THE CITY OF PLEASANTON

PUBLIC WORKS DEPARTMENT

REQUEST FOR PROPOSALS (RFP)
#PWD 25.701

MILLINGS STOCKPILE REMOVAL

Bid Due Date:

Wednesday September 10, 2025

by 11 a.m.

City Clerk's Office
123 Main Street
Pleasanton, CA 94566

pleasantoncityclerk@cityofpleasantonca.gov

BID MAY BE DISQUALIFIED IF BID PACKAGE DOES NOT INCLUDE ALL REQUESTED DOCUMENTS AND DOES NOT ADHERE TO ALL GUIDELINES IN THIS DOCUMENT

APPROVED

Adam Nelkie
Assistant Director of Public Works

I. INTRODUCTION

The City of Pleasanton is seeking proposals to remove and dispose of approximately 10,000 – 15,000 cubic yards of asphalt millings stockpiled at Bernal Community Park near intersection of Pleasanton Avenue and Bernal Avenue. Currently, off-hauling of materials is taking place and shall be assumed to be in place during the contract. The millings were placed in a stockpile between 2021 and 2024, with the majority of the millings stockpiled in 2024 from the milling operations of the last year's streets resurfacing project. The millings generally meet Class 2 aggregate base when placed in the stockpile, but do have some mixed larger **6-to-8-inch** asphalt chunks, 6-8". The stockpile did have trucking on the surface, but was graded last fall and covered with tarps. The millings include ground Petromat. Vulcan Materials has agreed to accept the materials at no cost, but the millings can be disposed of by an approved legal disposal or reuse facility. The work shall include the full removal and disposal of the asphalt milling down to dirt, installation of Best Management Practices (BMPs), removal and disposal of the silt fence after areas are reestablished with vegetation, and folding and palletizing the tarps.

All work to be performed shall be in accordance with the City of Pleasanton Standard Specifications and Details* dated July 2024, and shall be overseen by the Engineering Division

II. SUBMITTAL PROCESS

Submittals will be received by the City of Pleasanton City Clerk's office:

- In-person, Civic Center, at 123 Main Street, Pleasanton, CA 94566
- By Express Courier only, send to City Clerk's Office 123 Main Street Pleasanton, CA 94566
- By email to: pleasantoncityclerk@cityofpleasantonca.gov
  - ❖ Special Notes: If sending electronically:
    Include a cc: dvillasenor@cityofpleasantonca.gov
    Do not provide links or a zip file; it should be a PDF attachment(s) only
    Recommend having an email delivery receipt set up to verify proof of submittal

Deadline: September 10, 2025, by 11 a.m.

Please reference the Title, Project Number, and ***Contractor Name*** for all Submittals

Millings Stockpile Removal
RFP No. PWD 25.701
[Contractor Name]

Qualifications and proposals shall include a completed Response Package with the following: Contractor Information, Implementation Plan, Work Experience, Scope of Services with Rate Sheet, and any Additional Information deemed relevant by the Contractor.

The bidder is responsible for ensuring that the City Clerk's office receives the complete bid package by the deadline and time. All bid packages received after the deadline will be returned to the bidder and the bid will not be considered.

III. PROCUREMENT SCHEDULE

EVENT	DATE/LOCATION	
RFP Advertised	**Friday, August 15, 2025**	
Written Questions Due	**Wednesday, August 27, 2025, by 5:00 p.m.**	
Submittal Due Date	**Wednesday, September 10, 2025, by 11 a.m.**	Pleasanton City Clerk: 123 Main Street Pleasanton, CA 94566 pleasantoncityclerk@cityofpleasantonca.gov with a copy to dvillasenor@cityofpleasantonca.gov
Council Consent Date	**City Manager Award 9/26/2025, City Council (if req'd 10/7/2025)**	
Contract Start Date	**City Manager Award September 29, 2025**	

Note: Council consent and start dates are approximate.

IV. SCOPE OF SERVICES/WORK (see Exhibit A for further details)

The selected contractor shall furnish all labor, equipment, transportation, and incidentals necessary to complete the following tasks:

- Load and haul approximately **10,000 – 15,000 cubic yards of asphalt millings**. The contractor is responsible for determining the volume of material off hauled and shall submit as part of the proposal the method of determining the volume of material that was removed.
- Remove materials from Bernal Community Park; contractor shall assume ownership of material.
- Properly **dispose or recycle** the material at an approved, legal disposal or reuse facility. Provide documentation on disposal location.
- Provide all trucking and weight ticket documentation if applicable.
- Maintain BMPs including dust control during all operations. Contractor shall have means to place water (water wagon, water truck, etc.) to control dust to ensure dust does not leave the site. All loads shall be tarped.
- Maintain Traffic safety and submit a hall plan and follow Section 2 Traffic Control of City Standard plans.
- Comply with all relevant local, state, and federal laws and regulations.
- Removing the millings down to dirt (95% of any given area is to be free of any asphalt milling materials based on sft basis, with no larger areas than 1 foot by 1 foot).

Truck Routes

Milling Pile to Pleasanton Avenue and Bernal Avenue to First Street to Stanley Blvd

Millings Pile to Pleasanton Avenue and Bernal Avenue to I-680

Millings Pile to Pleasanton Avenue to Valley Avenue to Sunol to I-680 (S) (No trucking at the intersection of Valley Avenue and Case Avenue within 30 minutes before or after of Pleasanton Unified School District bell schedule for Hearst Elementary and Pleasanton Middle School, check PUSD website for current schedule.)

In town truck routes shall be submitted and reviewed and approved by the City but no trucking down Bernal Avenue east of First Street allowed unless disposal site is located on Bernal Avenue.

Working Hours: Monday through Friday 8am till 5pm. Traffic Control restrictions may impact hours of trucking.

V. AGREEMENT TERMS

Bidder shall agree to commence work under this Contract within fifteen (15) calendar days after the date of written "Notice to Proceed" and fully complete the project within 35 calendar days after start of work. Bidder shall pay as liquidated damages in the sum of **$500.00** per calendar day should the successful Bidder fail to complete the work within this time limit unless the successful Bidder is granted a time extension. Bidder shall assume 15,000 cubic yards of material.

Within ten days of being notified by the City, Contractor shall submit to the City:

- A signed copy of the City's standard Maintenance and Trade Services Agreement
- Certificates of Insurance, with Endorsement letter naming the City as additional insurer
- Evidence of a current business license to conduct business in the City of Pleasanton
- Completed W-9 Form for all new contractors

VI. CONTRACTOR SELECTION PROCESS

It is the City's intention to select the most qualified contractor with the lowest responsible and responsive bid.

Rejection of Proposal - The City reserves the right to reject any or all proposals and to determine which bid is, in the City's judgment, the lowest responsible bid. The City also reserves the right to waive any inconsequential omissions or discrepancies in any bid and to delete certain items listed in the bid as set forth therein. Costs for developing, submitting, and presenting bids are the sole responsibility of the Bidder, and claims for reimbursement will not be accepted by the City.

Bid Withdrawal - Bidders claiming mistakes must specify in written detail how the errors occurred and must file their written statement with the Office of the City Clerk within five (5) working days of the bid deadline. For bids opened between 11:00 a.m. - 12:00 p.m. on a Wednesday, the deadline is 12 p.m. the following Wednesday. Failure to meet the deadline may result in an otherwise valid claim for relief due to a mistake being denied. (ref. Public Contract Code §5100-5110). A bidder that has withdrawn its bid due to a mistake is prohibited from

participating in further bidding on the project, including re-bids or a substantially similar project.

Bid Protest - Any bidder or other interested party desiring to protest any proposal must file a written bid protest with the Office of the City Clerk within five (5) working days of the bid opening. For bids opened 11:00 a.m. - 12:00 p.m. on a Wednesday, the Bid Protest Deadline is 12:00 p.m. the following Wednesday.

The written bid protest must comply with the following requirements:

a. Only a bidder who has actually submitted a bid for the subject project is eligible to submit a protest against another bidder. Subcontractors are not eligible to submit protests. A bidder may not rely on the protest submitted by another bidder but must timely pursue its own protest.
b. The protest must contain a complete statement of the basis for the protest and all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion(s) of the Contract Documents upon which the protest is based. The protest must contain the project number and project name. The protest must contain the name, address, and telephone number of the person representing the protesting bidder.
c. A copy of the protest and all supporting documents must also be transmitted by fax or email, by or before the Bid Protest Deadline, to the protested bidder and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.
d. The protested bidder(s) may submit a written response to the protest, provided the response is received by the City before 5:00 p.m. within two (2) working days after the Bid Protest Deadline or after receipt of the bid protest, whichever is sooner ("Response Deadline"). The response must include all supporting documentation and the name, address, and telephone number of the person representing the protested bidder. Material submitted after the Response Deadline will not be considered.
e. A copy of the protest response and all supporting documents must also be transmitted by fax or email, by or before the Response Deadline, to the protesting bidder and any other bidder who has a reasonable prospect of receiving an award depending upon the outcome of the protest.
f. The procedures and time limits set forth in this section are mandatory and are the bidder's sole and exclusive remedy in the event of bid protest. The bidder's failure to comply with these procedures shall constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.
g. In all cases, the first level of review of any protest shall be conducted by a PWD Management Analyst, who shall, within 48 hours of receiving a protest from the City Clerk's office, acknowledge receipt of the protest in writing to the protesting bidder. As appropriate, the City Clerk, the Project Manager, the Management Analyst, and/or the City Attorney will be consulted to resolve the protest.
h. The City shall make its best effort to resolve the protest within twenty-five (25) working days after it is filed. The PWD Management Analyst on behalf of the City will issue a written determination of the protest to the protesting bidder.

The City may not award the contract pending the City's determination of the protest unless the contract award is justified for urgent and compelling reasons or is determined to be in the best interest of the City. Such justification or determination shall be approved by the Director of the Public Works Department or the designee.

VII. SPECIAL PROVISIONS & ADDITIONAL INFORMATION

Bids Received After Deadline

Bids received after the time established for receiving bids will not be considered.

Location of Proposals

This RFP has been posted on the City's website and at the following locations:
https://www.cityofpleasantonca.gov/business/bids/
https://www.bidnetdirect.com/california/cityofpleasantonca

It shall be the Contractor's responsibility to check the City's website to obtain any addenda that may be issued by City Staff. If an addendum is added, it must be submitted with the Bid Response Package, with a signature acknowledging any changes. Failure to do so will be deemed a non-responsive bid submittal.

It is the responsibility of each prospective bidder to download and print all bid documents, including any addenda, and to verify the completeness of their printed bid documents before submitting a bid. The City does not warrant, represent, or guarantee the accuracy or completeness of any bid documents and/or information retrieved from other sources. The City is not responsible for any loss or damage, including, but not limited to, time, money, or goodwill, arising from errors, inaccuracies, or omissions in any bid documents and/or information obtained from other sources. It is each prospective bidder's responsibility to check these sites through to the close of bids for any applicable addenda or updates.

Insurance

Contractor and Sub-contractors must provide and maintain in full force for the duration of the Agreement General Liability and Bodily Injury Insurance, Automobile Insurance, Worker's Compensation Insurance and Certificates of Insurance with a supporting endorsement letter according to Agreement (**Attachment IV**).

Registration of Contractors with the Department of Industrial Relations

For bids submitted, the bidder and its subcontractors must be registered and qualified to perform public work pursuant to section 1725.5 of the Labor Code, subject to limited legal exceptions under Labor Code section 1771.1.(a). A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, or engage in the performance of any contract for public work unless currently registered and qualified to perform public work pursuant to Section 1725.5. A bid will not be accepted, nor any contract entered into, without proof that the bidder and its subcontractors are registered with the California Department of Industrial Relations to perform public work pursuant to Labor Code Section 1725.5, subject to limited legal exceptions.

Certified Payroll Records
Contractor shall furnish the records specified in California Labor Code section 1776, including but not limited to the certified payrolls, directly to the Labor Commissioner. The Contractor shall furnish the records specified in California Labor Code section 1776 to the Labor Commissioner for all projects, whether new or ongoing. Copies of those certified payroll records shall also be submitted electronically to the City, upon request.

Prevailing Wage
In accordance with California Labor Code Section 1170 et seq., the Contractor shall pay the general prevailing rate of per diem wages to all workers employed under this contract.

Job Site Postings by Contractor
Contractors are required to post all job site notices prescribed by law or regulation. See 8 Calif. Code Reg. section 16451(d).

Labor Nondiscrimination
The awarded Contractor shall comply with the requirements of the State of California's Standard Specification Code Section 7-1.01A(4) "Labor Nondiscrimination" under this contract.

License/Certification
The Contractor must have a valid and appropriate Pest Control Business License with the California Department of Pesticide Regulation. The contractor must also register each calendar year with the Alameda County Agricultural Commissioner before conducting any pest control work in the county. The company must have a staff member with a current Qualified Applicators License (QAL). The QAL holder must have supervision authority over the applicator, and/or make the pesticide applications themselves.

Traffic Control
Traffic Control is not envisioned to be require but if contractor's operations do require traffic control within the City of Pleasanton a plan shall be in conformance with Section 2 of City Standard Specification and Details dated July 2024. When working in street locations and transporting equipment on public streets, the Contractor shall comply with the California State Vehicle Code. Contractors are required to provide all safety cones, sign boards, arrow boards, and other appropriate measures and equipment as prescribed by the California Manual on Uniform Traffic Control Devices (CA-MUTCD) for traffic control. Contractor should conduct its operations to cause the least possible obstruction and inconvenience to public traffic. To the greatest extent possible, all traffic shall be permitted to pass through the work area. For work requiring traffic control, the Contractor must submit a traffic control plan to the City of Pleasanton Public Works Department for approval 72 hours prior to the scheduled work.

Identification
Contractor's employee(s) shall be identified at all times either by a Company uniform, or by a safety vest worn outside other clothing with the Company name clearly displayed. Vehicles will have a Company sign clearly displayed.

Conflict of Interest

The City has established a policy concerning potential conflict of interest in maintenance services, program management, design and construction. This policy applies to all proposers and their proposed contractors/consultants/sub-consultants. See Standard Professional Services Contract for additional information.

Clarification Questions

Questions should be directed only to the Management Analyst, Daniel Villasenor by email at dvillasenor@cityofpleasantonca.gov. If interpretation or change is deemed necessary to the original document, then the question(s) shall be addressed in writing, and an Addendum shall be posted to the City's website. To allow time for issuance of addenda, questions shall only be accepted prior to seven (7) calendar days before the bid opening date.

END OF SECTION

ATTACHMENTS/EXHIBITS:

ATTACHMENT I – BID RESPONSE PACKAGE

ATTACHMENT II – MILLINGS PILE EXHIBIT

ATTACHMENT III – SAMPLE OF AGREEMENT

ATTACHMENT IV – SWPPP PLAN

ATTACHMENT I
BID RESPONSE PACKAGE

Required Documentation and Submittals
All of the specific documentation listed below is **required** to be submitted with the Exhibit A – Bid Response Packet in order for a bid to be deemed complete. Bidders shall submit all documentation in the order listed below and clearly label each section with the appropriate title.

Submitted bid MUST contain the following or may be subjected to disqualification:

☐ 1. **CONTRACTOR INFORMATION**: name, address, year established, principals of company and professional status as applicable.

☐ 2. **IMPLEMENTATION PLAN**: Is a comprehensive plan that will be Implemented by the Contractor to perform and accomplish all tasks within the Scope of Services. Contractor shall provide information on location/s of disposal, method of determining volume of material removed, estimated daily trucks, haul route, etc.

☐ 2. **WORK EXPERIENCE/REFERNCES**: 3 references for work or services that have been completed by your company in the last three years within the Bay Area, Contra Costa County, or San Joaquin Valley.

☐ 3. **BID FORM:** Complete the tables with the dollar amount for each line item.

☐ 4. **EQUIPMENT:** The bid response shall include a list of proposed equipment to accomplish the actual service work requested in this RFP.

☐ 5. **PERSONNEL:** Bid responses shall include a complete list of all key personnel associated with the RFP. For each person on the list, the following information shall be included:

a. Name, including job title and years of employment with Bidder.

b. The role that the person will play in connection with the RFP.

c. Person's relevant experience, certifications, and/or merits

☐ 6. **SUPPLEMENTAL INFORMATION:** Any additional information deemed necessary by your company to assist the City in the selection process including any special project provisions or specifications that the contractor brings to the bid process and actual service work.

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, provide legal name of corporation, state where incorporated, and names of the president and secretary thereof; if a partnership, give name of the company, also names of individuals co-partners composing company; if contractor or other interested person is an individual, give first and last names in full.

CONTRACTOR INFORMATION

(Required)

CONTRACTOR: (Company Name)		Year Est.:
BUSINESS ADDRESS:		
WEBSITE:		
CONTRACTOR LICENSE #		
DIR REGISTRATION NUMBER:	*DIR # must match the Company Named mentioned above	
APPLICABLE LICENSE(S) #: (CALIFORNIA DPR QAL# & BUSINESS LICENSE#)		
SUBMITTED BY: (Name & Title)	Name: Title:	
TELEPHONE:	Office: Cell:	
EMAIL:	Email: Email:	

Questionnaire (please circle):

1. Has the contractor license been suspended in the past? (If Yes, please explain)
   Yes No If, Yes_____
2. Do you have any contracts terminated by Owner in the past? (If Yes, please explain)
   Yes No If, Yes_____
3. Has the company been debarred or suspended by Owner in the past? (If yes, please explain)
   Yes No If, Yes_____

SIGNATURE: DATE:

PRINT NAME: TITLE:

I declare under penalty of perjury that I have the authority to execute this bid and that the foregoing is true and correct.

WORK EXPERIENCE/REFERENCES

(Required)

Years the Company has been in the Trade _____

Provide locations and contact information regarding three (3) projects or services that have been completed by your company in the last three (3) years within the Bay Area, Contra Costa County, or San Joaquin Valley. Examples are to be of a similar type as the type of work you are bidding on, and with a public agency.

Please provide a list of references of (3) on a separate sheet of paper if different than the ones listed below.

PROJECT I

LOCATION AND FOR AGENCY PERFORMED:	
CONTACT PERSON AND PHONE NUMBER:	
YEAR PERFORMED:	
TYPE OF WORK PERFORMED:	
CONTRACT AMOUNT:	

PROJECT II

LOCATION AND FOR AGENCY PERFORMED:	
CONTACT PERSON AND PHONE NUMBER:	
YEAR PERFORMED:	
TYPE OF WORK PERFORMED:	
CONTRACT AMOUNT:	

PROJECT III

LOCATION AND FOR AGENCY PERFORMED:	
CONTACT PERSON AND PHONE NUMBER:	
YEAR PERFORMED:	
TYPE OF WORK PERFORMED:	
CONTRACT AMOUNT:	

BID FORM

(Required)

Bidder hereby certifies to the City that all representations, certifications, and statements made by Bidder, as set forth in this Bid Form and attachments, are true and correct and are made under penalty of perjury pursuant to the laws of California.

The cost quoted below shall include all taxes and all other charges, including travel expenses, and is the cost the City will pay for the term of any contract that is a result of this bid.

The listed prices include the composite price for labor and equipment, including all incidentals, power tools, hand tools, and vehicles, street sweeping, dust control, BMPs as well as all overhead costs.

The unit price for "Removal and Disposal of milling stockpile" is not eligible for price adjustment.

Item No.	Description	Quantity	Unit of Measure	Unit Price	Total
1	Removal and Disposal of milling stockpile	15,000	Cubic Yard	$	
2	SWPPP & Site Restoration	1	LS	$	
3	Relocation of Milling to Onsite Parking Area	800	Cubic Yard	$	
4	Grading of Onsite Parking Area	1	LS	$	
5	Mobilization	1	LS	$	

Company: _____ Representative Name: _____

SIGNATURE: _____ Date: _____

Exhibit A: Description of Work

Bid Item 1: Removal and Disposal of Milling Stockpile
This item shall consist of loading, hauling, and disposing of surplus materials from the designated stockpile location(s) as directed by the City/Engineer. Work includes furnishing all labor, equipment, and incidentals necessary to remove the materials from the stockpile, transport them to an approved disposal or recycling facility, and provide documentation of proper disposal in accordance with applicable regulations. The unit price shall include all costs for equipment, fuel, loading, hauling, disposal/recycling fees, traffic control, and site cleanup. Measurement for payment will be by the cubic yard of material removed and accepted by the City/Engineer.

Bid Item 2: SWPPP and Site Restoration
Work under this item shall include all labor, materials, equipment, and incidentals necessary to implement BMPs as outlined in the city-provided (Attachment 4) Storm Water Pollution Prevention Plan (SWPPP) throughout the duration of the project. The contractor does not need to have a QSP or perform the water quality testing. This includes but is not limited to installation and update of existing BMPs, inspection, maintenance, and removal of Best Management Practices (BMPs); monitoring and documentation; and any corrective actions required to ensure compliance with stormwater regulations. This includes maintaining existing tarps, silt fence and construction entrances until the site is restored.

Upon completion of construction, the Contractor shall perform site restoration to return all disturbed areas to pre-construction or better condition (95% of areas free of millings with no areas greater than 1 sft in any given area), including seeding the exposed areas with approved erosion control stabilization seed. It shall be assumed to provide clean up of the entire existing stockpile area, silt fence, waddles and tarps (approximately 100,000 sft). Site restoration shall include grading, re-establishment of vegetation, repair or replacement of damaged improvements, removal of temporary facilities, including access roads to the stockpile back to the main trail area, and final cleanup of the site. All work shall be completed to the satisfaction of the Engineer and in compliance with applicable environmental and municipal requirements.

Bid Item 3: Relocation of Millings to Onsite Parking Area
Work under this item shall include all labor, materials, equipment, and incidentals necessary to relocate 800 cubic yards of asphalt millings from the designated onsite stockpile to the location identified for the parking area extension (22,000 sft). Work includes loading, hauling, and dumping the materials spread out to provide a generally 1-foot-deep section.

Bid Item 4: Grading of Onsite Parking Area
Work under this item shall include all labor, materials, equipment, and incidentals necessary to grade the relocated materials from Bid Item 3. The area shall be graded to provide a positive drainage from the north (high side) to the south, generally following the existing topography as shown on the plans or directed by the Engineer. All work shall be performed in a manner that provides a stable, uniform surface and minimizes low/high spots over 1 inch within 10 feet.

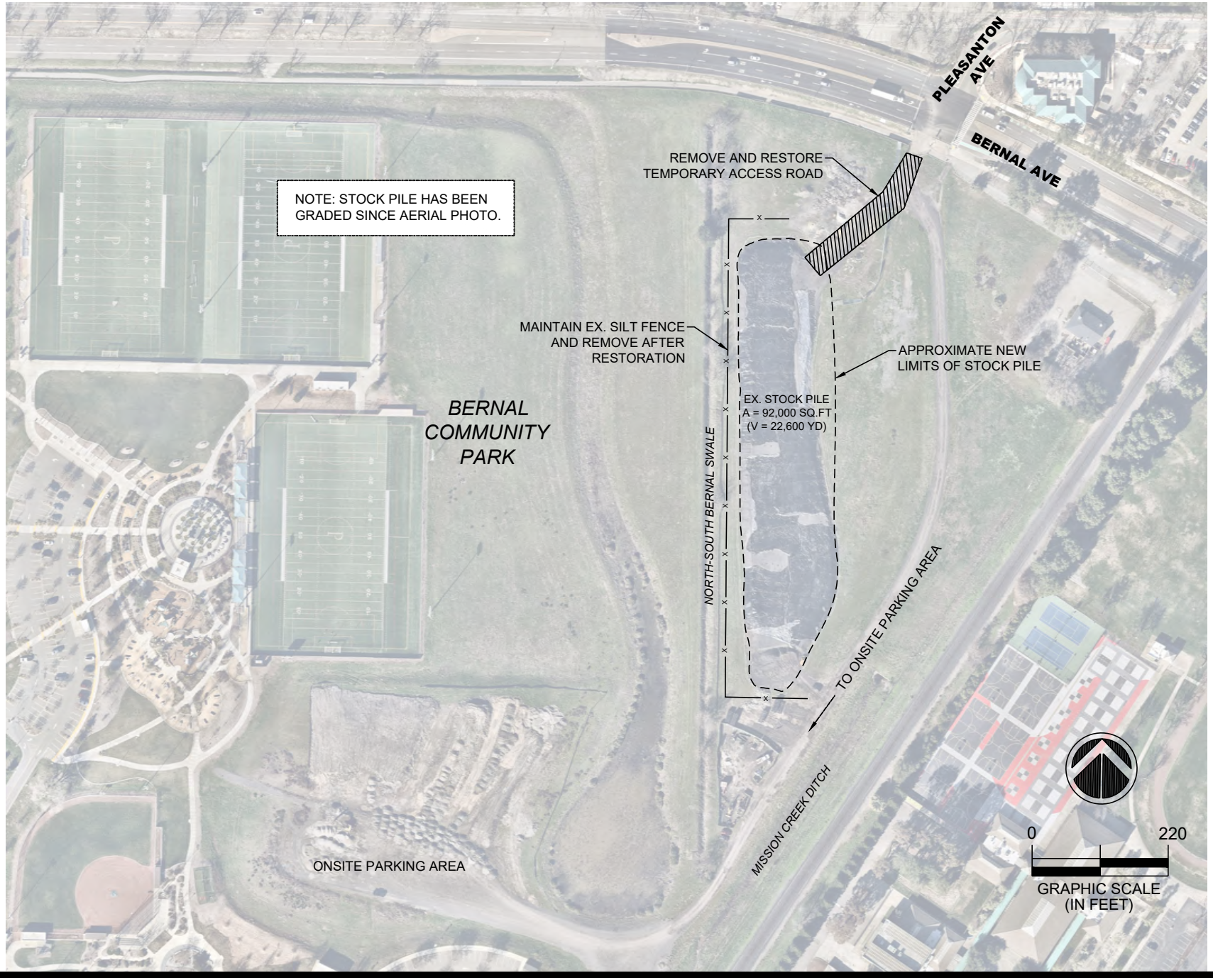
Bid Item 5: Mobilization

The contract lump sum (LS) price paid for Mobilization shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all work involved in Mobilization preparatory work and operations, including but not limited to: those necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for the establishment any facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site; acquiring and securing construction staging area and laydown yard, USA notification and removal of USA markings; surveying and staking if needed; and general housekeeping at the end of each day; as shown on the plans, as specified in the Standard Specifications, and as directed by the Engineer.

END OF SECTION

ATTACHMENT II
MILLINGS PILE EXHIBIT

CITY OF PLEASANTON
PUBLIC WORKS DEPARTMENT
BERNAL PARK - STOCK PILE YARD



ONSITE PARKING AREA

Existing Condition

1. Dump the Mixed (Dirty)Grinds as close as possible to the purple area or along the blue line.
2. Spread the Mixed Grinds into the purple area as the base course.
3. Move and spread the Clean Grinds over the base course in the purple area and compact.
4. Move and shape the last remaining Clean Grinds to the far west of the purple area and shape the berms west and south of the purple area.

Proposed Condition

ATTACHMENT III
SAMPLE OF AGREEMENT

MAINTENANCE AND TRADE SERVICES AGREEMENT
MILLINGS PILE PROJECT PWD 25.701

THIS AGREEMENT is made and entered into this _____ day of October 2025 between **XXX, Inc.** ("Contractor"), whose address XXX and the **CITY OF PLEASANTON**, a municipal corporation ("City").

In consideration of the mutual promises set forth in this Agreement, the parties agree as follows:

1. **Services to be Performed**. Contractor shall perform, or cause to be performed, work as defined in RFQ Millings Stock Pile Removal PWD 25.701 attached **Exhibit A** and Scope of Services as **Exhibit B**.

   No work shall be performed unless approved by the City's designated project manager.

2. **Term**. This contract shall commence on the first day of construction or 15 days after the notice to proceed whichever comes first and extend 35 calendar days and not later than December 1, 2025.

3. **Compensation**. City shall pay Contractor monthly with work completed through the 20th of each month. Final payment will be paid upon acceptance by City Engineer in conformance with Bid Form attached as **Exhibit C**.

4. **Method of Payment.** Payments shall be paid monthly with quantities completed through the 20th of each month. Final payment will be made upon completion of the project and approval by the City Engineer.

5. **Indemnification**. Contractor shall hold harmless, defend, and indemnify the City, its officers, agents and employees ("Indemnities"), against any and all claims, costs, demands, causes of action, suits, losses, expenses, attorney's fees, or liability, arising from or in any manner related to Contractor's (includes Contractor's employees, agents, or subcontractors) negligent act or omission, whether alleged or actual, regarding the work or services performed or caused to be performed pursuant to this Agreement and any amendments thereto. Contractor shall not, however, be obligated to indemnify Indemnities from claims arising from the sole negligence or willful misconduct of Indemnities. This indemnification includes any claim that the materials or equipment provided under this Agreement, or any tool, article or process used, constitutes an infringement of any patent issued by the United States. This indemnification provision shall survive termination or cancellation of the Agreement.

6. **Insurance**. During the term of this Agreement, Contractor shall maintain at its own cost and expense the following insurance coverage with insurers with an A.M. Best's rating of no less than A:VII. Contractor shall have the obligation to furnish City, as additional insured, the minimum coverages identified below, or such greater or broader coverage for City, if available in the Contractor's policies:

a. General Liability and Bodily Injury Insurance. Commercial general liability insurance with limits of at least $2,000,000 combined limit for bodily injury and property damage that provides that the City, its officers, employees and agents are named additional insured's under the policy as evidenced by an additional insured endorsement satisfactory to the City Attorney. The policy shall further state in writing either on the Certificate of Insurance or attached rider that this insurance will operate as primary insurance for work performed by Contractor and its subcontractors, and that no other insurance effected by City or other named insured will be called on to cover a loss.

b. Automobile Liability Insurance. Automobile liability insurance with limits not less than $2,000,000 per person/per occurrence.

c. Workers' Compensation Insurance. Workers' Compensation Insurance for all of Contractor's employees shall be in strict compliance with State laws, including a waiver of subrogation and Employer's Liability Insurance with limits of at least $1,000,000.

   For work or services deemed public works, by signing this Agreement, Contractor is certifying, pursuant to Section 1861 of the California Labor Code, that: "I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract."

d. Certificate of Insurance. Contractor shall file a certificate of insurance with the City prior to the City's execution of this Agreement, and prior to engaging in any operation or activity set forth in this Agreement. The Certificate of Insurance shall provide in writing that the insurance afforded by this Certificate shall not be suspended, voided, canceled, reduced in coverage or in limits without providing notice to the City in accordance with California Insurance Code section 677.2 which requires the notice of cancellation to: 1) include the effective date of the cancellation; 2) include the reasons for the cancellation; and 3) be given at least 30 days prior to the effective date of the cancellation, except that in the case of cancellation for nonpayment of premiums or for fraud, the notice shall be given no less than 10 days prior to the effective date of the cancellation. Notice shall be sent by certified mail, return receipt requested. In addition, the insured shall provide thirty (30) days prior written notice to the City of any cancellation, suspension, reduction of coverage or in limits, or voiding of the insurance coverage required by this agreement. The City reserves the right to require complete certified copies of policies.

e. Subcontractors. Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage's for subcontractors shall be subject to all of the requirements stated in this Agreement, including but not limited to naming additional insureds.

f. Waiver of Subrogation. The insurer agrees to waive all rights of subrogation against the City, its officers, employees and agents.

g. Defense Costs. Coverage shall be provided on a "pay on behalf of" basis, with defense costs payable in addition to policy limits. There shall be no cross-liability exclusions.

7. **Independent Contractor**. The Contractor is an independent contractor retained by the City. All personnel employed by the Contractor, including subcontractors, and personnel of subcontractors, are not and shall not be employees of the City.

8. **Contractor's Warranty**. Contractor shall bear the risk of loss or damage to any goods associated with the services until delivered to and accepted by City. Contractor further warrants that all work done and goods provided under this Agreement shall: a) meet all conditions of the Agreement; b) shall be free from all defects in design, material and workmanship; and 3) shall be fit for the purposes intended. If any defects occur within the 12 months following acceptance, Contractor shall be solely responsible for the correction of those defects.

9. **Labor Code/Prevailing Wages.** The work performed under this Agreement is a "public work" and prevailing wage laws shall apply. No less than the general prevailing rate of per diem wages, and not less than the general prevailing rate of per diem wages for holidays and overtime work, for each craft, classification or type of worker needed to execute the work under this Agreement shall be paid to all workers, laborers and mechanics employed in the execution of the work by the Contractor or any subcontractor doing or contracting to do any part of the work. The appropriate determination of the Director of the California Department of Industrial Relations shall be available for inspection. Contractor shall post, at each job site, a copy of the prevailing rate of per diem wages.

   To the extent applicable, Contractor shall comply with all requirements of the California Labor Code, including but not limited to, Labor Code sections: 1773.2 (regarding posting wage determinations at each job site); section 1776 (regarding the certification, maintenance, and availability for inspection of payroll records); section 1777.5 (regarding employment of apprentices); section 1810 (regarding a legal day's work as 8 hours of labor); and section 1775 (regarding penalties for violations). The Contractor shall forfeit fifty dollars ($50.00) for each calendar day or portion thereof for each worker paid less than the stipulated prevailing rates for any public work done under the Agreement by it or by any subcontractor under Contractor.

10. **Notices.** All notices, demands, requests or approvals to be given under this Agreement shall be given in writing and conclusively shall be deemed served when delivered personally or on the second business day after the deposit thereof in the United States Mail, postage prepaid, registered or certified, addressed as hereinafter provided.

    To Contractor: _____
    _____
    _____
    _____

    To City: City Manager
    City of Pleasanton
    P.O. Box 520
    Pleasanton, CA 94566

11. **Miscellaneous Provisions.**

a. City may terminate this Agreement at any time, including failure to adhere to OSHA Safety Requirements, by mailing a notice to Contractor. Contractor shall be paid for that portion of work or services already completed by Contractor as approved by City.
b. Contractor acknowledges that time is of the essence regarding the performance of this Agreement.
c. Contractor shall not assign or transfer this Agreement.
d. If either City or Contractor waives a breach of this Agreement, such waiver shall not constitute a waiver of other or succeeding breaches of this Agreement.
e. This Agreement constitutes the entire understanding of the parties.
f. This Agreement may only be modified by a writing signed by the authorized representative of both parties.
g. Contractor covenants that it has obtained and will keep in effect during the term of the Agreement all certificates, licenses, including a City Business License, permits or the like required by any federal, state or local regulatory agency in order to perform the work under this Agreement.
h. Contractor shall comply with all federal, state and local laws, regulations and rules, including but not limited to applicable safety and environmental laws. Contractor shall bear full and exclusive responsibility for any release of hazardous or non-hazardous substances and disposal of hazardous wastes.
i. The Contractor will permit the City to audit, examine and make copies of all contracts, invoices, payrolls and other documents or data relating to this Agreement. Such records shall be maintained for three years from the date of final payment under this Agreement.
j. This Agreement may be executed in multiple counterparts, each of which shall be an original and all of which together shall constitute one agreement. Counterparts may be delivered via facsimile, electronic mail (including pdf or any electronic signature complying with U.S. federal E-Sign Act of 2000 (15 U.S. Code §7001 et seq.), California Uniform Electronic Transactions Act (Cal. Civil Code §1633.1 et seq.), or other applicable law) or other transmission method, and any counterpart so delivered shall be deemed to have been duly and validly delivered and be valid and effective for all purposes.
k. This Agreement shall be governed by the laws of the State of California, with venue for any action under this Agreement in Alameda County, California.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the date and year first above written.

