

City of San Diego ORIGINAL

CONTRACTOR'S NAME: TechCom International, Corp.

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CITY CONTACT: Clementina Giordano - Contract Specialist, Email:CGiordano@sandiego.gov

Phone No. (619) 533-3481, Fax No. (619) 533-3633

WMeerdith/BDoringo/Lad

CONTRACT DOCUMENTS



FOR

MISSION BEACH BOARDWALK BULKHEAD

VOLUME 1 OF 2

BID NO.: K-15-1142-DBB-3

SAP NO. (WBS/IO/CC): S-00726

CLIENT DEPARTMENT: 2113

COUNCIL DISTRICT: 2

PROJECT TYPE: II

THIS CONTRACT IS SUBJECT TO THE FOLLOWING:

- THE CITY'S SUBCONTRACTING PARTICIPATION REQUIREMENTS FOR SLBE PROGRAM.
- PREVAILING WAGE RATES: STATE FEDERAL
- APPRENTICESHIP

BID DUE DATE:

2:00 PM

MARCH 10, 2015

CITY OF SAN DIEGO

PUBLIC WORKS CONTRACTS

1010 SECOND AVENUE, 14th FLOOR, MS 614C

SAN DIEGO, CA 92101

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:

J. A. Baker
For City Engineer

2/10/15
Date

Seal

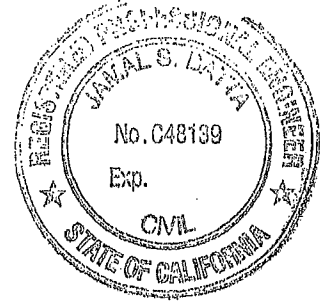


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CITY OF SAN DIEGO, CALIFORNIA

NOTICE INVITING BIDS

1. **RECEIPT AND OPENING OF BIDS:** Bids will be received at the Public Works Contracts at the location, time, and date shown on the cover of these specifications for performing work on **Mission Beach Boardwalk Bulkhead** (Project).
2. **SUMMARY OF WORK:** The Work involves furnishing all labor, materials, equipment, services, and other incidental works and appurtenances for the construction of the Project as described as described in ATTACHMENT A.
3. **BIDS ARE PUBLIC RECORDS:** Upon receipt by the City, Bids shall become public records subject to public disclosure. It is the responsibility of the respondent to clearly identify any confidential, proprietary, trade secret or otherwise legally privileged information contained within the Bid. General references to sections of the California Public Records Act (PRA) will not suffice. If the Contractor does not provide applicable case law that clearly establishes that the requested information is exempt from the disclosure requirements of the PRA, the City shall be free to release the information when required in accordance with the PRA, pursuant to any other applicable law, or by order of any court or government agency, and the Contractor will hold the City harmless for release of this information.
4. **SUBCONTRACTING PARTICIPATION PERCENTAGES:**
 - 4.1. The City has incorporated **mandatory** SLBE-ELBE subcontractor participation percentages to enhance competition and maximize subcontracting opportunities. For the purpose of achieving the mandatory subcontractor participation percentages, a recommended breakdown of the SLBE and ELBE subcontractor participation percentages based upon certified SLBE and ELBE firms has also been provided to achieve the mandatory subcontractor participation percentages:

1. SLBE participation	11.9%
2. ELBE participation	24.0%
3. Total mandatory participation	35.9%
 - 4.2. The Bidders are strongly encouraged to attend the Pre-Bid Meeting to better understand the Good Faith Effort requirements of this contract. See the City's document titled "SLBE Program, Instructions For Bidders Completing The Good Faith Effort Submittal" available at: <http://www.sandiego.gov/eoc/>
 - 4.3. The Bid will be declared **non-responsive** if the Bidder fails the following mandatory conditions:
 - 4.3.1. Bidder's inclusion of SLBE-ELBE certified subcontractors at the overall mandatory participation percentage identified in this document; OR.
 - 4.3.2. Bidder's submission of Good Faith Effort documentation, saved in searchable Portable Document Format (PDF) and stored on Compact Disc (CD) or Digital Video Disc (DVD), demonstrating the Bidder made a good faith effort to outreach to and include SLBE-ELBE Subcontractors required in this document

4.4. For additional Equal Opportunity Contracting Program requirements, see Attachment C.

5. **PRE-BID MEETING:**

5.1. There will be a Pre-Bid Meeting to discuss the scope of the Project, bidding requirements, pre-qualification process, and Equal Opportunity Contracting Program requirements and reporting procedures in the Public Works Contracts, Conference Room at 1010 Second Avenue, 14th Floor, San Diego, CA 92101 **at 10:00 A.M., on February 24, 2015.**

5.2. All potential bidders are encouraged to attend.

5.3. To request a copy of the agenda on an alternative format, or to request a sign language or oral interpreter for this meeting, call the Public Works Contracting Group at (619) 533-3450 at least 5 Working Days prior to the Pre-Bid Meeting to ensure availability.

6. **CONTRACTOR REGISTRATION AND ELECTRONIC REPORTING SYSTEM:**

6.1. **Prior** to the Award of the Contract or each Task Order, you and your Subcontractors and Suppliers must register with the City's web-based vendor registration and bid management system, BidsOnline™ hosted by PlanetBids System. For additional information go to:

<http://www.sandiego.gov/purchasing/bids-contracts/vendorreg.shtml>.

6.2. The City may not award the contract until registration of all subcontractors and suppliers is complete. In the event this requirement is not met within the time frame specified in the Notice of Intent to Award letter, the City reserves the right to rescind the Notice of Award / Intent to Award and to make the award to the next responsive and responsible bidder / proposer.

7. **JOINT VENTURE CONTRACTORS.** Provide a copy of the Joint Venture agreement and the Joint Venture license to the City within 10 Working Days after receiving the Contract forms. See 2-1.1.2, "Joint Venture Contractors" in The WHITEBOOK for details.

8. **PREVAILING WAGE RATES:** Pursuant to San Diego Municipal Code section 22.3019, construction, alteration, demolition, repair and maintenance work performed under this Contract is subject to State prevailing wage laws. For construction work performed under this Contract cumulatively exceeding \$25,000 and for alteration, demolition, repair and maintenance work performed under this Contract cumulatively exceeding \$15,000, the Contractor and its subcontractors shall comply with State prevailing wage laws including, but not limited to, the requirements listed below.

8.1. **Compliance with Prevailing Wage Requirements.** Pursuant to sections 1720 through 1861 of the California Labor Code, the Contractor and its subcontractors shall ensure that all workers who perform work under this Contract are paid not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations (DIR). This includes work performed during the design and preconstruction phases of construction including, but not limited to, inspection and land surveying work.

- 8.1.1.** Copies of such prevailing rate of per diem wages are on file at the City and are available for inspection to any interested party on request. Copies of the prevailing rate of per diem wages also may be found at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Contractor and its subcontractors shall post a copy of the prevailing rate of per diem wages determination at each job site and shall make them available to any interested party upon request.
- 8.1.2.** The wage rates determined by the DIR refer to expiration dates. If the published wage rate does not refer to a predetermined wage rate to be paid after the expiration date, then the published rate of wage shall be in effect for the life of this Contract. If the published wage rate refers to a predetermined wage rate to become effective upon expiration of the published wage rate and the predetermined wage rate is on file with the DIR, such predetermined wage rate shall become effective on the date following the expiration date and shall apply to this Contract in the same manner as if it had been published in said publication. If the predetermined wage rate refers to one or more additional expiration dates with additional predetermined wage rates, which expiration dates occur during the life of this Contract, each successive predetermined wage rate shall apply to this Contract on the date following the expiration date of the previous wage rate. If the last of such predetermined wage rates expires during the life of this Contract, such wage rate shall apply to the balance of the Contract.
- 8.2. Penalties for Violations.** Contractor and its subcontractors shall comply with California Labor Code section 1775 in the event a worker is paid less than the prevailing wage rate for the work or craft in which the worker is employed.
- 8.3. Payroll Records.** Contractor and its subcontractors shall comply with California Labor Code section 1776, which generally requires keeping accurate payroll records, verifying and certifying payroll records, and making them available for inspection. Contractor shall require its subcontractors to also comply with section 1776. Contractor and its subcontractors shall submit weekly certified payroll records online via the City's web-based Labor Compliance Program. Contractor is responsible for ensuring its subcontractors submit certified payroll records to the City.
- 8.3.1.** For contracts entered into on or after April 1, 2015, Contractor and their subcontractors shall furnish records specified in Labor Code section 1776 directly to the Labor Commissioner in the manner required by Labor Code section 1771.4.
- 8.4. Apprentices.** Contractor and its subcontractors shall comply with California Labor Code sections 1777.5, 1777.6 and 1777.7 concerning the employment and wages of apprentices. Contractor is held responsible for the compliance of their subcontractors with sections 1777.5, 1777.6 and 1777.7.
- 8.5. Working Hours.** Contractor and their subcontractors shall comply with California Labor Code sections 1810 through 1815, including but not limited to: (i) restrict working hours on public works contracts to eight hours a day and forty hours a week, unless all hours worked in excess of 8 hours per day are compensated at not less than 1½ times the basic rate of pay; and (ii) specify penalties to be imposed on design

professionals and subcontractors of \$25 per worker per day for each day the worker works more than 8 hours per day and 40 hours per week in violation of California Labor Code sections 1810 through 1815.

- 8.6. Required Provisions for Subcontracts.** Contractor shall include at a minimum a copy of the following provisions in any contract they enter into with a subcontractor: California Labor Code sections 1771, 1771.1, 1775, 1776, 1777.5, 1810, 1813, 1815, 1860 and 1861.
- 8.7. Labor Code Section 1861 Certification.** Contractor in accordance with California Labor Code section 3700 is required to secure the payment of compensation of its employees and by signing this Contract, Contractor certifies that “I am aware of the provisions of Section 3700 of the California 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.”
- 8.8. Labor Compliance Program.** The City has its own Labor Compliance Program authorized in August 2011 by the DIR. The City will withhold contract payments when payroll records are delinquent or deemed inadequate by the City or other governmental entity, or it has been established after an investigation by the City or other governmental entity that underpayment(s) have occurred. For questions or assistance, please contact the City of San Diego’s Equal Opportunity Contracting Department at 619-236-6000.
- 8.9. Contractor and Subcontractor Registration Requirements.** This project is subject to compliance monitoring and enforcement by the DIR. As of March 1, 2015, no contractor or subcontractor may be listed on a bid or proposal for a public works project unless registered with the DIR pursuant to Labor Code section 1725.5. As of April 1, 2015, a contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, or enter into any contract for public work, unless currently registered and qualified to perform public work pursuant to Labor Code section 1725.5. By submitting a bid or proposal to the City, Contractor is certifying that he or she has verified that all subcontractors used on this public work project are registered with the DIR in compliance with Labor Code sections 1771.1 and 1725.5, and Contractor shall provide proof of registration to the City upon request.

 - 8.9.1.** A Contractor’s inadvertent error in listing a subcontractor who is not registered pursuant to Labor Code section 1725.5 in response to a solicitation shall not be grounds for filing a bid protest or grounds for considering the bid non-responsive provided that any of the following apply: (1) the subcontractor is registered prior to bid opening; (2) within twenty-four hours after the bid opening, the subcontractor is registered and has paid the penalty registration fee specified in Labor Code section 1725.5; or (3) the subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.

9. INSURANCE REQUIREMENTS:

- 9.1.** All certificates of insurance and endorsements required by the contract are to be provided upon issuance of the City’s Notice of Intent to Award letter.

- 9.2. Refer to sections 7-3, "LIABILITY INSURANCE", and 7-4, "WORKERS' COMPENSATION INSURANCE" of the Supplementary Special Provisions (SSP) for the insurance requirements which must be met.

10. PREQUALIFICATION OF CONTRACTORS:

- 10.1. Contractors submitting Bid must be pre-qualified for the total amount proposed, inclusive of all alternate items prior to the date of submittal. Bids from contractors who have not been pre-qualified as applicable and Bids that exceed the maximum dollar amount at which contractors are pre-qualified will be deemed **non-responsive** and ineligible for award. Complete information and prequalification questionnaires are available at:

<http://www.sandiego.gov/cip/bidopps/prequalification.shtml>

- 10.2. The completed questionnaire, financial statement, and bond letter or a copy of the contractor's SLBE-ELBE certification and bond letter, must be submitted no later than 2 weeks prior to the bid opening to the Public Works Contracts, Prequalification Program, 1010 Second Avenue, 14th Floor, San Diego, CA 92101. For additional information or the answer to questions about the prequalification program, contact David Stucky at 619-533-3474 or dstucky@sandiego.gov.

11. **REFERENCE STANDARDS:** Except as otherwise noted or specified, the Work shall be completed in accordance with the following standards:

Title	Edition	Document Number
Standard Specifications for Public Works Construction ("The GREENBOOK")	2012	PITS070112-01
City of San Diego Standard Specifications for Public Works Construction ("The WHITEBOOK")*	2012	PITS070112-02
City of San Diego Standard Drawings*	2012	PITS070112-03
Caltrans Standard Specifications	2010	PITS070112-04
Caltrans Standard Plans	2010	PITS070112-05
California MUTCD	2012	PITS070112-06
City Standard Drawings - Updates Approved For Use (when specified)*	Varies	Varies
Standard Federal Equal Employment Opportunity Construction Contract Specifications and the Equal Opportunity Clause Dated 09-11-84	1984	769023

Title	Edition	Document Number
NOTE: *Available online under Engineering Documents and References at: http://www.sandiego.gov/publicworks/edocref/index.shtml		

12. **CITY'S RESPONSES AND ADDENDA:** The City at its option, may respond to any or all questions submitted in writing, via letter, or FAX in the form of an addendum. No oral comment shall be of any force or effect with respect to this solicitation. The changes to the Contract Documents through addendum are made effective as though originally issued with the Bid. The Bidders shall acknowledge the receipt of Addenda on the form provided for this purpose in the Bid.
13. **CITY'S RIGHTS RESERVED:** The City reserves the right to cancel the Notice Inviting Bids at any time, and further reserves the right to reject submitted Bids, without giving any reason for such action, at its sole discretion and without liability. Costs incurred by the Bidder(s) as a result of preparing Bids under the Notice Inviting Bids shall be the sole responsibility of each bidder. The Notice Inviting Bids creates or imposes no obligation upon the City to enter a contract.
14. **CONTRACT PRICING FORMAT:** This solicitation is for a Lump Sum contract with Unit Price provisions as set forth in the Bid Proposal Form(s), Volume 2.
15. **SUBMITTAL OF "OR EQUAL" ITEMS:** See Section 4-1.6, "Trade Names or Equals" in The WHITEBOOK and as amended in the SSP.
16. **AWARD PROCESS:**
 - 16.1. The Award of this contract is contingent upon the Contractor's compliance with all conditions precedent to Award.
 - 16.2. Upon acceptance of a Bid, the City will prepare contract documents for execution within approximately 21 days of the date of the Bid opening and award the Contract approximately within 7 days of receipt of properly executed Contract, bonds, and insurance documents.
 - 16.3. This contract will be deemed executed, and effective, only upon the signing of the Contract by the Mayor or designee of the City.
17. **SUBCONTRACT LIMITATIONS:** The Bidder's attention is directed to Standard Specifications for Public Works Construction, Section 2-3, "SUBCONTRACTS" in The GREENBOOK and as amended in the SSP which requires the Contractor to self perform the amount therein stipulated. Failure to comply with these requirements may render the Bid **non-responsive** and ineligible for award.
18. **AVAILABILITY OF PLANS AND SPECIFICATIONS:** Contract Documents may be obtained by visiting the City's website: <http://www.sandiego.gov/cip/>. Plans and Specifications for this contract are also available for review in the office of the City Clerk or Public Works Contracts.

19. SUBMISSION OF QUESTIONS:

19.1. The Director (or designee), of the Public Works Department is the officer responsible for opening, examining, and evaluating the competitive Bids submitted to the City for the acquisition, construction and completion of any public improvement except when otherwise set forth in these documents. All questions related to this solicitation shall be submitted to:

Public Works Contracts
1010 Second Avenue, 14th Floor
San Diego, California, 92101
Attention: [Contract Specialist listed on the front cover hereof]

OR:

Email address of the Contract Specialist listed on the front cover hereof.

19.2. Questions received less than 14 days prior to the date for opening of Bids may not be considered.

19.3. Clarifications deemed by the City to be material shall be issued by Addenda and uploaded to the City's online bidding service.

19.4. Only questions answered by formal written addenda will be binding. Oral and other interpretations or clarifications will be without legal effect. It is the Bidder's responsibility to become informed of any Addenda that have been issued and to include all such information in its Bid.

20. ELIGIBLE BIDDERS: No person, firm, or corporation shall be allowed to make, file, or be interested in **more** than one (1) Bid for the same work unless alternate Bids are called for. A person, firm or corporation who has submitted a sub-proposal to a Bidder, or who has quoted prices on materials to a Bidder, is not hereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or from submitting a Bid in its own behalf. Any Bidder who submits more than one bid will result in the rejection of all bids submitted.

21. SAN DIEGO BUSINESS TAX CERTIFICATE: The Contractor and Subcontractors, not already having a City of San Diego Business Tax Certificate for the work contemplated shall secure the appropriate certificate from the City Treasurer, Civic Center Plaza, first floor and submit to the Contract Specialist upon request or as specified in the Contract Documents. Tax Identification numbers for both the Bidder and the listed Subcontractors must be submitted on the City provided forms with the Notice Inviting Bids and Contract forms.

22. PROPOSAL FORMS: Bid shall be made only upon the Bidding Documents i.e., Proposal form attached to and forming a part of the specifications. The signature of each person signing shall be in longhand.

22.1. Bidder shall complete and submit all pages in the "Bidding Document" Section (see Volume 2) as their Bid per the schedule given under "Required Documents Schedule," (see Volume 1). Bidder is requested to retain for their reference other portions of the

Contract Documents that are not required to be submitted with the Bid. The entire specifications for the bid package do not need to be submitted with the bid.

- 22.2. The City may require any Bidder to furnish a statement of experience, financial responsibility, technical ability, equipment, and references.
- 22.3. Bids and certain other forms and documents as specified in the Volume 2 of 2 of the Contract Documents shall be enclosed in a sealed envelope and shall bear the title of the work and name of the Bidder and the appropriate State Contractors License designation which the Bidder holds.
- 22.4. Bids may be withdrawn by the Bidder prior to, but not after, the time fixed for opening of Bids.

23. BIDDER'S GUARANTEE OF GOOD FAITH (BID SECURITY):

- 23.1. Bidders shall submit Bid Security at bid time. Bid Security shall be in one of the following forms: a cashier's check, or a properly certified check upon some responsible bank; or an approved corporate surety bond payable to the City of San Diego for an amount of not less than 10% of the total bid amount.
- 23.2. This check or bond, and the monies represented thereby, will be held by the City as a guarantee that the Bidder, if awarded the contract, will in good faith enter into the contract and furnish the required final performance and payment bonds.
- 23.3. The Bidder agrees that in the event of the Bidder's failure to execute this contract and provide the required final bonds, the money represented by the cashier's or certified check will remain the property of the City; and the Surety agrees that it will pay to the City the damages, not exceeding the sum of 10% of the amount of the Bid, that the City may suffer as a result of such failure.
- 23.4. A Bid received without the specified bid security may be rejected as **non-responsive**.

24. AWARD OF CONTRACT OR REJECTION OF BIDS:

- 24.1. This contract may be awarded to the lowest responsible and reliable Bidder.
- 24.2. Bidders shall complete the entire Bid schedule (also referred to as "schedule of prices" or Proposal form). Incomplete price schedules will be rejected as being non-responsive.
- 24.3. The City reserves the right to reject any or all Bids, and to waive any informality or technicality in Bids received and any requirements of these specifications as to bidding procedure.
- 24.4. Bidders will not be released on account of their errors of judgment. Bidders may be released only upon receipt by the City from the Bidder within 3 Working Days, excluding Saturdays, Sundays, and state holidays, after the opening of Bids, of written notice which includes proof of honest, credible, clerical error of material nature, free from fraud or fraudulent intent, and of evidence that reasonable care was observed in the preparation of the Bid.

- 24.5. A non-selected Bidder may protest award of the Contract to the selected Bidder by submitting a written "Notice of Intent to Protest" including supporting documentation which shall be received by Public Works Contracting Group no later than 10 days after the City's announcement of the selected Bidder or no later than 10 days from the date that the City issues notice of designation of a Bidder as non-responsible in accordance with San Diego Municipal Code Chapter 2, § 22.3029, "Protests of Contract Award."
- 24.6. The City of San Diego will not discriminate with regard to race, religious creed, color, national origin, ancestry, physical handicap, marital status, sex or age, in the award of contracts.
- 24.7. Each Bid package properly executed as required by these specifications shall constitute a firm offer, which may be accepted by the City within the time specified in the Proposal.
- 24.8. The City reserves the right to evaluate all Bids and determine the lowest Bidder on the basis of any proposed alternates, additive items or options, at its discretion that will be disclosed in the Volume 2 of 2.

25. BID RESULTS:

- 25.1. The Bid opening by the City shall constitute the public announcement of the Apparent Low Bidder. In the event that the Apparent Low Bidder is subsequently deemed non-responsive or non-responsible, a public announcement will be posted in the City's web page <http://www.sandiego.gov/cip/index.shtml>, with the name of the newly designated Apparent Low Bidder.
- 25.2. To obtain Bid results, either attend Bid opening, review the results on the City's web site, or provide a self-addressed, stamped envelope, referencing Bid number, and Bid tabulation will be mailed to you upon verification of extensions. Bid results cannot be given over the telephone.

26. THE CONTRACT:

- 26.1. The Bidder to whom award is made shall execute a written contract with the City of San Diego and furnish good and approved bonds and insurance certificates specified by the City within 14 days after receipt by Bidder of a form of contract for execution unless an extension of time is granted to the Bidder in writing.
- 26.2. If the Bidder takes longer than 14 days to fulfill these requirements, then the additional time taken shall be added to the Bid guarantee. The Contract shall be made in the form adopted by the City, which includes the provision that no claim or suit whatsoever shall be made or brought by Contractor against any officer, agent, or employee of the City for or on account of anything done or omitted to be done in connection with this contract, nor shall any such officer, agent, or employee be liable hereunder.
- 26.3. If the Bidder to whom the award is made fails to enter into the contract as herein provided, the award may be annulled and the Bidder's Guarantee of Good Faith will be subject to forfeiture. An award may be made to the next lowest responsible and reliable Bidder who shall fulfill every stipulation embraced herein as if it were the party to whom the first award was made.

- 26.4. Pursuant to the San Diego City Charter section 94, the City may only award a public works contract to the lowest responsible and reliable Bidder. The City will require the Apparent Low Bidder to (i) submit information to determine the Bidder's responsibility and reliability, (ii) execute the Contract in form provided by the City, and (iii) furnish good and approved bonds and insurance certificates specified by the City within 14 Days, unless otherwise approved by the City, in writing after the Bidder receives notification from the City, designating the Bidder as the Apparent Low Bidder and formally requesting the above mentioned items.
- 26.5. The award of the Contract is contingent upon the satisfactory completion of the above mentioned items and becomes effective upon the signing of the Contract by the Mayor or designee. If the Apparent Low Bidder does not execute the Contract or submit required documents and information, the City may award the Contract to the next lowest responsible and reliable Bidder who shall fulfill every condition precedent to award. A corporation designated as the Apparent Low Bidder shall furnish evidence of its corporate existence and evidence that the officer signing the Contract and bond for the corporation is duly authorized to do so.
27. **EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK:** The Bidder shall examine carefully the Project Site, the Plans and Specifications, other materials as described in the Special Provisions, Section 2-7, and the proposal forms (e.g., Bidding Documents). The submission of a Bid shall be conclusive evidence that the Bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of Work, the quantities of materials to be furnished, and as to the requirements of the Bidding Documents Proposal, Plans, and Specifications.
28. **CITY STANDARD PROVISIONS.** This contract is subject to the following standard provisions. See The WHITEBOOK for details.
- 28.1. The City of San Diego Resolution No. R-277952 adopted on May 20, 1991 for a Drug-Free Workplace.
- 28.2. The City of San Diego Resolution No. R-282153 adopted on June 14, 1993 related to the Americans with Disabilities Act.
- 28.3. The City of San Diego Municipal Code §22.3004 for Pledge of Compliance.
- 28.4. The City of San Diego's Labor Compliance Program and the State of California Labor Code §§1771.5(b) and 1776.
- 28.5. Sections 1777.5, 1777.6, and 1777.7 of the State of California Labor Code concerning the employment of apprentices by contractors and subcontractors performing public works contracts.
- 28.6. The City's Equal Benefits Ordinance (EBO), Chapter 2, Article 2, Division 43 of The San Diego Municipal Code (SDMC).
- 28.7. The City's Information Security Policy (ISP) as defined in the City's Administrative Regulation 90.63.

29. PRE-AWARD ACTIVITIES:

- 29.1. The selected contractor by the City to execute a contract for this Work shall provide the information required within the time specified in "Required Documents," of this bid package. Failure to provide the information within the time specified may result in the Bid being rejected as **non-responsive**.
- 29.2. If the Bid is rejected as non-responsive, the selected contractor by the City to execute a contract for this Work shall forfeit the required Bid. The decision that the selected contractor by the City to execute a contract for this Work is non-responsive for failure to provide the information required within the time specified shall be at the sole discretion of the City.

30. REQUIRED DOCUMENT SCHEDULE:

- 30.1. The Bidder's attention is directed to the City's Municipal Code §22.0807(e), (3)-(5) for important information regarding grounds for debarment for failure to submit required documentation.
- 30.2. The specified Equal Opportunity Contracting Program (EOCP) forms are available for download from the City's web site at:

<http://www.sandiego.gov/eoc/forms/index.shtml>

ITEM	WHEN DUE	FROM	DOCUMENT TO BE SUBMITTED
1.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Bid
2.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Bid Bond
3.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Non-collusion Affidavit to be Executed By Bidder and Submitted with Bid under 23 USC 112 and PCC 7106
4.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Contractors Certification of Pending Actions
5.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Equal Benefits Ordinance Certification of Compliance
6.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Form AA35 - List of Subcontractors
7.	BID SUBMITTAL DATE/TIME	ALL BIDDERS	Form AA40 - Named Equipment/Material Supplier List

ITEM	WHEN DUE	FROM	DOCUMENT TO BE SUBMITTED
8.	WITHIN 3 WORKING DAYS OF BID OPENING WITH GOOD FAITH EFFORT DOCUMENTATION	ALL BIDDERS	SLBE Good Faith Efforts Documentation
9.	WITHIN 3 WORKING DAYS OF BID OPENING WITH GOOD FAITH EFFORT DOCUMENTATION	ALL BIDDERS	Form AA60 – List of Work Made Available
10.	WITHIN 3 WORKING DAYS OF BID OPENING WITH GOOD FAITH EFFORT DOCUMENTATION	ALL BIDDERS	Proof of Valid DBE-MBE-WBE-DVBE Certification Status e.g., Certs.
11.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Names of the principal individual owners of the Apparent Low Bidder
12.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	If the Contractor is a Joint Venture: <ul style="list-style-type: none"> • Joint Venture Agreement • Joint Venture License
13.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Form BB05 - Work Force Report
14.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contract Forms - Agreement
15.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contract Forms - Payment and Performance Bond
16.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Certificates of Insurance and Endorsements
17.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractor Certification - Drug-Free Workplace

ITEM	WHEN DUE	FROM	DOCUMENT TO BE SUBMITTED
18.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractor Certification - American with Disabilities Act
19.	WITHIN 10 WORKING DAYS AFTER RECEIPT BY BIDDER OF CONTRACT FORMS	APPARENT LOW BIDDER	Contractors Standards - Pledge of Compliance

CONTRACT FORMS
AGREEMENT

CONTRACT FORMS

CONSTRUCTION CONTRACT

This contract is made and entered into between THE CITY OF SAN DIEGO, a municipal corporation, herein called "City", and TechCom International, Corp., herein called "Contractor" for construction of Mission Beach Boardwalk Bulkhead; Bid No. K-15-1142-DBB-3; in the amount of Two Million One Hundred Seventy Four Thousand Three Hundred Forty-Six Dollars and .68/100 (\$2,174,346.68), which is comprised of the Base Bid Only.

IN CONSIDERATION of the payments to be made hereunder and the mutual undertakings of the parties hereto, City and Contractor agree as follows:

1. The following are incorporated into this contract as though fully set forth herein:
 - (a) The attached Faithful Performance and Payment Bonds.
 - (b) The attached Proposal included in the Bid documents by the Contractor.
 - (c) Reference Standards listed in the Notice Inviting Bids and the Supplementary Special Provisions (SSP).
 - (d) That certain documents entitled Mission Beach Boardwalk Bulkhead Project, on file in the office of the City Clerk Department as Document No. S-00726, as well as all matters referenced therein.
2. The Contractor shall perform and be bound by all the terms and conditions of this contract and in strict conformity therewith shall perform and complete in a good and workmanlike manner Mission Beach Boardwalk Bulkhead; Bid Number K-15-1142-DBB-3, San Diego, California.
3. For such performances, the City shall pay to Contractor the amounts set forth at the times and in the manner and with such additions or deductions as are provided for in this contract, and the Contractor shall accept such payment in full satisfaction of all claims incident to such performances.
4. No claim or suit whatsoever shall be made or brought by Contractor against any officer, agent, or employee of the City for or on account of anything done or omitted to be done in connection with this contract, nor shall any such officer, agent, or employee be liable hereunder.
5. This contract is effective as of the date that the Mayor or designee signs the agreement.

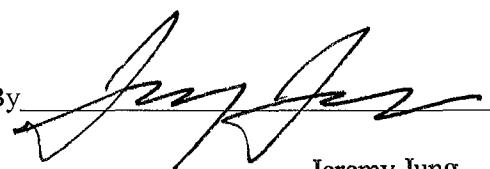
CONTRACT FORMS (continued)

IN WITNESS WHEREOF, this Agreement is signed by the City of San Diego, acting by and through its Mayor or designee, pursuant to Municipal Code 22.3107 authorizing such execution.

THE CITY OF SAN DIEGO

APPROVED AS TO FORM

By 

Jan I. Goldsmith, City Attorney
By 

Print Name: Stephen Samara,
Principal Contract Specialist (Acting)

Print Name: Jeremy Jung
Deputy City Attorney

Date: 6-15-15

Date: 6-16-15

CONTRACTOR

By 

Print Name: BOB KATEBIAN

Title: PRESIDENT

Date: APRIL 20, 2015

City of San Diego License No.: B 2001010548

State Contractor's License No.: 824687

CONTRACT FORMS

ATTACHMENTS

CONTRACT FORMS ATTACHMENTS
PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND

FAITHFUL PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND:

TechCom International Corporation dba Solar 2 Power, a corporation, as principal, and United Fire & Casualty Company, a corporation authorized to do business in the State of California, as Surety, hereby obligate themselves, their successors and assigns, jointly and severally, to The City of San Diego a municipal corporation in the sum of Two Million One Hundred Seventy Four Thousand Three Hundred Forty Six & 68/100 Dollars (\$2,174,346.68) for the faithful performance of the annexed contract, and in the sum of Two Million One Hundred Seventy Four Thousand Three Hundred Forty Six & 68/100 Dollars (\$2,174,346.68) for the benefit of laborers and materialmen designated below.

Conditions:

If the Principal shall faithfully perform the annexed contract **Mission Beach Boardwalk Bulkhead**; Bid Number **K-15-1142-DBB-3**, San Diego, California then the obligation herein with respect to a faithful performance shall be void; otherwise it shall remain in full force.

If the Principal shall promptly pay all persons, firms and corporations furnishing materials for or performing labor in the execution of this contract, and shall pay all amounts due under the California Unemployment Insurance Act then the obligation herein with respect to laborers and materialmen shall be void; otherwise it shall remain in full force.

The obligation herein with respect to laborers and materialmen shall inure to the benefit of all persons, firms and corporations entitled to file claims under the provisions of Chapter 3 of Division 5 of Title I of the Government Code of the State of California or under the provisions of Section 3082 et seq. of the Civil Code of the State of California.

Changes in the terms of the annexed contract or specifications accompanying same or referred to therein shall not affect the Surety's obligation on this bond, and the Surety hereby waives notice of same.

CONTRACT FORMS ATTACHMENTS (continued)
PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND

The Surety shall pay reasonable attorney's fees should suit be brought to enforce the provisions of this bond.

Dated April 20, 2015

Approved as to Form

TechCom International Corporation dba Solar 2 Power
Principal

By B. Katebian

BOB KATEBIAN
Printed Name of Person Signing for Principal

Jan I. Goldsmith, City Attorney

By [Signature]
Deputy City Attorney

United Fire & Casualty Company
Surety

By [Signature]
Attorney-in-fact Yung T. Mullick

Approved:

By [Signature]
Mayor or Designee

118 Second Avenue SE
Local Address of Surety

Cedar Rapids, IA 52407
Local Address (City, State) of Surety

(800) 553-7937
Local Telephone No. of Surety

Premium \$ 23,943.00

Bond No. 54-203486

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

County of Orange

On April 20, 2015 before me, Terah Johnston, Notary Public,
Date Insert Name of Notary exactly as it appears on the official seal

personally appeared Yung T. Mullick

Name(s) of Signer(s)



Place Notary Seal Above

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature Terah Johnston
Signature of Notary Public Terah Johnston

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of the form to another document.

Description of Attached Document

Title or Type of Document: Performance Bond and Labor and Materialmen's Bond 54-203486

Document Date: April 20, 2015 Number of Pages: 2

Signer(s) Other Than Named Above: None

Capacity(ies) Claimed by Signer(s)

Signer's Name: Yung T. Mullick

- Individual
 Corporate Officer — Title(s): _____
 Partner Limited General
 Attorney in Fact
 Trustee
 Guardian or Conservator
 Other: _____

RIGHT THUMBPRINT
OF SIGNER

Top of thumb here

Signer is Representing:
United Fire & Casualty
Company

Signer's Name: _____

- Individual
 Corporate Officer — Title(s): _____
 Partner Limited General
 Attorney in Fact
 Trustee
 Guardian or Conservator
 Other: _____

RIGHT THUMBPRINT
OF SIGNER

Top of thumb here

Signer is Representing:

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

County of ORANGE

On APRIL 20, 2015 before me, JENNIFER C. ANAYA, NOTARY PUBLIC, Notary Public,
Date Insert Name of Notary exactly as it appears on the official seal

personally appeared BOB KATEBIAN

Name(s) of Signer(s)

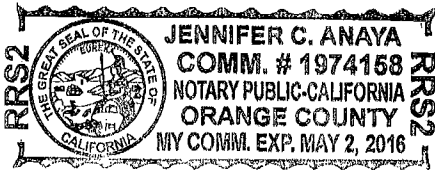
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal

Signature

Signature of Notary Public JENNIFER C. ANAYA



Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of the form to another document.

Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____

- Individual
- Corporate Officer — Title(s): _____
- Partner Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____

RIGHT THUMBPRINT
OF SIGNER

Top of thumb here

Signer is Representing:

Signer's Name: _____

- Individual
- Corporate Officer — Title(s): _____
- Partner Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____

RIGHT THUMBPRINT
OF SIGNER

Top of thumb here

Signer is Representing:



UNITED FIRE & CASUALTY COMPANY, CEDAR RAPIDS, IA
 UNITED FIRE & INDEMNITY COMPANY, GALVESTON, TX
 FINANCIAL PACIFIC INSURANCE COMPANY, ROCKLIN, CA
 CERTIFIED COPY OF POWER OF ATTORNEY

Inquiries: Surety Department
 118 Second Ave SE
 Cedar Rapids, IA 52401

(original on file at Home Office of Company – See Certification)

KNOW ALL PERSONS BY THESE PRESENTS, That UNITED FIRE & CASUALTY COMPANY, a corporation duly organized and existing under the laws of the State of Iowa; UNITED FIRE & INDEMNITY COMPANY, a corporation duly organized and existing under the laws of the State of Texas; and FINANCIAL PACIFIC INSURANCE COMPANY, a corporation duly organized and existing under the laws of the State of California (herein collectively called the Companies), and having their corporate headquarters in Cedar Rapids, State of Iowa, does make, constitute and appoint JAMES W. MOILANEN, OR YUNG T. MULLICK, OR JENNIFER C. ANAYA, ALL INDIVIDUALLY OF MISSION VIEJO CA

their true and lawful Attorney(s)-in-Fact with power and authority hereby conferred to sign, seal and execute in its behalf all lawful bonds, undertakings and other obligatory instruments of similar nature provided that no single obligation shall exceed \$15,000,000.00 and to bind the Companies thereby as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Companies and all of the acts of said Attorney, pursuant to the authority hereby given and hereby ratified and confirmed

The Authority hereby granted shall expire the 22nd day of October, 2016 unless sooner revoked by UNITED FIRE & CASUALTY COMPANY, UNITED FIRE & INDEMNITY COMPANY, AND FINANCIAL PACIFIC INSURANCE COMPANY.

This Power of Attorney is made and executed pursuant to and by authority of the following bylaw duly adopted on May 15, 2013, by the Boards of Directors of UNITED FIRE & CASUALTY COMPANY, UNITED FIRE & INDEMNITY COMPANY, and FINANCIAL PACIFIC INSURANCE COMPANY.

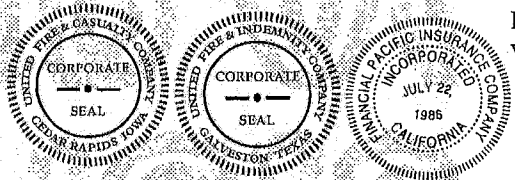
“Article VI – Surety Bonds and Undertakings”

Section 2: Appointment of Attorney-in-Fact. “The President or any Vice President, or any other officer of the Companies may, from time to time, appoint by written certificates attorneys-in-fact to act in behalf of the Companies in the execution of policies of insurance, bonds, undertakings and other obligatory instruments of like nature. The signature of any officer authorized hereby, and the Corporate seal, may be affixed by facsimile to any power of attorney or special power of attorney or certification of either authorized hereby; such signature and seal, when so used, being adopted by the Companies as the original signature of such officer and the original seal of the Companies, to be valid and binding upon the Companies with the same force and effect as though manually affixed. Such attorneys-in-fact, subject to the limitations set forth in their respective certificates of authority shall have full power to bind the Companies by their signature and execution of any such instruments and to attach the seal of the Companies thereto. The President or any Vice President, the Board of Directors or any other officer of the Companies may at any time revoke all power and authority previously given to any attorney-in-fact

IN WITNESS WHEREOF, the COMPANIES have each caused these presents to be signed by its vice president and its corporate seal to be hereto affixed this 22nd day of October, 2014

UNITED FIRE & CASUALTY COMPANY
 UNITED FIRE & INDEMNITY COMPANY
 FINANCIAL PACIFIC INSURANCE COMPANY

By: *Dennis J. Richman* Vice President



State of Iowa, County of Linn, ss:
 On 22nd day of October, 2014, before me personally came Dennis J. Richmann

to me known, who being by me duly sworn, did depose and say; that he resides in Cedar Rapids, State of Iowa; that he is a Vice President of UNITED FIRE & CASUALTY COMPANY, a Vice President of UNITED FIRE & INDEMNITY COMPANY, and a Vice President of FINANCIAL PACIFIC INSURANCE COMPANY the corporations described in and which executed the above instrument; that he knows the seal of said corporations; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporations and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporations

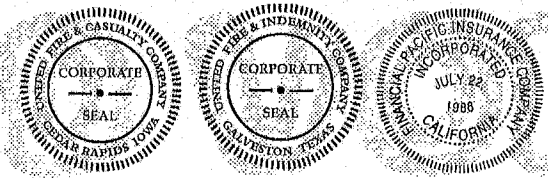


Judith A. Davis Notary Public
 My commission expires: 4/23/2015

I, David A. Lange, Secretary of UNITED FIRE & CASUALTY COMPANY and Assistant Secretary of UNITED FIRE & INDEMNITY COMPANY, and Assistant Secretary of FINANCIAL PACIFIC INSURANCE COMPANY, do hereby certify that I have compared the foregoing copy of the Power of Attorney and affidavit, and the copy of the Section of the bylaws and resolutions of said Corporations as set forth in said Power of Attorney, with the ORIGINALS ON FILE IN THE HOME OFFICE OF SAID CORPORATIONS, and that the same are correct transcripts thereof, and of the whole of the said originals, and that the said Power of Attorney has not been revoked and is now in full force and effect

In testimony whereof I have heretunto subscribed my name and affixed the corporate seal of the said Corporations this 20 day of April, 2015.

By: *David A. Lange*
 Secretary, UF&C
 Assistant Secretary, UF&I/PIC



CONTRACTOR CERTIFICATION

DRUG-FREE WORKPLACE

PROJECT TITLE: Mission Beach Boardwalk Bulkhead

I hereby certify that I am familiar with the requirements of San Diego City Council Policy No. 100-17 regarding Drug-Free Workplace as outlined in the WHITEBOOK, Section 7-13.3, "Drug-Free Workplace", of the project specifications, and that;

TECHCOM INTERNATIONAL dba SOLAR 2 POWER

(Name under which business is conducted)

has in place a drug-free workplace program that complies with said policy. I further certify that each subcontract agreement for this project contains language which indicates the subcontractor's agreement to abide by the provisions of subdivisions a) through c) of the policy as outlined.

Signed

B. Katebian

CA LICENSE # 824687

Printed Name

BOB KATEBIAN

Title

PRESIDENT

CONTRACTOR CERTIFICATION

AMERICAN WITH DISABILITIES ACT (ADA) COMPLIANCE CERTIFICATION

PROJECT TITLE: Mission Beach Boardwalk Bulkhead

I hereby certify that I am familiar with the requirements of San Diego City Council Policy No. 100-4 regarding the American With Disabilities Act (ADA) outlined in the WHITEBOOK, Section 7-13.2, "American With Disabilities Act", of the project specifications, and that;

TECHCOM INTERNATIONAL dba SOLAR 2 POWER
(Name under which business is conducted)

has in place workplace program that complies with said policy. I further certify that each subcontract agreement for this project contains language which indicates the subcontractor's agreement to abide by the provisions of the policy as outlined.

Signed B. Katebian
CA LICENSE # 824687
Printed Name BOB KATEBIAN
Title PRESIDENT

CONTRACTOR CERTIFICATION

CONTRACTOR STANDARDS – PLEDGE OF COMPLIANCE

PROJECT TITLE: Mission Beach Boardwalk Bulkhead

I declare under penalty of perjury that I am authorized to make this certification on behalf of ~~TECHCOM INTERNATIONAL~~ BOB SOLARI as ^{owner} Contractor, that I am familiar with the requirements of City of San Diego Municipal Code § 22.3224 regarding Contractor Standards as outlined in the WHITEBOOK, Section 7-13.4, ("Contractor Standards"), of the project specifications, and that Contractor has complied with those requirements.

I further certify that each of the Contractor's subcontractors whose subcontracts are greater than \$50,000 in value has completed a Pledge of Compliance attesting under penalty of perjury of having complied with City of San Diego Municipal Code § 22.3224.

Dated this 20th Day of APRIL, 2015.

Signed B. Katchian
CA LIC. # 824687

Printed Name BOB KATEBIAN

Title PRESIDENT

AFFIDAVIT OF DISPOSAL

WHEREAS, on the _____ DAY OF _____, 2_____ the undersigned entered into and executed a contract with the City of San Diego, a municipal corporation, for:

Mission Beach Boardwalk Bulkhead

(Name of Project)

as particularly described in said contract and identified as Bid No. **K-15-1142-DBB-3**; SAP No. (WBS/IO/CC) **S-00726**; and **WHEREAS**, the specification of said contract requires the Contractor to affirm that "all brush, trash, debris, and surplus materials resulting from this project have been disposed of in a legal manner"; and **WHEREAS**, said contract has been completed and all surplus materials disposed of:

NOW, THEREFORE, in consideration of the final payment by the City of San Diego to said Contractor under the terms of said contract, the undersigned Contractor, does hereby affirm that all surplus materials as described in said contract have been disposed of at the following location(s)

and that they have been disposed of according to all applicable laws and regulations.

Dated this _____ DAY OF _____, _____.

by _____ Contractor

ATTEST:

State of _____
County of _____

On this _____ DAY OF _____, 2_____, before the undersigned, a Notary Public in and for said County and State, duly commissioned and sworn, personally appeared _____ known to me to be the _____ Contractor named in the foregoing Release, and whose name is subscribed thereto, and acknowledged to me that said Contractor executed the said Release.

Notary Public in and for said County and State

COMPANY LETTERHEAD

CERTIFICATE OF COMPLIANCE

Materials and Workmanship Compliance

For Contract or Task _____

I certify that the material listed below complies with the materials and workmanship requirements of the Caltrans Contract Plans, Special Provisions, Standard Specifications, and Standard Plans for the contract listed above.

I also certify that I am an official representative for _____, the manufacturer of the material listed above. Furthermore, I certify that where California test methods, physical or chemical test requirements are part of the specifications, that the manufacturer has performed the necessary quality control to substantiate this certification.

Material Description:

Manufacturer: _____
Model: _____
Serial Number (if applicable) _____
Quantity to be supplied: _____
Remarks: _____

Signed by: _____

Printed Name: _____

Title: _____

Company: _____

Date: _____

ATTACHMENTS

ATTACHMENT A

SCOPE OF WORK

SCOPE OF WORK

1. **SCOPE OF WORK:** The Work involves furnishing all labor, materials, equipment, services, and other incidental works and appurtenances for the construction of the Project as described below:

Project plans to replace in kind 1670 LF of the existing parapet sea wall and walkway of the Mission Beach Boardwalk spanning from south of Ventura Place to San Fernando Place. Other work includes 4 ADA compliant ramps at the beach openings and replacement of light poles.

