIONS

All necessary information must be provided on the form. Type or print in the appropriate areas only. Submit additional information, if necessary, on a separate sheet of paper.

SECTION I--WDID NO.

The WDID No. is a number assigned to each discharger covered under the General Permit. If you do not know your WDID No., please call the State Water Board or Regional Water Board and request it prior to submittal of the Notice of Termination.

SECTION II--OWNER

Enter the owner of the construction site's official or legal name (This should correspond with the name on the Notice of Intent submitted for the site), address of the owner, contact person, and contact person's title and telephone number.

SECTION III--CONSTRUCTION SITE INFORMATION

In Part A, enter the name of the developer (or general contractor), address, contact person, and contact person's title and telephone number. The contact person should be the construction site manager completely familiar with the construction site and charged with compliance and oversight of the general permit. This information should correspond with information on the Notice of Intent submitted for the site.

In Part B, enter the address, county, and telephone number (if any) of the construction site. Construction sites that do not have a street address must attach a legal description of the site.

SECTION IV--BASIS OF TERMINATION

Check the category which best defines the basis of your termination request. See the discussion of the criteria in the Who May File section of these instructions. Provide dates and other information requested. Use the space under Explanation of Basis of Termination heading.

SECTION V--EXPLANATION OF BASIS OF TERMINATION

Please explain the basis or reasons why you believe your construction site is not required to comply with the General Permit. To support your explanation, provide a site map and photograph of your site.

SECTION VI--CERTIFICATION

This section must be completed by the owner of the site.

The Notice of Termination must be signed by:

For a Corporation: a responsible corporate officer

For a Partnership or Sole Proprietorship: a general partner or the proprietor, respectively.

For a Municipality, State, or other Non-Federal Public Agency: either a principal executive officer or ranking elected official.

For a Federal Agency: either the chief or senior executive officer of the agency.

NOTICE OF TERMINATION

OF COVERAGE UNDER THE NPDES GENERAL PERMIT NO. CAS000002 FOR DISCHARGES OF STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY

Submission of this Notice of Termination constitutes notice that the owner (and his/her agent) of the site identified on this form is no longer authorized to discharge storm water associated with construction activity by NPDES General Permit No. CAS000002.

I. **WDID NO.** _____

II. **OWNER**

COMPANY NAME _____ CONTACT PERSON _____

STREET ADDRESS _____ TITLE _____

CITY _____ STATE _____ ZIP _____ PHONE _____

III. **CONSTRUCTION SITE INFORMATION**

A. DEVELOPER NAME _____ CONTACT PERSON _____

STREET ADDRESS _____ TITLE _____

CITY _____ CA _____ ZIP _____ PHONE _____

B. SITE ADDRESS _____ COUNTY _____

CITY _____ CA _____ ZIP _____ PHONE _____

IV. **BASIS OF TERMINATION**

_____ 1. The construction project is complete and the following conditions have been met.

- All elements of the Storm Water Pollution Prevention Plan have been completed.
- Construction materials and waste have been disposed of properly.
- The site is in compliance with all local storm water management requirements.
- A post-construction storm water operation and management plan is in place.

Date of project completion ____/____/____

_____ 2. Construction activities have been suspended, either temporarily _____ or indefinitely _____ and the following conditions have been met.

- All elements of the Storm Water Pollution Prevention Plan have been completed.
- Construction materials and waste have been disposed of properly.
- All denuded areas and other areas of potential erosion are stabilized.
- An operation and maintenance plan for erosion and sediment control is in place.
- The site is in compliance with all local storm water management requirements.

Date of suspension ____/____/____ Expected start up date ____/____/____

_____ 3. Site can not discharge storm water to waters of the United States (check one).

_____ All storm water is retained on site.

_____ All storm water is discharged to evaporation or percolation ponds offsite.

_____ 4. Discharge of storm water from the site is now subject to another NPDES general permit or an individual NPDES permit.

NPDES Permit No. _____ Date coverage began ____/____/____

_____ 5. There is a new owner of the identified site. Date of owner transfer ____/____/____

Was the new owner notified of the General Permit requirements? YES ___ NO ___

NEW OWNER INFORMATION

COMPANY NAME _____ CONTACT PERSON _____

STREET ADDRESS _____ TITLE _____

CITY _____ STATE _____ ZIP _____ PHONE _____

V. EXPLANATION OF BASIS OF TERMINATION (Attach site photographs - see instructions).

VI. CERTIFICATION:

I certify under penalty of law that all storm water discharges associated with construction activity from the identified site that are authorized by NPDES General Permit No. CAS000002 have been eliminated or that I am no longer the owner of the site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with construction activity under the general permit, and that discharging pollutants in storm water associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this Notice of Termination does not release an owner from liability for any violations of the general permit or the Clean Water Act.

PRINTED NAME _____ TITLE _____

SIGNATURE: _____ DATE ____/____/____

REGIONAL WATER BOARD USE ONLY

This Notice of Termination has been reviewed, and I recommend termination of coverage under the subject NPDES general permit.

Printed Name _____ Region No. _____

Signature _____ Date ____/____/____

**STATE AND REGIONAL BOARD
CONTACT LIST**

Contact List is located at
www.swrcb.ca.gov/stormwtr/contact.html
under *Contacts*

Appendix 'A'

**SWPPP
PROJECT AMENDMENTS**

**City of Santa Cruz, California
De Laveaga Golf Course**

SWPP AMENDMENT: JANUARY 14, 2005

The original SWPPP and NOI were submitted prior to the closing of the project bid period and contractor selection. The final contract value necessitated a reduction in project scope, including the elimination of improvements to the Driving Range facility and Barbeque area, with consequent elimination of those construction-related disturbances.

See the attached January 14, 2005 Amendments :

1. Revised Disturbance Acreages
(Amended paged 7-of-16 from the original SWPPP)
2. Completed signature page
(Amended paged 16-of-16 from the original SWPPP)
3. SWPPP California Construction General Permit Form Revised
4. Updated NOI (Notice of Intent), including assigned project contacts:
Responsible Personnel
Contractor
Subcontractors
5. Revised 24" x 36" and 11" x 17" SWPPP Site Plan

As is to be anticipated in any large-scale project of this nature, some adjustments to the BMP's have been made during construction. While none of the originally selected BMP's have been eliminated, nor new ones selected, the 'balance' has been changed. More sandbagging has been instituted (SC-8); more silt fencing has been installed (ESC50); fewer fiber rolls have been installed (SC-5). The revised configuration of installed BMP's is shown on the amended Figure 3: SWPPP Site Map, which is attached.

The SWPPP Site Plan is continually amended manually on an as needed basis by the SWPPP Project Manager. Periodically the field comments and revisions are transferred to the CAD file drawing for a project record and re-plotted and distributed to the SWPPP on site Project Manager.

4. ~~New barbeque area 7,989 s.f. (3,300 s.f. previously existing)~~
5. Three (3) remodeled Greens, and 18 remodeled Tees.
6. ~~Remodel of existing grass Driving Range.~~
7. ~~One (1) New Restroom/Concession Building at 300 s.f. replacing existing (+/- 300 s.f.) of a similar size.~~

These existing paved areas are shown on the Site Plan. The comparison of undisturbed vs. disturbed areas is as follows:

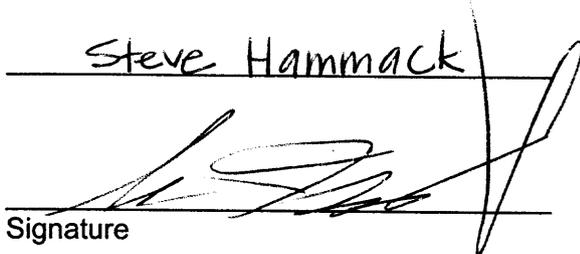
Project Disturbance Area	
Greens	3.17 acres
Cart Paths	3.27 acres
Tees	2.13 acres
Driving Range	3.34 acres
Parking Lot	1.43 acres
Barbecue area	1.18 acres
TOTAL DISTURBED AREA	<u>13.5 ACRES</u> 10

8. **Locations of Post Construction Control Practices:** All permanent control measures to control pollutants in stormwater discharges are shown on Site Map and Construction Plans. These measures include landscape areas, sub-drainage systems and oil and grease trap catch basin, located in the Parking Lot.
9. **Vehicle and Equipment Storage and Service Areas:** The Vehicle and Construction Equipment Storage and Service Area shown on the Site Plan is located next to the 18th Green. The location meets the following criteria:
 - a. Minimize the risks associated with equipment leaks impacting receiving waters
 - b. Contain equipment wastes within a specific area
 - c. Allow for easy cleanup or servicing of equipment
 - d. Prevent run-on/run-off from passing through the area
10. **Areas of Existing Vegetation:** The total Eighteen Hole Golf Course (not including Building, Parking Lot, and Maintenance Building) equals approximately 106 acres of turf, with numerous trees lining and back dropping most holes.