CITY OF PLEASANTON

_____
Gerry Beaudin, City Manager

CONTRACTOR

By: _____
Signature

_____
Print name

ATTEST:

_____
Jocelyn Kwong, City Clerk

APPROVED AS TO FORM:

_____
Dan Sodergren, City Attorney

Title: _____

[If Contractor is a corporation, signatures must comply with California Corporations Code §313]

_____
Signature

_____
Print name

Title: _____

EXHIBIT B – SCOPE OF SERVICES/WORK

GENERAL ITEMS:

- **City Project Manager** - Project Manager will be xx

- **Contractor Entry into Bernal Community Park**
- **Hours of Services** – will be 8:00am to 5:00pm; any variation in start/end times must be approved prior to with the Project Manager and agreed upon by both parties

- **Uniforms** - Contractor's crews should be identified either by a Company uniform, or by a safety vest worn outside other clothing with the Company name clearly displayed

- **Materials** - Contractor shall furnish, as part of this agreement, all necessary personnel, supplies and materials needed for the completion of the identified project. Debris and trash shall be removed at the end of each day's work. All defective materials shall be removed in accordance with all applicable rules, regulations, codes, law, ordinances, statues, etc.

- **Equipment and Tools** – Contractor is responsible for supplying all necessary equipment and tools to perform the project as outlined, whether owned or rented with a third-party agency.

- **Supervision** - Contractor must provide for adequate supervision and inspection of all work performed to ensure that each requirement of these specifications is consistently met

- **Communication** - A supervisor/foreman representing the contractor shall be readily available to meet with the Project Manager or Designee as needed for the purposes of correcting problems, conflicts, and coordinating work schedules

- **Inspection** - Inspection by Project Manager or Designee shall be made during normal City operating hours, unless otherwise arranged

- **Satisfaction** - The progress and standard of quality of work to be accomplished shall be to the degree reasonably acceptable to the Project Manager. In the event the Project Manager or his designee determines contractor's work is unsatisfactory, contractor will be required to perform the additional work at no cost to the City

- **Damages** - All damages to sprinklers and/or surrounding work areas shall be reported by Contractor to the City and will be repaired by the Contractor at no additional cost.

- **Safety** - All OSHA Safety Requirements must be adhered to by the Contractor and/or any subcontractors while on-site

ATTACHMENT IV
SWPPP PLAN

EROSION AND SEDIMENT CONTROL PLAN

FOR

CITY OF PLEASANTON
BERNAL PARCEL - STOCKPILE YARD

PREPARED FOR

CITY OF PLEASANTON

OCTOBER 2024

Prepared by:

City of Pleasanton
Public Works Engineering

Gerry Parco, P.E.

and

Huy Ho, P.E.

QSD #

200 Old Bernal Avenue
Pleasanton, CA 94566

925-931-5650

Table of Contents

SECTION 1 - INTRODUCTION:

The following document is intended to demonstrate how the City of Pleasanton proposes to prevent contamination of storm water runoff and discharges, in and around areas impacted by work operations relating to the “Bernal Parcel Stockpile Yard” Project.

The purpose of this Erosion and Sediment Control Plan (ESCP) and BMP plan is to:

1. Identify pollutant sources that may affect the quality of storm water discharges or runoff, associated with or impacted by this contract.
2. Identify, construct and implement storm water pollution prevention measures to reduce pollutants in storm water discharge and runoff from the construction site, both during and after construction.

The objective of this plan is to minimize degradation of the off-site storm water receiving waters, in this case the San Francisco Bay.

SECTION 2 – PROJECT INFORMATION:

2.1 - Project and Site Description

Project Location: The work to be done under this Project will be performed in one operation:

The protection of the stockpiled recycled pavement grinds material on the 2.11 acre site by the deployment of the prescribed BMP's presented on this document.

DESCRIPTION OF WORK

The City of Pleasanton's work under this project includes the following:

Bernal Parcel Stockpile Yard - Bulk Material Weather Protection:

- Installation of 92,000 square feet of solid polyethylene cover.
- Installation of 1725 linear feet of straw roll or silt fence;
- Installation of 3 curb inlet protection for existing inlets on Bernal Avenue;
- Installation of 50 linear feet of 12' wide 3" angular rock bed as a stabilized construction entrance.
- Watering of work area and dirt access road for dust control.

2.2 – Soil Disturbance Activities

Activities on this project that could result in soil disturbance include, but are not limited to:

1. Site Clearing and Grubbing
2. Re-shaping and grading of material stockpile into a uniform, engineered material stockpile

2.3 – Potential Sources of Pollution

The potential sources of water pollution on this project are as follows:

1. Dry material Goods
2. Equipment Maintenance
3. Waste Handling
4. Equipment wash-downs
5. Airborne Contaminants
6. Undocumented Soil Conditions
7. Soil Erosion
8. Cleared Vegetation/plant material
9. Airborne dust from equipment use on dirt access road

SECTION 3: BEST MANAGEMENT PRACTICES:

3.1 – Site Protection/Erosion Control

Erosion control of the site is a practice that protects the soil surface and prevents soil particles from being detached by flowing water or wind. Erosion Control BMP's protect the soil surface by covering soil particles. The following minimum Erosion Controls are required to be implemented during construction activities.

BMP EC-2 : Preservation of Existing Vegetation

Limits of Disturbance to marked out and fencing/ fiber rolls to be installed outlining the limits. Crews to remain with this and avoid disturbing vegetation from outside these limits. Other procedures per EC-2 or other functional alternatives to be followed

BMP EC-7: Temporary Cover

Crews to provide effective cover for inactive areas and all finished slopes. Crews to install control measures where applicable to prevent or help reduce possible erosion.

BMP WE-1: Wind Erosion Control

The City shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.
Wind erosion or dust control consists of applying water or other dust palliatives as necessary to prevent or alleviate dust nuisance generated by construction activities.

3.2 – Stabilization Practices:

The control of potential pollutants around the project site will be accomplished while maintaining the existing drainage flow in the area. Fiber roll, inlet capture bags and crushed rock will be provided and used, as required, to prevent transportation of sediment from our work areas to waterways; see "Appendix C" for installation details.

BMP SE-1/BMP SE-5/BMP SE-8

Silt Fence/Fiber Rolls/Sandbag Barriers will be installed around our construction laydown areas, stockpiles and grading sites, to prevent transportation of sediments from those areas to waterways and/or adjacent sites. (See "Appendix B" for installation Locations)

BMP SE -7: Street Sweeping

Public Road Sweeping will occur daily and/or as often as needed.
City Staff or the Sub-Contractor will inspect potential sediment tracking daily.
Visible Sediment will be swept or vacuumed on a daily basis.

BMP SE-10: Storm drain/inlet protection:

Storm drain inlet protection must be implemented at all active inlets within the work areas and downstream from construction activity.

BMP TC-1: Stabilized Construction Entrance/Exit

Crushed rock will be installed, if and as required, at entry locations from our work sites to public/service roads or in other heavily trafficked areas to reduce the amount of mud transported per TC-1 or other functional alternatives.

Post Construction Stabilization Measures

Temporary sediment trapping devices must not be removed until permanent stabilization is established in all affected areas.

All temporary erosion and sediment control measures shall be removed after final site stabilization. Disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized within 30 days of removal.

At the completion of all testing and backfill operations, all trench excavation (paved and unpaved areas) will be restored per the City's Street Restoration/Trench Detail.

3.3 – Pollution Controls:

BMP WM-1 Material Delivery / WM-2 Material Use

The contractors on site will possibly store fuels, oils and other liquids for various uses. Each of these products has Safety Data Sheets (SDS) that will be kept in a separate folder or in binders marked (SDS).

Hazardous materials will be stored in metal container boxes or in storage sheds with suitable walls and roof.

Dry material stored onsite that can dissolve and create pollution will be covered.

To store liquids The City or its subcontractors will construct separate storage facilities that will be in contaminant area of sufficient size and strength to each contain 150% of the volume of liquids stored. Materials that have the potential to react with each other will be stored separately.

Each containment shall have polyethylene sheeting laid down as a ground and perimeter barrier. The perimeter will be supported and anchored to timber or metal curbs of sufficient height & strength to meet the 150% containment criteria and will be no less than 12 inches high.

Within each containment area, all liquids will be elevated on wood pallets or lumber and ½ inch plywood. Fire retardant plywood will be used when applicable. Sand will be onsite for installation around furl and oil drums if required. Storage of dry material goods that can be dissolved and create pollutants will be in containment areas constructed of polyethylene sheeting rolled at the ends or they will be elevated on pallets or like supports and properly sealed for moisture protection.

A diaper of sufficient size will when necessary be laid underneath the equipment being fueled or serviced. The diaper will consist of polyethylene sheeting rolled at the ends. Rags and towels will be available to wipe up any spills. The rags and towels will be disposed of in a separate container marked “oil rags”. Topping off of fuel tanks will not be permitted.

See Appendix C – BMP WM-1 Material Delivery and Storage and BMP WM-2 Material Use for additional procedures.

BMP WM-3: Stockpile Management:

The City plans to protect the stockpile with solid polyethylene covering material. Additional polyethylene covering material for potential repairs will be stored onsite as a safety measure:

All stockpiles will be protected with a temporary linear sediment barrier (SE-5). Prior to the onset of precipitation they shall be covered or stabilized except during the workday if they are being used.

Inactive soil stockpiles shall be covered or protected with stabilization measures and be protected with a linear sediment barrier. **(*see Appendix C for further details*)**

BMP WM-4: Spill Prevention and Control:

If underground fuel lines or storage facilities of any kind are exposed, Staff will promptly notify the CITY OF PLEASANTON's Project Engineer of the discovery and await direction.

In order to minimize the chance that an unforeseen discovery of fuel lines and utility lines occurs, we will review existing as built documents made available to us and contact USA.

City Staff or their sub-contractors will verify the location of various utilities that require relocation, removal and/or protection as shown on the contract plans. Underground Service Alert (USA) will be called at (800) 642 2444 to locate most affected utilities.

In case of accidental spills, the cleanup will be immediate. Our supervisory personnel shall become familiar with the SDS's in order to take the appropriate actions.

If a spill occurs, the first order of business is to shut off or isolate the source. Next, absorbent materials will be used to control the spill or wipe it up. If necessary, a berm will be built around the spill to prevent its further spread.

No attempt will be made to wash away the spills.

If spills of hazardous material occur onto soil, the soil will be dug up and disposed of in accordance with all applicable regulations.

Rags, towels or absorbent materials will also be disposed of in accordance with all applicable regulations. Toxic material will not be disposed of in regular debris boxes.

No other construction activity is proposed or expected on the project site other than grading of the bulk material (recycled AC pavement grinds). In the event of an accidental fuel leak from a piece of construction equipment, Spill Kits will be onsite at all times and maintained by the Project Superintendent or another designated employee. Spill kits will be located in the assigned laydown area.

At a minimum, spill kits shall contain the following items:

- Absorbent spill pads and socks;
- Absorbent material (e.g., solvent absorbent, vermiculite, etc.);
- Hydrophobic mop (i.e., a mop that absorbs oil, but not water);
- Safety gloves (that are appropriate for oils and other petroleum);
- 20 gallon bucket/drum with lid; and
- Drum labels and writing instrument

Any spill shall be controlled using the following measures:

- Store all materials with secondary containment;
- Use secondary containment with drip reservoirs for dispensers;

- Place absorbent pads or drip pans under equipment that contains fluids;
- Keep a properly sized spill kit in all areas with the potential for leaks;
- Stock spill prevention equipment and spill cleanup kits at various locations around the project site;
- At a minimum, provide oil-absorbent mats for all equipment;
- Place secondary containment for any stationary equipment that needs to be within the setback area for streams, wetlands, or drainages; and
- Have absorbent pads and spill kits handy whenever hazardous materials are being used near surface water during construction.

Major and/or hazardous spills will be handled through notification to the CITY OF PLEASANTON'S personnel, or if necessary, by dialing the local emergency response number. City Staff or their sub-contrators will attempt to contain and manage the spill as safety permits and will work together with emergency responders to manage, contain, and clean all spills.

All equipment used for cleaning up contaminated soil or other Haz-Mats needs to be thoroughly cleaned. The water/liquid used to clean the equipment must be disposed of in accordance with all applicable regulations.

In the event of a major spill City Staff will provide all necessary information regarding the spill (i.e., what, where, when, how) and the City Regulatory Representative will make any notification as necessary to the State Office of Emergency Services and/or the Regional Water Quality Control Board.

See BMP WM-4 in Appendix C for full procedures regarding Spill Prevention

BMP WM-5: Solid Waste Management:

Solid waste management procedures and practices are designed to 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.

Waste handling will be done as follows:

1. A sanitary service company will dispose sanitary waste from containment tanks regularly.
2. Construction debris will be removed by debris box or trucking services. The containers will then be covered before they leave the construction area.
3. Should the need arise, removal and handling of contaminated soil, sludge and water will be done in accordance with the specifications, but not without prior knowledge or direction from CITY OF PLEASANTON's Project Engineer.
4. Select designated waste collection areas on-site. During the course of the project, it is understood that these locations are subject to change.
5. 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 is windy.
6. Plan for additional containers and more frequent pickup during the removal of asphalt/concrete
7. Collect site trash on a daily basis, especially during windy conditions.

All wastes will be disposed of in accordance with Federal, State and Local regulations. Solid material will be disposed of as concrete debris.

BMP WM-8: Concrete Waste Management:

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout offsite, performing onsite washout in a designated area with containment, and training employee and subcontractors. City Staff or the Sub-Contractor hope to perform all wash out offsite but if required a temporary washout pit, lined with an impervious barrier, shall be implemented at the site during construction similar to the procedures/requirements in BMP WM8 or other functional alternatives.

BMP WM-9: Sanitary/Septic Waste Management:

Proper Sanitary and septic waste management procedures will be in place per BMP WM-9 (or other functional alternatives) to prevent the discharge of pollutants to stormwater from Sanitary and septic waste.

Convenient, well maintained facilities will be provided by employees use.

A sanitary service company will dispose sanitary waste from containment tanks regularly.

3.4 – Non-Stormwater Management

Non Storm water discharges directly connected to receiving waters or the Storm Drain system have the potential to negatively impact water quality. City Staff will implement measures to control all non-storm water discharges during construction, and from dewatering activities associated with construction.

The following are the minimum requirements that must be implemented for this Project:

1. Control non-storm water discharges
2. Wash Vehicles in a manner that prevents discharge to surface water
3. Clean Streets in a manner that prevents discharge to surface water

The following BMP's have been selected to control runoff of all non-storm water runoff:

BMP NS – 2: Dewatering

Although encountering groundwater during Construction is unlikely, precipitation or non-storm water that accumulates in open excavations must be removed so that construction work may continue. Typical sources of Non-Storm waters that are removed from trench excavations may include groundwater, water diversions, and waters used during construction activities that must be removed from the work area. (BMP NS-2 procedures (or other functional alternatives) to be used when necessary - see Appendix C).

BMP NS-3: Paving, Saw-cutting and Grinding Operations

No Saw cutting or grinding is proposed on this project. But if such work becomes necessary, City Staff shall provide BMP's when saw-cutting and grinding to prevent slurry run off and to maintain any debris or rubble that these operations may create. Vacuums may be used to control slurry created from saw cutting, sealing, paving and grinding.

BMP NS-8: Vehicle Equipment Cleaning

Vehicle and equipment cleaning should be conducted off-site, but if it must occur onsite, it shall only be conducted within the staging / lay down area with temporary secondary containment.

City Staff will not permit steam cleaning onsite. Steam cleaning can generate significant pollutant concentrates. Cleaning of vehicles and equipment with soap, solvents or steam should not occur onsite unless resulting wastes are fully contained and disposed of. Resulting wastes shall not be discharged or buried, and must be captured and recycled or disposed ofaccordingly.

BMP NS-9: Vehicle Equipment Fueling

Use off-site controlled fueling stations as often as possible. If onsite fueling is necessary the following must be followed:

- Never top off Vehicles
- Avoid fueling during rain or provide cover
- Place plastic sheeting beneath vehicle equipment
- Absorbent spill clean-up materials and spill kits shall be available on fueling trucks and should be disposed of after use.

Equipment and transportation vehicles will be maintained off site as much as possible and where feasible. Should onsite maintenance be needed, we will employ similar methods to that used for fueling operations. Used carpet or towels may be laid over the polyethylene sheeting for additional absorption and protection. Drip pans may be used instead of polyethylene sheeting.

Where feasible, in addition to measures already proposed in the ESCP, vehicle/equipment fueling and/or maintenances will be performed off site or at a minimum away from waterways and storm drains (>50' where feasible).

SECTION 4 - BMP INSPECTION, MAINTENANCE AND MONITORING

4.1 - Inspection, Maintenance & Repair

The following describes methods and frequencies for required inspections, maintenance, and repair of BMPs:

1. All inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by the Qualified SWPPP Practitioner (QSP). The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.

The City of Pleasanton has assigned Huy Ho to inspect all erosion and pollution control measures. Mr. Ho is our QSD & QSP/Designated Representative.

Our QSP/QSD can be contacted at:

Huy Ho
(925) 931-5663 – Office
Scott Petersen, Project Inspector
(925) 437-3983 - Cell
Spetersen@cityofpleasantonca.gov – e-mail

2. QSP/delegated employee shall conduct visual inspections and observations daily during working hours.

3. Upon identifying failures or other shortcomings, as directed by the QSP, the OSD shall begin implementing repairs or design changes to BMPs within 72 hours of identification.

4. For each pre and post storm event inspection required City Staff shall complete an inspection checklist and take photographs of the project site during inspections. Inspections will also be performed during the rain events if it is safe to do so. **A blank inspection form is included in Appendix D of this ESCP.**

5. City Staff will have a Rain gauge set up on site or at a nearby location and will record readings during all rainfalls. These will be recorded on the inspection checklist.

6. City Staff will monitor the forecast on the NOAA website and print copies of all likely precipitation of 50% or greater probability.

7. City Staff will ensure that completed checklists will be retained in Appendix D of the ESCP, at the construction site.

8. The entire plan shall be kept and maintained onsite for the duration of the Project. If any changes are required to be made to the ESCP these will be documented and retained in the WPCP at the construction site while construction is ongoing and these records will be kept for a period of at least 3 years.

4.2 - Inspection Requirements

City Staff will ensure that all inspections are performed or supervised by the QSP. The QSP may delegate any or all of these activities to an employee trained to the task(s) appropriately, but shall ensure adequate deployment.

City Staff will ensure that all visual inspections for this Project are conducted daily during working hours and in conjunction with other daily activities in areas where active construction is occurring.

City Staff will conduct these daily/weekly inspections for this **project** to verify the following:

1. Appropriate BMP's for Storm Water and non-storm water are being implemented in areas where active construction is occurring (including staging)
2. Project excavations are closed, with properly protected spoils, and that road surfaces are cleaned of excavated material and construction materials such as chemicals by either removing or storing the material in protective storage containers at the end of every construction day
3. Land areas disturbed during construction are returned to pre-construction conditions or an equivalent protection is used at the end of each day to eliminate or minimize erosion and the possible discharge or other pollutants during a rain event.

With concurrence with the City Engineer, City Staff may discontinue inspections in non-active construction areas where soil disturbing activities are completed and final soil stabilization is achieved (eg paving is completed, substructures are installed, vegetation meets minimum cover requirements for final stabilization)

Inspections shall be conducted where temporary or permanent stabilization BMPs are installed. Areas where permanent stabilization BMPs are installed shall be continually monitored until adequate permanent stabilization is established and, in areas where re-vegetation is provided, until minimum vegetative coverage is established.

City Staff or the Sub-Contractor will work closely with CITY OF PLEASANTON Inspection personnel at all times, to coordinate protective measures throughout the site. We will also respond quickly to alleviate any concerns they might have, with the implementation of this plan during construction.

4.3 - Monitoring Requirements for Non-Visible Pollutants

Water sampling and analysis of non-visible pollutants are required when City Staff or the Sub-Contractor believes pollutants associated with construction activities have the potential to discharge off-site. Pollutants may discharge off- site as a result of a spill or breach where it comes into contact with storm or non-storm water runoff. Additionally, failure or negligence to implement effective BMPs may require City Staff or the Sub-Contractor to collect and analyze water samples in runoff. **However, City Staff or the Sub-Contractor is not required to collect and analyze water samples if the site where the spill or breach occurred is contained and cleaned prior to the next rain event.**

Water samples should be collected and analyzed where they are associated with:

1. Construction sites;
2. Activities producing pollutants that are not visually detectable in storm water discharges; and
3. Activities, which could cause or contribute to an exceedance of water quality objectives in the receiving waters.

Visual observations made during the Monitoring program described above will help City Staff or the Sub-Contractor of this project determine when to collect samples.

City Staff or the Sub-Contractor for this project is not required to sample if one of the conditions described above (e.g., breach or spill) occurs and the site is cleaned of material and pollutants and/or BMPs are implemented prior to the next rain event.

If sampling is required:

1. Water should be collected down-gradient from all discharge locations where the visual observations were made. City Staff or the Sub-Contractor shall designate personnel that is trained in water quality sampling procedures to collect storm water samples.
2. Samples must be collected during the first two hours of discharge from rain events that occur during (daylight) business hours, which generate runoff.
3. An uncontaminated control sample must be collected to compare levels of pollutants.

A comparison between the subject discharge sample and uncontaminated sample using a test field instrument or through laboratory to determine levels of pH, specific conductance, dissolved oxygen, conductivity, salinity, and Total Dissolved Solids (TDS), and any other parameter required by the SFPUC.

For laboratory analyses, all sampling, sample preservation, and other analyses must be conducted according to test procedures pursuant to 40 CFR Part 136. The Contractor for this project will ensure that field samples are collected and analyzed according to the manufacturer's specifications of the sampling devices employed. Portable meters should be calibrated according to manufacturer's specification.

All sampling data shall be kept in the ESCP.

SECTION 5 - TRAINING

Each of The City's supervisory personnel will be apprised of the Erosion and Sediment Control Plan and made aware of its requirements.

Instruction/Training will also be given to supervisors for all employees and subcontractors working on the project by our QSD/QSP. (See attached Appendix F – Field Training Log)

1. Stormwater Training will be provided in the following subjects:

- Water Pollution Control Rules and Regulations
- Implementation and maintenance of:
    - Temporary soil stabilization
    - Temporary sediment control
    - Tracking Control
    - Wind Erosion
    - Material pollution prevention and control
    - Waste Management
    - Non stormwater Management

All of our supervisors and many of our workers have completed a 40-hour Hazardous Waste Operations & Emergency Response course (HAZWOPER). This training allows them to work with hazardous materials and educates them on the regulatory requirements that govern hazardous waste management. It also provides them with a better understanding of how hazardous wastes should be handled from the point of generation to the point of disposal.

SECTION 6 - CLOSING COMMENTS

City Staff or the Sub-Contractor are very aware of the sensitive environment where this jobsite is located.

During the course of construction, City Staff or the Sub-Contractor will perform the contract work in strict compliance with the approved ESCP. We will also cooperate with CITY OF PLEASANTON's maintenance personnel working in the area, to ensure that they can likewise comply with their respective ESCP'S.

The City Representative / Collection System Division must be notified 48 hours prior to commencement of Construction.

If the approved plan needs to be modified additional sediment and stormwater control measures may be required as deemed necessary by the City of Pleasanton.

APPENDIX A

CITY OF PLEASANTON TELEPHONE NUMBERS

Office: (925) 931-5650
Office Fax: (925) 931-5479

24 Hour Emergency Contacts

Huy Ho P.E., Qualified SWPPP Practitioner:	**(925) 931-5663 (Office)**
Qualified SWPPP Developer:	**(925) 931-5650 (Office)**
Gerry Parco P.E., Project Manager:	**(925) 931-5676 (Office)**
Scott Petersen, Project Superintendent:	**(925) 437-3983 (Cell)**
Adam Nelkie, Owner – City Engineer:	**(925) 818-4418 (Cell)**

Additional telephone numbers will be provided as manpower on site increases or changes.

APPENDIX B

Project Site Map

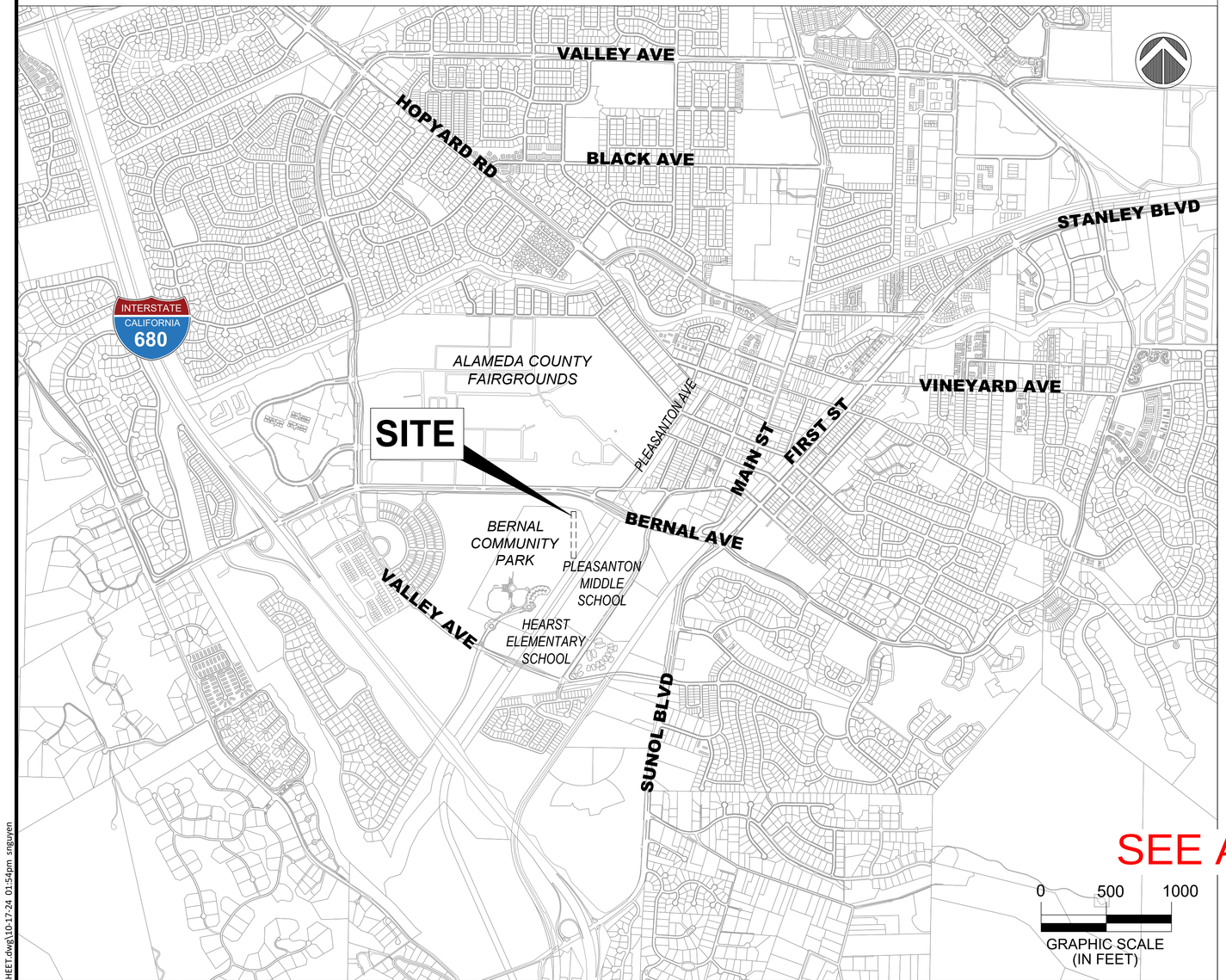
BMP Notes:

- Street sweeping and application of water for dust control to be performed daily/as required.
- Stockpiles shall be covered or stabilized and protected with a temporary linear sediment barrier (SE-5) prior to the onset of precipitation.
- Equipment storage areas to be cleaned and free of spills. Drip pans to be used under equipment stored onsite overnight and spill kits to be stored onsite.
- Silt Fence (BMP SE-1)/Fiber Rolls (BMP SE-5) will be installed alongside jobsite staging area perimeter. (Location of Staging Area's are shown in attached drawings)
- Protect all drain inlets in construction vicinity (BMP SE-10).
- Vacuums to be used to control slurry created from saw cutting paving and grinding.
- Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout offsite or if required performing onsite washout in a designated area an appropriate distance from any Storm Drains.
- All debris, trash and other material shall be picked up on a daily basis.
- Spill Kits will be onsite at all times and maintained by the Project Superintendent or another designated employee.
- Initiate repair or replacement of damaged erosion and sediment control BMPs immediately, and work completed by end of next work day. Significant replacement or repair must be completed within 7 days, unless infeasible.
- Within 24 hours, remediate any significant sediment that has left construction site. Investigate cause of the sediment release and implement steps to prevent a recurrence of discharge within same 24 hours. Perform in-stream cleanup of sediment according to applicable regulations.

CITY OF PLEASANTON
PUBLIC WORKS DEPARTMENT

BERNAL PARCEL - STOCK PILE YARD
OCTOBER 2024

LOCATION MAP



SHEET INDEX

ABBREVIATIONS

AVE	AVENUE
BLVD	BOULEVARD
BMP	BEST MANAGEMENT PRACTICES
DWG	DRAWING
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
SD	STORM DRAIN
SF	SQUARE FEET
SS	SANITARY SEWER
ST	STREET
TYP	TYPICAL
W	POTABLE WATER
VCP	VITRIFIED CLAY PIPE

SYMBOLS AND LINETYPES

"	INCH
'	FEET
@	AT
	STRAW ROLL
	LIMITS OF WORK
	DIRECTION OF DRAINAGE
	DRAIN INLET PROTECTION
	EXISTING DRAIN INLET
	EXISTING STORM DRAIN OUTFALL
SD	EXISTING STORM DRAIN MAIN
SS	EXISTING SANITARY SEWER MAIN
W	EXISTING WATER MAIN

PROJECT BASIS OF BEARING

THE FOLLOWING WAS PROVIDED BY ALEXANDER & ASSOCIATES: THE BEARINGS SHOWN HERON ARE BASED UPON RECORD-OF-SURVEY NO. 1109 FILED IN THE BOOK 18 OF MAPS AT PAGE 3. THE BEARING BETWEEN THE MONUMENT AT OLD BERNAL AVENUE AT MAIN STREET, SOUTHERLY TO THE STANDARD CITY MONUMENT WAS TAKEN AS S 45° 43' 30" W.

PROJECT BENCHMARK

THE FOLLOWING WAS PROVIDED BY ALEXANDER & ASSOCIATES: THE BASIS OF ELEVATIONS FOR THIS PROJECT WAS BASED UPON CITY OF PLEASANTON BENCHMARK N-1 ON THE HEADWALL ON NEAL STREET WEST OF FIRST STREET. ELEVATION = 353.14

PROJECT TEAM

GERRY PARCO SENIOR CIVIL ENGINEER	CITY OF PLEASANTON 200 OLD BERNAL AVE PLEASANTON, CA 94566 (925) 931-5676
MATT GRUBER CITY LANDSCAPE ARCHITECT	CITY OF PLEASANTON 200 OLD BERNAL AVE PLEASANTON, CA 94566 (925) 931-5672

APPENDIX B - SITE MAP

SEE ATTACHED BMP NOTES IN APPENDIX B

NOTE: UNAUTHORIZED CHANGES AND USES: THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

ADAM M. NELKIE, CITY ENGINEER

REV.	DATE	DESCRIPTION

THE CITY OF PLEASANTON

CITY OF PLEASANTON
PUBLIC WORKS DEPARTMENT

ADAM M. NELKIE
CITY ENGINEER
NO. 78830
EXP. 9/30/25

BERNAL PARCEL - STOCK PILE YARD

TITLE SHEET

DESIGN:	XX
DRAWN:	XX
CHECKED:	AN
TRAFFIC ENGINEER:	MT

SCALE:	AS SHOWN
PROJECT NO.:	CIP-XXXX
DATE:	OCT 16, 2024

DWG NO. **SW-1**

1 OF 4

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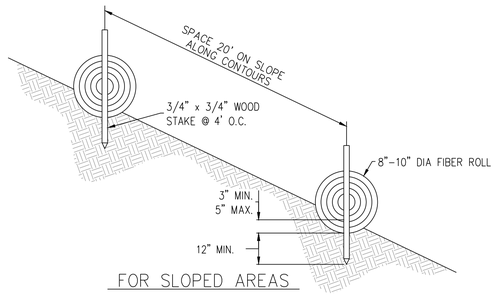
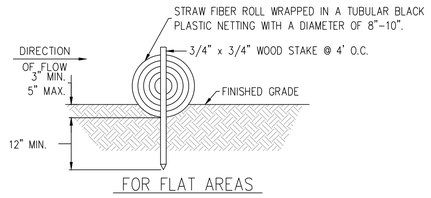


FOR SLOPED AREAS



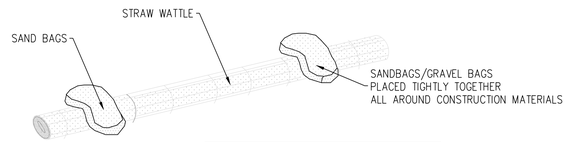
FOR FLAT AREAS

NOTES:

1. FIBER ROLL COMPOSED OF BIO-DEGRADEABLE FIBERS STUFFED INTO A PHOTO-DEGRADEABLE OPEN WEAVE NETTING.
2. FIBER ROLL EROSION BARRIER TRAPS SEDIMENT AND REDUCES SHEET AND HILL SIDE EROSION BY REDUCING SLOPE GRADIENT. IT INCREASING INFILTRATION RATES AND BY PRODUCING A FAVORABLE ENVIRONMENT FOR PLANT ESTABLISHMENT.
3. FIBER ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE FIBER ROLL IN A TRENCH 3"-5" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND FIBER ROLL.

FIBER ROLL EROSION BARRIER

SCALE: N.T.S.



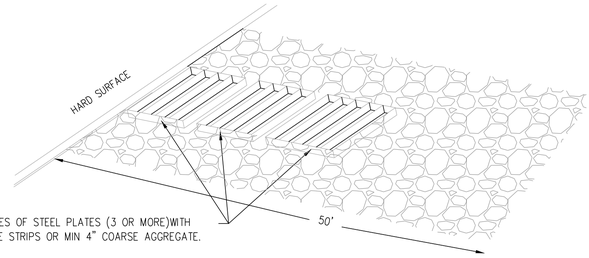
STOCK PILING NOTE:

1. 5' MIN SPACING BETWEEN BAGS
2. SAW WATTLE SHALL BE PLACED PER PLAN

STRAW WATTLE PROTECTION ON HARD SURFACE

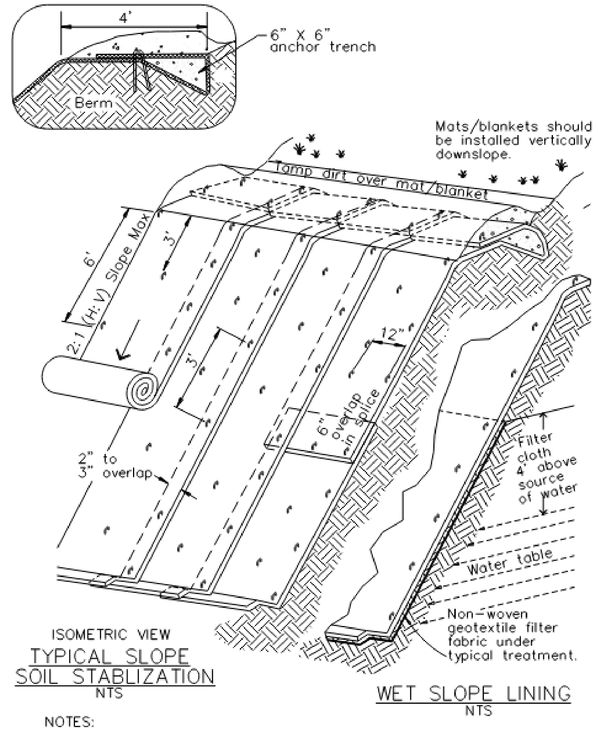
SCALE: N.T.S.