- 1.1. The Work shall be performed in accordance with:

- 1.1.1. The Notice Inviting Bids and Plans numbered **37271-1-D** through **37271-35-D**, inclusive.

2. **CONSTRUCTION COST:** The City's estimated construction cost for this contract is **\$2,040,00.00**

3. **LOCATION OF WORK:** The location of the Work is as follows:

Mission Beach Boardwalk spanning 1,670 feet from south of Ventura Place to San Fernando Place.

4. **CONTRACT TIME:** The Contract Time for completion of the Work shall be **120 Working Days**. Commencement of work shall not begin until the end of the 2015 summer beach moratorium.

5. **CONTRACTOR'S LICENSE CLASSIFICATION:** In accordance with the provisions of California Law, the Contractor shall possess valid appropriate license(s) at the time that the Bid is submitted. Failure to possess the specified license(s) shall render the Bid as **non-responsive** and shall act as a bar to award of the Contract to any Bidder not possessing required license(s) at the time of Bid.

- 5.1. The City has determined the following licensing classification(s) for this contract:

- CLASS A

ATTACHMENT B

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ATTACHMENT C

EQUAL OPPORTUNITY CONTRACTING PROGRAM

EQUAL OPPORTUNITY CONTRACTING PROGRAM

1. To The WHITEBOOK, Chapter 10, Sections D and E, DELETE each in its entirety, and SUBSTITUTE with the following:

D. CITY'S EQUAL OPPORTUNITY COMMITMENT.

1. Nondiscrimination in Contracting Ordinance.

1. The Contractor, Subcontractors and Suppliers shall comply with requirements of the City's Nondiscrimination in Contracting Ordinance, San Diego Municipal Code §§22.3501 through 22.3517.

The Contractor shall not discriminate on the basis of race, gender, religion, national origin, ethnicity, sexual orientation, age, or disability in the solicitation, selection, hiring, or treatment of subcontractors, vendors, or suppliers. The Contractor shall provide equal opportunity for subcontractors to participate in subcontracting opportunities. The Contractor understands and agrees that violation of this clause shall be considered a material breach of the contract and may result in contract termination, debarment, or other sanctions.

The Contractor shall include the foregoing clause in all contracts between the Contractor and Subcontractors and Suppliers.

2. Disclosure of Discrimination Complaints. As part of its Bid or Proposal, the Bidder shall provide to the City a list of all instances within the past 10 years where a complaint was filed or pending against Bidder in a legal or administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors, or suppliers, and a description of the status or resolution of that complaint, including any remedial action taken.
3. Upon the City's request, the Contractor agrees to provide to the City, within 60 days, a truthful and complete list of the names of all Subcontractors and Suppliers that the Contractor has used in the past 5 years on any of its contracts that were undertaken within San Diego County, including the total dollar amount paid by the Contractor for each subcontract or supply contract.
4. The Contractor further agrees to fully cooperate in any investigation conducted by the City pursuant to the City's Nondiscrimination in Contracting Ordinance, Municipal Code §§22.3501 through 22.3517. The Contractor understands and agrees that violation of this clause shall be considered a material breach of the Contract and may result in remedies being ordered against the Contractor up to and including contract termination, debarment and other sanctions for violation of the provisions of the Nondiscrimination in Contracting Ordinance. The Contractor further understands and agrees that the procedures, remedies and sanctions provided for in the Nondiscrimination in Contracting Ordinance apply only to violations of the Ordinance.

E. EQUAL EMPLOYMENT OPPORTUNITY OUTREACH PROGRAM.

1. The Contractor, Subcontractors and Suppliers shall comply with the City's Equal Employment Opportunity Outreach Program, San Diego Municipal Code §§22.2701 through 22.2707.

The Contractor shall not discriminate against any employee or applicant for employment on any basis prohibited by law. Contractor shall provide equal opportunity in all employment practices. Prime Contractor shall ensure their subcontractors comply with this program. Nothing in this section shall be interpreted to hold a prime contractor liable for any discriminatory practice of its subcontractors.

The Contractor shall include the foregoing clause in all contracts between the Contractor and Subcontractors and Suppliers.

2. If the Contract is competitively solicited, the selected Bidder shall submit a Work Force Report (Form BB05), within 10 Working Days after receipt by the Bidder of Contract forms to the City for approval as specified in the Notice of Intent to Award letter from the City.
3. If a Work Force Report is submitted, and the City determines there are under-representations when compared to County Labor Force Availability data, the selected Bidder shall submit an Equal Employment Opportunity Plan.
4. If the selected Bidder submits an Equal Employment Opportunity Plan, it shall include the following assurances:
 1. The Contractor shall maintain a working environment free of discrimination, harassment, intimidation and coercion at all sites and in all facilities at which the Contractor's employees are assigned to work.
 2. The Contractor reviews its EEO Policy, at least annually, with all on-site supervisors involved in employment decisions.
 3. The Contractor disseminates and reviews its EEO Policy with all employees at least once a year, posts the policy statement and EEO posters on all company bulletin boards and job sites, and documents every dissemination, review and posting with a written record to identify the time, place, employees present, subject matter, and disposition of meetings.
 4. The Contractor reviews, at least annually, all supervisors' adherence to and performance under the EEO Policy and maintains written documentation of these reviews.
 5. The Contractor discusses its EEO Policy Statement with subcontractors with whom it anticipates doing business, includes the EEO Policy Statement in its subcontracts, and provides such documentation to the City upon request.

6. The Contractor documents and maintains a record of all bid solicitations and outreach efforts to and from subcontractors, contractor associations and other business associations.
7. The Contractor disseminates its EEO Policy externally through various media, including the media of people of color and women, in advertisements to recruit, maintains files documenting these efforts, and provides copies of these advertisements to the City upon request.
8. The Contractor disseminates its EEO Policy to union and community organizations.
9. The Contractor provides immediate written notification to the City when any union referral process has impeded the Contractor's efforts to maintain its EEO Policy.
10. The Contractor maintains a current list of recruitment sources, including those outreaching to people of color and women, and provides written notification of employment opportunities to these recruitment sources with a record of the organizations' responses.
11. The Contractor maintains a current file of names, addresses and phone numbers of each walk-in applicant, including people of color and women, and referrals from unions, recruitment sources, or community organizations with a description of the employment action taken.
12. The Contractor encourages all present employees, including people of color and women employees, to recruit others.
13. The Contractor maintains all employment selection process information with records of all tests and other selection criteria.
14. The Contractor develops and maintains documentation for on-the-job training opportunities, participates in training programs, or both for all of its employees, including people of color and women, and establishes apprenticeship, trainee, and upgrade programs relevant to the Contractor's employment needs.
15. The Contractor conducts, at least annually, an inventory and evaluation of all employees for promotional opportunities and encourages all employees to seek and prepare appropriately for such opportunities.
16. The Contractor ensures the company's working environment and activities are non-segregated except for providing separate or single-user toilets and necessary changing facilities to assure privacy between the sexes.

ATTACHMENT D

INTENTIONALLY LEFT BLANK

ATTACHMENT E

SUPPLEMENTARY SPECIAL PROVISIONS

SUPPLEMENTARY SPECIAL PROVISIONS

The following Supplementary Special Provisions (SSP) modifies the following documents:

- 1) Standard Specifications for Public Works Construction (The GREENBOOK) currently in effect.
 - 2) The City of San Diego Standard Specifications for Public Works Construction (The WHITEBOOK).
-

SECTION 2 - SCOPE AND CONTROL OF WORK

2-3.2 Self Performance. DELETE in its entirety and SUBSTITUTE with the following:

1. You must perform, with your own organization, Contract work amounting to at least 50% of the base bid alone or base bid and any additive or deductive alternate(s) that together when added or deducted form the basis of award.
2. The self performance percentage requirement will be waived for contracts when a "B" License is required or allowed.

2-5.3.1 General. To the City Supplement, ADD the following

7. For products for which an AML is available, products listed in the AML shall be used. A submittal review will be conducted for products not identified on an AML on a case-by-case basis when:
 - a) The product type or category is not in the AML.
 - b) The AML does not list at least two available manufacturers of the product.
 - c) The material or manufacturer listed in the AML is no longer available. Documentation to substantiate the product is no longer available or in production is required as part of the submittal.

In the case of conducting a submittal review when required by the Plans or Special Provisions, or when requested by the Engineer, all submittals shall be accompanied by the City's submittal form.

The Product Submittal Form is available for download at:

<http://www.sandiego.gov/publicworks/edocref/index.shtml>

2-7 SUBSURFACE DATA. ADD the following:

4. In preparation of the Contract Documents, the designer has relied upon the following reports of explorations and tests of subsurface conditions at the Work Site:

1. Report of Observations and Conclusions Engineering Consultation Seawall and Boardwalk Integrity Study.
5. The report(s) listed above is(are) available for review by contacting the City Project Manager or visiting:

<ftp://ftp.sannet.gov/OUT/ECP/2-7%20SUBSURFACE%20DATA/Mission%20Beach%20Boardwalk%20Bulkhead%20Phases%201%20and%202/>

SECTION 4 - CONTROL OF MATERIALS

4-1.3.4 Inspection Paid For By the Contractor. To the City Supplement,, ADD the following:

Special Inspection shall be in accordance with the California Building Code and the following:

1. Concrete construction- Section 1704.4 and table 1704.4
2. Pile foundations- Section 1704.8 and table 1704.8.
3. Post installed adhesive for rebar.
4. Contractor or construction manager shall provide a written statement acknowledging special inspections, stating quality control procedures including method, frequency and distribution of reports. The statement shall also identify individuals exercising control including qualifications and position in organization. This shall be submitted prior to the start of work.
5. A certificate of satisfactory completion of work requiring special inspection must be completed and submitted to the inspection services division.

Table 1704.4

REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD*	IBC REFERENCE
1) Inspection of reinforcing steel and placement.	—	X	ACI 318: 3.5, 7.1-7.7	1913.4

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD*	IBC REFERENCE
2) Inspection of anchors and rebar installed in hardened concrete.	—	X	ACI 318: 3.8.6, 8.1.3, 21.2.8	1912.1
3) Verifying use of required design mix.	—	X	ACI 318: CH 4, 5.2-5.4	1904.2.2, 1913.2, 1913.3
4) At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172, ASTM C 31, ACI 318: 5.6, 5.8	1913.10
5) Inspection of concrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1913.6, 1913.7, 1913.8
6) Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI: 5.11-5.13	1913.9

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD*	IBC REFERENCE
7) Verification of in-situ concrete strength, and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 6.2	—
8) Inspect Formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318: 6.1.1	—

*When applicable, see also Section 1707.1, special inspection for seismic resistance.

TABLE 1704.7 REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1) Verify excavations are extended to proper depth and have reached proper material.	_____	X
2) Perform classification and testing of compacted fill materials.	_____	X
3) Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	_____
4) Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.	_____	X

TABLE 1704.8

REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1) Verify element materials, sizes and lengths comply with the requirements.	X	—
2) Determine capacities of test elements and conduct additional load tests, as required.	X	—
3) Observe driving operations and maintain complete and accurate records for each element.	X	—
4) Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	X	—

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
5) For concrete elements and concrete-filled elements, perform additional inspections in accordance with Section 1704.4.	—	—
6) For specialty elements, perform additional inspections as determined by the registered design professional in responsible charge.	—	—

Special Inspection (Continued):

- A. The special inspections listed are in addition to the called inspections required by section 108 of the CBS, as amended. Special inspection is not a substitute for inspection by a city inspector.
- B. Continuous inspection is always required during the performance of the work unless otherwise specified. When work in more than one category of work requiring special inspection is to be performed simultaneously, or the geographic location of the work is such that it cannot be continuously observed in accordance with the provisions of CBC section 1701.6.1, it is the agent’s responsibility to employ a sufficient number of inspectors to assure that all the work is inspected in accordance with those provisions.
- C. The special inspectors must be certified by the City of San Diego to perform the type of inspection specified. Exceptions:
 - 1. When waived by the Building Official.
- D. It is the responsibility of the contractor to notify the special inspector or inspection agency at least one working day prior to performing any work that requires special inspection.
- E. Specially inspected work that is installed or covered without the approval of the City Inspector is subject to removal or exposure.
- F. The special inspector shall submit in writing a report of observations and testing for each inspection.

- G. The inspector shall report in advance their assignment to the City of San Diego Building Inspection Department.
- H. A certificate of satisfactory completion of work requiring special inspection must be completed and submitted to the field inspection division.
- I. Fabricator must be registered and approved by the City of San Diego, development services, for the fabrication of members and assemblies on the premises of the fabricator's shop.
- J. Fabricator shall submit an "Application to Perform Off-site Fabrication" to the inspection services division for approval prior to the commencement of fabrication.
- K. Fabricator shall submit a "Certificate of Compliance for Off-site Fabrication" to the inspection services division prior to erection of fabricated items and assemblies.
- L. Fabrication of members and assemblies done in fabricator's shop approved by inspection services need not have continuous or periodic special inspection. At completion of fabrication, the approved fabricator shall submit the "Certificate of Compliance" form to inspection services.
- M. A certificate of compliance for off-site fabrication must be completed and submitted to the field inspection division prior to erection of prefabricated components.
- N. The construction materials testing laboratory must be approved by the City of San Diego, development services, for testing of materials, systems, components and equipment.

4-1.3.6 Preapproved Materials. To the City Supplement, ADD the following:

- 3. You shall submit in writing a list of all products to be incorporated in the Work that are on the AML.

4-1.6 Trade Names or Equals. ADD the following:

You must submit your list of proposed substitutions for "an equal" ("or equal") item(s) **no less than 15 Working Days prior to Bid due date/** and on the City's Product Submittal Form available at.

<http://www.sandiego.gov/publicworks/edocref/index.shtml>

SECTION 6 - PROSECUTION, PROGRESS AND ACCEPTANCE OF WORK

6-2.1 Moratoriums. To the City Supplements, ADD the following:

Do not work in the areas where there is currently a moratorium issued by the City. The areas subject to moratorium are listed here:

- a) Mission Beach Boardwalk spanning 1,670 feet south of Ventura Place to San Fernando Place from May 25, 2015 to September 8, 2015 (inclusive).

SECTION 7 - RESPONSIBILITIES OF THE CONTRACTOR

7-3 **LIABILITY INSURANCE.** DELETE in its entirety and SUBSTITUTE with the following:

The insurance provisions herein must not be construed to limit your indemnity obligations contained in the Contract.

7-3.1 **Policies and Procedures.**

1. You must procure the insurance described below, at its sole cost and expense, to provide coverage against claims for loss including injuries to persons or damage to property, which may arise out of or in connection with the performance of the Work by you, your agents, representatives, officers, employees or Subcontractors.
2. Insurance coverage for property damage resulting from your operations is on a replacement cost valuation. The market value will not be accepted.
3. You must maintain this insurance for the duration of this contract and at all times thereafter when you are correcting, removing, or replacing Work in accordance with this contract. Your liabilities under the Contract, e.g., your indemnity obligations, is not deemed limited to the insurance coverage required by this contract.
4. Payment for insurance is included in the various items of Work as bid by you, and except as specifically agreed to by the City in writing, you are not entitled to any additional payment. Do not begin any work under this contract until you have provided and the City has approved all required insurance.
5. Policies of insurance must provide that the City is entitled to 30 days (10 days for cancellation due to non-payment of premium) prior written notice of cancellation or non-renewal of the policy. Maintenance of specified insurance coverage is a material element of the Contract. Your failure to maintain or renew coverage or to provide evidence of renewal during the term of the Contract may be treated by the City as a material breach of the Contract.

7-3.2 **Types of Insurance.**

7-3.2.1 **Commercial General Liability Insurance.**

1. Commercial General Liability Insurance must be written on the current version of the ISO Occurrence form CG 00 01 07 98 or an equivalent form providing coverage at least as broad.
2. The policy must cover liability arising from premises and operations, XCU (explosions, underground, and collapse), independent contractors, products/completed operations, personal injury and advertising injury, bodily injury, property damage, and liability assumed under an insured's contract (including the tort liability of another assumed in a business contract).

3. There must be no endorsement or modification limiting the scope of coverage for either “insured vs. insured” claims or contractual liability. You must maintain the same or equivalent insurance for at least 10 years following completion of the Work.
4. All costs of defense must be outside the policy limits. Policy coverage must be in liability limits of not less than the following:

<u>General Annual Aggregate Limit</u>	<u>Limits of Liability</u>
Other than Products/Completed Operations	\$2,000,000
Products/Completed Operations Aggregate Limit	\$2,000,000
Personal Injury Limit	\$1,000,000
Each Occurrence	\$1,000,000

7-3.2.2 Commercial Automobile Liability Insurance.

1. You must provide a policy or policies of Commercial Automobile Liability Insurance written on the current version of the ISO form CA 00 01 12 90 or later version or equivalent form providing coverage at least as broad in the amount of \$1,000,000 combined single limit per accident, covering bodily injury and property damage for owned, non-owned, and hired automobiles (“Any Auto”).
2. All costs of defense must be outside the limits of the policy.

7-3.2.5 Contractors Builders Risk Property Insurance..

1. You must provide at its expense, and maintain until Final Acceptance of the Work, a Special Form Builders Risk Policy or Policies. This insurance must be in an amount equal to the replacement cost of the completed Work (without deduction for depreciation) including the cost of excavations, grading, and filling. The policy or policies limits must be 100% of this contract value of the Work plus 15% to cover administrative costs, design costs, and the costs of inspections and construction management.
2. Insured property must include material or portions of the Work located away from the Site but intended for use at the Site, and must cover material or portions of the Work in transit. The policy or policies must include as insured property scaffolding, falsework, and temporary buildings located at the Site. The policy or policies must cover the cost of removing debris, including demolition.
3. The policy or policies must provide that all proceeds thereunder must be payable to the City as Trustee for the insured, and must name the City, the Contractor, Subcontractors, and Suppliers of all tiers as named insured. We as Trustee will collect, adjust, and receive all monies which may become due and payable under the policy or policies, may compromise any and all claims thereunder, and will apply the proceeds of such insurance to the repair, reconstruction, or replacement of the Work.

4. Any deductible applicable to the insurance must be identified in the policy or policies documents and responsibility for paying the part of any loss not covered because of the application of such deductibles must be apportioned among the parties except for the City as follows: if there is more than one claimant for a single occurrence, then each claimant must pay a pro-rata share of the per occurrence deductible based upon the percentage of their paid claim to the total paid for insured. The City must be entitled to 100% of its loss. The Contractor must pay the City any portion of that loss not covered because of a deductible, at the same time the proceeds of the insurance are paid to the City as trustee.
5. Any insured, other than the City, making claim to which a deductible applies must be responsible for 100% of the loss not insured because of the deductible. Except as provided for under California law, the policy or policies must provide that the City is entitled to 30 days prior written notice (10 days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

7-3.3 Rating Requirements. Except for the State Compensation Insurance Fund, all insurance required by this contract as described herein must be carried only by responsible insurance companies with a rating of, or equivalent to, at least “A-, VI” by A.M. Best Company, that are authorized by the California Insurance Commissioner to do business in the State, and that have been approved by the City.

7-3.3.1 Non-Admitted Carriers. The City will accept insurance provided by non-admitted, “surplus lines” carriers only if the carrier is authorized to do business in the State and is included on the List of Approved Surplus Lines Insurers (LASLI list).

All policies of insurance carried by non-admitted carriers must be subject to all of the requirements for policies of insurance provided by admitted carriers described herein.

7-3.4 Evidence of Insurance. Furnish to the City documents e.g., certificates of insurance and endorsements evidencing the insurance required herein, and furnish renewal documentation prior to expiration of this insurance. Each required document must be signed by the insurer or a person authorized by the insurer to bind coverage on its behalf. We reserve the right to require complete, certified copies of all insurance policies required herein.

7-3.5 Policy Endorsements.

7-3.5.1 Commercial General Liability Insurance

7-3.5.1.1 Additional Insured.

- a) You must provide at your expense policy endorsement written on the current version of the ISO Occurrence form CG 20 10 11 85 or an equivalent form providing coverage at least as broad.
- b) To the fullest extent allowed by law e.g., California Insurance Code §11580.04, the policy must be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured.

- c) The additional insured coverage for projects for which the Engineer's Estimate is \$1,000,000 or more must include liability arising out of: (a) Ongoing operations performed by you or on your behalf, (b) your products, (c) your work, e.g., your completed operations performed by you or on your behalf, or (d) premises owned, leased, controlled, or used by you.
- d) The additional insured coverage for projects for which the Engineer's Estimate is less than \$1,000,000 must include liability arising out of: (a) Ongoing operations performed by you or on your behalf, (b) your products, or (c) premises owned, leased, controlled, or used by you.

7-3.5.1.2 Primary and Non-Contributory Coverage. The policy must be endorsed to provide that the coverage with respect to operations, including the completed operations, if appropriate, of the Named Insured is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives. Further, it must provide that any insurance maintained by the City and its elected officials, officers, employees, agents and representatives must be in excess of your insurance and must not contribute to it.

7-3.5.1.3 Project General Aggregate Limit.

The policy or policies must be endorsed to provide a Designated Construction Project General Aggregate Limit that will apply only to the Work. Only claims payments which arise from the Work must reduce the Designated Construction Project General Aggregate Limit. The Designated Construction Project General Aggregate Limit must be in addition to the aggregate limit provided for the products-completed operations hazard.

7-3.5.2 Commercial Automobile Liability Insurance.

7-3.5.2.1 Additional Insured. Unless the policy or policies of Commercial Auto Liability Insurance are written on an ISO form CA 00 01 12 90 or a later version of this form or equivalent form providing coverage at least as broad, the policy must be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured, with respect to liability arising out of automobiles owned, leased, hired or borrowed by you or on your behalf. This endorsement is limited to the obligations permitted by California Insurance Code §11580.04.

7-3.5.5 Builders Risk Endorsements.

7-3.5.5.1 Waiver of Subrogation. The policy or policies must be endorsed to provide that the insurer will waive all rights of subrogation against the City, and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from work performed by the Named Insured for the City.

7-3.5.5.2 Builders Risk – Partial Utilization. If the City desire to occupy or use a portion or portions of the Work prior to Acceptance in accordance with this contract, the City will notify you and you must immediately notify your Builder's Risk insurer and obtain an endorsement that the policy or policies must not be cancelled or lapse on account of any such partial use or occupancy. You must obtain the endorsement prior to our occupation and use.

7-3.6 Deductibles and Self-Insured Retentions. You must pay for all deductibles and self-insured retentions. You must disclose deductibles and self-insured retentions to the City at the time the evidence of insurance is provided.

7-3.7 Reservation of Rights. The City reserves the right, from time to time, to review your insurance coverage, limits, deductibles and self-insured retentions to determine if they are acceptable to the City. The City will reimburse you, without overhead, profit, or any other markup, for the cost of additional premium for any coverage requested by the Engineer but not required by this contract.

7-3.8 Notice of Changes to Insurance. You must notify the City 30 days prior to any material change to the policies of insurance provided under this contract.

7-3.9 Excess Insurance. Policies providing excess coverage must follow the form of the primary policy or policies e.g., all endorsements.

7-4 WORKERS' COMPENSATION INSURANCE. DELETE in its entirety and SUBSTITUTE with the following:

7-4.1 Workers' Compensation Insurance and Employers Liability Insurance.

1. In accordance with the provisions of §3700 of the California Labor Code, you must provide at your expense Workers' Compensation Insurance and Employers Liability Insurance to protect you against all claims under applicable state workers compensation laws. The City, its elected officials, and employees will not be responsible for any claims in law or equity occasioned by your failure to comply with the requirements of this section.

2. Limits for this insurance must be not less than the following:

<u>Workers' Compensation</u>	<u>Statutory Employers Liability</u>
Bodily Injury by Accident	\$1,000,000 each accident
Bodily Injury by Disease	\$1,000,000 each employee
Bodily Injury by Disease	\$1,000,000 policy limit

3. By signing and returning the Contract you certify that you are aware of the provisions of §3700 of the Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code and you must comply with such provisions before commencing the Work as required by §1861 of the California Labor Code.

7-4.1.1 Waiver of Subrogation.

The policy or policies must be endorsed to provide that the insurer will waive all rights of subrogation against the City, and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from work performed by the Named Insured for the City.

7-5 **PERMITS, FEES, AND NOTICES.** To the City Supplement, ADD the following:

The City will obtain, at no cost to the Contractor; the following permits:

1. Coastal Development Permit

7-10.5.3 **Steel Plate Covers.** Table 7-10.5.3(A), REVISE the plate thickness for 5'-3" trench width to read 1 3/4".

7-15 **INDEMNIFICATION AND HOLD HARMLESS AGREEMENT.** To the City Supplements, fourth paragraph, last sentence, DELETE in its entirety and SUBSTITUTE with the following:

Your duty to indemnify and hold harmless does not include any claims or liability arising from the established active or sole negligence, or willful misconduct of the City, its officers, or employees.

7-16 **COMMUNITY LIASON.** To the City Supplement, DELETE in its entirety and SUSBTITUTE with the following:

ADD:

7-16 **COMMUNITY OUTREACH.**

7-16.1 **General.**

1. To ensure consistency with the City's community outreach plan for the project, the City will work with the Contractor to inform the public (which includes, but is not limited to, property owners, renters, homeowners, business owners, recreational users, and other community members and stakeholders) of construction impacts. Efforts by the Contractor to mitigate construction impacts by communicating with the public require close coordination and cooperation with the City.
2. The Contractor will perform the community outreach activities required throughout the Contract Time.
3. The Contractor shall closely coordinate the Work with the businesses, institutions, residents and property owners impacted by the Project. Example duties of the Contractor include notification to the businesses, institutions and residents of the commencement of construction activities not less than 5 days in advance, coordination of access for vehicular and pedestrian traffic to businesses, institutions and residences impacted by the Project, reporting of Contractor activities at all Project progress meetings scheduled by the Engineer, attendance to the Project Pre-construction Meeting, attendance at 2 community meetings, response to community questions and complaints related to Contractor activities, and written documentation including logging in all inquiries and complaints received into the City's Public Contact Log located on the City's SDShare site:

<http://sdshare/forums/ecp/PITS/picr/Lists/Public%20Contact%20Log/AllItems.aspx>

4. The Contractor shall execute the Information Security Policy Acknowledgement Form - For Non-City Employees within 15 days of the award of the Contract if:
 - a) The contact information for the Contractor is made available on any outreach materials or;
 - b) The Contractor will be the primary point of contact to resolve project related inquiries and complaints.
5. Electronic Communication.

All inquiries and complaints will be logged in to the City's SDSShare site within 24 hours of receipt of inquiries and complaints.

Any updates or a resolution of inquiries, and complaints shall be documented in the City's SDSShare site within 24 hours.

Copies of email communications shall be saved on to the City's SDSShare site as individually as an Outlook Message Format (*.msg).

All graphics, photos, and other electronic files associated with the inquiries and or complaints shall be saved into the individual record.
6. **When specified**, present your Exclusive Community Liaison to the Engineer, in writing, within 15 days of the award of the Contract.

7-16.2

Submittals.

1. The Contractor shall submit to the Resident Engineer, for review and approval, all drafts of letters, notices, postcards, door hangers, signs, mailing lists, proposed addresses for hand-delivery, and any other notices and letters that are to be mailed and or distributed to the public.
 - a. Prior to distributing or mailing, the Contractor shall submit final drafts of letters, notices, postcards, door hangers, signs, and any other notices and letters to the Resident Engineer for final review and approval.
 - b. After distributing or mailing, the Contractor shall submit verification of delivery and any copies of returned notices to the Resident Engineer.
2. The Contractor will use the City's SDSShare site to identify and summarize communications (via phone, in person, and email) with the public the within 24 hours of receipt, even if the Contractor's response to the individual is still incomplete. The Contractor will upload to the City's SDSShare site copies of all written, electronic, and verbal communications and conversations with the public.

7-16.3 Public Notice by Contractor.

1. Furnish and distribute public notices in the form of door hangers using the City's format to all occupants and/or property owners along streets where Work is to be performed at least 5 days before starting the Work as directed by the Resident Engineer.
2. For all Work on private property, contact each owner and occupant individually a minimum of 15 days prior to the Work. If the Work has been delayed, re-notify owners and occupants of the new Work schedule, as directed by the Resident Engineer.

7-16.4 Quality Assurance.

1. During the course of community outreach, the Contractor shall ensure the character of all persons that conduct community outreach (distributing door hangers, attending community meetings, interacting with the public, etc.), on behalf of the Contractor:
 - a. Have the ability to speak and comprehend English and/or Spanish, as appropriate for the community or public they are informing,
 - b. Possess and display easily verifiable and readable personal identification that identifies the person as an employee of the Contractor,
 - c. Have the interpersonal skills to effectively, professionally, and tactfully represent the project, Contractor, and City to the public.

7-16.5 Communications with the Public.

1. The Contractor shall provide updates on construction impacts to the Resident Engineer. The Contractor shall notify the Resident Engineer in advance about time-sensitive construction impacts and may be required to distribute construction impact notices to the public on short notice.
2. The Contractor shall incorporate community outreach activities related to construction impacts in the baseline schedule and update the Resident Engineer with each week's submittal of the Three-Week Look Ahead Schedule.
3. At the request of the Resident Engineer, the Contractor shall attend and participate in project briefings at community meetings.
4. The Contractor shall coordinate with the Resident Engineer on all responses and actions taken to address public inquiries and complaints within 24-hours that they are received.

7-16.6 Communications with Media.

1. The City may allow members of the media access to its construction site(s) on a case-by-case basis only.

2. Occasionally, members of the media may show up at construction sites, uninvited. Members of the media (including, but not limited to newspaper, magazine, radio, television, bloggers, and videographers) do not have the legal right to be in the construction site without the City's permission.
3. In the event media representatives arrive near or on the construction site(s), the Contractor shall keep them off the site(s), in a courteous and professional manner, until a Public Information Officer is available to meet them at an approved location.
4. The Contractor shall report all members of the media visits to the Resident Engineer as quickly as possible, so that the City's Public Information Officer can meet with the members of the media at the construction site(s).
5. If the City allows members of the media to access a construction site, the Contractor shall allow the City to escort the media representatives while they are on the construction site and shall ensure their safety.
6. The Contractor shall require media representatives to sign in and out of the Site Visitor Log and to use Personal Protective Equipment.
7. The Contractor has a right to speak to members of the media about its company and its role on the project. All other questions shall be referred to the City.

7-16.7 Exclusive Community Liaison Services.

If directed to conduct Exclusive Community Liaison Services, the Contractor shall retain an Exclusive Community Liaison for the Project whose sole responsibilities will be as follows:

1. Develop a contact list of community, tenants, property owners, and agencies with a stake in the project.
2. Notify businesses, institutions, property owners, and residents of the commencement of construction activities and utility service interruptions not less than 5 days in advance.
3. Coordinate access for vehicular and pedestrian traffic to businesses, institutions and residences impacted by the Project.
4. Prepare and present of materials in coordination with the Resident Engineer (the City's standards and guidelines for the communication materials are available for review by Bidders by sending a request to the Contract Specialist).
5. Respond to community questions and complaints related to Contractor activities.
6. Write, edit, update, or produce brochures, pamphlets and news releases.
7. Provide standard telephone inquiries and e-mail responses:

- a) Respond to telephone calls and e-mails from the public.
 - b) Record calls and e-mails on the City's SDSShare site.
8. Report Exclusive Community Liaison activities at all progress meetings scheduled by the Resident Engineer.
9. Attendance at pre-construction, community and stakeholders meetings.

7-16.7.1 Exclusive Community Liaison Work Plan. The Work plan for the Exclusive Community Liaison shall address the items of Work specified in these specifications. Present your Exclusive Community Liaison and submit your exclusive community outreach plan (in writing) **as specified** within 15 days of the Award of the Contract.

7-16.8 Payment. The Payment for the community outreach and public notices is included in the various Bid items. The payment for exclusive community liaison is in the bid item for "Exclusive Community Liaison Services."

7-20 ELECTRONIC COMMUNICATION. ADD the following:
Virtual Project Manager will be used on this contract.

SECTION 9 - MEASUREMENT AND PAYMENT

9-3.2.5 Withholding of Payment. To the City Supplements, item i), DELETE in its entirety and SUBSTITUTE with the following:

- i) Your failure to comply with 7-2.3, "PAYROLL RECORDS" and 2-16, "CONTRACTOR REGISTRATION AND ELECTRONIC REPORTING SYSTEM."

SECTION 300 – EARTHWORK

300-1.3.2 Requirements. To the City Supplement, ADD the following:

- d) **Parapet Wall & Pile Cap.** Parapet wall and pile cap to be removed to nearest joint.
- e) **Sheetpile Wall.** Sheet pile wall to be chipped as shown on the Plans. Structural Engineer shall observe condition of sheet piles when exposed, prior to construction of pile cap. Condition of existing piles may force additional demolition as directed by the Structural Engineer.
- f) **Stairs.** Stairs shall be removed to neatly sawcut edges per requirements of b) Concrete Pavement.

300-2.6 Surplus Material. To the City Supplement, ADD the following:
If allowed by the Engineer, the contractor may dispose of excess sand on the beach at amounts and locations directed by the Engineer

300-2.9 Payment. To the City Supplement, ADD the following:

Contractor shall notify Resident Engineer for approval prior to work and submit backup documentation to justify use of allowance funds prior to authorization of payment.

300-4.1 General. To the City Supplement, ADD the following:

Unclassified fill shall be used to fill potential voids that may exist beneath the pavement sections being removed.

300-4.9 Measurement and Payment. To the City Supplement, ADD the following:

Contractor shall notify Resident Engineer for approval prior to work and submit backup documentation to justify use of allowance funds prior to authorization of payment.

300-10.1.2 Measurement and Payment. To the City Supplement, ADD the following:

All excavation, backfill, and other earthwork required for installation of geotextiles shall be included in the cost of excavation for the concrete wall.

SECTION 302 – ROADWAY SURFACING

302-6.8 Payment. To the City Supplement, ADD the following:

Concrete Pavement will be paid for per Square Foot of installed concrete and shall include all boardwalk paving, including at pop-outs, walkways, and curb ramps. Cost of removal and recompaction of subgrade materials, reinforcement for concrete and visqueen lining shall be included in the unit price for concrete paving.

Concrete Pavement with Detectable Warning Tiles will be paid for per Square Foot of installed area and shall include the cost for concrete as well as detectable warning tiles and the cost of removal and recompaction of subgrade materials.

SECTION 303 – CONCRETE AND MASONRY CONSTRUCTION

303-1.9.5 Painting. To the City Supplement ADD the following:

North facing ends of wall pilasters, adjacent to boardwalk paving, on the south side of new popouts shall be painted yellow.

303-1.9.6 Anti-graffiti coating. To the City Supplement ADD the following:

Entire exposed surface of new wall shall include anti-graffiti coating

303-1.11 Payment. ADD the following:

Concrete wall will be paid for at the Contract Unit Price and shall include parapet wall, pile cap, pilasters, formwork, reinforcement, excavation, and backfill.

Ramps and stairs shall include concrete, reinforcement, formwork, foundations, toekick, architectural features and any work associated and shall be paid for at the contract unit bid price in the bid for Concrete Stairs and Ramps.

Payment for reinforcing steel will be made on a per pound basis as shown on the bid.

303-1.12 Wall Mock-up. ADD the following:

A full-size 5' wide mock-up of the splash/parapet wall shall be constructed and provided to the Resident Engineer for approval prior to beginning actual wall construction. Payment for wall mock-up will be made at the Contract Unit Price.

SECTION 307 – STREET LIGHTING AND TRAFFIC SIGNAL SYSTEMS

307-1.1 General. To the City Supplement, ADD the following

4. Historic Light Replica: Contractor to provide 3 shop drawing submittals that closely resemble the design of the historic light for Resident Engineer approval.
5. See Appendix E of these Supplementary Special provisions for additional electrical specifications.

307-2 PAYMENT. To the City Supplement, ADD the following:

4. Historic Light Replica will be paid for at the Contract Unit Price and shall include fixtures, anchors, pedestals, and any other required costs of materials and installation.
5. Electrical conduit will be paid for at the Contract Unit Price and shall include wiring, pullboxes, transformer yard modification, and any other facilities needed to provide power feed to Historic Light Replicas.

SECTION 314 – TRAFFIC STRIPING, CURB AND PAVEMENT MARKINGS, AND PAVEMENT MARKERS

314-1.1 Measurement and Payment. To the City Supplements, ADD the following:

All striping, marking, and painting will be paid for at the Contract Lump Sum Price for Signing and Striping and shall include the cost of furnishing and installing all new and existing signage and striping as shown on the plans.

314-2.3 Payment. To the City Supplements, ADD the following:

All Striping, marking, and painting will be paid for at the contract unit Price and shall include the cost of furnishing and installing all new and existing signage and striping as shown on the plans.

ADD: SECTION 315 – MISCELLANEOUS

315-1 General

Section includes all bench renovations, accessible picnic tables, and demountable posts.

315-2 Accessible Picnic Tables

Contractor shall submit shop drawing of accessible picnic table to Engineer of Work for approval

Accessible picnic tables shall include anti-graffiti coating

315-3 Bench Renovations

Benches shall be renovated to provide a level seat height of between 17” and 19” above the finished surface.

Renovated benches shall be located at the same location as in the existing condition.

315-4 Measurement and Payment

All miscellaneous items shall be paid for at the Contract Unit Price for each specific item and shall include the entire cost for furnishing and installing as shown on the plans

SECTION 707 – RESOURCE DISCOVERIES

**ADD:
707-1.1**

Environmental Document. The City of San Diego Environmental Analysis Section (EAS) of the Development Services Department has prepared a **memo of consistency to the EIR for Mission Beach Boardwalk Bulkhead Project, DEP No. 304211**, as referenced in the Contract Appendix. You must comply with all requirements of the memo of consistency and the **Coastal Development Permit** as set forth in the Contract **Appendix A**.

Compliance with the City’s environmental document is included in the various Bid items, unless a bid item has been provided.

END OF SUPPLEMENTARY SPECIAL PROVISIONS (SSP)

SUPPLEMENTARY SPECIAL PROVISIONS
APPENDICES

APPENDIX A

COSTAL DEVELOPMENT PERMIT

CALIFORNIA COASTAL COMMISSION

San Diego Coast District Office
7575 Metropolitan Drive, Suite 103
San Diego, California 92108-4402
PH (619) 767-2370 FAX (619) 767-2384



Page 1

Date: November 19, 2014

Permit Application No.: 6-13-1359

COASTAL DEVELOPMENT PERMIT

On October 8, 2014, the California Coastal Commission granted to **City of San Diego** this permit subject to the attached Standard and Special conditions, for development consisting of: **Replace in-kind approximately 1760 linear feet of existing parapets, pile caps, and related damaged portions of the Mission Beach Boardwalk, and installing four concrete access ramps within existing concrete pop-outs** more specifically described in the application filed in the Commission offices.

The development is within the coastal zone at **3146 Mission Boulevard, Mission Beach, San Diego (San Diego County)**

Issued on behalf of the California Coastal Commission by

CHARLES LESTER,
Executive Director

A handwritten signature in cursive script, appearing to read "Alex Llerandi".

Alexander Llerandi
Coastal Program Analyst

ACKNOWLEDGMENT:

The undersigned permittee acknowledges receipt of this permit and agrees to abide by all terms and conditions thereof.

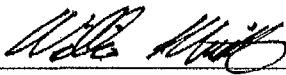
The undersigned permittee acknowledges that Government Code Section 818.4 which states in pertinent part of that: "A Public entity is not liable for injury caused by the issuance... of any permit..." applies to the issuance of this permit.

Date: November 19, 2014

Permit Application No.: 6-13-1359

COASTAL DEVELOPMENT PERMIT

IMPORTANT: THIS PERMIT IS NOT VALID UNLESS AND UNTIL A COPY OF THE PERMIT WITH THE SIGNED ACKNOWLEDGEMENT HAS BEEN RETURNED TO THE COMMISSION OFFICE. 14 Cal. Admin. Code Section 13158(a).

Date: 2/6/15Signature **STANDARD CONDITIONS:**

1. **Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. **Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. **Interpretation.** Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.
4. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
5. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

SPECIAL CONDITIONS:

The permit is subject to the following conditions:

1. **Final Plans.** PRIOR TO THE ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, the applicant shall submit to the Executive Director for review and written approval final project plans. Said plans shall first be approved by the City of San Diego and be in substantial conformance with the plans dated November 27, 2013, and submitted by the City of San Diego on December 10, 2013.

The applicant shall undertake the development in accordance with the approved plans. Any proposed changes to the approved plans shall be reported to the Executive Director. No changes to the plans shall occur without a Coastal Commission-approved amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

COASTAL DEVELOPMENT PERMIT

2. **Staging, Storage, and Public Access Plan.** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT applicant shall submit to the Executive Director for review and approval a final staging and storage plan that shall include the following:
- a. No construction work shall occur on the beach or boardwalk between Memorial Day weekend and Labor Day of any year. However, the applicant may undertake construction during this period upon obtaining a written statement of the Executive Director authorizing construction on specified dates. To obtain such a determination, the applicant must submit information documenting that construction on the specified dates proposed will not cause adverse impacts on public access.
 - b. At least fifty percent of the width of the boardwalk shall be maintained open for public traffic throughout the construction period.
 - c. Overnight storage or staging areas shall not be permitted on public beaches, within public beach parking lots, within the section of the boardwalk available for public access, or in any other location that would otherwise restrict public access to the beach at any time, with the exception of a 2,500 square foot area (10 parking space maximum) located in the southeastern corner of the Belmont Park south parking lot, which may be utilized only by the applicant. The staging and storage site shall be removed and/or restored immediately following completion of the development.
 - d. Immediately upon completion of construction and/or when the staging site is no longer needed, the site shall be returned to its preconstruction state.
 - e. The applicant shall submit evidence that the approved staging and storage plans/notes have been incorporated into construction bid documents.

The applicant shall undertake the development in accordance with the approved plans. Any proposed changes to the approved plans shall be reported to the Executive Director. No change to the plans shall occur without a Commission-approved amendment to the permit unless the Executive Director determines that no such amendment is legally required.

3. **Construction Pollution Prevention Plan (CPPP).** PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the permittee shall submit for the review and approval of the Executive Director, two (2) sets of a Construction Pollution Prevention Plan (CPPP) prepared and signed by licensed engineer that, at a minimum, includes the following:
- i. Best Management Practices (BMPs) designed to prevent spillage and/or runoff of construction-related materials, sediment, or contaminants associated with construction activity shall be implemented prior to the on-set of such activity. Selected BMPs shall be maintained in a functional condition throughout the duration of the project. Such measures shall include:

COASTAL DEVELOPMENT PERMIT

1. No demolition or construction materials, equipment, debris, or waste shall be placed or stored where it may enter sensitive habitat, receiving waters or a storm drain, or be subject to wave, wind, rain or tidal erosion and dispersion;
2. Any and all debris resulting from demolition or construction activities, and any remaining construction material, shall be removed from the project site within 24 hours of completion of the project;
3. Demolition or construction debris and sediment shall be removed from work areas each day that demolition or construction occurs to prevent the accumulation of sediment and other debris that may be discharged into coastal waters or storm drains;
4. Erosion control/sedimentation Best Management Practices (BMPs) shall be used to control dust and sedimentation impacts to coastal waters during construction. BMPs shall include, but are not limited to: placement of sand bags around drainage inlets to prevent runoff/sediment transport into coastal waters;
5. Machinery or construction materials not essential for project improvements will not be allowed at any time in the intertidal zone;
6. If turbid conditions are generated during construction, a silt curtain will be utilized to control turbidity;
7. Floating booms will be used to contain debris discharged into coastal waters and any debris discharged will be removed as soon as possible but no later than the end of each day;
8. Non-buoyant debris discharged into coastal waters will be recovered by divers as soon as possible after loss;
9. All trash and debris shall be disposed in the proper trash and recycling receptacles at the end of every construction day.
10. The applicant shall provide adequate disposal facilities for solid waste, including excess concrete, produced during demolition or construction;
11. Debris shall be disposed of at a legal disposal site or recycled at a recycling facility. If the disposal site is located in the coastal zone, a Coastal Development Permit or an amendment to this permit shall be required before disposal can take place unless the Executive Director determines that no amendment or new permit is legally required;
12. All construction materials stockpiled on site, excluding lumber, shall be covered and enclosed on all sides to ensure that the materials are not discharged to a storm drain inlet or receiving waters;

COASTAL DEVELOPMENT PERMIT

13. Machinery and equipment shall be maintained and washed in confined areas specifically designed to control runoff. If thinners, petroleum products or solvents must be used on site, they shall be properly recycled or disposed after use and not be discharged into storm drains, sewers, receiving waters or onto the unpaved ground;
14. The discharge of any hazardous materials into any receiving waters shall be prohibited;
15. Spill prevention and control measures shall be implemented to ensure the proper handling and storage of petroleum products and other construction materials. Measures shall include a designated fueling and vehicle maintenance area with appropriate berms and protection to prevent any spillage of gasoline or related petroleum products or contact with runoff. The designated area shall be equipped with spill control materials and located to minimize the risk of spills reaching receiving waters, storm drains, sewers or unpaved ground;
16. Best Management Practices (BMPs) and Good Housekeeping Practices (GHPs) designed to prevent spillage and/or runoff of demolition or construction-related materials, and to contain sediment or contaminants associated with demolition or construction activity, shall be implemented prior to the on-set of such activity; and
17. All BMPs shall be maintained in a functional condition throughout the duration of construction activity.