XII. CERTIFICATION:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibilities of fine and imprisonment for knowing violations.

CITY OF SANTA CRUZ, CALIFORNIA

Steve Hammack

Signature

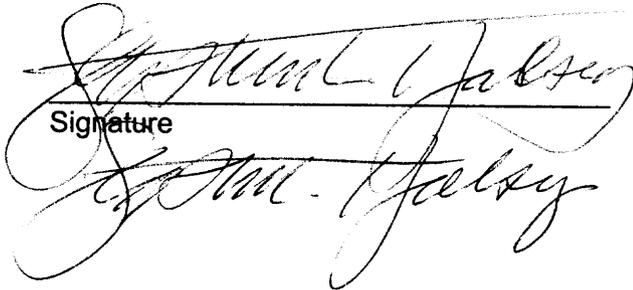
Superintendent of Parks
Title

1/14/05
Date of Preparation

This SWPPP was prepared by:
HALSEY DARAY GOLF, INC.

Stephen L. Halsey RLA# 1300
Name

Principal
Title


Signature

1/14/05 amended.
Date of Preparation

1/14/05 amended

*** End of Report ***

Amendments Attached

Revisions	Date
Site Plan/Report	1/14/05

NOI Attached?
 Yes
 No

Waste Discharge Identification Number: **344C330064**

**Storm Water Pollution Prevention Plan (SWPPP)
 California Construction General Permit**

I. Project Information

1. Project Name: Delaveaga Golf Course Remodel and Improvements
- Project Location: Street Address (or equivalent): 401 Upper Park Road
 County: Sanata Cruz Zip Code: 95060
2. Project Owner: City of Santa Cruz
 Contact Person: Steve Hammack, Director of Parks and Recreation.
 Phone Number: (831) 420-5366
 Owner's Mailing: Street Address (or equivalent): 323 Church Street
 Address: City: Santa Cruz State: California Zip Code: 95060

Responsible Personnel:

Implementing and revising the SWPPP: Miles Hicks, Golf Course Supt.

Inspecting equipment: Miles Hicks

Regular inspections of BMPs: Miles Hicks

Training employees about BMPs affecting their job: Miles Hicks with assistance from Stephen Halsey, Landscape Architect

Contractors and Subcontractors responsible for implementing SWPPP for the Project:

Project Prime Contractor: Golf Corse Builders Int'l

Contact Person: Lee Bilberry Phone Number: (360) 303-7770
 Mailing Address: Street Address (or equivalent): 1109 N. Palmetto Circo
 City: Evsas, Fla. County: _____ Zip Code 32727

Estimated Start Date: September 2004

Estimated End Date; Golf Course: June 30, 2005

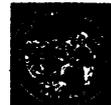
Subcontractors

Name	Contact Person	Date Work Begins	Date Work Ends
<i>Soltis Golf</i>	Barry Jones	9/04	4/05
Richards Const.	Richard Muiz	9/04	4/05

State Water Resources Control Board



NOTICE OF INTENT
TO COMPLY WITH THE TERMS OF THE
GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH CONSTRUCTION ACTIVITY (WQ ORDER No. 99-08-DWQ)

**I. NOI STATUS (SEE INSTRUCTIONS)**

MARK ONLY ONE ITEM	1. <input checked="" type="checkbox"/> New Construction	2. <input type="checkbox"/> Change of Information for WDID#	<input type="text"/>
--------------------	---	---	----------------------

II. PROPERTY OWNER

Name Parks & Recreation Department	Contact Person Steve Hammack		
Mailing Address 323 Church Street	Title Superintendent of Parks		
City Santa Cruz	State CA	Zip 95060	Phone (831) 420-5366

III. DEVELOPER/CONTRACTOR INFORMATION

Developer/Contractor Golf Course Builders International	Contact Person Scott Monn		
Mailing Address 1109 North Palmetto Circle	Title Vice President		
City Eustis	State FL	Zip 32726	Phone (352) 357-5615

IV. CONSTRUCTION PROJECT INFORMATION

Site/Project Name De LaVeaga Golf Course Improvements		Site Contact Person Miles Hicks	
Physical Address/Location 401 Upper Park Road		Latitude 36° 59'	Longitude 122° 01'
City (or nearest City) Santa Cruz		County Santa Cruz	
City (or nearest City) Santa Cruz		Zip 95060	Site Phone Number (831) 420-6121
Emergency Phone Number (831) 420-5366			
A. Total size of construction site area: 108.5 Acres	C. Percent of site imperviousness (including rooftops): Before Construction: 9.2 % After Construction: 9.3 %		D. Tract Number(s): N/A
B. Total area to be disturbed: 28.43 Acres (% of total 26%)	E. Mile Post Marker: N/A		
F. Is the construction site part of a larger common plan of development or sale? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		G. Name of plan or development:	
H. Construction commencement date: 9/20/04		J. Projected construction dates: Complete grading: 11/30/04 Complete project: 4/30/05	
I. % of site to be mass graded: 19%			
K. Type of Construction (Check all that apply): 1. <input type="checkbox"/> Residential 2. <input type="checkbox"/> Commercial 3. <input type="checkbox"/> Industrial 4. <input checked="" type="checkbox"/> Reconstruction 5. <input type="checkbox"/> Transportation 6. <input type="checkbox"/> Utility Description: _____ 7. <input checked="" type="checkbox"/> Other (Please List): Park & Recreation Facility			

V. BILLING INFORMATION

SEND BILL TO: <input checked="" type="checkbox"/> OWNER (as in II. above)	Name City of Santa Cruz, Parks & Recreation Department	Contact Person Steve Hammack, Park & Recreation Director	
<input type="checkbox"/> DEVELOPER (as in III. above)	Mailing Address 323 Church Street	Phone/Fax PHONE: (831)420-5366 Fax (831)420-5361	
<input type="checkbox"/> OTHER (enter information at right)	City Santa Cruz	State CA	Zip 95060

VI. REGULATORY STATUS

A. Has a local agency approved a required erosion/sediment control plan YES NO
Does the erosion/sediment control plan address construction activities such as infrastructure and structures?..... YES NO
Name of local agency: City of Santa Cruz Phone: (831) 420 - 5366

B. Is this project or any part thereof, subject to conditions imposed under a CWA Section 404 permit of 401 Water Quality Certification?..... YES NO
If yes, provide details: _____

VII. RECEIVING WATER INFORMATION

A. Does the storm water runoff from the construction site discharge to (Check all that apply):

1. Indirectly to waters of the U.S.
2. Storm drain system - Enter owner's name: City of Santa Cruz
3. Directly to waters of U.S. (e.g. , river, lake, creek, stream, bay, ocean, etc.)

B. Name of receiving water: (river, lake, creek, stream, bay, ocean): Arana Creek, or Branciforte Creek

VIII. IMPLEMENTATION OF NPDES PERMIT REQUIREMENTS

A. STORM WATER POLLUTION PREVENTION PLAN (SWPPP) (check one)

A SWPPP has been prepared for this facility and is available for review: Date Prepared: 8 / 6 / 04 Date Amended: / /
 A SWPPP will be prepared and ready for review by (enter date): / /
 A tentative schedule has been included in the SWPPP for activities such as grading, street construction, home construction, etc.