APPENDIX B - DETAILS



STABILIZED ENTRANCE CASQA TC-1

SCALE: N.T.S.



ISOMETRIC VIEW

TYPICAL SLOPE SOIL STABLIZATION

NTS

WET SLOPE LINING

NTS

NOTES:

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

TYPICAL INSTALLATION DETAIL

Geotextiles and Mats — EC-7

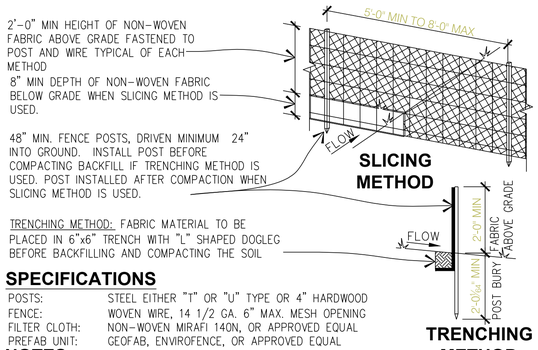
Anchoring

- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Wire staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Metal stake pins should be 0.188 in. diameter steel with a 1.5 in. steel washer at the head of the pin, and 8 in. in length.
- Wire staples and metal stakes should be driven flush to the soil surface.

Installation on Slopes

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Begin at the top of the slope and anchor the blanket in a 6 in. deep by 6 in. wide trench. Backfill trench and tamp earth firmly.
- Unroll blanket down slope in the direction of water flow.
- Overlap the edges of adjacent parallel rolls 2 to 3 in. and staple every 3 ft (or greater, per manufacturer's specifications).
- When blankets must be spliced, place blankets end over end (shingle style) with 6 in. overlap. Staple through overlapped area, approximately 12 in. apart.
- Lay blankets loosely and maintain direct contact with the soil. Do not stretch.
- Staple blankets sufficiently to anchor blanket and maintain contact with the soil. Staples should be placed down the center and staggered with the staples placed along the edges. Steep slopes, 1:1 (H:V) to 2:1 (H:V), require a minimum of 2 staples/yd². Moderate slopes, 2:1 (H:V) to 3:1 (H:V), require a minimum of 1 ½ staples/yd². Check manufacturer's specifications to determine if a higher density staple pattern is required.



SPECIFICATIONS

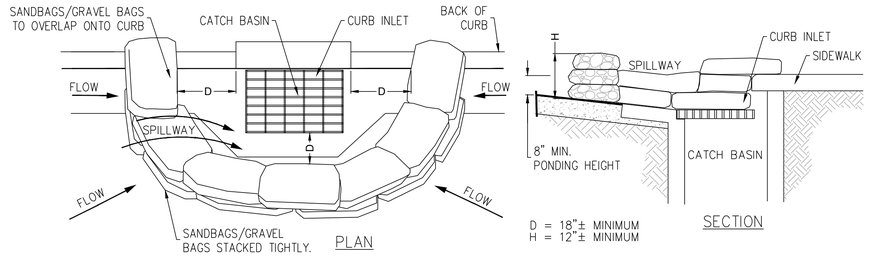
POSTS:	STEEL EITHER "T" OR "U" TYPE OR 4" HARDWOOD
FENCE:	WOVEN WIRE, 14 1/2 GA. 6" MAX. MESH OPENING
FILTER CLOTH:	NON-WOVEN MIRAFI 140N, OR APPROVED EQUAL
PREFAB UNIT:	GEOFAB, ENVIROFENCE, OR APPROVED EQUAL

NOTES

A. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS W/ WIRE TIES OR STAPLES.
B. FABRIC FASTENED SECURELY TO FENCE W/ TIES SPACED AT 24" AT TOP AND MID SECTION.
C. WHEN TWO SECTIONS OF FABRIC ADJOIN EACH OTHER THEY SHALL OVERLAP BY (6) INCHES.
D. LOCATE POSTS DOWN SLOPE OF FABRIC FOR FENCE SUPPORT.
E. MAINTENANCE SHALL BE PERFORMED AFTER EACH RAINFALL AND AS NEEDED, SEDIMENT TO BE REMOVED WHEN "BULGES" DEVELOP.

SILT FENCE INSTALLATION

SCALE: N.T.S. (NON-WOVEN MIRAFI 140N FILTER FRABRIC OR APPROVED EQUAL)



NOTES:

1. CATCH BASIN/INLET PROTECTION SHALL BE INSTALLED WHEREVER THERE IS A POTENTIAL OF STORMWATER OR NON-STORMWATER BEING DISCHARGED INTO IT.
2. INLET PROTECTION IS REQUIRED ALONG WITH OTHER POULLTION PREVENTION MEASURES SUCH AS; EROSION CONTROL, SOIL STABILIZATION, AND MEASURES TO PREVENT TRACKING ONTO PAVED SURFACES. MODIFY INLET PROTECTION AS NEEDED TO AVOID CREATING TRAFFIC HAZARDS.
3. INCLUDE INLET PROTECTION MEASURES AT HILLSIDE V-DITCHES AND MISC. DRAINAGE SWALES.
4. INLET PROTECTION SHALL BE INSPECTED AND ACCUMULATED SEDIMENTS REMOVED. SEDIMENT SHALL BE DISPOSED OF PROPERLY IN A MANNER THAT ASSURES THAT THE SEDIMENT DOES NOT ENTER THE STORM DRAIN SYSTEM.
5. DAMAGED BAGS SHALL BE REPLACED IMMEDIATELY.
6. ADDITIONAL SANDBAG SEDIMENT TRAPS SHALL BE PLACED AT INTERVALS AS INDICATED ON SITE PLAN.
7. REFER TO CASQA SE-10 STORM DRAIN INLET PROTECTION FOR ADDITIONAL GUIDANCE.

CATCH BASIN/DRAIN INLET PROTECTION

SCALE: N.T.S.

SEE ATTACHED BMP NOTES IN APPENDIX B

REV.	DATE	DESCRIPTION

THE CITY OF PLEASANTON

CITY OF PLEASANTON
PUBLIC WORKS DEPARTMENT

ADAM M. NELKIE
CITY ENGINEER
NO. 78830
EXP. 9/30/25

BERNAL PARCEL - STOCK PILE YARD

DETAILS

DESIGN:	GP
DRAWN:	SN
CHECKED:	AN
TRAFFIC ENGINEER:	MT

SCALE:	AS SHOWN
PROJECT NO.:	CIP-XXXX
DATE:	OCT 16, 2024

DWG NO. **SW-4**

4 OF 4

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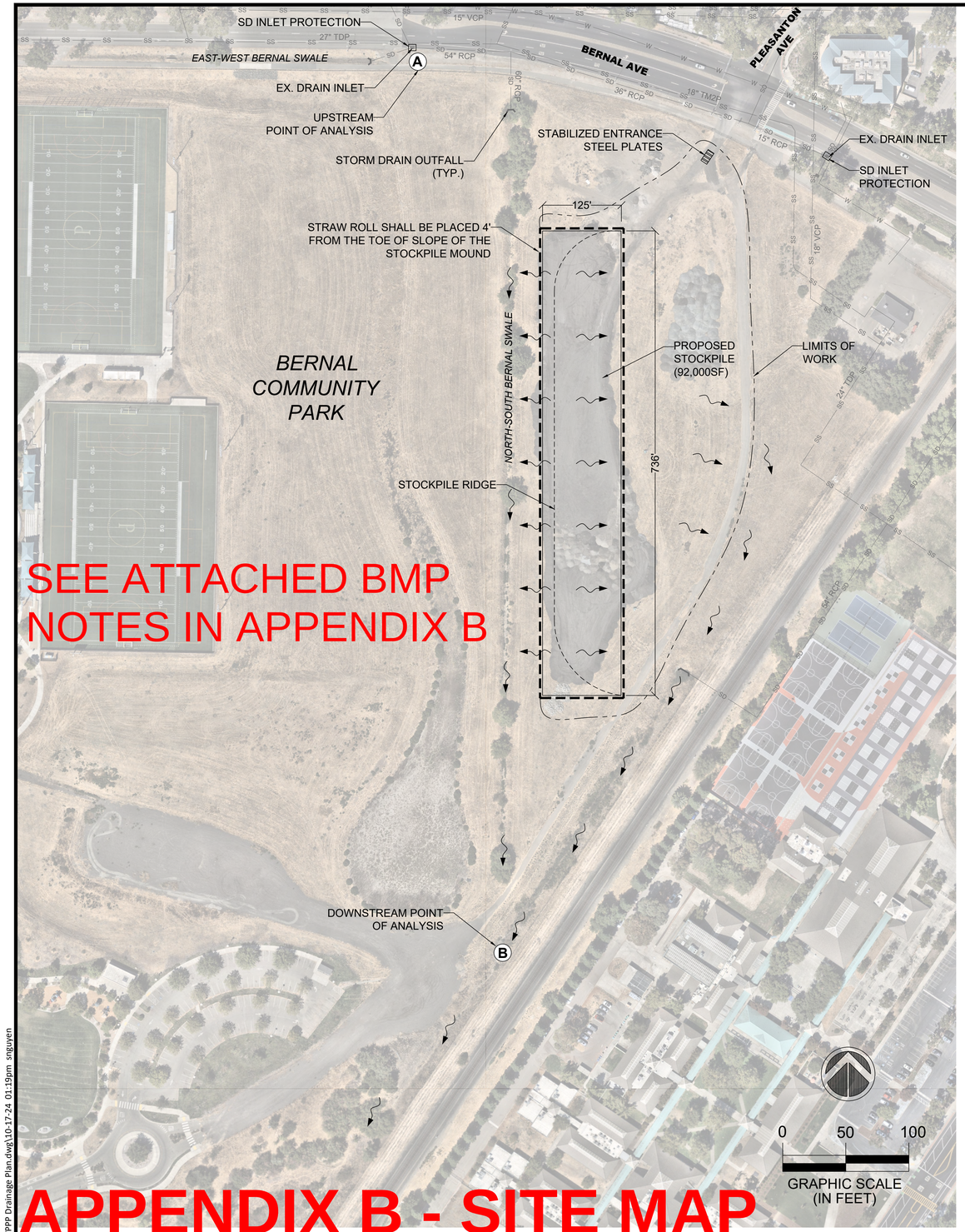

SEE ATTACHED BMP NOTES IN APPENDIX B

APPENDIX B - SITE MAP

GENERAL

1. MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE CONTRACT DOCUMENTS, INCLUDING THE CITY OF PLEASANTON STANDARD SPECIFICATIONS, WHICH ARE AVAILABLE IN THE OFFICE OF THE CITY ENGINEER. THE CITY ENGINEER'S OFFICE (925-931-5650) SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO CONSTRUCTION ACTIVITIES.
2. THE LOCATION AND, WHERE SHOWN, DEPTHS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS BASED UPON AVAILABLE RECORD INFORMATION. THE CONTRACTOR SHALL DETERMINE THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES CROSSING OR WITHIN 5 FEET OF THE PROPOSED PIPELINE ALIGNMENTS. THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES AT LEAST 48 HOURS IN ADVANCE OF CONSTRUCTION. SEE SPECIAL PROVISIONS FOR ALIGNMENT AND PROFILE VERIFICATION PROCESS.
3. AERIAL IMAGERY USED IN THE PLAN DRAWINGS IS PROVIDED FOR REFERENCE AND THE CONVENIENCE OF THE CONTRACTOR. LOCATIONS AND ELEVATIONS OF THE CONSTRUCTED WORK SHALL BE AS INDICATED IN THE CONTRACT DOCUMENTS AND SHALL BE VERIFIED BY THE CONTRACTOR USING GPS LOCATING EQUIPMENT.
4. FIELD CHANGES SHALL BE APPROVED BY THE CITY PRIOR TO IMPLEMENTING OR AS ORDERED BY THE CITY. NO PAYMENT WILL BE MADE FOR FIELD CHANGES NOT AUTHORIZED BY THE CITY AND THAT UNAUTHORIZED WORK IS SUBJECT TO REMOVAL AS DIRECTED BY THE CITY.
5. CONTRACTOR SHALL NOTIFY THE CITY OF INCOMPLETE, INCONSISTENT OR INCORRECT REQUIREMENTS IN THE CONTRACT DOCUMENTS AND SHALL REQUEST CLARIFICATION IN WRITING FROM THE CITY PRIOR TO COMMENCING WORK.

SAFETY

1. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE THROUGH THE DURATION OF CONSTRUCTION INCLUDING SAFETY OF PERSONS AND PROPERTY, AND FOR OBTAINING NECESSARY CITY REVIEWS OF THE CONDITIONS. THE CITY'S JOB SITE REVIEW DOES NOT RELIEVE CONTRACTOR OF RESPONSIBILITY FOR THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE OR INJURIES RESULTING FROM CONTRACTOR'S OPERATIONS AND/OR MATERIALS AND EQUIPMENT STORED IN STAGING AREAS. THE CITY IS NOT RESPONSIBLE FOR SECURING THE CONTRACTOR'S EQUIPMENT AND WORK SITES.
3. NOT ALL UTILITY SERVICE LATERALS ARE SHOWN ON PLANS. THOSE THAT ARE SHOWN MAY NOT BE SHOWN AT THEIR TRUE LOCATIONS. CONTRACTOR SHALL COORDINATE WITH USA TO FIELD LOCATE SERVICE LATERALS AND USE EXTREME CAUTION WHEN WORKING IN THE VICINITY OF GAS, TELECOMMUNICATION AND ELECTRIC SERVICE LINES.

EXISTING UTILITIES, BURIED STRUCTURES AND FEATURES

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION OF EXISTING UTILITIES VIA UNDERGROUND SERVICE ALERT AND TO COMMUNICATE WITH THE APPROPRIATE UTILITY AGENCIES AND POTHOLING PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

USA NORTH 811 Call 811 Before You Dig

2. EXISTING UTILITIES SHOWN ARE SHOWN BASED UPON AVAILABLE RECORD INFORMATION AND ARE APPROXIMATE IN LOCATION AND DEPTH. CONTRACTOR SHALL SUPPORT CROSSING AND PARALLEL EXISTING UTILITIES EXPOSED DURING CONSTRUCTION.
3. NOT ALL UTILITY SERVICE LATERALS ARE SHOWN ON THE PLANS. THOSE THAT ARE SHOWN MAY NOT BE SHOWN AT THEIR TRUE LOCATIONS.
4. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING ADJACENT TO OVERHEAD AND UNDERGROUND UTILITIES. DAMAGE TO UTILITIES, INCLUDING SERVICES AND LATERALS, RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPORTED IMMEDIATELY TO THE CITY AND UTILITY OWNER, AND SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CITY AND/OR UTILITY COMPANY. COSTS INCURRED BY UTILITY SERVICE INTERRUPTION RESULTING FROM THE CONTRACTOR'S OPERATION SHALL ALSO BE ENTIRELY REIMBURSED BY THE CONTRACTOR.
5. THE CONTRACTOR SHALL REMOVE ALL USA MARKINGS BY CLEANING WITH PRESSURE WASHER OR OTHER APPROVED METHOD AT THE COMPLETION OF WORK IN ANY STREET BLOCK.
6. CONTRACTOR SHALL COORDINATE WITH OWNERS OF EXISTING UTILITIES WHEN WORKING IN THE VICINITY OF THOSE UTILITIES. SEE THE UTILITY CONTACT TABLE FOR CONTACT PERSONS AND INFORMATION.
7. CONTRACTOR SHALL PERFORM WORK IN THE VICINITY OF EXISTING UTILITIES AS SHOWN AND SPECIFIED AND IN CONFORMANCE WITH UTILITY OWNER REQUIREMENTS. EARLY COORDINATION WITH UTILITY OWNERS IS REQUIRED.

COORDINATION

1. WORK AREA LIMITS: THE CONTRACTOR SHALL CONTAIN ITS OPERATIONS WITHIN THE DESIGNATED SITE WORK AREA LIMITS SHOWN AND IN ACCORDANCE WITH THE CONDITIONS OF THE CONTRACT.
2. THE CONTRACTOR SHALL SUBMIT A TEMPORARY TRAFFIC CONTROL PLAN AS NEEDED FOR HAUL ROUTE ACCESS. TRAFFIC CONTROL PLANS MUST BE APPROVED BY THE CITY TRAFFIC ENGINEER BEFORE WORK CAN START.
3. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT IN THE PUBLIC RIGHT-OF-WAY SHALL NOT BE PERMITTED, EXCEPT AT LOCATION(S) APPROVED BY THE CITY.
4. THE CONTRACTOR SHALL NOTIFY, BY CIRCULAR, ALL BUSINESS ESTABLISHMENTS AND RESIDENCES LOCATED IN AREAS AFFECTED BY THE WORK AT LEAST 2 WEEKS, FORTY-EIGHT (48) HOURS, AND IMMEDIATELY PRIOR TO START OF CONSTRUCTION IN A PARTICULAR AREA. THE CIRCULAR SHALL INCLUDE EXPECTED DATES OF THE WORK AFFECTING THAT PROPERTY, CONTACT INFORMATION FOR THE GENERAL CONTRACTOR, AND A BRIEF DESCRIPTION OF THE WORK. CIRCULAR SHALL BE SUBJECT TO THE APPROVAL OF THE CITY.
5. THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING FOR REQUIRED INSPECTIONS. THE PRESENCE OR ABSENCE OF THE INSPECTOR WILL NOT RELIEVE THE CONTRACTOR OF FULL RESPONSIBILITY FOR THE PROPER PERFORMANCE OF THE WORK.

ACCESS AND STAGING

1. THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION HAUL ROUTE PLAN TO THE CITY FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION.
2. THE CONTRACTOR SHALL RESTORE ALL AREAS AFFECTED BY CONSTRUCTION TO THEIR ORIGINAL OR BETTER CONDITION AS DETERMINED BY THE CITY . LANDSCAPE PLANTINGS AND IRRIGATION COMPONENTS DISTURBED OR DAMAGED BY CONTRACTOR ACTIVITY, SHALL BE REPAIRED OR REPLACED IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS, TO THE SATISFACTION OF THE CITY WITHIN 24 HOURS.

MAINTENANCE SCHEDULE

CONTROL	INSPECTION FREQUENCY	MAINTENANCE/REPAIR MEASURES
STABILIZED CONSTRUCTION ENTRANCE	WEEKLY & AFTER EACH RAIN	REPLACE GRAVEL MATERIAL WHEN VOIDS ARE PRESENT REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS WITHIN 24 HOURS REMOVE GRAVEL AT COMPLETION OF CONSTRUCTION
STORM DRAIN INLET PROTECTION	WEEKLY & AFTER EACH RAIN	REPLACE CLOGGED FILTER FABRIC IMMEDIATELY REMOVE SEDIMENT WHEN IT REACHES 1/2 THE HEIGHT OF THE FILTER
FIBER ROLLS	WEEKLY & AFTER EACH RAIN	REPAIR WHENEVER STRAW ROLL IS DAMAGED REMOVE SEDIMENT WHEN IT REACHES 1/3 THE HEIGHT OF THE ROLLS ESPECIALLY IF HEAVY RAINS ARE EXPECTED

NOTE: PROJECT 1ST DRAINAGE POINT OF ANALYSIS DOWNSTREAM OF PROJECT AREA IS AN EXISTING OUTLET PIPE IN A DRAINAGE SWALE AS NOTED ON THIS DRAWING.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN CONTROL OF THE ENTIRE CONSTRUCTION OPERATION AND TO KEEP THE ENTIRE SITE IN COMPLIANCE WITH THE SOIL EROSION CONTROL PLAN.
2. THIS PLAN IS INTENDED TO BE USED FOR INTERIM EROSION AND SEDIMENT CONTROL ONLY AND IS NOT TO BE USED FOR FINAL ELEVATIONS OR PERMANENT IMPROVEMENTS.
3. CONTRACTOR WILL SUBMIT TO THE CITY MONTHLY (AT THE FIRST OF EACH MONTH BETWEEN OCT 1ST AND APRIL 30TH) CERTIFICATIONS THAT ALL EROSION/SEDIMENT MEASURES IDENTIFIED ON THE APPROVED EROSION CONTROL PLAN ARE IN PLACE. IF MEASURES ARE NOT IN PLACE, CONTRACTOR SHALL PROVIDE THE CITY WITH A WRITTEN EXPLANATION OF WHY THE MEASURE IS NOT IN PLACE AND WHAT WILL BE DONE TO REMEDY THIS SITUATION.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR MONITORING EROSION AND SEDIMENT CONTROL MEASURES PRIOR, DURING, AND AFTER STORM EVENTS.
5. REASONABLE CARE SHALL BE TAKEN WHEN HAULING ANY EARTH, SAND, GRAVEL, STONE, DEBRIS, PAPER OR ANY OTHER SUBSTANCE OVER ANY PUBLIC STREET, ALLEY OR OTHER PUBLIC PLACE. SHOULD ANY BLOW, SPILL, OR TRACK OVER AND UPON SAID PUBLIC OR ADJACENT PRIVATE PROPERTY, IMMEDIATE REMEDY SHALL OCCUR.
6. SANITARY FACILITIES SHALL BE MAINTAINED ON THE SITE.
7. DURING THE RAINY SEASON, ALL PAVED AREAS SHALL BE KEPT CLEAR OF EARTH MATERIAL AND DEBRIS. THE SITE SHALL BE MAINTAINED SO AS TO MINIMIZE SEDIMENT LADEN RUNOFF TO ANY STORM DRAINAGE SYSTEM, INCLUDING EXISTING DRAINAGE SWALES AND WATER COURSES.
8. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION WILL BE MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT SHALL BE COMPLIED WITH.
9. CONTRACTOR SHALL PROVIDE DUST CONTROL AS REQUIRED BY THE APPROPRIATE FEDERAL, STATE AND LOCAL AGENCY REQUIREMENTS.

EROSION AND SEDIMENT CONTROL MEASURES

1. THE FACILITIES SHOWN ON THIS PLAN ARE DESIGNED TO CONTROL EROSION AND SEDIMENT DURING THE RAINY SEASON, OCTOBER 1 TO APRIL 30. FACILITIES ARE TO BE OPERABLE PRIOR TO SEPTEMBER 15 OF ANY YEAR. GRADING OPERATIONS DURING THE RAINY SEASON WHICH LEAVE DENUDED SLOPES SHALL BE PROTECTED WITH EROSION CONTROL MEASURES IMMEDIATELY FOLLOWING GRADING ON THE SLOPES. DURING THE NON-RAINY SEASON BEST MANAGEMENT PRACTICES (BMP'S) MUST BE IMPLEMENTED DURING CONSTRUCTION WHICH INCLUDES, BUT IS NOT LIMITED TO: STABALIZED CONSTRUCTION ENTRANCE, TIRE WASH AREA AND INLET PROTECTION.
2. CONSTRUCTION ENTRANCES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF GRADING. CONTRACTOR SHALL MAINTAIN STABILIZED ENTRANCE AT EACH VEHICLE ACCESS POINT TO EXISTING PAVED STREETS. ANY MUD OR DEBRIS TRACKED ONTO PUBLIC STREETS SHALL BE REMOVED DAILY AND AS REQUIRED BE THE CITY.
3. INLET PROTECTION SHALL BE INSTALLED AT OPEN INLETS TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAIN SYSTEM. INLETS NOT USED IN CONJUNCTION WITH EROSION CONTROL ARE TO BE BLOCKED TO PREVENT ENTRY OF SEDIMENT.
4. THIS EROSION AND SEDIMENT CONTROL PLAN MAY NOT COVER ALL THE SITUATIONS THAT MAY ARISE DURING CONSTRUCTION DUE TO UNANTICIPATED FIELD CONDITIONS. VARIATIONS AND ADDITIONS MAY BE MADE TO THIS PLAN IN THE FIELD. NOTIFY THE CITY REPRESENTATIVE OF ANY FIELD CHANGES.

BMP SUMMARY TABLE

BMP CATEGORY	BMP USED
EROSION CONTROL	SCHEDULING, PRESERVATION OF EXISTING VEGETATION
SEDIMENT CONTROL	FIBER ROLLS, STREET SWEEPING, STORM DRAIN INLET PROTECTION, CONSTRUCTION ENTRANCE/EXIT
GOOD SITE MANAGEMENT	MATERIAL DELIVERY AND STORAGE, MATERIAL USE, STOCKPILE MANAGEMENT, SPILL PRESERVATION AND CONTROL, SOLID WASTE MANAGEMENT, HAZARDOUS WASTE, CONCRETE WASTE MANAGEMENT, SANITARY-SEPTIC WASTE MANAGEMENT
NON-STORMWATER MANAGEMENT	PAVING AND GRINDING OPERATION, ILLICIT CONNECTION-ILLEGAL DISCHARGE CONNECTION
RUN-ON AND RUN-OFF CONTROL	FIBER ROLLS, SANDBAGS
ACTIVE TREATMENT SYSTEMS	NOT APPLICABLE

MAINTENANCE NOTES

1. MAINTENANCE IS TO BE PERFORMED AS FOLLOWS:
   A. REPAIR DAMAGES CAUSED BY SOIL EROSION OR CONSTRUCTION AT THE END OF EACH WORKING DAY.
   B. SWALES SHALL BE INSPECTED PERIODICALLY AND MAINTAINED AS NEEDED.
   C. SEDIMENT TRAPS, BERMS, AND SWALES ARE TO BE INSPECTED AFTER EACH STORM AND REPAIRS MADE AS NEEDED.
   D. SEDIMENT SHALL BE REMOVED AND SEDIMENT TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO A DEPTH OF 1 FOOT.
   E. SEDIMENT REMOVED FROM TRAP SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
   F. RILLS AND GULLIES MUST BE REPAIRED.
2. SAND BAG INLET PROTECTION SHALL BE CLEANED OUT WHENEVER SEDIMENT DEPTH IS ONE HALF THE HEIGHT OF ONE SAND BAG.

UTILITY PROVIDERS

WATER, STORM AND SEWER:	CITY OF PLEASANTON 3333 BUSCH ROAD PLEASANTON, CA 94566 (925) 931-5500
PG&E GAS	PACIFIC GAS & ELECTRIC COMPANY 24300 CLAWITER RD. HAYWARD, CA 94545 (510) 784-3376
PG&E ELECTRIC	PACIFIC GAS & ELECTRIC COMPANY 998 MURRIETA BLVD. LIVERMORE, CA 94550 (925) 373-2603
AT&T	AT&T 5005 EXECUTIVE PKWY 3N750J SAN RAMON, CA 94583 KG2513@ATT.COM
COMCAST	COMCAST 3011 COMCAST PL LIVERMORE, CA 94583 (510) 377-5462
MCI/VERIZON	VERIZON (415) 218-8936
GARBAGE SERVICE	PLEASANTON GARBAGE SERVICES 3110 BUSCH ROAD PLEASANTON, CA 94566 (925) 846-2042

REV.	DATE	DESCRIPTION

THE CITY OF PLEASANTON

CITY OF PLEASANTON
PUBLIC WORKS DEPARTMENT

ADAM M. NELKIE
CITY ENGINEER
NO. 78830
EXP. 9/30/25

BERNAL PARCEL - STOCK PILE YARD

BERNAL STOCK PILE YARD SITE SWPPP DRAINAGE PLAN

DESIGN:	XX
DRAWN:	XX
CHECKED:	AN
TRAFFIC ENGINEER:	MT

SCALE:	AS SHOWN
PROJECT NO.:	CIP-XXXX
DATE:	OCT 16, 2024

DWG NO. SW-2

2 OF 4

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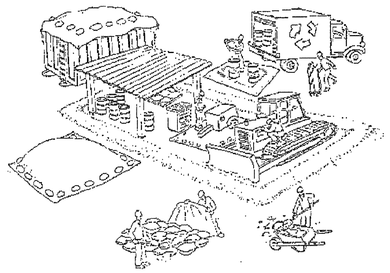
Pollution Prevention - It's Part of the Plan



Make sure your crews and subs do the job right!

Runoff from streets and other paved areas are a major source of pollution in San Francisco Bay. Construction activities can directly affect the health of the Bay unless contractors and crews plan ahead to keep dirt, debris, and other construction waste away from strom drains and local creeks. Following these guidelines will ensure your compliance with the City of Pleasanton requirements. Contact the City of Pleasanton, Department of Engineering at (925) 931-5650, or for private onsite work, please contact the Building and Safety Division at (925) 931-5300.

Materials storage & spill cleanup

Non-hazardous materials management

- Sand, dirt, and similar materials must be stored at least 10 feet from catch basins, and covered with a tarp during wet weather or when rain is forecast.
- Use (but don't overuse) reclaimed water for dust control as needed.
- Sweep or vacuum streets and other paved areas daily. Do not wash down streets or work areas with water!
- Recycle all asphalt, concrete, and aggregate base material from demolition activities.

Comply with City Ordinance for recycling construction materials, wood, gyp board, pipe, etc.
Contact Pleasanton Garbage Service at 925-846-2042 for both recycling and debris disposal.

- Check dumpsters regularly for leaks and to make sure they don't overflow.

Repair or replace leaking dumpsters promptly.

Hazardous materials management

- Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, state, and federal regulations.
- Store hazardous materials and wastes in secondary containment and cover them during wet weather.
- Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- Be sure to arrange for appropriate disposal of all hazardous wastes.

Spill prevention and control

- Keep a stockpile of spill cleanup materials (rags, absorbents, etc.) available at the construction site at all times.
- When spills or leaks occur, contain them immediately and be particularly careful to prevent leaks and spills from reaching the gutter, street, or storm drain.

Never wash spilled material into a gutter, street, storm drain, or creek!

- Report any hazardous materials spills immediately! Dial 911 or the Livermore/Pleasanton Fire Department at 925-454-2330.

Vehicle and equipment maintenance & cleaning

- Inspect vehicles and equipment for leaks frequently. Use drip pans to catch leaks until repairs are made; repair leaks promptly.
- Fuel and maintain vehicles on site only in a bermed area or over a drip pan that is big enough to prevent runoff.
- If you must clean vehicles or equipment on site, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or creeks.
- Do not clean vehicles or equipment on-site using soaps, solvents, degreasers, steam cleaning equipment, etc.

Earthwork & contaminated soils

- Keep excavated soil on the site where it is least likely to collect in the street.

Transfer to dump trucks should take place on the site, not in the street.

- Use fiber rolls, silt fences, or other control measures to minimize the flow of silt off the site. See the approved erosion control plan for this site.

- Earth moving activities are only allowed during dry weather by permit and as approved by the City Inspector in the Field.
- Mature vegetation is the best form of erosion control. Minimize disturbance to existing vegetation whenever possible.
- If you disturb a slope during construction, prevent erosion by securing the soil with erosion control fabric, or seed with fast-growing grasses as soon as possible. Place fiber rolls down-slope until soil is secure.
- If you suspect contamination (from site history, discoloration, odor, texture, abandoned underground tanks or pipes, or buried debris), call Pleasanton/Livermore Fire Department at 925-454-2330 or the Regional Water Quality Control Board for help in determining what should be done, and manage disposal of contaminated soil according to their instuctions.

Dewatering operations

- Reuse water for dust control, irrigation, or another on-site purpose to the greatest extent possible.
- Be sure to call Pleasanton's storm drain source control inspector, Brian Lorimer, before discharging water to a street, gutter, or storm drain (925-931-5511). Filtration or diversion through a basin, tank, or sediment trap may be required.
- In areas of known contamination, testing is required prior to reuse or discharge of groundwater. Consult with the city inspector to determine what testing is required and how to interpret results. Contaminated groundwater must be treated or hauled off-site for proper disposal.

Saw cutting

- Always completely cover or barricade storm drain inlets when saw cutting. Use filter fabric, catch basin inlet filters, or sand/gravel bags to keep slurry out of the storm drain system.
- Shovel, absorb, or vacuum saw-cut slurry and pick up all waste as soon as you are finished in one location or at the end of each work day (whichever is sooner!).
- If saw cut slurry enters a catch basin, clean it up immediately.

Paving/asphalt work

- Do not pave during wet weather or when rain is forecast.
- Always cover storm drain inlets and manholes when paving or applying seal coat, tack coat, slurry seal, or fog seal.
- Place drip pans or absorbent material under paving equipment when not in use.
- Protect gutters, ditches, and drainage courses with sand/gravel bags, or earthen berms.
- Do not sweep or wash down excess sand from sand sealing into gutters, storm drains, or creeks. Collect sand and return it to the stockpile, or dispose of it as trash.
- Do not use water to wash down fresh asphalt concrete pavement.

Concrete, grout, and mortar storage & waste disposal

- Be sure to store concrete, grout, and mortar under cover and away from drainage areas. These materials must never reach a storm drain.
- Wash out concrete equipment/trucks off-site or designate an on-site area for washing where water will flow onto dirt or into a temporary pit in a dirt area. Let the water seep into the soil and dispose of hardened concrete with trash.

- Divert water from washing exposed aggregate concrete to a dirt area where it will not run into a gutter, street, or storm drain.
- If a suitable dirt area is not available, collect the wash water and remove it for appropriate disposal off site.

Painting

- Never rinse paint brushes or materials in a gutter or street!
- Paint out excess water-based paint before rinsing brushes, rollers, or containers in a sink. If you can't use a sink, direct wash water to a dirt area and spade it in.
- Paint out excess oil-based paint before cleaning brushes in thinner.
- Filter paint thinners and solvents for reuse whenever possible. Dispose of oil-based paint sludge and unusable thinner as hazardous waste.

Storm drain polluters maybe liable for fines of $10,000 or more per day!

Bay Area Stormwater Management Agencies Association (BASMAA)
1-888-BAYWISE

For more detailed information:
Get a copy of the "Field Manual" -- (510) 622-2465 or www.abag.ca.gov/bayarea/sfep/reports/construction.html

APPENDIX B - PLAN

REV.	DATE	DESCRIPTION

THE CITY OF PLEASANTON

CITY OF PLEASANTON
PUBLIC WORKS DEPARTMENT

ADAM M. NELKIE
CITY ENGINEER
NO. 78830
EXP. 9/30/25

BERNAL PARCEL - STOCK PILE YARD

POLLUTION PREVENTION PLAN

DESIGN:	XX
DRAWN:	XX
CHECKED:	AN
TRAFFIC ENGINEER:	MT

SCALE:	AS SHOWN
PROJECT NO.:	CIP-XXXX
DATE:	OCT 16, 2024

DWG NO. **SW-3**
3 OF 4

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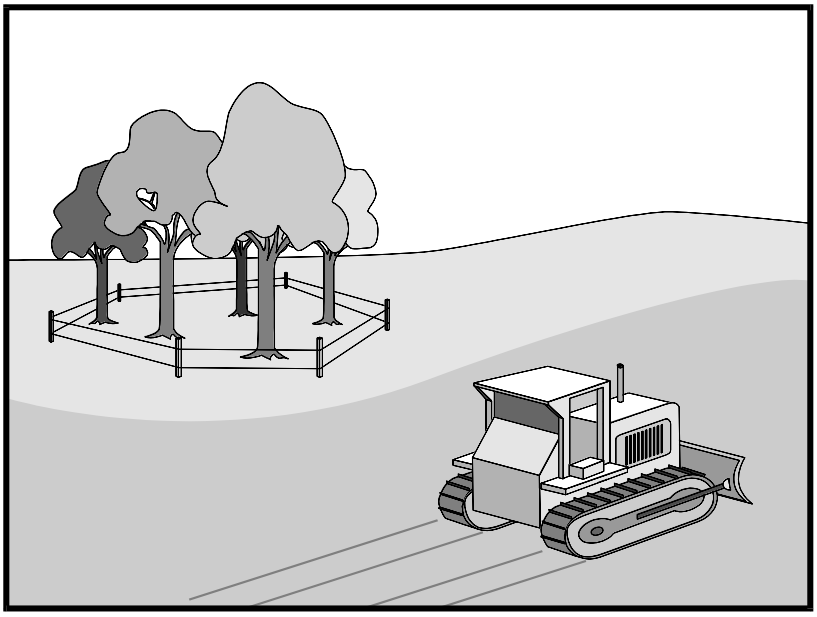
APPENDIX C

Construction Site Best Management Practices Selected For This Project:

Appendix C Table of Contents

Preservation of Existing Vegetation EC-2



Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.
- Protecting existing vegetation buffers and swales.