The applicant shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this Coastal Development Permit unless the Executive Director determines that no amendment is legally required.

4. Assumption of Risk, Waiver of Liability, and Indemnity Agreement

- i. By acceptance of this permit, the applicant acknowledges and agrees (i) that the site may be subject to hazards from waves and flooding; (ii) to assume the risks to the applicant and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development; (iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs, (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards.
- ii. PRIOR TO ANY CONVEYANCE OF THE PROPERTY THAT IS THE SUBJECT OF THIS COASTAL DEVELOPMENT PERMIT, the applicant shall execute and record a deed restriction, in a form and content acceptable to the Executive Director: (1) indicating that,

COASTAL DEVELOPMENT PERMIT

pursuant to this permit, the California Coastal Commission has authorized development on the subject property, subject to terms and conditions that restrict the use and enjoyment of that property (hereinafter referred to as the “Standard and Special Conditions”); and (2) imposing all Standard and Special Conditions of this permit as covenants, conditions, and restrictions on the use and enjoyment of the Property. The restriction shall include a legal description of the applicant’s entire parcel or parcels. It shall also include that, in the event of an extinguishment or termination of the deed restriction for any reason, the Standard and Special Conditions of this permit shall continue to restrict the use and enjoyment of the subject property so long as either this permit or the development it authorizes – or any part, modification, or amendment thereof – remains in existence on or with respect to the subject property.

- iii. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the applicant shall submit a written agreement, in a form and content acceptable to the Executive Director, incorporating all of the above terms of this condition.

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APPENDIX B

FIRE HYDRANT METER PROGRAM

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 1 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

1. **PURPOSE**

1.1 To establish a Departmental policy and procedure for issuance, proper usage and charges for fire hydrant meters.

2. **AUTHORITY**

2.1 All authorities and references shall be current versions and revisions.

2.2 San Diego Municipal Code (NC) Chapter VI, Article 7, Sections 67.14 and 67.15

2.3 Code of Federal Regulations, Safe Drinking Water Act of 1986

2.4 California Code of Regulations, Titles 17 and 22

2.5 California State Penal Code, Section 498B.0

2.6 State of California Water Code, Section 110, 500-6, and 520-23

2.7 Water Department Director

Reference

2.8 State of California Guidance Manual for Cross Connection Programs

2.9 American Water Works Association Manual M-14, Recommended Practice for Backflow Prevention

2.10 American Water Works Association Standards for Water Meters

2.11 U.S.C. Foundation for Cross Connection Control and Hydraulic Research Manual

3. **DEFINITIONS**

3.1 **Fire Hydrant Meter:** A portable water meter which is connected to a fire hydrant for the purpose of temporary use. (These meters are sometimes referred to as Construction Meters.)

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3.2 **Temporary Water Use:** Water provided to the customer for no longer than twelve (12) months.

3.3 **Backflow Preventor:** A Reduced Pressure Principal Assembly connected to the outlet side of a Fire Hydrant Meter.

4. **POLICY**

4.1 The Water Department shall collect a deposit from every customer requiring a fire hydrant meter and appurtenances prior to providing the meter and appurtenances (see Section 7.1 regarding the Fees and Deposit Schedule). The deposit is refundable upon the termination of use and return of equipment and appurtenances in good working condition.

4.2 Fire hydrant meters will have a 2 ½" swivel connection between the meter and fire hydrant. The meter shall not be connected to the 4" port on the hydrant. All Fire Hydrant Meters issued shall have a Reduced Pressure Principle Assembly (RP) as part of the installation. Spanner wrenches are the only tool allowed to turn on water at the fire hydrant.

4.3 The use of private hydrant meters on City hydrants is prohibited, with exceptions as noted below. All private fire hydrant meters are to be phased out of the City of San Diego. All customers who wish to continue to use their own fire hydrant meters must adhere to the following conditions:

a. Meters shall meet all City specifications and American Water Works Association (AWWA) standards.

b. Customers currently using private fire hydrant meters in the City of San Diego water system will be allowed to continue using the meter under the following conditions:

1. The customer must submit a current certificate of accuracy and calibration results for private meters and private backflows annually to the City of San Diego, Water Department, Meter Shop.

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2. The meter must be properly identifiable with a clearly labeled serial number on the body of the fire hydrant meter. The serial number shall be plainly stamped on the register lid and the main casing. Serial numbers shall be visible from the top of the meter casing and the numbers shall be stamped on the top of the inlet casing flange.
3. All meters shall be locked to the fire hydrant by the Water Department, Meter Section (see Section 4.7).
4. All meters shall be read by the Water Department, Meter Section (see Section 4.7).
5. All meters shall be relocated by the Water Department, Meter Section (see Section 4.7).
6. These meters shall be tested on the anniversary of the original test date and proof of testing will be submitted to the Water Department, Meter Shop, on a yearly basis. If not tested, the meter will not be allowed for use in the City of San Diego.
7. All private fire hydrant meters shall have backflow devices attached when installed.
8. The customer must maintain and repair their own private meters and private backflows.
9. The customer must provide current test and calibration results to the Water Department, Meter Shop after any repairs.
10. When private meters are damaged beyond repair, these private meters will be replaced by City owned fire hydrant meters.

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11. When a private meter malfunctions, the customer will be notified and the meter will be removed by the City and returned to the customer for repairs. Testing and calibration results shall be given to the City prior to any re-installation.
 12. The register shall be hermetically sealed straight reading and shall be readable from the inlet side. Registration shall be in hundred cubic feet.
 13. The outlet shall have a 2 ½ "National Standards Tested (NST) fire hydrant male coupling.
 14. Private fire hydrant meters shall not be transferable from one contracting company to another (i.e. if a company goes out of business or is bought out by another company).
- 4.4 All fire hydrant meters and appurtenances shall be installed, relocated and removed by the City of San Diego, Water Department. All City owned fire hydrant meters and appurtenances shall be maintained by the City of San Diego, Water Department, Meter Services.
- 4.5 If any fire hydrant meter is used in violation of this Department Instruction, the violation will be reported to the Code Compliance Section for investigation and appropriate action. Any customer using a fire hydrant meter in violation of the requirements set forth above is subject to fines or penalties pursuant to the Municipal Code, Section 67.15 and Section 67.37.
- 4.6 **Conditions and Processes for Issuance of a Fire Hydrant Meter**
- Process for Issuance
- a. Fire hydrant meters shall only be used for the following purposes:
 1. Temporary irrigation purposes not to exceed one year.

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2. Construction and maintenance related activities (see Tab 2).
 - b. No customer inside or outside the boundaries of the City of San Diego Water Department shall resell any portion of the water delivered through a fire hydrant by the City of San Diego Water Department.
 - c. The City of San Diego allows for the issuance of a temporary fire hydrant meter for a period not to exceed 12 months (365 days). An extension can only be granted in writing from the Water Department Director for up to 90 additional days. A written request for an extension by the consumer must be submitted at least 30 days prior to the 12 month period ending. No extension shall be granted to any customer with a delinquent account with the Water Department. No further extensions shall be granted.
 - d. Any customer requesting the issuance of a fire hydrant meter shall file an application with the Meter Section. The customer must complete a "Fire Hydrant Meter Application" (Tab 1) which includes the name of the company, the party responsible for payment, Social Security number and/or California ID, requested location of the meter (a detailed map signifying an exact location), local contact person, local phone number, a contractor's license (or a business license), description of specific water use, duration of use at the site and full name and address of the person responsible for payment.
 - e. At the time of the application the customer will pay their fees according to the schedule set forth in the Rate Book of Fees and Charges, located in the City Clerk's Office. All fees must be paid by check, money order or cashiers check, made payable to the City Treasurer. Cash will not be accepted.
 - f. No fire hydrant meters shall be furnished or relocated for any customer with a delinquent account with the Water Department.
 - g. After the fees have been paid and an account has been created, the

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meter shall be installed within 48 hours (by the second business day). For an additional fee, at overtime rates, meters can be installed within 24 hours (within one business day).

4.7 Relocation of Existing Fire Hydrant Meters

- a. The customer shall call the Fire Hydrant Meter Hotline (herein referred to as "Hotline"), a minimum of 24 hours in advance, to request the relocation of a meter. A fee will be charged to the existing account, which must be current before a work order is generated for the meter's relocation.
- b. The customer will supply in writing the address where the meter is to be relocated (map page, cross street, etc). The customer must update the original Fire Hydrant Meter Application with any changes as it applies to the new location.
- c. Fire hydrant meters shall be read on a monthly basis. While fire hydrant meters and backflow devices are in service, commodity, base fee and damage charges, if applicable, will be billed to the customer on a monthly basis. If the account becomes delinquent, the meter will be removed.

4.8 Disconnection of Fire Hydrant Meter

- a. After ten (10) months a "Notice of Discontinuation of Service" (Tab 3) will be issued to the site and the address of record to notify the customer of the date of discontinuance of service. An extension can only be granted in writing from the Water Department Director for up to 90 additional days (as stated in Section 4.6C) and a copy of the extension shall be forwarded to the Meter Shop Supervisor. If an extension has not been approved, the meter will be removed after twelve (12) months of use.
- b. Upon completion of the project the customer will notify the Meter Services office via the Hotline to request the removal of the fire hydrant meter and appurtenances. A work order will be generated

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for removal of the meter.

- c. Meter Section staff will remove the meter and backflow prevention assembly and return it to the Meter Shop. Once returned to the Meter Shop the meter and backflow will be tested for accuracy and functionality.
- d. Meter Section Staff will contact and notify Customer Services of the final read and any charges resulting from damages to the meter and backflow or its appurtenance. These charges will be added on the customer's final bill and will be sent to the address of record. Any customer who has an outstanding balance will not receive additional meters.
- e. Outstanding balances due may be deducted from deposits and any balances refunded to the customer. Any outstanding balances will be turned over to the City Treasurer for collection. Outstanding balances may also be transferred to any other existing accounts.

5. **EXCEPTIONS**

- 5.1 Any request for exceptions to this policy shall be presented, in writing, to the Customer Support Deputy Director, or his/her designee for consideration.

6. **MOBILE METER**

- 6.1 Mobile meters will be allowed on a case by case basis. All mobile meters will be protected by an approved backflow assembly and the minimum requirement will be a Reduced Pressure Principal Assembly. The two types of Mobile Meters are vehicle mounted and floating meters. Each style of meters has separate guidelines that shall be followed for the customer to retain service and are described below:

- a) **Vehicle Mounted Meters:** Customer applies for and receives a City owned Fire Hydrant Meter from the Meter Shop. The customer mounts the meter on the vehicle and brings it to the Meter Shop for

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inspection. After installation is approved by the Meter Shop the vehicle and meter shall be brought to the Meter Shop on a monthly basis for meter reading and on a quarterly basis for testing of the backflow assembly. Meters mounted at the owner's expense shall have the one year contract expiration waived and shall have meter or backflow changed if either fails.

b) **Floating Meters:** Floating Meters are meters that are not mounted to a vehicle. **(Note: All floating meters shall have an approved backflow assembly attached.)** The customer shall submit an application and a letter explaining the need for a floating meter to the Meter Shop. The Fire Hydrant Meter Administrator, after a thorough review of the needs of the customer, (i.e. number of jobsites per day, City contract work, lack of mounting area on work vehicle, etc.), may issue a floating meter. At the time of issue, it will be necessary for the customer to complete and sign the "Floating Fire Hydrant Meter Agreement" which states the following:

- 1) The meter will be brought to the Meter Shop at 2797 Caminito Chollas, San Diego on the third week of each month for the monthly read by Meter Shop personnel.
- 2) Every other month the meter will be read and the backflow will be tested. This date will be determined by the start date of the agreement.

If any of the conditions stated above are not met the Meter Shop has the right to cancel the contract for floating meter use and close the account associated with the meter. The Meter Shop will also exercise the right to refuse the issuance of another floating meter to the company in question.

Any Fire Hydrant Meter using reclaimed water shall not be allowed use again with any potable water supply. The customer shall incur the cost of replacing the meter and backflow device in this instance.

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7. **FEE AND DEPOSIT SCHEDULES**

- 7.1 **Fees and Deposit Schedules:** The fees and deposits, as listed in the Rate Book of Fees and Charges, on file with the Office of the City Clerk, are based on actual reimbursement of costs of services performed, equipment and materials. These deposits and fees will be amended, as needed, based on actual costs. Deposits, will be refunded at the end of the use of the fire hydrant meter, upon return of equipment in good working condition and all outstanding balances on account are paid. Deposits can also be used to cover outstanding balances.

All fees for equipment, installation, testing, relocation and other costs related to this program are subject to change without prior notification. The Mayor and Council will be notified of any future changes.

8. **UNAUTHORIZED USE OF WATER FROM A HYDRANT**

- 8.1 Use of water from any fire hydrant without a properly issued and installed fire hydrant meter is theft of City property. Customers who use water for unauthorized purposes or without a City of San Diego issued meter will be prosecuted.
- 8.2 If any unauthorized connection, disconnection or relocation of a fire hydrant meter, or other connection device is made by anyone other than authorized Water Department personnel, the person making the connection will be prosecuted for a violation of San Diego Municipal Code, Section 67.15. In the case of a second offense, the customer's fire hydrant meter shall be confiscated and/or the deposit will be forfeited.
- 8.3 Unauthorized water use shall be billed to the responsible party. Water use charges shall be based on meter readings, or estimates when meter readings are not available.
- 8.4 In case of unauthorized water use, the customer shall be billed for all applicable charges as if proper authorization for the water use had been obtained, including but not limited to bi-monthly service charges, installation charges and removal charges.

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 10 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

- 8.5 If damage occurs to Water Department property (i.e. fire hydrant meter, backflow, various appurtenances), the cost of repairs or replacements will be charged to the customer of record (applicant).

**Larry Gardner
Water Department Director**

- Tabs: 1. Fire Hydrant Meter Application
2. Construction & Maintenance Related Activities With No Return To Sewer
3. Notice of Discontinuation of Service

APPENDIX

Administering Division: Customer Support Division

Subject Index: Construction Meters
Fire Hydrant
Fire Hydrant Meter Program
Meters, Floating or Vehicle Mounted
Mobile Meter
Program, Fire Hydrant Meter

Distribution: DI Manual Holders



Application for Fire Hydrant Meter (EXHIBIT A)

(For Office Use Only)

NS REQ	FAC#
DATE	BY

METER SHOP (619) 527-7449

Meter Information

Application Date	Requested Install Date:
------------------	-------------------------

Fire Hydrant Location: (Attach Detailed Map//Thomas Bros. Map Location or Construction drawing.) <u>Zip:</u>	T.B.	G.B. (CITY USE)
Specific Use of Water:		
Any Return to Sewer or Storm Drain, if so, explain:		
Estimated Duration of Meter Use:	<input type="checkbox"/>	<input type="checkbox"/> Check Box if Reclaimed Water

Company Information

Company Name:			
Mailing Address:			
City:	State:	Zip:	Phone: ()
*Business license#		*Contractor license#	
A Copy of the Contractor's license OR Business License is required at the time of meter issuance.			
Name and Title of Billing Agent: <small>(PERSON IN ACCOUNTS PAYABLE)</small>			Phone: ()
Site Contact Name and Title:			Phone: ()
Responsible Party Name:			Title:
Cal ID#			Phone: ()
Signature:		Date:	
Guarantees Payment of all Charges Resulting from the use of this Meter. Insures that employees of this Organization understand the proper use of Fire Hydrant Meter			

<input type="checkbox"/>	Fire Hydrant Meter Removal Request	Requested Removal Date:
Provide Current Meter Location if Different from Above:		
Signature:		Title:
Date:		
Phone: ()	Pager: ()	

<input type="checkbox"/>	City Meter	<input type="checkbox"/>	Private Meter
Contract Acct #:		Deposit Amount: \$ 936.00	Fees Amount: \$ 62.00
Meter Serial #		Meter Size: 05	Meter Make and Style: 6-7
Backflow #		Backflow Size:	Backflow Make and Style:
Name:		Signature:	Date:

WATER USES WITHOUT ANTICIPATED CHARGES FOR RETURN TO SEWER

Auto Detailing
Backfilling
Combination Cleaners (Vactors)
Compaction
Concrete Cutters
Construction Trailers
Cross Connection Testing
Dust Control
Flushing Water Mains
Hydro Blasting
Hydro Seeing
Irrigation (for establishing irrigation only; not continuing irrigation)
Mixing Concrete
Mobile Car Washing
Special Events
Street Sweeping
Water Tanks
Water Trucks
Window Washing

Note:

1. If there is any return to sewer or storm drain, then sewer and/or storm drain fees will be charges.

Date

Name of Responsible Party
Company Name and Address
Account Number: _____

Subject: Discontinuation of Fire Hydrant Meter Service

Dear Water Department Customer:

The authorization for use of Fire Hydrant Meter # _____, located at *(Meter Location Address)* ends in 60 days and will be removed on or after *(Date Authorization Expires)*. Extension requests for an additional 90 days must be submitted in writing for consideration 30 days prior to the discontinuation date. If you require an extension, please contact the Water Department, or mail your request for an extension to:

City of San Diego
Water Department
Attention: Meter Services
2797 Caminito Chollas
San Diego, CA 92105-5097

Should you have any questions regarding this matter, please call the Fire Hydrant Hotline at (619) _____ - _____.

Sincerely,

Water Department

APPENDIX C

MATERIALS TYPICALLY ACCEPTED BY CERTIFICATE OF COMPLIANCE

Materials Typically Accepted by Certificate of Compliance

1. Soil amendment
2. Fiber mulch
3. PVC or PE pipe up to 16 inch diameter
4. Stabilizing emulsion
5. Lime
6. Preformed elastomeric joint seal
7. Plain and fabric reinforced elastomeric bearing pads
8. Steel reinforced elastomeric bearing pads
9. Waterstops (Special Condition)
10. Epoxy coated bar reinforcement
11. Plain and reinforcing steel
12. Structural steel
13. Structural timber and lumber
14. Treated timber and lumber
15. Lumber and timber
16. Aluminum pipe and aluminum pipe arch
17. Corrugated steel pipe and corrugated steel pipe arch
18. Structural metal plate pipe arches and pipe arches
19. Perforated steel pipe
20. Aluminum underdrain pipe
21. Aluminum or steel entrance tapers, pipe downdrains, reducers, coupling bands and slip joints
22. Metal target plates
23. Paint (traffic striping)
24. Conductors
25. Painting of electrical equipment
26. Electrical components
27. Engineering fabric
28. Portland Cement
29. PCC admixtures
30. Minor concrete, asphalt
31. Asphalt (oil)
32. Liquid asphalt emulsion
33. Epoxy

APPENDIX D

SAMPLE CITY INVOICE

City of San Diego, Field Engineering Div., 9485 Aero Drive, SD CA 92123						Contractor's Name:					
Project Name:						Contractor's Address:					
SAP No. (WBS/IO/CC)											
City Purchase Order No.						Contractor's Phone #:			Invoice No.		
Resident Engineer (RE):						Contractor's Fax #:			Invoice Date:		
RE Phone#:			RE Fax#:			Contact Name:			Billing Period:		
Item #	Item Description	Contract Authorization				Previous Estimate		This Estimate		Totals to Date	
		Unit	Qty	Price	Extension	%/QTY	Amount	%/QTY	Amount	%/QTY	Amount
1	2 Parallel 4" PVC C900	LF	1,380	\$34.00	\$46,920.00						
2	48" Primary Steel Casing	LF	500	\$1,000.00	\$500,000.00						
3	2 Parallel 12" Secondary Steel	LF	1,120	\$53.00	\$59,360.00						
4	Construction and Rehab of PS 49	LS	1	\$150,000.00	\$150,000.00						
5	Demo	LS	1	\$14,000.00	\$14,000.00						
6	Install 6' High Chain Link Fence	LS	1	\$5,600.00	\$5,600.00						
7	General Site Restoration	LS	1	\$3,700.00	\$3,700.00						
8	10" Gravity Sewer	LF	10	\$292.00	\$2,920.00						
9	4" Blow Off Valves	EA	2	\$9,800.00	\$19,600.00						
10	Bonds	LS	1	\$16,000.00	\$16,000.00						
11	Field Orders	AL	1	80,000	\$80,000.00						
11.1	Field Order 1	LS	5,500	\$1.00	\$5,500.00						
11.2	Field Order 2	LS	7,500	\$1.00	\$7,500.00						
11.3	Field Order 3	LS	10,000	\$1.00	\$10,000.00						
11.4	Field Order 4	LS	6,500	\$1.00	\$6,500.00						
12	Certified Payroll	LS	1	\$1,400.00	\$1,400.00						
CHANGE ORDERS											
Change Order 1			4,890								
Items 1-4					\$11,250.00						
Item 5-Deduct Bid Item 3		LF	120	-\$53.00	(\$6,360.00)						
Change Order 2			160,480								
Items 1-3					\$95,000.00						
Item 4 Deduct Bid Item 1		LF	380	-\$340.00	(\$12,920.00)						
Item 5-Increase bid Item 9		LF	8	\$9,800.00	\$78,400.00						
Change Order 3 (Close Out)			-121,500								
Item 1 Deduct Bid Item 3			53	-500.00	(\$26,500.00)						
Item 2 Deduct Bid Item 4		LS	-1	45,000.00	(\$45,000.00)						
Items 3-9			1	-50,500.00	(\$50,500.00)						
SUMMARY								Total This	\$ -	Total Billed	\$0.00
A. Original Contract Amount						Retention and/or Escrow Payment Schedule					
B. Approved Change Order 1 Thru 3						Total Retention Required as of this billing					
C. Total Authorized Amount (A+B)						Previous Retention Withheld in PO or in Escrow					
D. Total Billed to Date						Add'l Amt to Withhold in PO/Transfer in Escrow:					
E. Less Total Retention (5% of D)						Amt to Release to Contractor from PO/Escrow:					
F. Less Total Previous Payments											
G. Payment Due Less Retention						Contractor Signature and Date:					
H. Remaining Authorized Amount											

APPENDIX E

ELECTRICAL SPECIFICATIONS

16010 - ELECTRICAL BASIC REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Basic requirements for electrical systems.

B. Related Sections include but are not necessarily limited to:

1. Section 16120 - Wire and Cable - 600 Volt and Below.
2. Section 16130 - Raceways and Boxes.

1.02 QUALITY ASSURANCE

A. Referenced Standards:

1. Aluminum Association (AA).
2. American Iron and Steel Institute (AISI).
3. ASTM International (ASTM):
 - a. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - b. A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
4. ETL Testing Laboratories (ETL).
5. Institute of Electrical and Electronics Engineers/American National Standards Institute (IEEE/ANSI):
 - a. C2, National Electrical Safety Code (NESC).
6. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
7. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
8. Underwriters Laboratories, Inc. (UL).

- B. Where Underwriters Laboratories, Inc. (UL) test procedures have been established for the product type, use UL or ETL Testing Laboratories (ETL) approved electrical equipment and provide with the UL or ETL label.

1.03 DEFINITIONS

- A. For the purposes of providing materials and installing electrical work the following definitions shall be used.
1. Outdoor Area: Exterior locations where the equipment is normally exposed to the weather and including below grade structures, such as vaults, manholes, handholes and in-ground pump stations.
 2. Architecturally Finished Interior Area: Offices, laboratories, conference rooms, restrooms, corridors and other similar occupied spaces.
 3. Non-Architecturally Finished Interior Area: Pump, chemical, mechanical, electrical rooms and other similar process type rooms.
 4. Highly Corrosive and Corrosive Area: Areas identified on the Drawings where there is a varying degree of spillage or splashing of corrosive materials such as water, wastewater or chemical solutions; or chronic exposure to corrosive, caustic or acidic agents, chemicals, chemical fumes or chemical mixtures.
 5. Hazardous Areas: Class I, II or III areas as defined in NFPA 70 (NEC) and NFPA 820.
 6. Shop Fabricated: Manufactured or assembled equipment for which a UL test procedure has not been established.

1.04 SUBMITTALS

- A. Shop Drawings:
1. See Division 1 for requirements for the mechanics and administration of submittal process.
 2. See Division 1 and individual specification sections for submittal requirements for products defined as equipment.
 3. General Requirements:
 - a. Provide manufacturer's technical information on products to be used, including product descriptive bulletin.
 - b. Include data sheets that include manufacturer's name and product model number. (1) Clearly identify all optional accessories.
 - c. Acknowledgement that products are UL or ETL listed or are constructed utilizing UL or ETL recognized components.
 - d. Manufacturer's delivery, storage, handling and installation instructions.
 - e. Product installation details.
 - f. See individual specification sections for any additional requirements.
- B. Operation and Maintenance Manuals:
1. See Division 1 for requirements for:

- a. The mechanics and administration of the submittal process.
 - b. The content process of Operation and Maintenance Manuals.
- C. When a Specification Section includes products specified in another Specification Section, each Section shall have the required Shop Drawing transmittal form per Division 1 and all Sections shall be submitted simultaneously.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. See Division 1.
- B. Protect nameplates on electrical equipment to prevent defacing.

1.06 AREA DESIGNATIONS

- A. Designation of an area will determine the NEMA rating of the electrical equipment enclosures, types of conduits and installation methods to be used in that area.
 - 1. Outdoor Areas:
 - a. Wet.
 - b. Also, corrosive and/or hazardous when specifically designated on the Drawings or in the Specifications.
 - 2. Indoor Areas:
 - a. Dry.
 - b. Also, wet, corrosive and/or hazardous when specifically designated on the Drawings or in the Specifications.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Refer to specific Division 16 sections and specific material paragraphs below.
- B. Provide all components of a similar type by one (1) manufacturer.

2.02 MATERIALS

- A. Electrical Equipment Support Pedestals and/or Racks:
 - 1. Approved Manufacturers:
 - a. Modular Strut:
 - (1) Unistrut Building Systems.
 - (2) B-Line.
 - (3) OCAL.
 - 2. Material Requirements:
 - a. Modular Strut:

- (1) Stainless steel: AISI Type 316.
 - (2) PVC coated galvanized steel: ASTM A123 or ASTM A153 and 20 mil PVC coating.
- b. Mounting Hardware:
- (1) Stainless steel.
 - (2) OCAL.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install and wire all equipment, including pre-purchased equipment, and perform all tests necessary to assure conformance to the Drawings and Specifications and ensure that equipment is ready and safe for energization.
- B. Install equipment in accordance with the requirements of:
1. NFPA 70 (NEC).
 2. IEEE/ANSI C2.
 3. The manufacturer's instructions.
- C. In general, conduit routing is not shown on the Drawings.
1. The Contractor is responsible for routing all conduits including those shown on one-line and control block diagrams and home runs shown on floor plans.
 2. Conduit routings and stub-up locations that are shown are approximate; exact routing to be as required for equipment furnished and field conditions.
- D. When complete branch circuiting is not shown on the Drawings:
1. A homerun indicating panelboard name and circuit number will be shown and the circuit number will be shown adjacent to the additional devices (e.g., light fixture and receptacles) on the same circuit.
 2. The Contractor is to furnish and install all conduit and conductors required for proper operation of the circuit.
 3. The indicated home run conduit and conductor size shall be used for the entire branch circuit.
 4. See Section 16120 for combining multiple branch circuits in a common conduit.
- E. Do not use equipment that exceed dimensions or reduce clearances indicated on the Drawings or as required by the NFPA 70 (NEC).
- F. Install equipment plumb, square and true with construction features and securely fastened.

- G. Install electrical equipment, including pull and junction boxes, minimum of 6-inches from process, gas, air and water piping and equipment.
- H. Install equipment so it is readily accessible for operation and maintenance, is not blocked or concealed and does not interfere with normal operating and maintenance requirements of other equipment.
- I. Avoid interference of electrical equipment operation and maintenance with structural members, building features and equipment of other trades.
- J. Provide electrical equipment support system per the following area designations:
 - 1. All Areas:
 - a. Stainless steel system consisting of stainless steel channels and fittings, nuts and hardware.
 - b. PVC coated steel system consisting of PVC coated steel channels and fittings with stainless steel nuts and hardware.
- K. Provide all necessary anchoring devices and supports rated for the equipment load based on dimensions and weights verified from approved submittals, or as recommended by the manufacturer.
 - 1. Do not cut, or weld to, building structural members.
 - 2. Do not mount safety switches or other equipment to equipment enclosures, unless enclosure mounting surface is properly braced to accept mounting of external equipment.
- L. Provide corrosion resistant spacers to maintain 1/4 IN separation between metallic equipment and/or metallic equipment supports and mounting surface in wet areas, on below grade walls and on walls of liquid containment or processing areas such as Basins, Clarifiers, Digesters, Reservoirs, etc.
- M. Do not place equipment fabricated from aluminum in direct contact with earth or concrete.
- N. Screen or seal all openings into equipment mounted outdoors to prevent the entrance of rodents and insects.
- O. Do not use materials that may cause the walls or roof of a building to discolor or rust.
- P. Identify electrical equipment and components.

3.02 FIELD QUALITY CONTROL

- A. Verify exact rough-in location and dimensions for connection to electrified equipment, provided by others.
 - 1. See Division 1 for openings and penetrations in structures.
- B. Replace equipment and systems found inoperative or defective and re-test.

- C. Cleaning:
 - 1. See Division 1.

- D. The protective coating integrity of support structures and equipment enclosures shall be maintained.
 - 1. Repair field damaged galvanized components utilizing a zinc rich paint.
 - 2. Repair painted components utilizing touch up paint provided by or approved by the manufacturer.
 - 3. Repair PVC coated components utilizing a patching compound, of the same material as the coating, provided by the manufacturer of the component.
 - 4. Repair surfaces which will be inaccessible after installation prior to installation.
 - 5. See Section 16130 for requirements for conduits and associated accessories.

- E. Replace nameplates damaged during installation.

3.03 DEMONSTRATION

- A. Demonstrate equipment in accordance with Division 1

16010 - GROUNDING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Material and installation requirements for grounding system(s).

B. Related Sections include but are not necessarily limited to:

1. Section 16010 - Electrical: Basic Requirements.
2. Section 16080 - Acceptance Testing.
3. Section 16120 - Wire and Cable - 600 Volt and Below.
4. Section 16130 - Raceways and Boxes.

1.02 QUALITY ASSURANCE

A. Referenced Standards:

1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. Standard Specification for Highway Bridges.
2. ASTM International (ASTM):
 - a. B8, Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
3. Institute of Electrical and Electronics Engineers (IEEE):
 - a. 837, Qualifying Permanent Connections Used in Substation Grounding.
4. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
5. Underwriters Laboratories, Inc. (UL):
 - a. 467, Standard for Safety Electrical Grounding and Bonding Equipment.

B. Assure ground continuity is continuous throughout the entire Project.

1.03 SUBMITTALS

A. Shop Drawings:

1. Product Technical Data.
 - a. Provide submittal data for all products specified in PART 2 of this Specification except:
 - (1) Grounding clamps, terminals and connectors.

- (2) Exothermic welding system.
- b. See Section 16010 for additional requirements.

1.04 WORK PAYMENT

- A. Payment for the Work in this section shall be included as part of the lump-sum or unit-price bid amount for which such Work is appurtenant thereto, including all Work and materials specified herein and as may be required to complete this portion of the Work.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

- 1. Ground Rods and Bars and Grounding Clamps, Connectors and Terminals:

- a. Burndy.
- b. Harger Lightning Protection.
- c. Heary Brothers.
- d. Joslyn.
- e. Robbins Lightning Protection.
- f. Thomas & Betts (Blackburn).
- g. Thompson.
- h. Or equal.

- 2. Exothermic Weld Connections:

- a. Erico Products Inc., Cadweld.
- b. Harger Lightning Protection.
- c. Thermoweld.
- d. Or equal.

- 3. Prefabricated Composite Test Stations:

- a. Quazite Composolite.
- b. Armocast Products Company.
- c. Or equal.

2.02 COMPONENTS

- A. Wire and Cable:

- 1. Bare Conductors: Soft drawn stranded copper meeting ASTM B8.
- 2. Insulated Conductors: Color coded green, per Section 16120.

- B. Conduit: As specified in Section 16130.

- C. Ground Bars:

- 1. Solid Copper:

- a. 1/4 inch thick.
 - b. 2 or 4 inch wide.
 - c. 24 inch long minimum in main service entrance electrical rooms, 12 inch long elsewhere.
2. Predrilled grounding lug mounting holes.
 3. Stainless steel or galvanized steel mounting brackets.
 4. Insulated standoffs.
- D. Ground Rods:
1. 3/4 inch x 10 FT, or as indicated on the Drawings.
 2. Copperclad:
 - a. Heavy uniform coating of electrolytic copper molecularly bonded to a rigid steel core.
 - b. Corrosion resistant bond between the copper and steel.
 - c. Hard drawn for a scar-resistant surface.
- E. Grounding Clamps, Connectors and Terminals:
1. Mechanical Type:
 - a. Standards: UL 467.
 - b. High copper alloy content.
 2. Compression Type for Interior Locations:
 - a. Standards: UL 467.
 - b. High copper alloy content.
 - c. Non-reversible.
 - d. Terminals for connection to bus bars shall have two bolt holes.
 3. Compression Type Suitable for Direct Burial in Earth or Concrete:
 - a. Standards: UL 467, IEEE 837.
 - b. High copper alloy content.
 - c. Non-reversible.
- F. Exothermic Weld Connections:
1. Copper oxide reduction by aluminum process.
 2. Molds properly sized for each application.
- G. Prefabricated Composite Material Test Stations:
1. Fiberglass reinforced polymer concrete.

2. Body and cover shall sustain a minimum vertical load test of 22,000 LBS over a 10 inch square or be H-20 rated per AASHTO.
3. Size: 12 inch round or 12 inch square.
4. Open bottom.
5. Stackable design as required for specified depth.
6. Engrave cover with the word "GROUND".

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Install products in accordance with manufacturer's instructions.
2. Size grounding conductors and bonding jumpers in accordance with NFPA 70 Article 250, except where larger sizes are indicated on the Drawings.
3. Remove paint, rust, or other nonconducting material from contact surfaces before making ground connections.
4. Where ground conductors pass through floor slabs or building walls provide non-metallic sleeves.
5. Do not splice grounding conductors except at ground rods.
6. Install ground rods and grounding conductors in undisturbed, firm soil.
 - a. Provide excavation required for installation of ground rods and ground conductors.
 - b. Use driving studs or other suitable means to prevent damage to threaded ends of sectional rods.
 - c. Unless otherwise specified, connect conductors to ground rods with compressor type connectors or exothermic weld.
 - d. Provide sufficient slack in grounding conductor to prevent conductor breakage during backfill or due to ground movement.
 - e. Backfill excavation completely, thoroughly tamping to provide good contact between backfill materials and ground rods and conductors.
7. Do not use exothermic welding if it will damage the structure the grounding conductor is being welded to.

B. Grounding Electrode System:

1. Provide a grounding electrode system in accordance with NFPA 70 Article 250 and as indicated on the Drawings.
2. Grounding Conductor Terminations:
 - a. Ground bars mounted on wall, use compression type terminal and bolt it to the ground bar with two bolts.
 - b. Ground bars in electrical equipment, use compression type terminal and bolt it to the ground bar.
 - c. Grounding Conductor: Bare conductor, size as indicated on the Drawings.

C. Raceway Bonding/Grounding:

1. All metallic conduit shall be installed so that it is electrically continuous.
2. All conduits to contain a grounding conductor with insulation identical to the phase conductors, unless otherwise indicated on the Drawings.
3. NFPA 70 required grounding bushings shall be of the insulating type.
4. Provide double locknuts at all panels.
5. Bond all conduit, at entrance and exit of equipment, to the equipment ground bus or lug.
6. Provide bonding jumpers if conduits are installed in concentric knockouts.
7. Make all metallic raceway fittings and grounding clamps tight to ensure equipment grounding system will operate continuously at ground potential to provide low impedance current path for proper operation of overcurrent devices during possible ground fault conditions.

D. Equipment Grounding:

1. All utilization equipment shall be grounded with an equipment ground conductor.

3.02 FIELD QUALITY CONTROL

A. Leave grounding system uncovered until observed by Owner.

B. Acceptance Testing:

1. See Section 16080.

16120 - WIRE AND CABLE – 600 VOLT AND BELOW

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Material and installation requirements for:
 - a. Building wire.
 - b. Power cable.
 - c. Control cable.
 - d. Wire connectors.
 - e. Insulating tape.
 - f. Pulling lubricant.

B. Related Sections include but are not necessarily limited to:

1. Section 16010 - Electrical: Basic Requirements.

1.02 QUALITY ASSURANCE

A. Referenced Standards:

1. Canadian Standards Association (CSA):
 - a. Test Methods for Electrical Wires and Cables (FT-4 Vertical Cable Tray Test).
2. National Electrical Manufacturers Association (NEMA):
 - a. ICS 4, Industrial Control and Systems: Terminal Blocks.
3. National Electrical Manufacturers Association/Insulated Cable Engineers Association (NEMA/ICEA):
 - a. WC 57/S-73-532, Standard for Control Cables.
4. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
5. Underwriters Laboratories, Inc. (UL):
 - a. 44, Standard for Safety Thermoset-Insulated Wires and Cables.
 - b. 83, Standard for Safety Thermoplastic-Insulated Wires and Cables.
 - c. 467, Standard for Safety Grounding and Bonding Equipment.

- d. 486A, Standard for Safety Wire Connectors and Soldering Lugs for use with Copper Conductors.
- e. 486C, Standard for Safety Splicing Wire Connections.
- f. 510, Standard for Safety Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape.
- g. 1581, Standard for Safety Reference Standard for Electrical Wires, Cables, and Flexible Cords.

1.03 DEFINITIONS

- A. Control Cable: Multi-conductor, insulated, with outer sheath containing building wires, No. 14, No. 12 or No. 10 AWG.
- B. Building Wire: Single conductor, insulated, with or without outer jacket depending upon type.

1.04 SUBMITTALS

- A. Shop Drawings:
 - 1. Product technical data:
 - a. Provide submittal data for all products specified in Part 2 of this specification except:
 - (1) Wire connectors.
 - (2) Insulating tape.
 - (3) Cable lubricant.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
 - 1. Building wire, power and control cable and multiplex cable:
 - a. American Insulated Wire Corporation.
 - b. General Cable.
 - c. Southwire Company.
 - 2. Wire connectors:
 - a. Burndy Corporation.
 - b. Buchanan.
 - c. Thomas and Betts.

3. Insulating and color coding tape:
 - a. 3M Co.
 - b. Plymouth Bishop Tapes.
 - c. Red Seal Electric Co.
- B. Submit request for substitution in accordance with Division 1.

2.02 MANUFACTURED UNITS

A. Building Wire:

1. Conductor shall be copper with 600 V rated insulation.
2. Conductors shall be stranded, except for conductors used in lighting and receptacle circuits which may be stranded or solid.
3. Surface mark with manufacturers name or trademark, conductor size, insulation type and UL label.
4. Conform to NEMA/ICEA WC 70/S-95-658 and UL 83 for type THHN/THWN and THHN/THWN-2 insulation.
5. Conform to NEMA/ICEA WC 70/S-95-658 and UL 44 for type XHHW-2 insulation.

B. Power Cable:

1. Conductor shall be copper with 600 V rated insulation.
2. Surface mark with manufacturers name or trademark, conductor size, insulation type and UL label.
3. Conform to NEMA/ICEA WC 70/S-95-658 and UL 83 and UL 1277 for type THHN/THWN insulation with an overall PVC jacket.
4. Number of conductors as required, including a bare ground conductor.
5. Individual conductor color coding:
 - a. ICEA Method 4.
 - b. See Part 3 of this specification for additional requirements.
6. Conform to NFPA 70 Type TC {and IEEE/ANSI 1202 or CSA FT-4}.

C. Control Cable:

1. Conductor shall be copper with 600 V rated insulation.
2. Surface mark with manufacturer's name or trademark, conductor size, insulation type and UL label.

3. Conform to NEMA/ICEA WC 57/S-73-532 and UL 83 and UL 1277 for type THHN/THWN insulation with an overall PVC jacket.
 4. Number of conductors as required, provided with or without bare ground conductor of the same AWG size.
 - a. When a bare ground conductor is not provided, an additional insulated conductor shall be provided and used as the ground conductor (e.g., 6/c No. 14 w/g and 7/c No. 14 are equal).
 5. Individual conductor color coding:
 - a. NEMA/ICEA Method 1, Table E-2.
 - b. See Part 3 of this Specification for additional requirements.
 6. Conform to NFPA 70 Type TC.
- D. Electrical Equipment Control Wire:
1. Conductor shall be copper with 600 V rated insulation.
 2. Conductors shall be stranded.
 3. Surface mark with manufacturers name or trademark, conductor size, insulation type and UL label.
 4. Conform to UL 44 for Type SIS insulation.
 5. Conform to UL 83 for Type MTW insulation.
- E. Wire Connectors:
1. Twist/screw on type:
 - a. Insulated pressure or spring type solderless connector.
 - b. 600 V rated.
 - c. Ground conductors: Conform to UL 486C and/or UL 467 when required by local codes.
 - d. Phase and neutral conductors: Conform to UL 486C.
 2. Compression and mechanical screw type:
 - a. 600 V rated.
 - b. Ground conductors: Conform to UL 467.
 - c. Phase and neutral conductors: Conform to UL 486A.
 3. Terminal block type:
 - a. High density, screw-post barrier-type with white center marker strip.
 - b. 600 V and ampere rating as required, for power circuits.
 - c. 600 V, 20 ampere rated for control circuits.
 - d. 300 V, 15 ampere rated for instrumentation circuits.

- e. Conform to NEMA ICS 4 and UL 486A.
- F. Insulating and Color Coding Tape:
 - 1. Pressure sensitive vinyl.
 - 2. Premium grade.
 - 3. Heat, cold, moisture, and sunlight resistant.
 - 4. Thickness, depending on use conditions: 7, 8.5, or 10 mil.
 - 5. For cold weather or outdoor location, tape must also be all-weather.
 - 6. Color:
 - a. Insulating tape: Black.
 - b. Color coding tape: Fade-resistant color as specified herein.
 - 7. Comply with UL 510.
- G. Pulling Lubricant: Cable manufacturer's standard containing no petroleum or other products which will deteriorate insulation.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Permitted Usage of Insulation Types:
 - 1. Type XHHW-2:
 - a. Building wire and power and control cable in architectural and non-architectural finished areas.
 - b. Building wire and power and control cable in conduit below grade.
 - 2. Type THHN/THWN and THHN/THWN-2:
 - a. Building wire and power and control cable No. 8 AWG and smaller in architectural and non-architectural finished areas.
- B. Conductor Size Limitations:
 - 1. Feeder and branch power conductors shall not be smaller than No. 12 AWG unless otherwise indicated on the Drawings.
 - 2. Control conductors shall not be smaller than No. 14 AWG unless otherwise indicated on the Drawings.
 - 3. Instrumentation conductors shall not be smaller than No. 18 AWG unless otherwise indicated on the Drawings.

C. Color Code All Wiring as Follows:

1. Building wire:

	240 V, 208 V, 240/120 V, 208/120 V	480 V, 480/277 V
Phase 1	Black	Brown
Phase 2	Red*	Orange
Phase 3	Blue	Yellow
Neutral	White	White
Ground	Green	Green
* Orange when it is a high leg of a 120/240 V Delta system.		

- a. Conductors No. 6 AWG and smaller: Insulated phase, neutral and ground conductors shall be identified by a continuous colored outer finish along its entire length.
- b. Conductors larger than No. 6 AWG:
 - (1) Insulated phase and neutral conductors shall be identified by one (1) of the following methods:
 - (a) Continuous colored outer finish along its entire length.
 - (b) 3 IN of colored tape applied at the termination.
 - (2) Insulated grounding conductor shall be identified by one (1) of the following methods:
 - (a) Continuous green outer finish along its entire length.
 - (b) Stripping the insulation from the entire exposed length.
 - (c) Using green tape to cover the entire exposed length.
 - (3) The color coding shall be applied at all accessible locations, including but not limited to: Junction and pull boxes, wireways, manholes and handholes.

2. Power cables ICEA Method 4 with:
 - a. Phase and neutral conductors identified with 3 IN of colored tape, per the Table herein, applied at the terminations.
 - b. Ground conductor: Bare.
 3. Control cables NEMA/ICEA Method 1, Table E-2:
 - a. When a bare ground is not provided, one (1) of the colored insulated conductors shall be re-identified by stripping the insulation from the entire exposed length or using green tape to cover the entire exposed length.
 - b. When used in power applications the colored insulated conductors used as phase and neutral conductors may have to be re-identified with 3 IN of colored tape, per the Table herein, applied at the terminations.
- D. Install all wiring in raceway unless otherwise indicated on the Drawings.
- E. Feeder, branch, control and instrumentation circuits shall not be combined in a raceway, cable tray, junction or pull box, except as permitted in the following:
1. Where specifically indicated on the Drawings.
 2. Where field conditions dictate and written permission is obtained from the Engineer.
 3. Control circuits shall be isolated from feeder and branch power and instrumentation circuits but combining of control circuits is permitted.
 - a. The combinations shall comply with the following:
 - (1) 12 Vdc, 24 Vdc and 48 Vdc may be combined.
 - (2) 125 Vdc shall be isolated from all other AC and DC circuits.
 - (3) AC control circuits shall be isolated from all DC circuits.
 4. Multiple branch circuits for lighting, receptacle and other 120 Vac circuits are allowed to be combined into a common raceway.
 - a. Contractor is responsible for making the required adjustments in conductor and raceway size, in accordance with all requirements of the NEC, including but not limited to:
 - (1) Up sizing conductor size for required ampacity de-ratings for the number of current carrying conductors in the raceway.
 - (2) The neutral conductor may be shared on sequential circuits (e.g., circuit numbers 1, 3, 5).
 - (3) Up sizing raceway size for the size and quantity of conductors.