B. MONITORING PROGRAM

A monitoring and maintenance schedule has been developed that includes inspection of the construction BMPs before anticipated storm events and after actual storm events and is available for review.
If checked above: A qualified person has been assigned responsibility for pre-storm and post-storm BMP inspections to identify effectiveness and necessary repairs or design changes..... YES NO
Name: Jeff Ball, Construction Manager Phone: (707) 696-5454
Golf Course Builders International

C. PERMIT COMPLIANCE RESPONSIBILITY

A qualified person has been assigned responsibility to ensure full compliance with the Permit, and to implement all elements of the Storm Water Pollution Prevention Plan including:

1. Preparing an annual compliance evaluation..... YES NO
Name: Steve Hammack Phone: (831) 420-5366

2. Eliminating all unauthorized discharges..... YES NO

IX. VICINITY MAP AND FEE (must show site location in relation to nearest named streets, intersections, etc.)

Have you included a vicinity map with this submittal? YES NO
Have you included payment of the annual fee with this submittal? YES NO

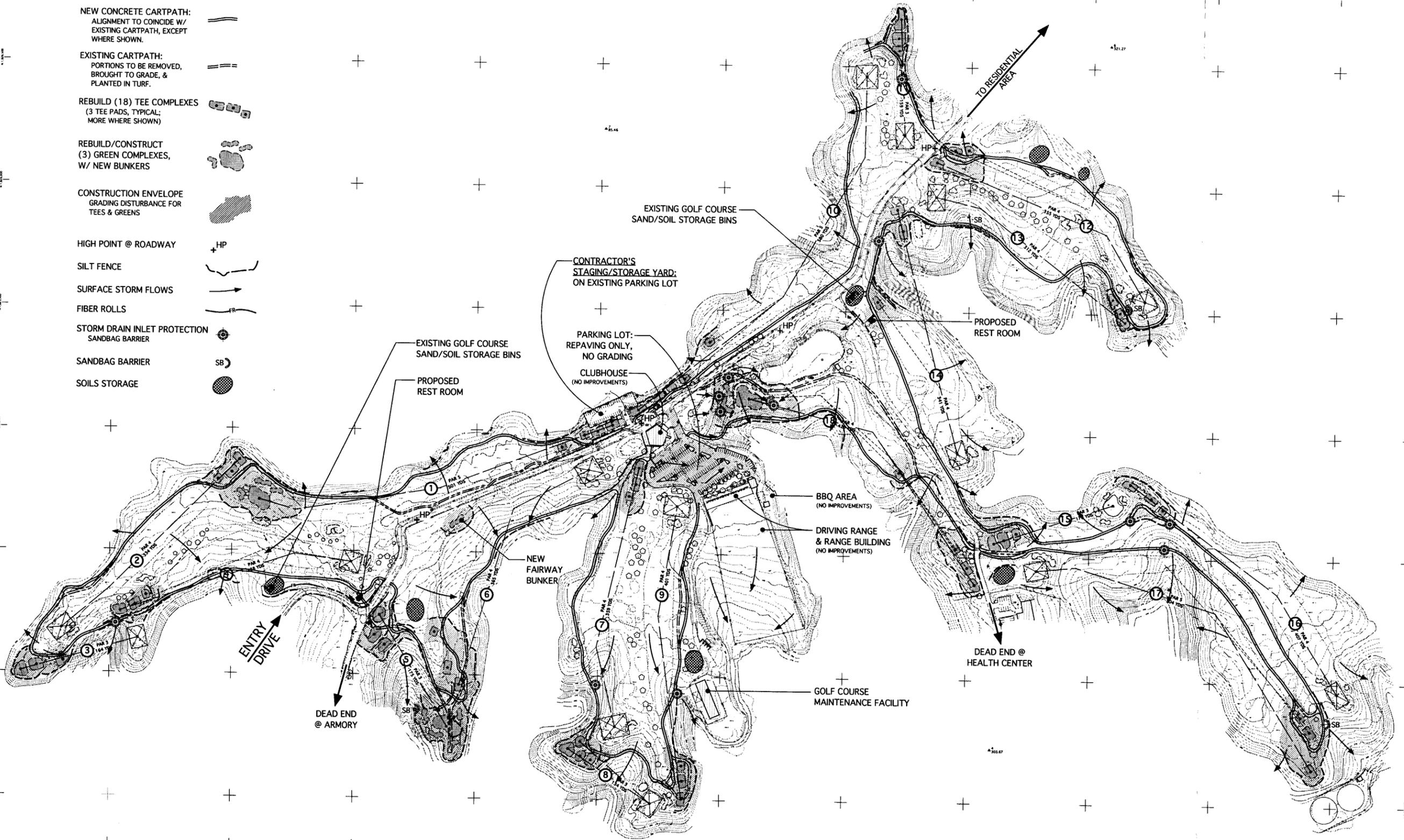
X. CERTIFICATIONS

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a Storm Water Pollution Prevention Plan and a Monitoring Program Plan will be complied with."

Printed Name: Steve Hammack
Signature: [Signature] Date: 9/16/04
Title: Superintendent of Parks

LEGEND

- NEW CONCRETE CARTPATH:
ALIGNMENT TO COINCIDE W/
EXISTING CARTPATH, EXCEPT
WHERE SHOWN.
- EXISTING CARTPATH:
PORTIONS TO BE REMOVED,
BROUGHT TO GRADE, &
PLANTED IN TURF.
- REBUILD (18) TEE COMPLEXES
(3 TEE PADS, TYPICAL;
MORE WHERE SHOWN)
- REBUILD/CONSTRUCT
(3) GREEN COMPLEXES,
W/ NEW BUNKERS
- CONSTRUCTION ENVELOPE
GRADING DISTURBANCE FOR
TEES & GREENS
- HIGH POINT @ ROADWAY
- SILT FENCE
- SURFACE STORM FLOWS
- FIBER ROLLS
- STORM DRAIN INLET PROTECTION
SANDBAG BARRIER
- SANDBAG BARRIER
- SOILS STORAGE



CONSULTANT:
HALSEY DARAY GOLF
5185 COMANCHE DRIVE, SUITE C
LA MESA, CA 91941
PHONE (619)463-9285
FAX (619)463-4985

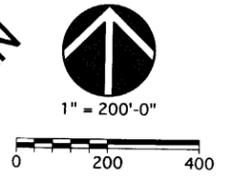


GOLF IMPROVEMENTS PROJECT
DE LAVEAGA GOLF COURSE
SANTA CRUZ, CALIFORNIA
401 UPPER PARK ROAD

CITY CONTACT:
STEVE HAMMACK,
SUPERINTENDENT OF PARKS
& RECREATION DEPARTMENT
323 CHURCH STREET
SANTA CRUZ, CA 95060
831-420-5366

REVIEWED	DATE
REVIEWED	DATE
REVISIONS	DATE
AMMENDED	01/14/05
SHEET NAME	DATE
	08/06/04

PRINT REDUCED
TO HALF-SIZE
**AMMENDED
PLAN**



SWPPP SITE MAP	
DRAWING NO.	JOB NO.
	122.2
FILE NO.	SHEET
	FIGURE 3

Attachment 2

Corrective Action and Cleanup Efforts In Response to Inspection of January 12, 2005.

Problem:

1. Containers and battery exposed to rain and runoff in construction trailer area.

Corrective Action:

1. Immediately following the inspection, these items were placed in secondary containment in the construction area.

Problem:

2. Unprotected storm drain inlets.

Corrective Action:

2. New fabric was installed on these inlets immediately following inspection.

Problem:

3. Significant erosion on slopes and a hole in filter fabric.

Corrective Action:

3. Fabric was replaced. Area is now sodded and therefore no longer eroding.

Problem:

4. Fiber rolls at Greens Complex #18 not properly staked.

Corrective Action:

4. Area is now sodded, and no longer requires fiber rolls.

Problem:

5. Dewatering of planter area of clubhouse without BMP's.

Corrective Action:

5. The dewatering Ms. Gonzales witnessed was a one time effort to allow staff to backfill the newly created planters. They have since been filled, and no longer require dewatering. As Ms. Gonzales mentioned, the sediment in the discharge was stopped by sandbags at the low point, and later cleaned up by staff.

Corrective Action and Cleanup Efforts
In Response to Inspection of January 12, 2005
Cont.

Problem:

6. Pond discharges to canyons without treatment.

Corrective Action:

6. This is an overflow drain. Treatment would prevent proper operation of the drain, resulting in potentially catastrophic overflow of the pond. Efforts have been made by staff to reduce sediment introduced to pond, such as is addressed in Corrective Action #7.

Problem:

7. Muddy water in pond and accumulated sediment below drainage pipe.

Corrective Action:

7. This is the outlet end of the drain shown in Problem #3. The hole in the fabric caused sediment to be deposited in the pond. As mentioned above, the area around the drain inlet is now turf; therefore no sediment is being introduced. Staff has removed the sediment deposit from the pond.

Problem:

8. On site silt fences improperly installed.

Corrective Action:

8. City staff and contractors have worked together to insure the proper installation of silt fences. Due to the severe slopes in areas adjacent to construction zones, it is not always possible to allow 2 to 5 feet at toe of slope for sediment accumulation. We have done our best in these cases to add several rows of control to counter this problem. Sandbags and fiber rolls have also been added in these areas to help.

Problem:

9. Silt fences in need of maintenance and/or replacement in various areas.

Corrective Action:

9. We appreciate Ms. Gonzales bringing these areas to our attention on the day of the inspection. These areas were noted in the inspection checklist, and repaired by the contractor immediately.

Corrective Action and Cleanup Efforts
In Response to Inspection of January 12, 2005
Cont.

Problem:

10. Pipes through and under silt fences in various locations on site

Corrective Action:

10. These pipes were an attempt at finding an alternative to overwhelmed silt fencing. As mentioned in our monitoring log, the pipes alleviate pressure at high points. Not shown in the pictures are the control measures at the discharge points, such as sandbags to dissipate velocity and act as a retention area for sediment. The area adjacent to the silt fence in the photos has now been turfed, controlling erosion.

Problem:

11. Silt fencing on #5 Green Complex and evidence of sediment travel around control measures.

Corrective Action:

11. As seen in the photos taken by Ms. Gonzales, every effort was made in this difficult area to control sediment flow. Not shown in the photo are two retention basins, fiber rolls, sand bagging, and a large area of turf. We have since turfed and mulched the entire complex, alleviating this vulnerability.

Problem:

12. Erosion and sediment deposits in canyon directly below sandbags at Greens Complex # at discharge point.

Corrective Action:

12. #5 Green Complex has been turfed and mulched, eliminating the possibility of future discharge.

Problem:

13. Failing silt fencing at #5 Green Complex.

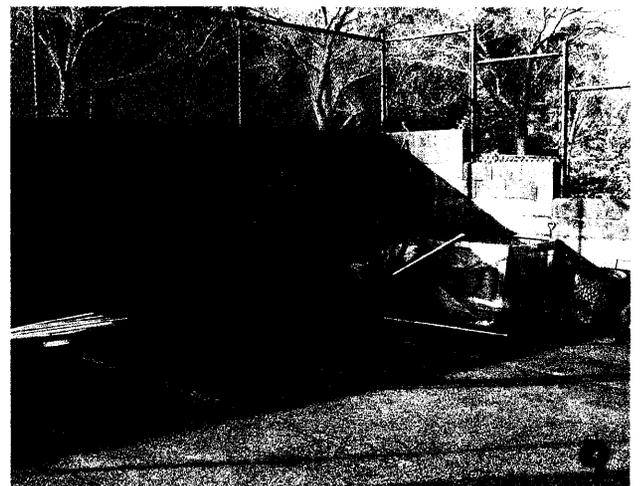
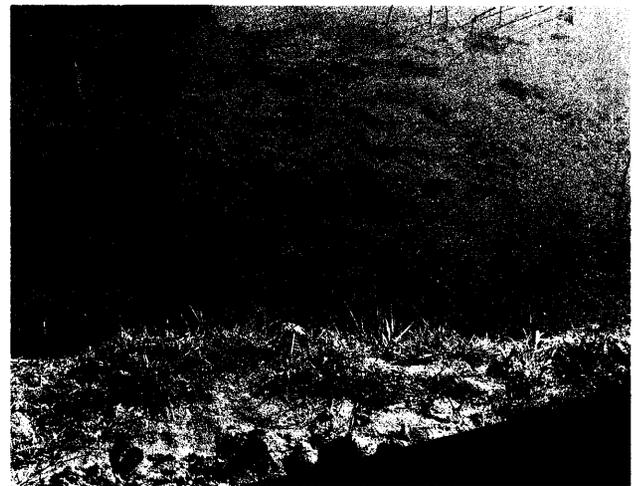
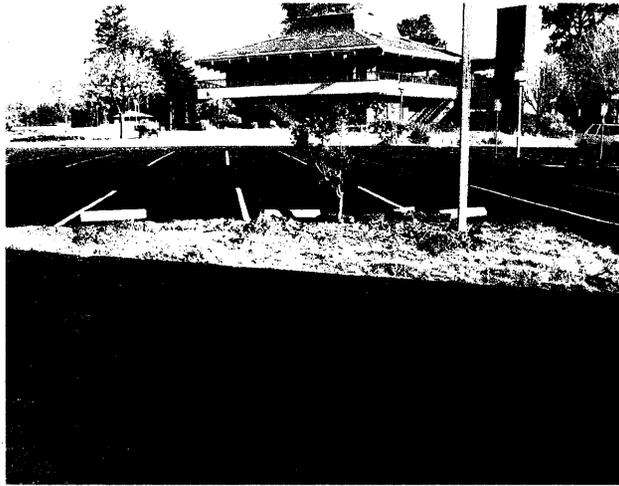
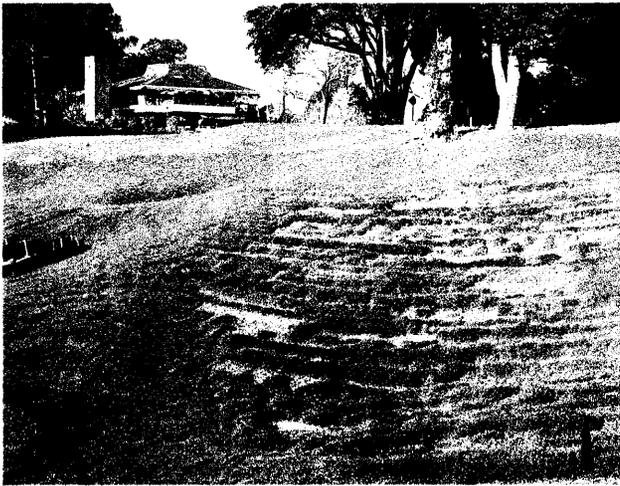
Corrective Action:

13. #5 Green Complex has been turfed and mulched, eliminating the need for silt fencing. See amended site plan.

Photographs Documenting Corrective Actions
In Response to January 12, 2005 Inspection

Photographs taken on April 4, 2005

1. Retention bunker with drain at bottom shown after turfing.
2. Parking lot planter shown backfilled.
3. #5 Green Complex shown after sodding and straw mulching complete.
4. Drain shown with fabric replaced.
5. #18 Green Complex shown after straw mulching and seed germination.
6. Outlet of drain from picture #1 shown with sediment removed from pond.
7. Drain shown with fabric replaced.
8. #18 Green Complex shown after sodding and straw mulching complete.
9. Construction yard area shown without chemical containers.



Attachment 3

Corrective Action and Cleanup Efforts In Response to Inspection of December 8, 2004.

Problem:

1. Parking lot area with unprotected stockpiles and no sediment controls.

Corrective Action:

1. Parking lot was resurfaced on December 20, 2004. Stockpiles have been removed, as well as the need for sediment controls. See photograph #14.

Problem:

2. Discharge of sediment-laden water from parking lot to surface waters.

Corrective Action:

2. Sediment sources in parking lot removed. Sandbagging added at discharge points to control sediment runoff. See photographs #17.

Problem:

3. Erosion at Greens Complex #18 and storm water drainage into pipe. No erosion controls.

Corrective Action:

3. Silt fencing repaired and sandbagging added to drain inlet on December 9, 2004. Silt fencing and fiber rolls installed above drain inlet to control erosion. See photographs #11 & 16.

Problem:

4. Pipe discharge of sediment-laden water over collapsed silt fence and into surface waters.

Corrective Action:

4. Silt fence repaired on December 9, 2004. Sandbagging and fiber added to drain inlet. Rip-rap added as velocity dissipater at discharge point. See photograph #4.

Problem:

5. Sediment in streets near construction staging area.

Corrective Action:

5. Inspector incorrectly reported sediment in streets. Inspector's photo shows material staging area within the construction staging area. Materials have since been removed and placed in their final destinations.

Corrective Action and Cleanup Efforts
In Response to Inspection of December 8, 2004
Cont.

Problem:

6. Oily sheen on runoff in construction staging area and uncovered partly-full gasoline containers.

Corrective Action:

6. Gasoline containers were placed in secondary containment. As was the case at the time of inspection, all drainage inlets in the staging area are protected by fabric and sandbags. It should be noted here that the staging area is normally a parking lot and that the oily sheen could be attributed to oil from the cars that park there, not to mention the properties of the asphalt surface itself.

Problem:

7. Greens complex 1 area with no erosion control, unprotected stockpiles, and failing sediment control. Discharge of sediment-laden water to surface waters.

Corrective Action:

7. Silt fence was repaired on December 9, 2004. Stockpiles have been removed or silt fenced.

Problem:

8. Sediment overwhelming silt fences in Greens complex 5. Widespread erosion and no erosion controls in disturbed areas. Discharges of sediment to surface waters.

Corrective Action:

8. Silt fencing repaired on December 10, 2004. Redundant fencing added in high pressure areas. Extensive sandbagging and fiber rolls used for erosion control in disturbed areas. Corrugated drain pipe used to direct site drainage through turf as bio-swale. See photographs #1,3,7, & 9.

Problem:

9. Sediment overwhelming silt fences at various tees, all resulting in discharge of sediment-laden water to surface waters.

Corrective Action:

9. Silt fences repaired on December 10, 2004. Fiber rolls and redundant silt fencing added for erosion control.

Corrective Action and Cleanup Efforts
In Response to Inspection of December 8, 2004
Cont.

Problem:

10. Tee area with no erosion or sediment controls. Sediment buried street curb and covers the street.

Corrective Action:

10. Inspector misinterpreted situation. The "curb" and "street" in inspector's report are in fact a cart path and cart path curb located on hole #1 of the golf course. Sedimentation did not reach the street, and was contained on the property. Fiber rolls and silt fencing were added, regardless, as seen in photograph #10.

Corrective Action and Cleanup Efforts
In Response to Inspection of December 8, 2004
Cont.

Problem:

10. Tee area with no erosion or sediment controls. Sediment buried street curb and covers the street.

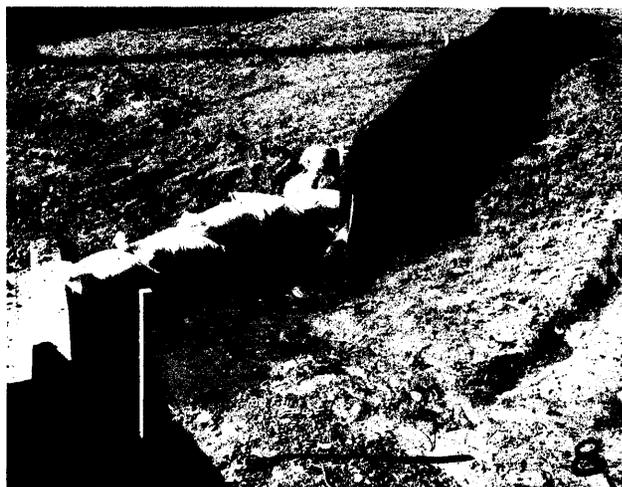
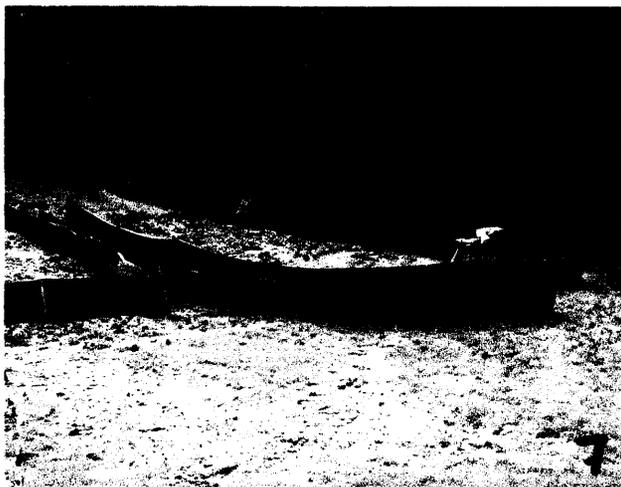
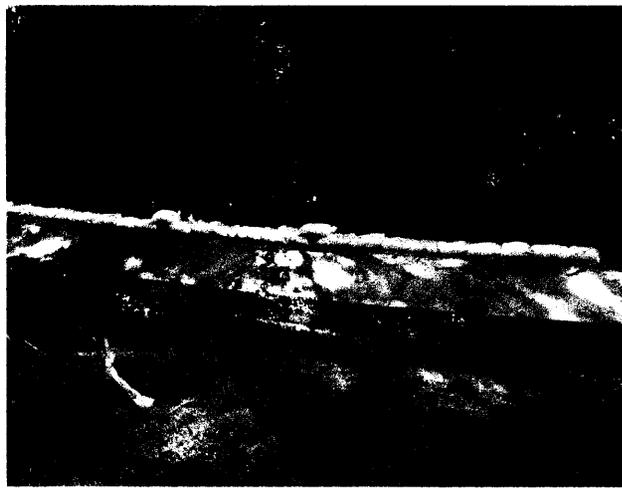
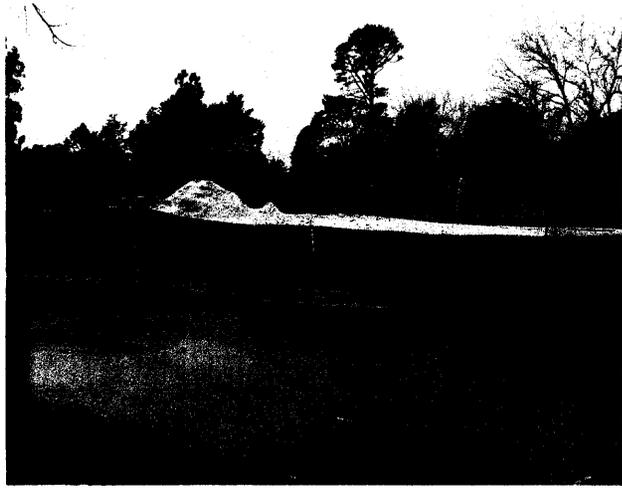
Corrective Action:

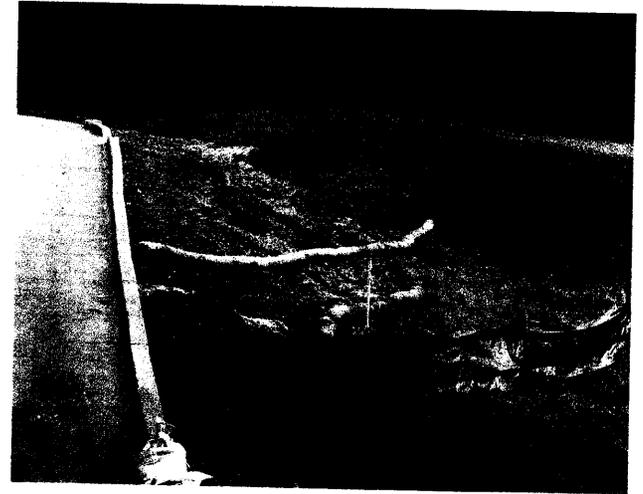
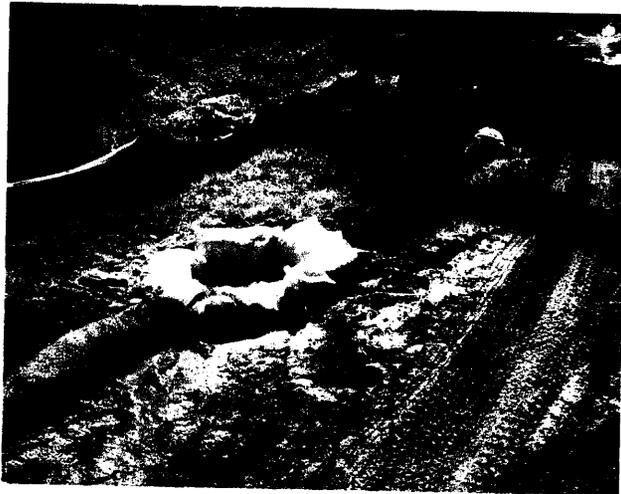
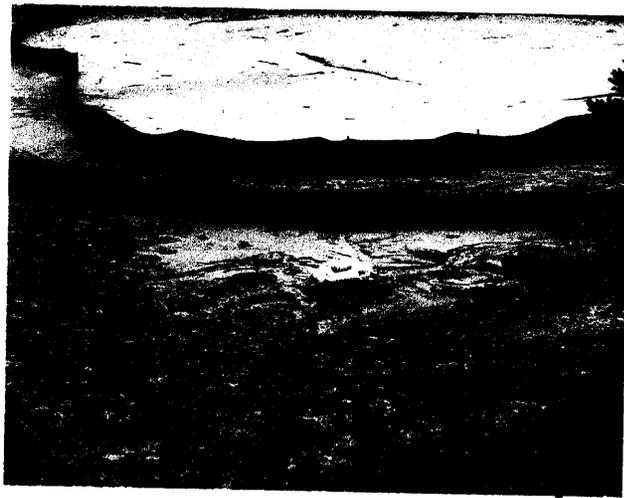
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Photographs Documenting Corrective Actions
In Response to December 8, 2004 Inspection

Photographs taken on January 10, 2005

1. Redundant silt fencing installed on #5 green complex.
2. Silt fencing and fiber rolls installed to protect parking lot surface from #7 tee complex sediments.
3. Sandbagging and silt fencing on #5 green complex.
4. Rip-rap used as velocity dissipater on #18 green complex.
5. Sandbagging and silt fencing on #13 cart path.
6. Rip-rap used on #2 cart path.
7. Redundant silt fencing used on #5 green complex.
8. Sandbagging and silt fencing on #14 tee complex.
9. Fiber rolls on slope of #5 green complex.
10. Fiber rolls and silt fencing used to protect road on #1 tee.
11. Sandbagging to protect drain inlet on #18 green complex.
12. Fiber rolls and silt fencing used to protect road near #4.
13. Fiber rolls, sandbagging, and silt fencing on #14 cart path.
14. Parking lot after improvements- stockpiles removed.
15. Fiber rolls and silt fencing on #3 cart path.
16. Fiber rolls, silt fencing, and sandbagging on #18 green complex.
17. Sandbagging used in parking lot for sediment control.
18. Fiber rolls and silt fencing on #4 tee.





**DeLaveaga Golf Course
Renovation Project
Monitoring and Reporting Log**

October 8, 2004- After a surprise visit from the RWQBC, action was taken to initiate the SWPPP and install erosion and sediment controls. Contracted staff is currently installing silt fence, drain protection, and fiber rolls per permit requirements. The contractor has been instructed to complete the installation by October 15, 2004.

October 13, 2004- A regular inspection was performed today to insure completion of installation as reported by the Contractor. Upon inspection, it is noted that fiber rolls have not been used to the extent called for in the SWPPP due to the interference they cause with regard to grading. The contractor has agreed to use more silt fencing in these areas to protect discharge areas while maintaining their ability to perform their contracted duties. The SWPPP should be revised to reflect these changes.

October 18, 2004- A post-rainfall event inspection was performed. One inch of rain fell on the project site. This was an unexpected rainfall given the amount of rain and time of year. Due to previously dry conditions, much of the rainfall was absorbed by the soil. There was no noticeable damage to silt fencing on the site. Protected drains are performing at a slowed rate, as expected. Some slight erosion is noted on the graded tee banks, but has not caused off-site sedimentation.

October 20, 2004- A post-rainfall event inspection was performed. 1.75 inches of rain was recorded at the site. Upon inspection, it was noted that some graded areas for new cart paths are close to discharge points. The contractor has been directed to install silt fence along these areas. Examples of these areas are #1 green complex and #6 fairway. Revise site plan to show these areas. Removal of sediment build up is needed on silt fencing for #1, 5, and 18 greens.

October 26, 2004- A post-rainfall event inspection was performed. 2.5 inches of rain fell on the site. Sediment removal required on silt fencing for #1, 5, and 18 greens as well as #6 tee. On-site erosion of bare slopes is noted. The sediment is not leaving the site, and is cleaned up, re-graded, and returned to the intended area by the Contractor as soon as possible.

**Delaveaga Golf Course
Renovation Project
Monitoring and Reporting Log**

November 3, 2004- A regular inspection was performed to verify repairs to silt fence noted in the previous inspection. Repairs are complete or on-going.

November 10, 2004- A post-rainfall event inspection was performed after a quarter of an inch. Sediment barriers on protected drains are causing extremely slow drainage which leads to large areas of standing water. Contractor instructed to clean/replace fiber barriers to insure proper permeability and drainage.

November 19, 2004- A regular inspection was conducted to insure proper repair of sediment laden fiber barriers on drains. Barriers clean/replace according to requirements.

December 3, 2004- A pre-rainfall event inspection was performed. Contractor instructed to replace silt fence on #18 that was removed for grading.

December 7, 2004- A post-rainfall event inspection was performed. 1.25 inches of rain were recorded.

December 10, 2004- A regular inspection was performed. RWQBC inspected golf course on 12/8/04. Complained that golf course had no erosion control measures in place. Were concerned about green complexes #5 and 18. Contractor instructed to make repairs and changes per RWQBC request. Revise site plan to indicate changes made.

December 22, 2004- Fiber rolls added to #5 and 18 in an attempt to control erosion on slopes. Will make effort despite lack of success with regards to fiber rolls. Revise site plan to show these new features.

December 28, 2004- Sandbagging added in low area of new parking lot to create retention basin for sediment. Received letter of violation from RWQBC. Begin mitigation process.

**Delaveaga Golf Course
Renovation Project
Monitoring and Reporting Log**

January 3, 2005- Lee Bilberry and Barry Jones contacted regarding need for SWPPP repairs and improvements. Barry Jones to arrive tomorrow.

January 6, 2005- Contractor implementing new approaches in areas where erosion is occurring and sedimentation pressure on silt fence is high. On #5 and 18, using silt fence to channel water away from bare soils and into turfed areas or "bio-swales". The turf will filter sediments before leaving site. Corrugated drain lines inserted through silt fence at key points to relieve pressure before collapse. Drains empty into bio-swales.

January 19, 2005- Steve Halsey, the architect of the plan, does a site visit and recommends additional erosion control methods for #5 and 18. Contractor will install temporary retention basins on #5 and 18 to collect sediment prior to discharge. Additional sandbagging will be used as needed in these areas. Plastic sheeting has been purchased as an additional erosion control method on rainy days only. Sheeting will be removed after rainfall is over.

January 25, 2005- Contractor has finished improvements recommended by architect. Retention basins have been installed on #5 and #18. Plastic sheeting has been purchased and is ready for use on #5. See site plan for detail of area.

January 27, 2005- A post-event (0.5" rain) inspection was done today. All areas look good. Repairs were made, as requested, by Contractor before event occurred (see 1/25 inspection). Retention basins and sandbagging done this week seem to have helped in most cases. Plastic sheeting on #5 obviously helped control erosion under the sheet, but caused sheet flow of high velocity off of plastic and onto adjacent areas. Sediment removal required on silt fence #2 tee.

February 7, 2005- A post event inspection was done after 0.25 inches of rain. Sandbagging and silt basins have proven to be the most effect methods of erosion control. Straw waddles are not effective in any application, unless used with sand bags. Silt fencing is holding up well.

Attachment 4

February 11, 2005- Contractor has been instructed to cover remaining spoil piles with plastic. Although sediment has not migrated from these piles while uncovered, it is good practice and necessary to keep soil dry and usable.

February 18, 2005- Contractor continues to make repairs. They seem to be spending more time maintaining SWPPPs than actually performing work on project. Sandbagging and silt fence seem to be the most effective combo.

February 24, 2005- Spoke with contractor about proper installation methods for silt fence and straw waddles. Need frequent reminders.

March 4, 2005- After inspection, noted that the sod around the greens complexes has helped control erosion and sediment migration tremendously. #5 green complex is now a stable environment. Will leave silt fence and sand bags in place for as long as possible for safe measure. #18 green is also much more sound. Retention basins left in key areas on #5 and #18 in case of heavy rains.

March 14, 2005- Weather is warm and dry. Construction areas are dry and stable. Turf has been installed on the putting surfaces and immediate surrounds of the green complexes on #1,5,18. The remaining area of these complexes has been seeded and mulched using either straw or hydromulch. In some cases, a combination of both has been used. Modify SWPPP to reflect removal of control measures in these areas. Control measures such as silt fence have been left in place on perimeters of #5 and #18 for insurance.

March 22, 2005- Rain over weekend has required the need for repairs to control measures. A site inspection was done and the contractor has received a list of repairs to be completed ASAP. Due to time constraints, only half of the seedbed on #18 green complex was straw mulched prior to rain. The result was some minor erosion and the need for some re-seeding. Straw mulch proves to be excellent erosion control. Contractor to repair and re-seed area, applying straw mulch upon completion.

March 29, 2005- Light rain overnight. Less than 0.15 inches. No repairs needed. Seeded areas are now germinating, and will soon be ready for mowing. Straw mulched areas have held up well, and will soon be mowed to remove mulch. New turf will provide excellent erosion control.

Attachment 5

**Delaveaga Golf Course
Renovation Project
Inspection Log
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6.	November 3, 2004
7.	November 10, 2004
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9.	December 3, 2004
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11.	December 10, 2004
12.	December 22, 2004
13.	December 27, 2004
14.	December 28, 2004
15.	January 3, 2005
16.	January 6, 2005
17.	January 19, 2005
18.	January 25, 2005
19.	January 27, 2005
20.	February 7, 2005
21.	February 11, 2005
22.	February 13, 2005
23.	February 14, 2005
24.	February 15, 2005
25.	February 16, 2005
26.	February 28, 2005
27.	March 4, 2005
28.	March 22, 2005
29.	March 29, 2005

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) ___ inches

Inspected by: MILES HUES

Date: 10/8/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
	✓		Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP? <i>BY 10/15/04</i>
	✓		Are all operation storm drain inlets protected from sediment inflow? <i>BY 10/15/04</i>
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
	✓		Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

Inspected by: MILES HICKS

Date: 10/13/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
	✓		Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP? <i>FIBER ROLLS NOT INSTALLED DUE TO NEED TO GRADE AREA</i>
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
	✓		Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <i>FIBER ROLLS SHOULD BE REMOVED FROM SITE PLAN IN AREAS NOT BEING USED.</i>

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) 1 inches

Inspected by: MICHAEL HARRIS

Date: 10/18/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
	✓		Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP? <i>NO PROBLEMS DUE TO NEED FOR FURTHER CHANGES</i>
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <i>CONTAINED ON SITES.</i>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <i>REVISE SWPPP TO REFLECT CHANGES REGARDING PAVED ROAD USE.</i>

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) 1.75 inches

Inspected by: MILES HUCKS

Date: 10/20/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP? <u>ADDT'L SILT FENCE WAS ADDED TO CONTROL EROSION TO CONTROL GRADIENT MOVEMENT.</u>
✓			Are all operation storm drain inlets protected from sediment inflow?
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <u>REPAIR SILT FENCE ON GULLS 1, 5, 18. REMOVE SEDIMENTATION</u>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <u>NOT LEAVING SITE</u>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <u>REVISE SWPPP TO SHOW NEW SILT FENCE AREAS NEAR CONCRETE</u>

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 2.5 inches

Inspected by: MICHAEL MICES

Date: 10/26/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <i>REMOVE SEDIMENTATION FROM SILT TRAPS ON #1, 5, 18, 14.</i>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <i>CONFINED ON SITE</i>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

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**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) ___ inches

Inspected by: Miles Hines

Date: 11/3/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <i>CONTRADICTORY ON SITE</i>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) 0.25 inches

Inspected by: MILES HICKS

Date: 11/10/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <i>REMOVE SILT FROM PRACTICE ON DRAINAGES</i>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <i>CONTAINED ON-SITE</i>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) ___ inches

Inspected by: M. W. Hicks

Date: 11/19/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Nct Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is their any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <i>From previous landscape</i>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

Inspected by: MILES HICKS

Date: 12/3/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <i>REPAIR SILT FENCE REMOVED FOR GRADING ON #18 TEE & GRN</i>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
	✓		Is there any evidence of erosion on cut or fill slopes? <i>TEE + GRN BANKS NE GRN</i>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) 1.25 inches

Inspected by: MIGUEL HUES

Date: 12/7/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
	✓		Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

Inspected by: MIGS HUKS

Date: 12/10/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
<input checked="" type="checkbox"/>			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
<input checked="" type="checkbox"/>			Are all operation storm drain inlets protected from sediment inflow?
<input checked="" type="checkbox"/>			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <i>PER RWABC INSTRUCTIONS</i> <i>ESP. #1, 5, 18 GRN COMPLIANT</i>
<input checked="" type="checkbox"/>			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
<input checked="" type="checkbox"/>			Are locations of temporary soil stock piles or construction materials in approved areas
		<input checked="" type="checkbox"/>	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	<input checked="" type="checkbox"/>		Is there any evidence that sediment is leaving the site?
<input checked="" type="checkbox"/>			Is there any evidence of erosion on cut or fill slopes? <i>CONTROLLED ON-SITE</i>
	<input checked="" type="checkbox"/>		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	<input checked="" type="checkbox"/>		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

Inspected by: MICHAEL HULL

Date: 12/2/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
	✓		Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP? <i>AND FIBER ROWS TO #5 + 18 AND COMPLEX</i>
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <i>CONTAINED ON SITE</i>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <i>REVISE TO SHOW FIBER ROWS INSTALLED ON #5 + 18.</i>

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CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 0.25 inches

Inspected by: MIGGS AUCS

Date: 12/27/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <u>ADD SANDBARRIERS IN PARKING LOT TO SITE PLAN</u>

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 2 inches

Inspected by: MUS HUCKS

Date: 12/28/04

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 4.25 inches

Inspected by: Muñoz Muñoz

Date: 1/3/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <i>SEE LIST</i>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) _____ inches

Inspected by: MILGS ANKS

Date: 1/6/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <i>UPDATE SITE PLAN TO SHOW ADDIT'L STRENGTH ON #5 + #18</i>

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

Inspected by: MICHA HUKS

Date: 1/19/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
<input checked="" type="checkbox"/>			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
<input checked="" type="checkbox"/>			Are all operation storm drain inlets protected from sediment inflow?
	<input checked="" type="checkbox"/>		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
<input checked="" type="checkbox"/>			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
<input checked="" type="checkbox"/>			Are locations of temporary soil stock piles or construction materials in approved areas
		<input checked="" type="checkbox"/>	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	<input checked="" type="checkbox"/>		Is there any evidence that sediment is leaving the site?
<input checked="" type="checkbox"/>			Is there any evidence of erosion on cut or fill slopes?
	<input checked="" type="checkbox"/>		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	<input checked="" type="checkbox"/>		Does the SWPPP require revision? If yes, explain:

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

Inspected by: MILUS HUKS

Date: 1/25/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <i>SF ON #3 GREEN - NOT INSTALLED IN TRENCH. TO INSTALL REPAIR SF AROUND #10 FWY BUNKER. REPAIR SF ON #7 TEE - PARKING LOT SIDE.</i>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <i>ADDITIONAL FEATURES ADDED ON SEVERAL HOLES. SEE SITE PLAN FOR UPDATES.</i>

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 0.5 inches

Inspected by: MICHAEL HUCKS

Date: 11/27/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <i>#2T - REMOVE SEDIMENT / RESURFACE SF.</i>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <i>ADD SIB'S ON #4 CARTRIDGE TO SITE PLAN.</i>

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 2.25 inches

Inspected by: MILES HUBS

Date: 2/7/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: *SEE BOTTOM OF PAGE
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:



* REPAIRS NEEDED

- #17 - REPAIR SILT BASIN (SF)
- #27 - " "
- #47 - REMOVE SEDIMENT FROM SF
- #5 - REMOVE SED FROM SF
- #5 - RESTORE SILT BASINS

- #7 - CLEAR DRAIN FABRIC
- #12 - PROTECT STOCKPILE W/ SF OR COVER
- #13 - REPAIR SF @ BOTTOM OF HILL
- #16 - REMOVE SEDIMENT FROM SF
- #18 - REPAIR SF @ GREEN COMPLEX (CANYON)

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection



Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

Inspected by: EF

Date: 2/11/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
X			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
X			Are all operation storm drain inlets protected from sediment inflow?
X			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
X			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
X			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain: <i>Revised in Jan</i>

Minor from past Rain events

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 2.3 inches

Inspected by: S

Date: 2/13/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
			Are all operation storm drain inlets protected from sediment inflow?
			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

*Pile next to #4 RR excavation
not covered. Will talk to contractor
Monday*

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection



Rainfall Event Inspection (before)
Rainfall Event Inspection (after) _____ inches

Inspected by: SS

Date: 2/14/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
			Are all operation storm drain inlets protected from sediment inflow?
			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

Lots of Rain expected this week. Had meeting w/BARRY of GCBI to talk specifically about SWPPP.

We worked all day on erosion control specifically cutting plastic out

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 0.9 inches

Inspected by: S

Date: 2/15/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
			Are all operation storm drain inlets protected from sediment inflow?
			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
			Are locations of temporary soil stock piles or construction materials in approved areas
		✓	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes?
✓			Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
	✓		Does the SWPPP require revision? If yes, explain:

Plastic over spoils pile. Raining constant + hard. Course holding up well. Staff helped Barry install more plastic.

→ Cloudy Run off down main Road in Gutter from #4. More PLASTIC Applied

**CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST**

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 2.23 inches

Inspected by: ES

Date: 2/16/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
			Are all operation storm drain inlets protected from sediment inflow?
			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
			Are locations of temporary soil stock piles or construction materials in approved areas
		X	Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	X		Is there any evidence that sediment is leaving the site?
X			Is there any evidence of erosion on cut or fill slopes?
	X		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
			Does the SWPPP require revision? If yes, explain:



Solid Rain all day yesterday + Night
Course held up well.
Minor Erosion NEART 5 Complex
3" at Shop

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 1.0 inches

Inspected by: MILLS HICKS

Date: 2/28/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow? <u>CLEAR SEDIMENT FROM D.I.'S ON COURSE</u>
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <u>* SEE BELOW</u>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
	✓		Are locations of temporary soil stock piles or construction materials in approved areas <u>REMOVE STOCKPILE FROM #5 GRN (BEHIND COMPLEX)</u>
	✓		Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
	✓		Is there any evidence of erosion on cut or fill slopes?
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <u>REMOVE BMP'S FROM PLAN FOR AREAS OF #1, 5, 18 GRNS THAT HAVD BEEN SEEDD.</u>

*** REPAIRS NEEDED**

CHEMICAL CONTAINERS IN CONSTRUCTION LOT NEED SEDIMENT CONTAINMENT
FOOD GARBAGE IN CONSTRUCTION LOT & OVERTLOWING TRASH CANS TO DUMPSTER.
REMOVE PLASTIC SHEETING NEAR #4T - NOT BEING USED.
REMOVE SEDIMENT FROM SILT POND #2T + #6 STRIPS
REMOVE STOCKPILE ON #5 GRN COMPLEX AND #6-8BT SILT POND
CLEAR DEBRIS FROM DRAIN INLETS ON COURSE

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 1 inches

Inspected by: MILES HUCKS

Date: 3/4/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
✓			Are all operation storm drain inlets protected from sediment inflow?
	✓		Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones:
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas
	✓		Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <i>MINOR, NOT MILEAGE</i>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <i>AMEND SWPP PLAN TO SHOW SOIL AROUND NOW BARS ON 1,511B.</i>

CONSTRUCTION GENERAL PERMIT
INSPECTION CHECKLIST

[] Regular Inspection

Rainfall Event Inspection (before)

Rainfall Event Inspection (after) _____ inches

3 During

Inspected by: MILES HICKS

Date: 3/22/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
<input checked="" type="checkbox"/>			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
<input checked="" type="checkbox"/>			Are all operation storm drain inlets protected from sediment inflow?
<input checked="" type="checkbox"/>			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <i>SEE ATTACHED LIST.</i>
<input checked="" type="checkbox"/>			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
<input checked="" type="checkbox"/>			Are locations of temporary soil stock piles or construction materials in approved areas
<input checked="" type="checkbox"/>			Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching? <i>MULCH #18 SWY</i>
	<input checked="" type="checkbox"/>		Is there any evidence that sediment is leaving the site?
<input checked="" type="checkbox"/>			Is there any evidence of erosion on cut or fill slopes? <i>EXISTING FROM PAST RAINFALL</i>
	<input checked="" type="checkbox"/>		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
<input checked="" type="checkbox"/>			Does the SWPPP require revision? If yes, explain: <i>REVISE SWPPP TO SHOW NEW TRUCK ACCESS, STRAW MULCHING, ETC.</i>

WORKS

#1 GRN -

REMOVE DEBRIS FROM SILT FENCE (RT SIDE OF CARPATH)
CLEAN UP TRASH DEBRIS + DISCARDED EROSION CONTROL.

#3 CARPATH -

CLEAN UP SEDIMENTATION AND RESET EROSION CONTROL
AT BOTTOM OF HILL, ON THE CARPATH, BETWEEN #3T + #3G.

#4 CARPATH -

REMOVE SBO'S FROM SILT FENCE. RE-SET EROSION CONTROL IN
2 PLACES ON #4 CARPATH.

#5 GRN -

REPAIR + PROTECT DRAIN INLETS.
REMOVE SBO'S FROM EARTH BASIN + SILT FENCES.

#7 CARPATH -

CLEAR / RE-PAV DUMPS AT BOTTOM OF HILL NEAR CARPATH

#9 CARPATH

CLEAR + REPAIR SILT FENCE ADJACENT TO CANYON NEAR #9T

HILL -

REMOVE TRASH DEBRIS
REPAIR SILT FENCE ADJACENT TO CARPATH BETWEEN T6 + GREEN

#13 -

REPAIR SILT FENCE @ #13 TEE.
REPAIR SILT FENCE @ BOTTOM OF HILL NEAR GREEN.

#14 -

REPAIR SWEEP'S ADJACENT TO CARPATH BETWEEN T6 COMPLEXES.

#17 -

EROSION CONTROL NEARBY ON #17 CARPATH.

IN GENERAL

REMOVE TRASH DEBRIS FROM CONSTRUCTION LOT.
STORE #12 ITEMS IN PROPER STORAGE.
REMOVE DEBRIS FROM CURB + DISCARD.

CONSTRUCTION GENERAL PERMIT INSPECTION CHECKLIST

Regular Inspection

Rainfall Event Inspection (before)
 Rainfall Event Inspection (after) 0.5 inches

Inspected by: MICHAEL HARRIS

Date: 3/29/05

Project: De Laveaga Golf Course Remodel and Improvements

Yes	No	Does Not Apply	
✓			Are the BMPs called for on the SWPPP installed in the proper location and according to the specifications for the SWPPP?
	✓		Are all operation storm drain inlets protected from sediment inflow? <u>REPAIR FABRIC ON DRAINS #1 & #7</u>
✓			Do any structural practices require repair or clean-out to maintain adequate functions? If yes, indicate which ones: <u>MINOR SLOTTED HOLE REPAIR ON HOLE #1, 6, 13, 18, #7. PERLS SAMPLING</u>
✓			Are construction on-site traffic routes, parking and storage of equipment and supplies restricted to areas specifically designated for those uses?
✓			Are locations of temporary soil stock piles or construction materials in approved areas <u>ADJUST COVER</u>
✓			Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching? <u>RE-GRASS, RE-SEED PARTS OF #15 GRASS COMPLEX</u>
	✓		Is there any evidence that sediment is leaving the site?
✓			Is there any evidence of erosion on cut or fill slopes? <u>SOME EROSION OF SEED BED #15 GRASS COMPLEX</u>
	✓		Is there any evidence of sediment, debris or mud on public roads at intersections with site access roads?
✓			Does the SWPPP require revision? If yes, explain: <u>AMEND SITE PLAN TO SHOW SOIL ON TOPS OF TREE PADS. SEED + SOIL COMPLETE IN #11.</u>

Attachment 6

Summary of Training For Miles Hicks, Golf Course Superintendent

October 6, 2004- Steve Halsey of Halsey Daray Golf Design provided on-site pre-construction training for Miles Hicks regarding storm water management, erosion and sedimentation control measures. During the extensive training, Mr. Halsey reviewed the SWPPP documents with Mr. Hicks. He provided detailed on-site training regarding measures such as equipment washing, silt fence installation and maintenance, and drain inlet protection. Exhibits were reviewed from the California Stormwater Best Management Practices Handbook. Also present that day were Jeff Ball, of Golf Course Builders International, and Barry Jones of Soltis Golf Irrigation

October 13, 2004- Steve Halsey toured the DeLaveaga Golf Course project site with Miles Hicks. During the tour they inspected the installation of erosion and sediment control measures. Mr. Halsey provided guidance on areas requiring additional control measures. He also provided training for Mr. Hicks regarding how to update the site plan to illustrate these changes. Mr. Halsey worked closely with Mr. Hicks to ensure contractor compliance with SWPPP requirements.

November 13, 2004- Steve Halsey conducted a project site visit with Miles Hicks. Mr. Halsey provided follow-up training regarding site conditions, and a review of the erosion and sedimentation measures utilized.

Miles Hicks did not attend a formal training course. Mr. Hicks did receive thorough on site training from Steve Halsey. Mr. Halsey prepared the SWPPP and has extensive experience in this area.