Categories

EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Limitations

- Requires forward planning by the owner/developer, contractor, and design staff.
- Limited opportunities for use when project plans do not incorporate existing vegetation into the site design.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactory for the planned development.

Implementation

The best way to prevent erosion is to not disturb the land. In order to reduce the impacts of new development and redevelopment, projects may be designed to avoid disturbing land in sensitive areas of the site (e.g., natural watercourses, steep slopes), and to incorporate unique or desirable existing vegetation into the site's landscaping plan. Clearly marking and leaving a buffer area around these unique areas during construction will help to preserve these areas as well as take advantage of natural erosion prevention and sediment trapping.

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 ensure the survival of desirable vegetation for shade, beautification, and erosion control. Mature vegetation has extensive root systems that help to hold soil in place, thus reducing erosion. In addition, vegetation helps 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.

Timing

- Provide for preservation of existing vegetation prior to the commencement of clearing and grubbing operations or other soil disturbing activities in areas where no construction activity is planned or will occur at a later date.

Design and Layout

- Mark areas to be preserved with temporary fencing. Include sufficient setback to protect roots.
  - Orange colored plastic mesh fencing works well.
  - Use appropriate fence posts and adequate post spacing and depth to completely support the fence in an upright position.
- Locate temporary roadways, stockpiles, and layout areas to avoid stands of trees, shrubs, and grass.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Maintain existing irrigation systems where feasible. Temporary irrigation may be required.
- Instruct employees and subcontractors to honor protective devices. Prohibit heavy equipment, vehicular traffic, or storage of construction materials within the protected area.

- Consider pruning or mowing vegetation instead of removing it to allow for regrowth.
- If possible, retain vegetation buffer around the site and adjacent waterways.

Costs

There is little cost associated with preserving existing vegetation if properly planned during the project design, and these costs may be offset by aesthetic benefits that enhance property values. During construction, the cost for preserving existing vegetation will likely be less than the cost of applying erosion and sediment controls to the disturbed area. Replacing vegetation inadvertently destroyed during construction can be extremely expensive, sometimes in excess of $10,000 per tree.

Inspection and Maintenance

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

- Verify that protective measures remain in place. Restore damaged protection measures immediately.
- Serious tree injuries shall be attended to by an arborist.
- Damage to the crown, trunk, or root system of a retained tree shall be repaired immediately.
- Trench as far from tree trunks as possible, usually outside of the tree drip line or canopy. Curve trenches around trees to avoid large roots or root concentrations. If roots are encountered, consider tunneling under them. When trenching or tunneling near or under trees to be retained, place tunnels at least 18 in. below the ground surface, and not below the tree center to minimize impact on the roots.
- Do not leave tree roots exposed to air. Cover exposed roots with soil as soon as possible. If soil covering is not practical, protect exposed roots with wet burlap or peat moss until the tunnel or trench is ready for backfill.
- Cleanly remove the ends of damaged roots with a smooth cut.
- Fill trenches and tunnels as soon as possible. Careful filling and tamping will eliminate air spaces in the soil, which can damage roots.
- If bark damage occurs, cut back all loosened bark into the undamaged area, with the cut tapered at the top and bottom and drainage provided at the base of the wood. Limit cutting the undamaged area as much as possible.
- Aerate soil that has been compacted over a trees root zone by punching holes 12 in. deep with an iron bar and moving the bar back and forth until the soil is loosened. Place holes 18 in. apart throughout the area of compacted soil under the tree crown.
- Fertilization:

- Fertilize trees in the late fall or early spring. Although to note, many native species do not require fertilization.

- Apply fertilizer to the soil over the feeder roots and in accordance with label instructions, but never closer than 3 ft to the trunk. Increase the fertilized area by one-fourth of the crown area for conifers that have extended root systems.

- Retain protective measures until all other construction activity is complete to avoid damage during site cleanup and stabilization.

References

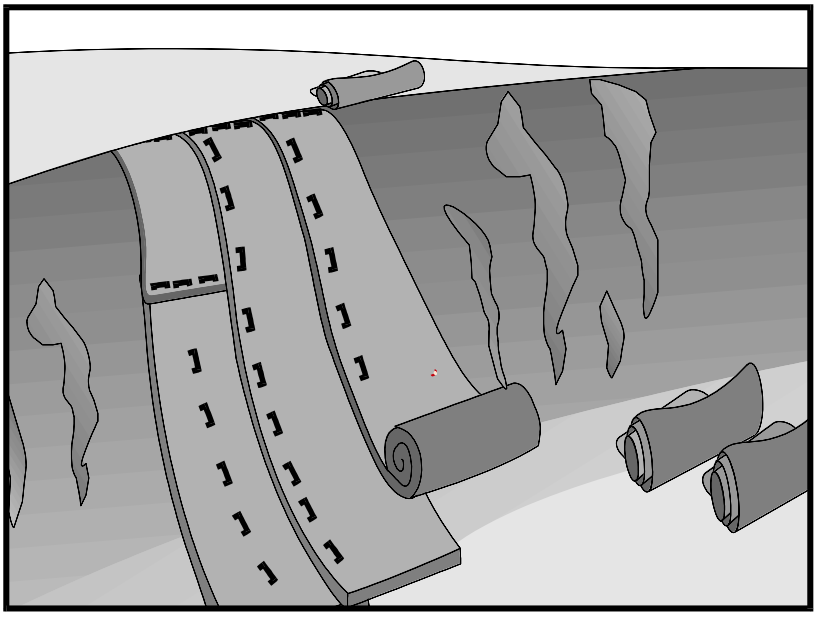
County of Sacramento Tree Preservation Ordinance, September 1981.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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

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

Geotextiles and Mats EC-7



Categories		
EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

Rolled Erosion Control Products (RECPs), also known as erosion control matting or blankets, can be made of natural or synthetic materials or a combination of the two. RECPs are used to cover the soil surface to reduce erosion from rainfall impact, hold soil in place, and absorb and hold moisture near the soil surface. Additionally, RECPs may be used to stabilize soils until vegetation is established or to reinforce non-woody surface vegetation.

Suitable Applications

RECPs are typically applied on slopes where erosion hazard is high, and vegetation will be slow to establish. Mattings are also used on stream banks, swales and other drainage channels where moving water at velocities between 3 ft/s and 6 ft/s are likely to cause scour and wash out new vegetation and in areas where the soil surface is disturbed and where existing vegetation has been removed. RECPs may also be used when seeding cannot occur (e.g., late season construction and/or the arrival of an early rain season). RECPs should be considered when the soils are fine grained and potentially erosive. RECPs should be considered in the following situations:

- Steep slopes, generally steeper than 3:1 (H:V).
- Long slopes.
- Slopes where the erosion potential is high.
- Slopes and disturbed soils where mulch must be anchored.

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-3 Hydraulic Mulch

EC-4 Hydroseeding

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

- Disturbed areas where temporary cover is needed, or plants are slow to establish or will not establish.
- Channels with flows exceeding 3.3 ft/s.
- Channels to be vegetated.
- Stockpiles.
- Slopes adjacent to water bodies.

Limitations

- RECP installed costs are generally higher than other erosion control BMPs, limiting their use to areas where other BMPs are ineffective (e.g., channels, steep slopes).
- RECPs may delay seed germination, due to reduction in soil temperature and/or sunlight.
- RECPs are generally not suitable for excessively rocky sites or areas where the final vegetation will be mowed (since staples and netting can catch in mowers). If a staple or pin cannot be driven into the soil because the underlying soil is too hard or rocky, then an alternative BMP should be selected.
- If used for temporary erosion control, RECPs should be removed and disposed of prior to application of permanent soil stabilization measures.
- The use of plastic sheeting should be limited to covering stockpiles or very small graded areas for short periods of time (such as through one imminent storm event) until other measures, such as seeding and mulching, may be installed.
    - Plastic sheeting is easily vandalized, easily torn, photodegradable, and must be disposed of at a landfill.
    - Plastic sheeting results in 100% runoff, which may cause serious erosion problems in the areas receiving the increased flow.
- According to the State Water Board's *CGP Review, Issue #2*, only RECPs that either do not contain plastic netting or contain netting manufactured from 100% biodegradable non-plastic materials, such as jute, sisal, or coir fiber should be used due to plastic pollution and wildlife concerns. If a plastic-netted product is used for temporary stabilization, it must be promptly removed when no longer needed and removed or replaced with non-plastic netted RECPs for final stabilization.
- RECPs may have limitations based on soil type, slope gradient, or channel flow rate; consult the manufacturer for proper selection.
- Not suitable for areas that have foot traffic (tripping hazard) – e.g., pad areas around buildings under construction.
- RECPs that incorporate a plastic netting (e.g. straw blanket typically uses a plastic netting to hold the straw in place) may not be suitable near known wildlife habitat. Wildlife can become trapped in the plastic netting. As per State Water Board guidance, RECPs that

contain plastic netting are discouraged for temporary controls and are not acceptable alternatives for permanent controls. RECPs that do not contain plastic netting or contain netting manufactured from 100% biodegradable non-plastic materials such as jute, sisal, or coir fiber should be used.

- RECPs may have limitations in extremely windy climates; they are susceptible to wind damage and displacement. However, when RECPs are properly trenched at the top and bottom and stapled in accordance with the manufacturer's recommendations, problems with wind can be minimized.

Implementation

Material Selection

- Natural RECPs have been found to be effective where re-vegetation will be provided by re-seeding. The choice of material should be based on the size of area, side slopes, surface conditions such as hardness, moisture, weed growth, and availability of materials.

- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.

- The following natural and synthetic RECPs are commonly used:

Geotextiles

- Material can be a woven or a non-woven polypropylene fabric with minimum thickness of 0.06 in., minimum width of 12 ft and should have minimum tensile strength of 150 lbs (warp), 80 lbs (fill) in conformance with the requirements in ASTM Designation: D 4632. The permittivity of the fabric should be approximately 0.07 sec^{-1} in conformance with the requirements in ASTM Designation: D4491. The fabric should have an ultraviolet (UV) stability of 70 percent in conformance with the requirements in ASTM designation: D4355. Geotextile blankets must be secured in place with wire staples or sandbags and by keying into tops of slopes to prevent infiltration of surface waters under geotextile. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

- Geotextiles may be reused if they are suitable for the use intended.

Plastic Covers

- Generally plastic sheeting should only be used as stockpile covering or for very small graded areas for short periods of time (such as through one imminent storm event). If plastic sheeting must be used, choose a plastic that will withstand photo degradation.

- Plastic sheeting should have a minimum thickness of 6 mils and must be keyed in at the top of slope (when used as a temporary slope protection) and firmly held in place with sandbags or other weights placed no more than 10 ft apart. Seams are typically taped or weighted down their entire length, and there should be at least a 12 in. to 24 in. overlap of all seams. Edges should be embedded a minimum of 6 in. in soil (when used as a temporary slope protection).

- All sheeting must be inspected periodically after installation and after significant rainstorms to check for erosion, undermining, and anchorage failure. Any failures must be repaired

immediately. If washout or breakages occur, the material should be re-installed after repairing the damage to the slope.

Erosion Control Blankets/Mats

- Biodegradable RECPs are typically composed of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials. In order for an RECP to be considered 100% biodegradable, the netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be biodegradable. See typical installation details at the end of this fact sheet.

  - **Jute** is a natural fiber that is made into a yarn that is loosely woven into a biodegradable mesh. The performance of jute as a stand-alone RECP is low. Most other RECPs outperform jute as a temporary erosion control product and therefore jute is not commonly used. It is designed to be used in conjunction with vegetation. The material is supplied in rolled strips, which should be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Excelsior** (curled wood fiber) blanket material should consist of machine produced mats of curled wood excelsior with 80 percent of the fiber 6 in. or longer. The excelsior blanket should be of consistent thickness. The wood fiber must be evenly distributed over the entire area of the blanket. The top surface of the blanket should be covered with a photodegradable extruded plastic mesh. The blanket should be smolder resistant without the use of chemical additives and should be non-toxic and non-injurious to plant and animal life. Excelsior blankets should be furnished in rolled strips, a minimum of 48 in. wide, and should have an average weight of 0.8 lb/yd^2, ±10 percent, at the time of manufacture. Excelsior blankets must be secured in place with wire staples. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

  - **Straw blanket** should be machine produced mats of straw with a lightweight biodegradable netting top layer. The straw should be attached to the netting with biodegradable thread or glue strips. The straw blanket should be of consistent thickness. The straw should be evenly distributed over the entire area of the blanket. Straw blanket should be furnished in rolled strips a minimum of 6.5 ft wide, a minimum of 80 ft long and a minimum of 0.5 lb/yd^2. Straw blankets must be secured in place with wire staples. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

  - **Wood fiber blanket** is composed of biodegradable fiber mulch with extruded plastic netting held together with adhesives. The material is designed to enhance re-vegetation. The material is furnished in rolled strips, which must be secured to the ground with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Coconut fiber blanket** should be a machine produced mat of 100 percent coconut fiber with biodegradable netting on the top and bottom. The coconut fiber should be attached to the netting with biodegradable thread or glue strips. The coconut fiber blanket should be of consistent thickness. The coconut fiber should be evenly distributed over the entire area of the blanket. Coconut fiber blanket should be furnished in rolled strips with a minimum of 6.5 ft wide, a minimum of 80 ft. long and a minimum of 0.5

lb/yd^2. Coconut fiber blankets must be secured in place with wire staples. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

- **Coconut fiber mesh** is a thin permeable membrane made from coconut or corn fiber that is spun into a yarn and woven into a biodegradable mat. It is designed to be used in conjunction with vegetation and typically has longevity of several years. The material is supplied in rolled strips, which must be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.

- **Straw coconut fiber blanket** should be machine produced mats of 70 percent straw and 30 percent coconut fiber with a biodegradable netting top layer and a biodegradable bottom net. The straw and coconut fiber should be attached to the netting with biodegradable thread or glue strips. The straw coconut fiber blanket should be of consistent thickness. The straw and coconut fiber should be evenly distributed over the entire area of the blanket. Straw coconut fiber blanket should be furnished in rolled strips a minimum of 6.5 ft wide, a minimum of 80 ft long and a minimum of 0.5 lb/yd^2. Straw coconut fiber blankets must be secured in place with wire staples. Staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.

- Non-biodegradable RECPs are typically composed of polypropylene, polyethylene, nylon or other synthetic fibers. In some cases, a combination of biodegradable and synthetic fibers is used to construct the RECP. Netting used to hold these fibers together is typically non-biodegradable as well. Only biodegradable RECPs can remain on a site applying for a Notice of Termination due to plastic pollution and wild life concerns (State Waterboard, 2016). RECPs containing plastic that are used on a site must be disposed of for final stabilization.

  - **Plastic netting** is a lightweight biaxially oriented netting designed for securing loose mulches like straw or paper to soil surfaces to establish vegetation. The netting is photodegradable. The netting is supplied in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Plastic mesh** is an open weave geotextile that is composed of an extruded synthetic fiber woven into a mesh with an opening size of less than ¼ in. It is used with re-vegetation or may be used to secure loose fiber such as straw to the ground. The material is supplied in rolled strips, which must be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Synthetic fiber with netting** is a mat that is composed of durable synthetic fibers treated to resist chemicals and ultraviolet light. The mat is a dense, three-dimensional mesh of synthetic (typically polyolefin) fibers stitched between two polypropylene nets. The mats are designed to be re-vegetated and provide a permanent composite system of soil, roots, and geomatrix. The material is furnished in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

  - **Bonded synthetic fibers** consist of a three-dimensional geometric nylon (or other synthetic) matting. Typically, it has more than 90 percent open area, which facilitates

root growth. It's tough root reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high volume discharges. It can be installed over prepared soil, followed by seeding into the mat. Once vegetated, it becomes an invisible composite system of soil, roots, and geomatrix. The material is furnished in rolled strips that must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

- **Combination synthetic and biodegradable RECPs** consist of biodegradable fibers, such as wood fiber or coconut fiber, with a heavy polypropylene net stitched to the top and a high strength continuous filament geomatrix or net stitched to the bottom. The material is designed to enhance re-vegetation. The material is furnished in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

Site Preparation

- Proper soil preparation is essential to ensure complete contact of the RECP with the soil. Soil Roughening is not recommended in areas where RECPs will be installed.
- Grade and shape the area of installation.
- Remove all rocks, clods, vegetation or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
- Prepare seedbed by loosening 2 to 3 in. of topsoil.

Seeding/Planting

Seed the area before blanket installation for erosion control and re-vegetation. Seeding after mat installation is often specified for turf reinforcement application. When seeding prior to blanket installation, all areas disturbed during blanket installation must be re-seeded. Where soil filling is specified for turf reinforcement mats (TRMs), seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Fertilize and seed in accordance with seeding specifications or other types of landscaping plans. The protective matting can be laid over areas where grass has been planted and the seedlings have emerged. Where vines or other ground covers are to be planted, lay the protective matting first and then plant through matting according to design of planting.

Check Slots

Check slots shall be installed as required by the manufacturer.

Laying and Securing Matting

- Before laying the matting, all check slots should be installed and the seedbed should be friable, made free from clods, rocks, and roots. The surface should be compacted and finished according to the requirements of the manufacturer's recommendations.
- Mechanical or manual lay down equipment should be capable of handling full rolls of fabric and laying the fabric smoothly without wrinkles or folds. The equipment should meet the fabric manufacturer's recommendations or equivalent standards.

Anchoring

- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Wire staples should be made of minimum 11-gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Metal stake pins should be 0.188 in. diameter steel with a 1.5 in. steel washer at the head of the pin, and 8 in. in length.
- Wire staples and metal stakes should be driven flush to the soil surface.

Installation on Slopes

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Begin at the top of the slope and anchor the blanket in a 6 in. deep by 6 in. wide trench. Backfill trench and tamp earth firmly.
- Unroll blanket down slope in the direction of water flow.
- Overlap the edges of adjacent parallel rolls 2 to 3 in. and staple every 3 ft (or greater, per manufacturer's specifications).
- When blankets must be spliced, place blankets end over end (shingle style) with 6 in. overlap. Staple through overlapped area, approximately 12 in. apart.
- Lay blankets loosely and maintain direct contact with the soil. Do not stretch.
- Staple blankets sufficiently to anchor blanket and maintain contact with the soil. Staples should be placed down the center and staggered with the staples placed along the edges. Steep slopes, 1:1 (H:V) to 2:1 (H:V), require a minimum of 2 staples/yd^2. Moderate slopes, 2:1 (H:V) to 3:1 (H:V), require a minimum of 1 ½ staples/yd^2. Check manufacturer's specifications to determine if a higher density staple pattern is required.

Installation in Channels

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Dig initial anchor trench 12 in. deep and 6 in. wide across the channel at the lower end of the project area.
- Excavate intermittent check slots, 6 in. deep and 6 in. wide across the channel at 25 to 30 ft intervals along the channels.
- Cut longitudinal channel anchor trenches 4 in. deep and 4 in. wide along each side of the installation to bury edges of matting, whenever possible extend matting 2 to 3 in. above the crest of the channel side slopes.

- Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 12 in. intervals. Note: matting will initially be upside down in anchor trench.
- In the same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 3 in.
- Secure these initial ends of mats with anchors at 12 in. intervals, backfill and compact soil.
- Unroll center strip of matting upstream. Stop at next check slot or terminal anchor trench. Unroll adjacent mats upstream in similar fashion, maintaining a 3 in. overlap.
- Fold and secure all rolls of matting snugly into all transverse check slots. Lay mat in the bottom of the slot then fold back against itself. Anchor through both layers of mat at 12 in. intervals, then backfill and compact soil. Continue rolling all mat widths upstream to the next check slot or terminal anchor trench.
- Alternate method for non-critical installations: Place two rows of anchors on 6 in. centers at 25 to 30 ft. intervals in lieu of excavated check slots.
- Staple shingled lap spliced ends a minimum of 12 in. apart on 12 in. intervals.
- Place edges of outside mats in previously excavated longitudinal slots; anchor using prescribed staple pattern, backfill, and compact soil.
- Anchor, fill, and compact upstream end of mat in a 12 in. by 6 in. terminal trench.
- Secure mat to ground surface using U-shaped wire staples, geotextile pins, or wooden stakes.
- Seed and fill turf reinforcement matting with soil, if specified.

Soil Filling (if specified for turf reinforcement mat (TRM))

Installation should be in accordance with the manufacturer's recommendations. Typical installation guidelines are as follows:

- After seeding, spread and lightly rake ½-3/4 inches of fine topsoil into the TRM apertures to completely fill TRM thickness. Use backside of rake or other flat implement.
- Alternatively, if allowed by product specifications, spread topsoil using lightweight loader, backhoe, or other power equipment. Avoid sharp turns with equipment.
- Always consult the manufacturer's recommendations for installation.
- Do not drive tracked or heavy equipment over mat.
- Avoid any traffic over matting if loose or wet soil conditions exist.
- Use shovels, rakes, or brooms for fine grading and touch up.
- Smooth out soil filling just exposing top netting of mat.

Temporary Soil Stabilization Removal

- Temporary soil stabilization removed from the site of the work must be disposed of if necessary.

Costs

Installed costs can be relatively high compared to other BMPs. Approximate costs for installed materials are shown below:

Rolled Erosion Control Products		Installed Cost per Acre
Biodegradable	Jute Mesh	$7,700-$9,000
	Curled Wood Fiber	$10,200-$13,400
	Straw	$10,200-$13,400
	Wood Fiber	$10,200-$13,400
	Coconut Fiber	$16,600-$18,000
	Coconut Fiber Mesh	$38,400-$42,200
	Straw Coconut Fiber	$12,800-$15,400
Non-Biodegradable	Plastic Netting	$2,600-$2,800
	Plastic Mesh	$3,800-$4,500
	Synthetic Fiber with Netting	$43,500-$51,200
	Bonded Synthetic Fibers	$57,600-$70,400
	Combination with Biodegradable	$38,400-$46,100

Source: Cost information received from individual product manufacturers solicited by Geosyntec Consultants (2004). Adjusted for inflation (2016 dollars) by Tetra Tech, Inc.

Inspection and Maintenance

- RECPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Areas where erosion is evident shall be repaired and BMPs reapplied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require reapplication of BMPs.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.
- Make sure matting is uniformly in contact with the soil.
- Check that all the lap joints are secure.
- Check that staples are flush with the ground.

References

CGP Review #2, State Water Resources Control Board, 2014. Available online at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/training/cgp_review_issue2.pdf.

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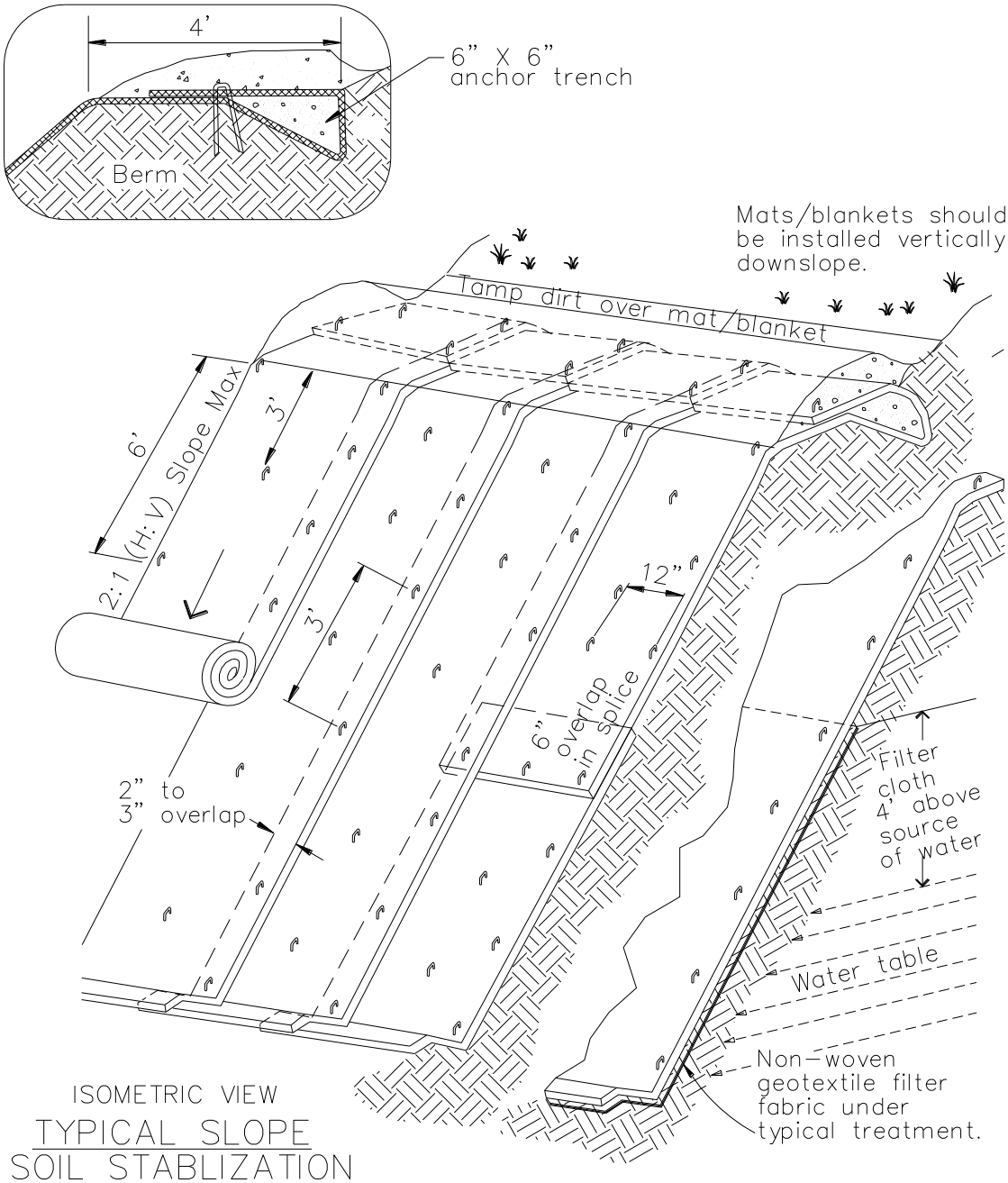


ISOMETRIC VIEW

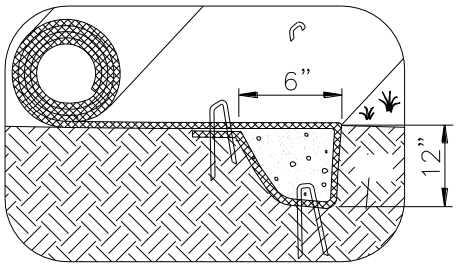
TYPICAL SLOPE
SOIL STABLIZATION
NTS

WET SLOPE LINING
NTS

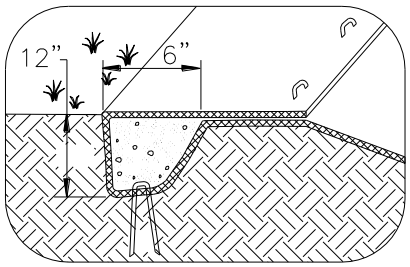
NOTES:

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

TYPICAL INSTALLATION DETAIL



INITIAL CHANNEL ANCHOR TRENCH
NTS



TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH
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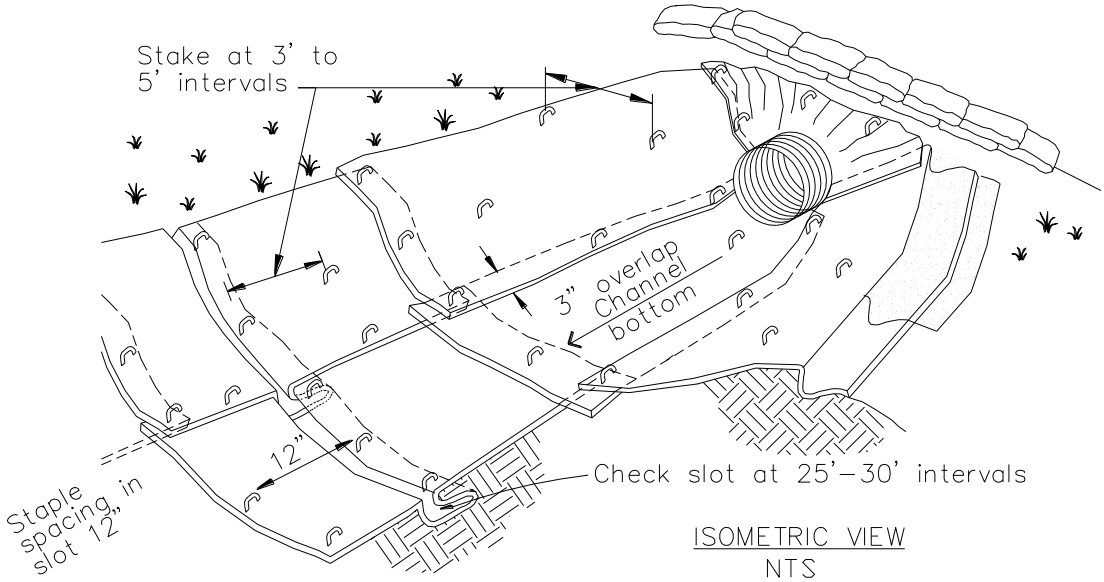
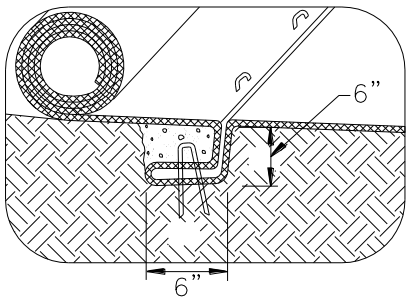
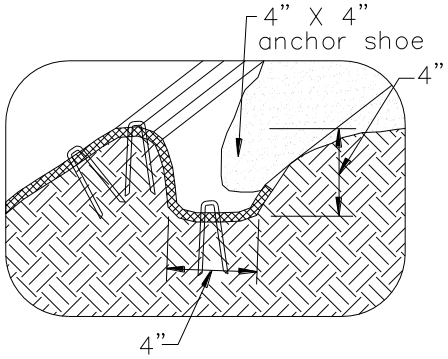


ISOMETRIC VIEW
NTS



INTERMITTENT CHECK SLOT
NTS

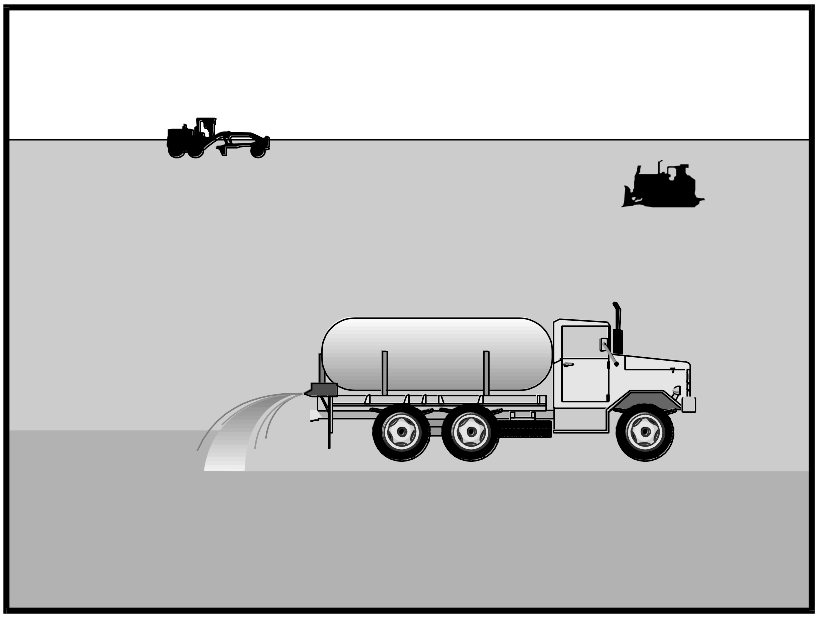


LONGITUDINAL ANCHOR TRENCH
NTS

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

TYPICAL INSTALLATION DETAIL

Wind Erosion Control WE-1



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	☑
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-5 Soil Binders

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Description and Purpose

Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

California's Mediterranean climate, with a short "wet" season and a typically long, hot "dry" season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking, and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water-based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

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- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period (generally less than a few hours) and should be applied daily (or more often) to be effective.
- Over watering may cause erosion and track-out.
- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Chemical dust suppression agents may have potential environmental impacts. Selected chemical dust control agents should be environmentally benign.
- Effectiveness of controls depends on soil, temperature, humidity, wind velocity and traffic.
- Chemical dust suppression agents should not be used within 100 feet of wetlands or water bodies.
- Chemically treated subgrades may make the soil water repellant, 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.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.
- If the soil surface has minimal natural moisture, the affected area may need to be pre-wetted so that chemical dust control agents can uniformly penetrate the soil surface.

Implementation

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table presents dust control practices that can be applied to varying site conditions that could potentially cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel 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 can be employed for areas of occasional or no construction traffic. Preventive measures include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph or less, and controlling the number and activity of vehicles on a site at any given time.

Chemical dust suppressants include: mulch and fiber based dust palliatives (e.g. paper mulch with gypsum binder), salts and brines (e.g. calcium chloride, magnesium chloride), non-petroleum based organics (e.g. vegetable oil, lignosulfonate), petroleum based organics (e.g. asphalt emulsion, dust oils, petroleum resins), synthetic polymers (e.g. polyvinyl acetate, vinyl, acrylic), clay additives (e.g. bentonite, montmorillonite) and electrochemical products (e.g. enzymes, ionic products).

Site Condition	Dust Control Practices							
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt	Temporary Gravel Construction Entrances/Equipment Wash Down	Synthetic Covers	Minimize Extent of Disturbed Area
Disturbed Areas not Subject to Traffic	X	X	X	X	X			X
Disturbed Areas Subject to Traffic			X	X	X	X		X
Material Stockpiles		X	X	X			X	X
Demolition			X			X	X	
Clearing/ Excavation			X	X				X
Truck Traffic on Unpaved Roads			X	X	X	X	X	
Tracking					X	X		

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (see EC-1, Scheduling).
- Quickly treat exposed soils using water, mulching, chemical dust suppressants, or stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Restrict construction traffic to stabilized roadways within the project site, as practicable.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.
- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality

Control Board (RWQCB) requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER - DO NOT DRINK."

- Pave 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 rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and wheel wash areas.
- Stabilize inactive areas of construction sites using temporary vegetation or chemical stabilization methods.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater and should meet all applicable regulatory requirements.

Costs

Installation costs for water and chemical dust suppression vary based on the method used and the length of effectiveness. Annual costs may be high since some of these measures are effective for only a few hours to a few days.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Check areas protected to ensure coverage.
- Most water-based dust control measures require frequent application, often daily or even multiple times per day. Obtain vendor or independent information on longevity of chemical dust suppressants.

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, updated annually.

Construction Manual, Chapter 4, Section 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative", California Department of Transportation (Caltrans), July 2001.