F. Splices and terminations for the following circuit types shall be made in the indicated enclosure type using the indicated method.

1. Feeder and branch power circuits:

a. Device outlet boxes:

(1) Twist/screw on type connectors.

b. Junction and pull boxes and wireways:

(1) Twist/screw on type connectors for use on No. 8 and smaller wire.

(2) Compression, mechanical screw or terminal block or terminal strip type connectors for use on No. 6 AWG and larger wire.

c. Motor terminal boxes:

(1) Twist/screw on type connectors for use on No. 10 AWG and smaller wire.

(2) Mechanical screw type connectors for use on No. 8 AWG and larger wire.

d. Manholes or handholes:

(1) Twist/screw on type connectors pre-filled with epoxy for use on No. 8 AWG and smaller wire.

(2) Watertight compression or mechanical screw type connectors for use on No. 6 AWG and larger wire. Provide cast resin submersible splices.

2. Control Circuits:

a. Junction and pull boxes: Terminal block type connector.

b. Manholes or handholes: Twist/screw on type connectors pre-filled with epoxy.

c. Control panels and motor control centers: Terminal block or strips provided within the equipment or field installed within the equipment by the Contractor.

3. Non-insulated compression and mechanical screw type connectors shall be insulated with tape or hot or cold shrink type insulation to the insulation level of the conductors.

G. Insulating Tape Usage:

1. For insulating connections of No. 8 AWG wire and smaller: 7 mil vinyl tape.

2. For insulating splices and taps of No. 6 AWG wire or larger: 10 mil vinyl tape.
 3. For insulating connections made in cold weather or in outdoor locations: 8.5 mil, all weather vinyl tape.
- H. Color Coding Tape Usage: For color coding of conductors.

16130 - RACEWAYS AND BOXES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Material and installation requirements for:
 - a. Conduits.
 - b. Conduit fittings.
 - c. Conduit supports.
 - d. Wireways.
 - e. Outlet boxes.
 - f. Pull and junction boxes.

B. Related Sections include but are not necessarily limited to:

1. Division 1 - General Requirements.
2. Section 16010 - Basic Electrical Requirements.
3. Section 16135 - Electrical: Exterior Underground.
4. Section 16140 - Wiring Devices.

1.02 QUALITY ASSURANCE

A. Referenced Standards:

1. American Iron and Steel Institute (AISI).
2. ASTM International (ASTM):
 - a. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - b. D2564, Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
3. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
 - b. RN 1, Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
 - c. TC 2, Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).
 - d. TC 3, PVC Fittings for Use with Rigid PVC Conduit and Tubing.

4. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
5. Underwriters Laboratories, Inc. (UL):
 - a. 1, Standard for Safety Flexible Metal Conduit.
 - b. 6, Standard for Safety Rigid Metal Conduit.
 - c. 50, Standard for Safety Enclosures for Electrical Equipment.
 - d. 360, Standard for Safety Liquid-Tight Flexible Steel Conduit.
 - e. 467, Standard for Safety Grounding and Bonding Equipment.
 - f. 514A, Standard for Safety Metallic Outlet Boxes.
 - g. 514B, Standard for Safety Fittings for Cable and Conduit.
 - h. 651, Standard for Safety Schedule 40 and 80 Rigid PVC Conduit.
 - i. 870, Standard for Safety Wireways, Auxiliary Gutters, and Associated Fittings.
 - j. 886, Standard for Safety Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations.

1.03 SUBMITTALS

- A. Shop Drawings:
 1. Product technical data:
 - a. Provide submittal data for all products specified in PART 2 of this Specification except:
 - (1) Conduit fittings.
 - (2) Support systems.
 - b. See Section 16010 for additional requirements.
 2. Fabrication and/or layout drawings:
 - a. Identify dimensional size of pull and junction boxes to be used.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. See Section 16010.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. PVC coated rigid metallic conduits and repair kits:

- a. Occidental Coating Company.
- b. Rob-Roy Ind.

2. Rigid non-metallic conduit:

- a. Carlon.
- b. Cantex.

3. Flexible conduit:

- a. AFC Cable Systems.
- b. Anamet, Inc.
- c. Electri-Flex.

4. Wireway:

- a. Hoffman Engineering Company.

5. Conduit fittings and accessories:

- a. OCAL.

6. Support systems:

- a. Unistrut Building Systems (stainless steel).
- b. OCAL.

7. Outlet, pull and junction boxes:

- a. OCAL.

2.02 RIGID METALLIC CONDUITS

A. PVC-Coated Rigid Steel Conduit (PVC-RGS):

1. Nominal 40 mil Polyvinyl Chloride Exterior Coating:

- a. Coating: Bonded to hot-dipped galvanized rigid steel conduit conforming to NEMA/ANSI C80.1.
- b. The bond between the PVC coating and the conduit surface: Greater than the tensile strength of the coating.

2. Nominal 2 mil, minimum, urethane interior coating.
3. Urethane coating on threads.
4. Conduit: Epoxy prime coated prior to application of PVC and urethane coatings.
5. Female Ends:
 - a. Have a plastic sleeve extending a minimum of 1 pipe diameter or 2 IN, whichever is less beyond the opening.
 - b. The inside diameter of the sleeve shall be the same as the outside diameter of the conduit to be used with it.
6. Standards: NEMA/ANSI C80.1, UL 6, NEMA RN 1.

2.03 RIGID NON-METALLIC CONDUIT

- A. Schedules 80 (PVC-80):
 1. Polyvinyl-chloride (PVC) plastic compound which includes inert modifiers to improve weatherability and heat distribution.
 2. Rated for direct sunlight exposure.
 3. Fire retardant and low smoke emission.
 4. Shall be suitable for use with 90 DegC wire and shall be marked "maximum 90 Deg C".
 5. Standards: NEMA TC 2, UL 651.

2.04 FLEXIBLE CONDUIT

- A. PVC-Coated Flexible Galvanized Steel (liquid-tight) Conduit (FLEX-LT):
 1. Core formed of continuous, spiral wound, hot-dip galvanized steel strip with successive convolutions securely interlocked. 3/4-inch minimum size.
 2. Extruded PVC outer jacket positively locked to the steel core.
 3. Liquid and vaportight.
 4. Standard: UL 360.

2.05 WIREWAY

- A. Watertight (NEMA 4X rated) Wireway:
 1. 14 GA Type 304 or 316 stainless steel bodies and covers without knockouts and 10 GA stainless steel flanges.

2. Cover: Fully gasketed and held in place with captive clamp type latches.
3. Flanges: Fully gasketed and bolted.

2.06 CONDUIT FITTINGS AND ACCESSORIES

A. Fittings for Use with PVC-RGS:

1. General:

- a. In hazardous locations listed for use in Class I, Division 2, Groups C and D locations.

2. Hubs: Threaded, insulated and gasketed metallic for raintight connection. Stainless steel or PVC coated.

3. Unions: Threaded PVC coated, galvanized steel or zinc plated malleable iron.

4. Conduit bodies (ells and tees):

- a. Body: PVC coated with threaded hubs.
- b. Standard and mogul size.
- c. Cover:

- (1) PVC coated, clip-on type with stainless steel screws.

5. Conduit bodies (round):

- a. Body: PVC coated with threaded hubs.
- b. Cover: Threaded screw on type, PVC coated.

6. Sealing fittings:

- a. Body: PVC coated.
- b. Standard and mogul size.
- c. With or without drain and breather.
- d. Fiber and sealing compound: UL listed for use with the sealing fitting.

B. Fittings for Use with FLEX-LT:

1. Connector:

- a. Straight or angle type.
- b. PVC coated, insulated and gasketed.
- c. Composed of locknut, grounding ferrule and gland compression nut.
- d. Liquid tight.

2. Standards: UL 467, UL 514B.

C. Fittings for Use with Rigid Non-Metallic PVC Conduit:

1. Coupling, adapters and conduit bodies:

- a. Same material, thickness, and construction as the conduits with which they are used.
 - b. Homogeneous plastic free from visible cracks, holes or foreign inclusions.
 - c. Bore smooth and free of blisters, nicks or other imperfections which could damage the conductor.
2. Solvent cement for welding fittings shall be supplied by the same manufacturer as the conduit and fittings.
 3. Standards: ASTM D2564, NEMA TC 3, UL 651, UL 514B.
- D. Weather and Corrosion Protection Tape:
1. PVC based tape, 10 mils thick.
 2. Protection against moisture, acids, alkalis, salts and sewage and suitable for direct bury.
 3. Used with appropriate pipe primer.

2.07 ALL RACEWAY AND FITTINGS

- A. Mark Products:
1. Identify the nominal trade size on the product.
 2. Stamp with the name or trademark of the manufacturer.

2.08 OUTLET BOXES

- A. Cast Outlet Boxes:
1. Threaded hubs and grounding screw.
 2. Styles:
 - a. "FS" or "FD".
 - b. "Bell".
 - c. Single or multiple gang and tandem.
 - d. "EDS" or "EFS" for hazardous locations.
 3. Accessories: 40 mil PVC exterior coating and 2 mil urethane interior coating.
 4. Standards: UL 514A, UL 886.
- B. See Section 16140 for wiring devices, wallplates and coverplates.

2.09 PULL AND JUNCTION BOXES

- A. NEMA 4X Rated (metallic):

1. Body and cover: 14 GA Type 304 or 316 stainless steel.
 2. Seams continuously welded and ground smooth.
 3. No knockouts.
 4. External mounting flanges.
 5. Hinged door and stainless steel screws and clamps.
 6. Door with oil-resistant gasket.
- B. Miscellaneous Accessories:
1. Rigid handles for covers larger than 9 SF or heavier than 25 LBS.
 2. Split covers when heavier than 25 LBS.
 3. Weldnuts for mounting optional panels and terminal kits.
 4. Terminal blocks: Screw-post barrier-type, rated 600 volt and 20 ampere minimum.
- C. Standards: NEMA 250, UL 50.

2.10 SUPPORT SYSTEMS

- A. Multi-conduit Surface or Trapeze Type Support and Pull or Junction Box Supports:
1. Material requirements:
 - a. Stainless steel: AISI Type 316.
 - b. PVC coated galvanized steel: ASTM A123 or ASTM A153 and 20 mil PVC coating.
- B. Single Conduit and Outlet Box Support Fasteners:
1. Material requirements:
 - a. Stainless steel.
 - b. PVC coat malleable iron or steel; 20 mil PVC coating.

PART 3 - EXECUTION

3.01 RACEWAY INSTALLATION - GENERAL

- A. Shall be in accordance with the requirements of:
1. NFPA 70.
 2. Manufacturer instructions.

- B. Size of Raceways:
1. Raceway sizes are shown on the Drawings, if not shown on the Drawings, then size in accordance with NFPA 70.
 2. Unless specifically indicated otherwise, the minimum raceway size shall be:
 - a. Conduit: 3/4 IN (exposed) and 1 IN (buried).
 - b. Wireway: 2-1/2 IN x 2-1/2 IN.
- C. Field Bending and Cutting of Conduits:
1. Utilize tools and equipment recommended by the manufacturer of the conduit, designed for the purpose and the conduit material to make all field bends and cuts.
 2. Do not reduce the internal diameter of the conduit when making conduit bends.
 3. Prepare tools and equipment to prevent damage to the PVC coating.
 4. Degrease threads after threading and apply a zinc rich paint.
 5. Debur interior and exterior after cutting.
- D. Male threads of conduit systems shall be coated with an electrically conductive anti-seize compound.
- E. The protective coating integrity of conduits, fittings, outlet, pull and junction boxes and accessories shall be maintained.
1. Repair painted components utilizing touch up paint provided by or approved by the manufacturer.
 2. Repair PVC coated components utilizing a patching compound, of the same material as the coating, provided by the manufacturer of the conduit; or a self-adhesive, highly conformable, cross-linked silicone composition strip, followed by a protective coating of vinyl tape.
 - a. Total nominal thickness: 40 mil.
 3. Repair surfaces which will be inaccessible after installation prior to installation.
- F. Remove moisture and debris from conduit before wire is pulled into place.
1. Pull mandrel with diameter nominally 1/4 IN smaller than the interior of the conduit, to remove obstructions.
 2. Swab conduit by pulling a clean, tight-fitting rag through the conduit.
 3. Tightly plug ends of conduit with tapered wood plugs or plastic inserts until wire is pulled.

- G. Only nylon or polyethylene rope shall be used to pull wire and cable in conduit systems.
- H. Where portions of a raceway are subject to different temperatures and where condensation is known to be a problem, as in cold storage areas of buildings or where passing from the interior to the exterior of a building, the raceway shall be sealed to prevent circulation of warm air to colder section of the raceway.
- I. Fill openings in walls, floors, and ceilings and finish flush with surface.
 - 1. See Division 1.

3.02 RACEWAY ROUTING

- A. Raceways shall be routed in the field unless otherwise indicated.
 - 1. Conduit and fittings shall be installed, as required, for a complete system that has a neat appearance and is in compliance with all applicable codes.
 - 2. Run in straight lines parallel to or at right angles to building lines.
 - 3. Do not route conduits:
 - a. Through areas of high ambient temperature or radiant heat.
 - b. In suspended concrete slabs.
 - 4. Conduit shall not interfere with, or prevent access to, piping, valves, ductwork, or other equipment for operation, maintenance and repair.
 - 5. Provide pull boxes or conduit bodies as needed so that there is a maximum of 360 degrees of bends in the conduit run or in long straight runs to limit pulling tensions.
- B. Conduits shall be installed to eliminate moisture pockets.
 - 1. Where water cannot drain to openings, provide drain fittings in the low spots of the conduit run.

3.03 RACEWAY APPLICATIONS

- A. Permitted Raceway Types per Wire or Cable Types:
 - 1. Power wire or cables: All raceway types.
 - 2. Control wire or cables: All raceway types.
- B. Permitted Raceway Types Per Area Designations:
 - 1. All exposed areas:
 - a. PVC-RGS.
- C. Permitted Raceway Types Per Routing Locations:

1. Direct buried conduits and ductbanks:
 - a. PVC-80.
 - b. 90 degree elbows for transitions to above grade:
 - (1) RGS wrapped with factory applied weather and corrosion protection tape.
 - (2) PVC-RGS.
 - c. Long sweeping bends greater than 15 degrees:
 - (1) RGS wrapped with factory applied weather and corrosion protection tape.
 - (2) PVC-RGS.
- D. FLEX-LT conduits shall be install as the final conduit connection to light fixtures, dry type transformers, motors, electrically operated valves, instrumentation primary elements, and other electrical equipment that is liable to vibrate.
 1. The maximum length shall not exceed:
 - a. 3 FT to motors.
 - b. 3 FT to all other equipment.

3.04 CONDUIT FITTINGS AND ACCESSORIES

- A. Rigid non-metallic conduit and fittings shall be joined utilizing solvent cement.
 1. Immediately after installation of conduit and fitting, the fitting or conduit shall be rotated 1/4 turn to provide uniform contact.
- B. Install Expansion Fittings:
 1. Where conduits are exposed to the sun and conduit run is greater than 200 FT.
 2. Elsewhere as identified on the Drawings.
- C. Install Expansion/Deflection Fittings:
 1. Where conduits enter a structure.
 - a. Except electrical manholes and handholes.
 - b. Except where the ductbank is tied to the structure with rebar.
 2. Where conduits span structural expansions joints.
 3. Elsewhere as identified on the Drawings.
- D. Threaded connections shall be made wrench-tight.

- E. Conduit joints shall be watertight:
 - 1. Where subjected to possible submersion.
 - 2. In areas classified as wet.
 - 3. Underground.
- F. Terminate Conduits:
 - 1. In NEMA 4 and 4X rated enclosures:
 - a. Watertight, insulated and gasketed hub and locknut.
 - 2. In NEMA 7 and 9 rated enclosures:
 - a. Into an integral threaded hub.
 - 3. When stubbed up through the floor into floor mount equipment:
 - a. With an insulated grounding bushing on metallic conduits.
 - b. With end bells on non-metallic conduits.
- G. Threadless couplings shall only be used to join new conduit to existing conduit when the existing conduit end is not threaded and it is not practical or possible to cut threads on the existing conduit with a pipe threader.

3.05 CONDUIT SUPPORT

- A. Permitted multi-conduit surface or trapeze type support system per area designations and conduit types:
 - 1. All areas:
 - a. Stainless steel system consisting of: Stainless steel channels and fittings, nuts and hardware and conduit clamps.
 - b. PVC coated steel system consisting of: PVC coated galvanized steel channels and fittings and conduit clamps with stainless steel nuts and hardware.
- B. Permitted single conduit support fasteners per area designations and conduit types:
 - 1. All areas:
 - a. Material: Stainless steel and PVC coat malleable iron or steel.
 - b. Types of fasteners: Straps, hangers with bolts, clamps with bolts and bolt on beam clamps.
- C. Conduit Support General Requirements:

1. Maximum spacing between conduit supports per NFPA 70.
2. Support conduit from the building structure.
3. Do not support conduit from process, gas, air or water piping; or from other conduits.
4. Provide hangers and brackets to limit the maximum uniform load on a single support to 25 LBS or to the maximum uniform load recommended by the manufacturer if the support is rated less than 25 LBS.
 - a. Do not exceed maximum concentrated load recommended by the manufacturer on any support.
 - b. Conduit hangers: Continuous threaded rods combined with struts or conduit clamps: Do not use perforated strap hangers and iron bailing wire.
5. Conduit support system fasteners:
 - a. Use sleeve-type expansion anchors as fasteners in masonry wall construction.
 - b. Do not use concrete nails and powder-driven fasteners.

3.06 OUTLET, PULL AND JUNCTION BOX INSTALLATION

A. General:

1. Install products in accordance with manufacturer's instructions.
2. See Section 16010 and the Drawings for area classifications.
3. Size boxes to accommodate quantity of conductors enclosed and quantity of conduits connected to the box.

B. Outlet Boxes:

1. Permitted uses of cast outlet boxes:
 - a. Housing of wiring devices surface mounted in non-architecturally finished dry, wet corrosive, highly corrosive and hazardous areas.
 - b. Pull and junction box surface mounted in non-architecturally finished dry, wet corrosive and highly corrosive areas.
2. Mount device outlet boxes where indicated on the Drawings and at heights as scheduled in Section 16010.
3. Set device outlet boxes plumb and vertical to the floor.
4. When an outlet box is connected to a PVC coated conduit, the box shall also be PVC coated.

C. Pull and Junction Boxes:

1. Install pull or junction boxes in conduit runs where indicated or required to facilitate pulling of wires or making connections.
 - a. Make covers of boxes accessible.
2. Permitted uses of NEMA 4X metallic enclosure:
 - a. Pull or junction box surface mounted in areas designated as wet and/or corrosive.
3. Permitted uses of NEMA 7 enclosure:
 - a. Pull or junction box surface mounted in areas designated as Class I hazardous.
 - (1) Provide PVC coating in corrosive and highly corrosive areas when PVC coated conduit is used.

16135 - ELECTRICAL: EXTERIOR UNDERGROUND

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Material and installation requirements for:
 - a. Handhole.
 - b. Underground conduits and ductbanks.

B. Related Sections include but are not necessarily limited to:

1. Division 1 - General Requirements.
2. Section 16060 - Grounding.
3. Section 16130 - Raceways and Boxes.

1.02 QUALITY ASSURANCE

A. Referenced Standards:

1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. Standard Specifications for Highway Bridges.
2. ASTM International (ASTM):
 - a. A536, Standard Specification for Ductile Iron Castings.
3. National Electrical Manufacturers Association (NEMA):
 - a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
4. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
5. Society of Cable Telecommunications Engineers (SCTE):
 - a. 77, Specification for Underground Enclosure Integrity.

1.03 DEFINITIONS

A. Direct-buried conduit(s):

1. Individual (single) underground conduit.
2. Multiple underground conduits, arranged in one or more planes, in a common trench.

- B. Concrete encased ductbank: An individual (single) or multiple conduit(s), arranged in one or more planes, encased in a common concrete envelope.

1.04 SUBMITTALS

A. Shop Drawings:

- 1. See Division 1 for requirements for the mechanics and administration of the submittal process.
- 2. Product technical data:
 - a. Provide submittal data for all products specified in PART 2 of this Specification.
- 3. Fabrication and/or layout drawings:
 - a. Provide dimensional drawings of each manhole indicating all specified accessories and conduit entry locations.

1.05 WORK PAYMENT

- A. Payment for the Work in this section shall be included as part of the lump-sum or unit-price bid amount for which such Work is appurtenant thereto, including all Work and materials specified herein and as may be required to complete this portion of the Work.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
 - 1. Precast handholes:
 - a. Utility Vault Co.
 - b. Oldcastle Precast, Inc.
 - c. Or equal.

2.02 HANDHOLES

A. Precast Handholes:

- 1. Fiberglass reinforced polymer concrete or steel reinforced cement concrete structures:
- 2. Shall have an AASHTO live load rating of H-20 for full deliberate vehicle traffic.
- 3. Mating edges shall be tongue and groove type.
- 4. Solid bottom with a 12 inch x 12 inch or 12 inch diameter French drain in the bottom of each manhole.

5. Gasketed removable top slab with lifting eyes and cast in frame for cover. Cover extension rings as required.

2.03 UNDERGROUND CONDUIT AND ACCESSORIES

- A. Concrete: Comply with Division 3.
- B. Conduit: See Section 16130.
- C. Duct Spacers/Supports:
 1. High density polyethylene or high impact polystyrene.
 2. Interlocking.
 3. Provide 3 inch minimum spacing between conduits.
 4. Accessories, as required:
 - a. Hold down bars.
 - b. Ductbank strapping.

PART 3 - EXECUTION

3.01 GENERAL

- A. Drawings indicate the intended location of handholes and routing of ductbanks and direct buried conduit.
 1. Field conditions may affect actual routing.
- B. Handhole Locations:
 1. Approximately where shown on the Drawings.
 2. As required for pulling distances.
 3. As required to keep pulling tensions under allowable cable tensions.
 4. As required for number of bends in ductbank routing.
 5. Shall not be installed in a swale or ditch.
 6. Determine the exact locations after careful consideration has been given to the location of other utilities, grading, and paving.
 7. Locations are to be approved by the Engineer prior to excavation and placement or construction of manholes and handholes.
- C. Install products in accordance with manufacturer's instructions.

- D. Install handholes in conduit runs where indicated or as required to facilitate pulling of wires or making connections.
- E. Comply with Division 2 for trenching, backfilling and compacting.

3.02 HANDHOLES

A. Precast Handholes:

- 1. For use in vehicular and non-vehicular traffic areas.
- 2. Construction:
 - a. Grout or seal all joints, per manufacturer's instructions.
- 3. Place manhole or handhole on a foundation of compacted 1/4 to 1/2 inch crushed rock or gravel a minimum of 8 inch thick and 6 inch larger than manholes or handholes footprint on all sides.
- 4. Install so that the top of cover is 1 inch above finished grade.
 - a. Where existing grades are higher than finished grades, install sufficient number of courses of curved segmented concrete block between top of handhole frame to temporarily elevate manhole cover to existing grade level.
- 5. After installation is complete, backfill and compact soil around handholes.
- 6. Handhole size:
 - a. As indicated on the Drawings or as required for the number and size of conduits entering or as indicated on the Drawings.

3.03 UNDERGROUND CONDUITS

A. General Installation Requirements:

- 1. Ductbank types per location:
 - a. Concrete encased ductbank:
 - (1) Under all traffic areas.
 - (2) Conduits containing medium voltage cables.
 - b. Direct-buried conduit(s):
 - (1) All other locations.
- 2. Do not place concrete or soil until conduits have been observed by the Owners Representative.

3. Ductbanks shall be sloped a minimum of 4 inch per 100-foot or as detailed on the Drawings.
 - a. Low points shall be at handholes.
4. During construction and after conduit installation is complete, plug the ends of all conduits.
5. Provide conduit supports and spacers.
 - a. Place supports and spacers for rigid nonmetallic conduit on maximum centers as indicated for the following trade sizes:
 - (1) 1 inch and less: 3 FT.
 - (2) 1-1/4 to 3 IN: 5 FT.
 - (3) 3-1/2 to 6 IN: 7 FT.
 - b. Place supports and spacers for rigid steel conduit on maximum centers as indicated for the following trade sizes:
 - (1) 1 inch and less: 10 FT.
 - (2) 1-1/4 to 2-1/2 IN: 14 FT.
 - (3) 3 inch and larger: 20 FT.
 - c. Securely anchor conduits to supports and spacers to prevent movement during placement of concrete or soil.
6. Stagger conduit joints at intervals of 6 inch vertically.
7. Make conduit joints watertight and in accordance with manufacturer's recommendations.
8. Accomplish changes in direction of runs exceeding a total of 15 degrees by long sweep bends having a minimum radius of 25 FT.
 - a. Sweep bends may be made up of one or more curved or straight sections or combinations thereof.
9. Furnish manufactured bends at end of runs.
 - a. Minimum radius of 18 inch for conduits less than 3 inch trade size and 36 inch for conduits 3 inch trade size and larger.
10. Field cuts requiring tapers shall be made with the proper tools and shall match factory tapers.

11. After the conduit run has been completed, pull a standard flexible mandrel having a length of not less than 12 inch and a diameter approximately 1/4 inch less than the inside diameter of the conduit through each conduit.
 - a. Then pull a brush with stiff bristles through each conduit to remove any foreign material left in conduit.
12. Pneumatic rodding may be used to draw in lead wire.
 - a. Install a heavy nylon cord free of kinks and splices in all unused new ducts.
 - b. Extend cord 3-foot beyond ends of conduit.
13. Transition from rigid non-metallic conduit to rigid metallic conduit, per Section 16130, prior to entering a structure or going above ground.
 - a. Except rigid non-metallic conduit may be extended directly to manholes, handholes, pad mounted transformer boxes and other exterior pad mounted electrical equipment where the conduit is concealed within the enclosure.
 - b. Terminate rigid PVC conduits with end bells.
 - c. Terminate steel conduits with insulated bushings.
14. Place warning tape in trench directly over ductbanks, direct-buried conduit, and direct-buried wire and cable.
15. Placement of conduits stubbing into handholes shall be located to allow for proper bending radiuses of the cables.

B. Direct-Buried Conduit(s):

1. Install so that the top of the uppermost conduit, at any point:
 - a. Is not less than 30 inch below grade.
 - b. Is below pavement sub-grading.
2. Provide a uniform minimum clearance of 2 inch between conduits or as required in Section 16130 for different cabling types.
 - a. Maintain the separation of multiple planes of conduits by one of the following methods:
 - (1) Install multilevel conduits with the use of conduit supports and separators to maintain the required separations, and backfill with flowable fill (100 PSI) or concrete per Division 2.
 - (2) Install the multilevel conduits one level at a time.
 - (a) Each level is backfilled with the appropriate amount of soil and compaction, per Division 2, to maintain the required separations.

- C. Conduits embedded in concrete structure (e.g., sidewalks, bridge decks) where shown on the Contract Drawings:
1. Shall not be considered to replace structurally the displaced concrete except as indicated in the following:
 2. Shall not be larger in outside diameter than one-third the thickness of concrete.
 3. Shall have a minimum spacing of 3 diameter OC.
 4. In reinforced concrete construction:
 - a. Place conduit after reinforcing steel has been laid.
 - b. The reinforcement steel shall not be displaced by the conduit.
 - c. Provide a minimum of 1-1/2 inch of cover over conduit.

16195 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Nameplates and labels.
- B. Wire and cable markers.
- C. Conduit markers

1.02 REFERENCES

- A. ANSI/NFPA 70 National Electrical Code.

1.03 SUBMITTALS

- A. Submit under provisions of the General Requirements.
- B. Product Data: Provide catalog data for nameplates, labels, and markers.

1.04 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

PART 2 - PRODUCTS

2.01 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background. Provide 316 stainless steel screws for mounting (adhesives not allowed). Seton Identifications Products or approved equal.
- B. Locations:
 - 1. Each electrical distribution and control equipment enclosure.
- C. Letter Size:
 - 1. Use 1/8 inch letters for identifying individual equipment and loads.
 - 2. Use 1/4 inch letters for identifying grouped equipment and loads.
- D. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background. Use only for identification of individual wall switches and receptacles, and control device stations.

2.02 WIRE MARKERS

- A. Description: Slip-on PVC sleeve type as manufactured by Brady or approved equal.
- B. Locations: Each conductor at terminal boards and at each termination.
- C. Wire Labeling Standard: The intent of this standard is to provide for a wire marking system that clearly identifies the termination point at either end of any given conductor. Implementing this system would facilitate quicker troubleshooting due to the immediate recognition of a wires origination and destination without the need of contract drawings.
 - 1. Method: The most powerful controller would take precedence as the first termination point called out on the label. The second half of the label would be the termination point at the other end. The wire label would remain the same at both ends of the wire. For example:
 - a. A circuit conductor originating from panel "LP" circuit breaker number 5 and feeding exhaust fan EF1 would read, LP-5/EF1.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.

3.02 APPLICATION

- A. Install nameplate and label parallel to equipment lines.
- B. Secure nameplate to equipment surface using 316 stainless steel machine screws. Sheet metal screws shall not be used. Adhesives are not allowed.
- C. Wire numbers shall be precisely located on each conductor, 3/8" from end of insulation. Where solderless type terminals are used, the number shall be applied to the wire not the terminal insulator.

16421 - UTILITY SERVICE ENTRANCE AND METER PEDESTAL

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Arrangement with Utility Companies for temporary and permanent electric and service.
- B. Underground service entrance.
- C. Metering equipment.

1.02 RELATED SECTIONS

- A. Section 16100 – Electrical General Provisions.

1.03 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

1.04 SYSTEM DESCRIPTION

- A. System Characteristics: 100A, 277/480 volts, three phase, four-wire, 60 Hertz.

1.05 SUBMITTALS

- A. Submit under provisions of the General Requirements.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with Utility Company written requirements.
- B. Maintain one copy of each document on site.

1.07 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.08 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on Utility Company drawings.

PART 2 - PRODUCTS

2.01 UTILITY METERS

- A. Meters will be furnished by SDG&E. Locate meter pedestal such that the pull section access meets the requirements of SDG&E.

2.02 UTILITY METER BASE

- A. Description: Meter base shall meet SDG&E electrical service requirements.
- B. Locate meter pedestal such that the pull section access meets the requirements of SDG&E

2.03 MANUFACTURES

- A. Tesco
- B. Approved equal
- C. Substitutions: Approved equals.

2.04 METER PEDESTAL

Ratings: NEMA 3R, 316 stainless steel enclosure, rating as indicated. Provide main over current device as indicated. Provide left side access for Utility so pedestal may be mounted against a wall

- A. Ratings: NEMA 3R enclosure, ratings as indicated. Provide main over current device as indicated.
- B. The meter pedestal shall have a meter socket with test blocks that meet the requirements of the serving utility (San Diego Gas and Electric Company). The service cabinet shall bear a UL 508 industrial control panel label for service entrance equipment.
- C. Cabinet shall be fabricated from 12 gauge hot dipped galvanized steel and shall be all welded construction. All fasteners, hinges, latches and hardware shall be of stainless steel and hinges shall be continuous piano style. Enclosure shall be vandal-resistant. There shall be no exposed, nuts, bolts, screws, rivets, or other fasteners on the exterior. Cabinet door shall have 2,000lb. Stress rated stainless steel hasp welded to cabinet and door
- F. All bussing shall be U.L. approved copper THHN cable bussing fully rated 100 or 200 amps, as indicated.
- G. Provide pad mount base for concrete foundation.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that service equipment is ready to be connected and energized.

3.02 PREPARATION

- A. Make arrangements with Utility Companies to obtain temporary and permanent services to the Project.

- B. Coordinate location of Utility Company's facilities to ensure proper access is available.

3.03 INSTALLATION

- A. Install service entrance conduits from Utility Company's indicated point of connection to building service entrance equipment per utility company drawings. Connect service lateral conductors to service entrance conductors.
- B. Provide concrete pad for Utility Company transformer as indicated in Utility Company drawings.
- C. Provide retaining wall and crash bollards per SDG&E drawings, if required.

16500 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.01 SUMMARY

A. Sections Includes:

1. Material and installation requirements for:
 - a. Lighting poles.
 - b. Lighting control.

B. Related Sections include but are not necessarily limited to:

1. Division 1 – General Requirements
2. Division 3 – Concrete.
3. Section 16010 – Electrical Basic Requirements.
4. Section 16120 – Wire and Cable: 600 Volt and Below.

1.02 QUALITY ASSURANCE

A. Referenced Standards:

1. National Fire Protection Association (NFPA):
 - a. 70, National Electrical Code (NEC).
 - b. 101, Life Safety Code.
2. Underwriters Laboratories, Inc. (UL):
 - a. 1598, Standard for Safety for Luminaires.
3. United States Department of Energy (USDOE):
 - a. EPCAct, the National Energy Policy Act.

1.03 SUBMITTALS

A. Shop Drawings:

1. Product technical data:

- a. Provide submittal data for all products specified in PART 2 of this Specification:
- b. Identify fixtures by Fixture Schedule number.
- c. Fixture data sheet including:
 - 1) Photometric performance data including candlepower distribution and coefficient of utilization (CU) table.
 - 2) Fixture EPA's for pole mounted fixtures.
- d. Pole data shall include:
 - 1) Pole wind loading.
 - 2) Anchor bolt template.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Lighting fixtures and poles: See Fixture Schedule. No equals allowed.

2.02 GENERAL REQUIREMENTS

- A. No live parts normally exposed to contact.
- B. When intended for use in wet areas: Mark fixtures "Suitable for wet locations".

2.03 POLES

- A. As scheduled or noted on the Drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Mount lighting fixtures at heights indicated on Drawings.
- B. Install exterior fixtures so that water cannot enter or accumulate in the wiring compartment.
- C. Ground fixtures.

3.02 POLE INSTALLATION

- A. Drawings indicate the intended location of light pole.
 - 1. Field conditions may affect actual location.
 - 2. Coordinate location with all existing or new utilities and pavement.

3.03 LIGHTING CONTROL

- A. Pole mounted fixtures controlled as detailed on Drawings.

APPENDIX F
WATER POLLUTION CONTROL PLAN

WATER POLLUTION CONTROL PLAN (WPCP)
FOR
CONSTRUCTION ACTIVITIES

CONSTRUCTION POLLUTION PREVENTION
PLAN (CPPP)
FOR
COASTAL DEVELOPMENT PERMIT

Mission Beach Boardwalk Bulkhead Project
Boardwalk between Ventura Place & San Fernando Place
San Diego, CA, 92109

PREPARED BY

RBF Consulting
A company of the Michael Baker Corporation
9755 Clairemont Mesa Blvd.
San Diego, CA 92124
858.614.5000

RBF Job Number
133097

Prepared:
November 22, 2013



A handwritten signature in black ink that reads "Jay Sullivan".

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LIST OF ACRONYMS

BAT - Best Available Technology Economically Achievable
BCT - Best Conventional Pollutant Control Technology
BMP - Best Management Practices
BOD - Biochemical Oxygen Demand
CFR - Code of Federal Regulations
CGP - NPDES General Permit for Storm Water Discharges Associated with Construction Activities
COC - Chain of Custody
CPESC - Certified Professional in Erosion and Sediment Control
CPSWQ - Certified Professional in Storm Water Quality
CSMP - Construction Site Monitoring Program
CWA - Clean Water Act
DWQ - Division of Water Quality
EPA - Environmental Protection Agency
LRP - Legally Responsible Person
LUP - Linear Underground/Overhead Projects
MRR - Monitoring and Reporting Requirements
MS4 - Municipal Separate Storm Sewer System
NAL - Numeric Action Level
NEL - Numeric Effluent Limitation
NICET - National Institute for Certification in Engineering Technologies
NOAA - National Oceanic and Atmospheric Administration
NOI - Notice of Intent
NOT - Notice of Termination
NPDES - National Pollutant Discharge Elimination System
NRCS - Natural Resources Conservation Service
NTU - Nephelometric Turbidity Units
O&M - Operation and Maintenance
PRDs - Permit Registration Documents
REAP - Rain Event Action Plan
Regional Board - Regional Water Quality Control Board
RUSLE - Revised Universal Soil Loss Equation
RW - Receiving Water
SMARTS - Storm water Multi Application Reporting and Tracking System
SUSMP - Standard Urban Storm Water Mitigation Plan
SWMP - Storm Water Management Program
SWPPP - Storm Water Pollution Prevention Plan
TMDL - Total Maximum Daily Load
WDID - Waste Discharge Identification Number
WQO - Water Quality Objective

WPCP REQUIREMENTS

1.1 Introduction

This WPCP is written for a project that does not require coverage under the State Water Resources Control Board Order No. 2009-0009-DWQ, General Permit No. CAS000002 and Amendment Order No. 2010-0014-DWQ. This project disturbed area is less than 1 acre and is therefore not subject to the Statewide General Permit.

The City of San Diego will ensure that the WPCP is developed and amended or revised to insure that:

1. All pollutants and their sources, including sources of sediment associated with construction are controlled.
2. All non-stormwater discharges are identified and either eliminated, controlled, or treated.
3. Best Management Practices (BMPs) are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from the project site during construction.
4. Post-construction stabilization BMPs installed to reduce or eliminate pollutants are effective and properly maintained.

Additionally, this WPCP will serve as a **Construction Pollution Prevent Plan (CPPP)** to satisfy Coastal Commission approval. The following items must be adhered to in accordance with issuance of a Coastal Development Permit:

BMPs must be designed and implemented to prevent spillage and/or runoff of construction-related materials, sediment, or contaminants associated with construction activity.

1. No demolition or construction materials, equipment, debris, or waste shall be placed or stored where it may enter sensitive habitat, receiving waters or a storm drain, or be subject to wave, wind, rain or tidal erosion and dispersion.
2. Any and all debris resulting from demolition or construction activities, and any remaining construction material, shall be removed from the project site within 24 hours of completion of the project.
3. Demolition or construction debris and sediment shall be removed from work areas each day that demolition or construction occurs to prevent accumulation of sediment and other debris that may be discharged into coastal waters or storm drains,
4. Erosion control/sedimentation BMPs shall be used to control dust and sedimentation impacts to coastal waters during construction. BMPs shall include, but are not limited to: placement of sand/gravel bags around drainage inlets to prevent runoff/sediment transport into coastal waters,

5. Machinery or construction materials not essential for project improvements will not be allowed at any time in the intertidal zone,
6. If turbid conditions are generated during construction, a silt curtain will be utilized to control turbidity,
7. Floating booms will be used to contain debris into coastal waters and any debris discharged will be removed as soon as possible, but no later than the end of the day,
8. Non-buoyant debris discharged into coastal waters will be recovered by divers as soon as possible after loss,
9. All trash and debris shall be disposed in the proper trash and recycling receptacles at the end of every construction day,
10. The applicant shall provide adequate disposal facilities for solid waste, including excess concrete, produced during demolition or construction,
11. Debris shall be disposed of at a legal disposal site or recycled at a recycling facility. If the disposal site is located in the coastal zone, a Coastal Development Permit or an amendment to this permit shall be required before disposal can take place unless the Executive Director determines that no amendment or new permit is legally required,
12. All construction materials stockpiled on site, excluding lumber, shall be covered and enclosed on all sides to ensure that the materials are not discharged to a storm drain inlet or receiving waters,
13. Machinery and equipment shall be maintained and washed in confined areas specifically designed to control runoff. If thinners, petroleum products or solvents must be used on site, they shall be properly recycled or disposed after use and not be discharged into storm drains, sewers, receiving waters or onto the unpaved ground,
14. The discharge of any hazardous materials into any receiving waters shall be prohibited,
15. Spill prevention and control measures shall be implemented to ensure the proper handling and storage of petroleum products and other construction materials. Measures shall include a designated fueling and vehicle maintenance area with appropriate berms and protection to prevent any spillage of gasoline or related petroleum products or contact with runoff. The designated area shall be equipped with spill control materials and located to minimize the risk of spills reaching receiving waters, storm drains, sewers, or unpaved ground.

16. BMPs and Good House Keeping Practices designed to prevent spillage and/or runoff of demolition or construction related materials, and to contain sediment or contaminants associated with demolition or construction activity, shall be implemented prior to the on-set of such activity, and,
17. All BMPs shall be maintained in a functional condition throughout the duration of construction activity.

1.2 PROJECT AND SITE INFORMATION

1.2.1 Project Team Information

Owner

Name: City of San Diego

Address: 600 B Street, Suite 800

City, State, ZIP: San Diego, CA, 92101

Contact: Steve Frick

1.2.2 WPCP Preparer

RBF Consulting

9755 Clairemont Mesa Blvd.

San Diego, CA 92124

858-614-5065

Contact: John Prince, PE

1.2.3 General Contractor

Name: _____TBD_____

Address: _____

City, State, ZIP: _____

Contact: _____

1.2.4 Storm Water Contractor

Name: _____TBD_____

Address: _____

City, State, ZIP: _____

Contact: _____

1.3 Project and Site Information

The Mission Beach Boardwalk Bulkhead project is located in the City of San Diego, adjacent to the Pacific Ocean. Like most regions of Southern California San Diego has a Mediterranean Climate with hot, dry summers and cool winters. San Diego has an annual rainfall of 8-12 inches, with most precipitation falling in the months between December and March.

The project site is located along the beach between Ventura Place and San Fernando Place. The site is located approximately 2.5 miles west of the I-5 freeway. A Vicinity Map is provided on the following page.

The project proposes the demolition and replacement of the existing sea wall (1,617 feet) and boardwalk (1,617 feet) within a 0.98-acre of property located in San Diego, California. Improvements will be made to the adjacent asphalt parking lot including: construction of two ADA ramps, 36-feet of new curb and gutter and ADA stripping.

The project site is located in the Mission Bay Watershed Management area, the Scripps Hydrologic Area (HA 906.30), and the Penasquitos Hydrologic Unit (HU 906.00).

- | | | |
|---|---|---|
| <input type="checkbox"/> San Juan (901) | <input type="checkbox"/> Santa Margarita (902) | <input type="checkbox"/> Carlsbad (904) |
| <input type="checkbox"/> San Dieguito (905) | <input checked="" type="checkbox"/> Penasquitos (906) | <input type="checkbox"/> Pueblo San Diego (908) |
| <input type="checkbox"/> San Diego (907) | <input type="checkbox"/> Sweetwater (909) | <input type="checkbox"/> Otay (910) |
| <input type="checkbox"/> Tijuana (911) | | |

Receiving Water	Mission Bay and/or Pacific Ocean	303(d) Impairments
Hydrologic Unit	Penasquitos (906.0)	Bacteria.
Hydrologic Area	Scripps (906.3)	
Hydrologic Sub-Area	N/A	

1.3.1 Vicinity Map

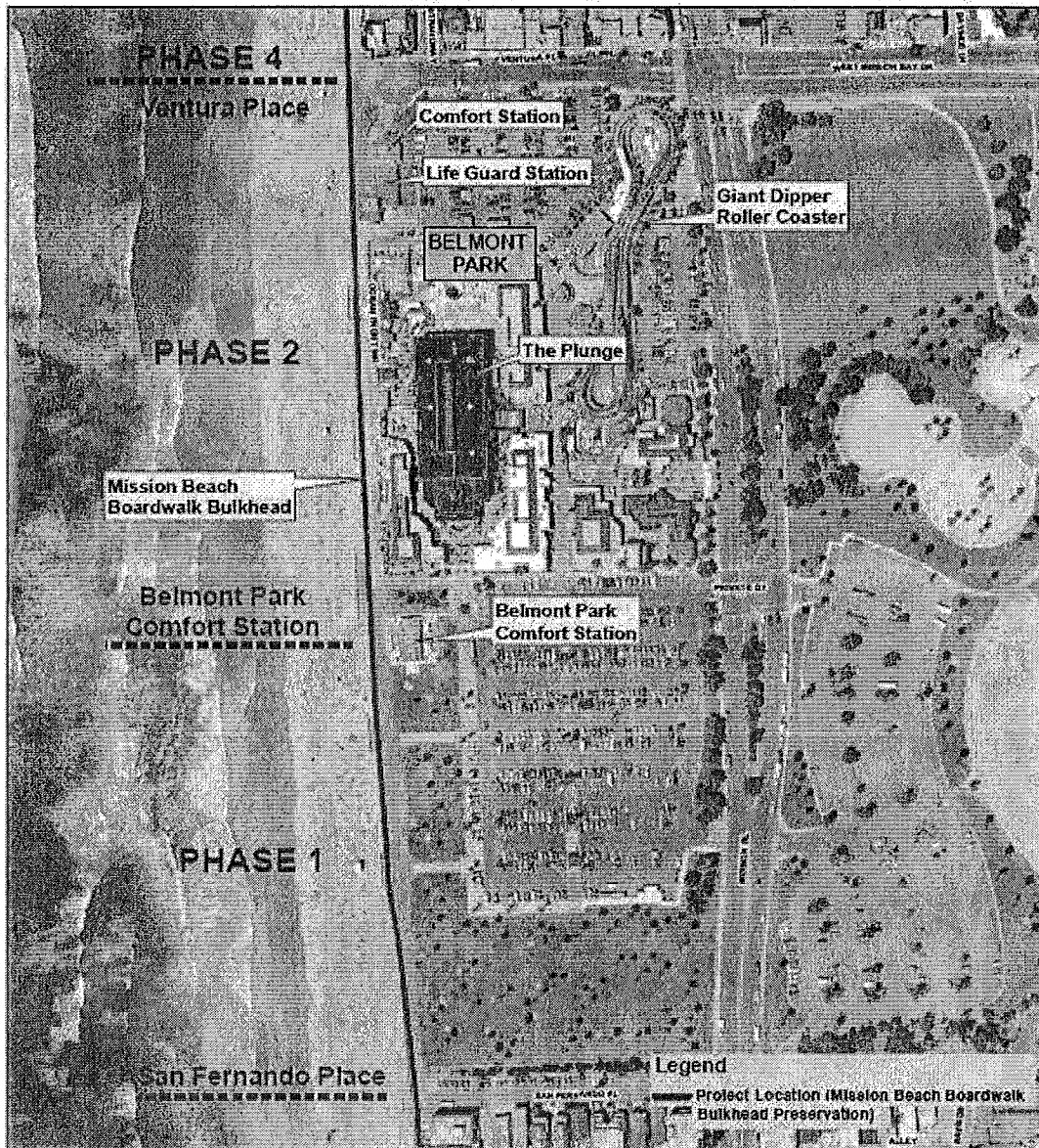


Figure 1: Vicinity Map

1.4 Potential Construction Site Pollutant Sources

A list of potential pollutants and their respective sources is located in the following sections. This list should be used to identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in stormwater discharges and authorized non-stormwater discharges. The list identifies non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, the City of San Diego will do the following:

1. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
2. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with stormwater.
3. Consider the direct and indirect pathways that pollutants may be exposed to stormwater or authorized non-stormwater discharges.
4. Conduct an assessment of past spills or leaks, non-stormwater discharges, and discharges from adjoining areas.
5. Ensure retention of visual observation, and inspection records.
6. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in stormwater discharges and authorized non-stormwater discharges.

1.4.1 Potential Sources of Sediment

Table 1: Potential Sources of Sediment from Construction Activities

Concrete demolition
Concrete curing
Vehicle tracking
Exposed soils and slopes
Import/export operations

1.4.2 Other Pollutants Sources

Table 2: Construction Activity, Associated Pollutants, and Equipment

Activity Type		Pollutant	Visually Observable
Soil Disturbance:			
	Clear & Grub	Sediment and organics	Cloudy to opaque
X	Remove and Re-compact	Sediment	Cloudy to opaque
X	Fine Grading	Sediment	Cloudy to opaque
	Trenching	Sediment	Cloudy to opaque
X	Stockpiling	Sediment	Cloudy to opaque
Asphalt:			
	Street Construction	Hydrocarbons	Oily sheen
	Street Improvements	Hydrocarbons	Oily sheen
	Street Demolition	Hydrocarbons	Oily sheen
Concrete Laden Liquid:			
X	Curb & Gutter	pH	Cloudy to Milky
X	Sidewalks	pH	Cloudy to Milky
	Foundations	pH	Cloudy to Milky
X	Driveways	pH	Cloudy to Milky
	Medians	pH	Cloudy to Milky
	Stuccoing	pH	Cloudy to Milky
	Grouting	pH	Cloudy to Milky
X	Concrete washouts/Clean up	pH	Cloudy to Milky
General:			
	Framing	Sawdust	Yes
X	Painting	Paint (when wet)	Yes
	Dry Walling	Gypsum/Joint Compound	Yes
	Tiling	Ceramic dust	Yes
	Cabinet Building/Installing	Sawdust	Yes
	Plumbing	PVC Glue (when wet)/Plastic	Yes
X	Wiring/Electrical Utilities	Copper/Plastic/Metals	Yes
	Heating/Air Conditioning	Sheet metal/fiberglass wool	Yes
	Landscaping	Containers/mulch/soil	Yes
	Equipment Type		Equipment Type
X	Backhoe loader(s)	X	Fork & Rough-terrain lifts
	Water truck(s)	X	Generator(s)
	Scraper(s)	X	Concrete boom pumps
X	Loader(s)	X	Concrete pumps
	Bull dozer(s)		Asphalt planer / grinder
	Motor-grader		Asphalt paving machine
X	Excavator(s) / Track hoe(s)	X	Street striping equipment
X	Dump trucks (10-wheel)	X	Building material delivery trucks
	Belly/Bottom dumps (tractor/trailer)	X	Personal cars and light trucks
X	Tractor: skip loader	X	Waste hauling trucks

Activity Type		Pollutant	Visually Observable
X	Skid steer loaders (Bobcat)		Trencher(s)
X	Concrete delivery trucks		Stucco/Plaster spray pumps
X	Portable concrete mixers	X	Spray paint equipment (airless)
X	Compaction equipment		Hole drilling rig

Table 3: Potential Construction Site Pollutants

YES	Material Type	Pollutant	Visually Observable	Typical Location
X	Diesel Fuel	Petroleum distillates, naphthalene, xylene	Sheen/Stain	Staging area, pole sites
X	Gasoline	Benzene, toluene, xylene, MTBE	Sheen/Stain	Staging area, pole sites
X	Hydraulic Oil	Mineral oil, trace additives	Sheen/Stain	Staging area, pole sites
X	Engine Oil	Mineral oil, additives, combustion byproducts	Sheen/Stain	Staging area, pole sites
X	Transmission Oil	Mineral oil, trace additives	Sheen/Stain	Staging area, pole sites
X	Engine Coolant	Ethylene and propylene glycol, heavy metals	Green/red	Staging area, pole sites
	Grease	Petroleum hydrocarbons	Sheen/Stain	Staging area, pole sites
	Kerosene	Petroleum hydrocarbons	Sheen/Stain	Staging area
	Fertilizer	Nitrogen, phosphorus	No	Material storage area
	Pesticide	Water-insoluble chlorinated hydrocarbons, organophosphates, carbonates, and pyrethrums.	Varies	Material storage area
	Herbicide	Chlorinated hydrocarbons, organophosphates	Varies	Material storage area
	Soil Amendments	Nutrients, organic matter	No	Material storage area
X	Concrete (wet)	Fly ash, heavy metals, Portland cement	White solid	Pole foundations
	Concrete coring slurry	Turbidity and pH	Gray liquid	Building construction & streets
X	Concrete sawing slurry	Turbidity and pH	Gray liquid	Building construction & streets
X	Cement	Aluminum calcium iron oxide, calcium sulfate	Gray powder	Building construction & streets
	Drywall joint compound	Pigment, vinyl acetate	White putty	Building construction

YES	Material Type	Pollutant	Visually Observable	Typical Location
	Grout	Silica sand, Portland cement	White powder	Block wall & Home construction
X	Paint	Ethylene glycol, titanium oxide, VOC	Colored liquid	Building construction
	Sealers	Diacetone alcohol		Building construction & Streets
	Adhesives		White/yellow	Building construction
X	Sanitary waste	Human waste	Yes	Staging areas & all construction areas
	Animal waste	Animal waste	Yes	All areas
	Asphalt	Asphalt fumes, cutback asphalt,	Black material	Streets
	Curing Compounds	Glass Oxide, urea extended phenol	Creamy white	Building construction & Streets
	Waste wash water	Varied	Suds, foam, froth	All areas
	Wood Preservatives	Arsenic	Amber liquid	Home construction
	Cleaning Solvents	Perchloroethylene, methylene chloride, TCE	Varies	Staging areas
X	Sediment	Soil, Turbidity, dust	Muddy	All areas
	Vegetation	Organic matter	Yes	All areas
X	Solid Waste	Floatable and blowable trash and debris	Yes	All areas
	Tile			Building construction & material storage areas

1.5 Identification of Non Stormwater Discharges

All efforts are to be made to minimize non-stormwater discharges. On-site inspections will include observations for non-stormwater discharges. Activities that may result in discharges will be monitored and controlled as needed.

Authorized non-stormwater discharges include:

- Discharges from fire-fighting activities.
- Fire hydrant flushing.
- Waters used to wash vehicles where detergents are not used.
- Water used to control dust.
- Potable water including uncontaminated water line flushing.

- Routine external building wash down that does not use detergents.
- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used.
- Uncontaminated air conditioning or compressor condensate.
- Uncontaminated ground water or spring water.
- Foundation or footing drains where flows are not contaminated with process materials such as solvents.
- Uncontaminated excavation dewatering.
- Landscape irrigation.

The discharge of non-stormwater is authorized under the following conditions:

- The discharge does not cause or contribute to a violation of any water quality standard.
- The discharge does not violate any provision of the General Permit.
- The discharge is not prohibited by the applicable Basin Plan
- The WPCP includes and implements BMPs required by the General Permit to prevent or reduce the contact of the non-stormwater discharge with construction materials or equipment
- The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants.

If any of the above conditions are not satisfied, the discharge is not authorized and not permitted by this WPCP. Notify the Regional Water Board of any anticipated non-stormwater discharges not already authorized by CA CGP or another NPDES permit, to determine whether a separate NPDES permit is necessary.

1.5.1 Expected Non-Stormwater Discharges and Controls

Allowable non-stormwater discharges anticipated to be encountered in this project include the following:

Fire Hydrant Flushing

In the event there is a need to flush the fire hydrant the person performing the operation will ascertain from the owner, contractor of the water line, or, fire department that there are no chemicals or other pollutants contained in the water. The flushed water will be diverted away from disturbed soils and into the storm drain system via a paved surface or lined channel so that erosion, scour and sediment laden discharges will be avoided. If chlorination is present, water will be dechlorinated prior to discharge. Contractor will place gravel bag check dams in the drainage swale to slow the velocity of the discharge. Contractor will verify that velocity dissipaters are installed, maintained and functioning prior to the discharge. Contractor will

monitor discharged water and cease operations in the event sediment or other pollutants are being discharged as a result of the fire hydrant flushing.

Responsible party: Underground contractor, water department, fire department

Waters to Control Dust

Dust control will be implemented via a small diameter (3/4" to 1") fire or garden hose or with a water truck depending on the area being serviced when wind exceeds 15 MPH or when there is visible dust generated from the site. Water will be sprayed to avoid any surface run off. Any discharges from the property will be observed and operations ceased if levels of sediment in the discharge pose a negative impact on the drainage system or receiving waters.

Responsible party: General Contractor & all trades are responsible to control dust for their operations.

Potable Water Including Uncontaminated Water Line Flushing

Domestic water lines will be flushed prior to completion. The owner or contractor of the water line will confirm that there are no chemicals or other pollutants contained in the water. If water supply is chlorinated, dechlorination steps will be taken prior to discharge, most likely using dechlorination tablets. Most of the discharge will infiltrate into the ground due to the permeability of existing soils. Any run off will be diverted away from disturbed soils and into the storm drain system via a paved surface or lined channel so that erosion, scour and sediment laden discharges will be avoided. Contractor will place gravel bag check dams in the drainage swale to slow the velocity of the discharge. Contractor will verify that velocity dissipaters are installed, maintained and functioning prior to the discharge. Contractor will monitor discharged water and cease operations in the event sediment or other pollutants are being discharged as a result of the uncontaminated water line flushing. **Prior to discharge from the site, potable water must be de-chlorinated.**

Responsible party: Underground "wet" utility contractor

Routine external building wash downs without detergents

Building siding may be washed down prior to the application of paint.

The contractor will use the least amount of water possible to wash the buildings. Any residues including caulking or adhesives will be removed and properly disposed of prior to the wash down. Contractor will use a spray nozzle that will shut off and stop the flow of water when not in use. Contractor will inspect inlet protection to be sure it is in place and functional prior to wash down. Sediment controls will be installed at the low end of the drainage swales in an area where it will prevent the water from discharging directly into the inlets. Inlets will be in place and functional.

Responsible party: Painting contractor

Uncontaminated air conditioning or compressor condensate

The discharges from air conditioning condensate is expected to be seasonal and at a minimum. Waters will be diverted into the landscaped and permeable areas so as not to be discharged into the storm drain system. The discharges will be monitored and if there is a chance of discharge to the storm drain system, BMPs will be installed to divert the water to a permeable area.

Responsible party: General Contractor

Landscape Irrigation

Irrigation water will be sprayed on permeable surfaces only. Landscape irrigation areas will be monitored to prevent over watering. Watering times and schedules will be adjusted in the event there is surface run off from the irrigated areas.

Responsible party: General Contractor and Landscape and irrigation contractor.

Any changes in construction that will produce other allowable non-stormwater discharges will be identified. The WPCP will be amended and the appropriate erosion and sediment controls will be implemented.

Compliance with the WPCP does not relieve the project of other potentially applicable discharge requirements of the various other plan requirements such as but not limited to the Basin Plan, ADBS, or adopted TMDL allocations.

2 SPECIFIC PROJECT REQUIREMENTS

2.1 Good Site Management Housekeeping

The City of San Diego will implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, the good housekeeping measures shall consist of the following:

1. Identify the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
2. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.). Inactive areas are defined as stockpiled materials: not scheduled to be re-disturbed for at least 14 days. Note: with the onset of precipitation all stockpile materials shall be protected.
3. Store chemicals in watertight containers with appropriate secondary containment to prevent any spillage or leakage or in a storage shed providing complete enclosure.
4. Minimize exposure of construction materials to precipitation (not applicable to materials designed to be outdoors and exposed to the environment).
5. Implement BMPs to control the off-site tracking of loose construction and landscape materials.

The City of San Diego will implement good housekeeping measures for waste management, which at a minimum shall consist of the following:

1. Preventing disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
2. Ensuring the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the stormwater drainage system or receiving water.
3. Cleaning or replacing sanitation facilities and inspecting them regularly for leaks and spills.
4. Covering waste disposal containers at the end of every business day and prior to a rain event.
5. Preventing discharges from waste disposal containers to the stormwater drainage system or receiving water. Containing and securely protecting stockpiled waste material from wind and rain at all times unless actively being used.
6. Implementing procedures that effectively address hazardous and non-hazardous spills.
7. Developing a spill response and implementation procedure prior to commencement of construction activities. To these ends, the WPCP shall require that:
 - Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly.

- Appropriate spill response personnel are assigned and trained.
8. Ensuring the containment of concrete washout areas and other washout areas that may contain additional pollutants to prevent discharge into the underlying soil and onto the surrounding areas.

The City of San Diego will implement good housekeeping for vehicle storage and maintenance, which at a minimum, shall consist of the following:

1. Preventing oil, grease, or fuel from leaking into the ground, storm drains or surface waters.
2. Implementing appropriate BMPs whenever equipment or vehicles are fueled, maintained, or stored.
3. Cleaning leaks immediately and disposing of leaked materials properly.

The City of San Diego will implement good housekeeping for landscape materials, which at a minimum shall consist of the following:

1. Containing stockpiled materials such as mulches and topsoil when they are not actively being used.
2. Containing fertilizers and other landscape materials when they are not actively being used.
3. Discontinuing the application of any erodible landscape material at least 2 days before a forecasted rain event (50 percent or greater chance of producing precipitation) or during periods of precipitation.
4. Applying erodible landscape material at quantities and application rates according to the manufacturer's recommendations or based on written specifications by knowledgeable and experienced field personnel.
5. Stacking erodible landscape material on pallets and covering or storing such materials when not being used or applied.

The City of San Diego will 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.

2.2 Non-Stormwater Management

The City of San Diego will practice proper management of non-stormwater by:

1. Implementing measures to control all non-stormwater discharges during construction.
2. Washing vehicles in such a manner as to prevent non-stormwater discharges to surface waters or Municipal Separate Storm Sewer System (MS4) drainage systems.
3. Cleaning streets in such a manner as to prevent unauthorized non-stormwater discharges from reaching surface water or MS4 drainage systems.

2.3 Erosion Control

The City of San Diego will practice proper and effective erosion control by:

1. Implementing effective wind erosion control.
2. Providing effective soil cover for inactive areas, all finished slopes, and utility backfill.
3. Limiting the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the City of San Diego will consider the use of plastic materials resistant to solar degradation.

2.4 Sediment Controls

The City of San Diego will practice proper and effective sediment control by:

1. Establishing and maintaining effective perimeter controls as needed, and implementing effective BMPs for all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. At minimum, designing sediment basins according to the guidance provided in California Stormwater Quality Association (CASQA's) Construction BMP Handbook on sites where sediment basins are to be used (not applicable for this project site).

2.5 Run-on and Run-off Controls

The City of San Diego will effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off-site shall be directed away from all disturbed areas.

3 BEST MANAGEMENT PRACTICES

Copies of BMP fact sheets specific to this project are located in Appendix C of this WPCP.

3.1 Erosion and Sediment Control

3.1.1 Erosion Control BMPs

Erosion control, also referred to as soil stabilization, consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in stormwater runoff. Erosion control BMPs protect the soil surface by covering and/or binding soil particles. This project will implement the following practices for effective erosion control:

- EC-1: Scheduling
- EC-7: Geotextiles and Mats

Sufficient erosion control materials, as detailed in Appendix C, will be maintained on site to allow implementation, in conformance with General Permit requirements and as described in this WPCP. This includes implementation requirements for active areas and inactive areas that require deployment before the onset of rain events.

3.1.2 Sediment Control BMPs

Sediment controls are structural measures that are intended to complement and enhance the selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. This project will implement the following practices for effective sediment control:

- SE-1: Silt Fence (or fiber rolls for perimeter protection)
- SE-5: Fiber Rolls (or silt fence for perimeter protection)
- SE-6: Gravel Bag Berm
- SE-7: Street Sweeping and Vacuuming (or hand sweeping as needed)
- SE-10: Storm Drain Inlet Protection

Sufficient quantities of temporary sediment control materials, as detailed in Appendix C, will be maintained on-site throughout the duration of the project to allow implementation of temporary sediment controls in the event of predicted rain and for rapid response to failures or emergencies, in conformance with other Permit requirements and as described in this WPCP. This includes implementation requirements for active areas and non-active areas before the onset of rain.

3.1.3 Wind Erosion Control

Wind erosion control consists of applying water or other dust palliatives to prevent or minimize dust nuisance. This project will implement the following practices for effective wind erosion control:

- WE-1: Wind Erosion Control

Water trucks and/or a portable tank shall be made available to the field crews with an adequate supply of water to be used as necessary to mitigate the generation of airborne dust particulates from the construction sites. Water used for dust control will be applied in such a manner to minimize runoff from the site.

3.1.4 Tracking Control

Tracking control consists of preventing or reducing the tracking of sediment off-site by vehicles leaving the construction area. This project will implement the following practices for tracking control:

- TC-1: Stabilized Construction Entrance/Exit

3.2 BMP Implementation Specific for this Project for Non-Stormwater Management and Material Management

3.2.1 Non-Stormwater Management BMPs

Non-stormwater management BMPs are source control BMPs that prevent pollution at their source by limiting or reducing potential pollutants at their source or eliminating off-site discharge. These practices involve day-to-day operations of the construction site and are usually under the control of the contractor. These BMPs are also referred to as “good housekeeping practices” which involve keeping a clean, orderly construction site. This project will implement the following practices for effective non-stormwater management controls:

- NS-3: Paving and Grinding Operations
- NS-6: Illicit Connection/Discharge
- NS-8: Vehicle and Equipment Cleaning
- NS-9: Vehicle and Equipment Fueling
- NS-10: Vehicle and Equipment Maintenance
- NS-12: Concrete Curing
- NS-13: Concrete Finishing

3.2.2 Waste Management and Materials Pollution Controls

Waste management and materials pollution control BMPs, like non-stormwater management BMPs, are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source before they come in contact with stormwater. These BMPs are also referred to as “good housekeeping practices” which involve keeping a clean, orderly construction site.

Waste management consists of implementing procedural and structural BMPs for handling, storing and disposing of wastes generated by a construction project to prevent the release of waste materials into stormwater runoff or discharges through proper management of the following types of wastes: solid, sanitary, concrete, hazardous, and equipment-related washes.

This project will implement the following practices for effective waste management controls:

- WM-1: Material Delivery and Storage

- WM-2: Material Use
- WM-3: Stockpile Management
- WM-4: Spill Prevention and Control
- WM-5: Solid Waste Management
- WM-8: Concrete Waste Management
- WM-9: Sanitary/Septic Waste Management

4 BMP INSPECTION AND MAINTENANCE

4.1 BMP Inspection and Maintenance

Inspections of active construction areas will be conducted by a qualified person who has received project specific WPCP training as follows:

- Weekly
- Prior to a forecast storm event
- After a rain event that causes runoff from the construction site
- At 24-hour intervals during extended rain events.
- Quarterly non-stormwater visual inspections

Daily inspections will be performed by a qualified person with appropriate training to verify that the appropriate BMPs for stormwater and non-stormwater are being implemented in the following construction site locations:

- Areas where active construction is occurring (including staging areas)
- 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
- Land areas disturbed during construction are returned to preconstruction conditions or an equivalent protection is used at the end of each workday to eliminate or minimize erosion and the possible discharge of sediment or other pollutants during a rain event.

If deficiencies are identified during BMP inspections, repairs or design changes to BMPs must be initiated within 72 hours of identification and need to be completed as soon as possible. Construction Site Monitoring Program (CSMP) Checklists, located in Appendix D-1, should be utilized to assess the condition of site compliance. See Section 8, Construction Site Monitoring Program, for guidance in filling out the CSMP Checklist. Completed checklists shall be kept in Appendix D-1 of the WPCP.

5 CONSTRUCTION SITE MONITORING PROGRAM (CSMP)

5.1 Introduction

This Construction Site Monitoring Program (CSMP) is a guide for the qualified individual(s) for monitoring procedures and instructions. This CSMP has been designed to meet WPCP requirements for the Mission Beach Boardwalk Bulkhead project.

The qualified individual is to determine whether BMPs included in the WPCP are effective and if immediate actions are needed and/or WPCP revisions are necessary to reduce pollutants in stormwater and authorized non-stormwater discharges. The QSP (or equivalent role) is responsible for implementing the requirements of the CSMP from the commencement to the completion of construction activity. Additionally, the QSP (or equivalent role) must ensure the site is stabilized after all construction activity has been completed.

This CSMP was developed to address the following objectives:

- To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives.
- To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or WPCP revisions are necessary to reduce pollutants in stormwater discharges and authorized non-stormwater discharges.
- To determine whether BMPs included in the WPCP are effective in preventing or reducing pollutants in stormwater discharges and authorized non-stormwater discharges.

Revisions to the CSMP are the responsibility of the City of San Diego and will be performed when any of the following occur:

- Site conditions or construction activities change such that a change in monitoring is required to comply with the requirements of the City of San Diego.

5.1.1 *Visual Monitoring, Inspection, and Sample Collection Requirements*

This CSMP requires routine and storm-related visual monitoring and inspections as well as requisite, conditionally based sample collection for the construction site. No sampling is required on this project, unless sampling is required by the State of California Water Resources Control Board and/or the City of San Diego. All blank forms (CSMP Checklist, and Exemption Records) can be found in Appendix D. Completed forms shall also be kept in Appendix G. Visual inspections shall be conducted per the following table:

Table 4: Summary of Visual Monitoring, Inspection, and Recording Requirements

Action	Visual Monitoring, Inspections, and Recording					
Form	BMP Log	CSMP Checklist				
Type	Daily BMP	Weekly BMP	Quarterly Non-Storm-water	Pre-Storm	During Storm	Post-Storm
WPCP		X		X	X	X

5.1.2 Visual Monitoring, Inspection, and Sample Collection Locations

The visual monitoring, inspections, and sample collection requirements displayed in Table 5, above, will be conducted at the locations identified in this section.

BMP Locations

BMP locations are shown on the WPCP Map in Appendix A.

Drainage Areas

Drainage areas are shown on the WPCP Map in Appendix A.

Stormwater Discharge Points

Stormwater discharge points are shown on the WPCP Map in Appendix A.

5.1.3 General Provisions

- A qualifying rain event is defined as a rain event producing ½ inch or more of precipitation.
- A minimum of 48 hours of dry weather will be used to distinguish between separate qualifying rain events.
- Visual monitoring and inspections are not required under the following conditions:
 - During dangerous weather conditions such as flooding and electrical storms
 - Outside of scheduled site business hours.

If no required visual observations are performed due to these exceptions, include a written explanation (Exemption Record) in Appendix D of the WPCP. Each Exemption Record shall document the reasons why the visual monitoring and inspection was not conducted.

- All completed forms (CSMP Checklists, and Exemption Records), and follow up actions shall be kept in the field copy of the WPCP (Appendix D) throughout the duration of construction and for at least 3 years after construction has been completed.

5.2 Visual Monitoring, Inspections, and Recording Methods

The following sections describe the tasks required for each of the visual monitoring and inspections required in Section 8.1.1. The locations for each visual monitoring and inspection are described in Section 8.1.2 and shown in the CSMP Locations Map in Appendix A. All corrective actions shall be recorded as an attachment to the form on which they were identified. If identified deficiencies require design changes, including additional BMPs, the implementation of changes will be initiated within 72 hours of identification and be completed as soon as possible. When design changes to BMPs are required, the WPCP shall be amended to reflect the changes.

5.2.1 Weekly BMP Inspection

Weekly inspections of all BMPs shall be conducted to:

- Inspect all stormwater drainage areas for the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants;
- Identify any spills, leaks, or uncontrolled pollutant sources that have or may discharge from the site;
- Inspect all BMPs;
- Identify all BMPs that need maintenance to operate effectively;
- Identify all BMPs that have failed;
- Identify all BMPs that could fail to operate as intended;
- Identify the need for additional BMPs;
- If needed implement appropriate corrective action items to repair all BMPs that need maintenance or have failed (include updates in WPCP); and
- Inspect all locations of stored or contained stormwater for the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

Weekly BMP inspections shall be recorded on the CSMP Checklist form. Weekly BMP inspections shall be performed once during each week throughout the project. All corrective action shall be recorded on the CSMP Checklist form or included as an attachment.

5.2.2 Quarterly Non-Stormwater Inspection

Quarterly inspections of each drainage area shall be conducted to:

- Identify any presence or evidence of any non-stormwater discharge for each drainage area (authorized or unauthorized);

- Record pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.);
- Identify source of discharge; and
- If needed implement appropriate corrective action items to eliminate unauthorized non-stormwater discharges and to reduce or prevent pollutants from contacting non-stormwater discharges.

Quarterly BMP inspections shall be recorded on the CSMP Checklist form. Quarterly BMP inspections shall be performed once during each quarter (January-March, April-June, July-September, and October-December) throughout the project.

5.2.3 Pre-Storm, During Storm, and Post-Storm Inspection

Pre-storm, during storm, and post-storm inspections shall be conducted to:

- Inspect all stormwater drainage areas for the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants;
- Identify any spills, leaks, or uncontrolled pollutant sources that have or may discharge from the site;
- Inspect all BMPs;
- Identify all BMPs that need maintenance to operate effectively;
- Identify all BMPs that have failed;
- Identify all BMPs that could fail to operate as intended;
- Identify the need for additional BMPs;
- If needed implement appropriate corrective action items to repair all BMPs that need maintenance or have failed (include updates in WPCP); and
- Inspect all locations of stored or contained stormwater for the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.

Pre-storm inspections shall be recorded on the CSMP Checklist form. Pre-storm inspections shall be performed within 48-hours prior to a predicted rain event with a 50% or greater probability of precipitation. The forecast shall be recorded from <http://www.srh.noaa.gov/> and included as an attachment to the CSMP Checklist form. All corrective action shall be recorded on the CSMP Checklist form or included as an attachment.

During storm inspections shall be recorded on the CSMP Checklist form. During storm inspections shall be performed each day that rainfall occurs within an extended rain event. This applies to rain events which were predicted to have a 50% or greater probability of precipitation or have accumulated at least ½ inch of rain. All corrective action shall be recorded on the CSMP Checklist form or included as an attachment.

Post-storm inspections shall be recorded on the CSMP Checklist form. Post-storm inspections shall be performed within 48-hours following the conclusion of a qualifying rain event. A summary of precipitation for the entire qualifying rain event shall be included as an attachment to the CSMP Checklist form. All corrective action shall be recorded on the CSMP Checklist form or included as an attachment.

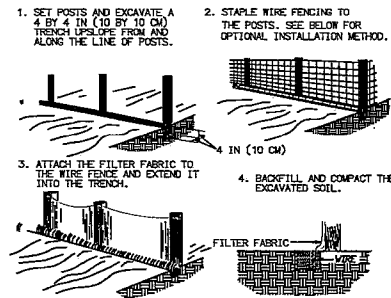
Appendix A

WPCP Site Plan

BMP DETAILS

EROSION AND SEDIMENT CONTROL NOTES

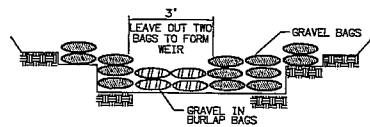
1. THE CONTRACTOR OR OWNER SHALL BE RESPONSIBLE FOR CONTINUAL MAINTENANCE OF THE EROSION AND SEDIMENT CONTROL PLAN.
2. ALL LOOSE SOIL AND DEBRIS SHALL BE REMOVED FROM THE BOARD WALK THE PARKING LOT AT THE END OF EACH WORKING DAY.
3. EMERGENCY WORK MAY BE NECESSARY DURING RAINSTORMS, CONSIDER THE AVAILABILITY OF STAND-BY WORK CREWS.
4. ALL REMOVABLE PROTECTION DEVICES SHOWN SHALL BE IN PLACE AT THE END OF EACH WORKING DAY AND DURING CONSTRUCTION WHEN RAIN IS OCCURRING.
5. FIBER ROLLS AND ALL OTHER CONSTRUCTION OR TEMPORARY BMP'S SHALL BE AVAILABLE ON SITE AND STOCKPILED AT CONVENIENT LOCATIONS TO FACILITATE RAPID CONSTRUCTION OF TEMPORARY DEVICES OR TO REPAIR ANY DAMAGED EROSION CONTROL MEASURES WHEN RAIN IS EMINENT.
6. THE CONTRACTOR SHALL ONLY GRADE, INCLUDING CLEARING AND GRUBBING FOR THE AREAS FOR WHICH THE CONTRACTOR OR QUALIFIED PERSON CAN PROVIDE EROSION/SEDIMENT CONTROL MEASURES.
7. THE CONTRACTOR SHALL RESTORE ALL EROSION AND SEDIMENT CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE QSP (OR EQUIVALENT ROLE) AFTER EACH RAIN EVENT.
8. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES DUE TO UNCOMPLETED GRADING OPERATIONS OR UNFORESEEN CIRCUMSTANCES WHICH MAY ARISE.
9. TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN WHICH INTERFERE WITH THE WORK SHALL BE RELOCATED OR MODIFIED (TEMPORARILY) AS THE WORK PROGRESSES, AS RECOMMENDED BY THE QSP (OR EQUIVALENT ROLE).
10. STORM DRAIN INLET PROTECTION SHALL BE PROVIDED AT EVERY STORM DRAIN INLET TO PREVENT SEDIMENT FROM ENTERING THE STORM DRAIN SYSTEM.
11. THE CONTRACTOR SHALL REMOVE SILT AND DEBRIS AFTER EACH MAJOR RAINFALL, OR WHEN SILT REACHES AN ELEVATION OF 0.5' BELOW WEIR OPENING FOR GRAVEL BAGS.
12. ALL EROSION AND SEDIMENT CONTROL MEASURES PROVIDED PER THE APPROVED WPCP SHALL BE INCORPORATED HEREON.
13. GRADED AREAS AROUND THE PROJECT PERIMETER MUST DRAIN AWAY FROM THE FACE OF THE SLOPE AT THE CONCLUSION OF EACH WORKING DAY.



SILT FENCE DETAIL

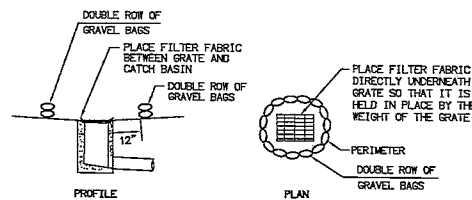
N.T.S.

SILT FENCE TO BE USED AT CONTRACTORS DISCRETION, FOR PERIMETER PROTECTION BASED ON INSTALLATION FEASIBILITY. REFER TO CASUAL BMP SILT EDGE FACT SHEET (S&E-1) AT THE END OF THIS REPORT FOR OPTIONAL INSTALLATION DETAILS.



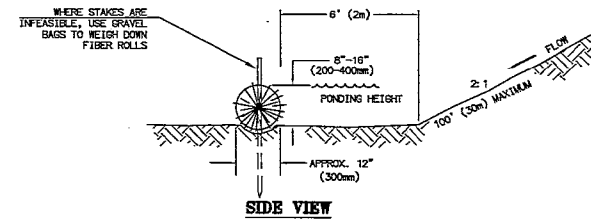
TYPICAL GRAVEL BAG SECTION

N.T.S.

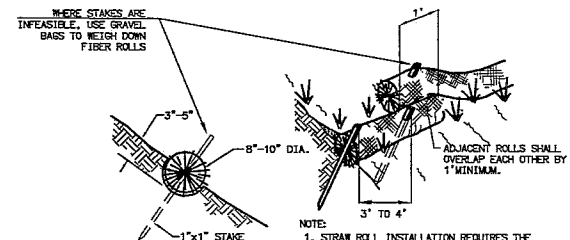


TYPICAL AREA DRAIN DETAIL

N.T.S.



PERIMETER SEDIMENT BARRIER



FIBER ROLL DETAIL

N.T.S.

MISSION BEACH BOARDWALK BULKHEAD PROJECT: EROSION & SEDIMENT CONTROL PLAN

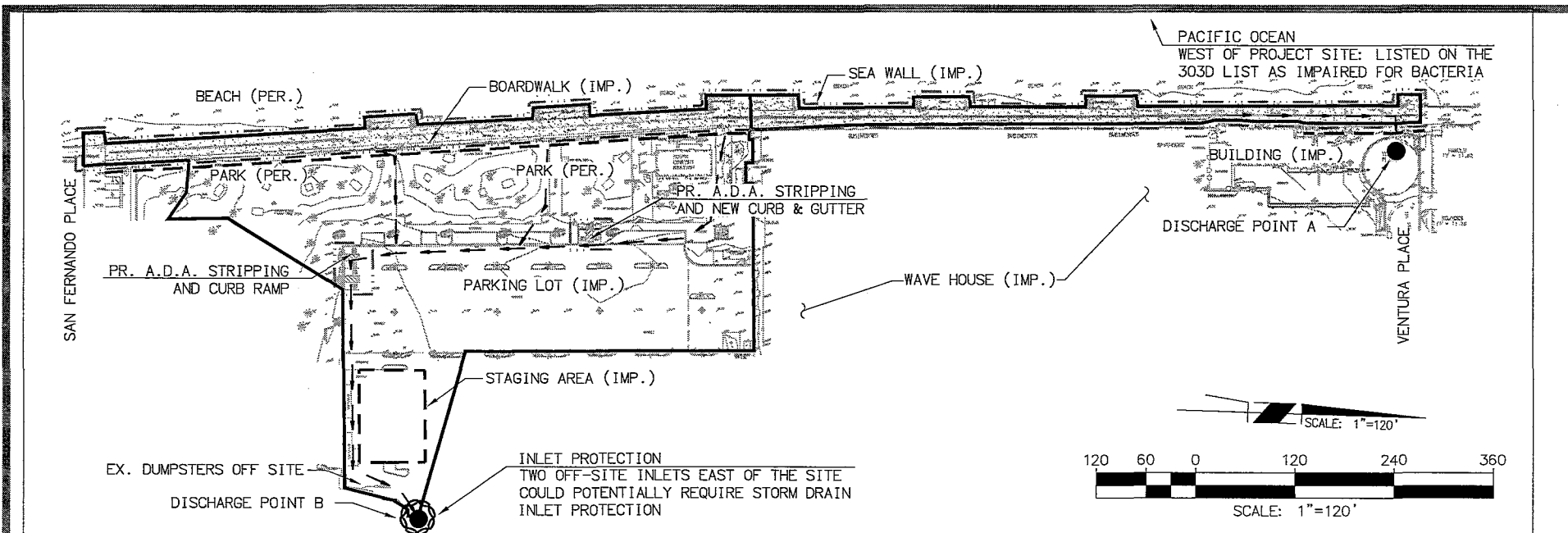
SHEET 1 OF 2



PLANNING ■ DESIGN ■ CONSTRUCTION

8755 CLAIREMONT MESA BOULEVARD, SUITE 100
SAN DIEGO, CALIFORNIA 92124-1324
858.614.6000 FAX 858.614.6001 www.RBF.com

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LEGEND

- PERIMETER PROTECTION (P.P.)- (SILT FENCE OR FIBER ROLL)
- GRAVEL BAG CHECK DAMNS (VELOCITY DISSIPATERS)
- LIMITS OF WORK
- DRAINAGE AREA
- INLET PROTECTION (TYP)
- DISCHARGE POINT
- FLOW DIRECTION

PROVIDE SOIL COVER (PLASTIC LINER OR SIMILAR) TO EXPOSED AREAS AT C.O.B. OR WHEN RAIN IS FORECASTED

SWEEPING WILL BE PERFORMED AT THE CLOSE OF BUSINESS EACH DAY AND AS NEEDED DURING WORKING HOURS

STAGING AREA BMP NOTES

- WM-1: MATERIAL DELIVERY AND STORAGE
- WM-2: SPILL PREVENTION AND CONTROL
- WM-3: STOCKPILE MANAGEMENT
- WM-4: SPILL PREVENTION AND CONTROL
- WM-5: SOLID WASTE MANAGEMENT
- WM-8: CONCRETE WASTE MANAGEMENT
- WM-9: SANITARY/SEPTIC WASTE MANAGEMENT (POTENTIALLY)

GENERAL NOTES

1. NO EXISTING STORM WATER CONTROLS.
2. NO EXISTING AREAS OF SOIL EROSION.
3. NO TOXIC OR HAZARDOUS MATERIAL HAVE SPILLED ON SITE IN THE PAST.
4. MATERIAL STORED IN THE STAGING AREA ARE REQUIRED TO BE COVERED TO AVOID DIRECT EXPOSURE TO STORMWATER.

MISSION BEACH BOARDWALK
BULKHEAD PROJECT:
EROSION & SEDIMENT CONTROL PLAN
SHEET 2 OF 2



PLANNING DESIGN CONSTRUCTION

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Appendix B

WPCP Amendment Log

WPCP AMENDMENT LOG

Amendment No.	Name of Ammender	Description	Date

Appendix C

CASQA BMP Handbook Fact Sheets

JANUARY				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
		1	2 NTP MOBILIZATION	3
			9	10 Grading
6 Install erosion & sediment control measures	7	8 Land clearing		16
		14	15	
12	13			22
				23

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	<input checked="" type="checkbox"/>
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Objective
- Secondary Objective

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates



to soil disturbing and re-stabilization activities. Incorporate the construction schedule into the SWPPP.

- Include on the schedule, details on the rainy season implementation and deployment of:
 - Erosion control BMPs
 - Sediment control BMPs
 - Tracking control BMPs
 - Wind erosion control BMPs
 - Non-stormwater BMPs
 - Waste management and materials pollution control BMPs
- Include dates for activities that may require non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, pavement cleaning, etc.
- Work out the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, foundation pouring utilities installation, etc., to minimize the active construction area during the rainy season.
 - Sequence trenching activities so that most open portions are closed before new trenching begins.
 - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
 - Schedule establishment of permanent vegetation during appropriate planting time for specified vegetation.
- Non-active areas should be stabilized as soon as practical after the cessation of soil disturbing activities or one day prior to the onset of precipitation.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year round to deploy erosion control and sediment control BMPs. Erosion may be caused during dry seasons by un-seasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year round, and retain and maintain rainy season sediment trapping devices in operational condition.
- Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.

Costs

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

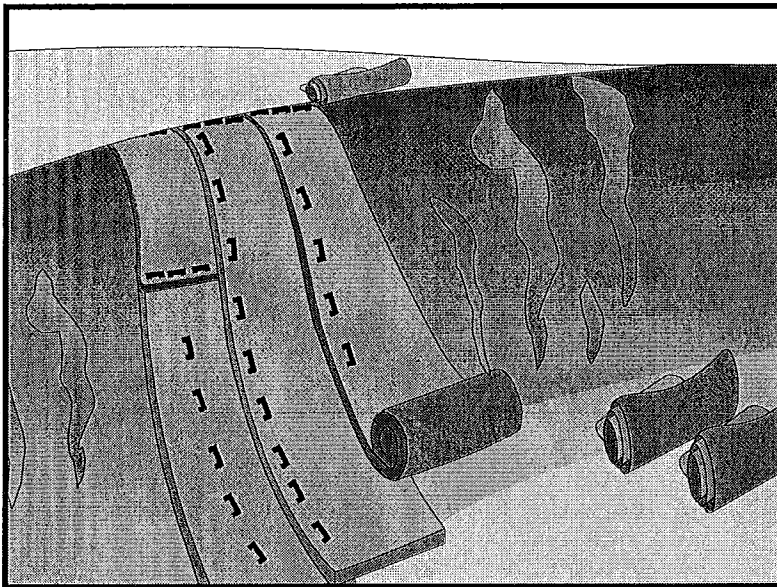
Inspection and Maintenance

- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
- Amend the schedule when changes are warranted.
- Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction site BMPs.

References

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-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.



Description and Purpose

Mattings, or Rolled Erosion Control Products (RECPs), 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)
- Slopes where the erosion potential is high
- Slopes and disturbed soils where mulch must be anchored
- Disturbed areas where plants are slow to develop

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Category
- Secondary Category

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

- EC-3 Hydraulic Mulch
- EC-4 Hydroseeding

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- 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.
- 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 should be limited to covering stockpiles or very small graded areas for short periods of time (such as through one imminent storm event) until more environmentally friendly 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.
- 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.
- RECPs may have limitations in extremely windy climates. 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/yd², ±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/yd². 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/yd². 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/yd². 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.
 - **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 geomatrix 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/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.

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 1/2-3/4 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 (2004) ¹	Estimated Cost per Acre (2009) ²
Biodegradable	Jute Mesh	\$6,000-\$7,000	\$6,600-\$7,700
	Curled Wood Fiber	\$8,000-\$10,500	\$8,800-\$11,050
	Straw	\$8,000-\$10,500	\$8,800-\$11,050
	Wood Fiber	\$8,000-\$10,500	\$8,800-\$11,050
	Coconut Fiber	\$13,000-\$14,000	\$14,300-\$15,400
	Coconut Fiber Mesh	\$30,000-\$33,000	\$33,000-\$36,300
	Straw Coconut Fiber	\$10,000-\$12,000	\$11,000-\$13,200
Non-Biodegradable	Plastic Netting	\$2,000-\$2,200	\$2,200-\$2,220
	Plastic Mesh	\$3,000-\$3,500	\$3,300-\$3,850
	Synthetic Fiber with Netting	\$34,000-\$40,000	\$37,400-\$44,000
	Bonded Synthetic Fibers	\$45,000-\$55,000	\$49,500-\$60,500
	Combination with Biodegradable	\$30,000-\$36,000	\$33,000-\$39,600

1. Source: Cost information received from individual product manufacturers solicited by Geosyntec Consultants (2004).
 2. 2009 costs reflect a 10% escalation over year 2004 costs. Escalation based on informal survey of industry trends. Note: Expected cost increase is offset by competitive economic conditions.

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

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

Erosion Control Pilot Study Report, State of California Department of Transportation (Caltrans), June 2000.

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

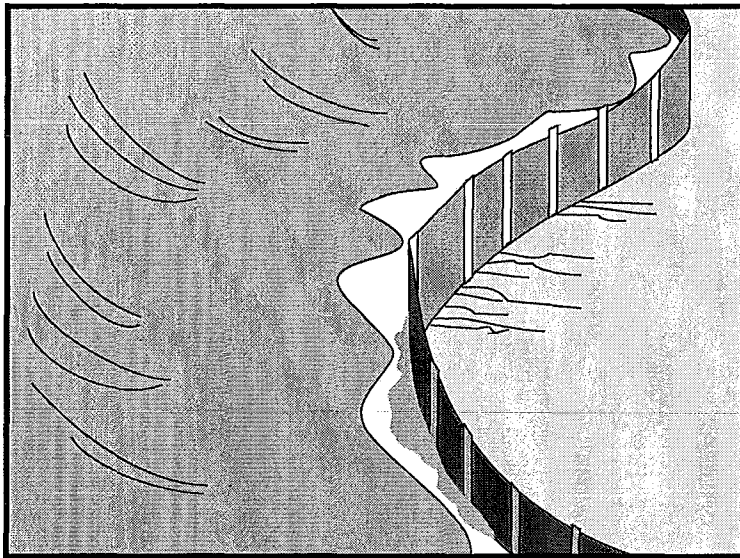
National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

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

Guidance Document: Soil Stabilization for Temporary Slopes, State of California Department of Transportation (Caltrans), November 1999.

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.



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 (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.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Category
- Secondary Category

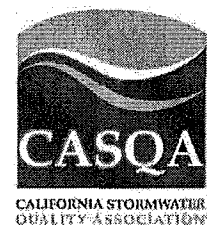
Targeted Constituents

Sediment (coarse sediment)	<input checked="" type="checkbox"/>
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

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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.
- 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 ft² 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 square feet of disturbed area.) (EPA 2012)

- The maximum length of slope draining to any point along the silt fence should be 100 ft per foot 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 $1/2$ 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 inches 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.

References

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

Monitoring Data on Effectiveness of Sediment Control Techniques, Proceedings of World Water and Environmental Resources Congress, Barrett M. and Malina J. 2004.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

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

Sedimentation and Erosion Control Practices, and Inventory of Current Practices (Draft), USEPA, 1990.

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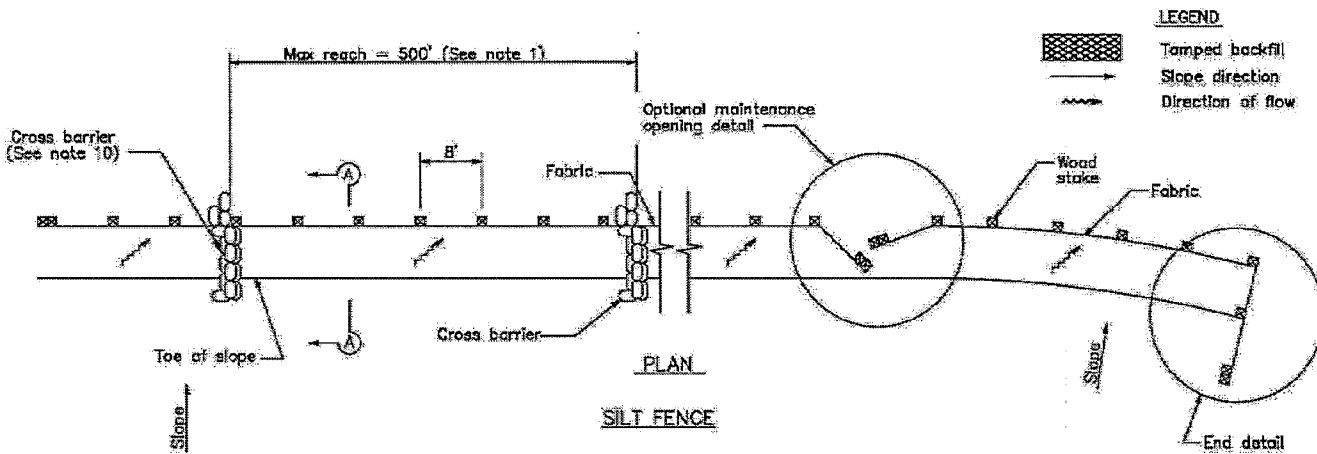
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U.S. Environmental Protection Agency (USEPA). Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 1992.

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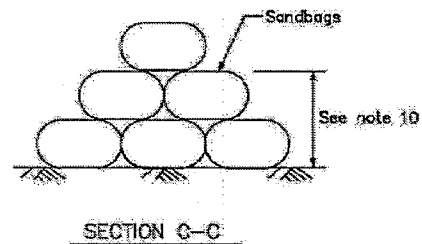
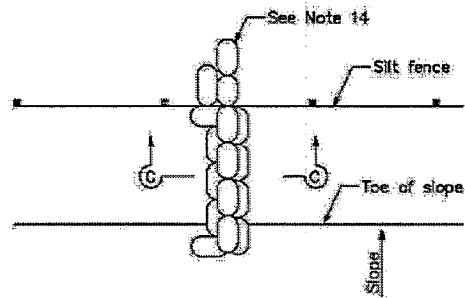
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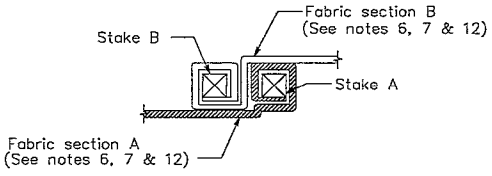
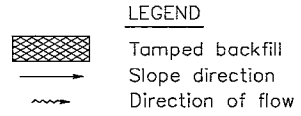
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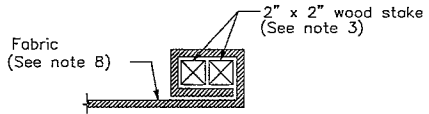
NOTES

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.

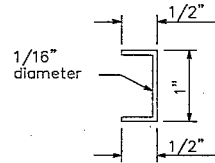




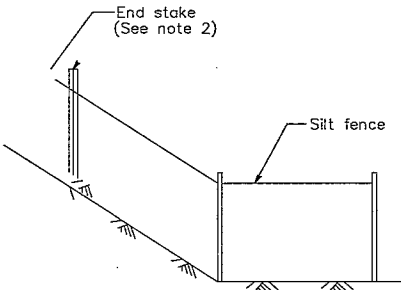
JOINING SECTION DETAIL (TOP VIEW)



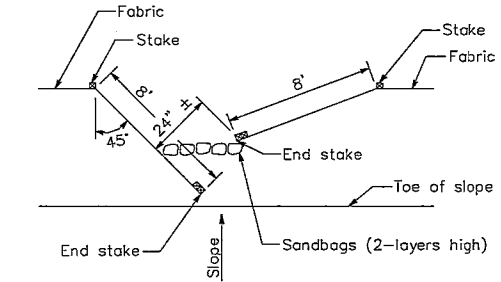
END STAKE DETAIL (TOP VIEW)



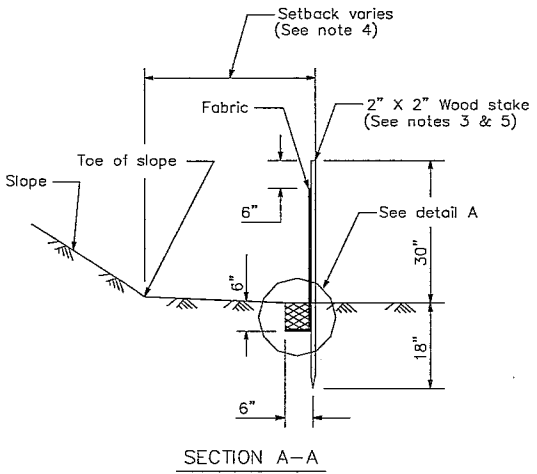
STAPLE DETAIL
(SEE NOTE 9)



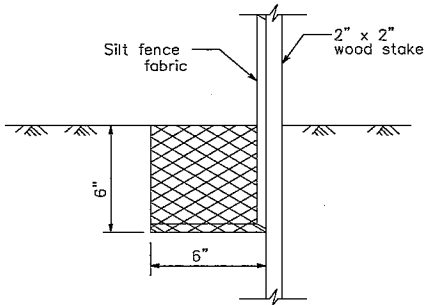
END DETAIL



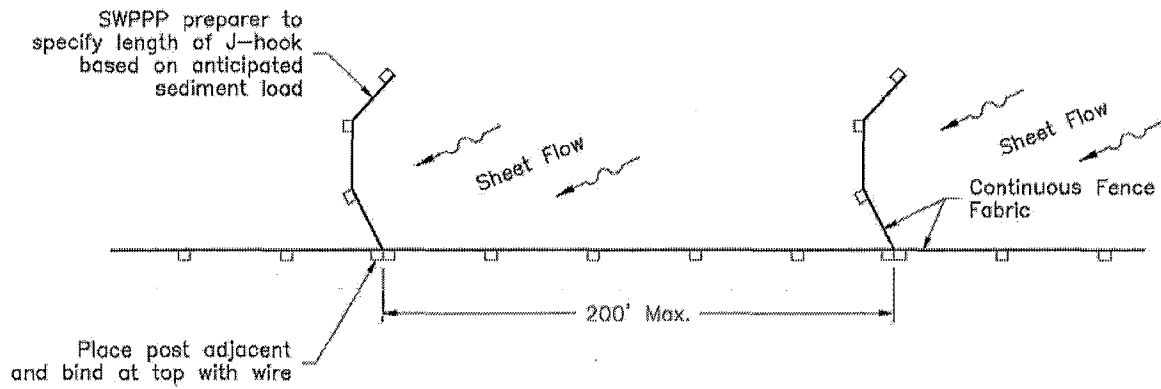
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)



SECTION A-A

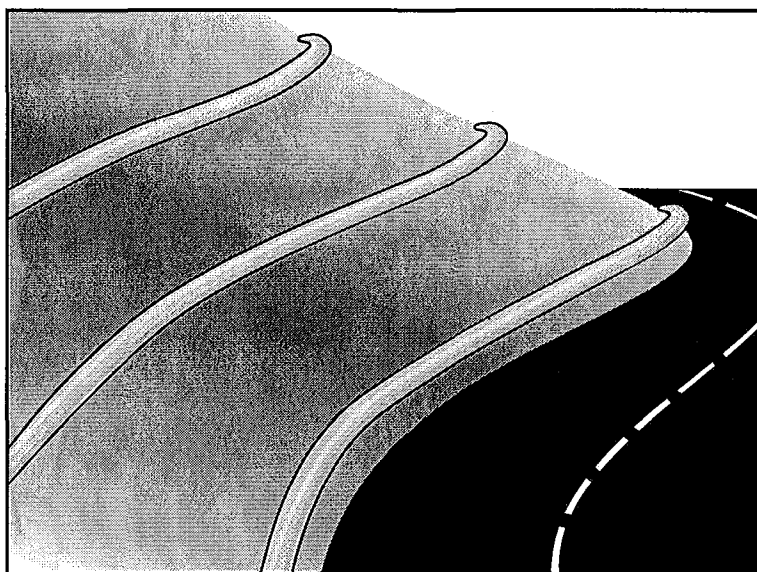


DETAIL A



Plan

J-HOOK



Description and Purpose

A fiber roll consists of straw, coir, or other biodegradable materials bound into a tight tubular roll wrapped by netting, which can be photodegradable or natural. 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.
- At operational storm drains as a form of inlet protection.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>
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

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- Around temporary stockpiles.

Limitations

- Fiber rolls are not effective unless trenched in and staked.
- Not intended for use in high flow situations.
- Difficult to move once saturated.
- If not properly staked and trenched in, fiber rolls could be transported by high flows.
- Fiber rolls have a very 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.

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, or a similar agricultural material bound into a tight tubular roll by netting.
- Typical fiber rolls vary in diameter from 9 in. to 20 in. Larger diameter rolls are available as well.

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 $\frac{1}{4}$ to $\frac{1}{3}$ 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). Typically, fiber rolls encased with plastic netting are used for a temporary application because the netting does not biodegrade. Fiber rolls used in a permanent application are typically encased with a biodegradable material and are left in place. Removal of a fiber roll used in a permanent application can result in greater disturbance.
- 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 regular fiber rolls range from \$20 - \$30 per 25 ft roll.

Material costs for PAM impregnated fiber rolls range between 7.00-\$9.00 per linear foot, 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.
- 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

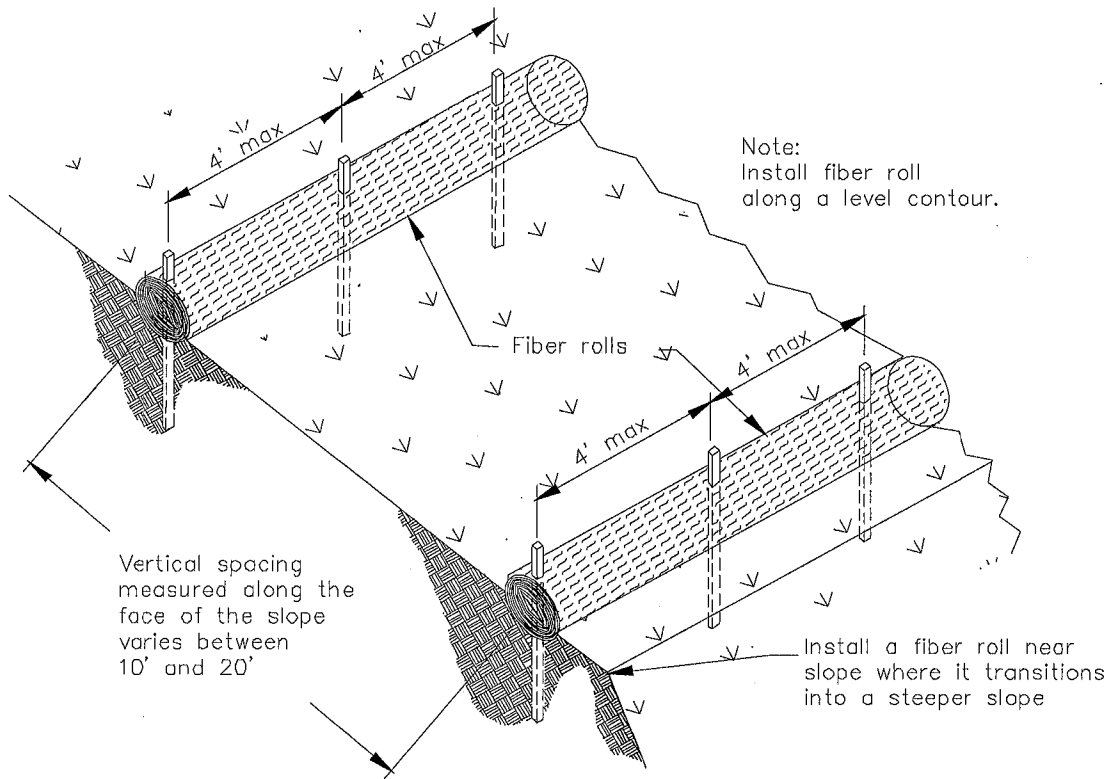
in order to maintain BMP effectiveness. Sediment should be removed when sediment accumulation reaches one-third the designated sediment storage depth.

- 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

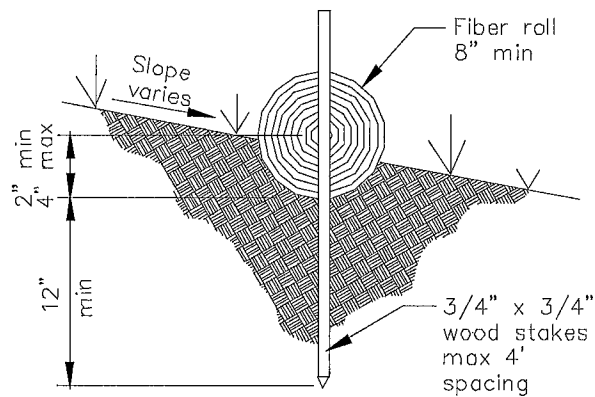
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

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



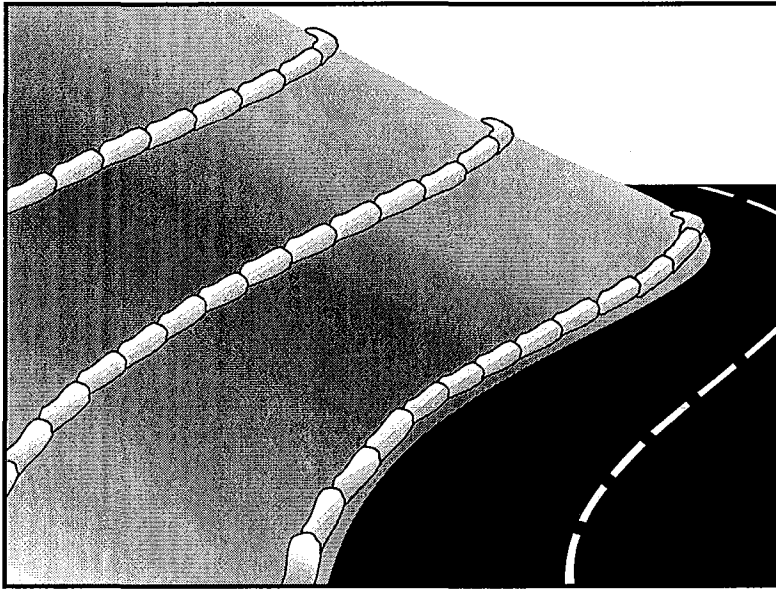
TYPICAL FIBER ROLL INSTALLATION

N.T.S.



ENTRENCHMENT DETAIL

N.T.S.



Description and Purpose

A gravel bag berm is a series of gravel-filled bags placed on a level contour to intercept sheet flows. Gravel bags pond sheet flow runoff, allowing sediment to settle out, and release runoff slowly as sheet flow, preventing erosion.

Suitable Applications

Gravel bag berms may be suitable:

- 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
- As a 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.

Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

- SE-1 Silt Fence
- SE-5 Fiber Roll
- SE-8 Sandbag Barrier
- SE-12 Temporary Silt Dike
- SE-14 Biofilter Bags

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- At the top of slopes to divert runoff away from disturbed slopes.
- As chevrons (small check dams) across mildly sloped construction roads. For use check dam use in channels, see SE-4, Check Dams.

Limitations

- Gravel berms may be difficult to remove.
- Removal problems limit their usefulness in landscaped areas.
- Gravel bag berm may not be appropriate for drainage areas greater than 5 acres.
- Runoff will pond upstream of the berm, possibly causing flooding if sufficient space does not exist.
- Degraded gravel bags may rupture when removed, spilling contents.
- Installation can be labor intensive.
- Durability of gravel bags is somewhat limited and bags may need to be replaced when installation is required for longer than 6 months.
- Easily damaged by construction equipment.
- When used to detain concentrated flows, maintenance requirements increase.

Implementation

General

A gravel bag berm consists of a row of open graded gravel-filled bags placed on a level contour. When appropriately placed, a gravel bag berm intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding allows sediment to settle. The open graded gravel in the bags is porous, which allows the ponded runoff to flow slowly through the bags, releasing the runoff as sheet flows. Gravel bag berms 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. Gravel bag berms are similar to sand bag barriers, but are more porous. Generally, gravel bag berms should be used in conjunction with temporary soil stabilization controls up slope to provide effective erosion and sediment control.

Design and Layout

- Locate gravel bag berms on level contours.
- When used for slope interruption, the following slope/sheet flow length combinations apply:
 - Slope inclination of 4:1 (H:V) or flatter: Gravel bags 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): Gravel bags 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: Gravel bags 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 gravel bag barriers up slope to prevent runoff from going around the berm.
- Allow sufficient space up slope from the gravel bag berm to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, gravel 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 gravel 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.
- In Non-Traffic Areas:
 - Height = 18 in. maximum
 - Top width = 24 in. minimum for three or more layer construction
 - Top width = 12 in. minimum for one or two layer construction
 - Side slopes = 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.
 - Top width = 12 in. minimum for one or two layer construction.
 - Side slopes = 2:1 (H:V) or flatter.
- Butt ends of bags tightly.
- On multiple row, or multiple layer construction, overlap butt joints of adjacent row and row beneath.
- Use a pyramid approach when stacking bags.

Materials

- **Bag Material:** Bags should be woven polypropylene, polyethylene or polyamide fabric or burlap, minimum unit weight of 4 ounces/yd², Mullen burst strength exceeding 300 lb/in² in conformance with the requirements in ASTM designation D3786, and ultraviolet stability exceeding 70% in conformance with the requirements in ASTM designation D4355.

- **Bag Size:** Each gravel-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:** Fill material should be 0.5 to 1 in. crushed rock, clean and free from clay, organic matter, and other deleterious material, or other suitable open graded, non-cohesive, porous gravel.

Costs

Material costs for gravel bags are average and are dependent upon material availability. \$2.50-3.00 per filled gravel bag is standard 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.
- Gravel bags exposed to sunlight will need to be replaced every two to three months due to degrading of the bags.
- Reshape or replace gravel bags as needed.
- Repair washouts or other damage as needed.
- 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.
- Remove gravel bag berms when no longer needed and recycle gravel fill whenever possible and properly dispose of bag material. Remove sediment accumulation and clean, re-grade, and stabilize the area.

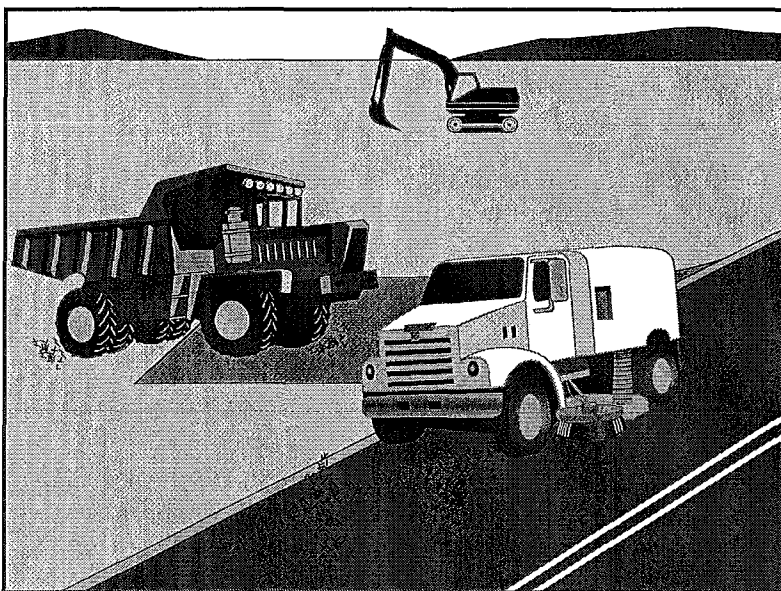
References

Handbook of Steel Drainage and Highway Construction, American Iron and Steel Institute, 1983.

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

Stormwater Pollution Plan Handbook, First Edition, State of California, Department of Transportation Division of New Technology, Materials and Research, October 1992.

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



Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	<input checked="" type="checkbox"/>
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Objective
- Secondary Objective

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	

Potential Alternatives

None

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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).

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 \$58/hour (3 yd³ hopper) to \$88/hour (9 yd³ hopper), 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.

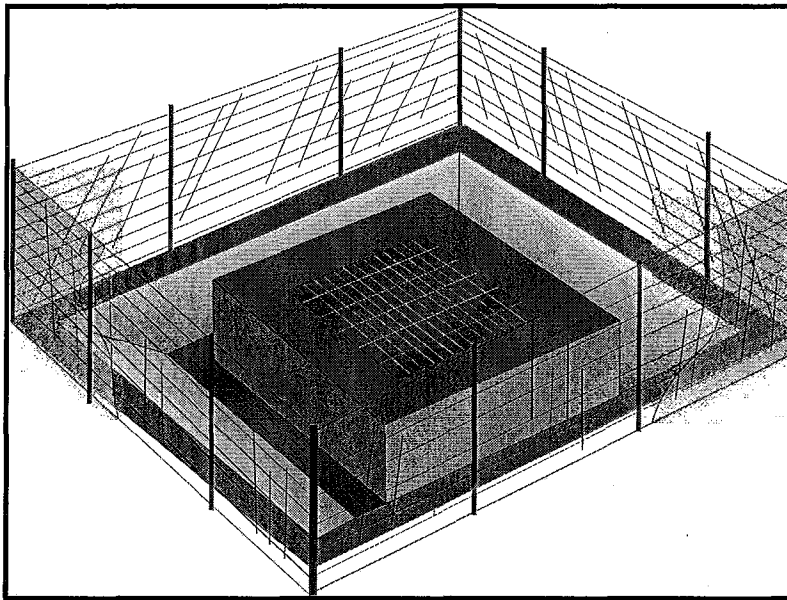
Inspection and Maintenance

- 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.

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



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

Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
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WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Category
- Secondary Category

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	<input checked="" type="checkbox"/>
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

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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 yd³/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.

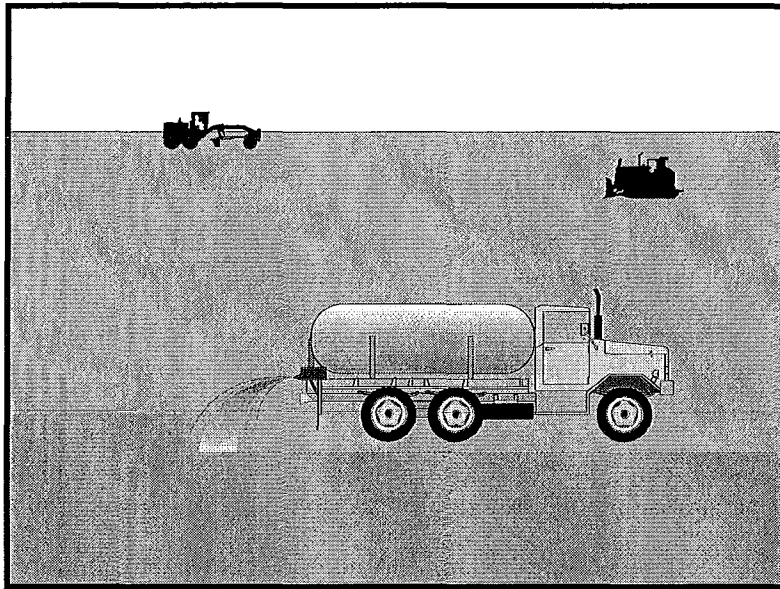
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Inspect and maintain temporary geotextile insert devices according to manufacturer's specifications.
- 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.



Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Category
- Secondary Category

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
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:



- 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 repellent, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- 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, vinyls, 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.

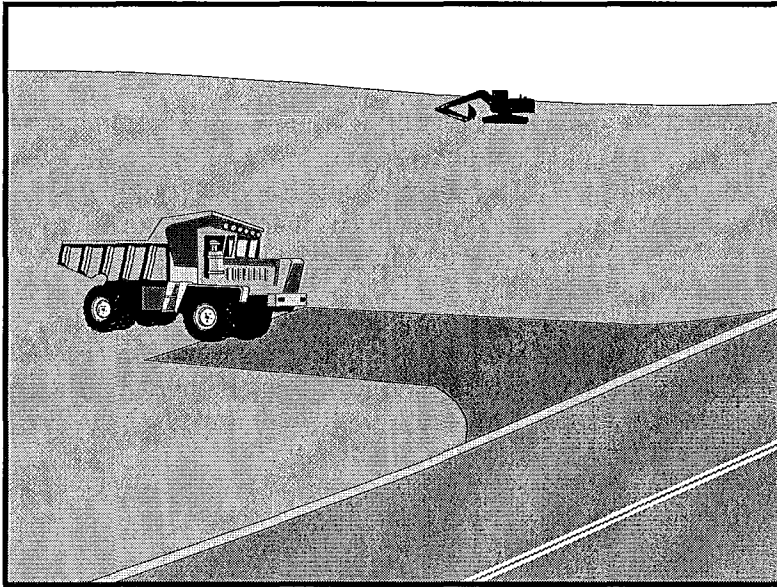
California Air Pollution Control Laws, California Air Resources Board, updated annually.

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

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

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

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	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
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WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Objective
- Secondary Objective

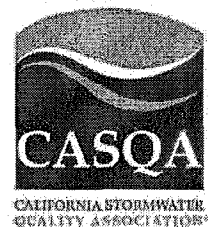
Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

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Stabilized Construction Entrance/Exit TC-1

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.

Stabilized Construction Entrance/Exit TC-1

- 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 \$1,200 to \$4,800 each, averaging \$2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from \$1,200 - \$6,000 each, averaging \$3,600 per entrance.

References

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

Stabilized Construction Entrance/Exit TC-1

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.

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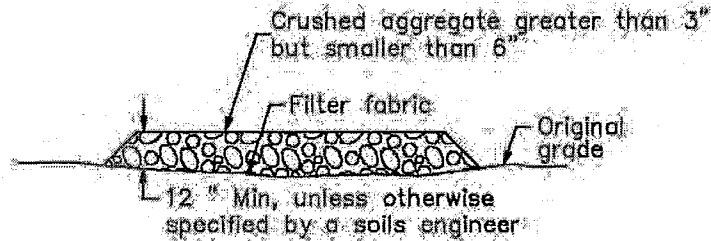
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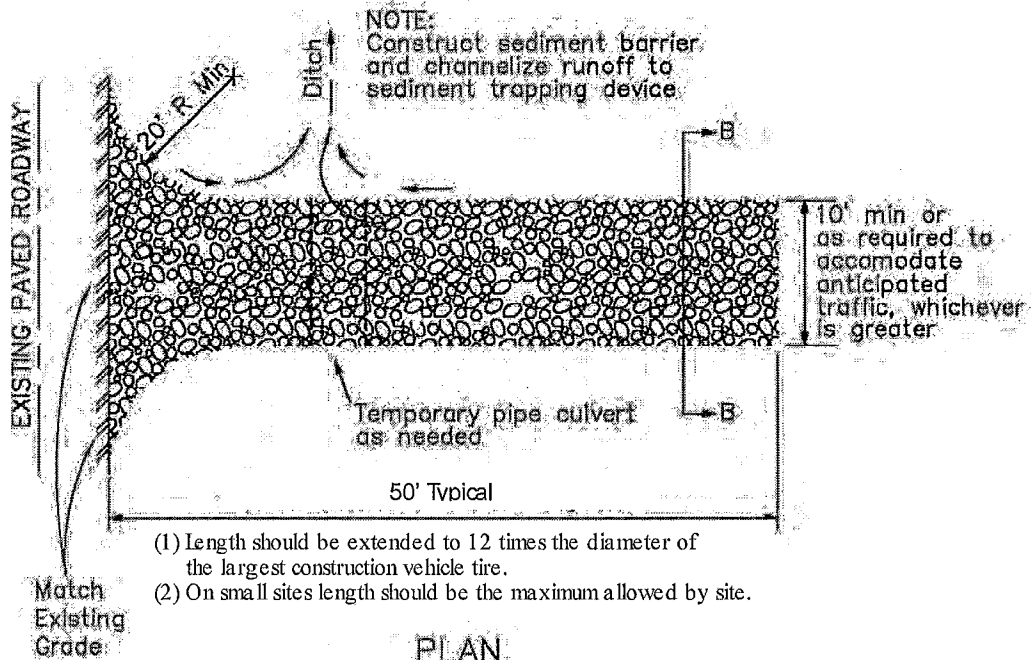
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Stabilized Construction Entrance/Exit TC-1

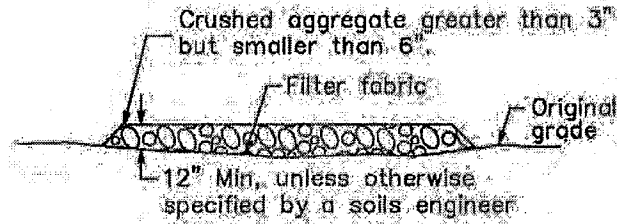


SECTION B-B
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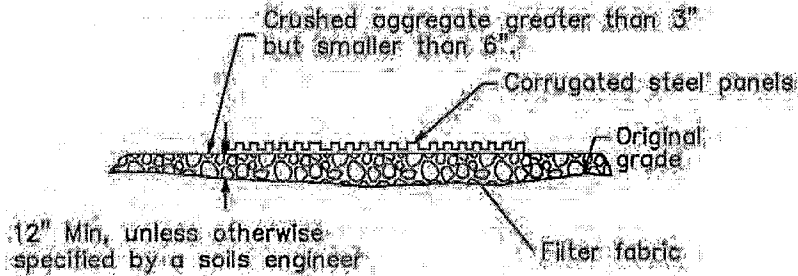


PLAN
NTS

Stabilized Construction Entrance/Exit TC-1

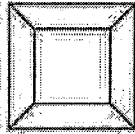


SECTION B-B
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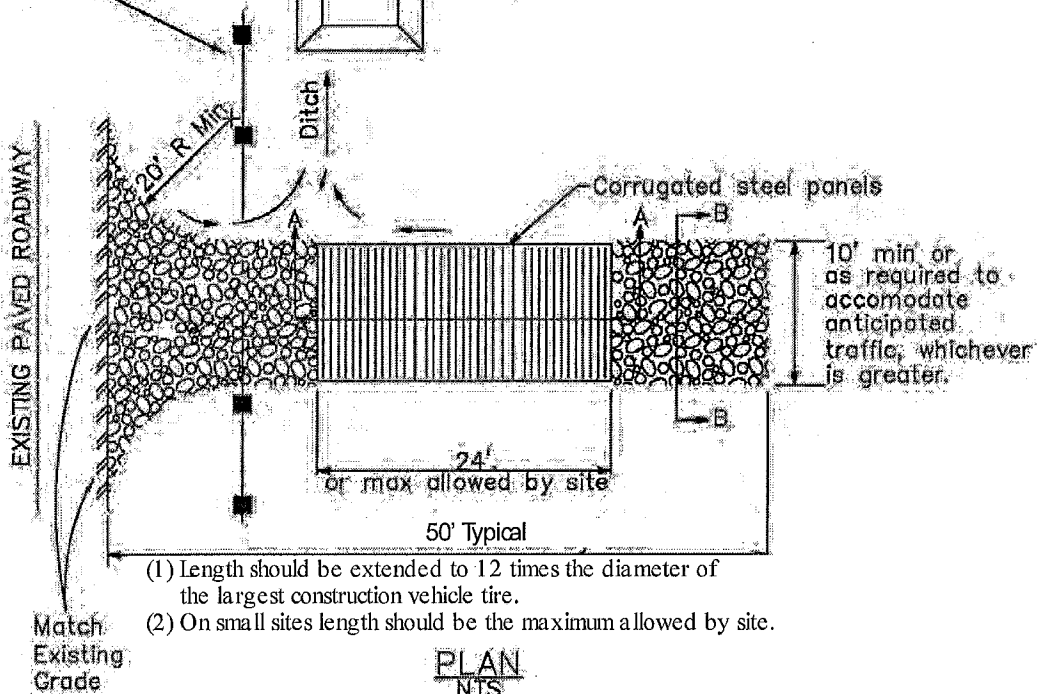


SECTION A-A
NOT TO SCALE

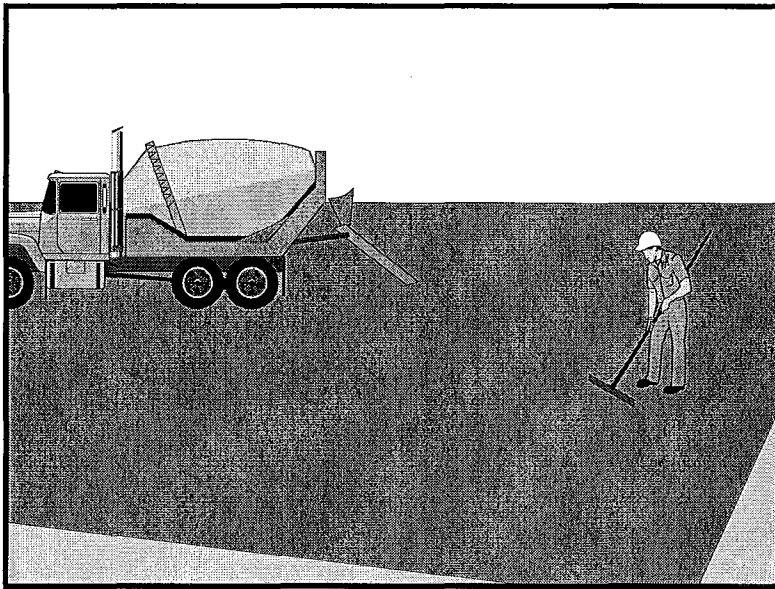
NOTE:
Construct sediment barrier and channelize runoff to sediment trapping device.



Sediment trapping device



PLAN
NTS



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

Legend:

- Primary Category
- Secondary Category

Description and Purpose

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

The General Permit incorporates Numeric Effluent Limits (NEL) and 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.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	

Potential Alternatives

None



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 runoff (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.

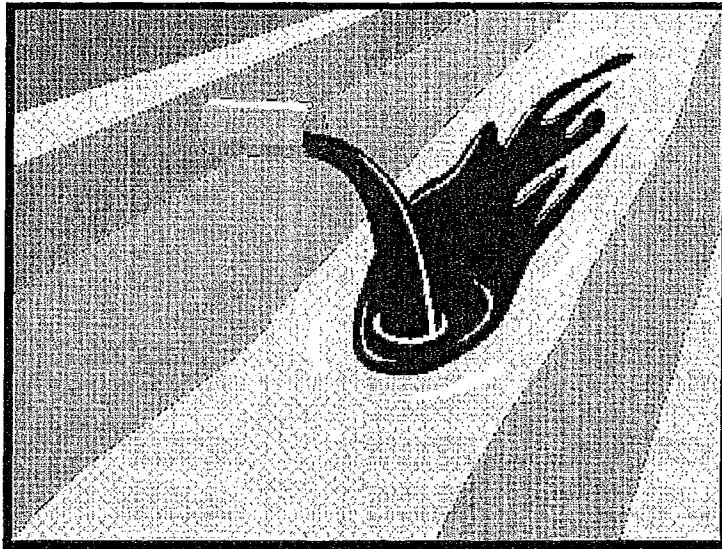
References

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

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



Description and Purpose

Procedures and practices designed for construction contractors to recognize illicit connections or illegally dumped or discharged materials on a construction site and report incidents.

Suitable Applications

This best management practice (BMP) applies to all construction projects. Illicit connection/discharge and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site.

Limitations

Illicit connections and illegal discharges or dumping, for the purposes of this BMP, refer to discharges and dumping caused by parties other than the contractor. If pre-existing hazardous materials or wastes are known to exist onsite, they should be identified in the SWPPP and handled as set forth in the SWPPP.

Implementation

Planning

- Review the SWPPP. Pre-existing areas of contamination should be identified and documented in the SWPPP.
- Inspect site before beginning the job for evidence of illicit connections, illegal dumping or discharges. Document any pre-existing conditions and notify the owner.

Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Objective
- Secondary Objective

Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None



NS-6

Illicit Connection/Discharge

- Inspect site regularly during project execution for evidence of illicit connections, illegal dumping or discharges.
- Observe site perimeter for evidence for potential of illicitly discharged or illegally dumped material, which may enter the job site.

Identification of Illicit Connections and Illegal Dumping or Discharges

- **General** – unlabeled and unidentifiable material should be treated as hazardous.
- **Solids** - Look for debris, or rubbish piles. Solid waste dumping often occurs on roadways with light traffic loads or in areas not easily visible from the traveled way.
- **Liquids** - signs of illegal liquid dumping or discharge can include:
 - Visible signs of staining or unusual colors to the pavement or surrounding adjacent soils
 - Pungent odors coming from the drainage systems
 - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
 - Abnormal water flow during the dry weather season
- **Urban Areas** - Evidence of illicit connections or illegal discharges is typically detected at storm drain outfall locations or at manholes. Signs of an illicit connection or illegal discharge can include:
 - Abnormal water flow during the dry weather season
 - Unusual flows in sub drain systems used for dewatering
 - Pungent odors coming from the drainage systems
 - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
 - Excessive sediment deposits, particularly adjacent to or near active offsite construction projects
- **Rural Areas** - Illicit connections or illegal discharges involving irrigation drainage ditches are detected by visual inspections. Signs of an illicit discharge can include:
 - Abnormal water flow during the non-irrigation season
 - Non-standard junction structures
 - Broken concrete or other disturbances at or near junction structures

Reporting

Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery. For illicit connections or discharges to the storm drain system, notify the local stormwater management agency. For illegal dumping, notify the local law enforcement agency.

Cleanup and Removal

The responsibility for cleanup and removal of illicit or illegal dumping or discharges will vary by location. Contact the local stormwater management agency for further information.

Costs

Costs to look for and report illicit connections and illegal discharges and dumping are low. The best way to avoid costs associated with illicit connections and illegal discharges and dumping is to keep the project perimeters secure to prevent access to the site, to observe the site for vehicles that should not be there, and to document any waste or hazardous materials that exist onsite before taking possession of the site.

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 weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect the site regularly to check for any illegal dumping or discharge.
- Prohibit employees and subcontractors from disposing of non-job related debris or materials at the construction site.
- Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery.

References

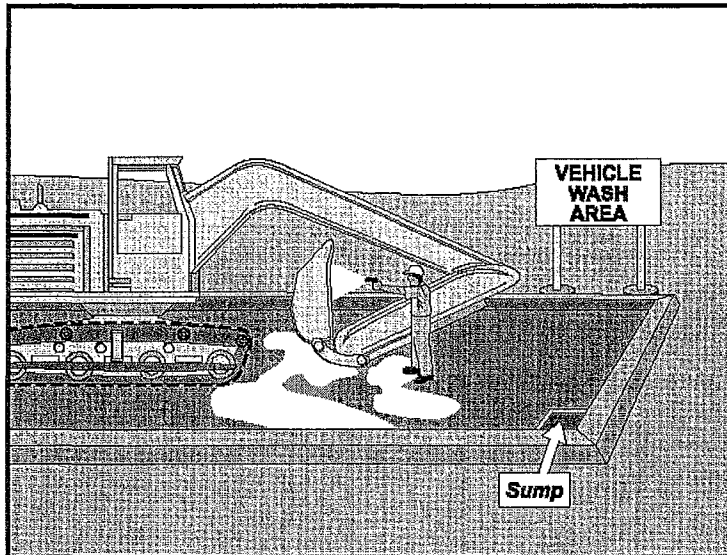
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Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Vehicle and Equipment Cleaning

NS-8



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 TR-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:

Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Objective
- Secondary Objective

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None



NS-8 Vehicle and Equipment Cleaning

- 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 runoff 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 weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- 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.

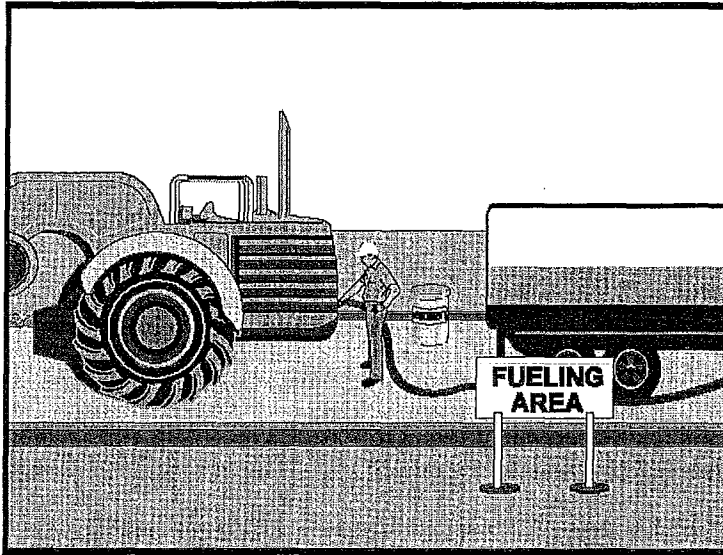
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Vehicle and Equipment Fueling

NS-9



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 TR-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.

Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Objective
- Secondary Objective

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	

Potential Alternatives

None



NS-9

Vehicle and Equipment Fueling

- 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 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 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

- 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

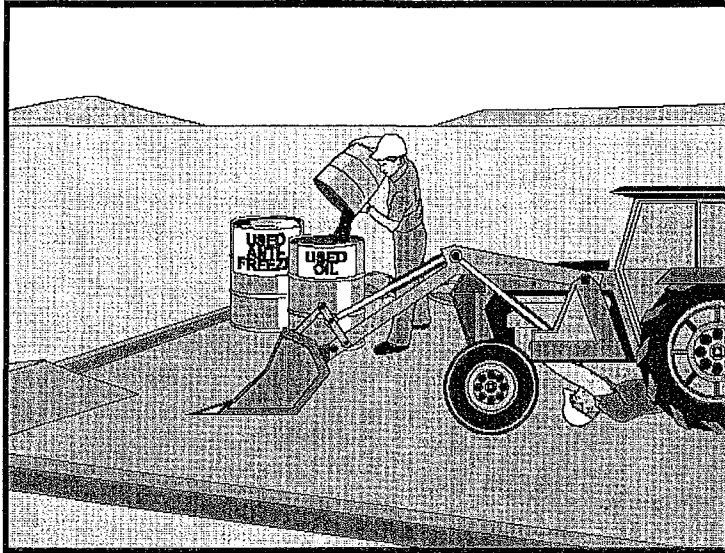
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Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Vehicle & Equipment Maintenance NS-10



Description and Purpose

Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance by running a "dry and clean site". The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures.

Suitable Applications

These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

Limitations

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

Outdoor vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service, changing or replacement of fluids, and outdoor equipment storage and parking (engine fluid leaks). For further information on vehicle or equipment servicing, see NS-8, Vehicle and Equipment Cleaning, and NS-9, Vehicle and Equipment Fueling.

Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

Legend:

- Primary Objective
- Secondary Objective

Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None



NS-10 Vehicle & Equipment Maintenance

Implementation

- Use offsite repair shops as much as possible. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur onsite, use designated areas, located away from drainage courses. Dedicated maintenance areas should be protected from stormwater runoff and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.
- Use adsorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately.
- Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- Drip pans or plastic sheeting should be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- For long-term projects, consider using portable tents or covers over maintenance areas if maintenance cannot be performed offsite.
- Consider use of new, alternative greases and lubricants, such as adhesive greases, for chassis lubrication and fifth-wheel lubrication.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose of or recycle used batteries.
- Do not bury used tires.
- Repair leaks of fluids and oil immediately.

Vehicle & Equipment Maintenance NS-10

Listed below is further information if you must perform vehicle or equipment maintenance onsite.

Safer Alternative Products

- Consider products that are less toxic or hazardous than regular products. These products are often sold under an "environmentally friendly" label.
- Consider use of grease substitutes for lubrication of truck fifth-wheels. Follow manufacturers label for details on specific uses.
- Consider use of plastic friction plates on truck fifth-wheels in lieu of grease. Follow manufacturers label for details on specific uses.

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, trichloroethane, or methylene chloride. Many of these cleaners are listed in California Toxic Rule as priority pollutants. These materials are harmful and must not contaminate stormwater. They must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check the list of active ingredients to see whether it contains chlorinated solvents. The "chlor" term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

Recycling and Disposal

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

Oil filters can be recycled. Ask your oil supplier or recycler about recycling oil filters.

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

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

Costs

All of the above are low cost measures. Higher costs are incurred to setup and maintain onsite maintenance areas.

NS-10 Vehicle & Equipment Maintenance

Inspection and Maintenance

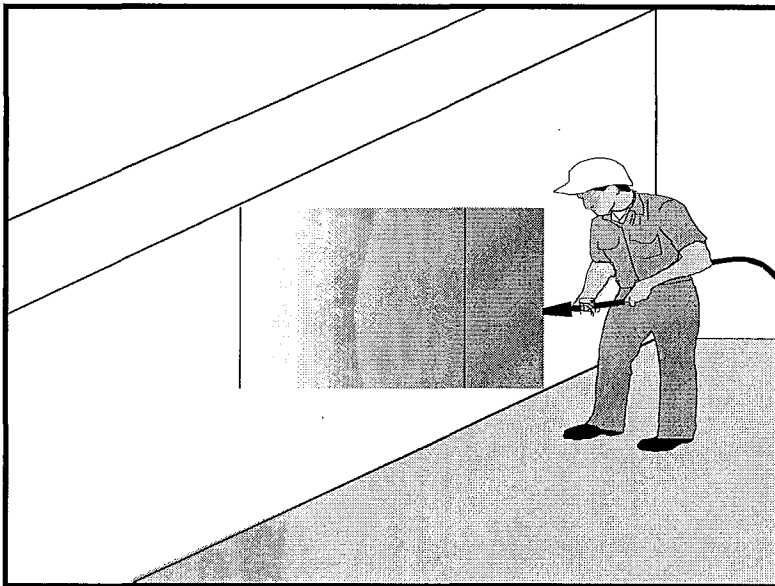
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Keep ample supplies of spill cleanup materials onsite.
- Maintain waste fluid containers in leak proof condition.
- Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately or the problem vehicle(s) or equipment should be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

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.



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

Legend:

- Primary Category
- Secondary Category

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	

Potential Alternatives

None

Description and Purpose

Concrete curing is used in the construction of structures such as bridges, retaining walls, pump houses, large slabs, and structured foundations. Concrete curing includes the use of both chemical and water methods.

Concrete and its associated curing materials have basic chemical properties that can raise the pH of water to levels outside of the permitted range. Discharges of stormwater and non-stormwater exposed to concrete during curing may have a high pH and may contain chemicals, metals, and fines. The General Permit incorporates Numeric Effluent Limits (NEL) and 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).

Proper procedures and care should be taken when managing concrete curing materials to prevent them from coming into contact with stormwater flows, which could result in a high pH discharge.

Suitable Applications

Suitable applications include all projects where Portland Cement Concrete (PCC) and concrete curing chemicals are placed where they can be exposed to rainfall, runoff from other areas, or where runoff from the PCC will leave the site.



Limitations

- Runoff contact with concrete waste can raise pH levels in the water to environmentally harmful levels and trigger permit violations.

Implementation

Chemical Curing

- Avoid over spray of curing compounds.
- Minimize the drift by applying the curing compound close to the concrete surface. Apply an amount of compound that covers the surface, but does not allow any runoff of the compound.
- Use proper storage and handling techniques for concrete curing compounds. Refer to WM-1, Material Delivery and Storage.
- Protect drain inlets prior to the application of curing compounds.
- Refer to WM-4, Spill Prevention and Control.

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

- Direct cure water away from inlets and watercourses to collection areas for evaporation or other means of removal in accordance with all applicable permits. See WM-8 Concrete Waste Management.
- Collect cure water at the top of slopes and transport to a concrete waste management area in a non-erosive manner. See EC-9 Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.
- Utilize wet blankets or a similar method that maintains moisture while minimizing the use and possible discharge of water.

Education

- Educate employees, subcontractors, and suppliers on proper concrete curing techniques to prevent contact with discharge as described herein.
- Arrange for the QSP or the appropriately trained contractor's superintendent or representative to oversee and enforce concrete curing procedures.

Costs

All of the above measures are generally low cost.

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.

- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Sample non-stormwater discharges and stormwater runoff that contacts uncured and partially cured concrete as required by the General Permit.
- Ensure that employees and subcontractors implement appropriate measures for storage, handling, and use of curing compounds.
- Inspect cure containers and spraying equipment for leaks.

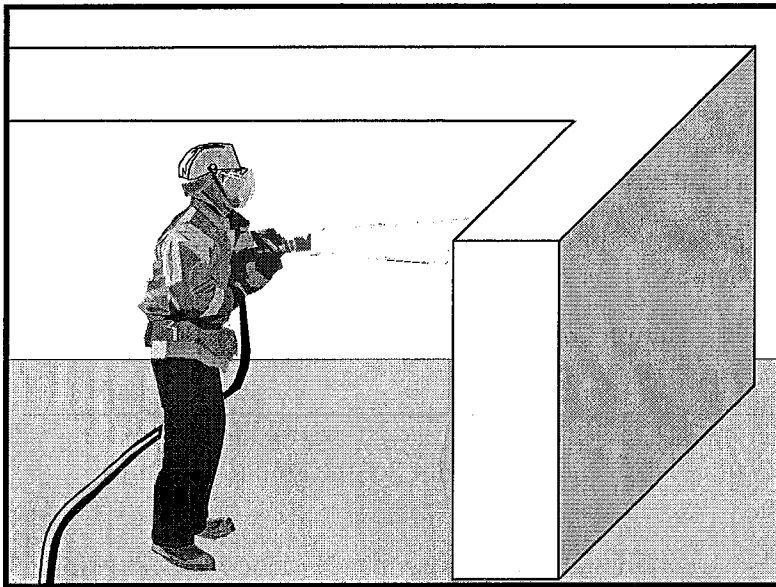
References

Blue Print for a Clean Bay-Construction-Related Industries: Best Management Practices for Stormwater Pollution Prevention; Santa Clara Valley Non Point Source Pollution Control Program, 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 Practices, EPA 832-R-92005; USEPA, April 1992.

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



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

Legend:

- Primary Category
- Secondary Category

Description and Purpose

Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high pressure water blasting. Stormwater and non-stormwater exposed to concrete finishing by-products may have a high pH and may contain chemicals, metals, and fines. Proper procedures and implementation of appropriate BMPs can minimize the impact that concrete-finishing methods may have on stormwater and non-stormwater discharges.

The General Permit incorporates Numeric Effluent Limits (NEL) and 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).

Concrete and its associated curing materials 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 apply to all construction locations where concrete finishing operations are performed.

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None



Limitations

- Runoff contact with concrete waste can raise pH levels in the water to environmentally harmful levels and trigger permit violations.

Implementation

- Collect and properly dispose of water from high-pressure water blasting operations.
- Collect contaminated water from blasting operations at the top of slopes. Transport or dispose of contaminated water while using BMPs such as those for erosion control. Refer to EC-9, Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.
- Direct water from blasting operations away from inlets and watercourses to collection areas for infiltration or other means of removal (dewatering). Refer to NS-2 Dewatering Operations.
- Protect inlets during sandblasting operations. Refer to SE-10, Storm Drain Inlet Protection.
- Refer to WM-8, Concrete Waste Management for disposal of concrete debris.
- Minimize the drift of dust and blast material as much as possible by keeping the blasting nozzle close to the surface.
- When blast residue contains a potentially hazardous waste, refer to WM-6, Hazardous Waste Management.

Education

- Educate employees, subcontractors, and suppliers on proper concrete finishing techniques to prevent contact with discharge as described herein.
- Arrange for the QSP or the appropriately trained contractor's superintendent or representative to oversee and enforce concrete finishing procedures.

Costs

These measures are generally of low cost.

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.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Sample non-stormwater discharges and stormwater runoff that contacts concrete dust and debris as required by the General Permit.

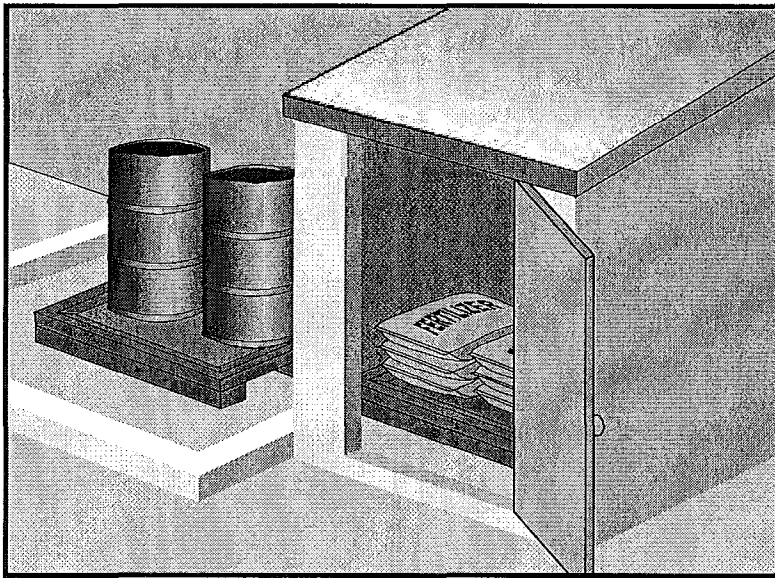
- Sweep or vacuum up debris from sandblasting at the end of each shift.
- At the end of each work shift, remove and contain liquid and solid waste from containment structures, if any, and from the general work area.
- Inspect containment structures for damage prior to use and prior to onset of forecasted rain.

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.

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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	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None



- 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.

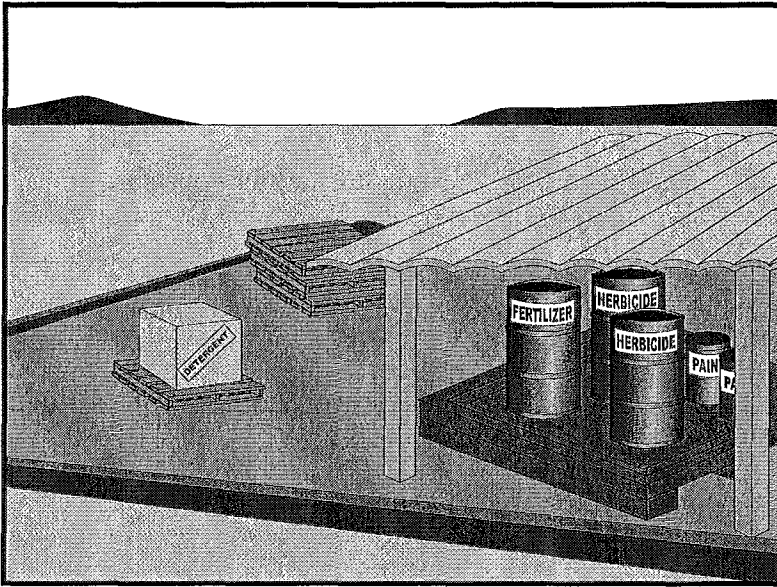
References

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.



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	<input checked="" type="checkbox"/>

Legend:

- Primary Category
- Secondary Category

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None

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



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

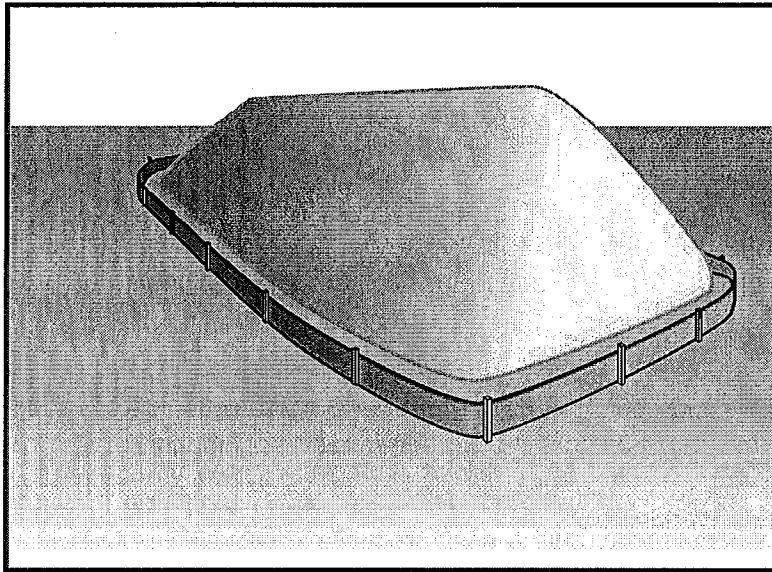
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Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

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.



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:

Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

Legend:

- Primary Category
- Secondary Category

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None



- On larger sites, a minimum of 50 ft separation from concentrated flows of stormwater, drainage courses, and inlets is recommended.
- All stockpiles are required to be protected immediately if they are not scheduled to be used within 14 days.
- Protect all stockpiles from stormwater runoff 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

Non-active stockpiles of the identified materials should be protected further 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 wood (Pressure treated with chromated copper arsenate or ammoniacal copper zinc arsenate)

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

Protection of Active Stockpiles

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

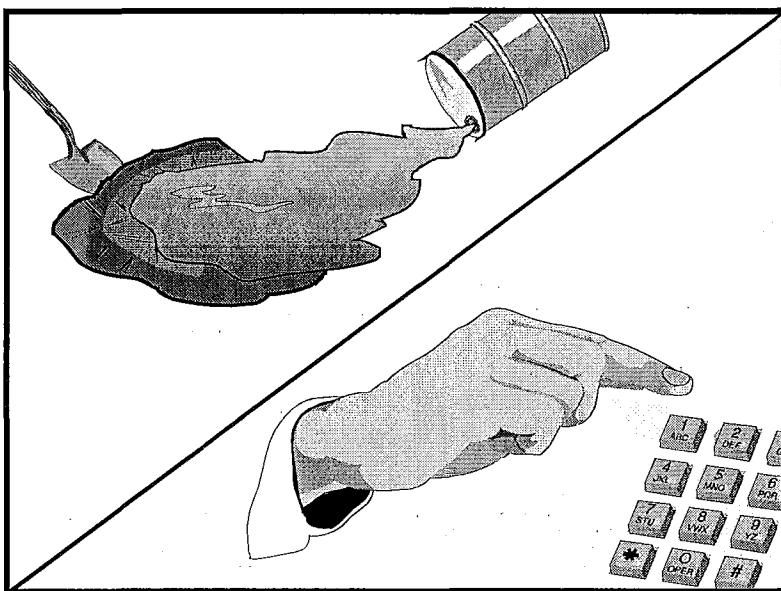
For cost information associated with stockpile protection refer to the individual erosion or sediment control BMP fact sheet considered for implementation (For example, refer to SE-1 Silt Fence for installation of silt fence around the perimeter of a stockpile.)

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.



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	<input checked="" type="checkbox"/>

Legend:

- Primary Objective
- Secondary Objective

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

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

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 runoff 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 spills 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 runoff 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 designated areas, located away from drainage courses, to prevent the runoff 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 weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.

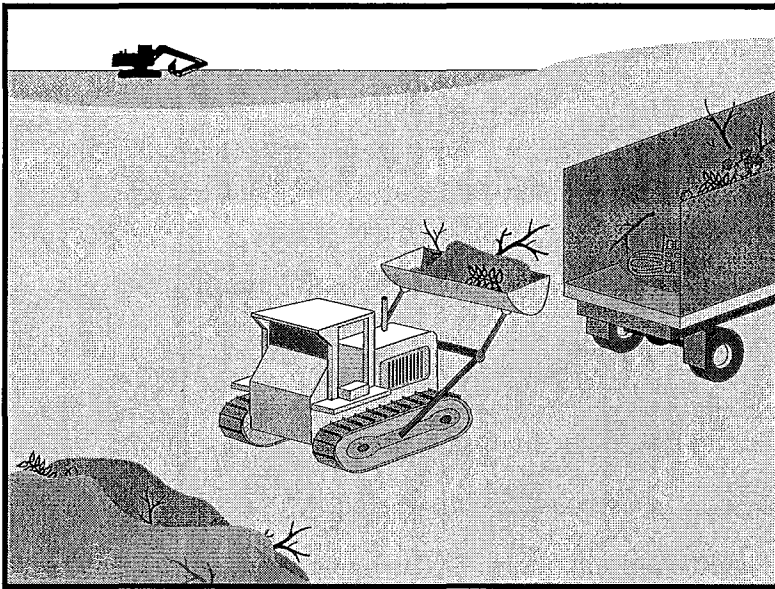
- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

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.



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	<input checked="" type="checkbox"/>

Legend:

- Primary Objective
- Secondary Objective

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None

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
- 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.
- 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 runoff 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

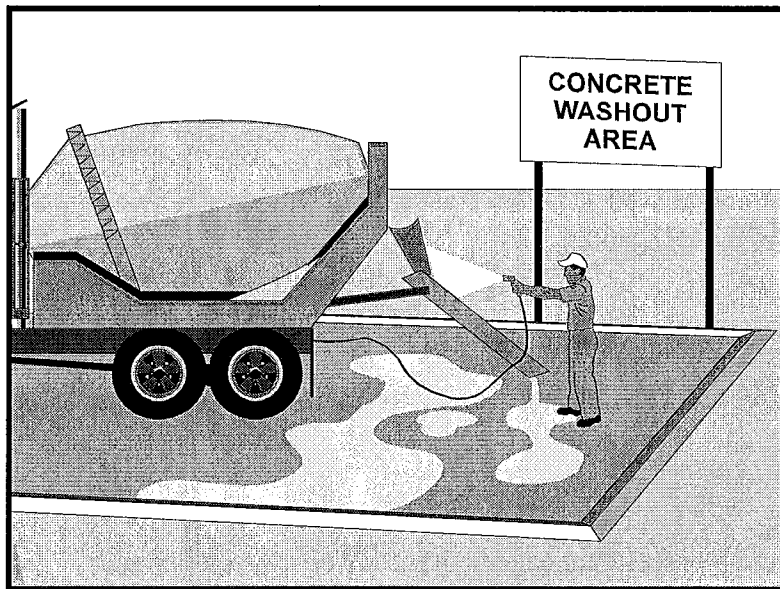
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect 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.



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 Effluent Limits (NEL) and 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.

Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

Legend:

- Primary Category
- Secondary Category

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None



- Concrete trucks and other concrete-coated equipment are washed onsite.
- 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.
 - Washout should be lined so there is no discharge into the underlying soil.
- 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

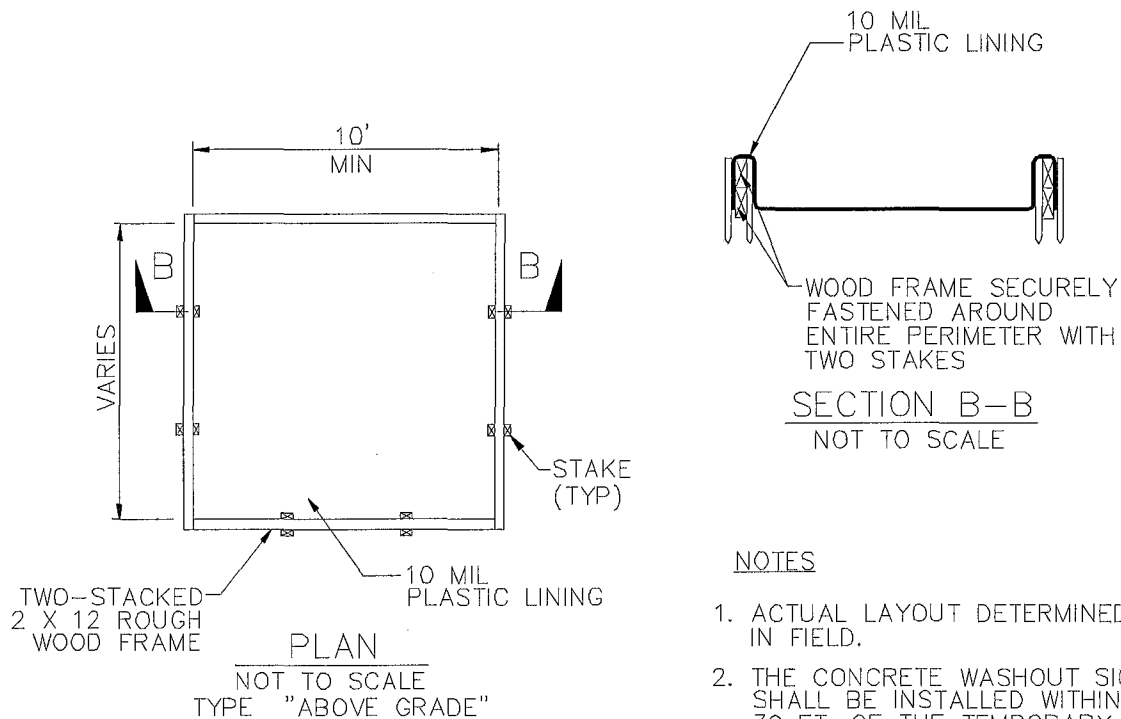
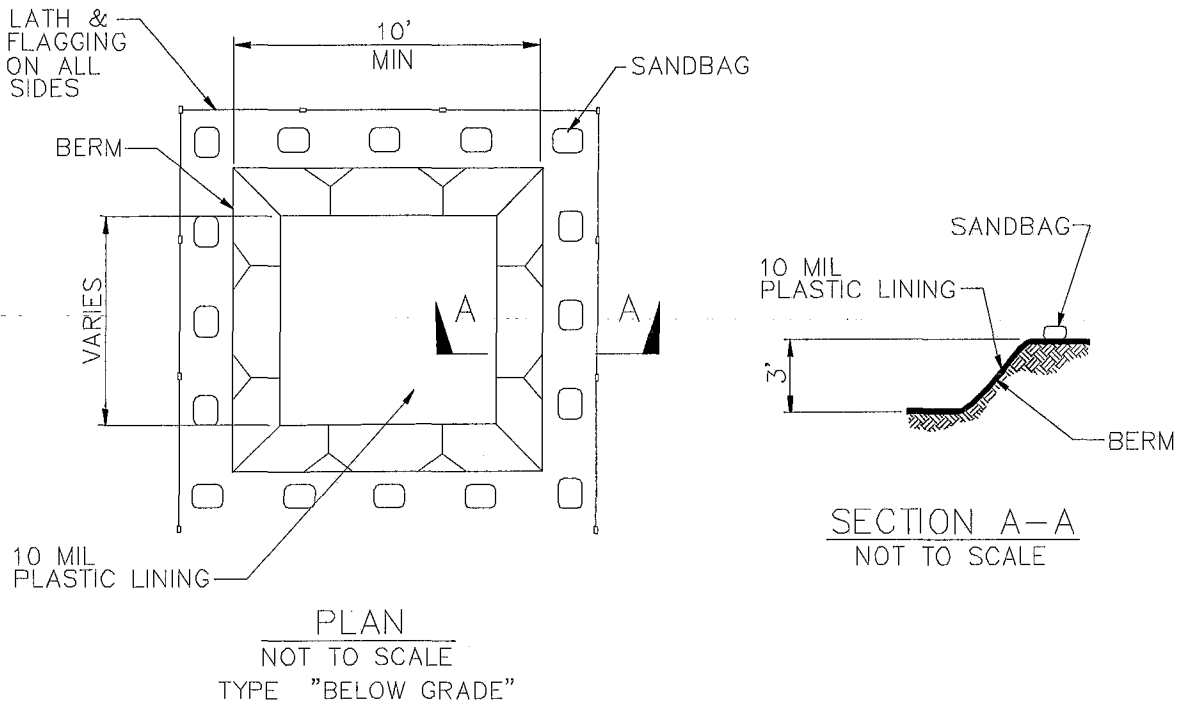
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Temporary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

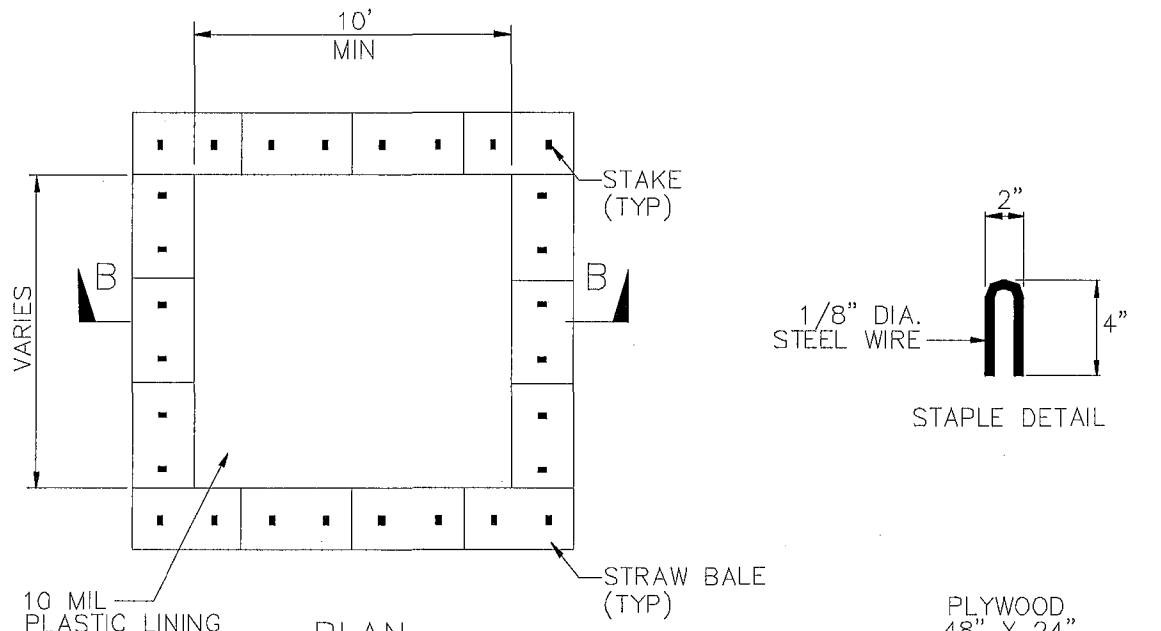
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000, Updated March 2003.

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

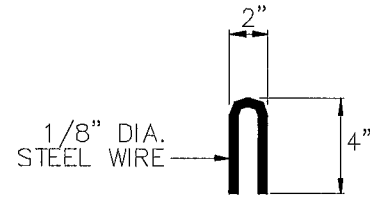


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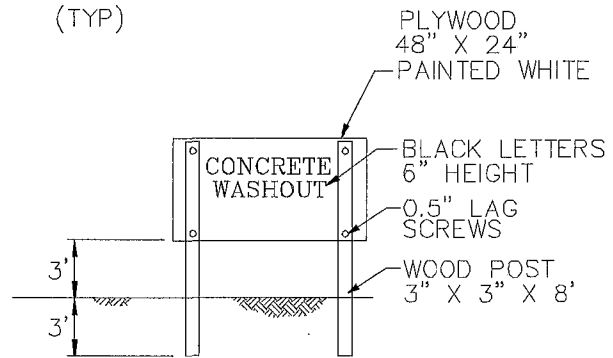
1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.



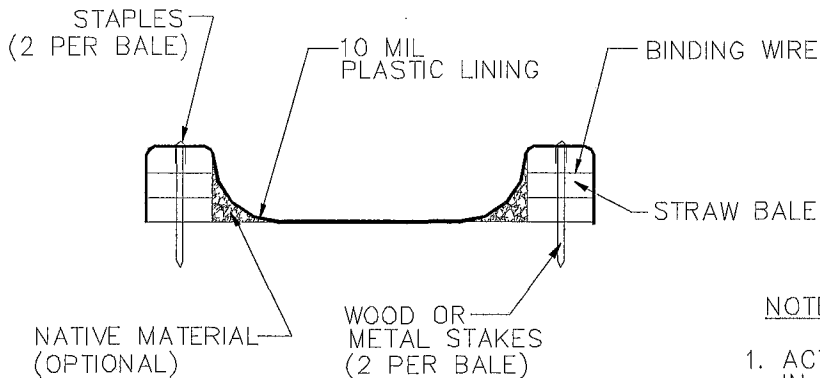
PLAN
NOT TO SCALE
TYPE "ABOVE GRADE"
WITH STRAW BALES



STAPLE DETAIL



CONCRETE WASHOUT SIGN DETAIL (OR EQUIVALENT)

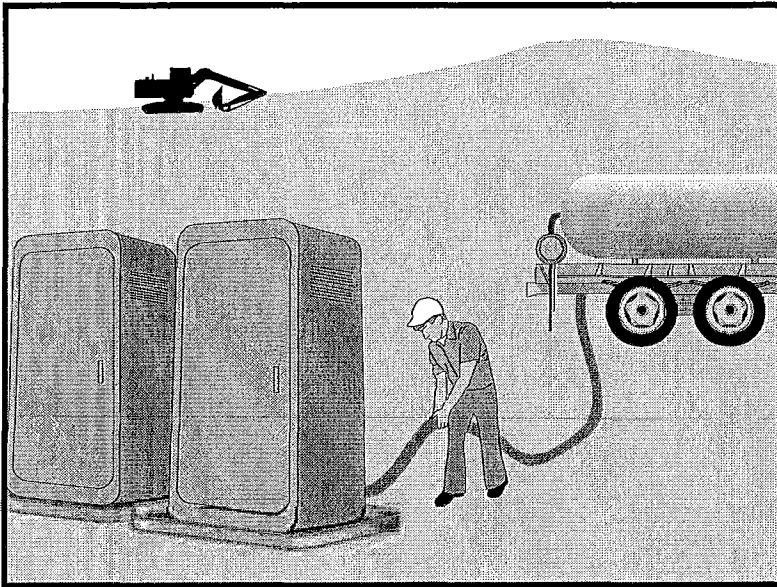


SECTION B-B
NOT TO SCALE

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



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.

Categories

EC	Erosion Control	
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WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

Legend:

- Primary Category
- Secondary Category

Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	
Organics	<input checked="" type="checkbox"/>

Potential Alternatives

None



Sanitary/Septic Waste Management WM-9

- 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.

Sanitary/Septic Waste Management WM-9

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

Construction Site Monitoring Program Documents

D-1: CSMP Checklist

CONSTRUCTION SITE INSPECTION CHECKLIST						
Project Name						
Inspector's Name				Inspector's Title		
Inspector Company						
Pictures taken?			Time of Inspection			
Date of Inspection			Date Inspection Report Written			
Inspection Type (Check Applicable)	<input type="checkbox"/> Weekly <input type="checkbox"/> Prior to forecast rain <input type="checkbox"/> 24-hr intervals during extended rain <input type="checkbox"/> After a rain event <input type="checkbox"/> Other _____ <input type="checkbox"/> Quarterly Non Stormwater					
Weather (circle all that apply)	Sunny	Partly Sunny	Partly Cloudy	Cloudy	Rainy	Windy
Most Recent Storm Data	Storm Start Date & Time:			Storm Duration (hrs):		
	Current Rain Gauge Reading (inches)			Total Storm Rainfall (inches)		
Visual Monitoring and Inspection Locations Observed (see section 8 of WPCP)						
Stage of Construction						
Activities Completed						
Approximate Exposed Site Area						
GENERAL INFORMATION						
Is the site in compliance with the WPCP and the permit requirements? <input type="checkbox"/> Yes <input type="checkbox"/> No If NO, indicate tasks necessary to bring the site into compliance in the area below. Include dates each task will be completed.						
_____ _____ _____						
Sign the following certification: "I certify that this inspection form is true, accurate, and complete, to the best of my knowledge and belief." Signature _____						
Requirement	Yes	No	N/A	Corrective Action/Location		
Temporary Erosion Controls						
Does the applied erosion control provide 100% coverage for the required areas?						

CONSTRUCTION SITE INSPECTION CHECKLIST				
Are there any non-vegetated areas that need erosion control?				
Is the area where erosion control is required free from visible erosion?				
Do any vegetated areas require maintenance, irrigation, fertilization, or mulching?				
Are there any areas of the site that are disturbed, but will likely lie dormant for over 14 days?				
Do any erosion control BMPs require maintenance?				
Temporary Sediment Controls				
Are temporary sediment controls functional, and installed in accordance with the details and/or the WPCP Map?				
Do any sediment control BMPs require maintenance?				
Is the built-up sediment less than 1/3 the height of the barrier?				
Are water bars or check dams installed where necessary and properly spaced according to the WPCP Map?				
Are sediment controls installed and maintained in accordance with the WPCP map, functional and maintained?				
Are silt fences and fiber rolls placed on level contours?				
Storm Drain Inlet Protection				
Are storm drain inlet BMPs internal to the project installed and maintained properly?				
Are offsite storm drain inlet BMPs installed and maintained properly?				
Stockpiles				
Are inactive stockpiles covered and protected from run-on, run-off from adjacent areas, and from winds?				
Are stockpiles located at least 50 feet from concentrated flows, downstream drainage courses and storm drain inlets?				
Concentrated Flows				
Are concentrated flow paths free of visible erosion?				
Tracking Control				
Does the project have a stabilized construction site entrance/exit and is it installed correctly according to the WPCP?				
Are points of ingress/egress to public/private roads inspected, swept, and maintained according to the WPCP?				
Wind Erosion Control				
Is dust control implemented?				
Dewatering Operations				
Is dewatering handled in conformance with the dewatering permit issued by the RWQCB?				
Is required treatment provided for dewatering effluent?				
Requirement	Yes	No	N/A	Corrective Action/Location
Vehicle & Equipment Fueling, Cleaning, and Maintenance				
Are vehicle and equipment fueling, cleaning, maintenance and parking areas reasonably clean and free of spills, leaks, or any other deleterious material?				

CONSTRUCTION SITE INSPECTION CHECKLIST				
Are vehicle and equipment fueling, cleaning and maintenance activities performed on an impermeable surface in dedicated areas? If no, are drip pans used?				
Are dedicated fueling, cleaning, and maintenance areas located at least 50 feet away from downstream drainage facilities and watercourses, and protected from run-on and runoff?				
Is wash water contained for infiltration/ evaporation?				
Is on-site cleaning limited to washing with water (no soap, soaps substitutes, solvents, or steam)?				
On each day of use, are vehicles and equipment inspected for leaks?				
Waste Management & Materials Pollution Control				
Are material storage areas and washout areas protected from run-on and runoff, and located at least 50 feet from concentrated flows and downstream drainage facilities?				
Are material handling and storage areas clean; organized; free of spills, leaks, or any other deleterious material; and stocked with appropriate clean-up supplies?				
Are liquid materials, hazardous materials, and hazardous wastes stored within secondary containment?				
Are packaged materials stored on pallets?				
Are hazardous materials and wastes stored in appropriate, labeled containers?				
Are secondary containment facilities and packaged materials covered or protected when inactive?				
Are temporary concrete washout facilities designated and water tight?				
Are concrete wastes, including residues from cutting and grinding, contained and disposed of off-site or in concrete washout facilities?				
Are spills from mobile equipment fueling and maintenance properly contained and cleaned up?				
Is litter from work areas within the construction limits of the project site collected and placed in dumpsters with lids?				
Are trash receptacles provided in the Contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods?				
Are waste management receptacles free of leaks?				
Is the site free of litter?				
Are waste management receptacles filled at or beyond capacity?				
Are portable toilets placed within containment to prevent the discharge (leaking) of pollutants?				
Spill Control and Response				
Are there proper spill clean-up materials, and posted spill-reporting procedures for hazardous materials and wastes in open and accessible locations adjacent to storage areas?				
If a spill has occurred, was the QSP contacted within 24 hours of a spill of a hazardous substance?				
Requirement	Yes	No	N/A	Corrective Action/Location
Non-Storm Water Discharges				
Is there any evidence of illicit discharges or illegal dumping on the project site?				

CONSTRUCTION SITE INSPECTION CHECKLIST				
If yes, has the QSP been notified?				
If there has been an unauthorized or non-storm water discharge, has it been immediately contained, cleaned up and documented in the WPCP?				
If yes, has the QSP been notified?				
Discharge Points				
Are discharge points and discharge flows free from visible pollutants?				
Are discharge points free of any significant erosion and deposition?				
WPCP Update				
Does the WPCP adequately reflect the current site conditions and contractor operations?				
Are all BMPs shown in the WPCP Map also installed on the construction site?				
Is the WPCP on-site where it is accessible to others?				
Does the WPCP contain a current list of potential pollutant sources?				
General				
If this is a pre-storm inspection?				
Are there any other potential stormwater or non-stormwater pollution control concerns at the site?				
Storm Water Monitoring				
Is there a 50% chance of rain or greater in the forecast? (http://www.weather.gov) Note: Print and attach NOAA forecast to this checklist.				
If a storm event occurred recently, did it produce precipitation of 0.5 inch or more? If so, this should be a post-storm inspection.				
Are there any noticeable odors or visible sheen on the surface of any runoff or discharges?				

D-2: Exemption Records

Visual monitoring and inspections, are not required under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms

- Outside of scheduled site business hours.

If no required visual observations (inspections) or samples are collected due to these exceptions, complete a form below. Each form shall document the reasons why the visual monitoring, inspection, and/or sample collection was not conducted. Completed forms shall be included in Appendix H.

Time:		Date:	
Exemption Type:	<input type="checkbox"/> Dangerous weather conditions	<input type="checkbox"/> Outside of scheduled site business hours	
Details of Exemption:			

Time:		Date:	
Exemption Type:	<input type="checkbox"/> Dangerous weather conditions	<input type="checkbox"/> Outside of scheduled site business hours	
Details of Exemption:			

Time:		Date:	
Exemption Type:	<input type="checkbox"/> Dangerous weather conditions	<input type="checkbox"/> Outside of scheduled site business hours	
Details of Exemption:			

Time:		Date:	
Exemption Type:	<input type="checkbox"/> Dangerous weather conditions	<input type="checkbox"/> Outside of scheduled site business hours	
Details of Exemption:			

Appendix E

Contractors and Subcontractors

CONTRACTORS AND SUBCONTRACTORS

Contractor/Subcontractor Name and Address	Contact Person/ Phone Number	Activity	Start Date	End Date

ATTACHMENT F
INTENTIONALLY LEFT BLANK

City of San Diego

CITY CONTACT: Clementina Giordano - Contract Specialist, Email: CGiordano@sandiego.gov
Phone No. (619) 533-3481, Fax No. (619) 533-3633

ADDENDUM "A"

FOR



MISSION BEACH BOARDWALK BULKHEAD

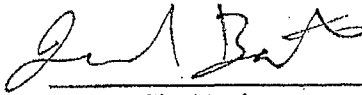
BID NO.:	K-15-1142-DBB-3
SAP NO. (WBS/IO/CC):	S-00726
CLIENT DEPARTMENT:	2113
COUNCIL DISTRICT:	2
PROJECT TYPE:	II

BID DUE DATE:

2:00 PM
MARCH 17, 2015
CITY OF SAN DIEGO
PUBLIC WORKS CONTRACTS
1010 SECOND AVENUE, 14th FLOOR, MS 614C
SAN DIEGO, CA 92101

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:

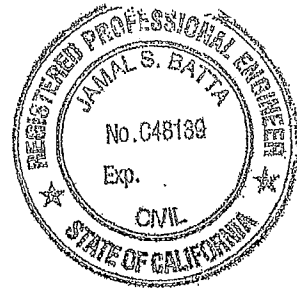


For City Engineer

2/19/15

Date

Seal:



A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN EXTENDED AS STATED ON THE COVER PAGE.

B. VOLUME 1

1. To the Notice Inviting Bids, page 4, Item 4, Subcontracting Participation Percentages, Sub-item 4.1, **DELETE** in its entirety and **SUBSTITUTE** with the following:

4.1 The City has incorporated **mandatory** SLBE-ELBE subcontractor participation percentages to enhance competition and maximize subcontracting opportunities. For the purpose of achieving the mandatory subcontractor participation percentages, a recommended breakdown of the SLBE and ELBE subcontractor participation percentages based upon certified SLBE and ELBE firms has also been provided to achieve the mandatory subcontractor participation percentages:

- | | |
|----------------------------------|--------------|
| 1. SLBE participation | 5.2% |
| 2. ELBE participation | 11.4% |
| 3. Total mandatory participation | 16.6% |

C. VOLUME 2

1. To the BIDDING DOCUMENTS, pages 10 through 14, Proposal (BID), **DELETE** in their entirety and **SUBSTITUTE** with pages 4 through 8 of this Addendum.

James Nagelvoort, Director
Public Works Department

Dated: *February 19, 2015*
San Diego, California

JN/BD/Lad

BIDDING DOCUMENTS

PROPOSAL (BID)

The Bidder agrees to the construction of **Mission Beach Boardwalk Bulkhead**, for the City of San Diego, in accordance with these contract documents for the prices listed below. The Bidder guarantees the Contract Price for a period of 120 days (90 days for federally funded contracts and contracts valued at \$500,000 or less) from the date of Bid opening to Award of the Contract. The duration of the Contract Price guarantee shall be extended by the number of days required for the City to obtain all items necessary to fulfill all conditions precedent e.g., bond and insurance.

Item	Quantity	Unit	NAICS	Payment Reference	Description	Unit Price	Extension
BASE BID							
1	1	LS	524126	2-4.1	Bonds (Payment and Performance)	 	\$
2	1	LS	237310	7-10.2.6	Traffic Control	 	\$
3	1	LS	238990	9-3.4.1	Mobilization	 	\$
4	1	AL		9-3.5	Field Orders - Type II	 	\$50,000.00
5	1	AL	238110	9-3.1	Special Inspection - Type I	 	\$40,000.00
6	4,000	LF	238990	7-10.4.2.3	Construction Fencing	\$	\$
7	76,150	LB	238110	217-1.4	Steel Reinforcing	\$	\$
8	1	LS	238910	300-1.4	Clearing and Grubbing	 	\$
9	1,050	SY	238990	300-10.1.2	Geotextiles Fabric	\$	\$
10	1,670	LF	238110	303-1.11	Concrete Wall	\$	\$
11	1	EA	238110	303-1.12	5' Wide Wall Mock-up	\$	\$

BIDDING DOCUMENTS

Item	Quantity	Unit	NAICS	Payment Reference	Description	Unit Price	Extension
12	1	LS	238990	303-1.1.1	Concrete Steps and Ramp	 	\$
13	44,400	SF	238990	303-5.9	Concrete Paving	\$	\$
14	155	LF	238990	303-5.9	Concrete Paving with DWT	\$	\$
15	50	SF	238990	302-5.9	Asphalt Concrete Pavement	\$	\$
16	50	LF	238990	303-5.9	6" Type G Curb & Gutter	\$	\$
17	1	LS	238110	303-1.9.6	Anti-Graffiti Coating	 	\$
18	140	LF	237310	304-2.1.4	Stainless Steel Handrail	\$	\$
19	26	EA	238210	307-2	Historic Light Fixture Replica	\$	\$
20	26	EA	238210	307-2	Composite Light Poles	\$	\$
21	2,350	LF	238210	307-2	Electrical Conduit (1-1/4")	\$	\$
22	300	LF	238210	307-2	Electrical Conduit (1")	\$	\$
23	7,000	LF	238210	307-2	#4 Conductors	\$	\$
24	900	LF	238210	307-2	#10 Conductors	\$	\$
25	1	EA	238210	307-2	Combination Service Entrance Metered Switch Pedestal	\$	\$
26	24	EA	238210	307-2	Lighting Pullbox 9-5/8"x16"x12"D	\$	\$
27	1	EA	238210	307-2	Outdoor Photocell	\$	\$
28	1	LS	238910	307-2	Transformer Yard Fence Modification	 	\$

BIDDING DOCUMENTS

Item	Quantity	Unit	NAICS	Payment Reference	Description	Unit Price	Extension	
29	1	LS	561730	308-8	Landscape and Irrigation Repair	 	\$	
30	2	EA	238910	315-4	Accessible Picnic Table	\$	\$	
31	8	EA	238910	315-4	Existing Bench Renovation	\$	\$	
32	6	EA	238990	9-3.1	Demountable Post	\$	\$	
33	1	LS	237310	314-4.3.7	Signage and Striping	 	\$	
34	1	LS	541330	701-13.9.5	Water Pollution Control Program Implementation	 	\$	
35	1	LS	238990	701-13.9.5	Water Pollution Control Program Development	 	\$	
ESTIMATED TOTAL BASE BID:							\$	

BIDDING DOCUMENTS

TOTAL BID PRICE FOR BID (Items 1 through 35 inclusive) amount written in words:

The Bid shall contain an acknowledgment of receipt of all addenda, the numbers of which shall be filled in on the Bid form. If an addendum or addenda has been issued by the City and not noted as being received by the Bidder, this proposal shall be rejected as being **non-responsive**. The following addenda have been received and are acknowledged in this bid: _____

The names of all persons interested in the foregoing proposal as principals are as follows:

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, state secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if Bidder or other interested person is an individual, state first and last names in full.

Bidder: _____

Title: _____

Business Address: _____

Place of Business: _____

Place of Residence: _____

Signature: _____

BIDDING DOCUMENTS

NOTES:

- A. The City shall determine the low Bid based on the Base Bid alone.
- B. Prices and notations shall be in ink or typewritten. All corrections (which have been initiated by the Bidder using erasures, strike out, line out, or "white-out") shall be typed or written in with ink adjacent thereto, and shall be initialed in ink by the person signing the bid proposal.
- C. Failure to initial all corrections made in the bidding documents may cause the Bid to be rejected as **non-responsive** and ineligible for further consideration.
- D. Blank spaces must be filled in, using figures. Bidder's failure to submit a price for any Bid item that requires the Bidder to submit a price shall render the Bid **non-responsive** and shall be cause for its rejection.
- E. Unit prices shall be entered for all unit price items. Unit prices shall not exceed two (2) decimal places. If the Unit prices entered exceed two (2) decimal places, the City will only use the first two digits after the decimal points without rounding up or down.
- F. All extensions of the unit prices bid will be subject to verification by the City. In the case of inconsistency or conflict between the product of the Quantity x Unit Price and the Extension, the product shall govern.
- G. In the case of inconsistency or conflict, between the sums of the Extensions with the estimated total Bid, the sum of the Extensions shall govern.
- H. Bids shall not contain any recapitulation of the Work. Conditional Bids will be rejected as being **non-responsive**. Alternative proposals will not be considered unless called for.
- I. Subcontractors' License Number must be filled in. Failure to provide the information specified may deem the bidder **non-responsive**.

City of San Diego

CITY CONTACT: Clementina Giordano - Contract Specialist, Email: CGiordano@sandiego.gov
Phone No. (619) 533-3481, Fax No. (619) 533-3633

ADDENDUM "B"

FOR



MISSION BEACH BOARDWALK BULKHEAD


BID NO.:	K-15-1142-DBB-3
SAP NO. (WBS/IO/CC):	S-00726
CLIENT DEPARTMENT:	2113
COUNCIL DISTRICT:	2
PROJECT TYPE:	II

BID DUE DATE:

2:00 PM
MARCH 26, 2015
CITY OF SAN DIEGO
PUBLIC WORKS CONTRACTS
1010 SECOND AVENUE, 14th FLOOR, MS 614C
SAN DIEGO, CA 92101

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



For City Engineer

3/16/15

Date

Seal:



A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ON THE COVER PAGE.**

B. VOLUME 1

1. To Supplementary Special Provisions, Section 303 - Concrete and Masonry Construction, Sub-section 303-1.12 Wall Mock-up page 58, **DELETE** in its entirety and **SUBSTITUTE** with the following:

303-1.12 Wall Mock-up. ADD the following:

A full-size 5' wide mock-up of the splash/parapet wall shall be constructed and provided to the Resident Engineer for approval by Historical Resources Board staff or professional who meets the Secretary of the Interior's Standards for Rehabilitation, prior to beginning actual wall construction. Mock-up shall include concrete date stamp as shown on plans. Payment for wall mock-up will be made at the Contract Unit Price.

2. To Supplementary Special Provisions, Section 307 - Street Lighting and Traffic Signal Systems, Sub-section 307-1.1 General, page 58, **DELETE** in its entirety and **SUBSTITUTE** with the following:

307-1.1 GENERAL. To the City Supplement, ADD the following

4. Historic Light Fixture: Install per manufacturer's specifications.
5. See Appendix E of these Supplementary Special provisions for additional electrical specifications.

3. To Supplementary Special Provisions Appendices, Appendix E, Electrical Specifications, pages 133, Section 16500 - Exterior Lighting, Sub-section Part 2 - Products, **DELETE** in its entirety and **SUBSTITUTE** with the following:

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Lighting fixtures and poles: Spring City Electrical Co. or an approved equal
 - a. Luminaire: ALMVLL-LE80/EVX/L1-27-CR3-YS29-FCA-GC-TB-CU
 - b. Lamp post: ALMEDG-18-5.10-TN2.88/3.00-323/1NW-XX-CU

2.02 GENERAL REQUIREMENTS

- A. No live parts normally exposed to contact.
- B. When intended for use in wet areas: Mark fixtures "Suitable for wet locations".
- C. All hardware is to be Stainless-Steel 18-8, as provided by manufacturer

2.03 POLES

- A. As scheduled or noted on the Drawings

4. To Supplementary Special Provisions Appendices, Appendix E, Electrical Specifications, pages 134, Section 16500 - Exterior Lighting, Sub-section Part 3 - Execution, **DELETE** in its entirety and **SUBSTITUTE** with the following:

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Mount lighting fixtures at heights indicated on Drawings.
- B. Install exterior fixtures so that water cannot enter or accumulate in the wiring compartment.
- C. Ground fixtures.
- D. Install per manufacturer specifications

3.02 POLE INSTALLATION

- A. Drawings indicate the intended location of light pole.
 - 1. Field conditions may affect actual location.
 - 2. Coordinate location with all existing or new utilities and pavement.
- B. Install per manufacturer specifications

3.03 LIGHTING CONTROL

- A. Pole mounted fixtures controlled as detailed on Drawings.

James Nagelvoort, Director
Public Works Department

Dated: *March 16, 2015*
San Diego, California

JN/BD/Lad

City of San Diego

CITY CONTACT: Clementina Giordano - Contract Specialist, Email: CGiordano@sandiego.gov
Phone No. (619) 533-3481, Fax No. (619) 533-3633

ADDENDUM "C"

FOR



MISSION BEACH BOARDWALK BULKHEAD

BID NO.:	K-15-1142-DBB-3
SAP NO. (WBS/IO/CC):	S-00726
CLIENT DEPARTMENT:	2113
COUNCIL DISTRICT:	2
PROJECT TYPE:	II

BID DUE DATE:

2:00 PM
APRIL 2, 2015
CITY OF SAN DIEGO
PUBLIC WORKS CONTRACTS
1010 SECOND AVENUE, 14th FLOOR, MS 614C
SAN DIEGO, CA 92101

A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ON THE COVER PAGE.**

James Nagelvoort, Director
Public Works Department

Dated: *March 25, 2015*
San Diego, California

JN/BD/Lad

City of San Diego

CITY CONTACT: Clementina Giordano - Contract Specialist, Email: CGiordano@sandiego.gov
Phone No. (619) 533-3481, Fax No. (619) 533-3633



ADDENDUM "D"

FOR

MISSION BEACH BOARDWALK BULKHEAD

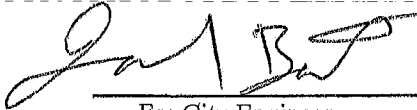
BID NO.: _____ K-15-1142-DBB-3
SAP NO. (WBS/IO/CC): _____ S-00726
CLIENT DEPARTMENT: _____ 2113
COUNCIL DISTRICT: _____ 2
PROJECT TYPE: _____ II

BID DUE DATE:

2:00 PM
APRIL 2, 2015
CITY OF SAN DIEGO
PUBLIC WORKS CONTRACTS
1010 SECOND AVENUE, 14th FLOOR, MS 614C
SAN DIEGO, CA 92101

ENGINEER OF WORK

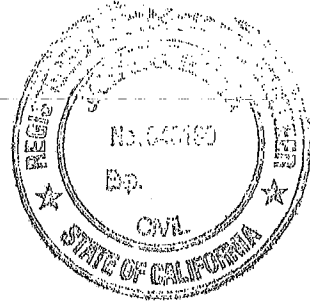
The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



For City Engineer

3/25/15
Date

Seal:



A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

B. BIDDER's QUESTIONS

- Q1. There is a link to a subsurface conditions report for the above project on page 40 of the Contract Documents Vol. 1 manual; however the link takes you to a blank folder online. Is this report available? If so, how do we go about getting it?
- A1. The report has been uploaded once again to the link provided under 2-7 located on page 40 of the contract documents, volume 1.
- Q2. Bid Item 14, Concrete Paving with DWT has a unit of measure of LF. The specifications state that this will be measured by SF. Please clarify.
- A2. The correct unit of measure for bid item 14 Concrete Paving with DWT is square footage (SF).
- Q3. Is the concrete pad under the picnic tables paid for under Bid Item 13, Concrete Paving?
- A3. Yes, the concrete pad is paid for under bid item 13, concrete paving
- Q4. The detail for the Contact Joints against existing concrete is G-10. This doesn't apply since the concrete is existing. Should these joints be drilled and dowelled? Please provide a detail.
- A4. A detail for the contact joints against the existing concrete has been provided.
- Q5. Could you add a Bid Item for the square piles that are required?
- A5. Payment for the square piles is included in section 303-1.11 located on page 57 in volume 1 of the contract documents.
- Q6. Payment for the Exclusive Community Liaison is supposed to be in its own bid item. Please add this bid item.
- A6. The Exclusive Community Liaison will not be required for this project. Please refer 7-6.18 on page 56 in volume 1 of the contract documents.
- Q7. Drawings C-2 and C-3 show asphalt and concrete paving that needs to be removed. What is the thickness of this paving?
- A7. The proposed thickness of the paving is 7" as shown in detail 2 located on sheet C-1

C. PLANS

To Drawings Sheets Numbers: 37271-1-D (G-1), 37271-2-D (G-2), 37271-5D (C-1), 37271-8-D (C-4), 37271-9-D (C-5), 37271-10-D (C-6), 37271-11-D (C-7), 37271-12-D (C-8), 37271-13-D (C-9), 37271-14-D (C-10), 37271-15-D (C-11), 37271-19-D (T-1), 37271-20-D (T-2), 37271-21-D (T-3), (37271-22-D (S-1), 37271-23-D (S-2), 37271-24-D (S-3), 37271-26-D (S-5); 37271-28-D (S-7) 37271-31-D (S-10), 37271-35-D (E-4), **DELETE** in their entirety and **REPLACE** with files located at FTP link listed below:

<ftp://ftp.sannet.gov/OUT/Mission%20Beach%20Boardwalk%20Bulkhead%20Revised%20Design%20Sheet/>

James Nagelvoort, Director
Public Works Department

Dated: *March 26, 2015*
San Diego, California

JN/BD/Lad

RIP

City of San Diego

CONTRACTOR'S NAME: TechCom International, Corp.
 ADDRESS: 440 Goddard, Irvine, CA 92618
 TELEPHONE NO.: (949) 453-1900 x222 FAX NO.: (949) 453-1902
 CITY CONTACT: Clementina Giordano - Contract Specialist, Email: CGiordano@san Diego.gov
Phone No. (619) 533-3481, Fax No. (619) 533-3633
 WMeredith / BDoringo / Lad

CONTRACT DOCUMENTS FOR



MISSION BEACH BOARDWALK BULKHEAD

VOLUME 2 OF 2

BID NO.: K-15-1142-DBB-3
 SAP NO. (WBS/IO/CC): S-00726
 CLIENT DEPARTMENT: 2113
 COUNCIL DISTRICT: 2
 PROJECT TYPE: II

THIS CONTRACT IS SUBJECT TO THE FOLLOWING:

- THE CITY'S SUBCONTRACTING PARTICIPATION REQUIREMENTS FOR SLBE PROGRAM.
- PREVAILING WAGE RATES: STATE FEDERAL
- APPRENTICESHIP

**THIS BIDDING DOCUMENT TO BE SUBMITTED IN IT'S ENTIRETY
REFER TO VOLUME 1 COVER PAGE FOR TIME, DATE, AND LOCATION**

TABLE OF CONTENTS

DESCRIPTION

PAGE NUMBER

Volume 2 - Bidding Documents

The following forms must be completed in their entirety and submitted with the Bid. Include the form(s) even if the information does not apply. Where the information does not apply write in N/A. Failure to include any of the forms may cause the Bid to be deemed **non-responsive**. If you are uncertain or have any questions about any required information, contact the City no later than 14 days prior to Bid due date.

1. Bid/Proposal.....	3
2. Bid Bond.....	6
3. Non-Collusion Affidavit to be executed by Bidder and Submitted with Bid under 23 USC 112 and PCC 7106.....	7
4. Contractors Certification of Pending Actions.....	8
5. Equal Benefits Ordinance Certification of Compliance.....	9
6. Proposal (Bid).....	10
7. Form AA35 - List of Subcontractors.....	15
8. Form AA40 - Named Equipment/Material Supplier List.....	16

BIDDING DOCUMENTS

PROPOSAL

Bidder's General Information

To the City of San Diego:

Pursuant to "Notice Inviting Bids", specifications, and requirements on file with the City Clerk, and subject to all provisions of the Charter and Ordinances of the City of San Diego and applicable laws and regulations of the United States and the State of California, the undersigned hereby proposes to furnish to the City of San Diego, complete at the prices stated herein, the items or services hereinafter mentioned. The undersigned further warrants that this bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

The undersigned bidder(s) further warrants that bidder(s) has thoroughly examined and understands the entire Contract Documents (plans and specifications) and the Bidding Documents therefore, and that by submitting said Bidding Documents as its bid proposal, bidder(s) acknowledges and is bound by the entire Contract Documents, including any addenda issued thereto, as such Contract Documents incorporated by reference in the Bidding Documents.

IF A SOLE OWNER OR SOLE CONTRACTOR SIGN HERE:

- (1) Name under which business is conducted _____
- (2) Signature (Given and surname) of proprietor _____
- (3) Place of Business (Street & Number) _____
- (4) City and State _____ Zip Code _____
- (5) Telephone No. _____ Facsimile No. _____
- (6) Email Address _____

BIDDING DOCUMENTS

IF A PARTNERSHIP, SIGN HERE:

- (1) Name under which business is conducted _____
- (2) Name of each member of partnership, indicate character of each partner, general or special (limited):

- (3) Signature (Note: Signature must be made by a general partner)

Full Name and Character of partner

- (4) Place of Business (Street & Number) _____
- (5) City and State _____ Zip Code _____
- (6) Telephone No. _____ Facsimile No. _____
- (7) Email Address _____

IF A CORPORATION, SIGN HERE:

- (1) Name under which business is conducted TechCom International, Corp.
- (2) Signature, with official title of officer authorized to sign for the corporation:
B. Katebian
(Signature)
Bob Katebian/ President
(Printed Name)
President, TechCom International, Corp.
(Title of Officer)

(Impress Corporate Seal Here)
- (3) Incorporated under the laws of the State of California
- (4) Place of Business (Street & Number) 440 Goddard
- (5) City and State Irvine, CA Zip Code 92618

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

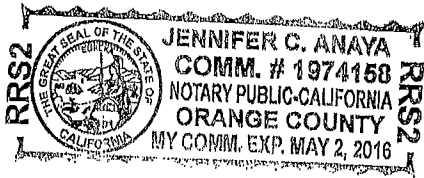
STATE OF CALIFORNIA

County of ORANGE

On 4/2/2015 before me, JENNIFER C. ANAYA, NOTARY PUBLIC
Date Here Insert Name and Title of the Officer

personally appeared BOB KATEBIAN
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/~~her~~/their authorized capacity(ies), and that by his/~~her~~/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.



Place Notary Seal Above

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature [Handwritten Signature]
Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: _____

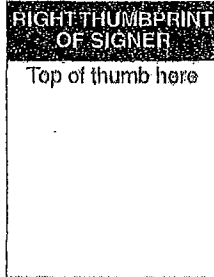
Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____

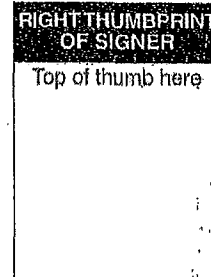
- Individual
- Corporate Officer — Title(s): _____
- Partner — Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____



Signer Is Representing: _____

Signer's Name: _____

- Individual
- Corporate Officer — Title(s): _____
- Partner — Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____



Signer Is Representing: _____

BIDDING DOCUMENTS

(6) Telephone No. (949) 453-1900 x222 Facsimile No. (949) 453-1902

(7) Email Address katebian@tci-corp.com

THE FOLLOWING SECTIONS MUST BE FILLED IN BY ALL PROPOSERS:

In accordance with the "NOTICE INVITING BIDS", the bidder holds a California State Contractor's license for the following classification(s) to perform the work described in these specifications:

LICENSE CLASSIFICATION A, B, C-10, C-12, C20, C46, C53

LICENSE NO. 824687 EXPIRES 9/30/2015

This license classification must also be shown on the front of the bid envelope. Failure to show license classification on the bid envelope may cause return of the bid unopened.

TAX IDENTIFICATION NUMBER (TIN): [REDACTED]

E-Mail Address: katebian@tci-corp.com

THIS PROPOSAL MUST BE NOTARIZED BELOW:

I certify, under penalty of perjury, that the representations made herein regarding my State Contractor's license number, classification and expiration date are true and correct.

Signature *B. Watterman* Title President, TechCom International, Corp.

SUBSCRIBED AND SWORN TO BEFORE ME, THIS _____ DAY OF _____.

Notary Public in and for the County of _____, State of _____

(NOTARIAL SEAL)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

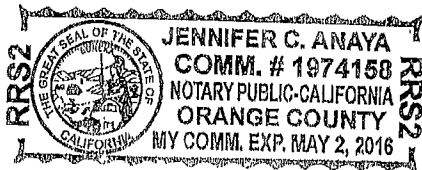
STATE OF CALIFORNIA

County of ORANGE

On 4/2/2015 before me, JENNIFER C. ANAYA, NOTARY PUBLIC
Date Here Insert Name and Title of the Officer

personally appeared BOB KATEBIAN
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/~~her~~/their authorized capacity(ies), and that by his/~~her~~/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.



Place Notary Seal Above

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature _____
Signature of Notary Public

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____

- Individual
- Corporate Officer — Title(s): _____
- Partner — Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer Is Representing: _____

Signer's Name: _____

- Individual
- Corporate Officer — Title(s): _____
- Partner — Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____

RIGHT THUMBPRINT OF SIGNER
Top of thumb here

Signer Is Representing: _____

BIDDING DOCUMENTS

BID BOND

KNOW ALL MEN BY THESE PRESENTS,

That TechCom International Corporation dba Solar 2 Power as Principal, and United Fire & Casualty Company as Surety, are held and firmly bound unto The City of San Diego hereinafter called "OWNER," in the sum of **10% OF THE TOTAL BID AMOUNT** for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has submitted a Bid to said OWNER to perform the WORK required under the bidding schedule(s) of the OWNER's Contract Documents entitled

Mission Beach Boardwalk Bulkhead

NOW THEREFORE, if said Principal is awarded a contract by said OWNER and, within the time and in the manner required in the "Notice Inviting Bids" enters into a written Agreement on the form of agreement bound with said Contract Documents, furnishes the required certificates of insurance, and furnishes the required Performance Bond and Payment Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect. In the event suit is brought upon this bond by said OWNER and OWNER prevails, said Surety shall pay all costs incurred by said OWNER in such suit, including a reasonable attorney's fee to be fixed by the court.

SIGNED AND SEALED, this 2 day of March, 20 15

TechCom International Corporation
dba Solar 2 Power (SEAL)
(Principal)

United Fire & Casualty Company (SEAL)
(Surety)

By: B. Katcham
(Signature)

By: [Signature]
(Signature) Yung T. Mullick, Attorney-In-Fact

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

County of Orange }

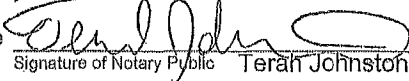
On March 2, 2015 before me, Terah Johnston, Notary Public,
Date Insert Name of Notary exactly as it appears on the official seal

personally appeared Yung T. Mullick
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature 
Signature of Notary Public Terah Johnston



Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of the form to another document.

Description of Attached Document

Title or Type of Document: Bid Bond

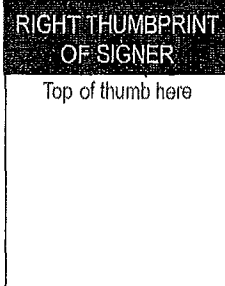
Document Date: March 2, 2015 Number of Pages: 1

Signer(s) Other Than Named Above: None

Capacity(ies) Claimed by Signer(s)

Signer's Name: Yung T. Mullick

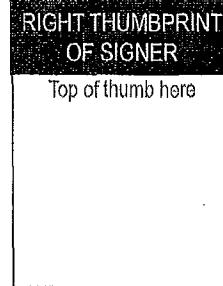
- Individual
- Corporate Officer — Title(s): _____
- Partner Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____



Signer is Representing:
United Fire & Casualty
Company

Signer's Name: _____

- Individual
- Corporate Officer — Title(s): _____
- Partner Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____



Signer is Representing:



UNITED FIRE & CASUALTY COMPANY, CEDAR RAPIDS, IA
 UNITED FIRE & INDEMNITY COMPANY, GALVESTON, TX
 FINANCIAL PACIFIC INSURANCE COMPANY, ROCKLIN, CA
 CERTIFIED COPY OF POWER OF ATTORNEY

Inquiries: Surety Department
 118 Second Ave SE
 Cedar Rapids, IA 52401

(original on file at Home Office of Company - See Certification)

KNOW ALL PERSONS BY THESE PRESENTS, That UNITED FIRE & CASUALTY COMPANY, a corporation duly organized and existing under the laws of the State of Iowa; UNITED FIRE & INDEMNITY COMPANY, a corporation duly organized and existing under the laws of the State of Texas; and FINANCIAL PACIFIC INSURANCE COMPANY, a corporation duly organized and existing under the laws of the State of California (herein collectively called the Companies); and having their corporate headquarters in Cedar Rapids, State of Iowa, does make, constitute and appoint JAMES W. MOILANEN, OR YONG T. MULLICK, OR JENNIFER C. ANAYA, AEL INDIVIDUALLY OF MISSION Viejo CA

their true and lawful Attorney(s)-in-fact with power and authority hereby conferred to sign, seal and execute in its behalf all lawful bonds, undertakings and other obligatory instruments of similar nature provided that no single obligation shall exceed \$15,000,000.00 and to bind the Companies thereby as fully and to the same extent as if such instruments were signed by the duly authorized officers of the Companies and all of the acts of said Attorney, pursuant to the authority hereby given and hereby ratified and confirmed.

The Authority hereby granted shall expire the 22nd day of October, 2016 unless sooner revoked by UNITED FIRE & CASUALTY COMPANY, UNITED FIRE & INDEMNITY COMPANY, AND FINANCIAL PACIFIC INSURANCE COMPANY.

This Power of Attorney is made and executed pursuant to and by authority of the following bylaw duly adopted on May 15, 2013, by the Boards of Directors of UNITED FIRE & CASUALTY COMPANY, UNITED FIRE & INDEMNITY COMPANY, and FINANCIAL PACIFIC INSURANCE COMPANY.

"Article VI - Surety Bonds and Undertakings"

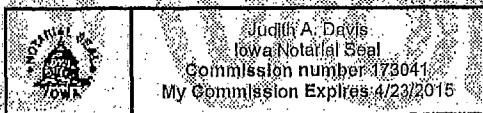
Section 2, Appointment of Attorney-in-Fact. "The President or any Vice President, or any other officer of the Companies may, from time to time, appoint by written certificates attorneys-in-fact to act in behalf of the Companies in the execution of policies of insurance, bonds, undertakings and other obligatory instruments of like nature. The signature of any officer authorized hereby, and the Corporate seal, may be affixed by facsimile to any power of attorney or special power of attorney or certification of either authorized hereby; such signature and seal, when so used, being adopted by the Companies as the original signature of such officer and the original seal of the Companies, to be valid and binding upon the Companies with the same force and effect as though manually affixed. Such attorneys-in-fact, subject to the limitations set forth in their respective certificates of authority shall have full power to bind the Companies by their signature and execution of any such instruments and to attach the seal of the Companies thereto. The President or any Vice President, the Board of Directors or any other officer of the Companies may at any time revoke all power and authority previously given to any attorney-in-fact.

IN WITNESS WHEREOF, the COMPANIES have each caused these presents to be signed by its vice president and its corporate seal to be hereto affixed this 22nd day of October, 2014

UNITED FIRE & CASUALTY COMPANY
 UNITED FIRE & INDEMNITY COMPANY
 FINANCIAL PACIFIC INSURANCE COMPANY

By: Dennis J. Richmann Vice President

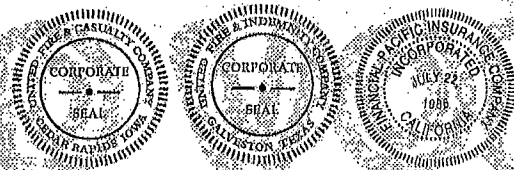
State of Iowa, County of Linn, ss:
 On 22nd day of October, 2014, before me personally came Dennis J. Richmann to me known, who being by me duly sworn, did depose and say; that he resides in Cedar Rapids, State of Iowa; that he is a Vice President of UNITED FIRE & CASUALTY COMPANY, a Vice President of UNITED FIRE & INDEMNITY COMPANY, and a Vice President of FINANCIAL PACIFIC INSURANCE COMPANY the corporations described in and which executed the above instrument; that he knows the seal of said corporations; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporations and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporations.



Judith A. Davis Notary Public
 My commission expires: 4/23/2015

I, David A. Lange, Secretary of UNITED FIRE & CASUALTY COMPANY and Assistant Secretary of UNITED FIRE & INDEMNITY COMPANY, and Assistant Secretary of FINANCIAL PACIFIC INSURANCE COMPANY, do hereby certify that I have compared the foregoing copy of the Power of Attorney and affidavit, and the copy of the Section of the bylaws and resolutions of said Corporations as set forth in said Power of Attorney, with the ORIGINALS ON FILE IN THE HOME OFFICE OF SAID CORPORATIONS; and that the same are correct transcripts thereof, and of the whole of the said originals, and that the said Power of Attorney has not been revoked and is now in full force and effect.

In testimony whereof I have hereunto subscribed my name and affixed the corporate seal of the said Corporations
 this 2 day of March, 2015



By: David A. Lange
 Secretary, UF&C
 Assistant Secretary, UF&I/FPIC

BIDDING DOCUMENTS

NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID UNDER 23 UNITED STATES CODE 112 AND PUBLIC CONTRACT CODE 7106

State of California)
County of _____) ss.

Bob Katebian, being first duly sworn, deposes and says that he or she is President of the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Signed: B. Katebian

Title: President, TechCom International, Corp.

Subscribed and sworn to before me this _____ day of _____, 20____

Notary Public

(SEAL)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

STATE OF CALIFORNIA

County of ORANGE

On 4/2/2015 before me, JENNIFER C. ANAYA, NOTARY PUBLIC
Date Here Insert Name and Title of the Officer

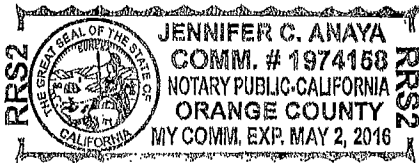
personally appeared BOB KATEBIAN
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/~~her~~/their authorized capacity(ies), and that by his/~~her~~/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

Witness my hand and official seal.

Signature _____
Signature of Notary Public



Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____

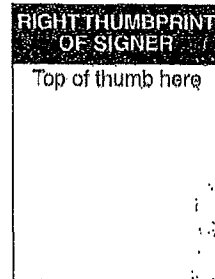
- Individual
- Corporate Officer — Title(s): _____
- Partner — Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____



Signer is Representing: _____

Signer's Name: _____

- Individual
- Corporate Officer — Title(s): _____
- Partner — Limited General
- Attorney in Fact
- Trustee
- Guardian or Conservator
- Other: _____



Signer is Representing: _____

BIDDING DOCUMENTS

CONTRACTORS CERTIFICATION OF PENDING ACTIONS

As part of its bid or proposal (Non-Price Proposal in the case of Design-Build contracts), the Bidder shall provide to the City a list of all instances within the past 10 years where a complaint was filed or pending against the Bidder in a legal or administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers, and a description of the status or resolution of that complaint, including any remedial action taken.

CHECK ONE BOX ONLY.

- The undersigned certifies that within the past 10 years the Bidder has NOT been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers.
- The undersigned certifies that within the past 10 years the Bidder has been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers. A description of the status or resolution of that complaint, including any remedial action taken and the applicable dates is as follows:

DATE OF CLAIM	LOCATION	DESCRIPTION OF CLAIM	LITIGATION (Y/N)	STATUS	RESOLUTION/REMEDIAL ACTION TAKEN

Contractor Name: TechCom International, Corp.

Certified By Bob Katebian Title President

Name
B. Katebian
Signature

Date 4/2/2015

USE ADDITIONAL FORMS AS NECESSARY

BIDDING DOCUMENTS

**EQUAL BENEFITS ORDINANCE
CERTIFICATION OF COMPLIANCE**



For additional information, contact:
CITY OF SAN DIEGO
EQUAL BENEFITS PROGRAM
 202 C Street, MS 9A, San Diego, CA 92101
 Phone (619) 533-3948 Fax (619) 533-3220

COMPANY INFORMATION	
Company Name: TechCom International, Corp.	Contact Name: Bob Katebian
Company Address: 440 Goddard, Irvine, CA 92618	Contact Phone: (714) 453-1900
	Contact Email: (714) 453-1902

CONTRACT INFORMATION	
Contract Title: MISSION BEACH BOARDWALK BULKHEAD	Start Date: 9/2015
Contract Number (If no number, state location): Mission Beach, San Diego, CA	End Date: 4/2016

SUMMARY OF EQUAL BENEFITS ORDINANCE REQUIREMENTS

The Equal Benefits Ordinance [EBO] requires the City to enter into contracts only with contractors who certify they will provide and maintain equal benefits as defined in SDMC §22.4302 for the duration of the contract. To comply:

- Contractor shall offer equal benefits to employees with spouses and employees with domestic partners.
 - Benefits include health, dental, vision insurance; pension/401(k) plans; bereavement, family, parental leave; discounts, child care; travel/relocation expenses; employee assistance programs; credit union membership; or any other benefit.
 - Any benefit not offer an employee with a spouse, is not required to be offered to an employee with a domestic partner.
- Contractor shall post notice of firm's equal benefits policy in the workplace and notify employees at time of hire and during open enrollment periods.
- Contractor shall allow City access to records, when requested, to confirm compliance with EBO requirements.
- Contractor shall submit *EBO Certification of Compliance*, signed under penalty of perjury, prior to award of contract.

NOTE: This summary is provided for convenience. Full text of the EBO and Rules Implementing the EBO are available at www.sandiego.gov/administration.

CONTRACTOR EQUAL BENEFITS ORDINANCE CERTIFICATION

Please indicate your firm's compliance status with the EBO. The City may request supporting documentation.

I affirm compliance with the EBO because my firm (*contractor must select one reason*):

- Provides equal benefits to spouses and domestic partners.
- Provides no benefits to spouses or domestic partners.
- Has no employees.
- Has collective bargaining agreement(s) in place prior to January 1, 2011, that has not been renewed or expired.

I request the City's approval to pay affected employees a cash equivalent in lieu of equal benefits and verify my firm made a reasonable effort but is not able to provide equal benefits upon contract award. I agree to notify employees of the availability of a cash equivalent for benefits available to spouses but not domestic partners and to continue to make every reasonable effort to extend all available benefits to domestic partners.

It is unlawful for any contractor to knowingly submit any false information to the City regarding equal benefits or cash equivalent associated with the execution, award, amendment, or administration of any contract. [San Diego Municipal Code §22.4307(a)]

Under penalty of perjury under laws of the State of California, I certify the above information is true and correct. I further certify that my firm understands the requirements of the Equal Benefits Ordinance and will provide and maintain equal benefits for the duration of the contract or pay a cash equivalent if authorized by the City.

Bob Katebian, President		4-2-2015
Name/Title of Signatory	Signature	Date

FOR OFFICIAL CITY USE ONLY

Receipt Date: _____ EBO Analyst: _____ Approved Not Approved – Reason: _____

rev 02/15/2011

BIDDING DOCUMENTS

PROPOSAL (BID)

The Bidder agrees to the construction of **Mission Beach Boardwalk Bulkhead**, for the City of San Diego, in accordance with these contract documents for the prices listed below. The Bidder guarantees the Contract Price for a period of 120 days (90 days for federally funded contracts and contracts valued at \$500,000 or less) from the date of Bid opening to Award of the Contract. The duration of the Contract Price guarantee shall be extended by the number of days required for the City to obtain all items necessary to fulfill all conditions precedent e.g., bond and insurance.

Item	Quantity	Unit	NAICS	Payment Reference	Description	Unit Price	Extension
BASE BID							
1	1	LS	524126	2-4.1	Bonds (Payment and Performance)	 	\$22,468.41
2	1	LS	237310	7-10.2.6	Traffic Control	 	\$10,850.00
3	1	LS	238990	9-3.4.1	Mobilization	 	\$80,000.00
4	1	AL		9-3.5	Field Orders - Type II	 	\$50,000.00
5	1	AL	238110	9-3.1	Special Inspection - Type I	 	\$40,000.00
6	4,000	LF	238990	7-10.4.2.3	Construction Fencing	\$12.18	\$48,720.00
7	76,150	LB	238110	217-1.4	Steel Reinforcing	\$3.39	\$258,148.50
8	1	LS	238910	300-1.4	Clearing and Grubbing	 	\$5,549.00
9	1,050	SY	238990	300-10.1.2	Geotextiles Fabric	\$25.10	\$26,355.00
10	1,670	LF	238110	303-1.11	Concrete Wall	\$184.00	\$307,280.00
11	1	EA	238110	303-1.12	5' Wide Wall Mock-up	\$ 6,008.50	\$ 6,008.50

BIDDING DOCUMENTS

Item	Quantity	Unit	NAICS	Payment Reference	Description	Unit Price	Extension
12	1	LS	238990	303-1.11	Concrete Steps and Ramp	 	\$268,955.50
13	44,400	SF	238990	303-5.9	Concrete Paving	\$14.25	\$632,700.00
14	155	LF	238990	303-5.9	Concrete Paving with DWT	\$105.02	\$16,278.10
15	50	SF	238990	302-5.9	Asphalt Concrete Pavement	\$25.00	\$1,250.00
16	50	LF	238990	303-5.9	6" Type G Curb & Gutter	\$116.10	\$5,805.00
17	1	LS	238110	303-1.9.6	Anti-Graffiti Coating \$22,468.41	 	\$64,800.00
18	140	LF	237310	304-2.1.4	Stainless Steel Handrail	\$ 63.72	\$8,920.80
19	26	EA	238210	307-2	Historic Light Fixture Replica	\$2,589.32	\$ 67,322.32
20	26	EA	238210	307-2	Composite Light Poles	\$ 2,539.20	\$66,019.20
21	2,350	LF	238210	307-2	Electrical Conduit (1-1/4")	\$21.52	\$50,572.00
22	300	LF	238210	307-2	Electrical Conduit (1")	\$ 11.55	\$3,465.00
23	7,000	LF	238210	307-2	#4 Conductors	\$2.14	\$14,980.00
24	900	LF	238210	307-2	#10 Conductors	\$ 6.31	\$5,679.00
25	1	EA	238210	307-2	Combination Service Entrance Metered Switch Pedestal	\$7,010.42	\$7,010.42
26	24	EA	238210	307-2	Lighting Pullbox 9-5/8"x16"x12"D	\$646.59	\$15,518.16
27	1	EA	238210	307-2	Outdoor Photocell	\$913.00	\$913.00
28	1	LS	238910	307-2	Transformer Yard Fence Modification	 	\$4,730.00

BIDDING DOCUMENTS

Item	Quantity	Unit	NAICS	Payment Reference	Description	Unit Price	Extension
29	1	LS	561730	308-8	Landscape and Irrigation Repair	 	\$5,400.00
30	2	EA	238910	315-4	Accessible Picnic Table	\$5,870.50	\$11,741.00
31	8	EA	238910	315-4	Existing Bench Renovation	\$1,414.50	\$11,316.00
32	6	EA	238990	9-3.1	Demountable Post	\$597.42	\$3,584.52
33	1	LS	237310	314-4.3.7	Signage and Striping	 	\$30,386.00
34	1	LS	541330	701-13.9.5	Water Pollution Control Program Implementation	 	\$21,081.25
35	1	LS	238990	701-13.9.5	Water Pollution Control Program Development	 	\$540.00
ESTIMATED TOTAL BASE BID:							\$2,174,346.68

BIDDING DOCUMENTS

TOTAL BID PRICE FOR BID (Items 1 through 35 inclusive) amount written in words:

Two Million, One Hundred Seventy Four Thousand, Three Hundred and Fourty Six Dollars and Sixty Eight Cents.

The Bid shall contain an acknowledgment of receipt of all addenda, the numbers of which shall be filled in on the Bid form. If an addendum or addenda has been issued by the City and not noted as being received by the Bidder, this proposal shall be rejected as being **non-responsive**. The following addenda have been received and are acknowledged in this bid: Addenda A, B, C & D

The names of all persons interested in the foregoing proposal as principals are as follows:

Clare Katebian/ C.E.O, TechCom International, Corp.

Bob Katebian/ President, TechCom International, Corp.

IMPORTANT NOTICE: If Bidder or other interested person is a corporation, state secretary, treasurer, and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if Bidder or other interested person is an individual, state first and last names in full.

Bidder: Bob Katebian

Title: President, TechCom International, Corp.

Business Address: 440 Goddard, Irvine, CA 92618

Place of Business: 440 Goddard, Irvine, CA 92618

Place of Residence: 11 Redondo, Laguna Niguel, CA 92677

Signature: 

BIDDING DOCUMENTS

NOTES:

- A. The City shall determine the low Bid based on the Base Bid alone.
- B. Prices and notations shall be in ink or typewritten. All corrections (which have been initiated by the Bidder using erasures, strike out, line out, or "white-out") shall be typed or written in with ink adjacent thereto, and shall be initialed in ink by the person signing the bid proposal.
- C. Failure to initial all corrections made in the bidding documents may cause the Bid to be rejected as **non-responsive** and ineligible for further consideration.
- D. Blank spaces must be filled in, using figures. Bidder's failure to submit a price for any Bid item that requires the Bidder to submit a price shall render the Bid **non-responsive** and shall be cause for its rejection.
- E. Unit prices shall be entered for all unit price items. Unit prices shall not exceed two (2) decimal places. If the Unit prices entered exceed two (2) decimal places, the City will only use the first two digits after the decimal points without rounding up or down.
- F. All extensions of the unit prices bid will be subject to verification by the City. In the case of inconsistency or conflict between the product of the Quantity x Unit Price and the Extension, the product shall govern.
- G. In the case of inconsistency or conflict, between the sums of the Extensions with the estimated total Bid, the sum of the Extensions shall govern.
- H. Bids shall not contain any recapitulation of the Work. Conditional Bids will be rejected as being **non-responsive**. Alternative proposals will not be considered unless called for.
- I. Subcontractors' License Number must be filled in. Failure to provide the information specified may deem the bidder **non-responsive**.

BIDDING DOCUMENTS

LIST OF SUBCONTRACTORS

In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act", Division 2, Part 1, Chapter 4 of the Public Contract Code, the Bidder shall list below the name and address of each Subcontractor who will perform work, labor, render services or specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the Contractor's total Bid. The Bidder shall also list below the portion of the work which will be done by each subcontractor under this Contract. The Contractor shall list only one Subcontractor for each portion of the Work. The **DOLLAR VALUE** of the total Bid to be performed shall be stated for all subcontractors listed. Failure to comply with this requirement shall result in the Bid being rejected as **non-responsive** and ineligible for award. The Bidder's attention is directed to the Special Provisions - General; Paragraph 2-3 Subcontracts, which stipulates the percent of the Work to be performed with the Bidders' own forces. The Bidder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors that Bidders are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

Subcontractors' License Number must be filled in. Failure to provide the information specified may deem the bidder **non-responsive**.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT (MUST BE FILLED OUT)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED	CHECK IF JOINT VENTURE PARTNERSHIP
Name: <u>Applied Restoration Inc.</u> Address: <u>3562 Grove Street</u> City: <u>Lemon Grove</u> State: <u>CA</u> Zip: <u>91945</u> Phone: <u>(619) 433-4701</u> Email: <u>dminer@appliedrestoration.com</u>	Constructor	#759308	Concrete Joints and Anti Graffiti Coatings	\$62,000.00	SLBE 11AR0349	CITY	
Name: <u>Rosenbach Company Inc.</u> Address: <u>1870 Joe Crosson Dr., Suite 200</u> City: <u>El Cajon</u> State: <u>CA</u> Zip: <u>92020</u> Phone: <u>(619) 200-0748</u> Email: <u>jerry@rosenbachcompany.com</u>	Constructor	#842271	Demolition & Saw Cut	\$457,800.00	ELBE 14RC1180	CITY	

① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

0.2885
RTR

② As appropriate, Bidder shall indicate if Subcontractor is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

BIDDING DOCUMENTS

LIST OF SUBCONTRACTORS

In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act", Division 2, Part 1, Chapter 4 of the Public Contract Code, the Bidder shall list below the name and address of each Subcontractor who will perform work, labor, render services or specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the Contractor's total Bid. The Bidder shall also list below the portion of the work which will be done by each subcontractor under this Contract. The Contractor shall list only one Subcontractor for each portion of the Work. The **DOLLAR VALUE** of the total Bid to be performed shall be stated for all subcontractors listed. Failure to comply with this requirement shall result in the Bid being rejected as **non-responsive** and ineligible for award. The Bidder's attention is directed to the Special Provisions - General; Paragraph 2-3 Subcontracts, which stipulates the percent of the Work to be performed with the Bidders' own forces. The Bidder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors that Bidders are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

Subcontractors' License Number must be filled in. Failure to provide the information specified may deem the bidder **non-responsive**.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT (MUST BE FILLED OUT)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED ②	CHECK IF JOINT VENTURE PARTNERSHIP
Name: <u>Nova (Barnett QC Services)</u> Address: <u>4373 Viewridge Avenue, Suite B</u> City: <u>Lemon Grove</u> State: <u>CA</u> Zip: <u>92123</u> Phone: <u>(858) 292-7575</u> Email: <u>dbarnett@usa-nova.com</u>	Design Inspection	N/A	Geotechnical & Inspection	\$38,255.00	SLBE 12BQ0666	CITY	
Name: <u>Sampo Engineering Services</u> Address: <u>171 Saxony Road, Suite 213</u> City: <u>Encinitas</u> State: <u>CA</u> Zip: <u>92024</u> Phone: <u>(760) 436-0660</u> Email: <u>info@sampoengineering.com</u>	Designer	N/A	Engineering Services	\$11,000.00	SLBE 14SE1216	CITY	

① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

② As appropriate, Bidder shall indicate if Subcontractor is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

BIDDING DOCUMENTS

LIST OF SUBCONTRACTORS

In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act", Division 2, Part 1, Chapter 4 of the Public Contract Code, the Bidder shall list below the name and address of each Subcontractor who will perform work, labor, render services or specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the Contractor's total Bid. The Bidder shall also list below the portion of the work which will be done by each subcontractor under this Contract. The Contractor shall list only one Subcontractor for each portion of the Work. The **DOLLAR VALUE** of the total Bid to be performed shall be stated for all subcontractors listed. Failure to comply with this requirement shall result in the Bid being rejected as **non-responsive** and ineligible for award. The Bidder's attention is directed to the Special Provisions - General; Paragraph 2-3 Subcontracts, which stipulates the percent of the Work to be performed with the Bidders' own forces. The Bidder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors that Bidders are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

Subcontractors' License Number must be filled in. Failure to provide the information specified may deem the bidder **non-responsive**.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT (MUST BE FILLED OUT)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED	CHECK IF JOINT VENTURE PARTNERSHIP
Name: McGrath Address: P.O. Box 2488 City: El Cajon State: CA Zip: 92021 Phone: (619) 433-3811 Email:	Designer	N/A	WPCP	\$500.00	ELBE 11MH0280	CITY	
Name: Foundation Pile, Inc. Address: P.O. Box 1167 City: Fontana State: CA Zip: 92335 Phone: (925) 625-5783 Email: mlindsay@foundationpile.com	Constructor	#360640	Pile Installation	\$57,800.00			

① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |

② As appropriate, Bidder shall indicate if Subcontractor is certified by:

- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | San Diego Regional Minority Supplier Diversity Council | SRMSDC |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

BIDDING DOCUMENTS

NAMED EQUIPMENT/MATERIAL SUPPLIER LIST

The Bidder seeking the recognition of equipment, materials, or supplies obtained from Suppliers towards achieving any mandatory, voluntary, or both subcontracting participation percentages shall list the Supplier(s) on the Named Equipment/Material Supplier List. The Named Equipment/Material Supplier List, at a minimum, shall have the name, locations (City) and the DOLLAR VALUE of the Suppliers. The Bidder will be credited up to 60% of the amount to be paid to the Suppliers for such materials and supplies unless vendor manufactures or substantially alters materials and supplies in which case 100% will be credited. The Bidder is to indicate (Yes/No) whether listed firm is a supplier or manufacturer. In calculating the subcontractor participation percentages, vendors/suppliers will receive 60% credit of the listed DOLLAR VALUE, whereas manufacturers will receive 100% credit. If no indication provided, listed firm will be credited at 60% of the listed dollar value for purposes of calculating the Subcontractor Participation Percentage, Suppliers will receive 60% credit of the listed DOLLAR VALUE, whereas manufacturers will receive 100% credit. If no indication provided, listed firm will be credited at 60% of the listed DOLLAR VALUE for purposes of calculating the subcontractor participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF VENDOR/SUPPLIER	MATERIALS OR SUPPLIES	DOLLAR VALUE OF MATERIAL OR SUPPLIES (MUST BE FILLED OUT)	SUPPLIER (Yes/No)	MANUFACTURER (Yes/No)	MBE, WBE, DBE, DVBE, OBE, ELBE, SEBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED
Name: <u>Hudson Safe-T-Lite Rentals</u> Address: <u>777 Gable Way</u> City: <u>El Cajon</u> State: <u>CA</u> Zip: <u>92020</u> Phone: <u>619) 441-3644</u> Email: <u>info@HudsonSafeTLite.com</u>	Equipment Rental	\$2,250.00	Yes	No	SLBE	CITY
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____						

① As appropriate, Bidder shall identify Vendor/Supplier as one of the following and shall include a valid proof of certification (except for OBE,SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		

② As appropriate, Bidder shall indicate if Vendor/Supplier is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC	San Diego Regional Minority Supplier Diversity Council	SRMSDC
State of California's Department of General Services	CADoGS	City of Los Angeles	LA
State of California	CA	U.S. Small Business Administration	SBA

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.