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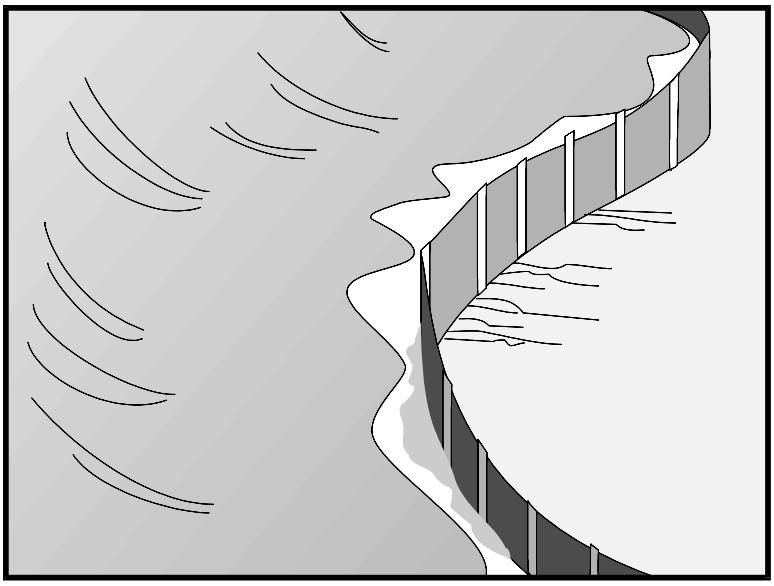
Silt Fence SE-1



Categories		
EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains water, promoting sedimentation of coarse sediment behind the fence. Silt fence does not retain soil fine particles like clays or silts.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (Storm Drain Inlet Protection, SE-10). Silt fences should not be used in locations where the flow is concentrated. Silt fences should always be used in combination with erosion controls. Suitable applications include:

- At perimeter of a project (although they should not be installed up and down slopes).
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.

Targeted Constituents	
Sediment (coarse sediment)	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm SE-12 Manufactured Linear Sediment Controls

SE-13 Compost Socks and Berms

SE-14 Biofilter Bags

- Around inlets.
- Below other small cleared areas.

Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.
- Do not use in locations where ponded water may cause a flooding hazard.
- Do not use silt fence to divert water flows or place across any contour line.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.
- Must be trenched and keyed in.
- According to the State Water Board's *CGP Review, Issue #2* (2014), silt fences reinforced with metal or plastic mesh should be avoided due to plastic pollution and wildlife concerns.
- Not intended for use as a substitute for Fiber Rolls (SE-5), when fiber rolls are being used as a slope interruption device.
- Do not use on slopes subject to creeping, slumping, or landslides.

Implementation

General

A silt fence is a temporary sediment barrier consisting of woven geotextile stretched across and attached to supporting posts, trenched-in, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap coarse sediment by intercepting and detaining sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

The following layout and installation guidance can improve performance and should be followed:

- Silt fence should be used in combination with erosion controls up-slope in order to provide the most effective sediment control.
- Silt fence alone is not effective at reducing turbidity. (Barrett and Malina, 2004)
- Designers should consider diverting sediment laden water to a temporary sediment basin or trap. (EPA, 2012)
- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 ft. at any point along the silt fence.

- 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 ft.^{2} of ponding area should be provided for every acre draining to the fence.
- Efficiency of silt fences is primarily dependent on the detention time of the runoff behind the control. (Barrett and Malina, 2004)
- The drainage area above any fence should not exceed a quarter of an acre. (Rule of Thumb-100-feet of silt fence per 10,000 ft.^{2} of disturbed area.) (EPA, 2012)
- The maximum length of slope draining to any point along the silt fence should be 100 ft. per ft of silt fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.
- Silt fences should remain in place until the disturbed area draining to the silt fence is permanently stabilized, after which, the silt fence fabric and posts should be removed and properly disposed.
- J-hooks, which have ends turning up the slope to break up long runs of fence and provide multiple storage areas that work like mini-retention areas, may be used to increase the effectiveness of silt fence.
- Be aware of local regulations regarding the type and installation requirements of silt fence, which may differ from those presented in this fact sheet.

Design and Layout

In areas where high winds are anticipated the fence should be supported by a plastic or wire mesh. The geotextile fabric of the silt fence should contain ultraviolet inhibitors and stabilizers to provide longevity equivalent to the project life or replacement schedule.

- Layout in accordance with the attached figures.
- For slopes that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to protect silt fence from rocks (e.g., rockfall netting) ensure the integrity of the silt fence installation.

Standard vs. Heavy Duty Silt Fence

Standard Silt Fence

- Generally applicable in cases where the area draining to fence produces moderate sediment loads.

Heavy Duty Silt Fence

- Heavy duty silt fence usually has 1 or more of the following characteristics, not possessed by standard silt fence.
  - Fabric is reinforced with wire backing or additional support.
  - Posts are spaced closer than pre-manufactured, standard silt fence products.
- Use is generally limited to areas affected by high winds.
- Area draining to fence produces moderate sediment loads.

Materials

Standard Silt Fence

- Silt fence material should be woven geotextile with a minimum width of 36 in. The fabric should conform to the requirements in ASTM designation D6461.

- Wooden stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15-gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.

Heavy-Duty Silt Fence

- Some silt fence has a wire backing to provide additional support, and there are products that may use prefabricated plastic holders for the silt fence and use metal posts instead of wood stakes.

Installation Guidelines – Traditional Method

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of the proposed silt fence (trenches should not be excavated wider or deeper than necessary for proper silt fence installation).

- Bottom of the silt fence should be keyed-in a minimum of 12 in.

- Posts should be spaced a maximum of 6 ft. apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.

- When standard strength geotextile is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy–duty wire staples at least 1 in. long. The mesh should extend into the trench.

- When extra-strength geotextile and closer post spacing are used, the mesh support fence may be eliminated.
- Woven geotextile should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, geotextile should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.
- The trench should be backfilled with native material and compacted.
- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.
- Cross barriers should be a minimum of 1/3 and a maximum of ½ the height of the linear barrier.
- See typical installation details at the end of this fact sheet.

Installation Guidelines - Static Slicing Method

- Static Slicing is defined as insertion of a narrow blade pulled behind a tractor, similar to a plow blade, at least 10 in. into the soil while at the same time pulling silt geotextile fabric into the ground through the opening created by the blade to the depth of the blade. Once the geotextile is installed, the soil is compacted using tractor tires.
- This method will not work with pre-fabricated, wire backed silt fence.
- Benefits:
    - Ease of installation (most often done with a 2-person crew).
    - Minimal soil disturbance.
    - Better level of compaction along fence, less susceptible to undercutting
    - Uniform installation.
- Limitations:
    - Does not work in shallow or rocky soils.
    - Complete removal of geotextile material after use is difficult.
    - Be cautious when digging near potential underground utilities.

Costs

- It should be noted that costs vary greatly across regions due to available supplies and labor costs.
- Average annual cost for installation using the traditional silt fence installation method (assumes 6 month useful life) is $7 per linear foot based on vendor research. Range of cost is $3.50 - $9.10 per linear foot.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair undercut silt fences.
- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches 1/3 of the barrier height.
- Silt fences should be left in place until the upgradient area is permanently stabilized. Until then, the silt fence should be inspected and maintained regularly.

- Remove silt fence when upgradient areas are stabilized. Fill and compact post holes and anchor trench, remove sediment accumulation, grade fence alignment to blend with adjacent ground, and stabilize disturbed area.

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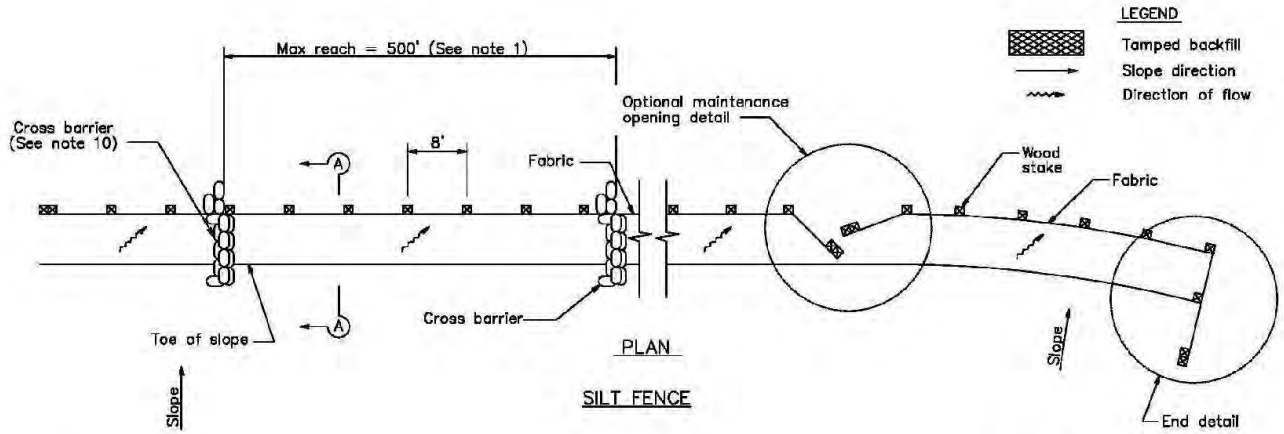
Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

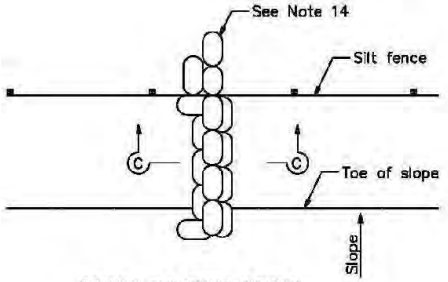


PLAN

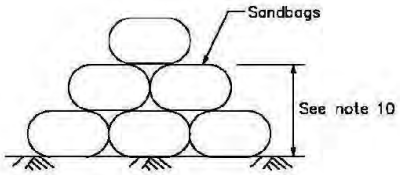
SILT FENCE

NOTES

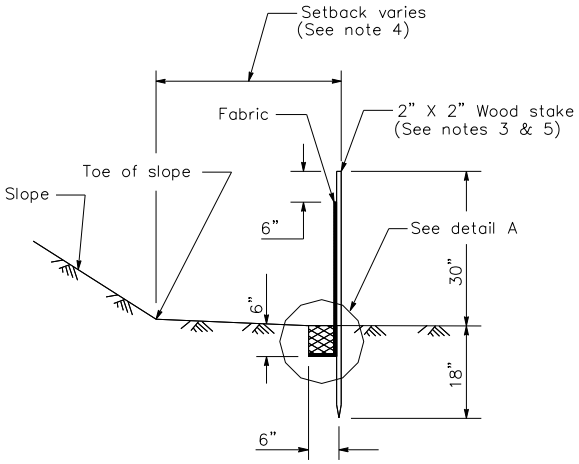
1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. The last 8'–0" of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'–0" maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow–through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
9. Minimum 4 staples per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.
14. Add 3–4 bags to cross barrier on downgradient side of silt fence as needed to prevent bypass or undermining and as allowable based on site limits of disturbance.



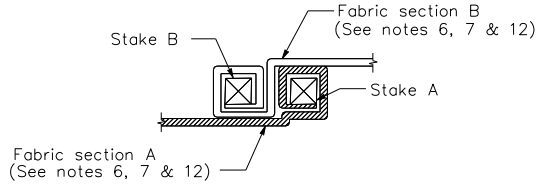
CROSS BARRIER DETAIL



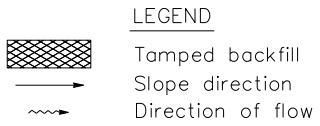
SECTION C–C

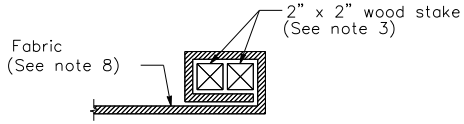


SECTION A–A

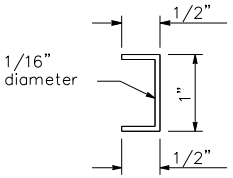


JOINING SECTION DETAIL (TOP VIEW)

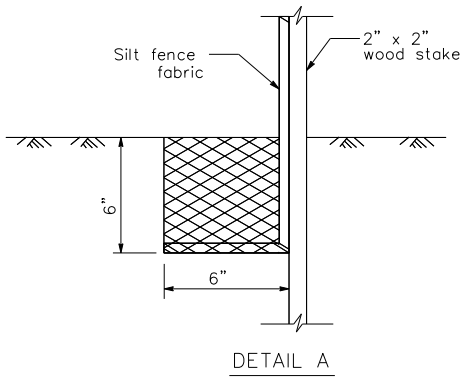




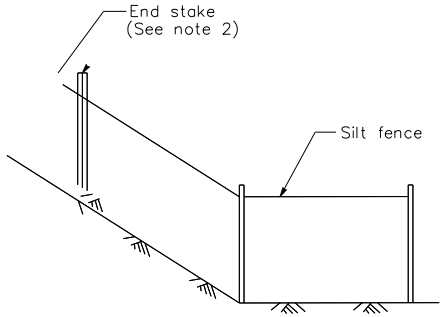
END STAKE DETAIL (TOP VIEW)



STAPLE DETAIL
(SEE NOTE 9)



DETAIL A



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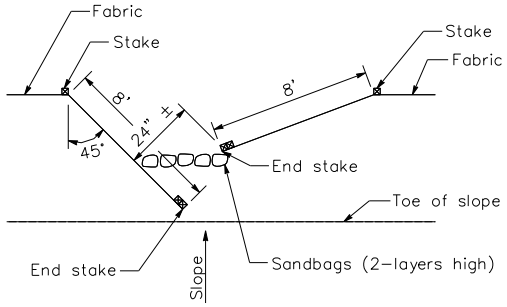
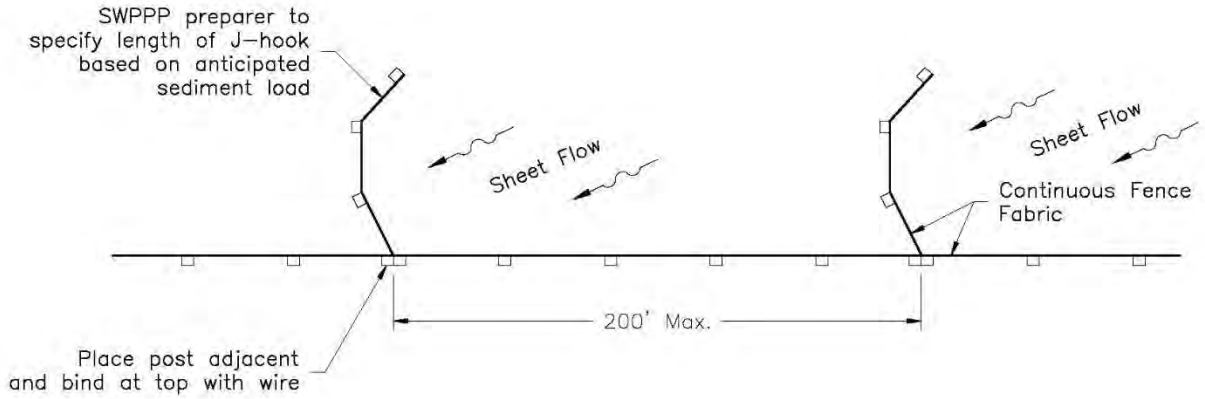


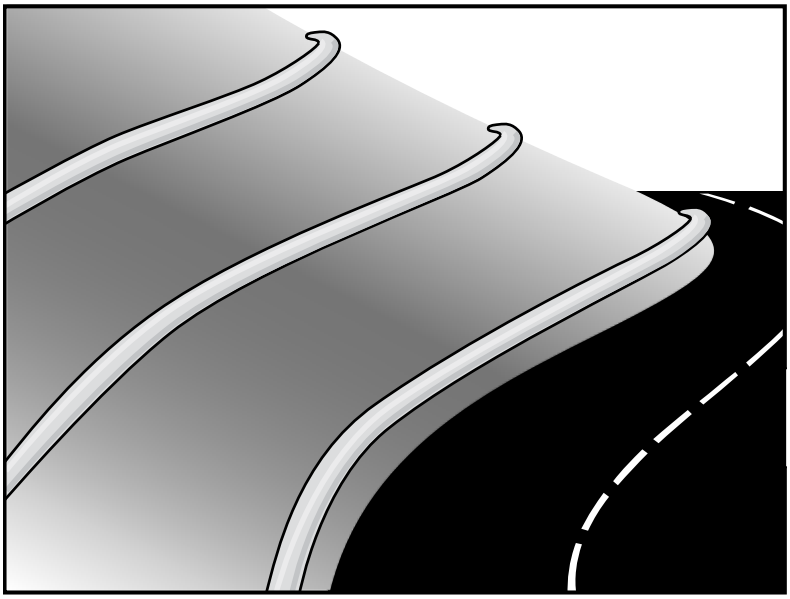
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)


SWPPP preparer to specify length of J–hook based on anticipated sediment load
Sheet Flow
Sheet Flow
Continuous Fence Fabric
200' Max.
Place post adjacent and bind at top with wire

Plan

J–HOOK

Fiber Rolls SE-5



Description and Purpose

A fiber roll (also known as wattles or logs) consists of straw, coir, curled wood fiber, or other biodegradable materials bound into a tight tubular roll wrapped by plastic netting, which can be photodegradable, or natural fiber, such as jute, cotton, or sisal. Additionally, gravel core fiber rolls are available, which contain an imbedded ballast material such as gravel or sand for additional weight when staking the rolls are not feasible (such as use as inlet protection). When fiber rolls are placed at the toe and on the face of slopes along the contours, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff (through sedimentation). By interrupting the length of a slope, fiber rolls can also reduce sheet and rill erosion until vegetation is established.

Suitable Applications

Fiber rolls may be suitable:

- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- At the end of a downward slope where it transitions to a steeper slope.
- Along the perimeter of a project.
- As check dams in unlined ditches with minimal grade.
- Down-slope of exposed soil areas.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-12 Manufactured Linear Sediment Controls

SE-14 Biofilter Bags

- At operational storm drains as a form of inlet protection.
- Around temporary stockpiles.

Limitations

- Fiber rolls should be used in conjunction with erosion control, such as hydroseed, RECPs, etc.
- Only biodegradable fiber rolls containing no plastic can remain on a site applying for a Notice of Termination due to plastic pollution and wildlife concerns (State Water Board, 2016). Fiber rolls containing plastic that are used on a site must be disposed of for final stabilization.
- Fiber rolls are not effective unless trenched in and staked. If not properly staked and trenched in, fiber rolls will not work as intended and could be transported by high flows.
- Not intended for use in high flow situations (i.e., for concentrated flows).
- Difficult to move once saturated.
- Fiber rolls have a limited sediment capture zone.
- Fiber rolls should not be used on slopes subject to creep, slumping, or landslide.
- Rolls typically function for 12-24 months, depending upon local conditions and roll material.

Implementation

Fiber Roll Materials

- Fiber rolls should be prefabricated.
- Fiber rolls may come manufactured containing polyacrylamide (PAM), a flocculating agent within the roll. Fiber rolls impregnated with PAM provide additional sediment removal capabilities and should be used in areas with fine, clayey or silty soils to provide additional sediment removal capabilities. Monitoring may be required for these installations.
- Fiber rolls are made from weed-free rice straw, flax, curled wood fiber, or coir bound into a tight tubular roll by netting or natural fiber (see *Limitations* above regarding plastic netting).
- Typical fiber rolls vary in diameter from 6 in. to 20 in. Larger diameter rolls are available as well. The larger the roll, the higher the sediment retention capacity.
- Typical fiber rolls lengths are 4, 10, 20 and 25 ft., although other lengths are likely available.

Installation

- Locate fiber rolls on level contours spaced as follows:
  - Slope inclination of 4:1 (H:V) or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.

  - Slope inclination between 4:1 and 2:1 (H:V): Fiber Rolls should be placed at a maximum interval of 15 ft. (a closer spacing is more effective).

  - Slope inclination 2:1 (H:V) or greater: Fiber Rolls should be placed at a maximum interval of 10 ft. (a closer spacing is more effective).

- Prepare the slope before beginning installation.

- Dig small trenches across the slope on the contour. The trench depth should be ¼ to 1/3 of the thickness of the roll, and the width should equal the roll diameter, in order to provide area to backfill the trench.

- It is critical that rolls are installed perpendicular to water movement, and parallel to the slope contour.

- Start building trenches and installing rolls from the bottom of the slope and work up.

- It is recommended that pilot holes be driven through the fiber roll. Use a straight bar to drive holes through the roll and into the soil for the wooden stakes.

- Turn the ends of the fiber roll up slope to prevent runoff from going around the roll.

- Stake fiber rolls into the trench.

  - Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center.

  - Use wood stakes with a nominal classification of 0.75 by 0.75 in. and minimum length of 24 in.

- If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.

- See typical fiber roll installation details at the end of this fact sheet.

Removal

- Fiber rolls can be left in place or removed depending on the type of fiber roll and application (temporary vs. permanent installation). Fiber rolls encased with plastic netting or containing any plastic material will need to be removed from the site for final stabilization. Fiber rolls used in a permanent application are to be encased with a non-plastic material and are left in place. Removal of a fiber roll used in a permanent application can result in greater disturbance; therefore, during the BMP planning phase, the areas where fiber rolls will be used on final slopes, only fiber rolls wrapped in non-plastic material should be selected.

- Temporary installations should only be removed when up gradient areas are stabilized per General Permit requirements, and/or pollutant sources no longer present a hazard. But they should also be removed before vegetation becomes too mature so that the removal process does not disturb more soil and vegetation than is necessary.

Costs

Material costs for straw fiber rolls range from $26 - $38 per 25-ft. roll[1] and curled wood fiber rolls range from $30 - $40 per roll[2].

Material costs for PAM impregnated fiber rolls range between $9.00-$12.00 per linear foot, based upon vendor research[1] .

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair or replace split, torn, unraveling, or slumping fiber rolls.
- If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when sediment accumulation reaches one-third the designated sediment storage depth.
- If fiber rolls are used for erosion control, such as in a check dam, sediment removal should not be required as long as the system continues to control the grade. Sediment control BMPs will likely be required in conjunction with this type of application.
- Repair any rills or gullies promptly.

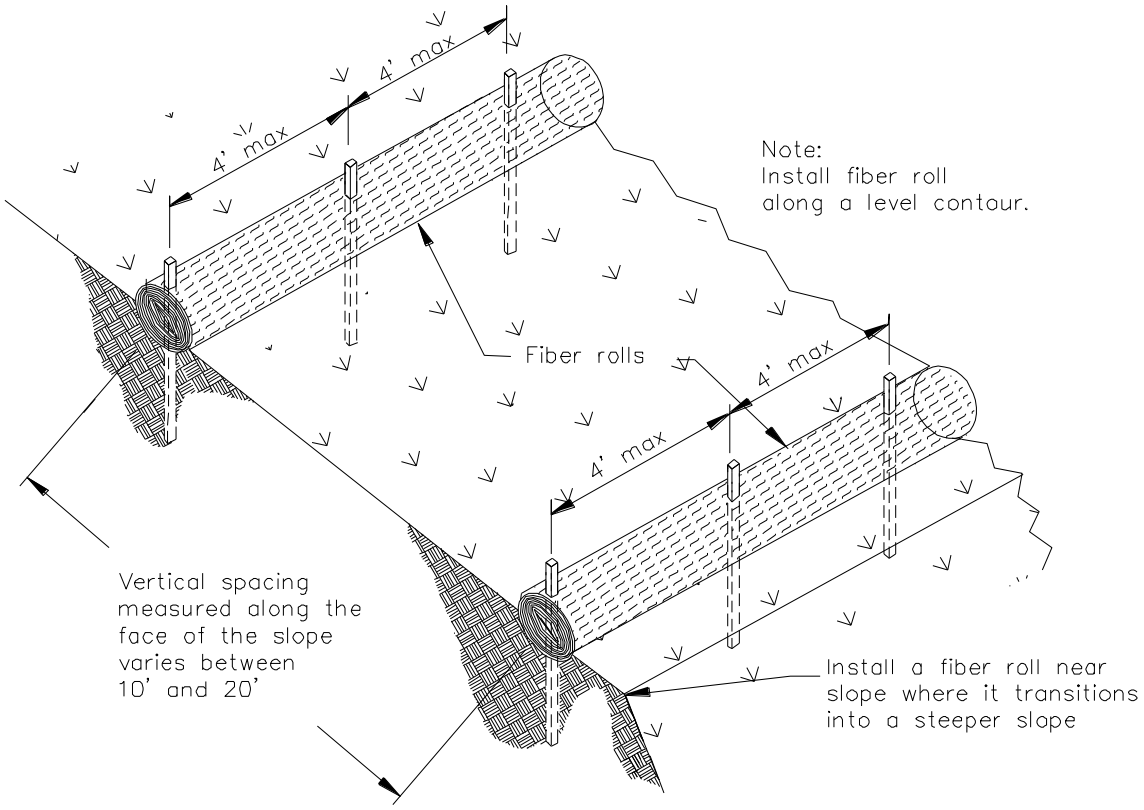
References

General Construction – Frequently Asked Questions, Storm Water Program website, State Water Resources Control Board, 2009 updated in 2016. Available online at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/gen_const_faq.shtml.

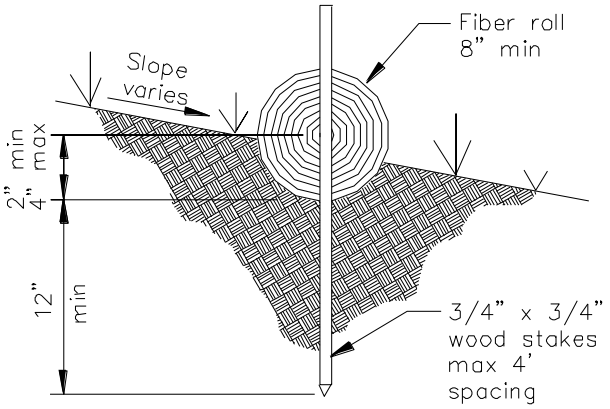
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

[1] Adjusted for inflation (2016 dollars) by Tetra Tech, Inc.
[2] Costs estimated based on vendor query by Tetra Tech, Inc. 2016.



TYPICAL FIBER ROLL INSTALLATION
N.T.S.



ENTRENCHMENT DETAIL
N.T.S.

Street Sweeping and Vacuuming SE-7

Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

- Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).
- Sweeping may be less effective for fine particle soils (i.e., clay).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused and perhaps save money.
- Inspect potential sediment tracking locations daily.

- Visible sediment tracking should be swept or vacuumed on a daily basis.
- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.
- If not mixed with debris or trash, consider incorporating the removed sediment back into the project

Costs

Rental rates for self-propelled sweepers vary depending on hopper size and duration of rental. Expect rental rates from $ 650/day to $2,500/day[1], plus operator costs. Hourly production rates vary with the amount of area to be swept and amount of sediment. Match the hopper size to the area and expect sediment load to minimize time spent dumping.

Inspection and Maintenance

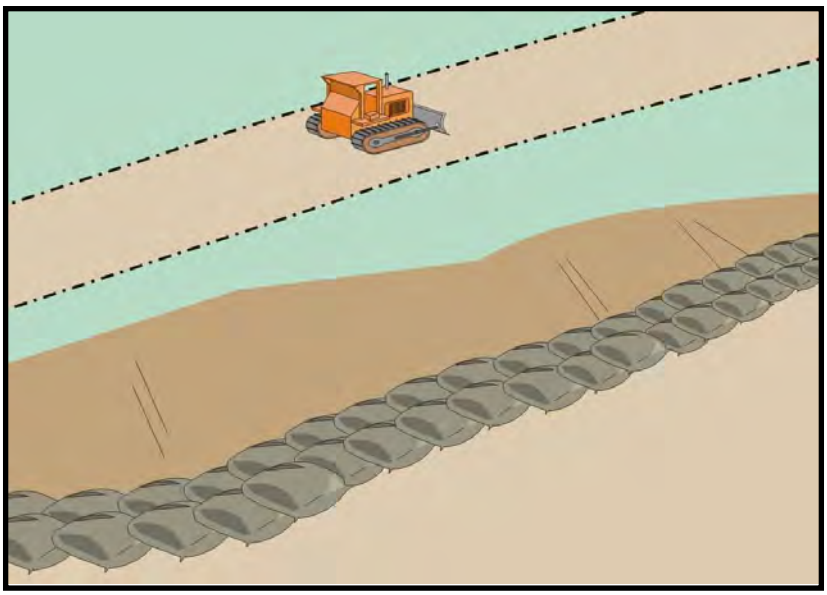
- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- When actively in use, points of ingress and egress must be inspected daily.
- When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. More frequent removal, even continuous removal, may be required in some jurisdictions.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

[1] Based on contractor query conducted by Tetra Tech, Inc. November 2016.

Sandbag Barrier SE-8



Categories		
EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

A sandbag barrier is a series of sand-filled bags placed on a level contour to intercept or to divert sheet flows. Sandbag barriers placed on a level contour pond sheet flow runoff, allowing sediment to settle out.

Suitable Applications

Sandbag barriers may be a suitable control measure for the applications described below. It is important to consider that sand bags are less porous than gravel bags and ponding or flooding can occur behind the barrier. Also, sand is easily transported by runoff if bags are damaged or ruptured. The SWPPP Preparer should select the location of a sandbag barrier with respect to the potential for flooding, damage, and the ability to maintain the BMP.

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes.
  - As sediment traps at culvert/pipe outlets.
  - Below other small cleared areas.
  - Along the perimeter of a site.
  - Down slope of exposed soil areas.
  - Around temporary stockpiles and spoil areas.
  - Parallel to a roadway to keep sediment off paved areas.
  - Along streams and channels.

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-12 Manufactured Linear Sediment Controls

SE-14 Biofilter Bags

- As linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
  - At the top of slopes to divert runoff away from disturbed slopes.
  - As check dams across mildly sloped construction roads.

Limitations

- It is necessary to limit the drainage area upstream of the barrier to 5 acres.
- Sandbags are not intended to be used as filtration devices.
- Easily damaged by construction equipment.
- Degraded sandbags may rupture when removed, spilling sand.
- Installation can be labor intensive.
- Durability of sandbags is somewhat limited, and bags will need to be replaced when there are signs of damage or wear.
- Burlap should not be used for sandbags.

Implementation

General

A sandbag barrier consists of a row of sand-filled bags placed on a level contour. When appropriately placed, a sandbag barrier intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding allows sediment to settle. Sand-filled bags have limited porosity, which is further limited as the fine sand tends to quickly plug with sediment, limiting or completely blocking the rate of flow through the barrier. If a porous barrier is desired, consider SE-1, Silt Fence, SE-5, Fiber Rolls, SE-6, Gravel Bag Berms or SE-14, Biofilter Bags. Sandbag barriers also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets which erode rills, and ultimately gullies, into disturbed, sloped soils. Sandbag barriers are similar to gravel bag berms, but less porous. Generally, sandbag barriers should be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment control.

Design and Layout

- Locate sandbag barriers on a level contour.
- When used for slope interruption, the following slope/sheet flow length combinations apply:
  - Slope inclination of 4:1 (H:V) or flatter: Sandbags should be placed at a maximum interval of 20 ft, with the first row near the slope toe.
  - Slope inclination between 4:1 and 2:1 (H:V): Sandbags should be placed at a maximum interval of 15 ft. (a closer spacing is more effective), with the first row near the slope toe.

  - Slope inclination 2:1 (H:V) or greater: Sandbags should be placed at a maximum interval of 10 ft. (a closer spacing is more effective), with the first row near the slope toe.

- Turn the ends of the sandbag barrier up slope to prevent runoff from going around the barrier.
- Allow sufficient space up slope from the barrier to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, sand bag barriers should be set back from the slope toe to facilitate cleaning. Where specific site conditions do not allow for a set-back, the sand bag barrier may be constructed on the toe of the slope. To prevent flows behind the barrier, bags can be placed perpendicular to a berm to serve as cross barriers.
- Drainage area should not exceed 5 acres.
- Butt ends of bags tightly.
- Overlap butt joints of row beneath with each successive row.
- Use a pyramid approach when stacking bags.
- In non-traffic areas
  - Height = 18 in. maximum
  - Top width = 24 in. minimum for three or more-layer construction
  - Side slope = 2:1 (H:V) or flatter
- In construction traffic areas
  - Height = 12 in. maximum
  - Top width = 24 in. minimum for three or more-layer construction.
  - Side slopes = 2:1 (H:V) or flatter.
- See typical sandbag barrier installation details at the end of this fact sheet.

Materials

- ***Sandbag Material:*** Sandbag should be woven polypropylene, polyethylene or polyamide fabric, minimum unit weight of 4 ounces/yd^2, Mullen burst strength exceeding 300 lb/in^2 in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355. Use of burlap is not an acceptable substitute, as sand can more easily mobilize out of burlap.
- ***Sandbag Size:*** Each sand-filled bag should have a length of 18 in., width of 12 in., thickness of 3 in., and mass of approximately 33 lbs. Bag dimensions are nominal and may vary based on locally available materials.

- ***Fill Material:*** All sandbag fill material should be non-cohesive, Class 3 (Caltrans Standard Specification, Section 25) or similar permeable material free from clay and deleterious material, such as recycled concrete or asphalt.

Costs

Empty sandbags cost $0.25 - $0.75. Average cost of fill material is $8 per yd^3. Additional labor is required to fill the bags. Pre-filled sandbags are more expensive at $1.50 - $2.00 per bag. These costs are based upon vendor research.

Inspection and Maintenance

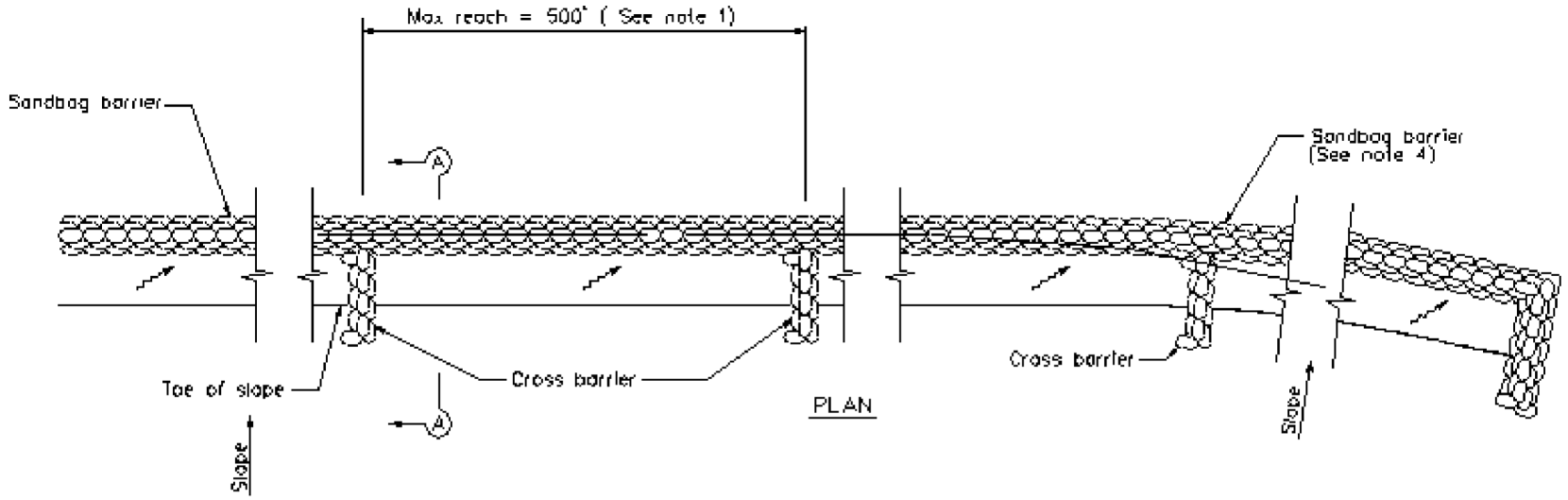
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Sandbags exposed to sunlight will need to be replaced every two to three months due to degradation of the bags.
- Reshape or replace sandbags as needed.
- Repair washouts or other damage as needed.
- Sediment that accumulates behind the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Remove sandbags when no longer needed and recycle sand fill whenever possible and properly dispose of bag material. Remove sediment accumulation, and clean, re-grade, and stabilize the area.

References

Standard Specifications for Construction of Local Streets and Roads, California Department of Transportation (Caltrans), July 2002.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

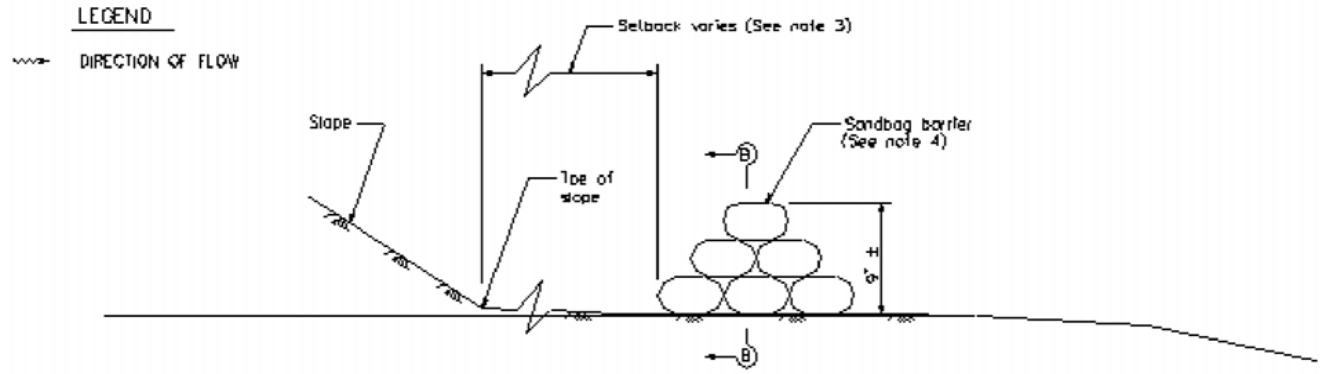
Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.



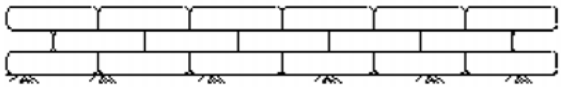
SANDBAG BARRIER

NOTES

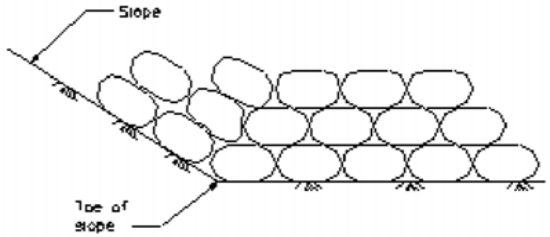
1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. Place sandbags tightly
3. Dimension may vary to fit field condition.
4. Sandbag barrier shall be a minimum of 3 bags high.
5. The end of the barrier shall be turned up slope.
6. Cross barriers shall be a min of 1/2 and a max of 2/3 the height of the linear barrier.
7. Sandbag rows and layers shall be staggered to eliminate gaps.



SECTION A–A



SECTION B–B



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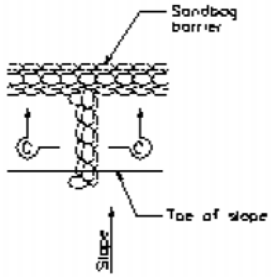
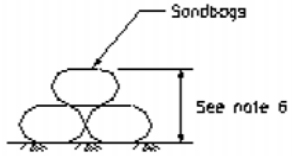
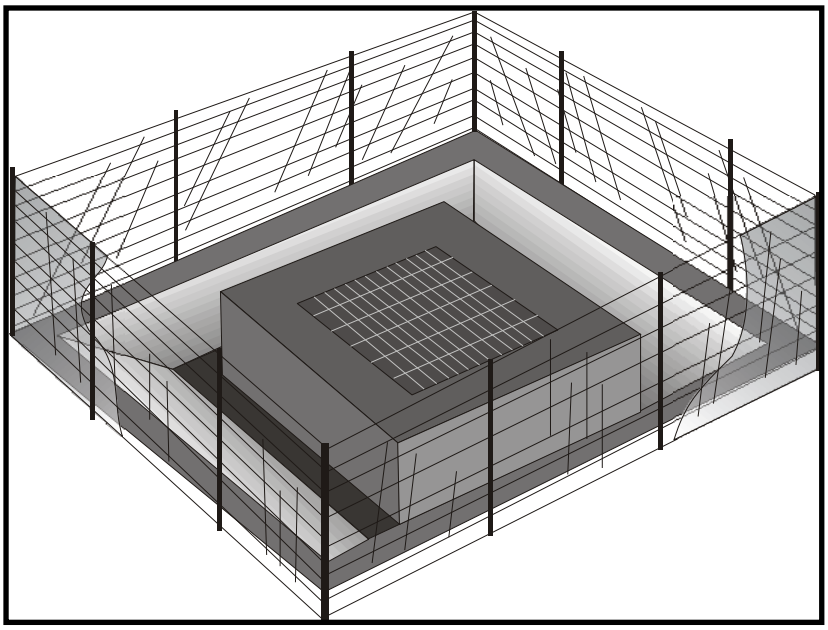


CROSS BARRIER DETAIL



SECTION C–C

Storm Drain Inlet Protection SE-10



Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☒
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-14 Biofilter Bags

SE-13 Compost Socks and Berms

Description and Purpose

Storm drain inlet protection consists of a sediment filter or an impounding area in, around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction. Temporary geotextile storm drain inserts attach underneath storm drain grates to capture and filter storm water.

Suitable Applications

- Every storm drain inlet receiving runoff from unstabilized or otherwise active work areas should be protected. Inlet protection should be used in conjunction with other erosion and sediment controls to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.

Limitations

- Drainage area should not exceed 1 acre.
- In general straw bales should not be used as inlet protection.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.
- Sediment removal may be inadequate to prevent sediment discharges in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are expected, use

other onsite sediment trapping techniques in conjunction with inlet protection.

- Frequent maintenance is required.
- Limit drainage area to 1 acre maximum. For drainage areas larger than 1 acre, runoff should be routed to a sediment-trapping device designed for larger flows. See BMPs SE-2, Sediment Basin, and SE-3, Sediment Traps.
- Excavated drop inlet sediment traps are appropriate where relatively heavy flows are expected, and overflow capability is needed.

Implementation

General

Inlet control measures presented in this handbook should not be used for inlets draining more than one acre. Runoff from larger disturbed areas should be first routed through SE-2, Sediment Basin or SE-3, Sediment Trap and/or used in conjunction with other drainage control, erosion control, and sediment control BMPs to protect the site. Different types of inlet protection are appropriate for different applications depending on site conditions and the type of inlet. Alternative methods are available in addition to the methods described/shown herein such as prefabricated inlet insert devices, or gutter protection devices.

Design and Layout

Identify existing and planned storm drain inlets that have the potential to receive sediment-laden surface runoff. Determine if storm drain inlet protection is needed and which method to use.

- The key to successful and safe use of storm drain inlet protection devices is to know where runoff that is directed toward the inlet to be protected will pond or be diverted as a result of installing the protection device.
  - Determine the acceptable location and extent of ponding in the vicinity of the drain inlet. The acceptable location and extent of ponding will influence the type and design of the storm drain inlet protection device.
  - Determine the extent of potential runoff diversion caused by the storm drain inlet protection device. Runoff ponded by inlet protection devices may flow around the device and towards the next downstream inlet. In some cases, this is acceptable; in other cases, serious erosion or downstream property damage can be caused by these diversions. The possibility of runoff diversions will influence whether or not storm drain inlet protection is suitable; and, if suitable, the type and design of the device.
- The location and extent of ponding, and the extent of diversion, can usually be controlled through appropriate placement of the inlet protection device. In some cases, moving the inlet protection device a short distance upstream of the actual inlet can provide more efficient sediment control, limit ponding to desired areas, and prevent or control diversions.
- Seven types of inlet protection are presented below. However, it is recognized that other effective methods and proprietary devices exist and may be selected.

- Silt Fence: Appropriate for drainage basins with less than a 5% slope, sheet flows, and flows under 0.5 cfs.

- Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment (SE-3).

- Gravel bag barrier: Used to create a small sediment trap upstream of inlets on sloped, paved streets. Appropriate for sheet flow or when concentrated flow may exceed 0.5 cfs, and where overtopping is required to prevent flooding.

- Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.

- Temporary Geotextile Storm drain Inserts: Different products provide different features. Refer to manufacturer details for targeted pollutants and additional features.

- Biofilter Bag Barrier: Used to create a small retention area upstream of inlets and can be located on pavement or soil. Biofilter bags slowly filter runoff allowing sediment to settle out. Appropriate for flows under 0.5 cfs.

- Compost Socks: Allow filtered run-off to pass through the compost while retaining sediment and potentially other pollutants (SE-13). Appropriate for flows under 1.0 cfs.

- Select the appropriate type of inlet protection and design as referred to or as described in this fact sheet.

- Provide area around the inlet for water to pond without flooding structures and property.

- Grates and spaces around all inlets should be sealed to prevent seepage of sediment-laden water.

- Excavate sediment sumps (where needed) 1 to 2 ft with 2:1 side slopes around the inlet.

Installation

- ***DI Protection Type 1 - Silt Fence -*** Similar to constructing a silt fence; see BMP SE-1, Silt Fence. Do not place fabric underneath the inlet grate since the collected sediment may fall into the drain inlet when the fabric is removed or replaced and water flow through the grate will be blocked resulting in flooding. See typical Type 1 installation details at the end of this fact sheet.

  1. Excavate a trench approximately 6 in. wide and 6 in. deep along the line of the silt fence inlet protection device.

  2. Place 2 in. by 2 in. wooden stakes around the perimeter of the inlet a maximum of 3 ft apart and drive them at least 18 in. into the ground or 12 in. below the bottom of the trench. The stakes should be at least 48 in.

  3. Lay fabric along bottom of trench, up side of trench, and then up stakes. See SE-1, Silt Fence, for details. The maximum silt fence height around the inlet is 24 in.

  4. Staple the filter fabric (for materials and specifications, see SE-1, Silt Fence) to wooden stakes. Use heavy-duty wire staples at least 1 in. in length.

5. Backfill the trench with gravel or compacted earth all the way around.

- ***DI Protection Type 2 - Excavated Drop Inlet Sediment Trap -*** Install filter fabric fence in accordance with DI Protection Type 1. Size excavated trap to provide a minimum storage capacity calculated at the rate 67 yd^3/acre of drainage area. See typical Type 2 installation details at the end of this fact sheet.

- ***DI Protection Type 3 - Gravel bag -*** Flow from a severe storm should not overtop the curb. In areas of high clay and silts, use filter fabric and gravel as additional filter media. Construct gravel bags in accordance with SE-6, Gravel Bag Berm. Gravel bags should be used due to their high permeability. See typical Type 3 installation details at the end of this fact sheet.

  1. Construct on gently sloping street.

  2. Leave room upstream of barrier for water to pond and sediment to settle.

  3. Place several layers of gravel bags – overlapping the bags and packing them tightly together.

  4. Leave gap of one bag on the top row to serve as a spillway. Flow from a severe storm (e.g., 10-year storm) should not overtop the curb.

- ***DI Protection Type 4 – Block and Gravel Filter -*** Block and gravel filters are suitable for curb inlets commonly used in residential, commercial, and industrial construction. See typical Type 4 installation details at the end of this fact sheet.

  1. Place hardware cloth or comparable wire mesh with 0.5 in. openings over the drop inlet so that the wire extends a minimum of 1 ft beyond each side of the inlet structure. If more than one strip is necessary, overlap the strips. Place woven geotextile over the wire mesh.

  2. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, so that the open ends face outward, not upward. The ends of adjacent blocks should abut. The height of the barrier can be varied, depending on design needs, by stacking combinations of blocks that are 4 in., 8 in., and 12 in. wide. The row of blocks should be at least 12 in. but no greater than 24 in. high.

  3. Place wire mesh over the outside vertical face (open end) of the concrete blocks to prevent stone from being washed through the blocks. Use hardware cloth or comparable wire mesh with 0.5 in. opening.

  4. Pile washed stone against the wire mesh to the top of the blocks. Use 0.75 to 3 in.

- ***DI Protection Type 5 – Temporary Geotextile Insert (proprietary) –*** Many types of temporary inserts are available. Most inserts fit underneath the grate of a drop inlet or inside of a curb inlet and are fastened to the outside of the grate or curb. These inserts are removable, and many can be cleaned and reused. Installation of these inserts differs between manufacturers. Please refer to manufacturer instruction for installation of proprietary devices.

- ***DI Protection Type 6 - Biofilter bags*** – Biofilter bags may be used as a substitute for gravel bags in low-flow situations. Biofilter bags should conform to specifications detailed in SE-14, Biofilter bags.

    1. Construct in a gently sloping area.
    2. Biofilter bags should be placed around inlets to intercept runoff flows.
    3. All bag joints should overlap by 6 in.
    4. Leave room upstream for water to pond and for sediment to settle out.
    5. Stake bags to the ground as described in the following detail. Stakes may be omitted if bags are placed on a paved surface.

- ***DI Protection Type 7 – Compost Socks*** – A compost sock can be assembled on site by filling a mesh sock (e.g., with a pneumatic blower). Compost socks do not require special trenching compared to other sediment control methods (e.g., silt fence). Compost socks should conform to specification detailed in SE-13, Compost Socks and Berms.

Costs

- Average annual cost for installation and maintenance of DI Type 1-4 and 6 (one-year useful life) is $200 per inlet.
- Temporary geotextile inserts are proprietary, and cost varies by region. These inserts can often be reused and may have greater than 1 year of use if maintained and kept undamaged. Average cost per insert ranges from $50-75 plus installation, but costs can exceed $100. This cost does not include maintenance.
- See SE-13 for Compost Sock cost information.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Silt Fences. If the fabric becomes clogged, torn, or degrades, it should be replaced. 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. At a minimum, remove the sediment behind the fabric fence when accumulation reaches one-third the height of the fence or barrier height.
- Gravel Filters. If the gravel becomes clogged with sediment, it should be carefully removed from the inlet and either cleaned or replaced. Since cleaning gravel at a construction site may be difficult, consider using the sediment-laden stone as fill material and put fresh stone around the inlet. Inspect bags for holes, gashes, and snags, and replace bags as needed. Check gravel bags for proper arrangement and displacement.

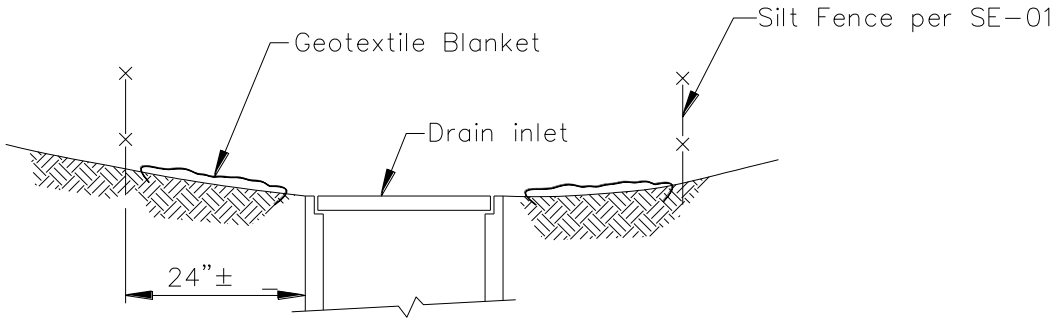
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Inspect and maintain temporary geotextile insert devices according to manufacturer's specifications.
- Remove storm drain inlet protection once the drainage area is stabilized.
    - Clean and regrade area around the inlet and clean the inside of the storm drain inlet, as it should be free of sediment and debris at the time of final inspection.

References

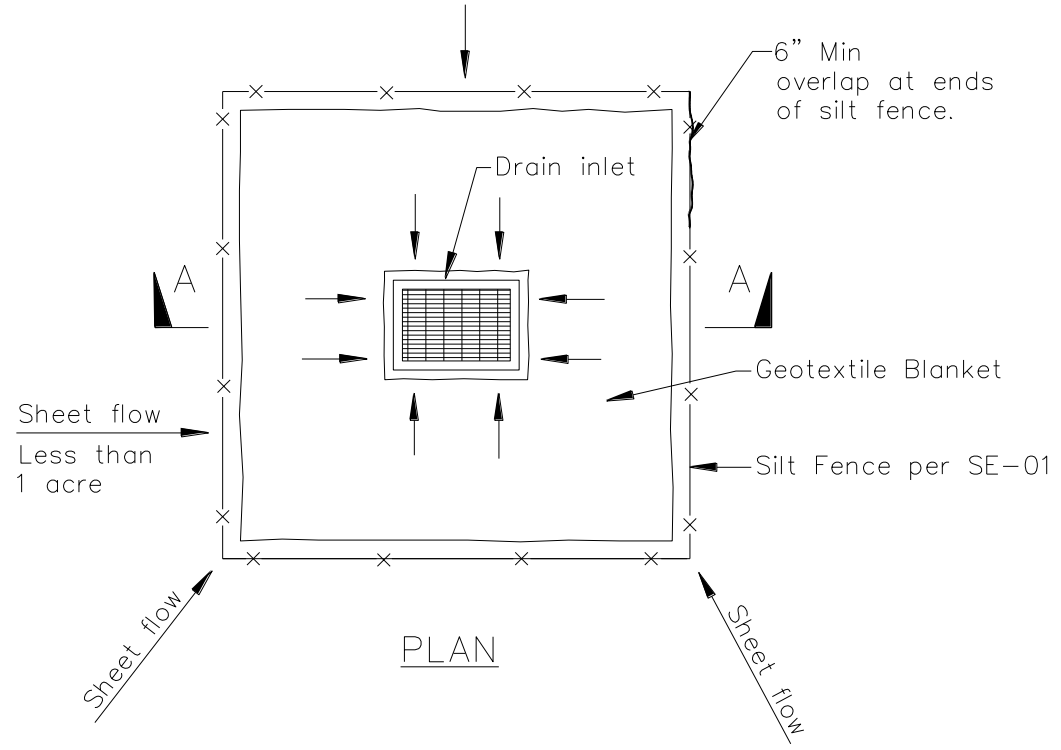
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.



SECTION A–A

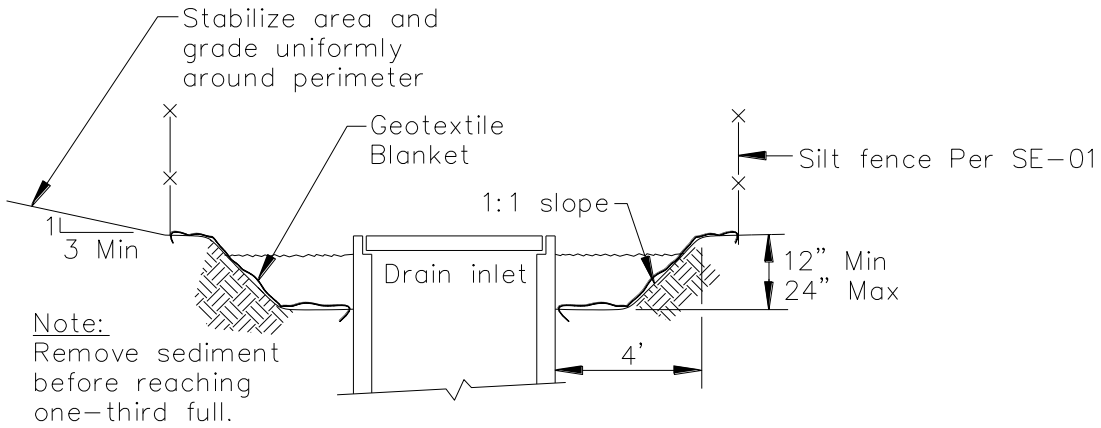


PLAN

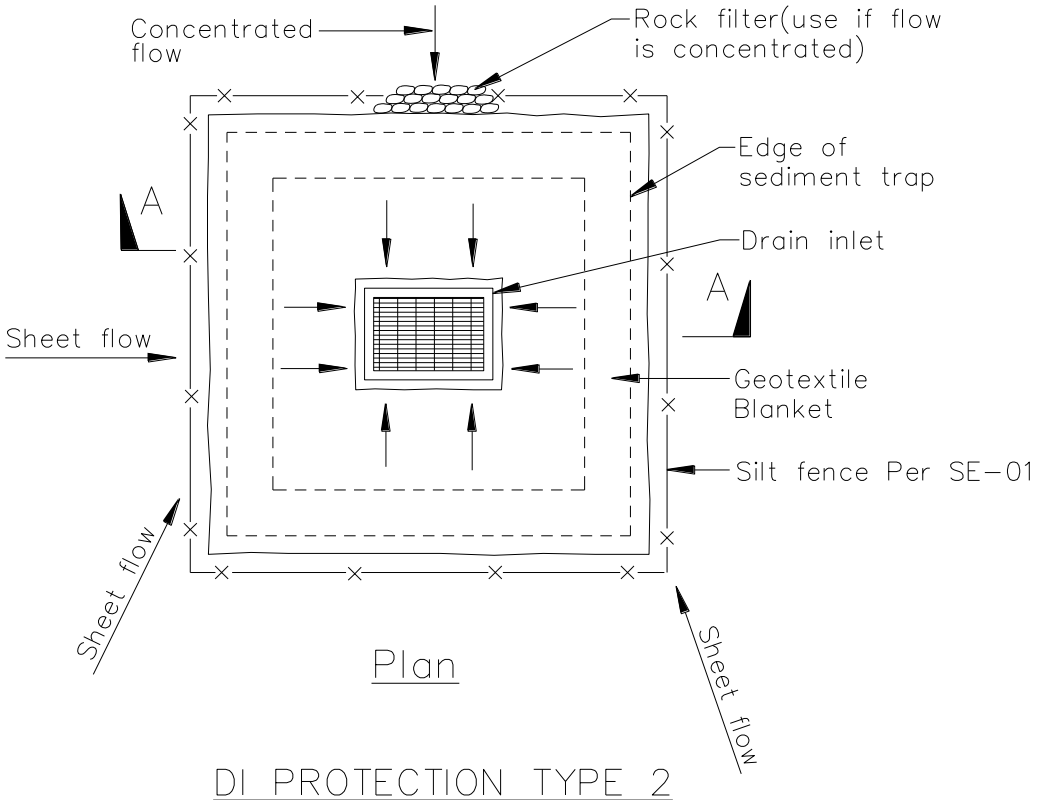
DI PROTECTION TYPE 1
NOT TO SCALE

NOTES:

1. For use in areas where grading has been completed and final soil stabilization and seeding are pending.
2. Not applicable in paved areas.
3. Not applicable with concentrated flows.



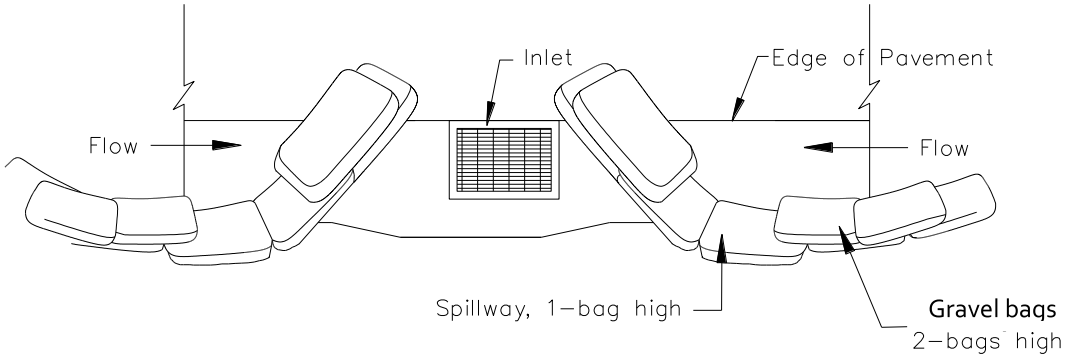
Section A–A



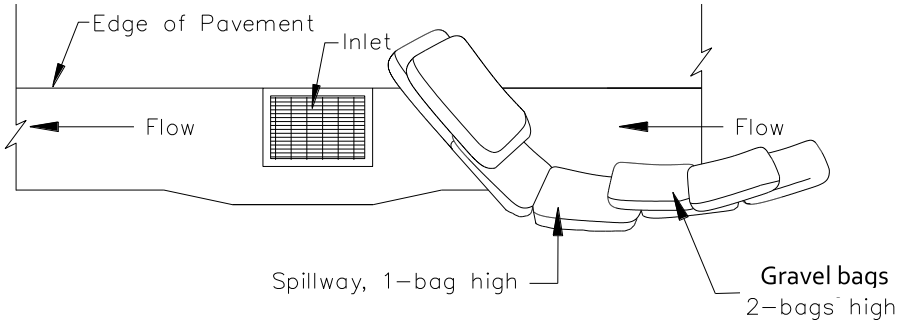
Plan

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.



TYPICAL PROTECTION FOR INLET ON SUMP

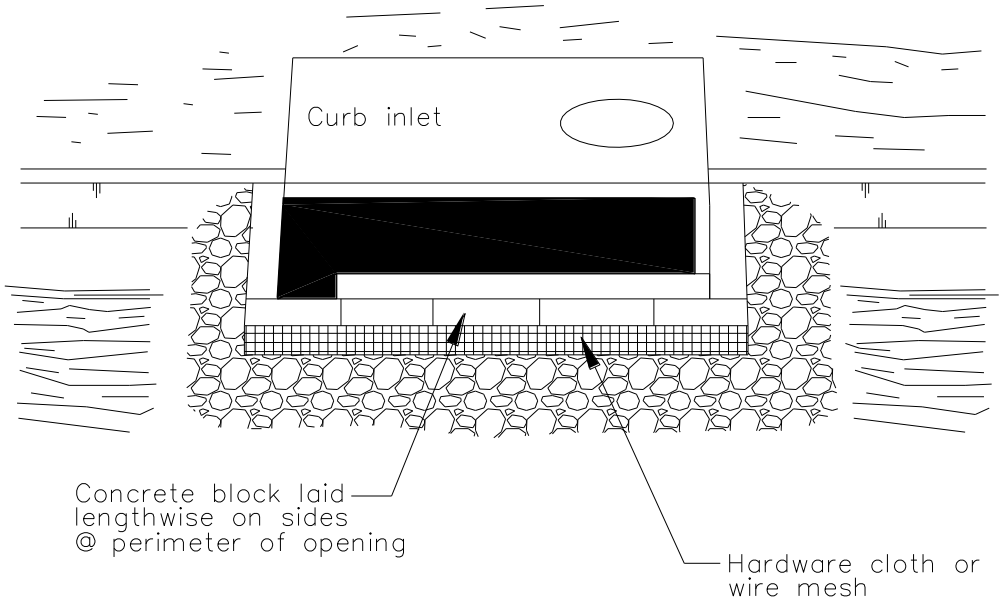


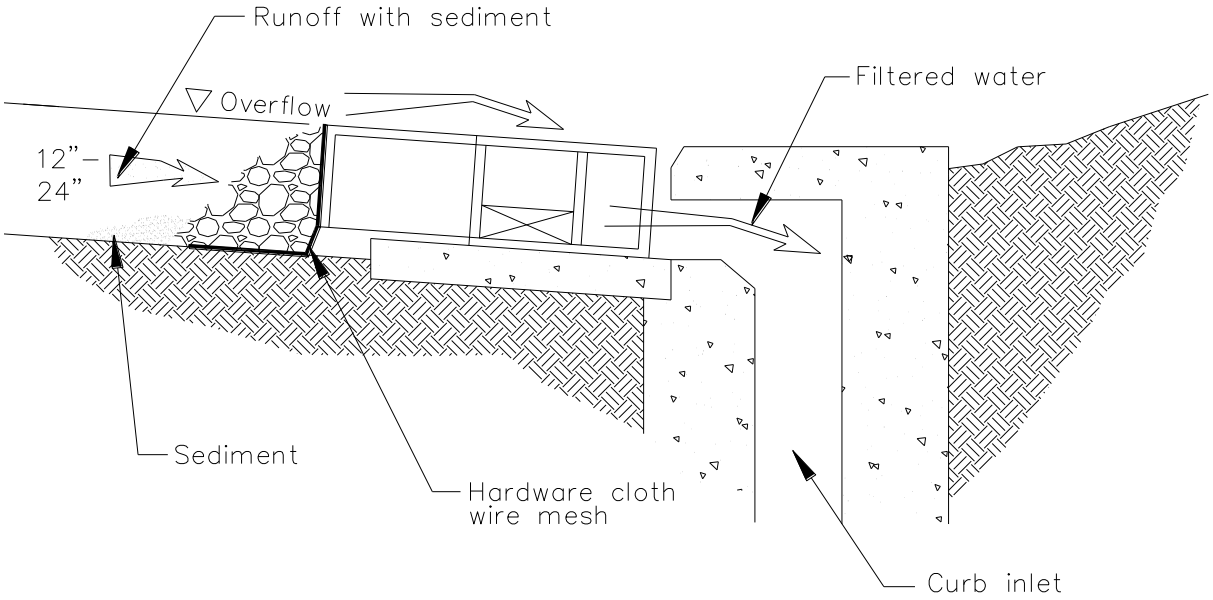
TYPICAL PROTECTION FOR INLET ON GRADE

NOTES:

1. Intended for short-term use.
2. Use to inhibit non-storm water flow.
3. Allow for proper maintenance and cleanup.
4. Bags must be removed after adjacent operation is completed
5. Not applicable in areas with high silts and clays without filter fabric.
6. Protection can be effective even if it is not immediately adjacent to the inlet provided that the inlet is protected from potential sources of pollution.

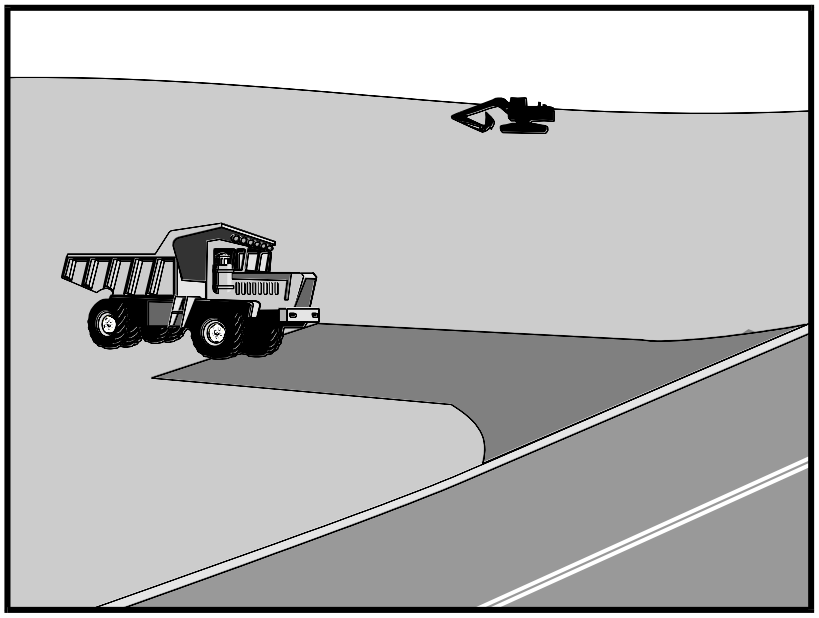
DI PROTECTION TYPE 3
NOT TO SCALE





DI PROTECTION – TYPE 4
NOT TO SCALE

Stabilized Construction Entrance/Exit TC-1



Description and Purpose

A stabilized construction access is defined by a 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.

Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

Categories

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Implementation

General

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

Design and Layout

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft or maximum site will allow, and 10 ft minimum width or to accommodate traffic.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- 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. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

Costs

Average annual cost for installation and maintenance may vary from $1,500 to $6,100 each, averaging $3,100 per entrance. Costs will increase with addition of washing rack and sediment trap. With wash rack, costs range from $1,500 - $7,700 each, averaging $4,600 per entrance (All costs adjusted for inflation, 2016 dollars, by Tetra Tech Inc.

References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

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

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

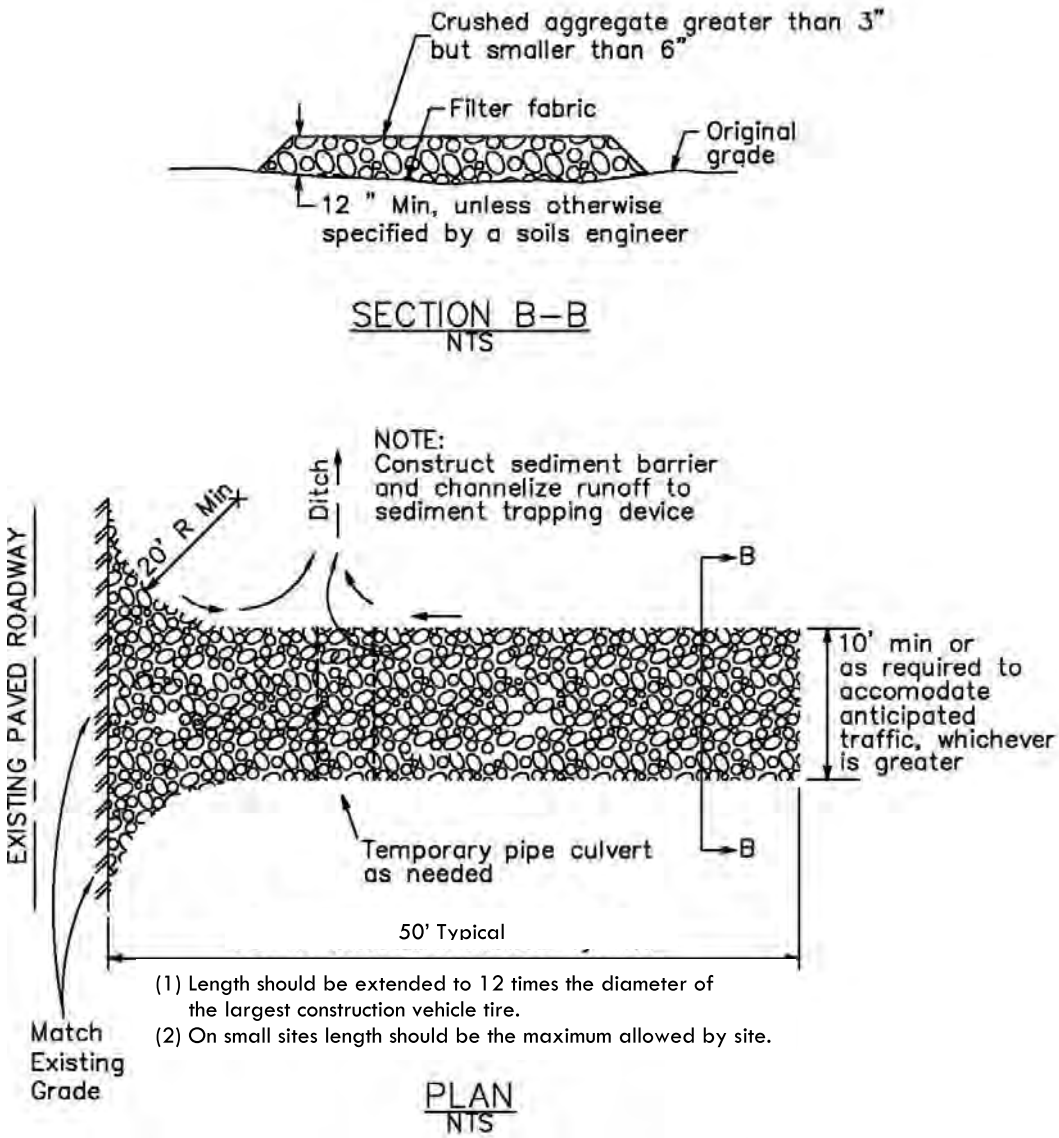
Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

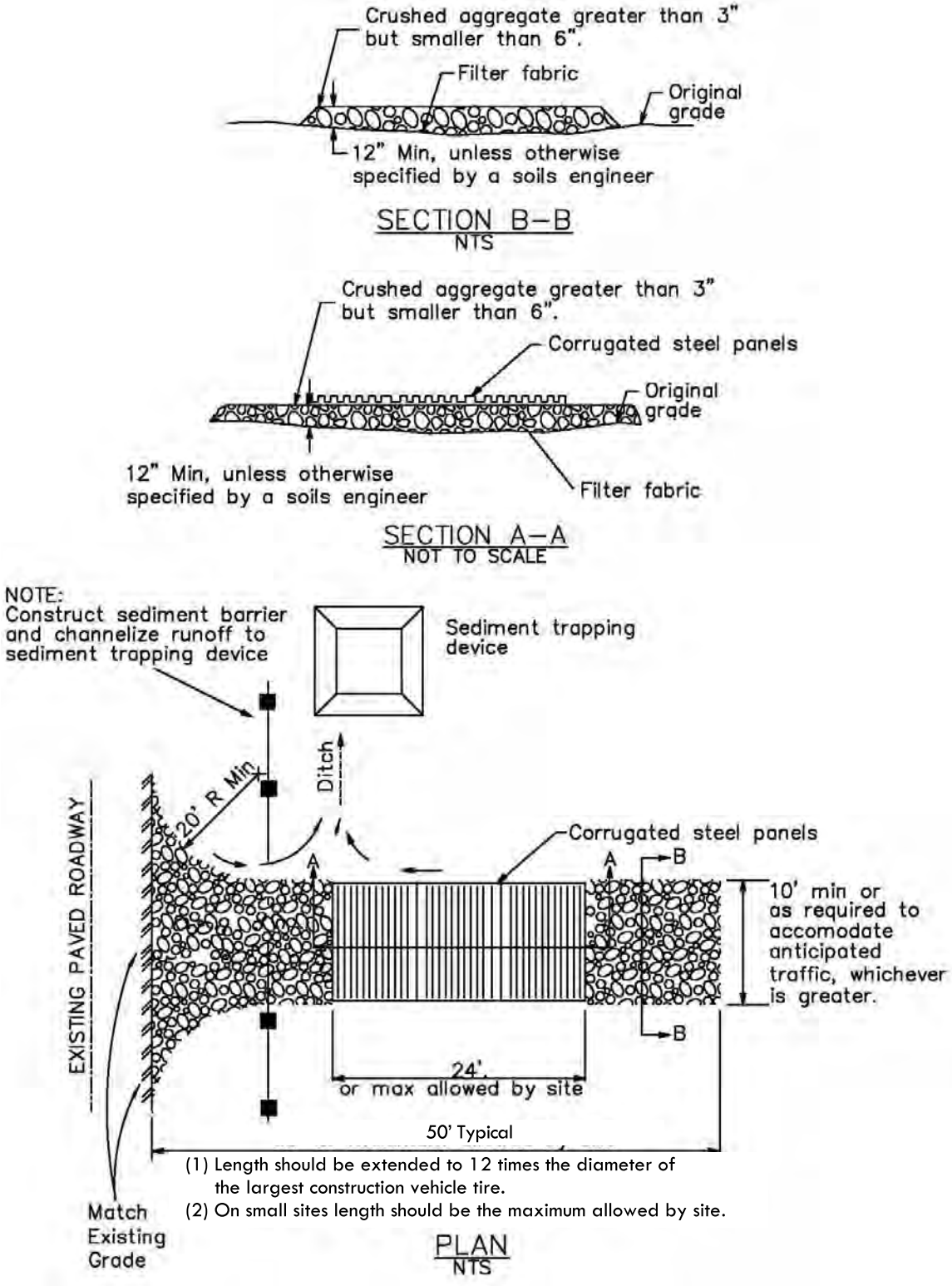
Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

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

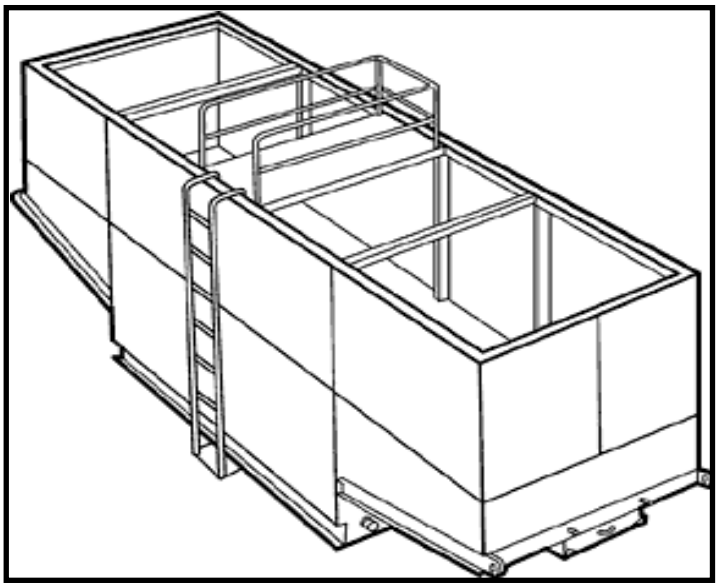
Stabilized Construction Entrance/Exit TC-1



Stabilized Construction Entrance/Exit TC-1



Dewatering Operations NS-2



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

SE-5: Fiber Roll

SE-6: Gravel Bag Berm

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Description and Purpose

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation (stormwater) must be removed from a work location to proceed with construction work or to provide vector control.

The General Permit incorporates Numeric Action Levels (NAL) for turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Discharges from dewatering operations can contain high levels of fine sediment that, if not properly treated, could lead to exceedances of the General Permit requirements or Basin Plan standards.

The dewatering operations described in this fact sheet are not Active Treatment Systems (ATS) and do not include the use of chemical coagulations, chemical flocculation or electrocoagulation.

Suitable Applications

These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area to facilitate construction.

Practices identified in this section are also appropriate for implementation when managing the removal of accumulated

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precipitation (stormwater) from depressed areas at a construction site.

Stormwater mixed with non-stormwater should be managed as non-stormwater.

Limitations

- Dewatering operations will require and should comply with applicable local and project-specific permits and regulations. In some areas, all dewatering activities, regardless of the discharge volume, require a dewatering permit.
- Site conditions will dictate design and use of dewatering operations.
- The controls discussed in this fact sheet primarily address sediment. Other secondary pollutant removal benefits are discussed where applicable.
- The controls detailed in this fact sheet only allow for minimal settling time for sediment particles. Use only when site conditions restrict the use of the other control methods.
- Avoid dewatering discharges where possible by using the water for dust control.

Implementation

- A Construction Site Monitoring Plan (CSMP) should be included in the project Stormwater Pollution Prevention Plan (SWPPP).
- Regional Water Quality Control Board (RWQCB) Regions may require notification and approval prior to any discharge of water from construction sites.
- The destination of discharge from dewatering activities will typically determine the type of permit required for the discharge. For example, when discharging to a water of the U.S., a dewatering permit may be required through the site's governing RWQCB. When discharging to a sanitary sewer or Municipal Separate Storm Sewer System (MS4), a permit may need to be obtained from the owner of the sanitary sewer or MS4 in addition to obtaining an RWQCB dewatering permit. Additional permits or permissions from other agencies may be required for dewatering cofferdams or diversions.
- Dewatering discharges should not cause erosion at the discharge point. Appropriate BMPs should be implemented to maintain compliance with all applicable permits.
- Maintain dewatering records in accordance with all local and project-specific permits and regulations.

Sediment Treatment

A variety of methods can be used to treat water during dewatering operations. Several devices are presented below and provide options to achieve sediment removal. The sediment particle size and permit or receiving water limitations on sediment or turbidity are key considerations for selecting sediment treatment option(s); in some cases, the use of multiple devices may be appropriate. Use of other enhanced treatment methods (i.e., introduction of chemicals or electric current to enhance flocculation and removal of sediment) must comply with: 1) for storm drain or surface water discharges, the requirements for Active Treatment Systems (see SE-11); or 2) for sanitary sewer discharges, the requirements of applicable sanitary sewer discharge permits.

Sediment Basin (see also SE-2)

Description:

- A sediment basin is a temporary basin with a controlled release structure that is formed by excavation or construction of an embankment to detain sediment-laden runoff and allow sediment to settle out before discharging. Sediment basins are generally larger than Sediment Traps (SE-3) and have a designed outlet structure.

Appropriate Applications:

- Effective for the removal of trash, gravel, sand, silt, some metals that settle out with the sediment.

Implementation:

- Excavation and construction of related facilities is required.
- Temporary sediment basins should be fenced if safety is a concern.
- Outlet protection is required to prevent erosion at the outfall location.

Maintenance:

- Maintenance is required for safety fencing, vegetation, embankment, inlet and outlet, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-third.

Sediment Trap (See also SE-3)

Description:

- A sediment trap is a temporary basin formed by excavation and/or construction of an earthen embankment across a waterway or low drainage area to detain sediment-laden runoff and allow sediment to settle out before discharging. Sediment traps are generally smaller than Sediment Basins (SE-2) and do not have a designed outlet (but do have a spillway or overflow).

Appropriate Applications:

Effective for the removal of large and medium sized particles (sand and gravel) and some metals that settle out with the sediment.

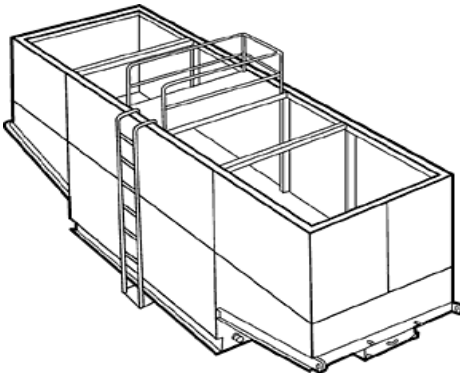
Implementation:

- Excavation and construction of related facilities is required.
- Trap inlets should be located to maximize the travel distance to the trap outlet.
- Use rock or vegetation to protect the trap outlets against erosion.

Maintenance:

- Maintenance is required for vegetation, embankment, inlet and outfall structures, as well as other features.
- Removal of sediment is required when the storage volume is reduced by one-third.

Weir Tanks



Description:

- A weir tank separates water and waste by using weirs. The configuration of the weirs (over and under weirs) maximizes the residence time in the tank and determines the waste to be removed from the water, such as oil, grease, and sediments.

Appropriate Applications:

- The tank removes trash, some settleable solids (gravel, sand, and silt), some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

Implementation:

- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors should be consulted to appropriately size tank.
- Treatment capacity (i.e., volume and number of tanks) should provide at a minimum the required volume for discrete particle settling for treatment design flows.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.
- Oil and grease disposal should be conducted by a licensed waste disposal company.

Dewatering Tanks

Description:

- A dewatering tank removes debris and sediment. Flow enters the tank through the top, passes through a fabric filter, and is discharged through the bottom of the tank. The filter separates the solids from the liquids.

Appropriate Applications:

- The tank removes trash, gravel, sand, and silt, some visible oil and grease, and some metals (removed with sediment). To achieve high levels of flow, multiple tanks can be used in parallel. If additional treatment is desired, the tanks can be placed in series or as pre-treatment for other methods.

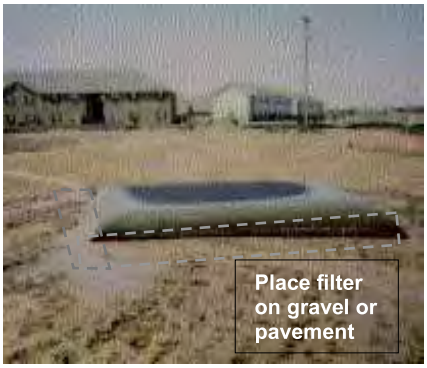
Implementation:

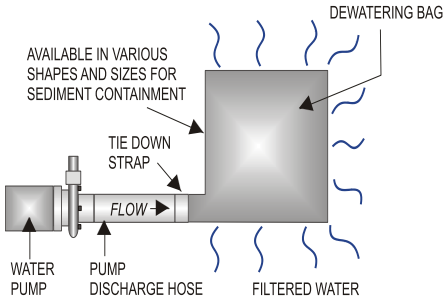
- Tanks are delivered to the site by the vendor, who can provide assistance with set-up and operation.
- Tank size will depend on flow volume, constituents of concern, and residency period required. Vendors should be consulted to appropriately size tank.

Maintenance:

- Periodic cleaning is required based on visual inspection or reduced flow.
- Oil and grease disposal should be conducted by licensed waste disposal company.

Gravity Bag Filter





Description:

- A gravity bag filter, also referred to as a dewatering bag, is a square or rectangular bag made of non-woven geotextile fabric that collects gravel, sand, silt, and fines.

Appropriate Applications:

- Effective for the removal of sediments (gravel, sand, silt, and fines). Some metals are removed with the sediment.

Implementation:

- Water is pumped into one side of the bag and seeps through the top, bottom, and sides of the bag.
- Place filter bag on pavement or a gravel bed or paved surface. Avoid placing a dewatering bag on unprotected bare soil. If placing the bag on bare soil is unavoidable, a secondary barrier should be used, such as a rock filter bed placed beneath and beyond the edges of the bag to, prevent erosion and capture sediments that escape the bag.
- Perimeter control around the downstream end of the bag should be implemented. Secondary sediment controls are important especially in the initial stages of discharge, which tend to allow fines to pass through the bag.

Maintenance:

- Inspection of the flow conditions, bag condition, bag capacity, and the secondary barrier (as applicable) is required.
- Replace the bag when it no longer filters sediment or passes water at a reasonable rate.
- Caution should be taken when removing and disposing of the bag, to prevent the release of captured sediment
- Properly dispose of the bag offsite. If sediment is removed from the bag prior to disposal (bags can potentially be reused depending upon their condition), dispose of sediment in accordance with the general maintenance procedures described at the end of this BMP Fact Sheet.

Sand Media Particulate Filter

Description:

- Water is treated by passing it through canisters filled with sand media. Generally, sand filters provide a final level of treatment. They are often used as a secondary or higher level of treatment after a significant amount of sediment and other pollutants have been removed using other methods.

Appropriate Applications:

- Effective for the removal of trash, gravel, sand, and silt and some metals, as well as the reduction of biochemical oxygen demand (BOD) and turbidity.
- Sand filters can be used for stand-alone treatment or in conjunction with bag and cartridge filtration if further treatment is required.
- Sand filters can also be used to provide additional treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filters require regular service to monitor and maintain the level of the sand media. If subjected to high loading rates, filters can plug quickly.
- Venders generally provide data on maximum head loss through the filter. The filter should be monitored daily while in use and cleaned when head loss reaches target levels.
- If cleaned by backwashing, the backwash water may need to be hauled away for disposal or returned to the upper end of the treatment train for another pass through the series of dewatering BMPs.

Pressurized Bag Filter

Description:

- A pressurized bag filter is a unit composed of single filter bags made from polyester felt material. The water filters through the unit and is discharged through a header. Vendors provide bag filters in a variety of configurations. Some units include a combination of bag filters and cartridge filters for enhanced contaminant removal.

Appropriate Applications:

- Effective for the removal of sediment (sand and silt) and some metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Oil absorbent bags are available for hydrocarbon removal.

- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance with installation and operation.

Maintenance:

- The filter bags require replacement when the pressure differential equals or exceeds the manufacturer's recommendation.

Cartridge Filter

Description:

- Cartridge filters provide a high degree of pollutant removal by utilizing a number of individual cartridges as part of a larger filtering unit. They are often used as a secondary or higher (polishing) level of treatment after a significant amount of sediment and other pollutants are removed. Units come with various cartridge configurations (for use in series with bag filters) or with a larger single cartridge filtration unit (with multiple filters within).

Appropriate Applications:

- Effective for the removal of sediment (sand, silt, and some clays) and metals, as well as the reduction of BOD, turbidity, and hydrocarbons. Hydrocarbons can effectively be removed with special resin cartridges.

- Filters can be used to provide secondary treatment to water treated via settling or basic filtration.

Implementation:

- The filters require delivery to the site and initial set up. The vendor can provide assistance.

Maintenance:

- The cartridges require replacement when the pressure differential equals or exceeds the manufacturer's recommendation.

Costs

- Sediment control costs vary considerably depending on the dewatering and sediment treatment system that is selected. Pressurized filters tend to be more expensive than gravity settling but are often more effective. Simple tanks are generally rented on a long-term basis (one or more months) and can range from $460 per month for a 1,000-gallon tank to $3,400 per month for a 10,000-gallon tank (adjusted for inflation, 2016 dollars, by Tetra Tech Inc.). Mobilization and demobilization costs vary considerably.

Inspection and Maintenance

- Inspect and verify that dewatering BMPs are in place and functioning prior to the commencement of activities requiring dewatering.

- Inspect dewatering BMPs daily while dewatering activities are being conducted.

- Inspect all equipment before use. Monitor dewatering operations to ensure they do not cause offsite discharge or erosion.
- Sample dewatering discharges as required by the General Permit.
- Unit-specific maintenance requirements are included with the description of each unit.
- Sediment removed during the maintenance of a dewatering device may be either spread onsite and stabilized or disposed of at a disposal site as approved by the owner.
- Sediment that is commingled with other pollutants should be disposed of in accordance with all applicable laws and regulations and as approved by the owner.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

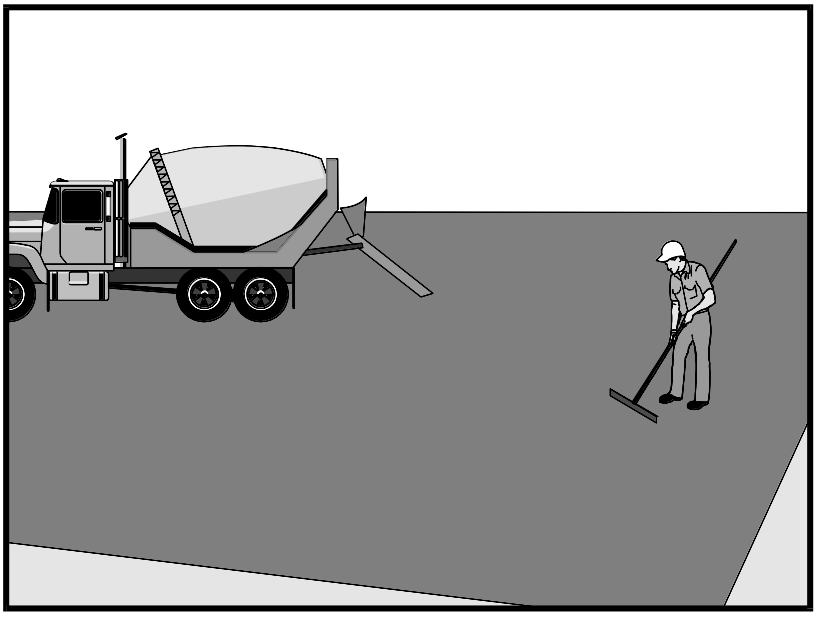
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003; Updated March 2004.

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

Labor Surcharge & Equipment Rental Rates, April 1, 2002 through March 31, 2003, California Department of Transportation (Caltrans).

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

Paving and Grinding Operations NS-3



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☒

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

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

The General Permit incorporates Numeric Action Levels (NAL) for pH and turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials associated with paving and grinding operations, including mortar, concrete, and cement and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Paving opportunities may be limited during wet weather.

  Discharges of freshly paved surfaces may raise pH to environmentally harmful levels and trigger permit violations.

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Implementation

General

- Avoid paving during the wet season when feasible.
- Reschedule paving and grinding activities if rain is forecasted.
- Train employees and sub-contractors in pollution prevention and reduction.
- Store materials away from drainage courses to prevent stormwater runon (see WM-1, Material Delivery and Storage).
- Protect drainage courses, particularly in areas with a grade, by employing BMPs to divert runoff or to trap and filter sediment.
- Stockpile material removed from roadways away from drain inlets, drainage ditches, and watercourses. These materials should be stored consistent with WM-3, Stockpile Management.
- Disposal of PCC (Portland cement concrete) and AC (asphalt concrete) waste should be in conformance with WM-8, Concrete Waste Management.

Saw Cutting, Grinding, and Pavement Removal

- Shovel or vacuum saw-cut slurry and remove from site. Cover or barricade storm drains during saw cutting to contain slurry.
- When paving involves AC, the following steps should be implemented to prevent the discharge of grinding residue, uncompacted or loose AC, tack coats, equipment cleaners, or unrelated paving materials:
  - AC grindings, pieces, or chunks used in embankments or shoulder backing should not be allowed to enter any storm drains or watercourses. Install inlet protection and perimeter controls until area is stabilized (i.e. cutting, grinding or other removal activities are complete and loose material has been properly removed and disposed of)or permanent controls are in place. Examples of temporary perimeter controls can be found in EC-9, Earth Dikes and Drainage Swales; SE-1, Silt Fence; SE-5, Fiber Rolls, or SE-13 Compost Socks and Berms
  - Collect and remove all broken asphalt and recycle when practical. Old or spilled asphalt should be recycled or disposed of properly.
- Do not allow saw-cut slurry to enter storm drains or watercourses. Residue from grinding operations should be picked up by a vacuum attachment to the grinding machine, or by sweeping, should not be allowed to flow across the pavement, and should not be left on the surface of the pavement. See also WM-8, Concrete Waste Management, and WM-10, Liquid Waste Management.
- Pavement removal activities should not be conducted in the rain.
- Collect removed pavement material by mechanical or manual methods. This material may be recycled for use as shoulder backing or base material.

- If removed pavement material cannot be recycled, transport the material back to an approved storage site.

Asphaltic Concrete Paving

- If paving involves asphaltic cement concrete, follow these steps:

  - Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks. Vacuum or sweep loose sand and gravel and properly dispose of this waste by referring to WM-5, Solid Waste Management.

  - Old asphalt should be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.

Portland Cement Concrete Paving

- Do not wash sweepings from exposed aggregate concrete into a storm drain system. Collect waste materials by dry methods, such as sweeping or shoveling, and return to aggregate base stockpile or dispose of properly. Allow aggregate rinse to settle. Then, either allow rinse water to dry in a temporary pit as described in WM-8, Concrete Waste Management, or pump the water to the sanitary sewer if authorized by the local wastewater authority.

Sealing Operations

- During chip seal application and sweeping operations, petroleum or petroleum covered aggregate should not be allowed to enter any storm drain or water courses. Apply temporary perimeter controls until structure is stabilized (i.e. all sealing operations are complete and cured and loose materials have been properly removed and disposed).

- Inlet protection (SE-10, Storm Drain Inlet Protection) should be used during application of seal coat, tack coat, slurry seal, and fog seal.

- Seal coat, tack coat, slurry seal, or fog seal should not be applied if rainfall is predicted to occur during the application or curing period.

Paving Equipment

- 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 and dispose of in accordance with the applicable regulations. See NS-10, Vehicle and Equipment Maintenance, WM-4, Spill Prevention and Control, and WM-10, Liquid Waste Management.

- Substances used to coat asphalt transport trucks and asphalt spreading equipment should not contain soap and should be non-foaming and non-toxic.

- Paving equipment parked onsite should be parked over plastic to prevent soil contamination.

- Clean asphalt coated equipment offsite whenever possible. When cleaning dry, hardened asphalt from equipment, manage hardened asphalt debris as described in WM-5, Solid Waste Management. Any cleaning onsite should follow NS-8, Vehicle and Equipment Cleaning.

Thermoplastic Striping

- Thermoplastic striper and pre-heater equipment shutoff valves should be inspected to ensure that they are working properly to prevent leaking thermoplastic from entering drain inlets, the stormwater drainage system, or watercourses.
- Pre-heaters should be filled carefully to prevent splashing or spilling of hot thermoplastic. Leave six inches of space at the top of the pre-heater container when filling thermoplastic to allow room for material to move.
- Do not pre-heat, transfer, or load thermoplastic near drain inlets or watercourses.
- Clean truck beds daily of loose debris and melted thermoplastic. When possible, recycle thermoplastic material.

Raised/Recessed Pavement Marker Application and Removal

- Do not transfer or load bituminous material near drain inlets, the stormwater drainage system, or watercourses.
- Melting tanks should be loaded with care and not filled to beyond six inches from the top to leave room for splashing.
- When servicing or filling melting tanks, ensure all pressure is released before removing lids to avoid spills.
- On large-scale projects, use mechanical or manual methods to collect excess bituminous material from the roadway after removal of markers.

Costs

- All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of paving and grinding operations.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Sample stormwater runoff required by the General Permit.
- Keep ample supplies of drip pans or absorbent materials onsite.
- Inspect and maintain machinery regularly to minimize leaks and drips.

References

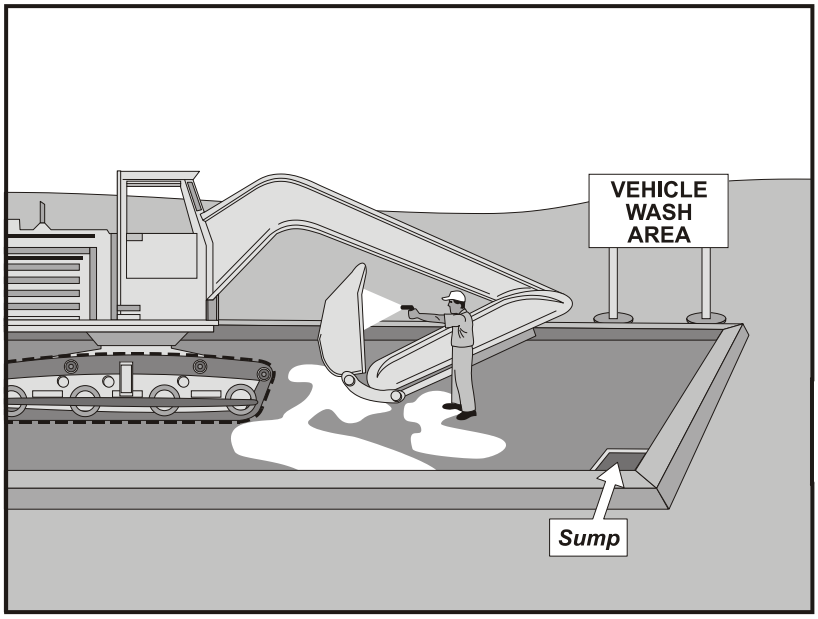
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

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

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

Vehicle and Equipment Cleaning NS-8



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

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- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning onsite. Steam cleaning can generate significant pollutant concentrates.
- Cleaning of vehicles and equipment with soap, solvents or steam should not occur on the project site unless resulting wastes are fully contained and disposed of. Resulting wastes should not be discharged or buried and must be captured and recycled or disposed according to the requirements of WM-10, Liquid Waste Management or WM-6, Hazardous Waste Management, depending on the waste characteristics. Minimize use of solvents. Use of diesel for vehicle and equipment cleaning is prohibited.
- All vehicles and equipment that regularly enter and leave the construction site must be cleaned offsite.
- When vehicle and equipment washing and cleaning must occur onsite, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area should have the following characteristics:
  - Located away from storm drain inlets, drainage facilities, or watercourses
  - Paved with concrete or asphalt and bermed to contain wash waters and to prevent runon and runoff
  - Configured with a sump to allow collection and disposal of wash water
  - No discharge of wash waters to storm drains or watercourses
  - Used only when necessary
- When cleaning vehicles and equipment with water:
  - Use as little water as possible. High-pressure sprayers may use less water than a hose and should be considered
  - Use positive shutoff valve to minimize water usage
  - Facility wash racks should discharge to a sanitary sewer, recycle system or other approved discharge system and must not discharge to the storm drainage system, watercourses, or to groundwater

Costs

Cleaning vehicles and equipment at an offsite facility may reduce overall costs for vehicle and equipment cleaning by eliminating the need to provide similar services onsite. When onsite cleaning is needed, the cost to establish appropriate facilities is relatively low on larger, long-duration projects, and moderate to high on small, short-duration projects.

Inspection and Maintenance

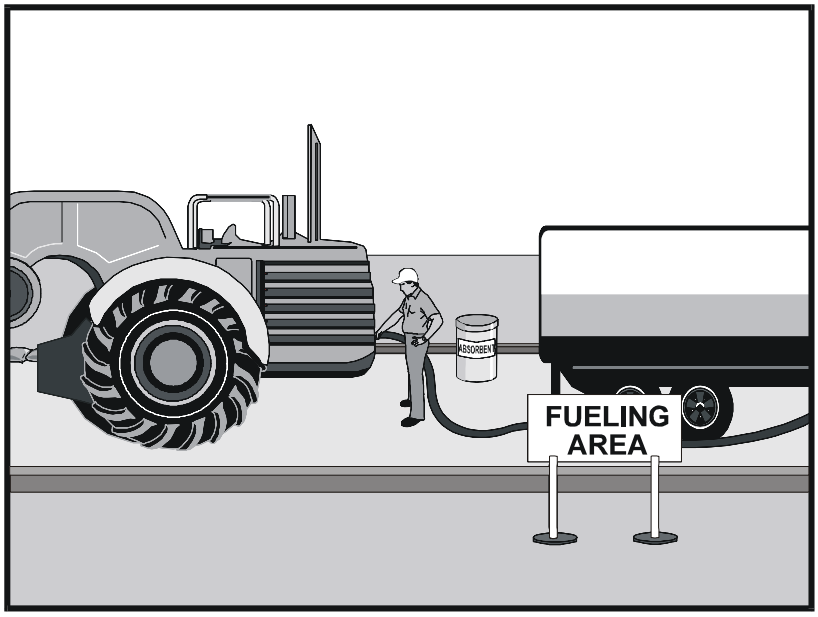
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspection and maintenance is minimal, although some berm repair may be necessary.
- Monitor employees and subcontractors throughout the duration of the construction project to ensure appropriate practices are being implemented.
- Inspect sump regularly and remove liquids and sediment as needed.
- Prohibit employees and subcontractors from washing personal vehicles and equipment on the construction site.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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

Vehicle and Equipment Fueling NS-9



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Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

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Description and Purpose

Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment fueling takes place.

Limitations

Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. Sending vehicles and equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/ Exit.

Implementation

- Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.
- Discourage "topping-off" of fuel tanks.

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- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks and should be disposed of properly after use.
- Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the adsorbent materials promptly and dispose of properly.
- 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 large excavators, 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.
- When fueling must take place onsite, designate an area away from drainage courses to be used. Fueling areas should be identified in the SWPPP.
- Dedicated fueling areas should be protected from stormwater runon and runoff and should be located at least 50 ft away from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas.
- Protect fueling areas with berms and dikes to prevent runon, runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD).
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

Costs

- 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.

Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately, or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.

- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.

References

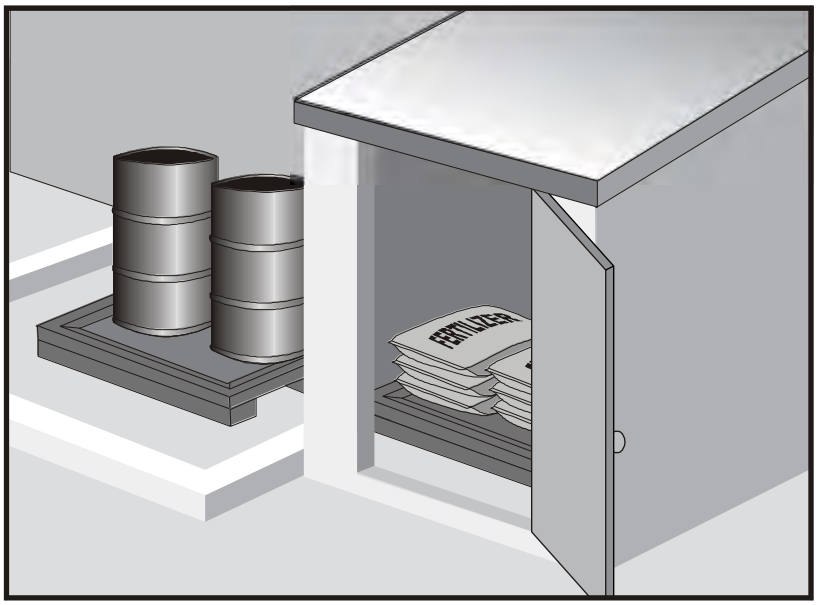
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

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

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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

Material Delivery and Storage WM-1



Categories		
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WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed 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 WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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- Asphalt and concrete components
- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

Limitations

- Space limitation may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

Implementation

The following steps should be taken to minimize risk:

- Chemicals must be stored in water tight containers with appropriate secondary containment or in a storage shed.
- When a material storage area is located on bare soil, the area should be lined and bermed.
- Use containment pallets or other practical and available solutions, such as storing materials within newly constructed buildings or garages, to meet material storage requirements.
- Stack erodible landscape material on pallets and cover when not in use.
- Contain all fertilizers and other landscape materials when not in use.
- Temporary storage areas should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be available on-site for all materials stored that have the potential to effect water quality.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located away from waterways, if possible.
    - Avoid transport near drainage paths or waterways.
    - Surround with earth berms or other appropriate containment BMP. See EC-9, Earth Dikes and Drainage Swales.
    - Place in an area that 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.
- An up to date inventory of materials delivered and stored onsite should be kept.

- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- Keep ample spill cleanup supplies appropriate for the materials being stored. Ensure that cleanup supplies are in a conspicuous, labeled area.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove and dispose of materials and any contaminated soil. See WM-7, Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

Material Storage Areas and Practices

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment facilities for storage.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25-year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Materials should be covered prior to, and during rain events.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM-3, Stockpile Management.
- Materials should be stored indoors within existing structures or completely enclosed storage sheds when available.
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- An ample supply of appropriate spill clean up material should be kept near storage areas.
- Also see WM-6, Hazardous Waste Management, for storing of hazardous wastes.

Material Delivery Practices

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

Spill Cleanup

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-7, Contaminated Soil Management.
- See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.
- If spills or leaks of materials occur that are not contained and could discharge to surface waters, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

Cost

- The largest cost of implementation may be in the construction of a materials storage area that is covered and provides secondary containment.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Keep storage areas clean and well organized, including a current list of all materials onsite.
- Inspect labels on containers for legibility and accuracy.

- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

References

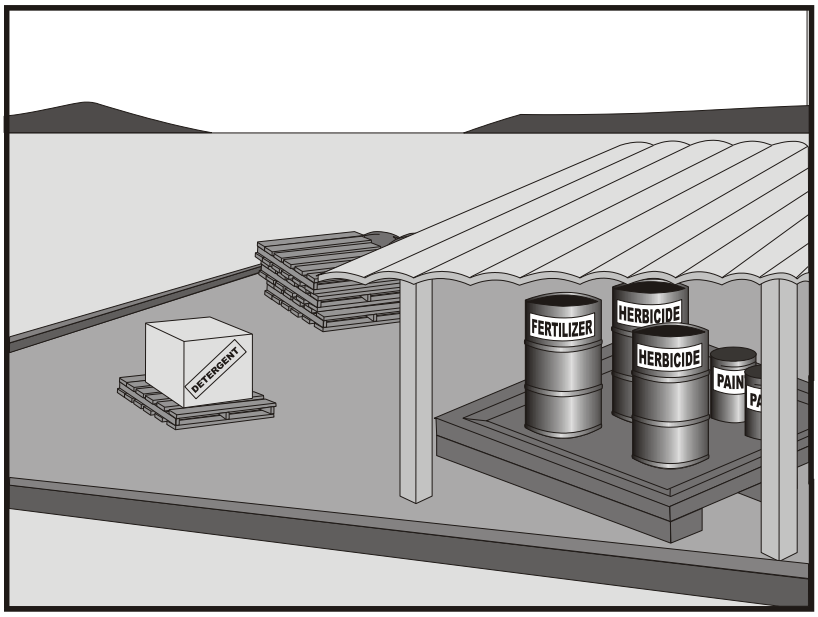
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

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

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

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

Material Use WM-2



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment

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Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- The preferred method of termiticide application is soil injection near the existing or proposed structure foundation/slab; however, if not feasible, soil drench application of termiticides should follow EPA label guidelines and the following recommendations (most of which are applicable to most pesticide applications):
  - Do not treat soil that is water-saturated or frozen.
  - Application shall not commence within 24-hours of a predicted precipitation event with a 40% or greater probability. Weather tracking must be performed on a daily basis prior to termiticide application and during the period of termiticide application.
  - Do not allow treatment chemicals to runoff from the target area. Apply proper quantity to prevent excess runoff. Provide containment for and divert stormwater from application areas using berms or diversion ditches during application.
  - Dry season: Do not apply within 10 feet of storm drains. Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds).
  - Wet season: Do not apply within 50 feet of storm drains or aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds) unless a vegetative buffer is present (if so, refer to dry season requirements).
  - Do not make on-grade applications when sustained wind speeds are above 10 mph (at application site) at nozzle end height.
  - Cover treatment site prior to a rain event in order to prevent run-off of the pesticide into non-target areas. The treated area should be limited to a size that can be backfilled and/or covered by the end of the work shift. Backfilling or covering of the treated area shall be done by the end of the same work shift in which the application is made.
  - The applicator must either cover the soil him/herself or provide written notification of the above requirement to the contractor on site and to the person commissioning the

application (if different than the contractor). If notice is provided to the contractor or the person commissioning the application, then they are responsible under the Federal Insecticide Fungicide, and Rodenticide Act (FIFRA) to ensure that: 1) if the concrete slab cannot be poured over the treated soil within 24 hours of application, the treated soil is covered with a waterproof covering (such as polyethylene sheeting), and 2) the treated soil is covered if precipitation is predicted to occur before the concrete slab is scheduled to be poured.

- 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 hydraulic application. 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 offsite by runoff. Do not apply these chemicals before predicted rainfall.
- Train employees and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoors or in a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse to a drain leading to a sanitary sewer where permitted or contain for proper disposal off site. For oil-based paints, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.
- Document the location, time, chemicals applied, and applicator's name and qualifications.
- Keep an ample supply of spill clean up material near use areas. Train employees in spill clean up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.
- Discontinue use of erodible landscape material within 2 days prior to a forecasted rain event and materials should be covered and/or bermed.

- Provide containment for material use areas such as masons' areas or paint mixing/preparation areas to prevent materials/pollutants from entering stormwater.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Ensure employees and subcontractors throughout the job are using appropriate practices.

References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

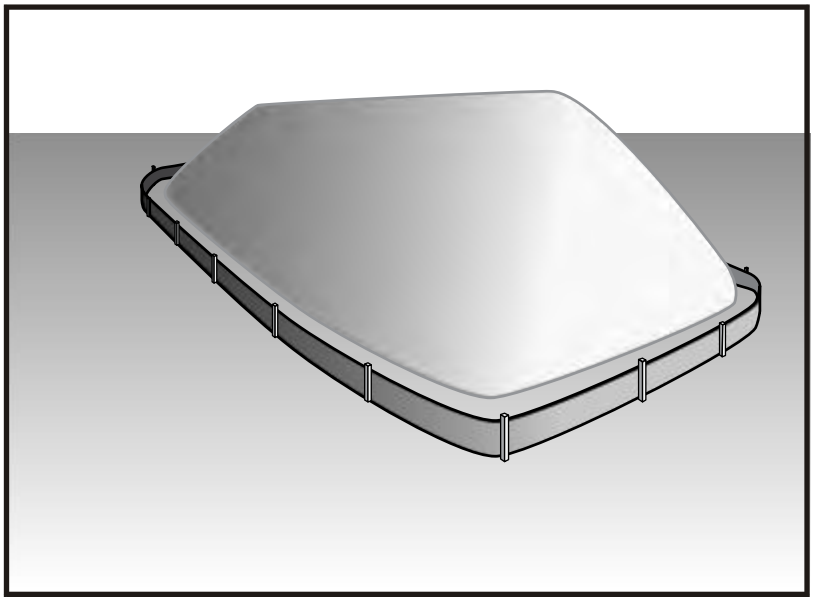
Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Comments on Risk Assessments Risk Reduction Options for Cypermethrin: Docket No. OPP–2005–0293; California Stormwater Quality Association (CASQA) letter to USEPA, 2006.Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products, EPA-HQ-OPP-2008-0331-0021; USEPA, 2008.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

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

Stockpile Management WM-3



Treat Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as Portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other loose materials.

Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of Plastic materials and photodegradable plastics should be avoided.

Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

- On larger sites, a minimum of 50 ft separation from concentrated flows of stormwater, drainage courses, and inlets is recommended.
- After 14 days of inactivity, a stockpile is non-active and requires further protection described below. All stockpiles are required to be protected as non-active stockpiles immediately if they are not scheduled to be used within 14 days.
- Protect all stockpiles from stormwater run-on using temporary perimeter sediment barriers such as compost berms (SE-13), temporary silt dikes (SE-12), fiber rolls (SE-5), silt fences (SE-1), sandbags (SE-8), gravel bags (SE-6), or biofilter bags (SE-14). Refer to the individual fact sheet for each of these controls for installation information.
- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.
- Ensure that stockpile coverings are installed securely to protect from wind and rain.
- Some plastic covers withstand weather and sunlight better than others. Select cover materials or methods based on anticipated duration of use.

Protection of Non-Active Stockpiles

A stockpile is considered non-active if it either is not used for 14 days or if it is scheduled not to be used for 14 days or more. Stockpiles need to be protected immediately if they are not scheduled to be used within 14 days. Non-active stockpiles of the identified materials should be protected as follows:

Soil stockpiles

- Soil stockpiles should be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- Temporary vegetation should be considered for topsoil piles that will be stockpiled for extended periods.

Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base

- Stockpiles should be covered and protected with a temporary perimeter sediment barrier at all times.

Stockpiles of "cold mix"

- Cold mix stockpiles should be placed on and covered with plastic sheeting or comparable material at all times and surrounded by a berm.

Stockpiles of fly ash, stucco, hydrated lime

- Stockpiles of materials that may raise the pH of runoff (i.e., basic materials) should be covered with plastic and surrounded by a berm.

Stockpiles/Storage of treated wood

- Treated wood should be covered with plastic sheeting or comparable material at all times and surrounded by a berm.

Protection of Active Stockpiles

A stockpile is active when it is being used or is scheduled to be used within 14 days of the previous use. Active stockpiles of the identified materials should be protected as follows:

- All stockpiles should be covered and protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of "cold mix" and treated wood, and basic materials should be placed on and covered with plastic sheeting or comparable material and surrounded by a berm prior to the onset of precipitation.
- The downstream perimeter of an active stockpile should be protected with a linear sediment barrier or berm and runoff should be diverted around or away from the stockpile on the upstream perimeter.

Costs

For cost information associated with stockpile protection refer to the individual erosion or sediment control BMP fact sheet considered for implementation (For example, refer to SE-1 Silt Fence for installation of silt fence around the perimeter of a stockpile.)

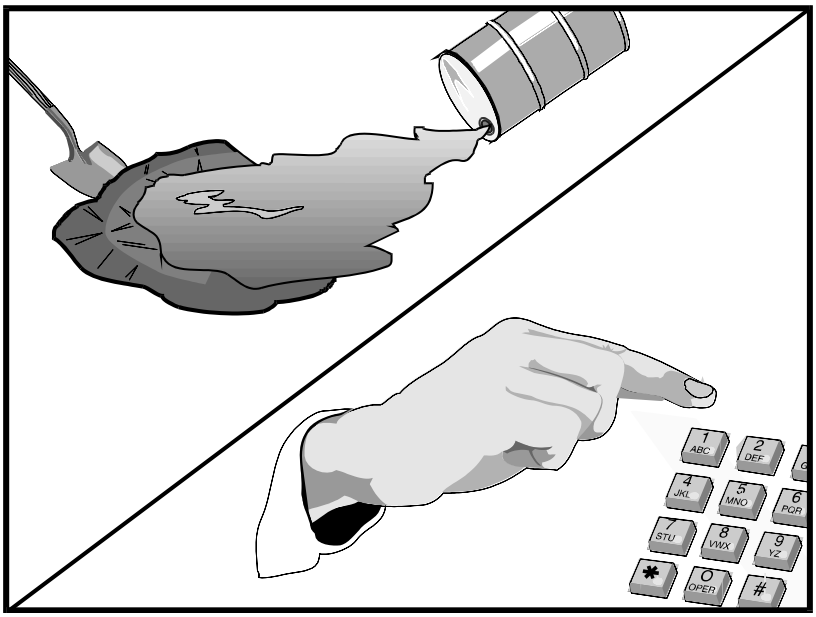
Inspection and Maintenance

- Stockpiles must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- It may be necessary to inspect stockpiles covered with plastic sheeting more frequently during certain conditions (for example, high winds or extreme heat).
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.
- Sediment shall be removed when it reaches one-third of the barrier height.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Spill Prevention and Control WM-4



Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses 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, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

- Fuels
- Lubricants
- Other petroleum distillates

Limitations

- In some cases, it may be necessary to use a private spill cleanup company.
- This BMP applies to spills caused by the contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite

Implementation

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

Education

- Be aware that 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.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

- To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect 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 to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runon during rainfall to the extent that it doesn't compromise clean up activities.
- Do not bury or wash spills with water.

- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, 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 section for specific information.

Minor Spills

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
  - Contain the spread of the spill.
  - Recover spilled materials.
  - Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

- Spills should be cleaned up immediately:
  - Contain spread of the spill.
  - Notify the project foreman immediately.
  - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
  - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
  - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

- For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
  - Notify the local emergency response by dialing 911. In addition to 911, the contractor will notify the proper county officials. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
  - Notify the Governor's Office of Emergency Services Warning Center, (916) 845-8911.
  - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
  - Notification should first be made by telephone and followed up with a written report.
  - The services of a spill's contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
  - Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, Cal/OSHA, etc.

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 hours).

Use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
- Regularly inspect onsite 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 onsite.
- 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 absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent 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 trashcans or dumpsters can leak oil and pollute stormwater. 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 the 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 onsite, use designate areas, located away from drainage courses, to prevent the runon of stormwater 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.

Costs

Prevention of leaks and spills is inexpensive. Treatment and/ or disposal of contaminated soil or water can be quite expensive.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Keep ample supplies of spill control and cleanup materials onsite, 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 onsite.

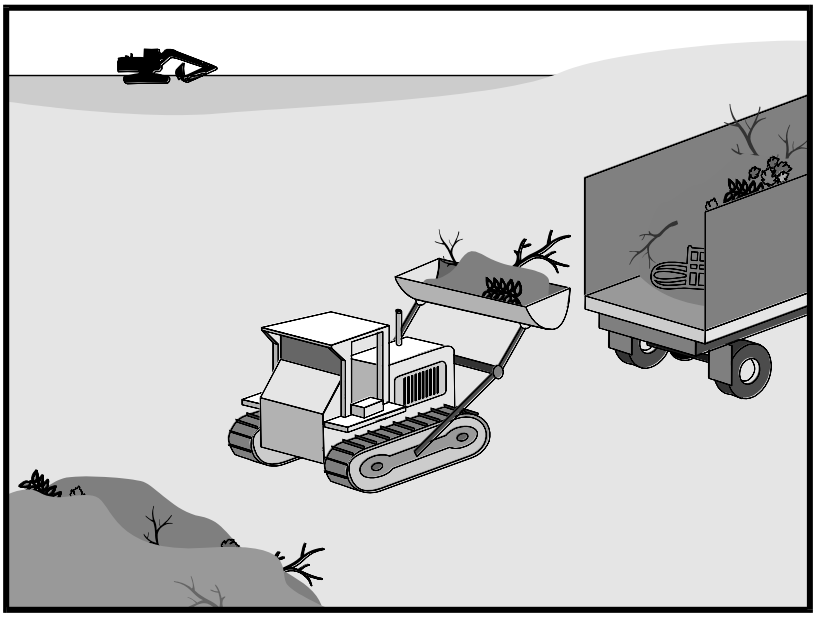
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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

Solid Waste Management WM-5



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

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Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- 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
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials

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- Highway planting wastes, including vegetative material, plant containers, and packaging materials

Limitations

Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

Implementation

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

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area 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 is windy.
- Cover waste containers at the end of each work day and when it is raining.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- 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.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

Education

- Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

Collection, Storage, and Disposal

- Littering on the project site should be prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority.
- Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project.
- Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor.
- Construction debris and waste should be removed from the site biweekly or more frequently as needed.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Stormwater runon should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be located at least 50 ft from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in watertight dumpsters should be securely covered from wind and rain by covering the waste with tarps or plastic.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- 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.

- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

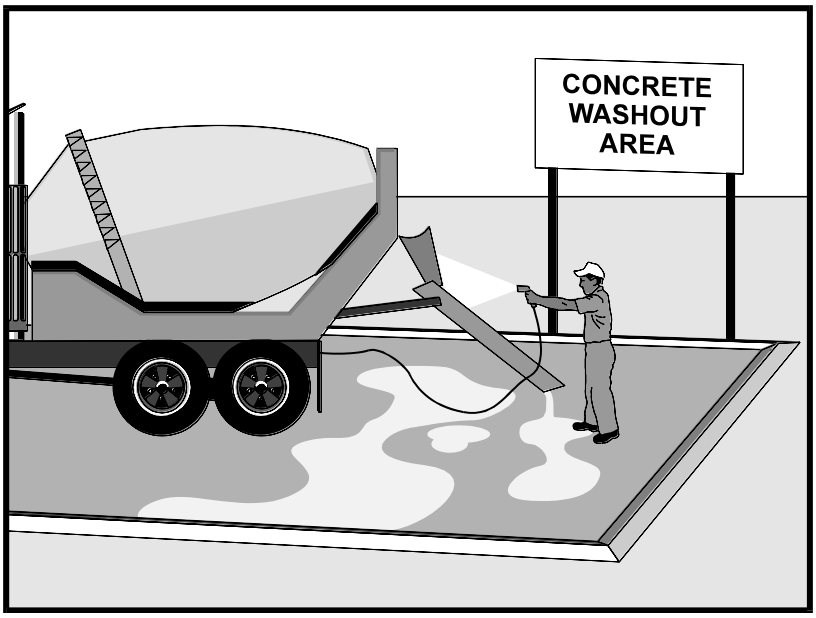
References

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

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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

Concrete Waste Management WM-8



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Prevent the discharge of pollutants to stormwater from concrete waste by conducting washout onsite or offsite in a designated area, and by employee and subcontractor training.

The General Permit incorporates Numeric Action Levels (NAL) for pH (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials, including mortar, concrete, stucco, cement and block and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows and raising pH to levels outside the accepted range.

Suitable Applications

Concrete waste management procedures and practices are implemented on construction projects where:

- Concrete is used as a construction material or where concrete dust and debris result from demolition activities.
- Slurries containing Portland cement concrete (PCC) are generated, such as from saw cutting, coring, grinding, grooving, and hydro-concrete demolition.
- Concrete trucks and other concrete-coated equipment are washed onsite.

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- Mortar-mixing stations exist.
- Stucco mixing and spraying.
- See also NS-8, Vehicle and Equipment Cleaning.

Limitations

- Offsite washout of concrete wastes may not always be possible.
- Multiple washouts may be needed to assure adequate capacity and to allow for evaporation.

Implementation

The following steps will help reduce stormwater pollution from concrete wastes:

- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Store dry and wet materials under cover, away from drainage areas. Refer to WM-1, Material Delivery and Storage for more information.
- Avoid mixing excess amounts of concrete.
- Perform washout of concrete trucks in designated areas only, where washout will not reach stormwater.
- Do not wash out concrete trucks into storm drains, open ditches, streets, streams or onto the ground. Trucks should always be washed out into designated facilities.
- Do not allow excess concrete to be dumped onsite, except in designated areas.
- For onsite washout:
  - On larger sites, it is recommended to locate washout areas 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.
  - Washout wastes into the temporary washout where the concrete can set, be broken up, and then disposed properly.
  - Washouts shall be implemented in a manner that prevents leaching to underlying soils. Washout containers must be water tight and washouts on or in the ground must be lined with a suitable impervious liner, typically a plastic type material.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile or dispose in the trash.
- See typical concrete washout installation details at the end of this fact sheet.

Education

- Educate employees, subcontractors, and suppliers on the concrete waste management techniques described herein.

- Arrange for contractor's superintendent or representative to oversee and enforce concrete waste management procedures.
- Discuss the concrete management techniques described in this BMP (such as handling of concrete waste and washout) with the ready-mix concrete supplier before any deliveries are made.

Concrete Demolition Wastes

- Stockpile concrete demolition waste in accordance with BMP WM-3, Stockpile Management.
- Dispose of or recycle hardened concrete waste in accordance with applicable federal, state or local regulations.

Concrete Slurry Wastes

- PCC and AC waste should not be allowed to enter storm drains or watercourses.
- PCC and AC waste should be collected and disposed of or placed in a temporary concrete washout facility (as described in Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures, below).
- A foreman or construction supervisor should monitor onsite concrete working tasks, such as saw cutting, coring, grinding and grooving to ensure proper methods are implemented.
- Saw-cut concrete slurry should not be allowed to enter storm drains or watercourses. Residue from grinding operations should be picked up by means of a vacuum attachment to the grinding machine or by sweeping. Saw cutting residue should not be allowed to flow across the pavement and should not be left on the surface of the pavement. See also NS-3, Paving and Grinding Operations; and WM-10, Liquid Waste Management.
- Concrete slurry residue should be disposed in a temporary washout facility (as described in Onsite Temporary Concrete Washout Facility, Concrete Transit Truck Washout Procedures, below) and allowed to dry. Dispose of dry slurry residue in accordance with WM-5, Solid Waste Management.

Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures

- Temporary concrete washout facilities should be located a minimum of 50 ft from storm drain inlets, open drainage facilities, and watercourses. Each facility should be located away from construction traffic or access areas to prevent disturbance or tracking.
- A sign should be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.
- Temporary concrete washout facilities should be constructed above grade or below grade at the option of the contractor. Temporary concrete washout facilities should be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.

- Temporary washout facilities should have a temporary pit or bermed areas of sufficient volume to completely contain all liquid and waste concrete materials generated during washout procedures.
- Temporary washout facilities should be lined to prevent discharge to the underlying ground or surrounding area.
- Washout of concrete trucks should be performed in designated areas only.
- Only concrete from mixer truck chutes should be washed into concrete wash out.
- Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated washout area or properly disposed of or recycled offsite.
- Once concrete wastes are washed into the designated area and allowed to harden, the concrete should be broken up, removed, and disposed of per WM-5, Solid Waste Management. Dispose of or recycle hardened concrete on a regular basis.
- Temporary Concrete Washout Facility (Type Above Grade)
  - Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft; however, smaller sites or jobs may only need a smaller washout facility. With any washout, always maintain a sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.
  - Materials used to construct the washout area should conform to the provisions detailed in their respective BMPs (e.g., SE-8 Sandbag Barrier).
  - Plastic lining material should be a minimum of 10 mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
  - Alternatively, portable removable containers can be used as above grade concrete washouts. Also called a “roll-off”; this concrete washout facility should be properly sealed to prevent leakage and should be removed from the site and replaced when the container reaches 75% capacity.
- Temporary Concrete Washout Facility (Type Below Grade)
  - Temporary concrete washout facilities (type below grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft. The quantity and volume should be sufficient to contain all liquid and concrete waste generated by washout operations.
  - Lath and flagging should be commercial type.
  - Plastic lining material should be a minimum of 10 mil polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

- The base of a washout facility should be free of rock or debris that may damage a plastic liner.

Removal of Temporary Concrete Washout Facilities

- When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and properly disposed or recycled in accordance with federal, state or local regulations. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and properly disposed or recycled in accordance with federal, state or local regulations.

- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

Costs

All of the above are low cost measures. Roll-off concrete washout facilities can be more costly than other measures due to removal and replacement; however, provide a cleaner alternative to traditional washouts. The type of washout facility, size, and availability of materials will determine the cost of the washout.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

- Temporary concrete washout facilities should be maintained to provide adequate holding capacity with a minimum freeboard of 4 in. for above grade facilities and 12 in. for below grade facilities. Maintaining temporary concrete washout facilities should include removing and disposing of hardened concrete and returning the facilities to a functional condition. Hardened concrete materials should be removed and properly disposed or recycled in accordance with federal, state or local regulations.

- Washout facilities must be cleaned, or new facilities must be constructed and ready for use once the washout is 75% full.

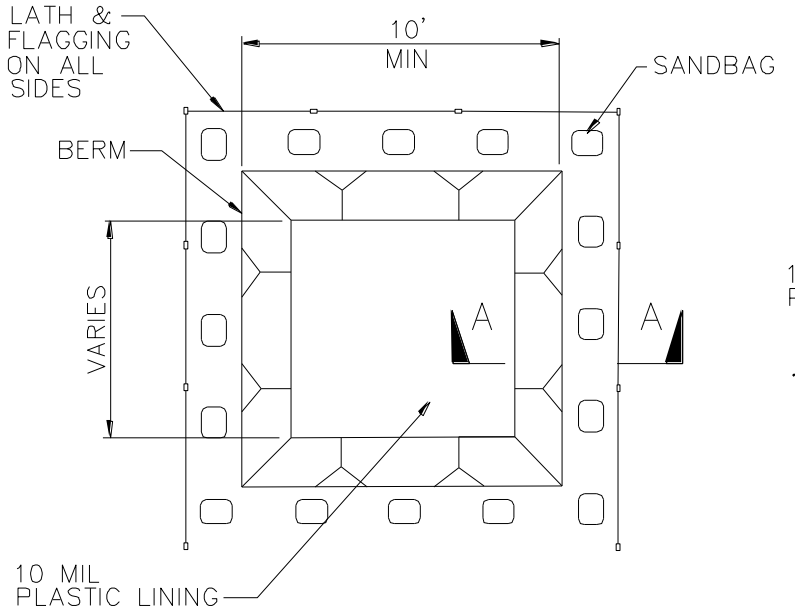
- Inspect washout facilities for damage (e.g. torn liner, evidence of leaks, signage, etc.). Repair all identified damage.

References

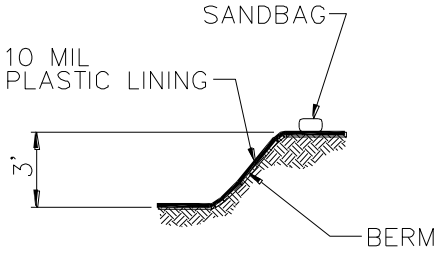
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000, Updated March 2003.

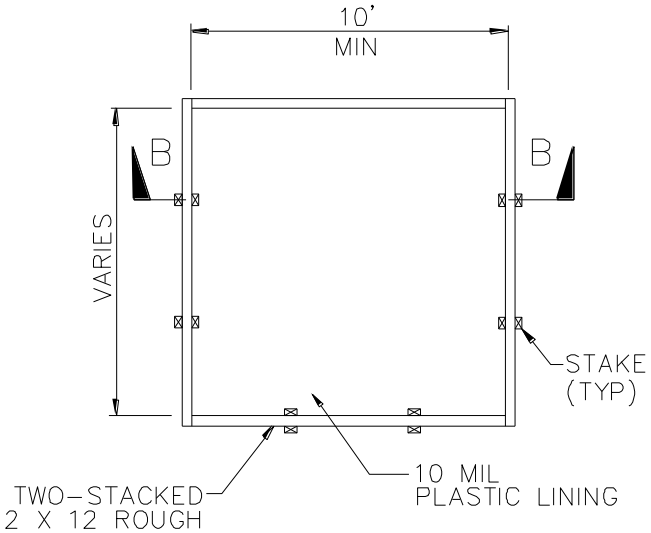
Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



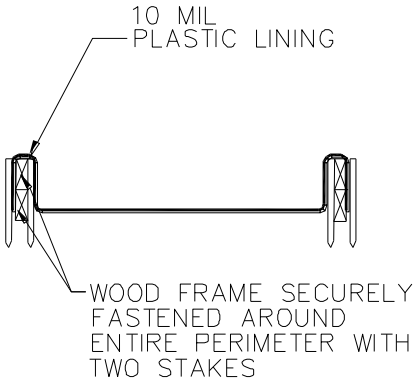
PLAN
NOT TO SCALE
TYPE "BELOW GRADE"



SECTION A–A
NOT TO SCALE



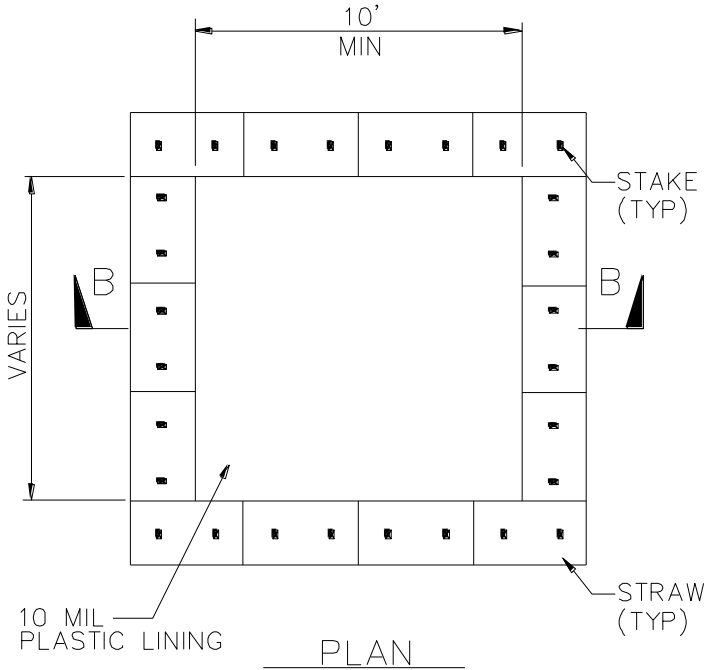
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"



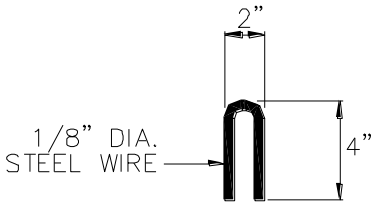
SECTION B–B
NOT TO SCALE

NOTES

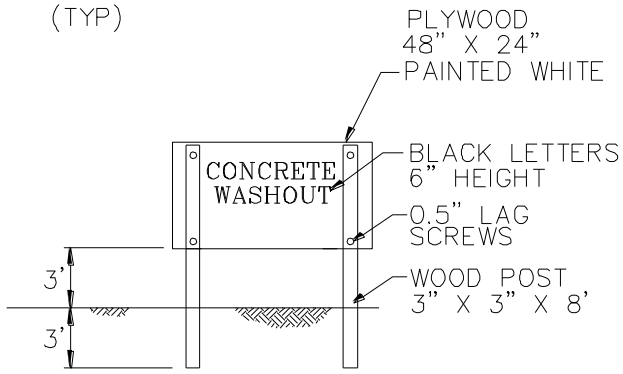
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.



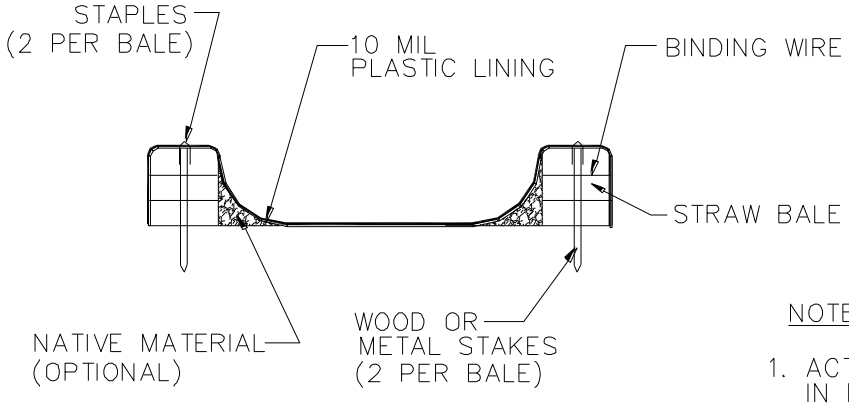
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"
WITH STRAW BALES



STAPLE DETAIL



CONCRETE WASHOUT
SIGN DETAIL
(OR EQUIVALENT)

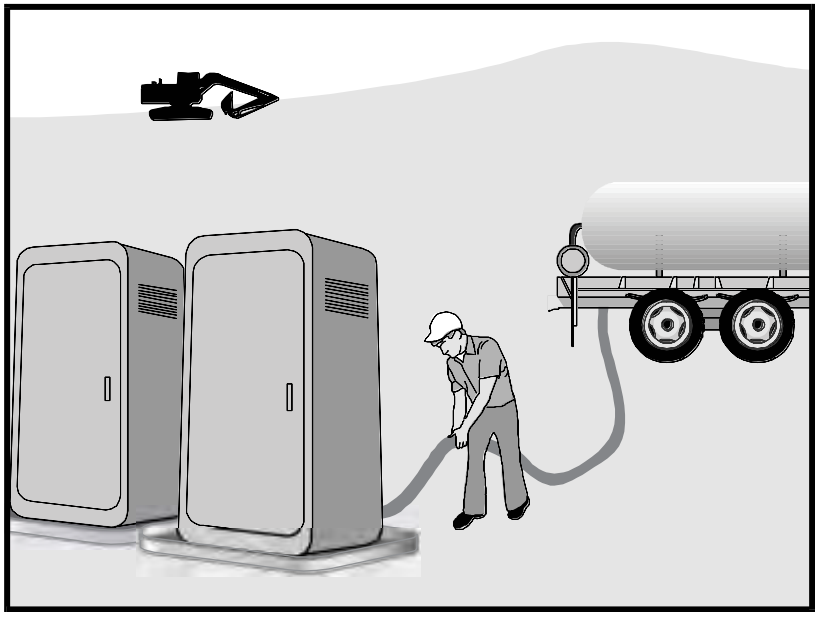


SECTION B-B
NOT TO SCALE

NOTES

1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

Sanitary/Septic Waste Management WM-9



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	
Nutrients	☑
Trash	☑
Metals	
Bacteria	☑
Oil and Grease	
Organics	☑

Potential Alternatives

None

If User/Subscriber modifies this fact sheet in any way, the CASQA name/logo and footer below must be removed from each page and not appear on the modified version.

Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

Limitations

None identified.

Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. If site conditions allow, place portable facilities a minimum of 50 feet from drainage conveyances and traffic areas. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.

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- Temporary sanitary facilities must be equipped with containment to prevent discharge of pollutants to the stormwater drainage system of the receiving water.
- Consider safety as well as environmental implications before placing temporary sanitary facilities.
- Wastewater should not be discharged or buried within the project site.
- Sanitary and septic systems that discharge directly into sanitary sewer systems, where permissible, should comply with the local health agency, city, county, and sewer district requirements.
- Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- If using an onsite disposal system (OSDS), such as a septic system, local health agency requirements must be followed.
- Temporary sanitary facilities that discharge to the sanitary sewer system should be properly connected to avoid illicit discharges.
- Sanitary and septic facilities should be maintained in good working order by a licensed service.
- Regular waste collection by a licensed hauler should be arranged before facilities overflow.
- If a spill does occur from a temporary sanitary facility, follow federal, state and local regulations for containment and clean-up.

Education

- Educate employees, subcontractors, and suppliers on sanitary and septic waste storage and disposal procedures.
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary and septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary and septic waste.
- Hold regular meetings to discuss and reinforce the use of sanitary facilities (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.

Costs

All of the above are low cost measures.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent over turning.
- If spills or leaks from sanitary or septic facilities occur that are not contained and discharge from the site, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

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

APPENDIX D

Best Management Practice (BMP) Inspection Checklist Form:

BEST MANAGEMENT PRACTISE (BMP)
INSPECTION REPORT

INSPECTION TYPE:	Routine Weekly/Monthly	Pre-Rain	During Rain	Post Rain

Date:	**For Week Ending:**
Weather:	
Storm Start Time:	**Storm Duration:**
Time Elapsed Since Last Storm:	
Inspected By:	

_____	_____	_____
(print name)	*(title)*	*(signature)*

Check "Yes", "No" or "N/A" if not applicable.

NO.	***DESCRIPTION***	***YES***	***NO****	***N/A***
1	Are sediment controls in place at site perimeter and storm drain inlets, including offsite tracking controls?			
2	Are all discharge points free of any noticeable pollutant discharge?			
3	Is sediment, debris or mud being cleaning from public roads where they intersect with site access roads?			
4	Are all temporary stockpiles or construction materials located in approved areas and protected from erosion?			
5	Are dust control measures being appropriately implemented?			
6	Are all materials and equipment properly covered?			
7	Are all material handling and storage areas clean and free of spills, leaks or any other deleterious materials?			
8	Are all hazardous materials properly stored in bermed, covered area and free of spills, leak or other deleterious materials?			
9	Are all equipment storage and maintenance areas clean and free of spills, leaks or any other deleterious material?			
10	Are all on-site traffic routes, parking and storage of equipment and supplies restricted to designated areas?			
11	Are all sediment traps, barriers and basins clean and functioning properly?			
12	Are all erosion control devices in-place and functioning in accordance with the erosion control plan?			
13	Are all exposed slopes protected from erosion through the implementation of acceptable soil stabilization practices?			
14	Other? (explain below)			

**If any answer is "no", describe needed correction(s) below. Indicate the location of needed correction(s), along with the date corrections are made, on attached map.*

_____

_____

APPENDIX E

Qualified SWPPP Developer (QSD) and Qualified SWPPP Practitioner (QSP) Certificate of Training:

CERTIFICATE OF TRAINING

CALIFORNIA CONSTRUCTION GENERAL PERMIT

QUALIFIED SWPPP DEVELOPER (QSD)
AND
QUALIFIED SWPPP PRACTITIONER (QSP)

Colin White

Oct 16, 2023 - Oct 29, 2025

Certificate # 23771

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California Stormwater Quality Association and
California Construction General Permit Training Team

APPENDIX F

ESCP Field Training Log:

FIELD TRAINING LOG

Project Name: _____

Project Number/Location: _____

Storm Water Pollution Prevention Plan Topic: (check as appropriate)

- ❑ Erosion Control
- ❑ Sediment Control
- ❑ Wind Erosion Control
- ❑ Tracking Control
- ❑ Non-storm Water management
- ❑ Waste Management and Materials Pollution Control
- ❑ Storm Water Sampling
- ❑ Other: (Identify below: e.g. Record keeping, BMP inspection, etc.)

_____

Specific Training Objective: _____

Location: _____ Date: _____

Instructor: _____ Telephone: _____

- Course Length (hours): _____

ATTENDEE ROSTER (ATTACH ADDITIONAL FORMS IF NECESSARY)

Name	Company	Phone

Name	Company	Phone

COMMENTS: