

OCEANO COMMUNITY SERVICES DISTRICT

STANDARD CONSTRUCTION CONTRACT GENERAL
CONDITIONS

OCEANO DRAINAGE UTILITY RELOCATION PROJECT

PROJECT NO. 2019-02

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ARTICLE 1 – GENERAL PROVISIONS

1.1 DEFINITIONS

Terms appearing in the Contract Documents with initial capitalization shall have the meanings set forth below:

1.1.1 ACCEPTANCE: The point after Final Completion when Contractor has fully performed all of the requirements of the Contract Documents and the Work is accepted by District in writing.

1.1.2 ADDENDA, ADDENDUM: Written or graphic information (including, without limitation, Drawings or Special Provisions and Technical Specifications) prepared and issued by District General Manager or its designee prior to the receipt of Contractor's Bid, which modify or interpret the Bid Documents by additions, deletions, clarifications or corrections.

1.1.3 ALLOWABLE COSTS: Costs for which reimbursement is allowed under Article 7.2.5 of these General Conditions and for which reimbursement is allowed under other provisions of the Contract Documents, that may be added by Change Order to the Contract Sum for Extra Work or deducted by Change Order from the Contract Sum for Deleted Work.

1.1.4 ALTERNATE(S): Those portions of the Bid setting forth the price(s) for optional or alternative items of Work not covered by the Base Bid.

1.1.5 APPLICABLE CODE REQUIREMENTS: All applicable federal, state and municipal laws, statutes, building codes, ordinances and regulations of governmental authorities having jurisdiction over the Project, Work, Site, Contractor or District.

1.1.6 APPLICATION FOR PAYMENT: An itemized application for payment prepared and submitted by Contractor for review and approval by District, which is prepared, submitted and accompanied by supporting documentation in accordance with the requirements of the Contract Documents.

1.1.7 APPROVE, APPROVED or APPROVAL: Whether capitalized or not capitalized, shall mean, unless otherwise stated, either an express approval contained in a written statement signed by the approving individual or entity or deemed approved in accordance with the terms, conditions and procedures set forth in the Contract Documents. All such approvals by or on behalf of District (including, without limitation, approvals by Construction Manager) may be granted or withheld in the sole discretion of District.

1.1.8 AS-BUILT DOCUMENTS: The Contract Documents showing the condition of the Work as actually built, including, without limitation, the locations of

mechanical, electrical, plumbing, HVAC or similar portions of the Work that are shown diagrammatically in the Contract Documents approved by District. These documents are maintained by Contractor on the Site and delivered, along with an electronic version of the set, to District upon Final Completion.

1.1.9 BASE BID: The sum stated in the Bid to perform the Work, exclusive of any Alternate(s).

1.1.10 BENEFICIAL OCCUPANCY: District's right, at its option and convenience, to occupy or otherwise make use of all or any part of the Work prior to either Substantial Completion, Final Completion, or Acceptance.

1.1.11 BID: Contractor's written bid proposal submitted to District for the Project in response to District's Notice Inviting Bids.

1.1.12 BID DOCUMENTS: The following collection of documents are designated as the Bid Documents:

- (i) Notice Inviting Bids.
- (ii) Instructions to Bidders.
- (iii) Blank Bid Form.
- (iv) Construction Contract between District and Contractor.
- (v) General Conditions.
- (vi) Special Provisions and Technical Specifications.
- (vii) Plans and Drawings.
- (viii) Bidding Addenda.
- (ix) Reports, Supplements, Attachments, Modifications, and Exhibits attached to the above items.

1.1.13 CERTIFICATE FOR PAYMENT: The form for approval by the Construction Manager of Contractor's Application for Payment.

1.1.14 CHANGE: Whether capitalized or not, when used in reference to changes in the Work is a generic term encompassing additions, deletion, alterations or changes in the Work, which may or may not involve Extra Work and for which Contractor may or may not be entitled to a Change Order under the terms of the Contract Documents.

1.1.15 CHANGE ORDER: A written instrument signed by District, or by District and

Contractor, describing a Change to the Work of Contractor.

1.1.16 CHANGE ORDER REQUEST: Contractor's written request for an adjustment in the Contract Sum or Contract Time due to a Change resulting in Extra Work or Deleted Work.

1.1.17 DISTRICT: Oceano Community Services District, a California special district.

1.1.18 CONTRACTOR CLAIM: A separate demand by a Contractor sent by registered mail or certified mail, with return receipt requested, for one or more of the following: (A) a time extension, including, without limitation, for relief from damages or penalties for delay assessed by the District; (B) payment by the District of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Construction Contract and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; (C) payment of an amount that is disputed by the District. A Contractor Claim does not include, and the procedures for processing of Contractor Claims do not apply to the following:

- (i) Penalties or forfeitures prescribed by statute or regulation imposed by a governmental agency other than penalties for delay assessed by the District pursuant to Section 1.1.18(B);
- (ii) Tort claims for personal injury or death;
- (iii) False claims liability under California Government Code Section 12650, et seq.;
- (iv) Defects in the Work first discovered by District after final payment by District to Contractor;
- (v) Stop notices;
- (vi) The right of District to specific performance or injunctive relief to compel performance of any provision of the Contract Documents or for other District claims against the Contractor.

1.1.19 COMPENSABLE DELAY: A Delay for which Contractor may be entitled under the Contract Documents to both an extension of the Contract Time and an adjustment of the Contract Sum for additional compensation. "Compensable Delay" means any Delay to the path of activities that is critical to Contractor's Substantial Completion of the Work within the Contract Time, which Delay is all of the following:

- (i) Solely due to Changes requested by District that adds time, but does not involve Extra Work.
- (ii) Not due, in whole or in part, to the fault or negligence or breach of Contractor or any Subcontractor or Sub-subcontractor, of any Tier.
- (iii) Not concurrent with another Excusable Delay or any Unexcused Delay.

1.1.20 CONSTRUCTION CONTRACT: The written contract executed between District and Contractor for construction of the Project.

1.1.21 CONSTRUCTION MANAGER: The District General Manager or any person designated by the District General Manager or District Board to oversee the Project. The Construction Manager can be an individual, partnership, corporation, joint venture or other legal entity under contract with District to perform construction management services for the Project. The term "Construction Manager" means Construction Manager or Construction Manager's authorized representative.

1.1.22 CONSTRUCTION SCHEDULE: The graphical representation of Contractor's as-planned schedule for performance of the Work, prepared in accordance with the requirements of the Contract Documents and that provides for Substantial Completion of the Work within the Contract Time.

1.1.23 CONTRACT DISPUTE: A dispute, other than a dispute listed in Section 14.2.1 (Non-Contract Disputes) of the Construction Contract, arising out of or related to the Construction Contract or the interpretation, enforcement or breach thereof.

1.1.24 CONTRACT DISPUTE RESOLUTION PROCESS: The process of resolution of Contract Disputes, and, upon election of District, disputes as set forth in Section 14 (Dispute Resolution) of the Construction Contract.

1.1.25 CONTRACT DOCUMENTS: The following collection of documents are designated as contract documents:

- (i) The Notice Inviting Pre-Qualification Statements, Pre-Qualification Statement, and Pre-Qualification Checklist (if applicable).
- (ii) Executed Construction Contract between District and Contractor.
- (iii) Notice Inviting Bids.
- (iv) Instructions to Bidders.

- (v) Bidding Addenda.
- (vi) Contractor's Bid.
- (vii) General Conditions.
- (viii) Special Provisions and Technical Specifications.
- (ix) Performance and Payment Bonds.
- (x) Insurance Forms.
- (xi) Plans and Drawings.
- (xii) Reports listed in the Bidding Documents.
- (xiii) Supplements, Attachments and Exhibits attached to the above items.
- (xiv) Modifications.
- (xv) Change Orders.
- (xvi) Field Orders.
- (xvii) Other Documents if so designated by written agreement of the Parties.

1.1.26 CONTRACT SUM: The total amount of compensation stated in the Construction Contract that is payable to Contractor for the performance of the Work in accordance with the Contract Documents.

1.1.27 CONTRACT TIME: The total number of days set forth in the Construction Contract within which Substantial Completion of the Work must be achieved by Contractor, including approved extensions of time permitted under the terms of the Contract Documents.

1.1.28 CONTRACTOR: The individual or firm under contract with District to serve as the General Contractor for construction of the Project. The term "Contractor" means Contractor or Contractor's authorized representative.

1.1.29 CONTRACTOR MARKUP: The additional sum or deductive credit provided for under the Construction Contract for Contractor's profit and overhead on Extra or Deleted Work for which a Change Order is required to be executed under the Contract Documents adjusting the Contract Sum.

1.1.30 DAY: Whether capitalized or not, unless otherwise specifically provided, means calendar day. NOTE: For Federally-funded projects DAY, whether capitalized or not, is considered WORKING DAY and is defined as any day, except weekends and legal holidays.

1.1.31 DEFECTIVE WORK: Work by Contractor that is unsatisfactory, faulty, omitted, incomplete, deficient or does not conform to the Applicable Code Requirements, the Contract Documents, the directives of District or the requirements of any inspection, reference standard, test, code or approval specified in the Contract Documents.

1.1.32 DELAY: Whether capitalized or not, includes any circumstances involving disruption, hindrance, or interference in the performance of the Work.

1.1.33 DELETED WORK: Work that is eliminated due to a Change in the Work requested by District or Contractor for which District is entitled to a deductive adjustment in the Contract Sum.

1.1.34 DESIGN CONSULTANT. The individual(s) or firm(s) under contract with District to provide design or engineering services for the Project and are responsible for preparing the Contract Documents for the Project. The term "Design Consultant" means Design Consultant or Design Consultant's authorized representative.

1.1.35 DIFFERING SITE CONDITIONS. Differing Site Conditions are those conditions encountered at the Site or in Existing Improvements that are (1) subsurface or concealed conditions which differ materially from those indicated in the Contract Documents; or (2) unknown physical conditions at the Site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the Work of the character provided for in the Contract Documents.

1.1.36 DRAWINGS: The graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, generally including plans, elevations, subparagraphs, details, schedules and diagrams. The Drawings are outlined in the Drawing Index. The term "Drawings" may be used interchangeably with "Plans."

1.1.37 ESCROW AGENT: A state or federally chartered bank in the State of California which holds securities pursuant to an escrow agreement as set forth in Article 9.5 of these General Conditions.

1.1.38 EXCUSABLE DELAY: A Delay for which Contractor may be entitled under the Contract Documents to an extension of time, but not compensation. "Excusable Delay" means any delay to the path of activities that is critical to Substantial Completion of the Work within the Contract Time caused by conditions beyond the control or foreseeability, and without the fault or negligence of Contractor or its Subcontractors or Sub-subcontractors, of any Tier, such as, but not limited to: war, embargoes, fire, unavoidable casualties, unusual delays in transportation, national emergency, and stormy and inclement weather

conditions that are unusual and unseasonable and in which the Work cannot continue. Without limitation to the foregoing, the financial inability of Contractor or any Subcontractor or Sub-subcontractor, shall not be deemed conditions beyond Contractor's control or foreseeability. Contractor may claim an Excusable Delay only if all Work on a critically scheduled activity is stopped for more than six (6) hours of a normal eight (8) hour working day, or if three to six hours are lost in one working day, then it may be claimed for one-half day. A Compensable Delay shall, to the extent that it is concurrent with an Excusable Delay, be conclusively deemed an Excusable Delay.

1.1.39 EXISTING IMPROVEMENTS: All improvements located on the Site as of the date of execution of the Construction Contract, whether above or below the surface of the ground, including but not limited to existing buildings, utilities, infrastructure improvements and other facilities.

1.1.40 EXTRA WORK: Additional Work or costs due to a Change in the Work that is not described in or reasonably inferable from the Contract Documents and for which Contractor is entitled to an adjustment of the Contract Sum under the terms of the Contract Documents. Extra Work shall not include additional Work or costs arising from Contractor's failure to perform any of its duties or obligations under the Contract Documents or arising from errors, omissions, conflicts, ambiguities, lack of coordination or noncompliance with Applicable Code Requirements in the Contract Documents with respect to which Contractor has assumed responsibility in connection with its obligation to conduct a careful review of the Bid Documents and Contract Documents.

1.1.41 FIELD ORDER: A written instrument signed by the Construction Manager that requests performance of Work in one of the following categories:

- (i) Over which there is a dispute as to whether the Work is or is not Extra Work.
- (ii) Involving Extra Work which District requests be performed without a unilateral Change Order adjustment to the Contract Sum or Contract Time and before all terms of an adjustment to the Contract Sum or Contract Time are fully agreed upon by District and Contractor.

The purpose of a Field Order is to direct performance of Work, which may be disputed, and, whether or not it expressly so states, shall not be construed as an acknowledgment by District that the Work described constitutes a Change or Extra Work if that is, in fact, not the case.

1.1.42 FINAL COMPLETION: The point at which:

- (i) Work is completed to the satisfaction of District in accordance with the Contract Documents, including minor corrective or completion items.

(ii) All requirements of the Contract Documents entitling Contractor to final payment shall have been performed by Contractor (including, without limitation, delivery of all warranties and guarantees, equipment operation and maintenance manuals, as-built drawings and schedules and certificates required prior to occupancy).

(iii) All approvals and acceptances shall have been made pursuant to Applicable Code Requirements.

(iv) All rubbish, tools, scaffolding and surplus materials and equipment have been removed from the Site.

1.1.43 FRAGNET: A "Fragnet", sometimes referred to as "time impact analysis," is a contemporaneous, fragmentary scheduling network, which graphically identifies the sequencing of all critical and non-critical new activities and/or activity revisions affected by a Change Order Request, Field Order or Change Order, with logic ties to all affected existing activities noted on the Construction Schedule. Its objective is to isolate and quantify any time impact of a specific issue, determine and demonstrate any such specific Delay in relation to past and/or other current Delays and to provide a method for incorporating adjustments to the Contract Time into the Construction Schedule.

1.1.44 GENERAL CONDITIONS: That portion of the Contract Documents relating to the administrative procedures to be followed by Contractor in carrying out the Work.

1.1.45 HAZARDOUS SUBSTANCES: Refers to, without limitation, the following: any chemical, material or other substance defined as or included within the definition of hazardous substances, hazardous wastes, extremely hazardous substances, toxic substances, toxic material, restricted hazardous waste, special waste, or words of similar import under any Environmental Law.

1.1.46 LOSSES: Any and all losses, costs, liabilities, Claims, damages, liquidated damages, actions, judgments, settlements, expenses, fines and penalties. "Losses" do not include attorneys' fees.

1.1.47 MODIFICATION: A document other than a Change Order, approved by District Legal Counsel and signed by District or Construction Manager and Contractor, agreeing to alter, amend or modify the Contract Documents.

1.1.48 NON-COMPENSABLE DELAY: An (i) Unexcused Delay; and (ii) an Excusable Delay that is not also a Compensable Delay.

1.1.49 NOTICE OF AWARD: Written notice issued by District notifying Contractor of issuance of the Construction Contract.

1.1.50 NOTICE TO PROCEED: Written notice issued by District to Contractor to

begin the Work.

1.1.51 PERFORMANCE BOND, PAYMENT BOND: The performance and payment bonds to be provided by Contractor for the Project.

1.1.52 PLANS: The graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, subparagraphs, details, schedules and diagrams. The term "Plans" may be used interchangeably with "Drawings."

1.1.53 PRE-CONSTRUCTION MEETING: A meeting held with the Project Team prior to beginning construction in order to review Contract Documents and clarify roles, responsibilities and authority of the Project Team.

1.1.54 PROJECT: The total construction, of which the Work performed by Contractor under the Contract Documents may be the whole or part and which may include Work performed by District's own forces or by Separate Contractors.

1.1.55 PROJECT TEAM: Collectively, the Contractor, District, Design Consultant, Separate Contractors, Construction Manager and other consultants and contractors providing professional and technical consultation for the design and construction of the Project.

1.1.56 RECORD DOCUMENTS: The term "Record Documents" refers to the As-Built Documents, warranties, guarantees and other documents required to be submitted by Contractor as a condition of Final Completion.

1.1.57 REQUEST FOR INFORMATION: A written instrument, prepared by Contractor, which requests an interpretation or clarification in the Work or a response to a question concerning the Work. A Request for Information does not entitle Contractor to an adjustment in the Contract Sum unless it requires Extra Work and Contractor requests and is entitled to such an adjustment in accordance with the provisions of the Contract Documents.

1.1.58 REQUEST FOR INFORMATION RESPONSE: A written instrument, usually prepared by the Design Consultant, which sets forth an interpretation or clarification in the Work or a response to a Contractor question concerning the Work.

1.1.59 SCHEDULE OF VALUES: A detailed, itemized breakdown of the Contract Sum, which provides for a fair and reasonable allocation of the dollar values to each of the various parts of the Work.

1.1.60 SEPARATE CONTRACTOR: A person or firm under separate contract with District or other entity performing other Work at the Site.

1.1.61 SITE: The physical site located within District where the Project is to be

constructed, including all adjacent areas for staging, storage, parking and temporary offices.

1.1.62 SPECIAL PROVISIONS AND TECHNICAL SPECIFICATIONS: The portion of the Contract Documents consisting of the written requirements for materials, equipment, standards, skill, quality for the Work and performance of related services. These provisions may also contain amendments, deletions or additions to the General Conditions.

1.1.63 STATEMENT OF CONTRACT DISPUTE: The Contractor's written statement prepared in accordance with Section 14.3 (Submission of Contractor Claim) of the Construction Contract required as a condition of its initiating the Contract Dispute Resolution Process.

1.1.64 SUBCONTRACTOR: A person or firm that has a contract with a Contractor to perform a portion of the Work. The term "Subcontractor" includes suppliers and vendors and is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor.

1.1.65 SUB-SUBCONTRACTOR: A person or firm that has a contract with a Subcontractor to perform a portion of the Work. The term "Sub-subcontractor" includes suppliers and vendors and is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

1.1.66 SUBCONTRACTOR/SUB-SUBCONTRACTOR MARKUPS: The sum allowable under the Construction Contract for Subcontractor and Sub-subcontractor profit and overhead on Extra or Deleted Work for which Contractor is entitled to a Change Order under the Contract Documents adjusting the Contract Sum.

1.1.67 SUBMITTALS: All shop drawings, samples, exemplars, product data and other submittals required to be submitted by Contractor under the Contract Documents.

1.1.68 SUBSTANTIAL COMPLETION, SUBSTANTIALLY COMPLETE: The point at which the Work is sufficiently complete to be occupied and/or utilized by District for its intended purpose, and Contractor has fulfilled its obligations under the Contract Documents as determined by District, except for minor punchlist items which do not impair District's ability to so occupy and utilize the Project.

1.1.69 SUPERINTENDENT: The person appointed by Contractor, subject to approval by District, to supervise and coordinate Contractor's own forces and Subcontractors in all aspects of the Work.

1.1.70 TIER: The contractual level of a Subcontractor with respect to Contractor. For example, a first-tier Subcontractor is under subcontract with Contractor. A Sub-subcontractor under subcontract with a first-tier Subcontractor, is in the second tier, and so on.

1.1.71 UNEXCUSED DELAY: Any Delay in the path of activities that is critical to Substantial Completion of the Work within the Contract Time resulting from causes other than Excusable Delay or Compensable Delay. An Unexcused Delay shall not entitle Contractor to either an extension of the Contract Time or an adjustment of the Contract Sum. A Compensable Delay or Excusable Delay shall, to the extent it is concurrent with an Unexcused Delay, be conclusively deemed an Unexcused Delay.

1.1.72 WORK: All labor, materials, equipment, services, permits, licenses and taxes, and all other things necessary for Contractor to perform its obligations and complete the Project, including, without limitation, any changes or additions requested by District, in accordance with the Contract Documents and all Applicable Code Requirements.

1.1.73 INTERPRETATION OF “SHALL” AND “MAY.” Where applicable to determine obligations of the Parties, the term “SHALL” is to be construed as mandatory and “MAY” shall be construed as permissive.

1.2 OWNERSHIP AND USE OF DOCUMENTS

1.2.1 All originals, copies and electronic forms of Drawings, Plans, specifications, shop drawings, samples, reports, schedules and other materials or documents prepared for the Project (including, without limitation, the Contract Documents) shall not be used by Contractor, or any Subcontractor or Sub-subcontractor, of any Tier, for any purpose other than performance of the Work. Contractor, Subcontractors and Sub-subcontractors are granted a limited license, revocable at will by District, to use and reproduce applicable portions of the Contract Documents appropriate to and for use in the execution of their Work under the Contract Documents; provided however, that such use shall not be construed in derogation of Owner’s rights to use and ownership under this provision.

1.2.2 Contractor shall keep on the Site of the Project, at all times, a complete set of District approved, permitted Contract Documents for use by District.

1.2.3 Proposed Changes or refinements and clarifications will be provided to Contractor in the form of reproducible prints. Contractor shall, at its own expense and without adjustment to the Contract Sum, do all reproduction and distribution of such reproducible prints as necessary for the complete pricing of the Change and for performance of the Work.

1.2.4 Contractor shall take all necessary steps to assure that a provision is included in all contracts with Subcontractors and Sub-subcontractors, of every

Tier, who perform Work on the Project, protecting and preserving District's rights to ownership and use of documents as set forth in this Article 1.2.

1.2.5 All documents, including but not limited to Drawings, Plans, specifications, shop drawings, samples, reports, schedules and other materials or documents prepared for the Project (including, without limitation, the Contract Documents) shall be owned exclusively by the District prior to and after completion of the Project.

1.3 AUTHORITY OF DISTRICT

1.3.1 The Design Consultant shall, upon request, make recommendations to District and the Construction Manager concerning the quality or acceptability of Work performed.

1.3.2 District, in its sole discretion, will interpret the Contract Documents and make the determination of whether or not Contractor has fulfilled the requirements of the Contract Documents. Such interpretations and decisions of District shall be final and binding upon Contractor.

1.4 INTERPRETATION OF CONTRACT DOCUMENTS

1.4.1 The Contract Documents are complementary and what is required by one shall be as binding as if required by all.

1.4.2 In general, the Drawings will show dimensions, positions, and kind of construction; and the Special Provisions and Technical Specifications will define materials, quality and standards. Any Work called for on the Drawings and not mentioned in the Special Provisions and Technical Specifications, or vice versa, shall be performed as though fully set forth in both. Work not particularly detailed, marked or specified, shall be the same as similar parts that are detailed, marked or specified.

1.4.3 Unless otherwise stated in the Contract Documents, technical words and abbreviations contained in the Contract Documents are used in accordance with commonly understood construction industry meanings and non-technical words and abbreviations are used in accordance with their commonly understood meanings.

1.4.4 The Contract Documents may omit modifying words such as "all" and "any," and articles such as "the" and "an." If a modifier or an article is not included in one statement and appears in another it is not intended to affect the interpretation of either statement. The use of the word "including," when following any general statement, shall not be construed to limit such statement to specific items or matters set forth immediately following such word or to similar items or matters whether or not non-limiting language (such as "without

limitation," "but not limited to," or words of similar import) is used with reference thereto, but rather shall be deemed to refer to all other items or matters that could reasonably fall within the broadest possible scope of such general statement. To the extent the Contract Documents define obligations of the parties, the word "shall" means a mandatory obligation and "may" means a permissive obligation.

1.4.5 Whenever the context so requires, the use of the singular number shall be deemed to include the plural and vice versa. Each gender shall be deemed to include the other gender, and each shall include corporation, partnership, trust, or other legal entity whenever the context so requires. The captions and headings of the various subdivisions of the Contract Documents are intended only as a matter of reference and convenience and in no way define, limit, or prescribe the scope or intent of the Contract Documents or any subdivision thereof.

1.4.6 Any cross-references indicated between various subparagraphs or Drawings and Documents are provided for the convenience of Contractor and shall not be deemed to be all-inclusive.

1.4.7 Unless specifically noted to the contrary, it is the intention of the Contract Documents that all Work, equipment, casework, mechanical, electrical and similar devices of whatever nature, be completely installed, hooked-up, made operational and made functional for the purpose such are intended, and that all costs therefor be included in the Contract Sum.

1.4.8 Figured dimensions on scale Drawings and on full size Drawings shall govern over scale Drawings without figured dimensions. The Drawings shall not be scaled to determine dimensions, and (except in the case of diagrammatic Drawings) shall be calculated from figures shown on the Drawings. Obvious discrepancies between scale and figured dimensions, not marked "not to scale," must be brought to the Construction Manager's attention before proceeding with the Work affected by the discrepancy.

1.4.9 If there is a conflict between or among any of the Contract Documents, Contractor shall immediately bring such conflict to the attention of District, whose decisions regarding such conflict shall be final and binding as to the requirements of the Contract Documents. In the event of any conflicts between or among the Applicable Code Requirements, the more stringent shall govern. In resolving any conflict in the Contract Documents, the highest standard of quality and skill, the most stringent requirements, and the most specific provision of the Contract Documents shall govern and shall be required in the performance of the Work.

1.4.10 The general character of the Work is shown in the Contract Documents, but Changes, Modifications, clarifications and refinements may be made in details when needed to more fully explain the Work. Provided that there is a logical evolution of the Bid Documents that were bid by Contractor or were reasonably

inferable as necessary to provide a completed and fully operational system, facility or structure, the same shall be considered part of the scope of the Work to be performed without adjustment in the Contract Sum or the Contract Time.

1.4.11 Where on any Drawing a portion of the Work is drawn out and the remainder is indicated in outline, the drawn-out parts shall apply also to all other like portions of the Work. Where ornament or other detail is indicated on starting only, such detail shall be continued throughout the course of parts in which it occurs and shall also apply to all other similar parts in the Work unless otherwise indicated.

1.4.12 For convenience, the Special Provisions and Technical Specifications are arranged in various trade subparagraphs, but such segregation shall not be considered as limiting the Work of any subcontract or trade. Contractor shall be solely responsible for all subcontract arrangements of Work regardless of the location or provision in the Special Provisions and Technical Specifications.

1.4.13 Contractor will provide all necessary labor, equipment, transportation and incidentals required to complete the Work, even if the Contract Documents do not describe the Work in complete detail.

1.4.14 Drawings and diagrams for mechanical, plumbing and electrical Work shall be considered as diagrammatic only, not to be used for any structural guidance or physical layout, unless specifically detailed or dimensioned, and Contractor shall be responsible to provide any and all numbers and lengths of mechanical, plumbing or electrical fittings, wire, conduit, connections, attachments or similar materials needed to complete the Work, at no adjustment to the Contract Sum or Contract Time, whether or not they exceed the numbers of such pieces or the lengths indicated by the Drawings.

ARTICLE 2 – DISTRICT

2.1 INFORMATION AND SERVICES PROVIDED BY DISTRICT

2.1.1 District will furnish up to five (5) (sets) of the Contract Documents or portions thereof free of charge.

2.1.2 Except as otherwise provided in the Special Provisions and Technical Specifications and Article 3.18 herein, District shall obtain and pay for any permits, easements and governmental approvals for the use or occupancy of permanent structures required in connection with the Work.

2.1.3 Requests for Information Responses, Approvals and decisions required of District, Design Consultant or Construction Manager under the Contract Documents shall be provided by District, Design Consultant or Construction Manager to Contractor upon request in a timely manner in order to avoid unreasonable Delay in the orderly and sequential progress of the Work. Notwithstanding the foregoing, failure by District, Design Consultant, Construction Manager or District's other consultants to provide Request for Information Response, Approvals or decisions shall not be considered as a basis for Contractor to seek adjustment in the Contract Time until seven (7) Days after Contractor has delivered written notice to District and to the person from whom such information, Approval or decision is needed, stating the following:

- (i) You are hereby notified that certain information, approval or decision described herein has not been provided in accordance with this provision and if not provided within seven (7) Days from this notice may result in additional cost or a request for time extension due to Delay;
- (ii) A detailed description of the information, approval or decision required; and
- (iii) The date by which the information, approval or decision must be received as to not result in Delay to the Project, which shall in no event be earlier than seven (7) Days after the date of District's receipt of such notice.

2.2 ACCESS TO PROJECT SITE

2.2.1 District will make available, no later than the date designated in the current Construction Schedule accepted by District, the lands and facilities upon which the Work is to be performed, including such access and other lands and facilities designated in the Contract Documents, for use by Contractor.

2.3 DISTRICT'S RIGHT TO STOP THE WORK

2.3.1 If Contractor fails to correct Defective Work as required by Article 12.2, fails to perform the Work in accordance with the Contract Documents, or violates

any Applicable Code Requirement, District may direct Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated by Contractor. Contractor shall not be entitled to any adjustment of Contract Time or Contract Sum as a result of any such order. District shall have no duty or responsibility to Contractor or any other party to exercise the right to stop the Work.

2.4 DISTRICT'S RIGHT TO CARRY OUT THE WORK

2.4.1 If Contractor fails to carry out the Work in accordance with the Contract Documents, fails to provide sufficient labor, materials, equipment, tools and services to maintain the Construction Schedule, or otherwise fails to comply with any requirement of the Contract Documents, and fails within the time specified in the Contract Documents, after receipt of notice from District to promptly commence and thereafter diligently continue to completion the correction of such failure, District may, without prejudice to other remedies District may have, correct such failure at Contractor's expense. In such case, District shall be entitled to deduct from payments then or thereafter due Contractor the cost of correcting such failure, including compensation for the additional services and expenses of District and District's consultants made necessary thereby. If payments then or thereafter due Contractor are not sufficient to cover such amounts, Contractor shall pay the additional amount to District.

ARTICLE 3 – CONTRACTOR

3.1 REVIEW OF THE SITE, CONTRACT DOCUMENTS AND FIELD CONDITIONS

3.1.1 Contractor acknowledges that it is satisfied as to character, quality, and quantities of surface and subsurface materials or obstacles to be encountered insofar as reasonably ascertainable from a careful inspection of the Site (including, without limitation, Existing Improvements on the Site) and from the geological investigation reports, data and similar information made available to Contractor by District. Any failure by Contractor to take such information or conditions into consideration will not relieve Contractor from responsibility for estimating the difficulty and cost of successfully completing the Work within the Contract Sum and Contract Time.

3.1.2 Contractor warrants and represents that it has carefully reviewed and compared the Bid and Bid Documents prior to submitting its Bid and executing the Contract. Based upon its careful review, Contractor agrees that it shall not be entitled, and conclusively waives any right, to an adjustment in the Contract Sum or Contract Time for any additional or unforeseen costs or Delay in the performance of Work due to conditions in Contract Documents constituting errors, omissions, conflicts, ambiguities, lack of coordination or noncompliance with Applicable Code Requirements, if such conditions were either discovered by Contractor or could have been reasonably discovered by Contractor or its Subcontractors or Sub-subcontractors, of every Tier, in the exercise of care and diligence in the review of the Bid Documents.

3.1.3 If Contractor discovers what it perceives to be errors, omissions, conflicts, ambiguities, lack of coordination or noncompliance with Applicable Code Requirements in the Contract Documents, then Contractor shall, before proceeding with the Work affected, notify District or the Construction Manager in writing within two (2) Days stating both of the following:

- (i) A detailed description of the conditions discovered; and
- (ii) Contractor's request for clarification, further details or correction of the Contract Documents.

Failure by Contractor to provide written notice within the period of time required shall result in Contractor waiving any right to adjustment in the Contract Sum or Contract Time on account thereof.

3.1.4 Contractor shall submit written notice thereof to District if, in Contractor's opinion, District, Design Consultant or Construction Manager furnishes additional written or verbal instructions, information or directions that Contractor considers constitute additional Work or Delay for which Contractor believes it is entitled to an adjustment of the Contract Sum or Contract Time. Such notice shall be provided

prior to performance of the Work affected by such instruction, information or direction and seven (7) Days after Contractor first received such instruction, information or direction. Failure to provide such written notice in the manner required by this provision shall constitute a waiver by Contractor of the right to any adjustment to the Contract Sum or Contract Time by reason of such instruction, information or direction.

3.1.5 Field measurements shall be taken and existing field conditions verified by Contractor, and carefully compared with the Contract Documents and other information known to Contractor before commencing the Work. Contractor shall promptly report in writing to the Construction Manager any errors, inconsistencies, or omissions discovered.

3.1.6 If Contractor or any Subcontractor or Sub-subcontractor, of every Tier, performs any portion of the Work which it knows, or in the exercise of care and diligence should have known, involves an error, omission, conflict, ambiguity, lack of coordination or noncompliance with Applicable Code Requirements, without notifying and obtaining the written Approval of District or before obtaining a written clarification, interpretation, instruction or decision from District, Design Consultant or Construction Manager, then any Work that is performed that is not in conformance with the clarifications, interpretation, instruction or decision of District, Design Consultant or Construction Manager shall be removed or replaced and Contractor shall be responsible for the resultant Losses with no adjustment in the Contract Sum or Contract Time.

3.1.7 District does not impliedly or expressly warrant, and assumes no responsibility for, the accuracy, suitability or completeness of the Bid Documents, Contract Documents or of the data, opinions or recommendations contained or expressed in any information, data or reports provided to Contractor relating to the following conditions at the Site: geological, soils, hydrologic, groundwater, Hazardous Substances, surface and subsurface obstructions, surface and subsurface utilities or Existing Improvements. Existing Improvements at the Site, for which no specific description is made on the Drawings, but which could be reasonably assumed to interfere with the satisfactory completion of the Work, shall be removed and disposed of by Contractor, but only upon the specific direction and control of District. Without limitation to the foregoing, and notwithstanding any information provided by District pertaining to groundwater elevations and/or geological and soils conditions encountered, it is understood that it is Contractor's responsibility to determine and allow for the elevation of groundwater, and the geological and soils conditions at the date of performance of the Work and any difference between elevation of groundwater and the geotechnical and soils conditions shown in the information provided by District and groundwater and the geotechnical and soils conditions actually encountered will not be considered as a Differing Site Condition or as a basis for an adjustment to the Contract Sum or Contract Time.

3.2 SUPERVISION AND CONSTRUCTION PROCEDURES

3.2.1 Contractor shall supervise, coordinate and direct the Work using Contractor's best skill and attention and shall provide supervision sufficient to assure proper coordination and timely completion. Contractor shall be solely responsible for and have control over construction means, methods, techniques, safety, sequences, procedures and the coordination of all portions of the Work.

3.2.2 Contractor shall be responsible for the accurate layout of all portions of the Work and shall verify all dimensions on the Drawings and shall report to District any discrepancies before proceeding with related Work.

3.2.3 Contractor may be assigned working space adjacent to the Site, and all field offices, materials and equipment shall be kept within this area. Contractor shall be responsible for leaving the space in as good condition as Contractor found it, or restoring it to the condition it was in prior to Contractor commencing the Work.

3.2.4 Contractor shall be responsible to District for acts and omissions of Contractor's agents, employees, and of Contractor's Subcontractors and Sub-subcontractors, of every Tier, and their respective agents and employees. Unless otherwise stated in the Contract Documents, references to Contractor, when used in reference to an obligation bearing upon performance of the Work, shall be deemed to include Contractor's Subcontractors and Sub-subcontractors of every Tier.

3.2.5 Contractor shall not be relieved of its obligation to perform the Work in accordance with the Contract Documents by the act(s) or omission(s) by District in the administration of the Contract, or by tests, inspections or Approvals required or performed by persons or firms other than Contractor.

3.3 RESPONSIBILITY FOR THE WORK

3.3.1 Contractor shall be in charge of and responsible for all portions of the Work of the Contract, and shall be responsible for conforming such portions to the requirements of the Contract Documents and readying such portions to receive subsequent Work.

3.3.2 Contractor shall at all times maintain good discipline and order among its employees and Subcontractors. Contractor shall provide competent, fully qualified personnel to perform the Work, and shall ensure that each Subcontractor and Sub-subcontractor engaged on the Site arranges the storage of materials and equipment and performance of its Work so as to interfere as little as possible with Separate Contractors or other persons engaged in work for District on the Site.

3.3.3 During the installation of Work, Contractor shall insure that existing facilities, fences, and other structures are all adequately protected. Upon Final Completion of all Work, all facilities that may have been damaged shall be restored to a condition acceptable to District.

3.3.4 Contractor is responsible for the security of the Site and all Work provided under the terms of this Contract, as well as all Work provided by Separate Contractors that occurs on the Site at any time prior to Final Completion and Acceptance of the Work by District.

3.4 LABOR, WORKMANSHIP, MATERIALS AND MANUFACTURED ITEMS

3.4.1 Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Unless otherwise provided in the Contract Documents or otherwise Approved by the Construction Manager, all articles, equipment and materials incorporated in the Work shall be new, of good quality, undamaged and not defective.

3.5 CONTRACTOR'S WARRANTY

3.5.1 Contractor warrants to District that all materials and equipment used in or incorporated into the Work will be of good quality, new and free of liens, Claims and security interests of third parties; that all labor, installation, materials and equipment used or incorporated into the Work will be of good quality and free from defects; and that the Work will conform with the requirements of the Contract Documents and Applicable Code Requirements. If required by District, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Manufactured items installed in the Work and not specifically covered in the Contract Documents are to be installed in strict accordance with manufacturers' current printed instructions.

3.5.2 All materials to be incorporated in the Work shall be protected from damage during delivery, storage, and handling, and after installation until Acceptance of the Work, and Contractor shall, without charge to District, be responsible for all damage due to Contractor's failure to provide such proper protection.

3.6 CONSTRUCTION METHODS AND PROCEDURES

3.6.1 The methods and procedures adopted by Contractor shall be such as to secure a quality of Work satisfactory to District and to enable completion of the Work in the time agreed upon. If at any time such methods and procedures appear inadequate, District may order Contractor to improve their character or

increase efficiency, and Contractor shall conform to such order; but the failure of District to order such improvement of methods or increase of efficiency will not relieve Contractor from its obligation to perform the Work in accordance with the Contract Documents or within the Contract Time.

3.6.2 If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, Contractor shall be fully and solely responsible for the Site safety for implementing such means, methods, techniques, sequences or procedures. If Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, Contractor shall give written notice to District and shall not proceed with that portion of the Work without further written instruction by District.

3.7 TAXES

3.7.1 Contractor, Subcontractors and Sub-subcontractors are responsible for paying all sales, consumer, business license, use, income and payroll, and similar taxes for the Work or portions thereof provided by Contractor and Subcontractors.

3.8 LEGAL REQUIREMENTS

3.8.1 Contractor shall perform the Work in accordance with all Applicable Code Requirements, even though such requirements are not specifically mentioned in the Contract Documents.

3.8.2 When the Work required by the Contract Documents is in conflict with any Applicable Code Requirement, Contractor shall notify District and shall not proceed with the Work until District has so ordered.

3.9 SUPERINTENDENT/PROJECT STAFF

3.9.1 Contractor shall employ a complete and competent project staff for the duration of the Work, which shall include separate individuals designated to act as Superintendent(s), project manager(s), project engineer(s) and administrative assistant(s), plus such other members as necessary to diligently prosecute the Work. Contractor shall not replace the designated Superintendent or project manager without a minimum seven (7) Day written notice and only with the written approval of District, which may be granted or withheld in its sole discretion. Any Project staff member and any replacement member shall be subject to the approval of District, which may be granted or withheld in its sole discretion. Upon notice from District requesting replacement of any Project staff member who is unsatisfactory to District, Contractor shall in a timely manner, but in no event longer than three (3) Days after notification, replace such member with a competent member satisfactory to District. Failure by Contractor to comply with this provision shall entitle District, at its option exercised in its sole discretion, to

terminate the Contract or suspend the Work until compliance is demonstrated. All costs or damages associated with such termination or suspension shall be borne by Contractor, without adjustment in the Contract Sum or Contract Time.

3.9.2 The Superintendent shall be at the Site at all times during the performance of the Work. The Superintendent shall represent Contractor and communications given to and acknowledged by the Superintendent shall be binding on Contractor. Further, communications issued by or received from the Superintendent shall be deemed as binding on Contractor. The Superintendent must be able to read, write and communicate fluently in English. The Superintendent shall not perform the Work of any trade, pickup materials or perform any Work not directly related to the supervision and coordination of the Work.

3.10 SCHEDULES REQUIRED OF CONTRACTOR

3.10.1 Contractor shall submit a preliminary Construction Schedule to District in a form approved by the Construction Manager at the Pre-Construction Meeting.

3.10.2 Updated Construction Schedules shall be submitted in the form and frequency approved by the Construction Manager.

3.10.3 The Construction Schedule and Construction Schedule updates shall meet the following requirements:

.1 Schedules must be suitable in format and clarity for monitoring progress of the Work and shall utilize the critical path method of scheduling.

.2 Schedules must provide necessary data about the timing for District's decisions and District-furnished items.

.3 Schedules must be in sufficient detail to demonstrate adequate planning and staffing for the Work.

.4 Schedules must represent a practical plan to complete the Work within the Contract Time. If at any time during the Work, any activity is not completed by its latest scheduled completion date, Contractor shall notify the Construction Manager within seven (7) Days of Contractor's plans to reorganize the work force to return to the schedule and prevent Delays on any other activity.

.5 An updated Construction Schedule shall be submitted with each progress payment request, but no less frequently than monthly, and shall include all of the following:

- (i) A written narrative report detailing the actual progress of the Work as of the date of submission;

- (ii) The expected progress of the Work as of such date according to the approved Construction Schedule;
- (iii) The reasons for any variance between the approved Construction Schedule and the updated Construction Schedule; and
- (iv) Contractor's plan for placing the Work back on Schedule, at Contractor's expense.

3.10.4 Contractor shall plan, develop, supervise, control and coordinate the performance of the Work so the progress, sequence and timing of the Work conform to the current accepted Construction Schedule. Contractor shall continuously obtain from Subcontractors information and data about the planning for and progress of the Work, the ordering and fabrication of materials, required Submittals, and the delivery of equipment, shall coordinate and integrate such information and data in updated Construction Schedules and Record Documents, and shall monitor the progress of the Work and the delivery of equipment. Contractor shall act as the expeditor of potential and actual delays, interruptions, hindrances or disruptions for its own forces and those forces of Subcontractors, regardless of Tier. Contractor shall cooperate with District in the development of the Construction Schedule and updated Construction Schedules.

3.10.5 District's review, comments, requests for revisions, or acceptance of any schedule or scheduling data shall not:

- (i) Relieve Contractor from its sole responsibility for the feasibility of the schedule and to plan for, perform, and complete the Work within the Contract Time;
- (ii) Transfer responsibility for any schedule from Contractor to District; nor
- (iii) Imply District's agreement with any assumption upon which such schedule is based or any matter underlying or contained in such schedule.

3.10.6 Failure of District to discover errors or omissions in schedules that it has reviewed, or to inform Contractor that Contractor, Subcontractors, or others are behind schedule, or to direct or enforce procedures for complying with the Construction Schedule, shall not relieve Contractor from its sole responsibility to perform and complete the Work within the Contract Time and shall not be a cause for an adjustment of the Contract Time or the Contract Sum.

3.10.7 Contractor shall cooperate with and coordinate its schedule with work of District and District's Separate Contractors.

3.11 DOCUMENTS AND SAMPLES AT PROJECT SITE

3.11.1 Contractor shall maintain one (1) set of As-Built Documents at the Site, which shall be kept up to date on a daily basis at all times during the performance of the Work. All performed changes, deletions or additions in the Work from that shown in the Contract Documents shall be recorded accurately and completely in the Record Documents. Upon Final Completion and as a condition to final payment, each sheet of the As-Built Documents and other Record Documents shall be signed and attested to by a representative of Contractor as being complete and accurate.

3.11.2 Contractor shall, at all times during performance of the Work, also maintain the following at the Site:

- (i) The latest updated Construction Schedule approved by District;
- (ii) Shop Drawings, product data, and samples; and
- (iii) All other required Submittals.

At all times during the course of the Project, these documents shall be available to District, the Construction Manager and the Design Consultant to audit, excerpt, or copy as they see fit. Upon Final Completion or termination of the Construction Contract, these shall be delivered to District.

3.11.3 It shall be the responsibility of Contractor to maintain a current and complete record of all Changes performed during the progress of the Project construction. The record shall be in the form of a complete set of prints of the As-Built Documents on which daily recordings are made by Contractor, indicating in detail and dimension each variation from the original set of Contract Documents and including all of the construction Work. At the completion of construction, Contractor shall, as a requirement of the Final Completion of the Work, certify that to the best of its knowledge, the As-Built Documents are true and accurate, and that the indications thereon represent all Changes performed during the construction of the Project. At the Final Completion of the Work, the As-Built and other Record Documents shall become the property of District.

3.11.4 Contractor, in concert with the Design Consultant and the Construction Manager, shall review Contractor's As-Built Documents for conformance with all current Changes prior to presenting its monthly Application For Payment. The monthly progress payment statement will not be accepted or processed by District unless the As-Built Documents are current and complete, and Approved by District.

3.11.5 At the Final Completion of the Work, all information annotated monthly on

the As-Built Documents shall be fully incorporated by Contractor onto a set of mylar reproducibles furnished by Contractor. These As-Built Documents will become the permanent property of District at the Final Completion of the Work. If the As-Built Documents are prepared on a computer, then the revised computer files shall also be provided to District in the file format specified by District.

3.12 SUBMITTALS

3.12.1 Submittals are not Contract Documents. Their purpose is to demonstrate, for those portions of the Work for which Submittals are required, how Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Prior to starting Work, Contractor shall provide to District an initial schedule for all materials and equipment for which shop drawings are required by the Contract Documents. For each required shop drawing, Contractor shall provide to District the date for the drawing's intended Submittal to the Design Consultant for review. The date required for its return to avoid Delay in any activity beyond the scheduled start date shall also be given.

3.12.2 All shop drawings and other Submittals shall be provided at Contractor's expense, when required by the Contract Documents or requested by the Construction Manager.

3.12.3 Contractor shall review, stamp approved, and submit to the Construction Manager, all Submittals required by the Contract Documents to be submitted and reviewed by the Design Consultant. Submittals to the Construction Manager without evidence thereon of Contractor's approval shall be returned, without further consideration, for resubmission in accordance with these requirements. Submittals shall be provided within the time frame specified in the Special Provisions and Technical Specifications in accordance with the Construction Schedule, and in such sequence as to cause no Delay in the Work or in the activities of District or of Separate Contractors. Submittals made by Contractor which are not required by the Contract Documents, may be returned without action by the Construction Manager or Design Consultant. Submittal to the Construction Manager and Design Consultant must include a statement, in writing, identifying any deviations from the Contract Documents required due to manufacturing or installation limitations contained in the Submittal.

3.12.4 All Submittals shall be submitted in six (6) sets, accompanied by letters of transmittal, and addressed to the Construction Manager for review. Unless otherwise specified in the Contract Documents, Submittals consisting of Drawings or Plans shall be in the form of six (6) copies. The Submittal must be in accordance with the Contract Documents. If the Submittal involves a request for substitution of materials, the request shall be clearly identified on the Submittal that it is a "Request for Substitution." Unless so clearly marked, Submittals shall not be considered as a request for substitution. If changes or corrections are

required, three marked-up prints shall be returned to Contractor. Submittals shall consist of the appropriate combination of catalog sheets, material lists, manufacturer's brochures, technical bulletins, specifications, diagrams, or product samples, necessary to describe a system, product, or item. The letter of transmittal shall give a list of the numbers of the sheets submitted. All sheets shall be marked with the name of the Project and the name of Contractor, shall be numbered consecutively, and shall be referenced to the sheets or paragraphs of the Contract Documents, referenced by sheet or subparagraph affected. Submittals shall be combined for singular assemblies, items or materials.

3.12.5 No Work requiring a Submittal shall be performed by Contractor until the Submittal has been reviewed by District, Construction Manager or Design Consultant and the Design Consultant has documented the exceptions noted on the Submittal. Contractor shall allow twenty (20) Days for review of Submittals. Once the Submittal is returned to Contractor by the Construction Manager with a statement that it has been reviewed and no exceptions are taken or further action requested, such Work shall be performed in accordance with the Submittal and the Contract Documents.

3.12.6 Contractor's Submittals represent that Contractor has determined or verified materials and field measurements and conditions related thereto and that it has checked and coordinated the information contained within such Submittals with the requirements of the Contract Documents and Submittals for related Work.

3.12.7 If Contractor discovers any conflicts, omissions or errors in Submittals, Contractor shall notify the Construction Manager and receive instruction before proceeding with the affected Work.

3.12.8 Contractor shall remain solely responsible, notwithstanding District, Construction Manager or Design Consultant's review or approval of Submittals, for deviations (including, without limitation, those arising from standard shop practice) from requirements of the Contract Documents, unless Contractor has specifically informed District, Construction Manager or Design Consultant in writing of such deviation at the time of transmitting the Submittal and District, Construction Manager or Design Consultant has given written approval of such deviation. No adjustment in the Contract Sum or Contract Time shall be permitted with respect to any such deviations that are noted in writing by Contractor and as to which District, Construction Manager or Design Consultant takes no exception or approves.

3.12.9 After review of Contractor's Submittals by District, Construction Manager or Design Consultant, the Construction Manager will transmit to Contractor the required number of sets. If the Submittals are found to be incomplete or incorrect, Contractor shall resubmit after corrective action has been taken. Contractor shall reimburse District, or District may withhold from payments due Contractor, sums owing by District for any fees charged by District, Construction Manager or

Design Consultant or District's other consultants for more than two (2) reviews of a Submittal, or for accelerated review in a shorter time than set forth in the approved Construction Schedule, if requested by Contractor or caused by late Submittals by Contractor. The return of a Submittal due to failure to comply with the Contract Documents or for correction or additional information shall be considered a review.

3.12.10 Review of Submittals by District, Construction Manager or Design Consultant will be general and for conformance with design intent, and shall not relieve Contractor from the responsibility for proper fitting and construction of the Work, nor from furnished materials and Work required by the Contract which may not be indicated on the reviewed Submittals.

3.12.11 Submittals shall be in English, be of good quality, and be of a size and scale to clearly show all necessary details. Submittals shall show in detail the size, sections and dimensions of all members; the arrangement and construction of all connections, joints and other pertinent details; and all holes, straps and other fittings required by other Separate Contractors for attaching their Work. When required by District, Construction Manager or Design Consultant, engineering computations shall be submitted. Contractor shall be responsible for delivering duplicates of Submittals to all other persons whose Work is dependent thereon.

3.12.12 Contractor shall, at all times, maintain at the Site a complete file of all District, Construction Manager or Design Consultant-reviewed Submittals.

3.13 TRADE NAMES, SUBSTITUTIONS

3.13.1 Except as otherwise noted and permitted by law, whenever in the Contract Documents any material or process is indicated or specified by two or fewer patents, proprietary names, brand names and/or manufacturers, such specification shall be deemed pursuant to Public Contract Code 3400 to be followed by the words "or approved equal".

3.13.2 Contractor shall have ten (10) Days after submission of the Bid to submit data substantiating substitution of "or equal" items. District, with the advice of the Design Consultant, will determine whether the proposed brand or item is equal in quality and utility to that specified in the Contract Documents, and its decision shall be final. District, Construction Manager or Design Consultant may require the submission of samples, formulae, and/or statements of physical properties for consideration in determining equality of the material or process in question. No proposal for an equal will be considered complete unless accompanied by complete information and descriptive data necessary to determine the equality of the offered equal.

3.13.3 If Contractor requests use of substitute material or process, it shall be incumbent upon Contractor to furnish sufficient evidence to support the claim

of equality to the satisfaction of District, Construction Manager or Design Consultant.

3.13.4 If District accepts for use in the Project a substitute material or process which in the opinion of District, Construction Manager or Design Consultant is not the equal of that specified, a Change Order shall be issued issuing a credit to District for the difference in value.

3.13.5 Substitutions by Contractor that are incorporated into the Work without the prior review and Approval by District, Construction Manager or Design Consultant in accordance with the requirements of the Contract Documents shall be deemed to be Defective Work.

3.13.6 The specified Construction Contract completion time shall not be affected by any circumstance developing from the substitution provisions of this Article 3.13.

3.14 DAILY REPORTS BY CONTRACTOR

3.14.1 At the end of each working day, Contractor shall submit a daily report to the Construction Manager (on a form provided by or accepted by the Construction Manager) listing:

- (i) At the end of each working day, Contractor shall submit a daily report to the Construction Manager (on a form provided by or accepted by the Construction Manager) listing: Labor - Names of workers, classification, and hours worked;
- (ii) Material - Description and list of quantities of materials used;
- (iii) Equipment - Type of equipment, size, identification number, and hours of operation, including loading and transportation, if applicable;
- (iv) Inspection and Testing Activities - Name, District or company and items involved;
- (v) Areas of Work - The areas of the Site on which Work was performed and a detailed description of the stage, status and progress of the Work in each such area at the beginning and end of the day;
- (vi) Accidents, Delays, Defective Work - Description in detail of any injuries to workers, accidents, Delays, or Defective Work that were encountered; and
- (vii) Other Services and Expenditures - Description in such detail as District may require of other services and expenditures.

3.14.2 Reports by Subcontractors and Sub-subcontractors that comply with the requirements of this Article 3.14 shall also be submitted to the Construction

Manager through Contractor at the end of each working day.

3.14.3 Submission of daily reports by Contractor, Subcontractors and Sub-subcontractors, of every Tier performing Work on the Site shall be a condition precedent to Contractor's right to payment under the Contract.

3.14.4 Facts, notice or information contained in daily reports of Contractor or its Subcontractors or Sub-subcontractors, whether known or not known to District or Construction Manager, shall under no circumstances be considered evidence of compliance by Contractor with any of the specific written notice requirements of the Contract Documents.

3.15 CUTTING AND PATCHING

3.15.1 Contractor shall do all cutting, fitting, or patching of the Work required to make all parts of the Work join properly and to allow the Work to join the work of Separate Contractors shown in, or reasonably implied by, the Contract Documents.

3.15.2 Contractor shall not endanger the Work, the Project, Existing Improvements, or adjacent property by cutting, digging, or otherwise. Contractor shall not cut or alter the work of any Separate Contractor without the prior consent of District.

3.15.3 In all cases, cutting shall be performed under the supervision of competent workers skilled in the applicable trade and shall cause the openings to be cut as small as possible to minimize unnecessary damage.

3.16 ACCESS TO THE WORK

3.16.1 District, Construction Manager, Design Consultant, their consultants and other persons authorized by District shall at all times have access to the Work wherever it is in preparation or progress. Contractor shall provide safe and proper facilities for such access and for inspection.

3.16.2 District may, at any time, and from time to time during the performance of the Work, enter the Project for the purpose of installing any necessary other work by District labor or other contracts or for any other purpose. Contractor shall cooperate with District and not interfere with other work being done by or on behalf of District.

3.17 ROYALTIES AND PATENTS

3.17.1 Contractor shall pay all royalties and license fees required for the performance of the Work. Contractor shall immediately notify District if it learns of any circumstances that may constitute an infringement of patent rights and shall defend and indemnify District and the members of the Project Team in

accordance with Article 3.21 against Losses, liabilities, suits or Claims resulting from Contractor's or any Subcontractor's or Sub-subcontractor's infringement of patent rights.

3.18 PERMITS AND LICENSES

3.18.1 Contractor and all Subcontractors shall obtain and be responsible for the cost of all permits and applications related to the construction of the Project.

3.19 DIFFERING SITE CONDITIONS

3.19.1 Save and except as permitted for Differing Site Conditions as defined in this Article 3.19, Contractor agrees to solely bear the risk and the additional cost and Delay of all concealed or unknown conditions at the Site or in Existing Improvements, without adjustment to the Contract Sum or Contract Time.

3.19.2 Differing Site Conditions are those conditions encountered at the Site or in Existing Improvements that are (1) subsurface or concealed conditions which differ materially from those indicated in the Contract Documents; or (2) unknown physical conditions at the Site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the Work of the character provided for in the Contract Documents.

3.19.3 If Contractor encounters conditions it believes constitute Differing Site Conditions, then notice of such conditions shall be immediately reported to District and the Construction Manager followed within twenty-four (24) hours by a written notice stating a detailed description of the conditions encountered.

3.19.4 District shall promptly investigate Contractor's report of Differing Site Conditions. If District finds that Differing Site Conditions exist, in accordance with this Article 3.19, an adjustment shall be made in the Contract Sum and Contract Time in such amount as District approves.

3.19.5 If Contractor intends to seek an adjustment to the Contract Sum or Contract Time based upon Differing Site Conditions, it must, within seven (7) Days after it first discovered, or should have discovered in the exercise of diligence and care, the existence of such Differing Site Conditions, submit a written statement setting forth a detailed cost breakdown in the form required by Article 7.2 setting forth the basis of Contractor's calculation of the costs saved or incurred, detailed information demonstrating the effect on the Construction Schedule in the same manner as required by the Contract Documents for obtaining approval of extensions of time, identification of the Bid Documents that formed the basis of Contractor's Bid estimate to perform the Work affected by such conditions and a complete and detailed explanation of the factual basis for the request.

3.19.6 Failure by Contractor to strictly comply with the requirements of this Article 3.19 concerning the timing and content of any notice of Differing Site Conditions

or request for adjustment in Contract Sum or Contract Time based on Differing Site Conditions shall be deemed a waiver of any right by Contractor for an adjustment in the Contract Sum or Contract Time by reason of such conditions.

3.19.7 No Claim by Contractor for additional compensation for Differing Site Conditions shall be allowed if asserted after final payment under the Construction Contract.

3.20 INSPECTIONS

3.20.1 In order to allow for inspection by District and other agencies, or any inspection required elsewhere in the Special Provisions and Technical Specifications, Contractor shall notify District in writing three (3) Days in advance of the permanent concealment of any materials or Work.

3.20.2 Whenever Contractor desires to carry on the Work of this Construction Contract at hours other than 7:00 AM to 6:00 PM, Monday through Friday and from 9:00 AM to 5:00 PM on Saturdays, it shall request authorization in writing from District for such Work at least twelve (12) Days in advance and, if approved to proceed, Contractor agrees to pay overtime reimbursement of costs, of such required inspector(s) and the Construction Manager, Design Consultant and/or other District consultants whose presence is necessary and requested by District.

3.20.3 If any Work is concealed or performed without the prior notice specified above, then the Work shall be subject to such tests or exposure as may be necessary to prove to District that the materials used and the Work done are in conformity with the Contract Documents. All labor and equipment necessary for exposing and testing shall be furnished by Contractor at its expense. Contractor shall replace, at its own expense and without reimbursement by District, any materials or Work damaged by exposure and any faulty materials or work evidenced by such exposure or testing.

3.20.4 When, in order to comply with the intent of the Contract Documents, inspection must be made at the plant or mill of the manufacturer or fabricator of material or equipment, Contractor shall notify District a sufficient length of time in advance to allow for arrangements to be made for such inspection.

3.20.5 Any inspection or approval by any representative or agent of District will not relieve Contractor of the responsibility of incorporating into the Work only those materials which conform to the Contract Documents, and any nonconforming materials all be removed from the Site whenever identified.

3.20.6 When Contractor believes it has achieved either Substantial or Final Completion of the Work, Contractor shall notify District and the Construction Manager in writing and request a Substantial or Final Completion inspection of the Work. District, Design Consultant and Construction Manager will make such inspection as soon thereafter as possible.

3.21 INDEMNIFICATION, STOP NOTICES

3.21.1 Contractor shall fully comply with the Indemnification provision of the Construction Contract.

3.21.2 Contractor shall take steps to assure that a right of indemnification is included in all subcontracts, purchase orders and other contracts entered into by Subcontractors and Sub-subcontractors, of every Tier, for the Project that afford the same coverage, benefits and protections as provided for in Article 3.21.1.

3.21.3 Nothing set forth in the Contract Documents shall be construed to give rise to any express or implied right in favor of Contractor for indemnity or contribution.

3.21.4 Contractor shall not permit any stop notices or other claims, valid or invalid, to be served, filed, recorded or otherwise imposed on District or on any part of the Work or the property on which the Work is performed. If any stop notice or other claim is served, filed or recorded in connection with the Work, District shall have the option, in its sole discretion, to require that Contractor immediately and at its own expense obtain a bond executed by a good and sufficient surety, in accordance with the California Civil Code, Section 3196, in a sum equal to one hundred twenty-five percent (125%) of the amount of such stop notice or claim. Such bond shall guarantee the payment of any amounts which the claimant may recover on the stop notice or claim, together with the claimant's costs of suit in any action to enforce such stop notice or claim if the claimant recovers therein. This remedy shall be in addition to all other rights and remedies of District under the Contract Documents and applicable law, including, without limitation, the right to withhold funds from sums due to Contractor.

3.22 PARKING

3.22.1 Contractor shall provide and maintain suitable parking areas, for use by all construction workers and others performing work or furnishing services in connection with the Project, as required to avoid any need for parking personal vehicles where they may interfere with public traffic, construction activities or public parking.

3.23 USE OF THE PROJECT SITE AND CLEAN UP

3.23.1 Contractor shall confine operations at the Site to areas permitted by Applicable Code Requirements and the Contract Documents. Contractor shall not encumber the Site with materials or equipment so that Separate Contractors' work is hindered or impeded due to such encumbrances.

3.23.2 Contractor shall, during performance of the Work, keep the Site and surrounding area free from the accumulation of excess dirt, dust, waste materials, water and rubbish caused by Contractor or any Subcontractors. Contractor shall

continuously remove all excess dirt, waste material, water and rubbish caused by Contractor and all tools, equipment, machinery and surplus materials from the Site and surrounding area at the completion of the Work. Adequate cleanup will be a condition for progress payments.

3.23.3 Personnel of Contractor, Subcontractors, and Sub-subcontractors shall not occupy, live upon, or otherwise make use of the Site during any time that Work is not being performed at the Site, except as otherwise provided in the Contract Documents.

3.23.4 Upon Final Completion of the Work, Contractor shall remove all construction facilities, appurtenances, tools, material and other articles from the Site. The entire area, including all fixed equipment, floors, surfaces and hardware shall be cleaned and restored to their original condition in accordance with the Special Provisions and Technical Specifications.

3.23.5 In addition to water sprinkling, temporary enclosures and anti-dust sweeping compounds should be used to limit dust and dirt rising and to keep the Site clean.

3.23.6 Construction materials shall be neatly stacked by Contractor when not in use. Dusty materials in piles or in transit shall be covered to prevent suspension of the dirt in the air. Contractor shall promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids and cleaning solutions from the affected surfaces to prevent marring or other damage.

3.23.7 Volatile wastes shall be properly stored in covered metal containers and removed daily. All other trash receptacles shall be promptly emptied when full. Contractor shall promptly and legally transport and dispose of removed and demolished items and waste materials not identified to be recycled or reused in a manner complying with local ordinances and anti-pollution laws. No rubbish or waste materials shall be burned, buried, or otherwise disposed of on the Site.

3.23.8 Sanitary facilities shall be of reasonable capacity, properly maintained throughout the construction period, and obscured from public view to the greatest practical extent. Contractor shall enforce the use of such sanitary facilities by all personnel at the Site. Sanitary facilities shall be on a portable trailer and shall be removed from the Site at the end of each workday. For sewer lining projects, Contractor shall provide additional sanitary facilities on a portable trailer to be used by the residents during lining installation (one sanitary facility per each 30 meters [100 feet]). Contractor shall remove those sanitary facilities as soon as relief holes are cut and notices of completion are delivered.

3.24 ENVIRONMENTAL CONTROLS

3.24.1 AIR POLLUTION CONTROL. Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes which apply to any work

performed pursuant to the Contract, including any air pollution control rules, regulations, ordinances and statutes, specified in the California Government Code, Section 11017, or any other applicable law. In the absence of any applicable air pollution control rules, regulations, ordinances or statutes governing solvents, all solvents, including but not limited to the solvent portions of paints, thinners, curing compounds and liquid asphalt used on the Project shall comply with the applicable material requirements of the San Luis Obispo County Air Pollution Control District. All containers of paint, thinner, curing compound or liquid asphalt shall be labeled to indicate that the contents fully comply with said requirements. Material to be disposed of shall not be burned.

.1 Mold. If any material susceptible to microbial growth becomes wet during the construction phase, that material should be carefully removed from the construction Site to prevent further contamination of the indoor air.

.2 VOC's. Construction materials that emit low levels of volatile organic compounds (VOC) shall be used to improve indoor air quality. Adequate ventilation of packaged dry products shall be used prior to installation. Contractor is responsible to ventilate the building during the application of wet products (e.g., paints, glues, sealants), which release their highest levels of VOC's during the curing period immediately after the application. Also, wet products shall be applied before installing materials that act as "sinks" such as carpets, fabric, ceiling tiles, movable partitions, furniture, etc. in order to reduce the chance of the "sinks" absorbing contaminants and slowly releasing them into the building over time.

.3 Off-Gassing. Contractor is responsible for identifying specific materials that require more complex ventilation to accelerate off-gassing. In addition to paints, glues and sealants, those materials that generally require temporary ventilation include, without limitation: composite wood products, plastics, waterproofing, insulation, fireproofing, caulking, acoustical ceilings, resilient flooring and wood preservatives.

.4 Barriers. Barriers shall be used to prevent the migration of airborne pollutants from areas under construction and to mitigate any construction noise that may disrupt occupant activities. If effective controls for pollution emissions cannot be practically implemented, activities involving significant airborne pollutants shall be scheduled during off-hours at Contractor's expense. The Site shall be ventilated with fresh outside air during and immediately after the noxious activity.

.5 Exhaust. Contractor shall install a temporary exhaust in a construction area to prevent contaminated air from entering the building's return-air system, including, without limitation:

- (i) Removing windows in a space.

- (ii) Using available or dedicated exhaust systems (e.g., kitchen or toilet exhaust) that are not tied into the building's overall return-air system.

The building shall be flushed with full outdoor air for seven (7) Days prior to occupancy. Full capacity of the HVAC system shall be used for at least 2.5 ACH (air changes per hour), provided by temporary fans. During this time, the interiors shall be thoroughly cleaned, the HVAC ducts vacuumed, and air and HVAC system filters replaced.

3.24.2 TEMPORARY WATER, LIGHT AND POWER. Water for any purpose shall be obtained by Contractor, at its expense, from District. Contractor is to contact the Construction Manager for a phone number and contact person. In no case may Contractor obtain water from unmetered fire hydrants. The costs of obtaining water shall be included in the prices paid for the various contract items of work included and no additional compensation will be allowed therefore, unless otherwise specified in these Contract Documents. Contractor should be aware that there is a penalty for taking water from an unmetered fire hydrant. This amount shall be deducted from the payment due Contractor.

3.24.3 WATER POLLUTION CONTROL.

.1 Contractor shall use “Best Available Technology” and “Best Management Practices” to prevent the pollution of drains and watercourses by discharges of materials other than uncontaminated storm water. Prohibited discharge include storm water, discharge that may threaten to cause pollution, contamination or nuisance, sanitary waste, sediment and debris from erosion and other substances resulting from construction activities. Sanitary wastes will not be permitted to enter any drain or watercourse other than sanitary sewers. No sediment, debris or other substance will be permitted to enter sanitary sewers.

.2 Contractor to provide effective and continuous control of water pollution, including where Work is in small or multiple units, on an out of phase schedule or with modified construction procedures. Contractor shall determine which methods are most effective in achieving control of water pollution as a result of Contractor's operations. Contractor shall coordinate water pollution control work with all other Work performed by Contractor and Separate Contractors.

.3 Before starting any Work on the Project, Contractor shall submit to the Construction Manager for acceptance a program for effective control of water pollution. Such program shall show the schedule and detailed description for the pollution and erosion control work or practices included in the Construction Contract and for all water pollution control measures which Contractor proposes to take in connection with construction of the Project to minimize the effects of their operations upon adjacent streams and other bodies of water. Contractor shall not perform any clearing and grubbing or earthwork on the Project, other than that specifically authorized in writing by the Construction Manager, until

such program has been approved by District or Construction Manager. Contractor shall revise and bring up to date said water pollution control program at any time the Construction Manager makes written request for such revisions.

.4 The Construction Manager will notify Contractor within seven (7) Days of its learning of the acceptance or rejection of any submitted or revised water pollution control program.

.5 District shall not be liable to Contractor for failure to accept all or any portion of any originally submitted or revised water pollution control program, or for any Delays to the Work due to Contractor's failure to submit an acceptable water pollution control program. Contractor assumes sole responsibility for all costs associated with treatment of water polluted as a result of Contractor's Site activities, whether treatment is initiated by Contractor or District.

.6 Contractor may request the Construction Manager to waive the requirement for submission of a written program for control of water pollution when the nature of Contractor's operation is such that pollution discharge or erosion is not likely to occur. Waiver of this requirement will not relieve Contractor from responsibility for compliance with the other provisions of this Section. Waiver of the requirement for a written program for control of water pollution will not preclude District requiring submittal of a written program at a later time if the Construction Manager deems it necessary because of the effect of Contractor's operations.

.7 Where erosion damage which will cause water pollution is probable due to the nature of the material or the season of the year, Contractor's operation shall be so scheduled that permanent erosion control features will be installed concurrently with or immediately following grading operations.

.8 All water pollution control work required elsewhere in the Contract Documents which may be accomplished under the various contract items of Work will be measured and paid for as provided in said items of Work elsewhere in these Contract Documents.

.9 All water pollution control work performed in accordance with the accepted program which is not otherwise required under the Construction Contract and which is ordered by the Construction Manager will be paid for as Extra Work as provided for in the General Conditions. Except as otherwise provided in Article 3.24.3 or elsewhere in the Contract Documents, full compensation for conforming to the requirements of Article 3.24.3 shall be considered as included in the prices paid for the various contract items of Work and no additional compensation will be allowed therefore.

3.24.4 URBAN RUNOFF. The following Best Management Practices which address the problem of urban runoff shall apply to all projects undergoing

construction in District. The Best Management Practices list set forth below is required by District, and shall apply at the time of demolition of an existing structure or commencement of construction until receipt of a certificate of occupancy or certificate of completion:

.1 Runoff, sediments and construction waste from construction sites and parking areas shall not leave the site.

.2 Any sediments or other materials which are tracked off the Site shall be removed the same day. When determined necessary by the Construction Manager to provide temporary pollution control measures, a temporary sediment barrier shall be installed.

.3 On an emergency basis only, plastic covering may be utilized to prevent erosion of an otherwise unprotected area, along with runoff devices to intercept and safely convey the runoff. Excavated soil shall be located on the Site in a manner that eliminates the possibility of sediment running into the street or adjoining properties. Undocumented fills shall be covered until the soil is either used or removed.

.4 No washing of construction or other industrial vehicles shall be allowed adjacent to the Site. No runoff from washing vehicles on the Site is allowed to leave the Site.

.5 Drainage controls shall be utilized as needed, depending on the extent of proposed grading and topography of the Site, including, but not limited to the following: (i) detention ponds, sediment ponds or infiltration pits; (ii) dikes, filter berms or ditches; and (iii) down drains, chutes or flumes.

3.24.5 STORMWATER POLLUTION. To avoid stormwater pollution, Contractor shall plan roadwork and pavement construction as follows:

(i) Apply concrete, asphalt, and seal coat during dry weather to prevent contaminants from contacting stormwater runoff.

(ii) Cover storm drain inlets and personnel access holes when paving or applying seal coat, slurry seal, fog seal, etc.

(iii) Always park paving machines over drip pans or absorbent materials, since they tend to drip continuously.

(iv) When making saw-cuts in pavement, use as little water as possible. Cover each catch basin completely with filter fabric during the sawing operation and contain the slurry by placing straw bales, sand bags, or gravel dams around the catch basin. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from the Site.

3.24.6 DRAINAGE CONTROL. Contractor shall provide for the drainage of storm water and such water as may be applied or discharged on the Site in performance of the Work. Drainage facilities shall be adequate to prevent damage to the Work, Site and adjacent property. Also drainage facilities shall be constructed to minimize the potential pollution to the ocean.

Existing drainage channels and conduits shall be cleaned, enlarged or supplemented as necessary to carry all increased runoff attributable to Contractor's operations. Dikes shall be constructed as necessary to divert increased runoff from entering adjacent property (except in natural channels), to protect District's private property and utility owner's facilities and the Work, and to direct water to drainage channels or conduits. Retention of drainage on the Site shall be provided as necessary to prevent downstream flooding.

3.24.7 SOUND CONTROL.

.1 Contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any Work performed pursuant to the Construction Contract, except as modified in the Special Provisions and Technical Specifications.

.2 Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the Project without said muffler. The noise level from Contractor's operations, between the hours of 7:00 A.M. and 6:00 P.M., shall not exceed 86 DBA at a distance of 15 meters (50 feet). This requirement in no way relieves Contractor from responsibility for complying with local ordinances regulating noise level.

.3 The noise level requirement shall apply to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

.4 Prior to starting construction, all equipment to be used on the Project shall be inspected and tested for compliance with the requirements of this Project. Sound blankets or other sound mitigation equipment approved by the Construction Manager shall be required to bring equipment into compliance with the requirements of this Project.

.5 Full compensation for conforming to the requirements of this provision shall be considered as included in the prices paid for the various contract items of Work involved and no additional compensation will be allowed therefor.

3.24.8 SPECIAL HAZARDOUS SUBSTANCES AND PROCESSES. Contractor acknowledges that it is aware of and in compliance with the provisions of the

Hazard Communication Standards (California Code of Regulations, Title 8, Section 5194). Contractor shall, at the request of the Construction Manager, demonstrate that Contractor is in complete compliance with the Hazard Communication Standards. In addition, Contractor shall, at the request of the Construction Manager, provide to the Construction Manager a material safety data sheet and a copy of the product label for any product handled or used by Contractor on District property or in an area where a District employee is working. Contractor shall contact the District's "Household Hazardous Waste Facility" regarding the intent to dispose of any materials containing asbestos or any petroleum-contaminated soil.

ARTICLE 4 – ADMINISTRATION OF THE CONTRACT

4.1 CONTRACT ADMINISTRATION BY DISTRICT, DESIGN CONSULTANT AND CONSTRUCTION MANAGER

4.1.1 District and the Construction Manager will provide administration of the Construction Contract as provided in the Contract Documents.

4.1.2 No actions taken by District, Construction Manager or Design Consultant shall relieve Contractor of its obligations as described in the Contract Documents.

4.1.3 The Construction Manager will be present on the Site, as is convenient or necessary in the sole discretion of the Construction Manager, during the performance of the Work primarily for the purposes of providing administration, inspection and expediting communications between District, Design Consultant and Contractor.

4.1.4 Neither District, Design Consultant nor Construction Manager will have control over, will be in charge of, or will be responsible for construction means, methods, techniques, safety, sequences or procedures or for safety precautions and programs in connection with the Work, all of which are the sole responsibility of Contractor.

4.1.5 Unless otherwise provided in the Contract Documents or when direct communications have been specifically authorized, communications between Contractor and District or Design Consultant shall be in writing through Construction Manager. Communications by Contractor, Subcontractors and Sub-subcontractors with Separate Contractors shall be through the Construction Manager. Contractor shall not rely on oral or other non-written communications.

4.1.6 Based on the Construction Manager's Site visits and evaluations of Contractor's Applications For Payment, the Construction Manager will review and recommend to District for District approval the amounts, if any, due Contractor.

4.1.7 Construction Manager will make recommendations to District to reject the Work, or any portion thereof, which does not conform to the Contract Documents. District alone shall have the authority to stop the Work or any portion thereof. Whenever District considers it necessary or advisable, District will have the authority to require additional inspection or testing of the Work in accordance with the Contract Documents, whether or not such Work is fabricated, installed or completed. However, no authority of District conferred by the Contract Documents nor any decision made in good faith either to exercise or not exercise such authority, nor any recommendation by the Construction Manager, shall give rise to a duty or responsibility of District or the Construction Manager to Contractor or its Subcontractors or Sub-subcontractors, of any Tier.

4.1.8 Construction Manager will have the authority to do the following:

- (i) Conduct inspections in connection with Beneficial Occupancy or beneficial use of the District;
- (ii) Assist District in determining the dates of Substantial Completion and Final Completion;
- (iii) Review any records, written warranties and related documents required by the Contract Documents and assembled by Contractor; and
- (iv) Make recommendations to District for issuance of final payment upon Contractor's compliance with the requirements of the Contract Documents.

4.1.9 District, with the assistance of recommendations from the Design Consultant and/or Construction Manager, shall be the ultimate interpreter of the requirements of the Contract Documents and the judge of performance thereunder by Contractor. Such decisions by District will be final and binding upon Contractor.

4.2 CLAIMS

As set forth in the Section 1.1.18, a Contractor Claim means a separate demand by a Contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following: (A) a time extension, including, without limitation, for relief from damages or penalties for delay assessed by the District; (B) payment by the District of money or damages arising from work done by, or on behalf of, the Contractor pursuant to the Construction Contract and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; (C) payment of an amount that is disputed by the District.

4.2.1 Time period for submission of Contractor Claim.

- (i) If a Contractor Claim involves an adjustment to the Contract Sum or to the Contract Time due to Extra Work, then the Claim arises upon issuance of a decision denying, in whole or in part, Contractor's Change Order Request. All other Claims arise when Contractor discovers, or should have discovered, the circumstances giving rise to the Claim (even if Contractor has not yet been damaged or delayed).
- (ii) A Contractor Claim that does not involve an adjustment to the Contract Sum or Contract Time for Extra Work may be asserted if, and only if, Contractor gives written notice of intent to file the Claim within five (5) Days of the date the Claim arises under Article 4.2.1. A written notice of intent to file a Claim shall be valid if, and only if, it identifies the event or condition giving rise to the Claim, states its probable effect, if any, with respect to Contractor's entitlement to an adjustment of the Contract Sum or Contract Time, and complies with the requirements of Article 4.2.3.

4.2.2 The claimant shall furnish reasonable documentation to support a Contractor Claim. The documentation is to include the following:

- (i) A statement that it is a Contractor Claim and a request for a decision on the Contractor Claim;
- (ii) A detailed description of the act, error, omission, Differing Site Condition, event or other circumstance giving rise to the Contractor Claim; and
- (iii) If the Contractor Claim involves an adjustment to the Contract Sum or Contract Time for Extra Work, a statement demonstrating that a Change Order Request was submitted in a timely manner as required by Article 7.2. If the Contractor Claim does not involve an adjustment to the Contract Sum or Contract Time for Extra Work, a statement demonstrating that a notice of intent to file the Contractor Claim was submitted in a timely manner as required by Article 4.2.2.
- (iv) A detailed justification for any remedy or relief sought by the Contractor Claim, including, without limitation:
 - a. A detailed cost breakdown in the form required for submittal of Change Order Requests and subject to the prohibition in Article 7.2.14 relating to calculations based on total cost methodology.
 - b. Copies of actual job cost records demonstrating that the costs have been incurred.
 - c. If the Contractor Claim is based on an error, omission, conflict or ambiguity in the Contract Documents: (i) a sworn statement by Contractor and any Subcontractors or Sub-subcontractors involved in the Claim, to the effect that the error, omission, conflict or ambiguity was not discovered prior to submission of the Bid, or (ii) if not discovered, a statement demonstrating that the error, omission, conflict or ambiguity could not have been discovered by Contractor, its Subcontractors or Sub-subcontractors in exercise of the degree of care required of them under the Contract Documents for review of the Bid Documents prior to submission of the Bid.
- (v) If the Contractor Claim involves a request for adjustment of the Contract Time, written documentation demonstrating that Contractor has complied with the requirements of the Contract Documents pertaining to proving the right to an extension of time and demonstrating that Contractor is entitled to an extension of time under the Contract Documents.
- (vi) A written certification signed by a responsible managing officer of Contractor's organization, who has the authority to sign subcontracts and purchase orders on behalf of Contractor and who has personally investigated

and confirmed the truth and accuracy of the matters set forth in such certification, in the following form:

I hereby certify under penalty of perjury under the laws of the State of California that I am a managing officer of [Contractor's name] and that I have reviewed the Claim presented herewith on Contractor's behalf and/or on behalf of [Subcontractor's/Sub-subcontractor's name(s)] and that the following statements are true and correct.

(i) The facts alleged in or that form the basis for the Claim are true and accurate; and,

(ii) Contractor does not know of any facts or circumstances, not alleged in the Claim, that by reason of their not being alleged render any fact or statement alleged in the Claim materially misleading; and,

(iii) Contractor has, with respect to any request for money or damages alleged in or that forms the basis for the Claim, reviewed the job cost records (including those maintained by Contractor and by any Subcontractor or Sub-subcontractor, of any Tier, that is asserting all or any portion of the Claim) and confirmed with reasonable certainty that the Losses or damages suffered by Contractor and/or such Subcontractor or Sub-subcontractor were in fact suffered in the amounts and for the reasons alleged in the Claim; and,

(iv) Contractor has, with respect to any request for extension of time or claim of Delay, disruption, hindrance or interference alleged in or that forms the basis for the Claim, reviewed the job schedules (including those maintained by Contractor and by any Subcontractor or Sub-subcontractor, of any Tier, that is asserting all or any portion of the Claim) and confirmed on an event-by-event basis that the delays or disruption suffered by Contractor and/or such Subcontractor or Sub-subcontractor were in fact experienced for the durations, in the manner, and with the consequent effects on the time and/or sequence of performance of the Work, as alleged in the Claim; and,

(v) Contractor has not received payment from District for, nor has Contractor previously released District from, any portion of the Claim.

Signature:

Name:

Title:

Company:

Date:

4.2.3 Notwithstanding the making of any Contractor Claim or the existence of any dispute regarding any Contractor Claim, unless otherwise directed by District, Contractor shall not delay, slow or stop performance of the Work, but shall diligently proceed with performance in accordance with the Contract Documents and District will continue to make payments as required by the Contract Documents.

4.2.4 All Contractor Claims and supporting documentation and certifications must be filed within thirty (30) Days after the Contractor Claim arises. No Contractor Claims shall be filed after the final payment has been issued unless otherwise permitted by law.

4.2.5 All Contractor Claims and supporting documentation must be sent by registered mail or certified mail with return receipt requested.

4.2.6 Time Period for Response.

(i) Upon receipt of a Contractor Claim pursuant to this Section 4.2, the District shall conduct a reasonable review of the claim and, within a period not to exceed forty-five (45) days, shall provide the claimant a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, the District and Contractor may, by mutual agreement, extend the time period provide in this Section 4.2.6(i).

(ii) If the District needs approval from its governing body to provide the claimant with a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the forty-five (45) days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the District shall have up to three (3) days following the next duly publicly noticed meeting of the governing body after the forty-five (45) day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.

(iii) Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the District issues its written statement. If the District fails to issue a written statement, Section 4.2.9 shall apply.

4.2.7 Meet and Confer Conference. If the claimant disputes the District's written response, or if the District fails to respond to a claim issued pursuant to Section 4.2 within the time prescribed, the claimant may demand in writing and an informal conference to meet and confer for settlement of the issue in dispute. Upon receipt

of a demand in writing sent by registered mail or certified mail, return receipt requested, the District shall schedule a meet and confer conference within 30 days for settlement of the dispute.

4.2.8. Mediation.

(i) Within ten (10) business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the District shall provide the claimant a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within sixty (60) days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the District and the claimant sharing the associated costs equally. The District and the claimant shall mutually agree to a mediator within ten (10) business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.

(ii) For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

(iii) Unless otherwise agreed to by the District and the contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Public Contract Code Section 20104.4 to mediate after litigation has been commenced.

(iv) In the event mediation does not resolve the parties' dispute, the parties shall comply with the binding Arbitration provisions set forth in Section 14.4.4 of the Construction Contract.

4.2.9 Failure by the District to respond to a Construction Claim within the time periods described in this subdivision or to otherwise meet the time requirements of this Section 4.2 shall result in the Construction Claim being deemed rejected in its entirety. A Construction Claim that is denied by reason of the District's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.

4.2.10 Amounts not paid in a timely as required by this section shall bear interest at 7 percent (7%) per annum.

4.2.11 If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against the District because privity of contract does not exist, the Contractor may present to the District a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that the Contractor present a claim for work which was performed by the subcontractor or by the lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the claim be presented to the District shall comply with the Agreement, including the General Conditions, and shall furnish reasonable documentation to support the Construction Claim. Within 45 days of the receipt of this written request, the Contractor shall notify the subcontractor in writing as to whether the Contractor presented the claim to the District and, if the Contractor did not present the claim, provide the subcontractor with a statement of reasons for not having done so.

4.2.12 There shall be no waiver of any of the rights set forth in this Section 4.2; provided, however, that (i) upon receipt of a Construction Claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (ii) the District may prescribe reasonable Change Order, Construction Claim, and Dispute Resolution Procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise the timeframes and procedures set forth in Public Contract Code Section 9204.

ARTICLE 5 – SUBCONTRACTORS

5.1 CONTRACTOR'S AWARD OF SUBCONTRACTS

5.1.1 Contractor shall perform, with its own employees, Work amounting to at least 50 percent of the Contract Sum except that any designated "Specialty Items" may be performed by subcontract and the amount of any such "Specialty Items" so performed may be deducted from the Contract Sum before computing the amount required to be performed by Contractor with its own employees. "Specialty Items" are identified in the Bid Documents. Where an entire item is subcontracted, the value of Work subcontracted will, where no prices are provided, be based on the unit price and when a portion of an item is subcontracted, the value of Work subcontracted will be based on the estimated percentage of the unit price. Such percentages will be determined from information submitted by Contractor, and subject to approval by the Construction Manager.

5.1.2 Unless otherwise stated in the Contract Documents, Contractor shall submit in writing, prior to entering into any subcontract agreements, the company name, address, telephone and facsimile numbers, point-of-contact and contractor's license number of all Subcontractors proposed for the Work that are changed from those previously listed in Contractor's Bid. Any Subcontractor may be disqualified if District or the Construction Manager determines that such Subcontractor fails to meet the requirements of the Contract Documents or for any other appropriate reason. If District or the Construction Manager has reasonable objections to a person or entity proposed by Contractor, Contractor shall propose an alternate party to whom District and the Construction Manager have no reasonable objection.

5.1.3 Contractor shall comply with the Subletting and Subcontracting Fair Practices Act, California Public Contract Code, Sections 4100 through 4114. Nothing herein shall be deemed to entitle Contractor, without the written approval of District, to substitute other Subcontractors for those named in Contractor's List of Subcontractors contained in the completed Bid; and, except with such approval, no such substitution shall be made. Should Contractor violate any of the provisions of the Subletting and Subcontracting Fair Practices Act, such violation shall be deemed a violation of the Construction Contract, entitling District, without limitation to any other rights or remedies under the law, to suspend or terminate the Construction Contract.

5.1.4 Except as hereinafter provided, any increase in the cost of the Work resulting from the replacement or substitution of a Subcontractor, shall be borne solely by Contractor and without any adjustment in Contract Sum or Contract Time. However, if a replacement or substitution of any Subcontractor is made as a result of a request of District or the Construction Manager for any reason other than failure of such Subcontractor to meet the requirements of the Contract Documents or a request by Contractor for substitution, the Contract Sum only,

and not the Contract Time, shall be subject to adjustment pursuant to the Change Order provisions of the Contract Documents for the amount of the increase or decrease in the original subcontract amount, with no additional sum for Contractor Markup. In such cases and at the request of District, the replacement Subcontractor shall be selected through a competitive bidding process acceptable to District.

5.1.5 Where a hearing is held pursuant to the provisions of the California Public Contract Code Division 2, Part 1 – Chapter 4 (commencing with Subparagraph 4100), by the awarding authority or a duly appointed hearing officer, District's representative shall prepare and certify a statement of all costs incurred by District for investigation and conduct of the hearing, including the costs of any hearing officer and reporter appointed. The statement shall then be sent to Contractor who shall reimburse District for such costs. If not paid separately, such reimbursement may be deducted from any money due and owing to Contractor.

5.2 SUBCONTRACTUAL RELATIONS

5.2.1 Prior to the execution of each subcontract agreement, Contractor shall make available to each proposed Subcontractor, copies of the Contract Documents to which the Subcontractor will be bound, including the provisions for dispute resolution. Within thirty (30) Days of the Notice To Proceed, Contractor shall provide District with a complete listing of all Subcontractors, which shall include, but not be limited to, the Work contracted for, Subcontractor's name, address, telephone and facsimile numbers, form for doing business (i.e., sole proprietor, corporation, partnership), point-of-contact and Subcontractor's license classification and number.

5.2.2 Any part of the Work performed for Contractor by a first Tier Subcontractor shall be pursuant to a written subcontract. Each such subcontract shall require that the Subcontractor:

- (i) Perform the Work in accordance with the terms of the Contract Documents.
- (ii) Assume toward Contractor all the obligations and responsibilities which Contractor assumes towards District by the Contract Documents.
- (iii) Preserve and protect the rights of District under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights.
- (iv) Waive all rights that the Subcontractor may have against District for damages caused by fire or other perils covered by builder's risk property insurance carried by Contractor or District, except for such rights Subcontractor may have to the proceeds of such insurance held by District under Article 11 of these General Conditions.

(v) Afford District and entities and agencies designated by District the same rights and remedies with respect to access to and the right to audit and the right to copy at District's cost all of the Subcontractor's books, records, contracts, correspondence, instructions, drawings, receipts, vouchers, purchase orders and memoranda relating to the Work and requiring the Subcontractor to preserve all such records and other items for a period of at least three (3) years after Final Completion.

(vi) Recognize the rights of District under Article 5.3, Contingent Assignment of Subcontracts, including, without limitation, District's right to elect to accept assignment of the subcontract and to retain Subcontractor pursuant to the terms of the subcontract, to complete the unperformed obligations under the subcontract and, if requested by District, to execute a written agreement on terms acceptable to District confirming that the Subcontractor is bound to District under the terms of the subcontract.

(vii) Submit Applications for payment, requests for Change Orders and extensions of time and Claims, and to comply with all other notice and submission requirements of the Contract Documents, sufficiently in advance to allow Contractor time to comply with its obligations under the Contract Documents.

(viii) Purchase and maintain insurance in accordance with the requirements of the Contract Documents and reserving the right to Owner to purchase, in its sole discretion, such insurance pursuant to an Owner Controlled Insurance or other form of Wrap-Up Program.

(ix) Defend and indemnify the Indemnitees listed in Article 3.21 on the same terms.

(x) Agree to participate in the dispute resolution procedures specified in the Contract, at the election of District.

5.2.3 Contractor shall promptly, after execution, furnish to District true, complete, and executed copies of all subcontracts, change orders and modifications thereto. Progress payments shall not be made for items of Work for which District has not received executed subcontracts or Change Orders.

5.2.4 Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor and District, except when, and only to the extent that, District elects to accept the assignment of the subcontract with such Subcontractor pursuant to Article 5.3.

5.2.5 District and the Construction Manager shall have the right to communicate with Contractor's Subcontractors and Sub-subcontractors with respect to matters that are related to Contractor's performance of its obligations under the Contract Documents. Contractor shall be provided with

a copy of all such written communications. Such communications shall not create or be interpreted as creating any contractual relationship between District or the Construction Manager and any such Subcontractor or Sub-subcontractor.

5.3 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.3.1 In the event of any suspension or termination of the Construction Contract, Contractor is hereby deemed to have assigned to District all its interest in contracts with Subcontractors now or hereafter entered into by Contractor for performance of any part of the Work. The assignment will be effective upon acceptance by District in writing and only as to those contracts which District designates in writing. District may accept, at its sole election, said assignment at any time during the course of the Work and prior to Final Completion in the event of a suspension or termination of Contractor's rights under the Contract Documents. Such assignment is part of the consideration to District for entering into the Contract with Contractor and may not be withdrawn prior to Final Completion.

ARTICLE 6 -
CONSTRUCTION BY DISTRICT OR BY SEPARATE CONTRACTORS

6.1 DISTRICT'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 District reserves the right to award separate contracts for, or to perform with its own forces as provided for by law, construction or operations related to the Work or other construction or operations at or affecting the Site, including portions of the Work which have been deleted by modification. Contractor shall cooperate with District's forces and Separate Contractors.

6.1.2 District shall provide coordination of the activities of District forces and of each Separate Contractor with the Work of Contractor. Contractor shall participate with District and Separate Contractors in joint review of construction schedules and Project requirements when directed to do so. Contractor shall make necessary revisions to the Construction Schedule after such joint review.

6.1.3 Without limitation upon any of the rights or remedies of District under the Contract Documents or under law arising from a default by Contractor, in the event that Contractor fails to have personnel on Site to supervise the Work, District shall have the right, in its sole discretion, but not the responsibility, upon twenty-four (24) hours' telephonic notice to Contractor, to provide such supervision on a temporary basis. Contractor shall, notwithstanding District's providing such temporary supervision, remain solely responsible for all actions of its personnel and Subcontractors and shall defend and indemnify District in accordance with Article 3.21 against any Losses arising therefrom. District shall have the right, in its discretion, to deduct from the sums owing to Contractor the reasonable cost of such temporary supervision.

6.2 MUTUAL RESPONSIBILITY

6.2.1 Contractor shall be responsible for affording Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities. Contractor shall schedule and coordinate its construction and operations with the construction and operations of Separate Contractors as required by the Contract Documents.

6.2.2 If a portion of the Work is dependent upon the proper execution or results of other construction or operations by Separate Contractors, Contractor shall inspect such other construction or operations before proceeding with that portion of the Work. Contractor shall promptly report to District apparent discrepancies or defects which render the other construction or operations unsuitable to receive the Work. Unless otherwise directed by District, Contractor shall not proceed with the portion of the Work affected until apparent discrepancies or defects have been corrected. Failure of Contractor to so report within a reasonable time after discovering such discrepancies or defects shall constitute an acknowledgment

that the other construction or operations by District or Separate Contractors is suitable to receive the Work, except as to defects not then reasonably discoverable.

6.2.3 In the event of Delays, improperly timed activities or Defective Work, the costs of such occurrences shall be borne by the party responsible therefore.

6.2.4 If Contractor wrongfully causes damage to completed or partially completed construction or to property of District or Separate Contractors, Contractor shall promptly remedy damage.

6.2.5 If a dispute, or other matters in question arise between Contractor and a Separate Contractor, these occurrences shall be subject to the provisions of Section 14 (Dispute Resolution) of the Construction Contract. Contractor shall immediately notify the Construction Manager in writing and within seventy-two (72) hours of such occurrences.

6.3 DISTRICT'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises between Contractor and Separate Contractors as to the responsibility under their respective contracts for maintaining the Site and surrounding areas free from waste materials and rubbish, District may clean up and allocate the cost between those firms it deems, in its sole discretion, to be responsible.

ARTICLE 7 – CHANGES

7.1 CHANGES

7.1.1 District may, at any time and without notice to Contractor's sureties, order Changes in the Work without invalidating the Construction Contract and without relieving sureties of their obligations to District.

7.1.2 District shall be entitled to a deductive adjustment in the Contract Sum for Changes that involve Deleted Work that result in a reduction in the cost of Contractor's performing the Work and shall be entitled to an adjustment reducing the Contract Time for Deleted Work that results in Contractor's being able to complete the Work earlier than the Contract Time.

7.1.3 Unless such rights have been waived and provided that Contractor has complied with the requirements of the Contract Documents with respect to, without limitation, complete and timely submission of all notices, requests and supporting documentation, Contractor shall be entitled to an additive adjustment to the Contract Sum for Changes that involve Extra Work and an adjustment extending the Contract Time for Delays for which Contractor is entitled under the Contract Documents to an extension of time.

7.1.4 District shall have the right to require performance of Changes that result in Extra Work on a lump sum basis, a unit price basis or a time and material basis, all as hereinafter more particularly described.

7.1.5 Changes may be ordered by District or the Construction Manager in writing by issuance of an agreed or unilateral Change Order or a Field Order. Contractor shall not be entitled to an adjustment of the Contract Sum or Contract Time for Changes that are not authorized by a Change Order or Field Order signed by District or Construction Manager. It is of essence to this agreement that all Changes in the Work that are the basis of an adjustment to the Contract Sum or Contract Time must be authorized in advance, in writing, by District or Construction Manager. Accordingly, no verbal directions, course of conduct between the parties or express or implied Acceptance of Changes or Work, and no claim that the Owner has been unjustly enriched (whether or not there has been such enrichment) shall be the basis for an adjustment to the Contract Sum or Contract Time if Contractor has not obtained advance written authorization to perform the Change in the manner required by this provision.

7.1.6 District reserves the absolute right to make whatever Changes that it determines in its sole discretion are necessary and in its best interests and under no circumstances shall the number (individual or cumulative value) or scope of Changes become a basis for Contractor to claim that the Construction Contract has been rescinded, terminated, abandoned or should be reformed nor shall such circumstances be the basis for Contractor, or any Subcontractor or Sub-subcontractor, of any Tier, to recover any compensation or damages not

permitted by, or in excess of that allowed under, the Contract Documents.

7.1.7 District shall have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order, and shall be binding on District and Contractor. Contractor shall carry out such written orders promptly.

7.2 CHANGE ORDERS AND CHANGE ORDER REQUESTS

7.2.1 Contractor may request adjustments to the Contract Sum or Contract Time if, and only if, Contractor follows the procedures specified in the Contract Documents, including, without limitation, the procedures set forth in this Article 7.2. If requested by District or Construction Manager, or if Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Time due to Extra Work, Contractor shall submit to District and the Construction Manager a Change Order Request in writing within seven (7) Days after the occurrence of the circumstances giving rise thereto setting forth the circumstances that are the basis of the Change and Contractor's estimate of the additional Allowable Costs associated with the Extra Work in the form required by the General Conditions, Special Provisions and Technical Specifications and Contractor's proposed adjustments of the Contract Sum and the Contract Time, if any, for performing the Extra Work. If Contractor's Change Order Request includes a request for adjustment to the Contract Time, it shall include such information as required by the General Conditions and/or Special Provisions and Technical Specifications, including but not limited to a "Fragnet" or "time impact analysis," which identifies all critical and non-critical activities affected by the Change Order Request and showing logic ties into all existing affected activities noted on the latest approved, updated Construction Schedule.

7.2.2 In the event that the parties are unable to agree as to the reasonable cost and time to perform a Change to the Work based upon Contractor's Change Order Request and District does not elect to have the Change in the Work performed on a time and material basis, District may, in its discretion, either order performance of the Work by Field Order or make a unilateral determination of the reasonable additions or savings in cost and time attributable to the Change in the Work, based upon District's estimate, Contractor's submission or a combination thereof. A Change Order shall be issued for the amounts of cost and time determined by District and shall be promptly performed by Contractor. District's unilateral determination shall become binding upon Contractor unless Contractor submits a Contractor Claim in writing to District within twenty-one (21) Days of the issuance of the Change Order. No dispute, disagreement, nor failure of the parties to reach agreement regarding the amount, if any, of any adjustment to the Contract Sum or Contract Time due to a Change in the Work, shall relieve Contractor from the obligation to proceed with performance of the Work, including, without limitation, performance of the Change, promptly and expeditiously.

7.2.3 Changes involving Extra Work that District elects to have performed on a time and material basis shall be performed, whether by Contractor's forces or the forces of Subcontractors or Sub-Subcontractors, based on actual Allowable Costs in performing the Change in the Work and with mark-ups in accordance with Section 7.3 of the Contract. Contractor shall submit on a daily basis to the Construction Manager daily time and material tickets to include the identification number assigned to the Change; the location and description of the Change; the classification of labor employed (and names and social security numbers if requested); the materials used; the equipment rented (not tools); and such other evidence of cost as the Construction Manager may require. The Construction Manager may require authentication of all time and material tickets and invoices by persons designated by the Construction Manager for such purpose. The failure of Contractor to secure any required authentication shall, if District elects to treat it as such, constitute a waiver by Contractor of any right to adjustment of the Contract Sum for the cost of all or that portion of the Extra Work covered by a non-authenticated ticket or invoice. The adjustment to the Contract Sum for the Extra Work will be based on the accumulation of Allowable Costs as provided in Article 7.2.5 below. It is Contractor's responsibility to review the Change Order Request invoicing of Contractor and Subcontractors and Sub-subcontractors for accuracy of Subcontractor Markups as defined in Section 7.3 (Compensation to Contractor) of the Construction Contract.

7.2.4 Adjustments to the Contract Sum for Changes for which Contractor is entitled to an adjustment of the Contract Sum by Change Order shall be computed at District's sole election on the basis of one or more of the following:

- (i) Unit prices stated in the Contract Documents or agreed upon by District and Contractor, which unit prices shall be deemed to include Contractor Markup and Subcontractor/Sub-subcontractor Markups permitted by Section 7.3 (Compensation for Extra or Deleted Work) of the Construction Contract.
- (ii) A lump sum agreed upon by District and Contractor, based on the estimated Allowable Costs and Contractor Markup and Subcontractor/Sub-Subcontractor Markup computed in accordance with Section 7.3 (Compensation for Extra or Deleted Work) of the Construction Contract.
- (iii) Contractor's Allowable Costs, plus Contractor Markup and Subcontractor/Sub-subcontractor Markups applicable to such Extra Work computed in accordance with Section 7.3 (Compensation for Extra or Deleted Work) of the Construction Contract.

7.2.5 Allowable Costs shall mean only those costs listed in, and substantiated and documented in accordance with, this provision and that are not disallowed pursuant to Articles 7.2.6, 7.2.11 or other provisions of the Contract Documents. Allowable Costs are the actual costs necessarily incurred by Contractor and all

Subcontractors and Sub- subcontractors, of every Tier, that actually perform the Extra Work caused by the Change(s) and that are incurred in the direct performance of the Extra Work or that are saved by reason of Deleted Work, and are strictly limited to the following:

.1 Labor. The actual straight-time (and the premium time portion of overtime, if approved in writing in advance by District or the Construction Manager) wages or salaries for employees employed at the Site, or at fabrication sites off the Site, plus employer payments collectively referred to as "Fringe Benefits and Payroll Taxes," of payroll, taxes and insurance, health and welfare pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. The use of a labor classification, which would increase the Allowable Costs will not be permitted unless Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be payable under this provision only when such costs are not included in the invoice for equipment rental.

.2 Material. The cost of materials and consumable items which are furnished and incorporated into the Work at invoice or lowest current price at which such materials are locally available and delivered to the Site in the quantities involved, plus sales tax, freight and delivery. District reserves the right to approve materials and sources of supply, or to supply materials to Contractor, if necessary, for the Work. No markup shall be applied to any material provided by District. Material re-stocking charges shall be limited to 5% of the amount of material. All discounts, rebates and refunds from the sale of surplus materials and consumable items shall accrue to District, and Contractor shall make provision so that they may be obtained.

.3 Tool and Equipment Rental. Rental charges for necessary machinery and equipment, whether owned or hired, as authorized in writing by District or the Construction Manager, exclusive of hand tools. No payment will be made for the use of tools that have a replacement value of \$500 or less. When the equipment is owned by Contractor, the rental rate shall be as listed for such equipment in the California Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates," which is in effect on the date the Work is accomplished. When equipment is not listed in said publication, the rate to be paid shall be as herein defined, or a suitable rental rate for such equipment will be established by the Construction Manager. Regardless of ownership, the rates to be used in determining equipment rental cost shall not exceed listed rates prevailing locally at equipment rental agencies or distributors at the time the work is performed. The rental rates paid shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance and all incidentals. If equipment is used intermittently, when not in use it shall be returned to its rental source unless Contractor elects to keep it at the Site at no expense to District.

The reported rental time for equipment already at the Site shall be the duration of its use on the Extra Work, commencing at the time it is first put into actual operation on the Extra Work, plus the time required to move it from its previous site and back, or to a closer site.

.4 Royalties and Permits. Costs of royalties and permits solely related to the Extra or Deleted Work.

.5 Insurance and Bonds. Additional costs of insurance and bonds, not to exceed two percent (2%) of the total of Parts .1 through .4, above.

7.2.6 Extra Work Costs shall not include any of the following, which are construed to be included in Contractor's Markup:

- (i) Superintendent(s).
- (ii) Assistant Superintendent(s).
- (iii) Project Engineer(s).
- (iv) Project Manager(s).
- (v) Scheduler(s).
- (vi) Estimator(s).
- (vii) Drafting or detailing.
- (viii) Small tools (with a replacement value under \$500).
- (ix) Home or field office expenses, including staff, materials, and supplies.
- (x) Trailer or storage rental and expense, whether on the Site or off the Site.
- (xi) Data processing personnel and equipment.
- (xii) Site fencing.
- (xiii) Utilities, including, without limitation, gas, electric, sewer, water, telephones.
- (xiv) Telephone, facsimile, e-mail and copier.
- (xv) Overhead, administrative, or general expenses of any kind.
- (xvi) Loss of efficiency or productivity, or other impact cost due to the effect of the Extra Work on the performance of other Work or the Work of other trades

on the Project.

(xvii) Capital expenses, including interest on capital employed in connection with Extra Work.

(xviii) Legal costs.

(xix) Federal, State, or local income and franchise taxes.

(xx) Profit.

(xxi) Any Extra Work Costs incurred more than twenty (20) Days prior to submission by Contractor of its Change Order Request pursuant to Article 7.2.1.

(xxii) Cost of any item not specifically and expressly included in the items described in Article 7.2.5.

7.2.7 The term "Contractor Markup" shall mean the full amount of compensation for all costs and expenses including overhead and profit not included in the Allowable Costs, whether or not referred to in Article 7.2.5. Contractor Markup shall be computed as provided in Section 7.3 (Compensation for Extra or Deleted Work) of the Construction Contract.

(i) For Work to be omitted by Change Order, the reduction of the Contract Sum shall be computed on the basis of one or more of the following: Unit prices stated in the Contract Documents or agreed upon by District and Contractor.

(ii) A lump sum agreed upon by District and Contractor, based upon the estimated Allowable Costs that would have been incurred in performing the Deleted Work, plus Contractor Markup provided for in the Construction Contract.

(iii) A sum unilaterally determined by District, if District and Contractor cannot agree upon one or both of the methods described in paragraphs (i) or (ii), above.

7.2.8 No Contractor Claim for adjustment of the Contract Sum shall be allowed if asserted after final payment under the Construction Contract.

7.2.9 If anyone Change involves both Extra Work and Deleted Work in the same portion of the Work, the Contractor Markup to be added or credited will be based on the net difference between amount allowed for the Extra Work and Deleted Work.

7.2.10 The Contract Sum will be adjusted for Delay only if and to the extent allowed by the Contract for Compensable Delay. Contractor agrees to accept such adjustments in its compensation as its sole and exclusive remedy and

recovery for Delay, disruption, hindrance, interference, loss of productivity, labor or material cost escalations, inefficiency, acceleration, impact costs associated with the effect of the Changes on the Work, extended or extraordinary overhead (direct or indirect) or other Losses or damages due to Delay, of any kind.

7.2.11 District has the right to increase or decrease the quantity of any unit price item for which an estimated quantity is stated in the Bid Documents.

7.2.12 The signing of a Change Order indicates that the parties have reached a full resolution, settlement and accord and satisfaction with respect to all Contractor Claims for cost and extensions of time that were asserted, or that could have been asserted, in connection with the Change, whether known or unknown at the time of execution of the Change Order, and that are related to the subject matter of the Change Order, including, without limitation, all Contractor Claims, costs or damages for Delay, disruption, hindrance, interference, extended or extraordinary direct and indirect overhead, multiplicity of Changes, loss of productivity, labor or material cost escalations, inefficiency, the impact of the Change on the Work, legal expenses, consultant costs, interest, lost profits or revenue, bond or insurance costs, currency fluctuations, changes in taxes or other related Claims, costs or damages. Change Orders shall be executed by Contractor without any express reservation of rights by Contractor to reserve for the future the right to assert or recover from District any such Claims, costs or damages.

7.2.13 Contractor's cost breakdowns submitted with its Change Order Requests (including, without limitation, requests for cost reimbursement for Delay, disruption, hindrance and interference associated with extras, Changes, additions or deletions) shall be itemized in a manner that, with mathematical certainty and without reliance upon probabilities or inferences, segregates the direct, actual reimbursable costs associated with each individual extra, Change, addition, deletion and (on an event-by-event basis) each individual Delay or disruption event. Change Order Requests shall not be based, in whole or in part, upon any methodology (such as total cost or modified total cost methodologies) that purports to calculate Contractor's additional costs of performance of the extra, Change, addition or deletion (including, without limitation, the additional costs of Delay, disruption or other impact) based on the difference between Contractor's total actual Project or line item costs and its original bid estimate for the Project or any original bid estimate line item. In connection with the foregoing, Contractor represents and warrants that it has the ability to generate and maintain complete and accurate cost accounting records that will reflect:

- (i) The actual Allowable Costs incurred or saved for each individual item of Extra Work or Deleted Work; and
- (ii) On an event-by-event basis, the effect of each Delay that forms the basis of each request for extension of time, regardless of their scope, number,

complexity, cumulative effect or time of issuance or occurrence.

7.2.14 As a further condition of Contractor's right to an adjustment of the Contract Sum for Extra Work, Contractor must keep daily, detailed and accurate records itemizing each element of Extra Work Cost and shall provide substantiating records and documentation, including time cards, invoices and delivery tickets listing all labor, materials, and equipment involved for that day. Failure to submit such records daily shall waive any rights for recovery of Allowable Costs for that day. Such records and documentation shall be submitted to and Approved by Construction Manager on a daily basis.

7.3 FIELD ORDERS

7.3.1 Upon receipt of a Field Order, Contractor shall, within a reasonable time, proceed with the Work described in the Field Order. If the Field Order involves Extra Work and sets forth a determination for adjustment of the Contract Sum or Contract Time with which Contractor disagrees, Contractor shall advise District of its agreement or disagreement in writing within seven (7) Days of such receipt. Failure by Contractor to provide such written notice shall result in its waiving any right to adjustment of the Contract Sum or Contract Time on account thereof.

7.4 DISPUTES REGARDING CHANGES

7.4.1 Provided that District pays to Contractor all undisputed sums due under the Contract Documents for Work performed under Change Orders, Contractor shall not delay, slow, interrupt, or suspend the performance of any Work or any Change because of a dispute between the parties with respect to an adjustment in the Contract Sum or Contract Time.

ARTICLE 8 – CONTRACT TIME

8.1 COMMENCEMENT OF THE WORK

8.1.1 Commencement of the Work shall begin on the date specified in the Notice to Proceed.

8.2 PROGRESS AND COMPLETION

8.2.1 By signing the Contract, Contractor represents to District that the Contract Time is reasonable for performing the Work and that Contractor is able to perform the Work within the Contract Time.

.1 The Construction Schedule may reflect a period of performance that is shorter than the Contract Time; provided however, that the difference shall be deemed as float and nothing in this provision or in any other provision of the Contract Documents shall be construed as creating any contractual right, express or implied, on the part of Contractor to finish the Project earlier than the Contract Time and under no circumstances shall District be liable to Contractor for any costs, damages or compensation due to the inability of Contractor to complete the Work earlier than the Contract Time, regardless of the cause, including, without limitation, acts or omissions (intentional or negligent) of District.

.2 Contractor has included in its Bid price the costs of all Contractor and Subcontractor overhead (direct and indirect) and Special Provisions and Technical Specifications, including but not limited to all Project staff, temporary facilities, temporary utilities, and home office overhead for the entire duration of the Contract Time. The above costs must be included in Contractor's Bid notwithstanding Contractor's anticipation of completion in fewer days than established by the Contract Time.

.3 No increase in the Contract Sum shall be made or granted for Compensable Delay if, for any reason including but not limited to Delay caused by District, Contractor completes the Work before expiration of the Contract Time.

.4 No reduction in the Contract Sum shall be made nor will Contractor be required to remain on the Project Site if the Work is completed before expiration of the Contract Time.

.5 The Construction Manager will schedule and hold weekly progress meetings and other meetings as determined by the Construction Manager. Contractor and/or Contractor's designee shall be present at each meeting. Contractor may also be required to request attendance by representatives of its suppliers, manufacturers and Subcontractors.

8.2.2 Except by agreement or instruction of District in writing, Contractor shall not commence operations on the Site or elsewhere prior to the effective date of

insurance required by Article 11 to be furnished by Contractor. Contractor's obligations to commence the Work and to complete the Work within the Contract Time shall not be changed by the effective date of such insurance.

8.2.3 Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time. If District determines and notifies Contractor that Contractor's progress is such that Contractor will not complete the Work within the Contract Time, Contractor shall, immediately and at no additional cost to District, take all measures necessary, including working such overtime and additional shifts (other than District's normal working hours of 7:00 AM to 6:00 PM, Monday through Friday and 9:00 AM to 5:00 PM on Saturday), to ensure that the Work is Substantially Completed within the Contract Time. Upon receipt of such notice from District, Contractor shall immediately respond in writing setting forth a detailed plan for accelerating the Work in a manner acceptable to District. Contractor shall not be entitled to any reimbursement or payment of costs, expenses or damages incurred as a result of an acceleration of the Work that is performed pursuant to this provision. District may also take all necessary measures to ensure no further Delays to the Substantial Completion of the Work within the Contract Time. Contractor shall reimburse District, or District may withhold from payment due to Contractor, sums expended by District to perform such measures.

8.2.4. During unfavorable weather, wet ground or other unsuitable construction conditions, Contractor shall confine the operations to Work that will not be affected adversely by such conditions. No portion of the Work shall be constructed under conditions which would affect adversely the quality thereof or be detrimental to the quality of water discharges, unless special means or precautions are taken by Contractor to perform the Work in a proper and satisfactory manner.

8.3 DELAY

8.3.1 Contractor may make a Contractor Claim for an extension of the Contract Time, for an Excusable Delay or a Compensable Delay, subject to the following:

.1 In order to avoid double counting concurrent Delays, if an Excusable Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of days from the commencement of the first Delay to the cessation of the Delay which ends last.

.2 If an Unexcused Delay occurs concurrently with either an Excusable Delay or a Compensable Delay, the maximum extension of the Contract Time shall be the number of Days, if any, by which the Excusable Delay or the Compensable Delay exceeds the Unexcused Delay.

.3 If an Unexcused Delay occurs concurrently with both an Excusable Delay and a Compensable Delay, the maximum extension of the Contract Time shall

be the number of Days, if any, by which the number of Days determined pursuant to Article 8.3.1.2 exceeds the number of Days of the Unexcused Delay.

8.3.2 As a condition precedent to Contractor's right to an extension of Time adjusting the Contract Time and the Contract Sum for Compensable Delay, it must provide written notice to District within seven (7) Days of the date that Contractor learned of the Delay or should have learned of the Delay in exercise of diligence and reasonable care, setting forth:

- (i) A description of the Delay;
- (ii) A statement that the Delay is critical to completion; and
- (iii) The probable effect of the Delay in terms of the number of Days' extension Contractor believes are required to the Contract Time.

It is agreed that the form, content and timeliness of the written notice required by Article 8.3.2 is of the essence to District's ability to adequately monitor the progress of the Work, to differentiate between critical and non-critical Delays, and to prioritize its actions in a manner that is appropriately targeted to mitigate the effect of delays. Accordingly, Contractor agrees that failure to provide written notice in the manner required by Article 8.3.2 shall be conclusively deemed a waiver of the right to an adjustment of the Contract Sum and Contract Time on account thereby, regardless of whether the circumstances of the Delay may have been known or suspected by District or the Construction Manager and that no other form of notice (including, without limitation, meeting minutes, log entries or schedule updates) shall suffice as constituting notice to District in accordance with Article 8.3.2.

8.3.3 For a Compensable Delay, Contractor shall be entitled to an adjustment in the Contract Sum in a daily amount equal to Contractor's per diem amount as stated in the Contract multiplied by the number of Days of extension for Compensable Delay, if any, permitted under the Contract Documents. Such per diem amount shall be Contractor's sole and exclusive right and compensation to cover all costs and damages to Contractor and to its Subcontractors and Sub-subcontractors, of every Tier, for Compensable Delays and all other Claims for costs, acceleration, expenses, Losses, damage or compensation, of any kind, for additional supervision, administration, extended or extraordinary overhead (direct or home office), additional insurance or bond costs, loss of productivity, inefficiency, labor, wage, material or equipment escalation, or other costs, expenses or damages due to Delay, interruption, hindrance, compression, disruption, or the impact or ripple effect of Delays on the Work, are conclusively waived.

8.3.4 The parties agree that District's exercise of its rights to order Changes, whether or not resulting in Extra Work, regardless of the extent and number of

Changes, or to suspend the Work, is within the contemplation of the parties.

8.3.5 The determination of whether a Delay is an Excusable Delay, Compensable Delay or Unexcused Delay shall not be affected by the fact that any earlier Delay occurred, regardless of fault or causation.

8.3.6 All time limits stated in the Contract Documents are of the essence.

ARTICLE 9 – PAYMENTS AND COMPLETION

9.1 SCHEDULE OF VALUES

9.1.1 Within thirty (30) Days after signing the Contract, but in any event a maximum of ten (10) Days of receipt of the Notice to Proceed, Contractor shall submit to District through the Construction Manager a Schedule of Values reflecting cost breakdown of the Contract Sum in a form approved by the Construction Manager. The Schedule of Values shall itemize as separate line items the cost of each scheduled Work activity and all other costs, including warranties, Record Documents, insurance, bonds, overhead and profit, the total of which shall equal the Contract Sum and shall be made out in a form approved by the Construction Manager. The Schedule of Values, when approved by District, shall become the basis for determining the cost of Work requested on Contractor's Applications for Payment. Contractor shall submit a statement based upon this breakdown, and if required, itemized in such form and supported by such evidence as the Construction Manager may direct, showing Contractor's right to the payment claimed.

9.2 PROGRESS PAYMENT

9.2.1 Subject to District's right of withholding under Article 9.4.2, District agrees to pay to Contractor within thirty (30) Days of receipt of an undisputed and properly submitted Application for Payment an amount equal to ninety-five percent (95%) of the sum of the following:

- (i) Construction Manager's determination of the value, expressed as a percentage of the Contract Sum, of the Work in permanent place that has been tested as of the end of the preceding month.
- (ii) Plus Construction Manager's determination of the value of materials suitably stored but not yet incorporated into the Work, subject to Article 9.3.6.
- (iii) Less amounts previously paid.

9.2.2 At any Time after 50% of the Work has been determined by District to be completed, if District determines in its sole discretion that satisfactory progress on the Work is being made, District may, in its sole discretion, make any of the remaining progress payments in accordance with the calculation in Article 9.2.1 based on 100% of District's determination of the value of the Work in place and of stored materials not incorporated.

9.2.3 Progress payments shall not be construed as District's Acceptance of any or all of the Work and shall not be a waiver of any or all rights District has under the Contract Documents.

9.3 APPLICATION FOR PAYMENT

9.3.1 At the end of each month, Contractor shall submit to District an itemized Application For Payment, requesting payment for Work as of the end of that month that is calculated in accordance with the formula for payment set forth in Article 9.2.1. The Application For Payment shall be prepared:

- (i) Utilizing the format as designated by District or the Construction Manager.
- (ii) Itemized in accordance with the Schedule of Values.
- (iii) Including such data substantiating Contractor's right to payment as District may reasonably require, such as invoices, certified payrolls, daily time and material records, and, if securities are deposited in lieu of retention pursuant to Article 9.5, a certification of the market value of all such securities as of a date not earlier than five (5) Days prior to the date of the Application For Payment.
- (iv) Showing itemized amounts for Change Orders, Modifications and retention.

9.3.2 Applications For Payment shall not include requests for payment on account of Changes which have not been authorized by Change Orders or amounts Contractor does not intend to pay a Subcontractor because of a dispute or other reason.

9.3.3 If required by District, an Application For Payment shall be accompanied by all of the following:

- (i) A summary showing payments that will be made to Subcontractors covered by such application.
- (ii) Conditional waivers and releases of claims and stop notices from Contractor and each Subcontractor and Sub-subcontractor, of every Tier, listed in the current Application For Payment covering sums requested in the current Application For Payment.
- (iii) Unconditional waivers and releases of claims and stop notices, from Contractor and each Subcontractor and Sub-subcontractor, of every Tier, listed in the preceding Application For Payment covering sums disbursed pursuant to that preceding Application For Payment.

9.3.4 Contractor warrants that, upon submittal of an Application For Payment, all Work for which Certificates For Payment have been previously issued and payment has been received from District, shall be free and clear of all claims, stop notices, security interests and encumbrances in favor of Contractor, Subcontractors, Sub-subcontractors, of every Tier, or other persons or firms entitled to make claims by reason of having provided labor, materials or equipment relating to the Work.

9.3.5 The making of final payment shall constitute a waiver of all Claims by District except those arising from unsettled liens, faulty or Defective Work, failure of the Work to comply with the requirements of the Contract Documents or terms of any special guarantees required by the Contract Documents.

9.3.6 At the sole discretion of District, the Construction Manager may approve for inclusion in Contractor's Application For Payment the cost of materials to be incorporated in the Work but not yet incorporated in the Work and already delivered and suitably stored either at the Site or at some other appropriate location acceptable to District. In such case, Contractor shall furnish evidence satisfactory to District:

- (i) Of the cost of such materials.
- (ii) That such materials are under the exclusive control of Contractor, or if not, that title to the materials is in District, free of any lien or encumbrance and that the materials are safely and suitably stored in a bonded warehouse with appropriate insurance coverage satisfactory to District to cover any Loss.

Any payment pursuant to this provision shall not be construed as an inspection or acceptance of the materials nor shall it relieve Contractor of its continuing and sole responsibility for the care and protection of such materials nor shall it relieve Contractor from sole responsibility for any loss or damage to the materials from any cause whatsoever nor act as a waiver of the right of District to require strict fulfillment by Contractor with all terms of the Contract Documents.

9.3.7 District shall have the right, in its sole discretion, to make payments of monies owing to Contractor by means of direct payment to Subcontractors or Sub-subcontractors, of any Tier of any unpaid work performed by any Subcontractor or Sub-subcontractor of any Tier, or by joint payment to Contractor and to Subcontractors or Sub-subcontractors, of any Tier. The making of such payments shall not be construed as the assumption of any obligation on the part of District or as creating any contractual relationship between District and any Subcontractor or Sub-subcontractor and shall not relieve Contractor of any of its obligations under the Contract Documents.

9.4 CERTIFICATE FOR PAYMENT

9.4.1 If Contractor has made an Application For Payment in accordance with Article 9.3, the Construction Manager will, not later than seven (7) Days after the date of receipt of an Application For Payment prepared and submitted in accordance with the Contract Documents, issue to District, with copy to Contractor, a Certificate For Payment in such amount as the Construction Manager determines is due.

If Construction Manager determines that Contractor's Application For Payment

has not been properly prepared or submitted, then Construction Manager, within the seven (7) Day period provided for in Article 9.4.1, notify Contractor in writing of the reasons why the Application for Payment is being rejected.

9.4.2 Approval of all or any part of an Application For Payment may be withheld, a Certificate For Payment may be withheld or all or part of a previous Certificate For Payment may be nullified and that amount withheld from a current Certificate For Payment in order to protect District against actual or threatened loss as a result of any of the following:

- (i) Defective Work not remedied.
- (ii) Third-party claims against Contractor or District arising from the acts or omissions of Contractor, Subcontractors, or Sub-subcontractor, of any Tier.
- (iii) Stop notices.
- (iv) Failure of Contractor to make timely payments due Subcontractors for material or labor.
- (v) A reasonable doubt that the Work can be completed for the balance of the Contract Sum then unpaid.
- (vi) Damage to District or Separate Contractor for which Contractor is responsible.
- (vii) Reasonable evidence that the Work will not be completed within the Contract Time.
- (viii) Failure of Contractor to maintain and update As-Built or Record Documents.
- (ix) Failure of Contractor to submit schedules, reports, or their updates as required by the Contract Documents.
- (x) Performance of Work by Contractor without approved Submittals.
- (xi) Liquidated or actual damages assessed in accordance with the Construction Contract.
- (xii) Any other failure of Contractor to perform an obligation under the Contract Documents.

9.4.3 Subject to the withholding provisions of Article 9.4.2 and when any or all of the noted deficiencies or others have been removed, District shall pay Contractor the amount set forth in the Certificate For Payment in accordance

with its normal disbursement procedures.

9.4.4 Neither District nor the Construction Manager shall have an obligation to pay or to see to the payment of money to a Subcontractor or Sub-subcontractors, of any Tier, except as may otherwise be required by Law.

9.4.5 Neither a Certificate for Payment nor any payment (progress or final) shall be construed as a waiver of any rights arising from Defective Work.

9.5 DEPOSIT OF SECURITIES IN LIEU OF RETENTION AND DEPOSIT OF RETENTION INTO ESCROW

9.5.1 At the request and expense of Contractor, a substitution of securities may be made as found in the California Government Code, Section 16430, and as authorized by the California Public Contract Code, Section 22300, in lieu of monies retained by District under Article 9.2 to ensure performance under the Contract Documents. Securities equivalent in value to the retention amount required by the Contract Documents for each Certificate For Payment shall be deposited by Contractor with a state or federally chartered bank in the State of California ("Escrow Agent"), which shall hold such securities pursuant to the escrow agreement referred to in Article 9.5.3 until final payment is due in accordance with Article 9.8. Securities shall be valued as often as conditions of the securities market warrant, but in no case less than once per month. Contractor shall deposit additional securities so that the current market value of the total of all deposited securities shall be at least equal to the total required amount of retention.

9.5.2 Alternatively to Article 9.5.1, and at the request and expense of Contractor, District shall deposit retention directly with the Escrow Agent. Contractor may direct the investment of such deposited retention into interest bearing accounts or securities, and such deposits or securities shall be held by the Escrow Agent upon the same terms provided for securities deposited by Contractor.

9.5.3 A prerequisite to the substitution of securities in lieu of retention or the deposit of retention into escrow shall be the execution by Contractor, District, and the Escrow Agent of an Escrow Contract for Deposit of Securities in Lieu of Retention and Deposit of Retention forms provided by District. The terms of such escrow agreement are incorporated into the requirements of Article 9.5.

9.5.4 Release of funds or securities from escrow shall be made with Contractor's final payment.

9.6 BENEFICIAL OCCUPANCY / BENEFICIAL USE

9.6.1 District reserves the right, at its option and convenience, to occupy or

otherwise make use of all or any part of the Work, at any time prior to issuing the Certificate of Substantial Completion, upon thirty (30) Days' notice to Contractor. Such occupancy or use is herein referred to as "Beneficial Occupancy/Use." Beneficial Occupancy/Use shall be subject to the following conditions:

.1 District, Design Consultant and Construction Manager will make an inspection of the portion of the Work to be beneficially occupied and prepare a list of items to be completed or corrected prior to Substantial Completion.

.2 Beneficial Occupancy/Use by District shall not be construed by Contractor as Acceptance by District of that portion of the Work which is to be occupied. District may, however, at its sole option, relieve Contractor of Contract requirements to protect Work being beneficially occupied by District where such relief is specifically designated by District in writing.

.3 Beneficial Occupancy/Use by District shall not constitute a waiver of existing Claims of District or Contractor against each other.

.4 Contractor shall provide, in the areas beneficially occupied and on a continual basis (if required), utility services, heating, and cooling for systems which are in operable condition at the time of Beneficial Occupancy/Use. All responsibility for the operation and maintenance of equipment shall remain with Contractor while the equipment is so operated. Contractor shall submit to District an itemized list of each piece of equipment so operated with the date operation commences.

.5 The Guarantee to Repair Periods, as defined in Article 12.2, will commence upon the first dates of actual occupancy or use of portions of the Work actually occupied and equipment or systems fully utilized.

.6 District shall pay all normal operating and maintenance costs resulting from its use of equipment in areas beneficially occupied.

.7 District shall pay all utility costs which arise out of the Beneficial Occupancy/Use.

.8 Contractor shall not be responsible for providing security in areas beneficially occupied or used.

.9 District shall use its best efforts to prevent its Beneficial Occupancy/Use from interfering with the conduct of Contractor's remaining Work.

.10 Contractor shall not be required to repair damage caused by District in its Beneficial Occupancy/Use.

.11 Except as provided in Article 9.6, there shall be no added cost to District due to Beneficial Occupancy/Use.

.12 Contractor shall continue to maintain all insurance required by the Contract in full force and effect.

9.7 SUBSTANTIAL COMPLETION

9.7.1 When Contractor gives notice to District that the Work, or portion thereof designated by District for separate delivery, is Substantially Complete, unless District determines that the Work or designated portion thereof is not sufficiently complete to warrant an inspection to determine Substantial Completion, District will inspect the Work, or such designated portion thereof, and prepare and give to Contractor a comprehensive list of items, if any, to be completed or corrected before establishing Substantial Completion. Contractor shall promptly proceed to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of Contractor to complete all Work in accordance with the Contract Documents. District will then make a further inspection to determine whether the Work or such designated portion thereof is Substantially Complete. If District's inspection discloses any item, whether or not included on the list, which must be completed or corrected before Substantial Completion, Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item. Contractor shall then submit a request for another inspection by District to determine Substantial Completion.

9.7.2 When District determines that the Work or such designated portion thereof is Substantially Complete, District will prepare a Certificate of Substantial Completion on District's form, which when signed by District shall establish the date of Substantial Completion and the responsibilities of District and Contractor for security, maintenance, heat, utilities, insurance, completion of minor items and correction or repair of the Work or such designated portion thereof. Unless otherwise provided in the Certificate of Substantial Completion, the Guarantee To Repair Period for the Work (which is defined in Article 12.2.1), or such designated portion thereof covered by the Certificate of Substantial Completion, excluding any systems provided by Separate Contractors which are not yet fully operational or accepted by District, shall commence on the date of Substantial Completion of the Work or such designated portion thereof. The Guarantee to Repair Period for systems which become fully operational or Accepted subsequent to Substantial Completion will begin on the later of the date they are operational or Acceptance of the Project by District.

9.8 FINAL COMPLETION AND FINAL PAYMENT

9.8.1 Upon receipt of notice from Contractor that the Work is ready for final inspection, District will make such inspection. District will file a notice of completion within ten (10) Days after Acceptance by District. After receipt of the Final Application for Payment, if District determines that Final Completion is achieved, District will issue a Certificate for final payment.

9.8.2 Without limitation to any other provisions of the Contract Documents, before final payment for Work under this Construction Contract is authorized, the Work has been completed in accordance with the Contract Documents and all applicable standards of care and the following requirements of the Contract Documents must be fulfilled by Contractor:

- (i) The submittal of an Application for Final Payment, together with supporting documentation, as required by Article 9.3.
- (ii) Completion and delivery by Contractor to District of all required written guarantees, warranties, operation and maintenance manuals, As-Built Documents and other Record Documents and such other documents as required by the Contract Documents.
- (iii) Delivery by Contractor to District of an affidavit, signed under penalty of perjury, stating that all workers and persons employed, all firms supplying the materials, and all Subcontractors and Sub-subcontractors, of every Tier, have been paid in full; and that there are no bills outstanding against the Work for either labor or materials, except certain items, to be set forth in such affidavit covering disputed claims or items in connection with which notices to withhold have been filed under the provisions of the statutes of the State of California.
- (iv) Completion of all construction work in a manner acceptable to District.
- (v) Submission of conditional releases of claims and stop notices upon final payment from Contractor and its Subcontractors and Sub-subcontractors, of every Tier, with no reservation of rights for disputed claims or amounts. Contractor shall pay or cause to be paid to Subcontractors and Sub-Subcontractors, of every Tier, the amount stated in the conditional releases within five (5) Days after receipt of the final payment, and shall promptly thereafter furnish evidence of such payment to District.

9.8.3 Acceptance of final payment by Contractor shall constitute a waiver of all Claims, except those previously made in writing and identified by Contractor as unsettled at the time of the Application for Final Payment.

9.8.4 District shall have the right, in its sole discretion, to make payment of amounts retained from progress payments on the Work of any Subcontractor at any time prior to Final Completion. The making of such early payment of retention shall not be construed as creating any obligation on the part of District nor shall it relieve Contractor of any of its obligations under the Contract Documents.

ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 Contractor shall be solely and completely responsible for initiating, maintaining and supervising all safety precautions and programs on the Site in connection with the performance of the Construction Contract, including safety of all persons for the duration of the Work, on a 24-hour day, 7-day week basis.

10.1.2 Prior to the start of construction, Contractor shall submit to District a copy of Contractor's safety program for the Project. A copy of this program shall be maintained on Site at all times. The safety program shall include, at a minimum:

- (i) Management policy, illness and injury prevention program (as described below).
- (ii) Safety meetings.
- (iii) Accident investigation.
- (iv) Basic accident causes.
- (v) Safety inspection check list.
- (vi) Fire prevention and control.
- (vii) Report forms.
- (viii) Employee safety manual.

10.1.3 Prior to the start of construction, Contractor shall submit to District a copy of an illness and injury prevention program as required by law. This program must be submitted prior to issuance by District of Notice to Proceed. It must include provisions for Contractor reviewing and monitoring all Subcontractor safety programs.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 Precaution shall be exercised at all times for the protection of persons and property. Contractor shall have available at the Site, copies or suitable extracts of "Construction Safety Orders" and "General Industrial Safety Orders" issued by the State Division of Industrial Safety. Contractor shall comply with provisions of these and all other applicable laws, ordinances, and regulations.

10.2.2 Contractor shall immediately respond to notice from District of unsafe conditions, shall take adequate precautions for safety of persons on the Site, and

shall provide adequate protection to prevent injury or Loss to the following:

- (i) Employees involved in the Work and other persons who may be affected thereby.
- (ii) The Work in place and materials and equipment to be incorporated therein, whether in storage on or off the Site, under care, custody, or control of Contractor, Subcontractors, or Sub-subcontractors.
- (iii) Other property at the Site and adjoining property(ies).

10.2.3 Contractor shall promptly remedy damage and Loss (other than damage or Loss insured under property insurance required by the Contract Documents) to property caused in whole or in part by Contractor or its Subcontractors or Sub-subcontractors, of any Tier, or anyone for whose acts they may be liable and for which Contractor is responsible. An exception is Loss attributable to acts of the Construction Manager, District or Design Consultant or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of Contractor or its Subcontractors or Sub-subcontractors, of any Tier.

10.2.4 Contractor shall erect and maintain, as required by existing conditions and performance of the Work, adequate safeguards for safety and protection, including providing adequate lighting and ventilation, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

10.2.5 When use or storage of hazardous materials, equipment, or unusual methods are necessary for execution of the Work, Contractor shall exercise the utmost care and carry on such activities only under the supervision of properly qualified personnel.

10.2.6 Contractor shall be required to provide at the Site a member of Contractor's organization, typically the Superintendent, whose responsibility it shall be to provide instruction to persons present on the Site about prevention of accidents and overall jobsite safety. If Contractor has another individual responsible for these activities, Contractor shall notify District in writing.

10.2.7 Contractor shall be responsible for locating, providing, and coordinating the storage and staging of materials and equipment on-Site and off-Site and shall not load/store or permit any part of the Work on the Site to be loaded/stored so as to endanger the safety of persons or property.

10.2.8 Contractor shall protect its materials and the Work from damage in a manner satisfactory to District and shall make good, without charge to District, all damage due to negligence in providing proper protection.

10.2.9 Contractor shall take necessary precautions to guard against and eliminate possible fire hazards and to prevent damage to the Work, building materials, equipment, temporary field offices, storage sheds and public and private property.

10.2.10 Contractor shall not permit the possession or use of alcohol or controlled substances on the Site.

10.2.11 Explosives may be used only when authorized in writing by District. Explosives shall be handled, used and stored in accordance with applicable regulations.

10.3 EMERGENCIES

10.3.1 In an emergency affecting the safety of persons or property, Contractor shall immediately act to prevent or minimize damage, injury or loss. Contractor shall immediately notify the Construction Manager and District, which notice may be oral, followed within twenty-four (24) hours after occurrence of the incident by written confirmation, of the occurrence of such an emergency and Contractor's action.

ARTICLE 11 – INSURANCE AND BONDS

11.1 CONTRACTOR'S INSURANCE

11.1.1 Prior to commencing the Work, Contractor shall procure and maintain at Contractor's own cost and expense, insurance as required in the Construction Contract between Contractor and District against claims for injuries to persons or damages to property which may arise out of or result from the performance of the Work by Contractor, its Subcontractors or Sub-subcontractors, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

11.2 BOND REQUIREMENTS

11.2.1 Within ten (10) Days after the issuance of the Notice of Award and prior to commencing Work on the Project, Contractor shall file with District good and sufficient Labor and Material Payment and Performance Bonds each in the amount of 100% of the Contract Sum. The bonds shall be signed by both Contractor and Surety and properly notarized on the District's forms or such other forms as required by District. Should any bond required hereunder or any surety on such bond become or be determined by District to be insufficient, it shall be replaced within ten (10) Days by a bond that fully complies with the requirements of Article 11.2. No further payments to Contractor for Work performed shall be made or due until Contractor has fully complied with the requirements of Article 11.2.

11.2.2 The Payment Bond shall remain in effect until Acceptance of the Work and payment of all Claims by Contractor, Subcontractors, or Sub-subcontractors, of any Tier, have been satisfied. The Performance Bond provided by Contractor shall remain in effect for the duration of the period of all warranties required by the Contract Documents and shall assure faithful performance of all Contractor's obligations under the Contract Documents, including, without limitation, all obligations that survive Final Completion or termination, such as, but not limited to. Contractor's warranty and indemnity obligations.

11.2.3 Contractor shall promptly furnish such additional security as may be required by District to protect its interests and those interests of persons or firms supplying labor or materials to the Work.

11.2.4 Surety companies used by Contractor shall be, on the date the Contract is signed by District and at all times while the bonds are in effect, either California Admitted Sureties or listed in the latest published United States Treasury Department list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies and either have a current A.M. Best A VIII rating or be an admitted surety that meets the requirements of the California Code of Civil Procedure, Section 995.660.

11.2.5 The premiums for all Bonds are included in the Contract Sum and shall be paid by Contractor.

11.2.6 The bonds shall name District as obligee.

11.2.7 Change Orders, Field Orders, Modifications, Changes in the Work and adjustments in the scope of Work Contract Sum or Contract Time shall in no way release or exonerate Contractor or its sureties from their obligations and notice thereof shall be waived by such sureties.

11.2.8 District and the Construction Manager shall have the right to communicate with Contractor's sureties with respect to matters that are related to Contractor's performance of its obligations under the Contract Documents. Contractor shall be provided with a copy of all such written communications. Such communications shall not create or be interpreted as creating any contractual relationship between District or the Construction Manager and any such surety.

11.2.9 In the event of a significant (15% or more) increase in Contract Sum, replacement bonds totaling the new Construction Contract amount may be required by District.

ARTICLE 12 – DEFECTIVE WORK

12.1 UNCOVERING OF WORK

12.1.1 If a portion of the Work is covered contrary to District's request or direction, or contrary to the requirements of the Contract Documents, it must, if required in writing by District, be uncovered for District's observation and be replaced at Contractor's expense without adjustment of the Contract Time or the Contract Sum.

12.1.2 If a portion of the Work has been covered, which is not required by the Contract Documents to be observed or inspected prior to its being covered and which District has not specifically requested to observe prior to its being covered, District may request to see such Work and it shall be uncovered and replaced by Contractor. If such Work is in accordance with the Contract Documents, the costs of uncovering and replacing the Work shall be added to the Contract Sum by Change Order; and if the uncovering and replacing of the Work extends the Contract Time, an appropriate adjustment of the Contract Time shall be made by Change Order. If such Work is not in accordance with the Contract Documents, Contractor shall pay such costs and shall not be entitled to an adjustment of the Contract Time or the Contract Sum.

12.2 CORRECTION OF DEFECTIVE WORK AND GUARANTEE TO REPAIR PERIOD

12.2.1 Besides guarantees required elsewhere, Contractor shall guarantee in writing all Work for a period of one (1) year. This guarantee termed "Guarantee To Repair Period," is a period of one (1) year, unless a longer period of time is specified in the Special Provisions and Technical Specifications, commencing as follows:

- (i) For any Work not described as incomplete in the Certificate of Substantial Completion, on the date of Substantial Completion.
- (ii) For space beneficially occupied or for separate systems fully utilized prior to Substantial Completion pursuant to Article 9.6, from the first date of such Beneficial Occupancy or actual use, as established an appropriate written authorization for Beneficial Occupancy.
- (iii) For all Work other than (i) or (ii) above, from the date of filing of notice of completion pursuant to Article 9.8.

12.2.2 Contractor shall (i) correct Defective Work that becomes apparent during the progress of the Work or during the Guarantee To Repair Period and (ii) replace, repair, or restore to District's satisfaction any other parts of the Work and any other real or personal property which is damaged or destroyed as a result of Defective Work or the correction of Defective Work, without any expense

whatsoever to District. District will give notice of observed Defective Work with reasonable promptness, and Contractor shall promptly commence such correction, replacement, repair or restoration upon notice from District, but in no case later than seven (7) Days after receipt of such notice. Contractor shall diligently and continuously prosecute such correction to completion. Contractor shall bear all costs of such correction, replacement, repair, or restoration and all Losses resulting from such Defective Work, including additional testing, inspection and compensation for District's or District's services and expenses. Contractor shall perform corrective Work at such times that are acceptable to District and in such a manner as to avoid, to the extent practicable, disruption to District's activities. Ordinary wear and tear, unusual abuse or neglect are excepted from this guarantee. Contractor shall notify District upon completion of repairs.

12.2.3 If immediate correction of Defective Work is required for life safety or the protection of property or, if in the opinion of District, Defective Work creates a dangerous condition or requires immediate corrections or attention to prevent further Loss to District or to prevent interruption of operations of District, District will attempt to give immediate notice to Contractor. If Contractor cannot be contacted or does not comply with District's request for correction within a reasonable time as determined by District, District or Separate Contractors under District's direction, may, notwithstanding the provisions of this Article, proceed to make such corrections or provide such attention; and the costs of such correction or attention shall be charged against Contractor. Such action by District will not relieve Contractor of the guarantees provided in this Article or elsewhere in the Construction Contract. Contractor shall replace, repair or restore to District's satisfaction any other parts of the Work and any other real or personal property, which is damaged or destroyed as a result of such Defective Work or the correction of such Defective Work.

12.2.4 Contractor shall promptly remove from the Site those portions of the Work and materials which are not in accordance with the Contract Documents and which are neither corrected by Contractor nor accepted by District.

12.2.5 If Contractor fails to commence correction of Defective Work within seven (7) Days after notice from District or fails to diligently prosecute such correction to completion, District may correct the Defective Work in accordance with Article 2.4; and, in addition, District may remove the Defective Work and store salvageable materials and equipment at Contractor's expense.

12.2.6 If Contractor fails to pay the costs of such removal and storage as required by Articles 12.2.4 and 12.2.5 within seven (7) Days after written demand, District may, without prejudice to other remedies, sell such materials at auction or at private sale or otherwise dispose of such material. Contractor shall be entitled to the proceeds of such sale, if any, in excess of the costs and damages for which Contractor is liable to District, including compensation for District's services and expenses. If such proceeds of sale do not cover costs and

damages for which Contractor is liable to District, the Contract Sum shall be reduced by such deficiency. If there are no remaining payments due Contractor or the remaining payments are insufficient to cover such deficiency, Contractor shall promptly pay the difference to District.

12.2.7 Contractor's obligations under this Article are in addition to and not in limitation of its warranty under Article 3.5 or any other obligation of Contractor under the Contract Documents. Enforcement of Contractor's express warranties and guarantees to repair contained in the Contract Documents shall be in addition to and not in limitation of any other rights or remedies District may have under the Contract Documents or at law or in equity for Defective Work. Nothing contained in this Article shall be construed to establish a period of limitation with respect to other obligations of Contractor under the Contract Documents, which may be longer specified periods. Establishment of the Guarantee To Repair Period relates only to the specific obligation of Contractor to correct the Work and in no way limits either Contractor's liability for Defective Work or the time within which proceedings may be commenced to enforce Contractor's obligations under the Contract Documents.

12.3 ACCEPTANCE OF DEFECTIVE WORK

12.3.1 Notwithstanding the provisions of Article 12.2 of these General Conditions, District shall have the option, at its sole discretion and by notice to Contractor, to accept Defective Work instead of requiring its removal or correction, in which case the Contract Sum shall be reduced by an amount equal to the difference between the value to District the Work would have had were it complete, correct and in conformity with the Contract Documents and the value to District of such Defective Work. Such option shall be exercised solely by notice to Contractor and shall not be implied from any act or omission by District or Construction Manager. If there are no remaining payments of the Contract Sum to be made to Contractor, or if the remaining payments and retention are insufficient to cover the amount of the reduction of the Contract Sum, Contractor shall promptly pay to District the amount of any such deficiency.

ARTICLE 13 – STATUTORY REQUIREMENTS

13.1 NONDISCRIMINATION/EQUAL OPPORTUNITY

13.1.1 For purposes of this Article, the term Subcontractor shall not include suppliers, manufacturers, or distributors, except those who will actually perform work on the Site.

13.1.2 Contractor shall comply and shall ensure that all Subcontractors comply with the California Government Code, Section 12900, and the applicable sections that follow.

13.1.3 Contractor agrees as follows during the performance of the Work:

.1 Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, ancestry, national origin, sexual orientation, handicap, veteran's status, medical condition (as defined in the California Government Code, Section 12926), marital status, or citizenship. All applicants for employment and employees are to be treated without regard to their race, color, religion, sex, age, ancestry, national origin, sexual orientation, handicap, veteran's status, medical condition (as defined in the California Government Code, Section 12926), marital status, or citizenship. Such equal treatment shall apply, but not be limited to:

- (i) Employment, upgrading, demotion, or transfer.
- (ii) Recruitment or recruitment advertising.
- (iii) Layoff or termination.
- (iv) Rates of pay or other forms of compensation.
- (v) Selection for training, including apprenticeship.

.2 Contractor agrees to post in conspicuous places, available to employees and applicants for employment, the Notice of Equal Employment Opportunity (EEO) setting forth this provision.

.3 Contractor shall send to each labor union, with which it has a collective bargaining agreement or other contract or understanding, the letter of Concurrence and the Notice of Equal Employment Opportunity (EEO) advising them of Contractor's commitments under this provision; and Contractor shall post copies of the Notice of Equal Employment Opportunity (EEO) in conspicuous places available to employees and applicants for employment. The Notice of Equal Employment Opportunity (EEO) shall be in English and other applicable languages.

.4 Contractor and all Subcontractors will permit access to their records of employment, employment advertisements, application forms, and other pertinent data and records by District or any appropriate District of the State of California designated by District for the purposes of investigation to ascertain compliance with this provision. The outcome of the investigation may result in the following:

a. A finding of willful violation of the provisions of this Construction Contract or of the Fair Employment Practices Act may be regarded by District as either of the following:

(i) A basis for determining that Contractor is not a "responsible bidder" as to future contracts for which such Contractor may submit bids.

(ii) A basis for refusing to accept or consider the bids of Contractor for future contracts.

b. District may deem a finding of willful violation of the Fair Employment Practices Act to have occurred upon receipt of written notice from the Fair Employment Practices Commission that it has done both of the following:

(i) Investigated and determined that Contractor has violated the Fair Employment Practices Act.

(ii) Issued an order under the California Government Code, Section 12970, or obtained an injunction under the California Government Code Section 12973.

c. Upon receipt of such written notice from the Fair Employment Practices Commission, District may notify Contractor that, unless it demonstrates to the satisfaction of District within a stated period that the violation has been corrected, Contractor's bids on future projects will not be considered.

.5 Contractor agrees that, should District determine that Contractor has not complied with this provision, Contractor shall forfeit to District, as a penalty, for each day or portion thereof, for each person who was denied employment as a result of such non-compliance, the penalties provided in Article 13.3 for violation of prevailing wage rates. Such penalty amounts may be recovered from Contractor; and District may deduct any such penalty amounts from the Contract Sum.

.6 Nothing contained in this provision shall be construed in any manner so as to prevent District from pursuing any other remedies that may be available at law.

.7 Contractor shall meet the following standards for affirmative compliance and provide District with satisfactory evidence of such compliance upon District's request, which shall be evaluated in each case by District:

a. Contractor shall notify its Superintendent and other supervisory personnel of the nondiscrimination requirements of the Contract Documents and their responsibilities thereunder.

b. Contractor shall notify all sources of employee referrals (including unions, employment agencies, and the State of California Department of Employment) of the nondiscrimination requirements of the Contract Documents by sending to such sources and by posting the Notice of Equal Employment Opportunity (EEO).

c. Contractor or its representative shall, through all unions with whom it may have agreements, develop agreements that:

(i) Define responsibilities for nondiscrimination in hiring, referrals, upgrading, and training.

(ii) Implement an affirmative nondiscrimination program, in terms of the unions' specific areas of skill and geography, such that qualified minority women, non-minority women, and minority men shall be available and given an equal opportunity for employment.

d. Contractor shall notify District of opposition to the nondiscrimination requirements of the Contract Documents by individuals, firms or organizations during the term of the Contract.

.8 Contractor shall include the provisions of the foregoing Articles 13.1.3.1 through 13.1.3.6 in all subcontracts with Subcontractors, so that such provisions will be binding upon each such Subcontractor.

13.2 STATE LABOR LAW

13.2.1 Contractor, its agents, and employees shall be bound by and comply with all applicable provisions of the Labor Code and such federal, state and local laws which affect the conduct of the Work.

13.2.2 Contractor shall strictly adhere to the provisions of the Labor Code regarding the employment of apprentices; minimum wages; payment of wages; alien labor, the eight- hour day; overtime, Saturday, Sunday and holiday work; registration with the Department of Industrial Relations to maintain eligibility to work on public works; and nondiscrimination because of race, color, national origin, age, marital status, sexual orientation, disability, sex or religion. Contractor shall forfeit to District the penalties prescribed in the Labor Code for violations.

13.2.3 District has ascertained that the general prevailing rate of wages and employer payments for health and welfare, vacation, pensions, and similar purposes applicable to the locality in which the Work is to be done are as set

forth in that certain document entitled, "Prevailing Wage Scale," as indicated in the California Labor Code Part 7, Chapter 1 – Article 2, as determined by the Director of Industrial Relations. Applicable Prevailing Wage Rates and related information not listed are to be obtained from the State of California by Contractor. Contractor shall post a copy of applicable exhibits/wage rates at each Site. Contractor to whom the Construction Contract is awarded and any Subcontractor agree to pay wages and benefits not less than said specified rates to all workers employed by them in the execution of the Construction Contract. A person or concern who fails to do so shall be subject to withholding of contract payments equal to the underpayment of required wages and benefits and subject to the penalties provided for in the California Labor Code, Section 1775. Contractor and each Subcontractor shall prepare and certify their payrolls on forms satisfactory and in accordance with instructions to be furnished by District.

13.2.4 In accordance with the Labor Code, prevailing wage rate determinations for the work to be done on this Project are maintained by the District.

13.2.5 In the event there is a determination that Contractor is in violation of prevailing wage requirements, Contractor shall reimburse District for all investigative costs incurred in addition to any other remedies provided under the Contract Documents.

13.3 PAYROLL RECORDS

13.3.1 Contractor and all Subcontractors shall keep an accurate payroll record, showing the name, address, social security number, job classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journey worker, apprentice worker, or other employee employed in connection with the Work. All payroll records shall be certified as being true and correct by Contractor or Subcontractors keeping such records; and the payroll records shall be available for inspection at all reasonable hours at the principal office of Contractor on the following basis:

.1 A certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or the employee's authorized representative upon request.

.2 A certified copy of all Contractor and Subcontractor payroll records shall be made available for inspection upon request to District, the State of California Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the State of California Division of Industrial Relations. A certified copy of all payroll records shall be furnished to District or its representatives upon request.

.3 A certified copy of all payroll records shall be made available upon request by the public for inspection or copies thereof made; provided, however, that the

request by the public shall be made to either District, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. The public shall not be given access to such records at the principal offices of Contractor or Subcontractors. Any copy of the records made available for inspection as copies and furnished upon request to the public or any public entity by District shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of Contractor awarded the Construction Contract or performing the Construction Contract shall not be marked or obliterated.

.4 As of April 1, 2015: contractors and subcontractors must furnish electronic certified payroll records to the Labor Commissioner (State of California, Division of Labor Standards Enforcement).

13.3.2 Contractor and all Subcontractors shall file a certified copy of the payroll records with the entity that requested the records within ten (10) Days after receipt of a written request. Contractor shall inform District of the location of such payroll records for the Project, including the street address, District, and county; and Contractor shall, within ten (10) days, provide notice of change of location of such records. In the event of noncompliance with the requirements of Article 13.3 or with the California Labor Code Section 1776, Contractor and its Subcontractors shall have ten (10) Days in which to comply following receipt of a notice specifying in what respects Contractor must comply. Should non-compliance still be evident after the ten (10) Day period, Contractor shall forfeit to District, as a penalty, one hundred dollars (\$100.00) for each Day, or portion thereof, for each worker, until strict compliance is accomplished. Such forfeiture amounts may be deducted from the Contract Sum. Contractor shall include stipulations in all of its subcontracts to ensure that Subcontractors comply with Section 13.3.

13.4 APPRENTICES

13.4.1 Attention is directed to the California Labor Code, Sections 1777.5, 1777.6, and 1777.7 and the California Code of Regulations, Title 8, Section 200, and the applicable sections that follow. To ensure compliance and complete understanding of the law requiring apprentices, and specifically the required ratio thereunder, Contractor or Subcontractors should, where some question exists, contact the State of California Division of Apprenticeship Standards prior to commencement of the Work. Responsibility for compliance with these requirements lies with Contractor

13.5 WORK DAY

13.5.1 Contractor shall not permit any worker to labor more than eight (8) hours during any one (1) Day or more than forty (40) hours during any one (1) calendar week, except as permitted by law and in such cases only upon such conditions as are provided by law. Contractor shall forfeit to District, as a penalty, fifty dollars (\$50.00) for each worker employed in the execution of this Construction Contract

by Contractor, or any Subcontractor, for each Day during which such worker is required or permitted to Work more than eight (8) hours in any one (1) Day and forty (40) hours in any one (1) calendar week in violation of the terms of this provision or in violation of the provisions of any law of the State of California. Such forfeiture amounts may be deducted from the Contract Sum. Contractor and each Subcontractor shall keep, or cause to be kept, an accurate record showing the actual hours worked each Day and each calendar week by each worker employed on the Project, which record shall be kept open at all reasonable hours to the inspection of District, its officers and agents, and to the inspection of the appropriate enforcement agency or representative and the State of California.

END OF GENERAL CONDITIONS

EXHIBIT D
PROJECT PLANS, SPECIAL PROVISIONS, TECHNICAL SPECIFICATIONS AND
COUNTY OF SAN LUIS OBISPO REVISED STANDARD SPECIFICATIONS (DATED 04-20-18)

Declaration of Responsible Charge

I hereby declare that I am the Engineer of Record for this project and that I have exercised responsible charge over the project as defined in Section 6703 of the Business and Professions Code. These plans and specifications, to the best of my knowledge, comply with the current standards.

Any errors, omissions, or other violations of those ordinances, standards or design criteria encountered during construction shall be corrected and such corrections reflected on corrected plans.



L. Alberto Lopez

R.C.E 67602



OCEANO COMMUNITY SERVICES DISTRICT OCEANO DRAINAGE IMPROVEMENTS OCEANO, CA

SHEET INDEX

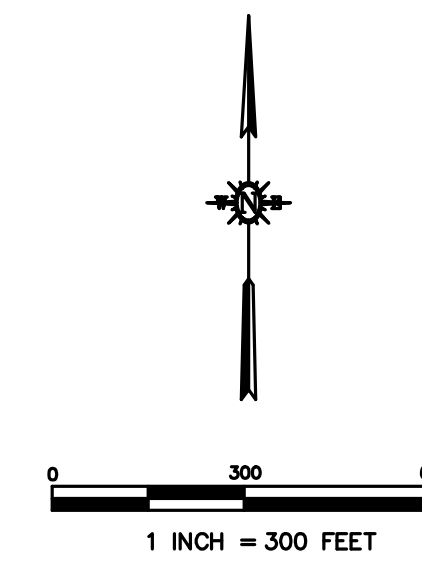
SHEET 1	TITLE SHEET
SHEET 2	PLAN AND PROFILE
SHEET 3	PLAN AND PROFILE
SHEET 4	RELOCATIONS

LEGEND

EXISTING	PROPOSED
PROPERTY LINE	---
RIGHT-OF-WAY	---
CURB	---
CURB & GUTTER	---
FENCE	X
DAYLIGHT LINE	---
EASEMENT	---
FLOWLINE	---
RETAINING WALL	---
SLOPE	---
CONTOURS	---
WATER MAIN	W
FIRE WATER LINE	FW
SANITARY SEWER LINE	SS
STORM DRAIN LINE	SD
GAS LINE	G
ELECTRIC LINE	E
OVERHEAD WIRES	OH
FIBER OPTICS	FO
TELEPHONE	T
UNDERGROUND TELEPHONE	UT
JOINT TRENCH	JT
TYPICAL LATERALS	XX
WATER VALVE	⊗
WATER METER	⊗
GAS METER	⊗
FIRE HYDRANT	⊗
STREET LAMP	⊗
STREET LIGHT	⊗
PG&E BOX	⊗
TRANSFORMER	⊗
MONUMENT	⊗
STORM DRAIN INLET	⊗
CURB INLET	⊗
FIRE DEPARTMENT CONNECTION	⊗
POWER POLE	⊗
FOUR-WAY SIGN	⊗
TWO-WAY SIGN	⊗
CLEANOUT	⊗
SDMH	⊗
SSMH	⊗
AIR RELEASE VALVE	ARV
ASPHALT CONCRETE	AC
BEGIN CURB RETURN	BCR
BEGIN CURVE	BC
BEGIN VERTICAL CURVE	BVC
CATCH BASIN	CB
CENTERLINE	CL
END CURB RETURN	ECR
END CURVE	EC
END VERTICAL CURVE	EVC
FINISHED GRADE	FG
FINISHED SURFACE	FS
FINISH FLOOR	FF
FIRE DEPARTMENT CONNECTION	FDC
FLOW LINE	FL
GRADE BREAK	GB
HIGH POINT	HP
INVERT	INV
OUTSIDE GRADE	OG
POINT OF CONNECTION	POC
POINT OF REVERSE CURVE	PRC
POINT OF REVERSE VERTICAL CURVE	PRVC
PROPERTY LINE	PL
PUBLIC UTILITY EASEMENT	PUE
RIGHT-OF-WAY	ROW
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TOP OF CURB	TC
TOP OF FOOTING	TF
TOP OF GRATE	TG
TOP OF WALL	TW
AC PAVING	---
CONCRETE	---

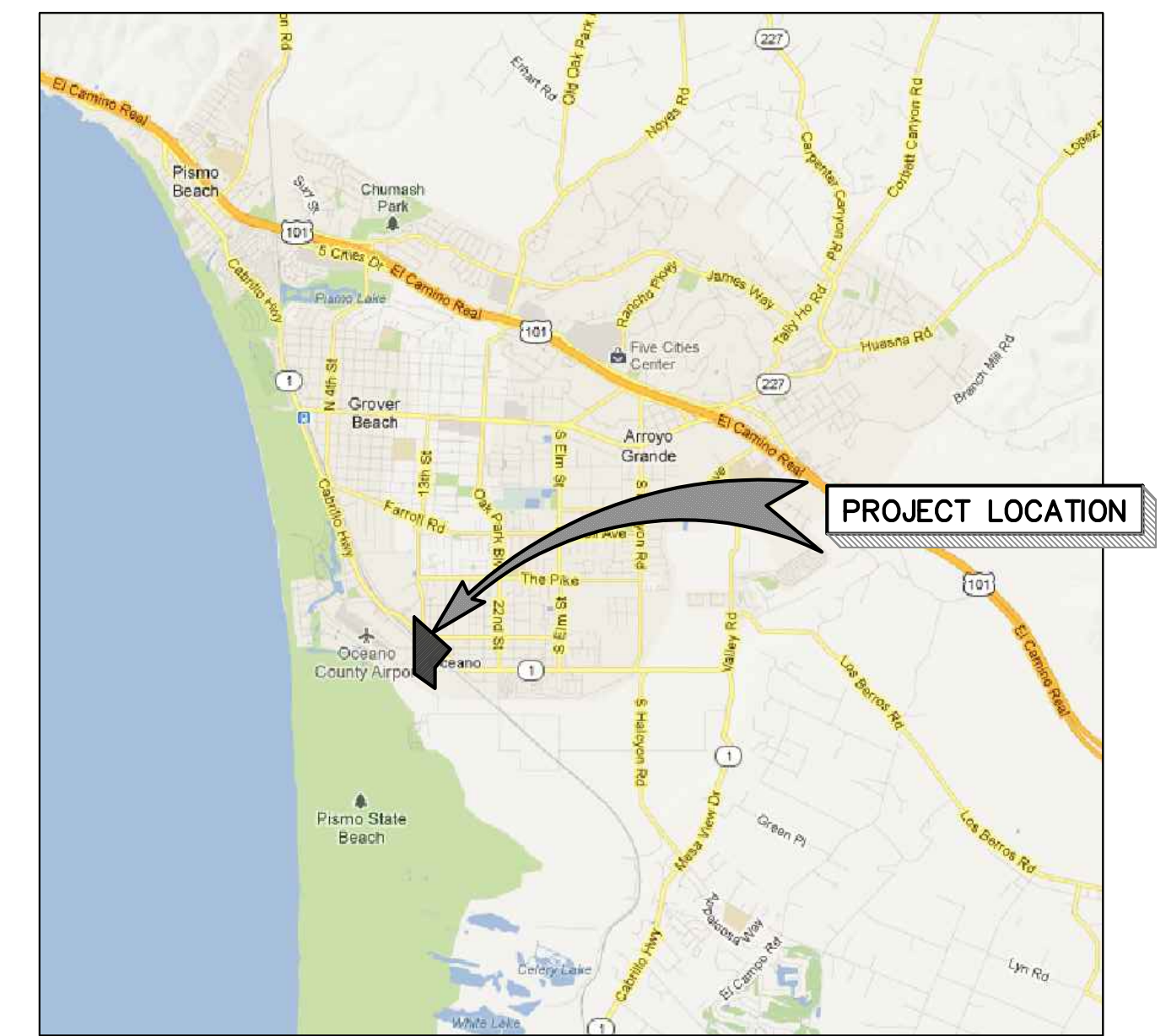
APPROVED: October 20, 2016

[Signature]
OCEANO COMMUNITY SERVICES DISTRICT, DISTRICT ENGINEER



SECTION AND DETAIL NUMBERING SYSTEM

- SECTION CUT ON DRAWING SHEET X. SECTION TITLE: SWALE SECTION. SECTION LETTER: L. SECTION LETTER DRAWING ON WHICH SECTION APPEARS: SHEET X. SCALE: 1"=X'.
- ON SHEET X, THIS SECTION IS IDENTIFIED AS SECTION X.
- DETAILS ARE CROSS-REFERENCED IN A SIMILAR MANNER; EXCEPT THAT DETAILS ARE IDENTIFIED BY NUMBER RATHER THAN LETTER.



VICINITY MAP

NTS

LOCATION MAP

SCALE HORIZ 1"=300'

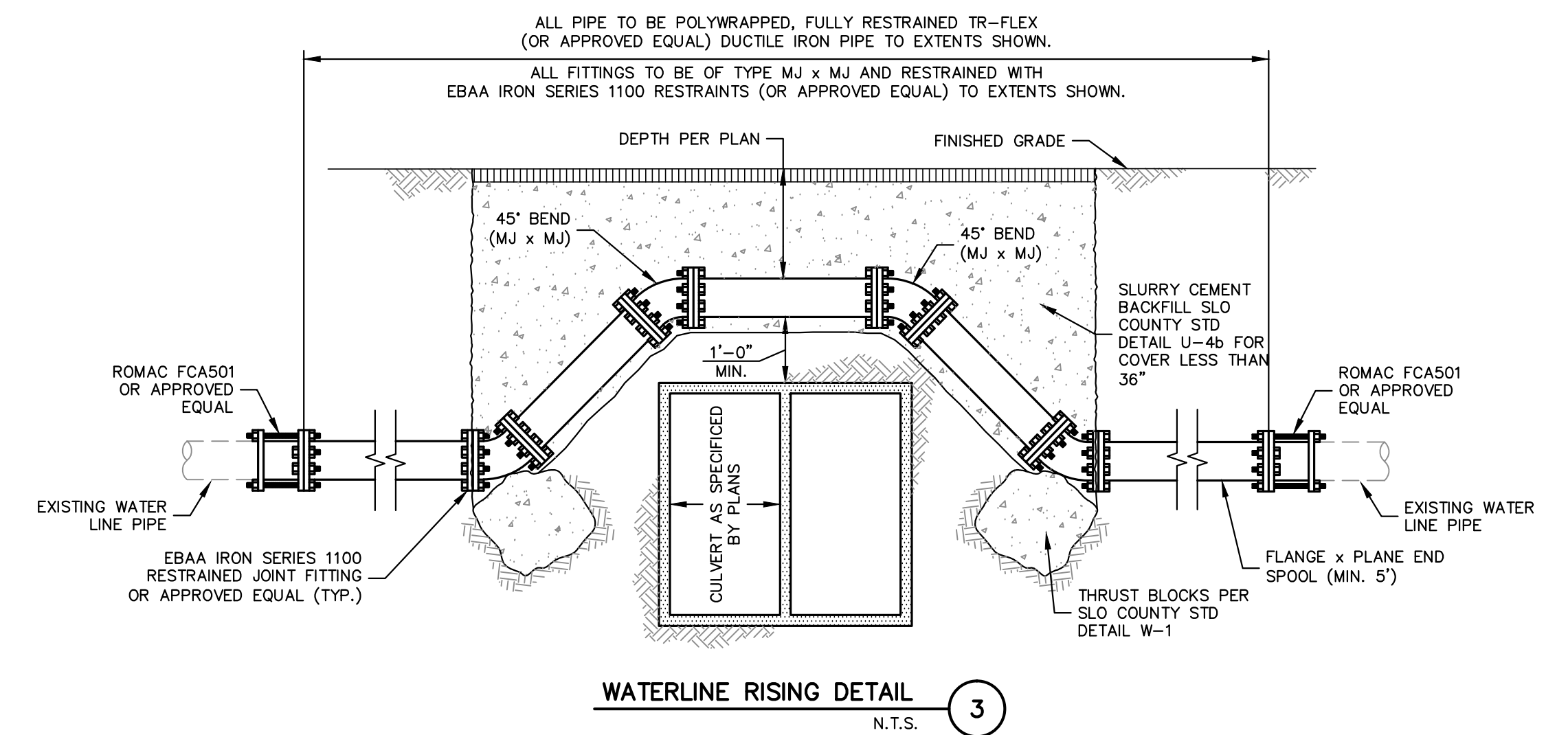
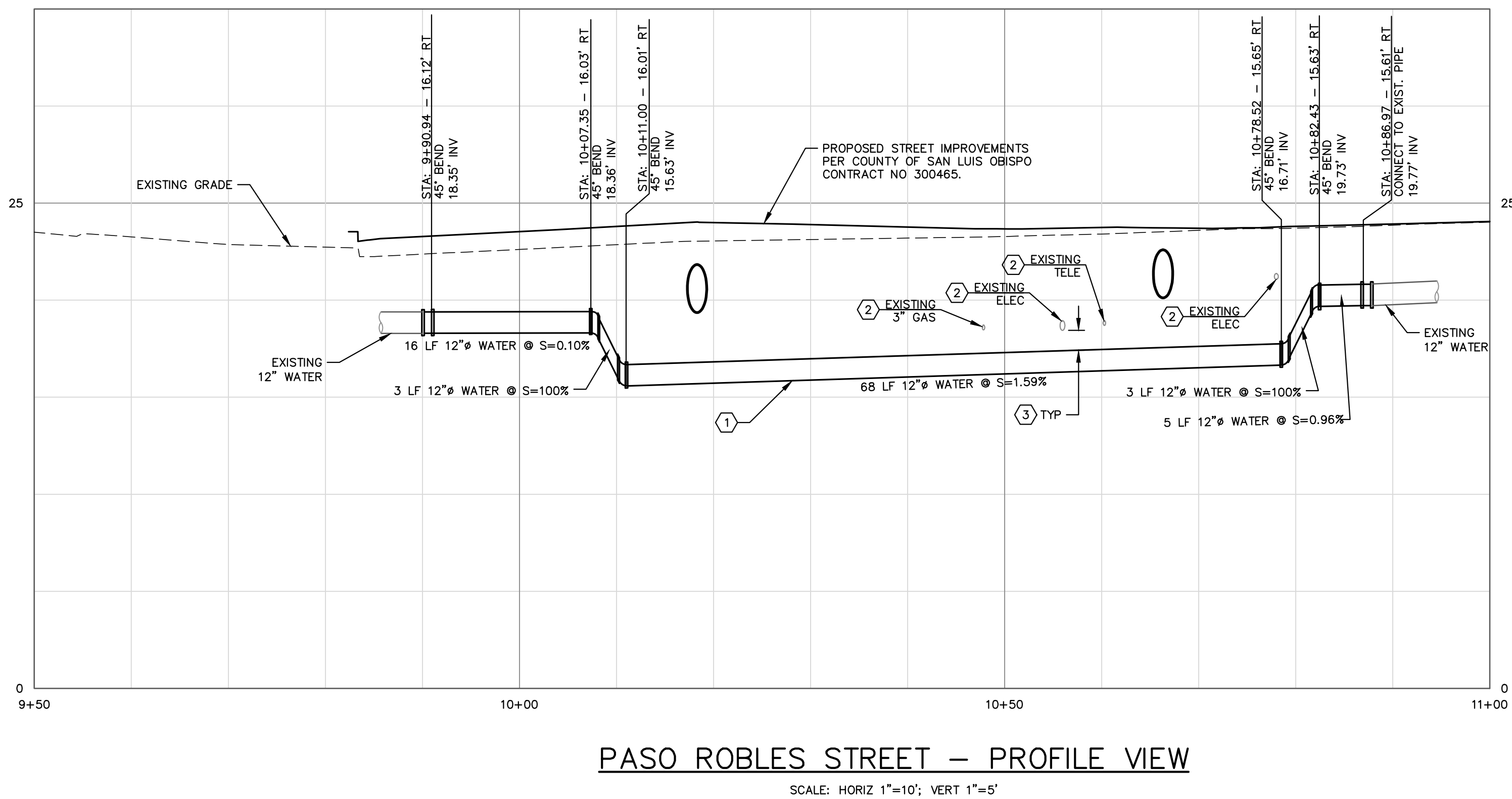
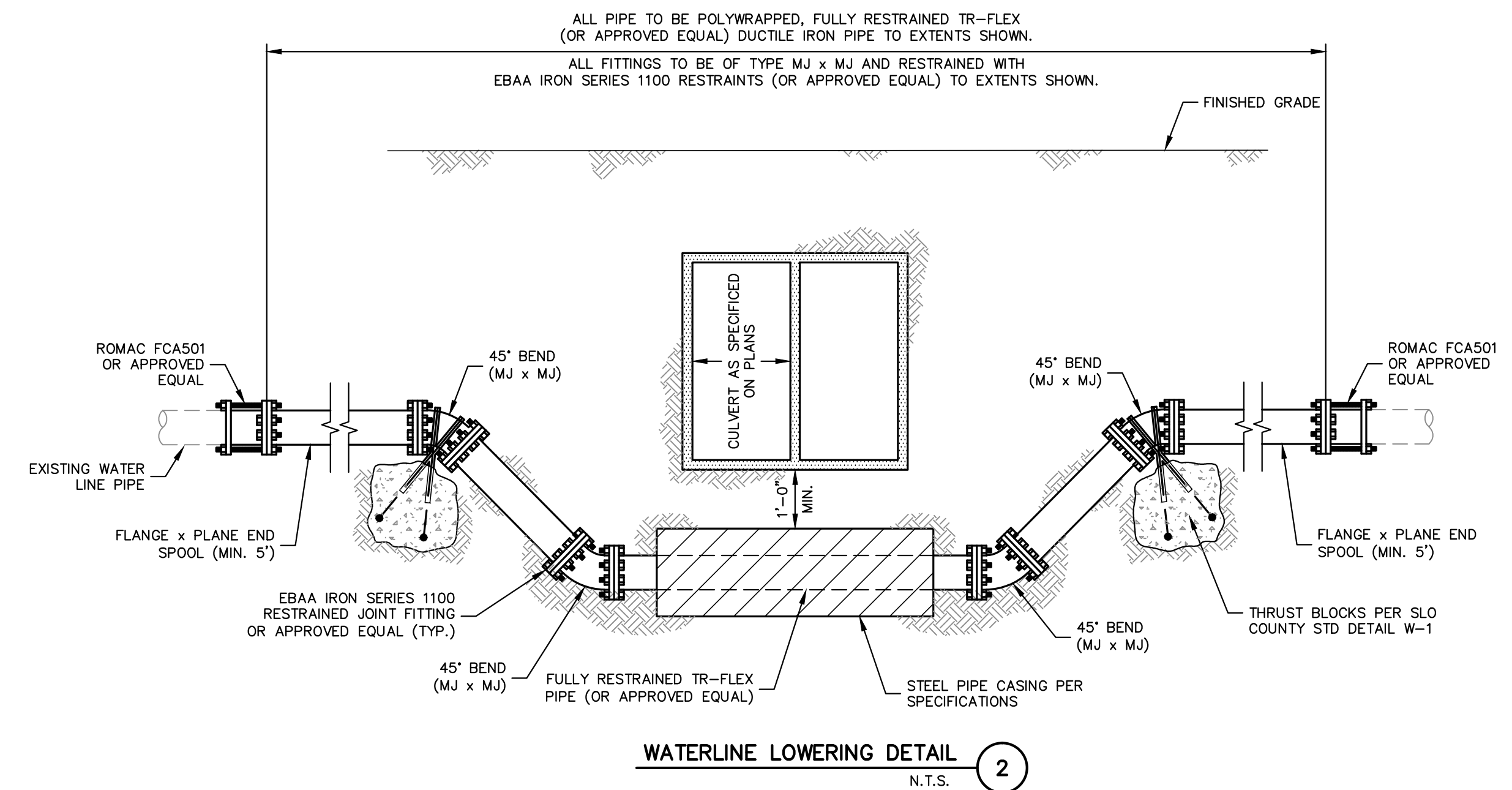
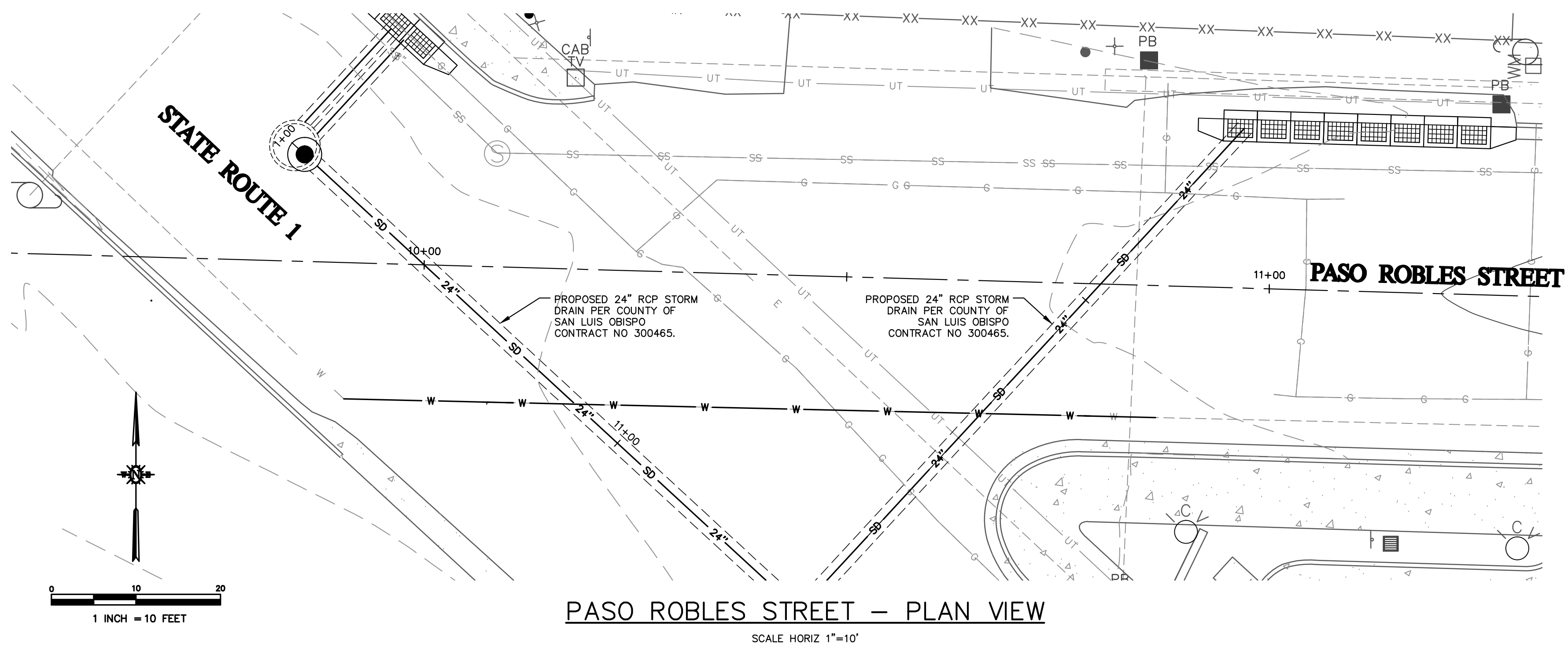


REV. NO	DATE	REVISED	DESTROY ALL PRINTS BEARING EARLIER DATE	REV. BY	CHK. BY	APRD. BY

1050 Southwood Drive
San Luis Obispo, CA 93401
P 805.544.7407 F 805.544.3863

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OCEANO COMMUNITY SERVICES DISTRICT OCEANO DRAINAGE IMPROVEMENTS		
TITLE SHEET		
OCEANO, CA		
DRAWN BY KM	DATE 09/07/2016	CA JOB NO. 160355.01
CHECKED BY	SCALE AS SHOWN	SHEET 1 OF 4



CONSTRUCTION NOTES

1. INSTALL 12" WATER LINE PER SAN LUIS OBISPO COUNTY DETAIL U-4.
2. ASSUMED RELOCATED UTILITIES. CONTRACTOR TO VERIFY PRIOR TO START OF WORK.
3. KEEP 1 FT MINIMUM SEPARATION FROM EXISTING AND PROPOSED UTILITIES AT ALL CROSSINGS.

GENERAL NOTES

1. FOR SURVEY CONTROL INFORMATION, REFER TO SHEET 2 OF THE PLANS FOR THE COUNTY OF SAN LUIS OBISPO CONTRACT NO 300465.

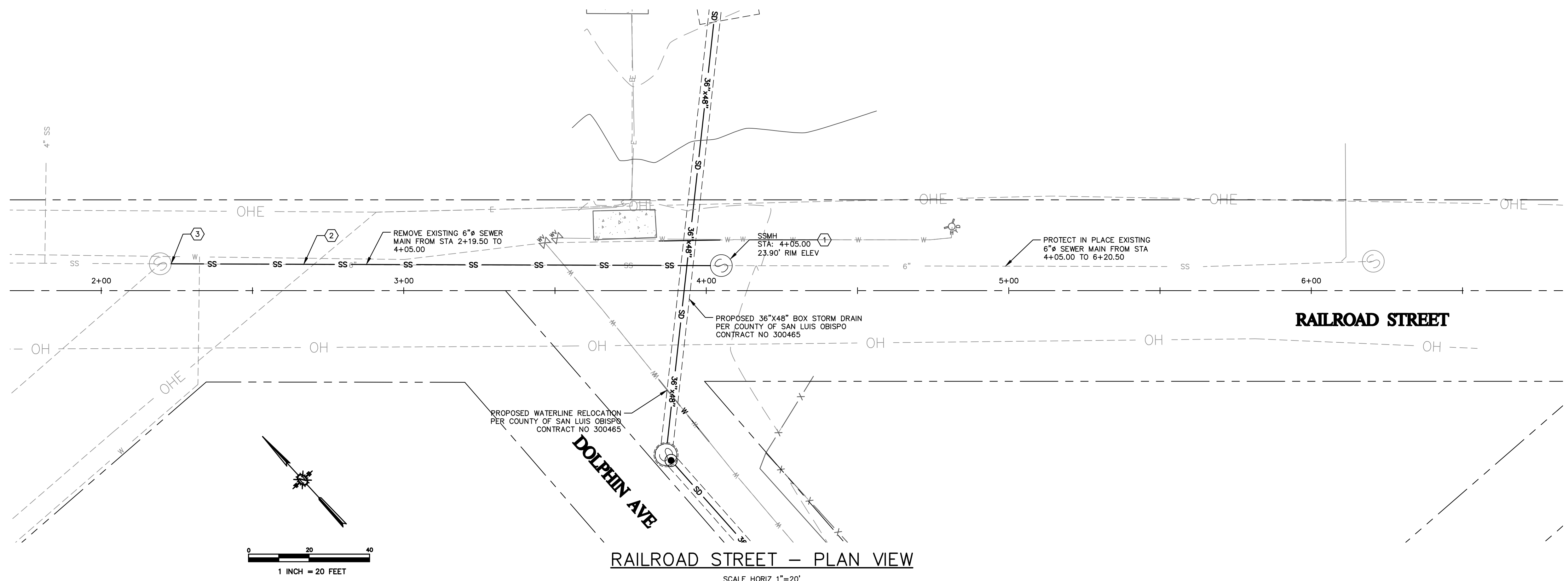


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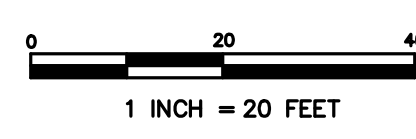
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OCEANO COMMUNITY SERVICES DISTRICT OCEANO DRAINAGE IMPROVEMENTS PLAN AND PROFILE OCEANO, CA		
DRAWN BY KM	DATE 09/07/2016	CA JOB NO. 160355.01
CHECKED BY	SCALE AS SHOWN	SHEET 2 OF 4

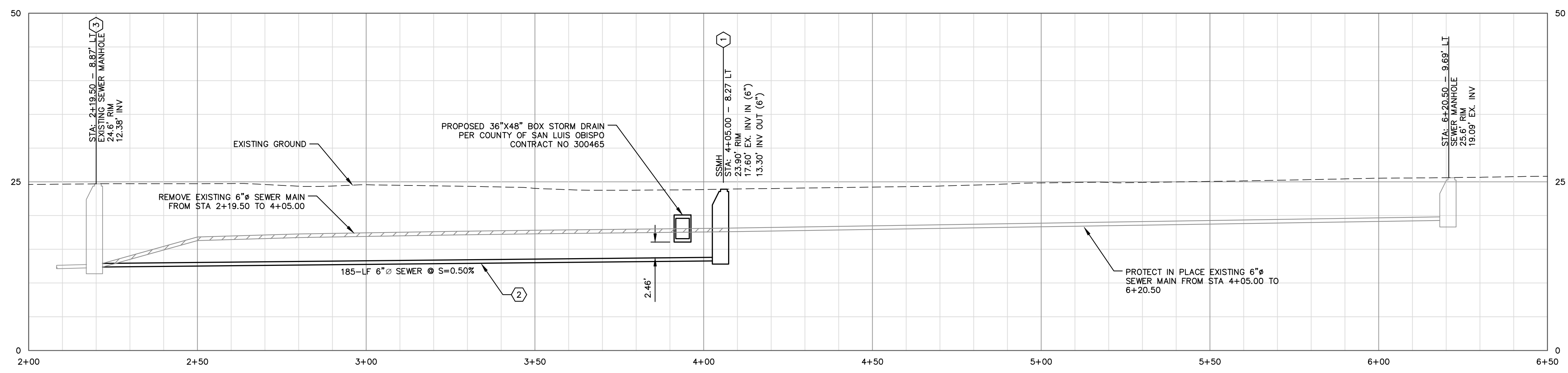
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- CONSTRUCTION NOTES**
- ① INSTALL SEWER DROP MANHOLE PER SAN LUIS OBISPO COUNTY DETAIL S-16, SHEET 4.
 - ② INSTALL 6" SDR 35 SEWER MAIN PER SAN LUIS OBISPO COUNTY DETAIL U-4, SHEET 4.
 - ③ CONNECT TO EXISTING SEWER MANHOLE.
- GENERAL NOTES**
- 1. FOR SURVEY CONTROL INFORMATION, REFER TO SHEET 2 OF THE PLANS FOR THE COUNTY OF SAN LUIS OBISPO CONTRACT NO. 300465.



RAILROAD STREET - PLAN VIEW
SCALE HORIZ 1"=20'



RAILROAD STREET - PROFILE VIEW
SCALE: HORIZ 1"=20'; VERT 1"=10'

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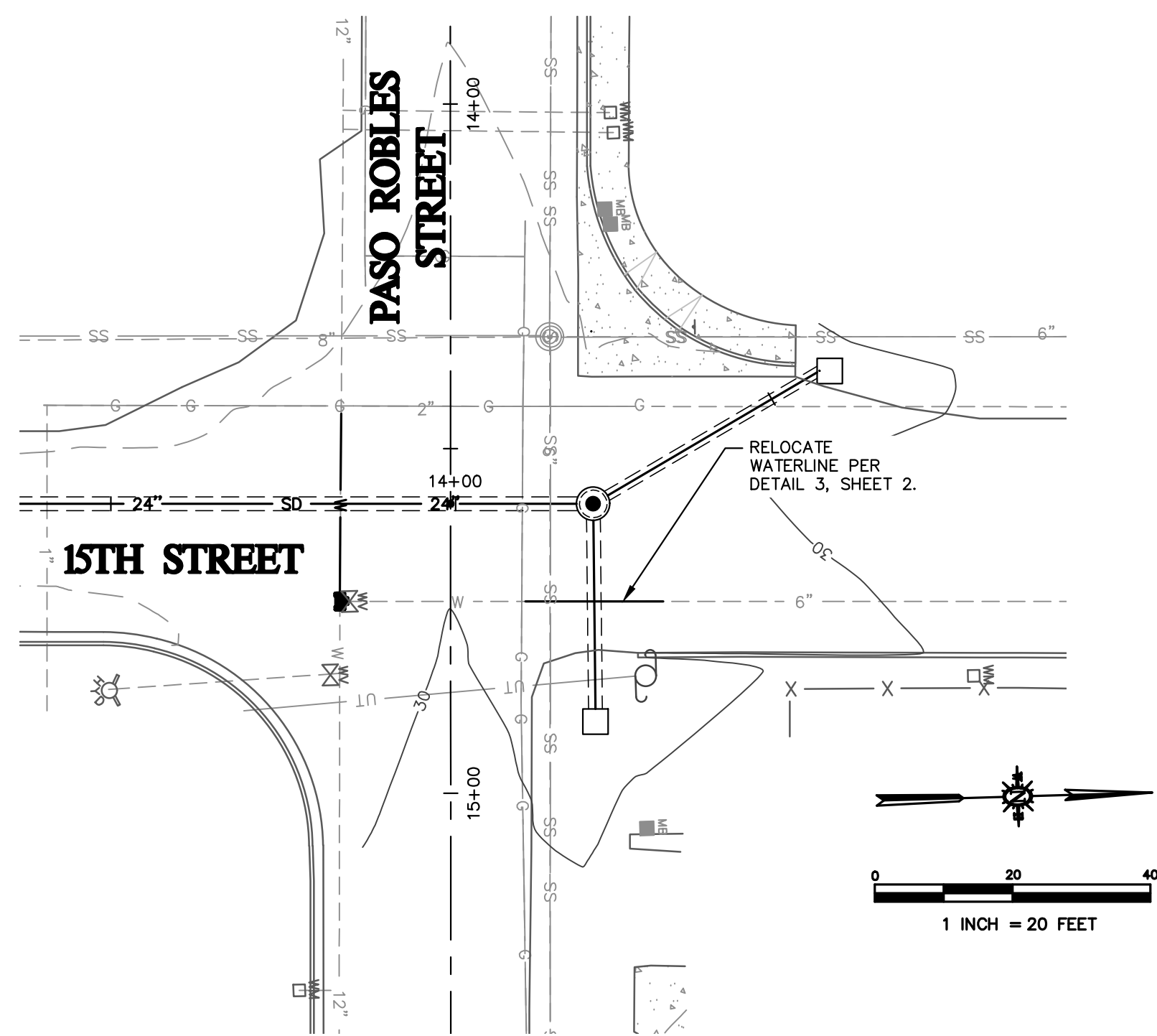


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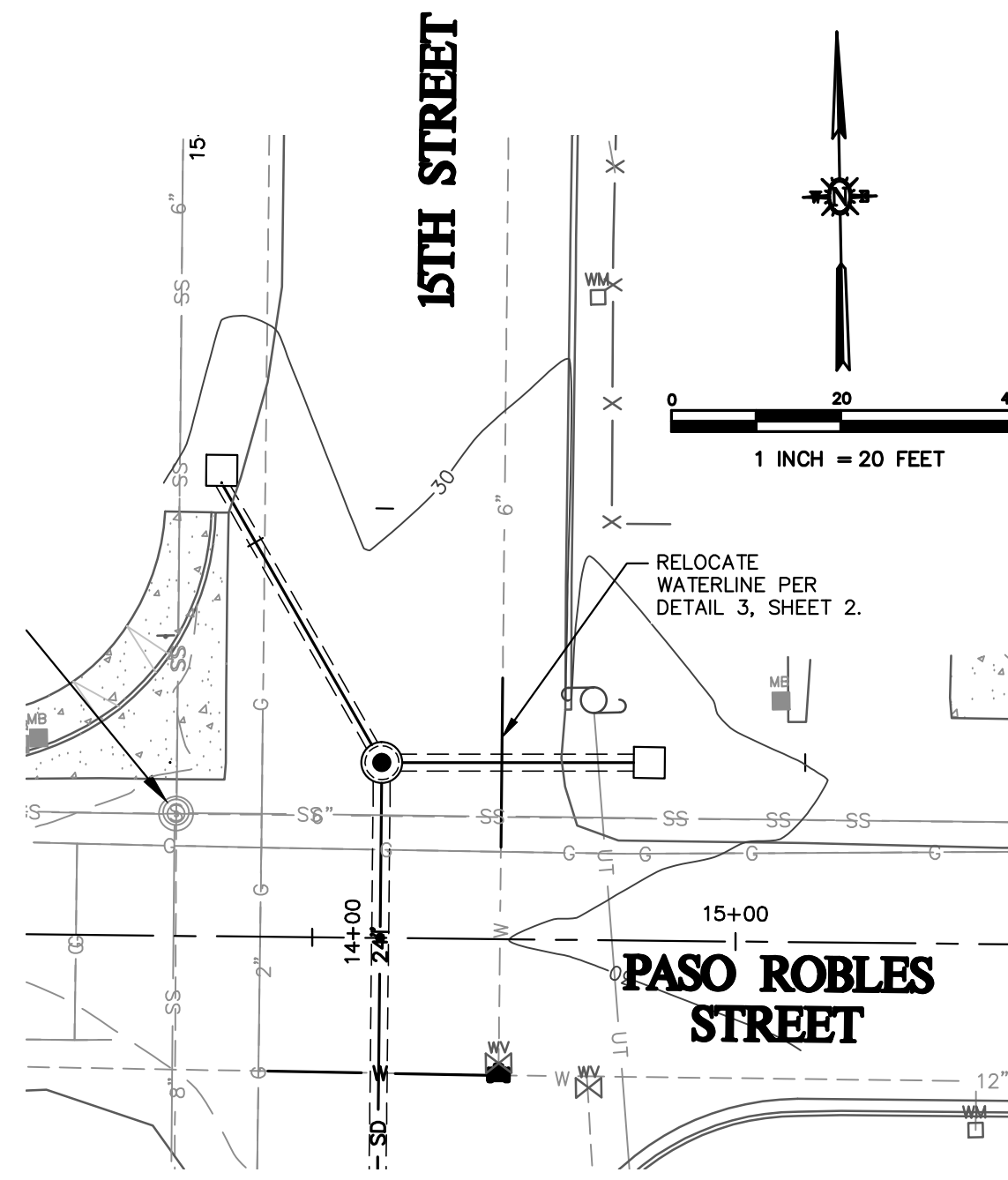
1050 Southwood Drive
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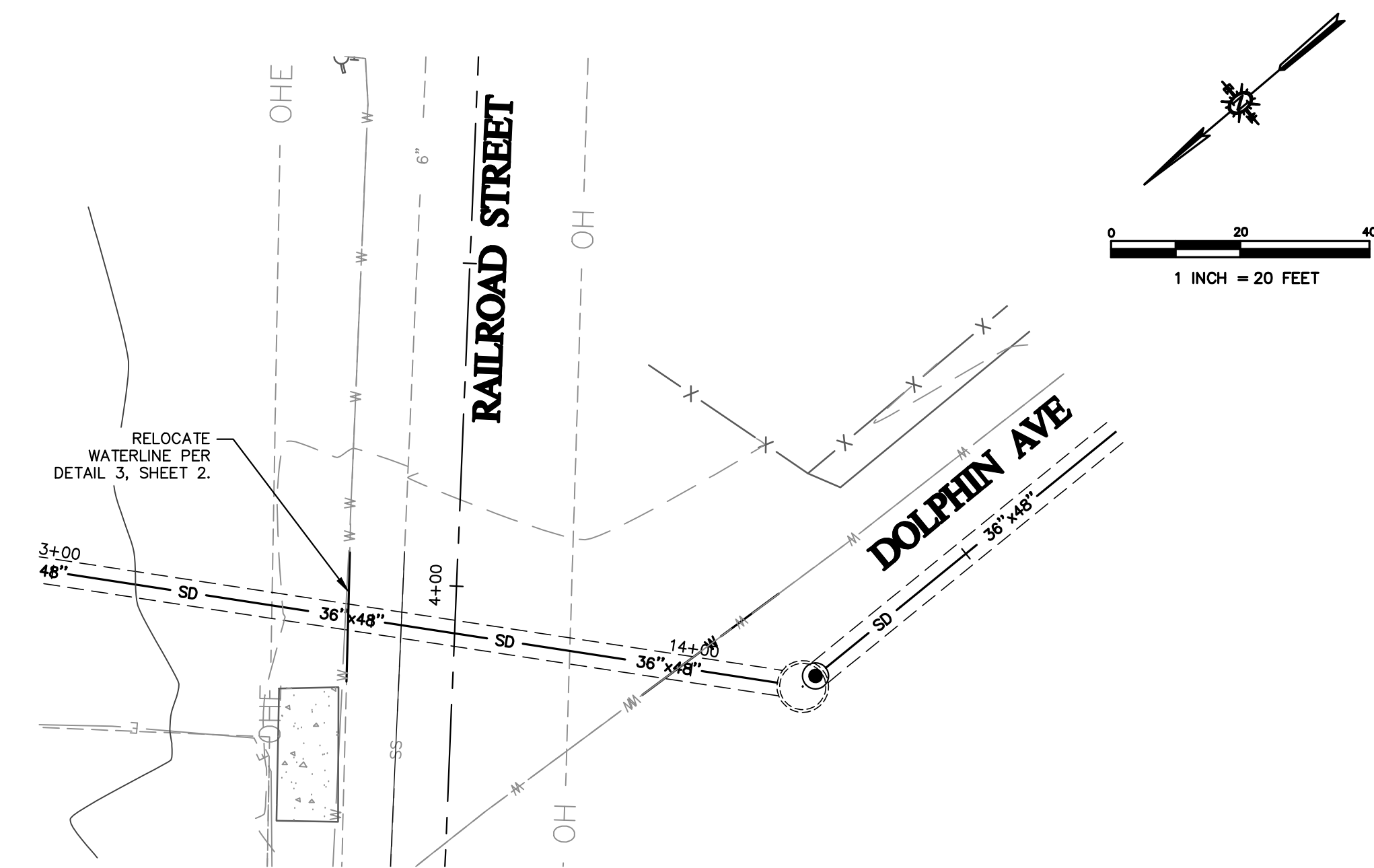
OCEANO COMMUNITY SERVICES DISTRICT OCEANO DRAINAGE IMPROVEMENTS PLAN AND PROFILE OCEANO, CA		
DRAWN BY KM	DATE 09/07/2016	CA JOB NO. 160355.01
CHECKED BY	SCALE AS SHOWN	SHEET 3 OF 4



15TH STREET WATERLINE RELOCATION – PLAN VIEW
SCALE HORIZ 1"=20'

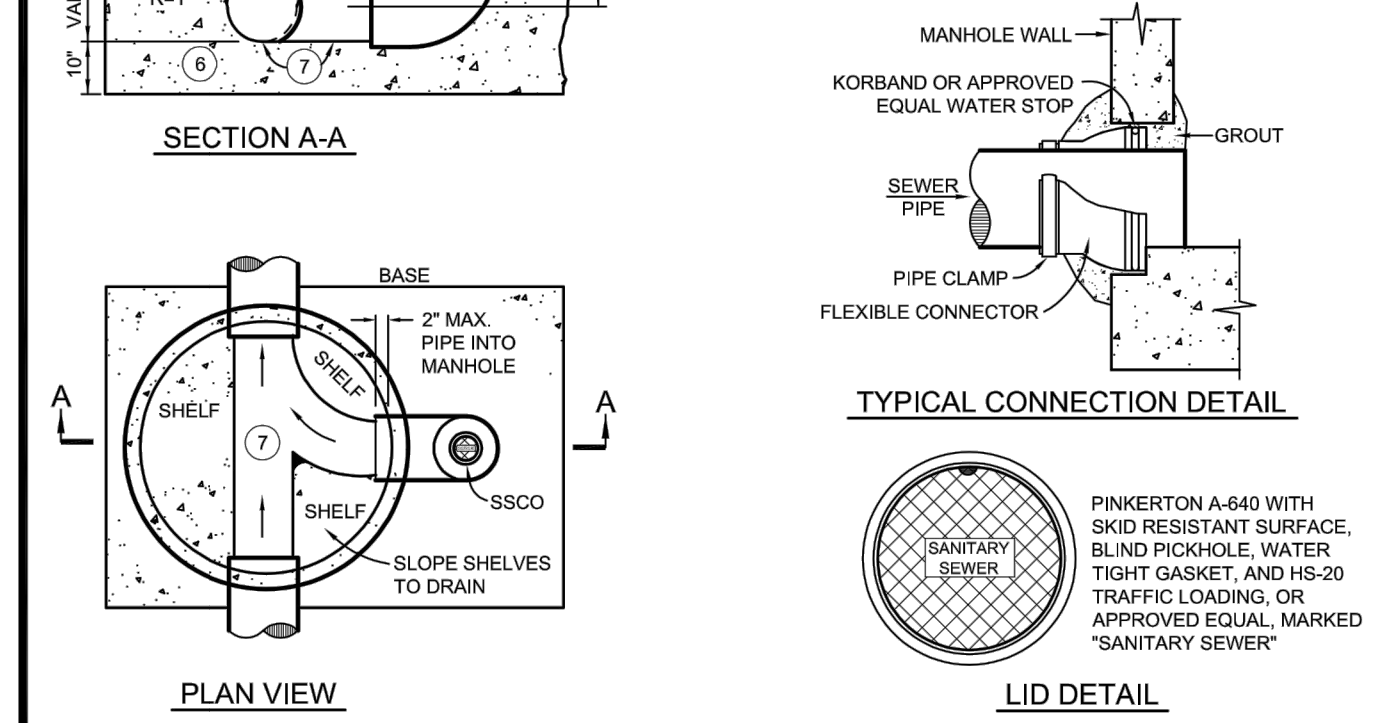
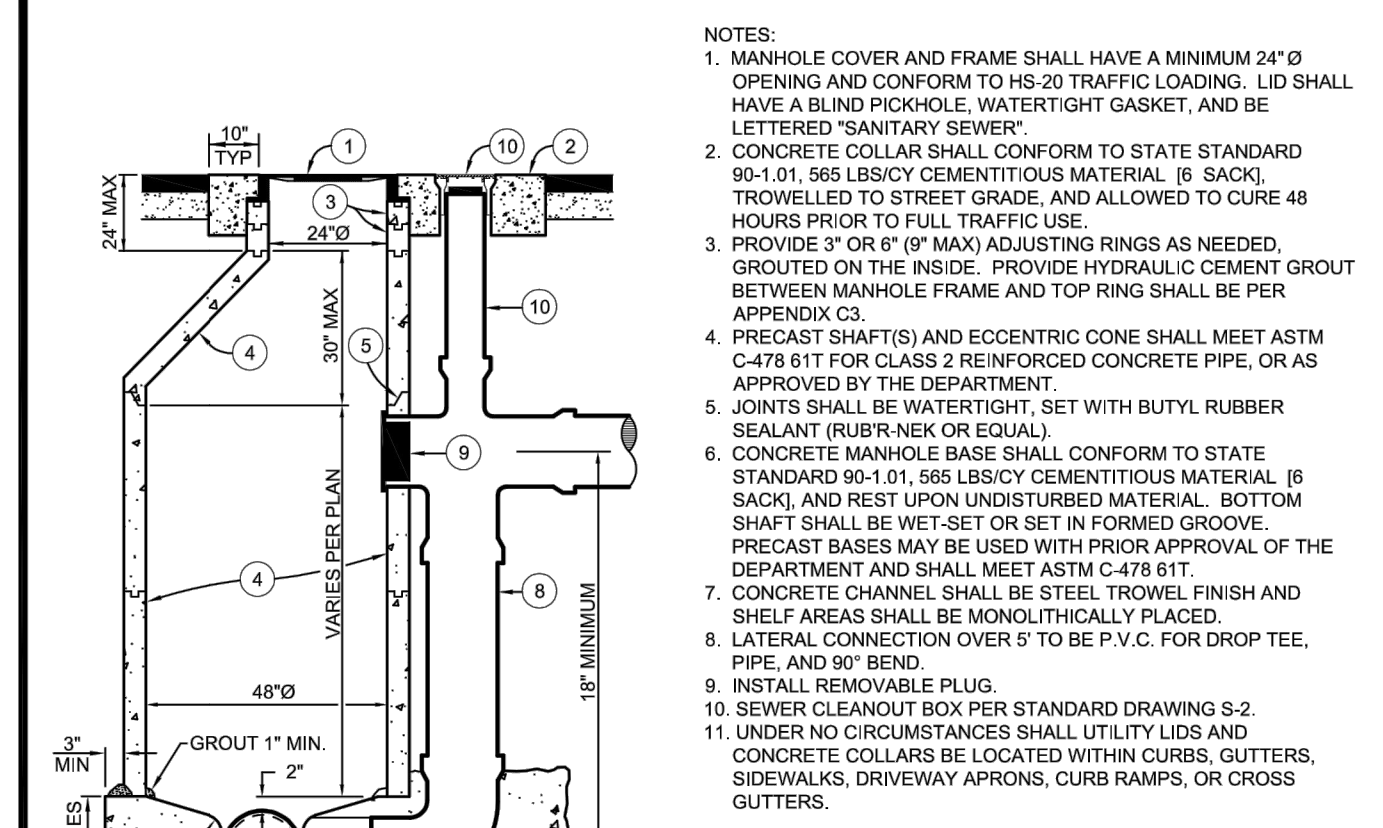


PASO ROBLES STREET WATERLINE RELOCATION – PLAN VIEW
SCALE HORIZ 1"=20'



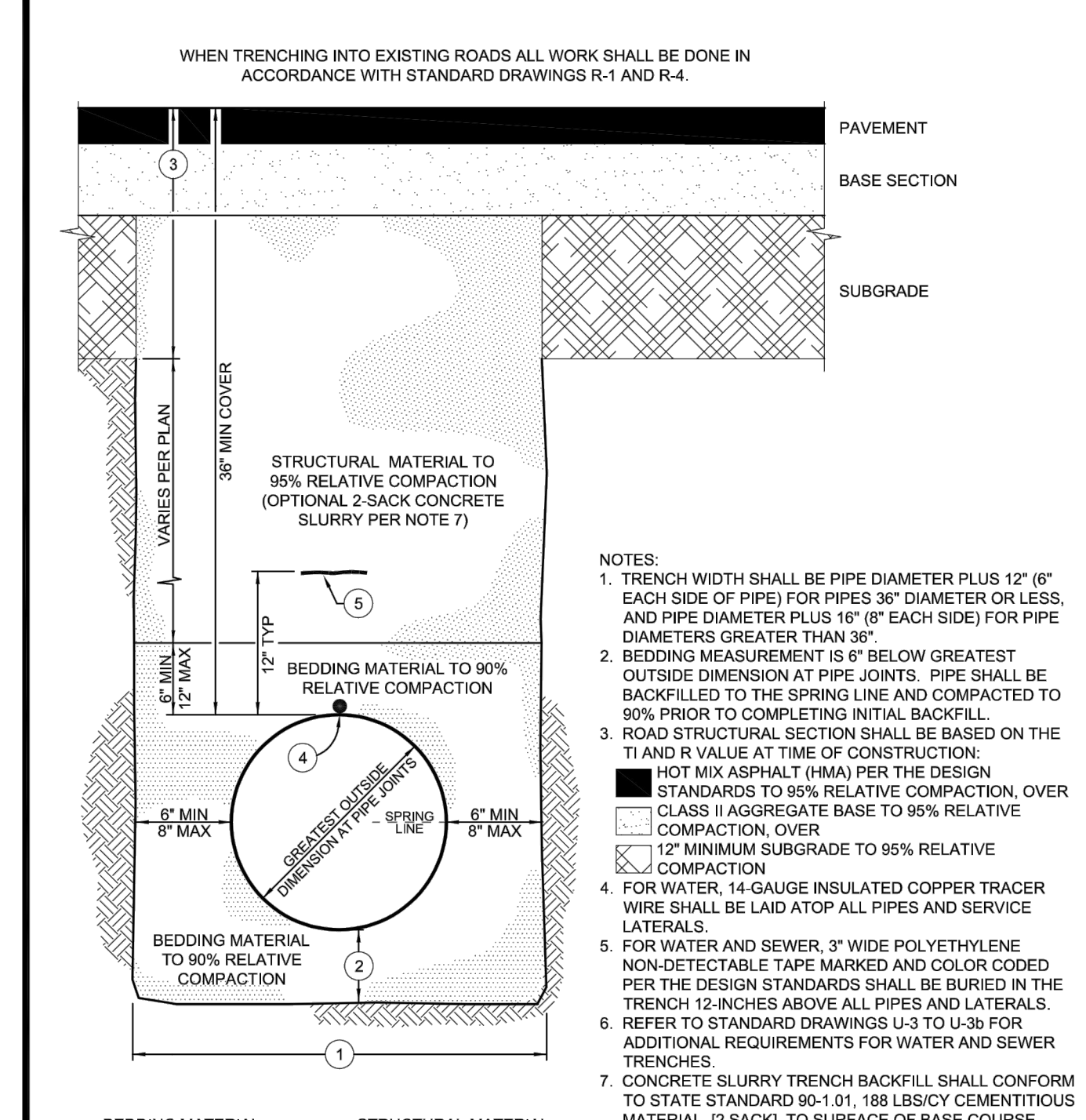
RAILROAD STREET WATERLINE RELOCATION – PLAN VIEW
SCALE HORIZ 1"=20'

Revisions				
Description	Approved	Date	Description	Date
NOTES 2 & 6	REM	NOV 07		
NOTES 3	GDM	JAN 11		



DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
Scale: NTS Adopted: 2011
Drawing No: S-1a
Sheet No: 1 OF 1

Revisions				
Description	Approved	Date	Description	Date
LOCATION OF DETECTOR WIRE & TAPE, NOTES 4 & 5	REM	NOV 07	NOTE 7 & REPLACE AC W/ HMA	
MISC CLARIFICATION	GDM	NOV 08		



BEDDING MATERIAL		STRUCTURAL MATERIAL	
NO.	PERCENT PASSING	NO.	PERCENT PASSING
No. 4	85% - 100%	No. 4	35% - 100%
No. 200	0% - 15%	No. 30	20% - 100%

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
Scale: NTS Adopted: 2011
Drawing No: U-4
Sheet No: 1 OF 1



REV. NO	DATE	REVISED	DESTROY ALL PRINTS BEARING EARLIER DATE	REV. BY	CKD. BY	APRD BY

1050 Southwood Drive
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OCEANO COMMUNITY SERVICES DISTRICT OCEANO DRAINAGE IMPROVEMENTS		
RELOCATIONS		
OCEANO, CA		
DRAWN BY KM	DATE 09/07/2016	CA JOB NO. 160355.01
CHECKED BY	SCALE AS SHOWN	SHEET 4 OF 4

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SPECIFICATIONS

DIVISION 1 GENERAL SPECIFICATIONS

1.01 SUMMARY

The section includes general provisions related to the implied intent of directives given in the Technical Specifications.

1. These "Technical Specifications" consist of additional requirements imposed upon the Contractor, including requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto. (The term "Technical Specifications" is synonymous with the term "Specifications" used in Section 00700.)
2. Any action, requirement or obligation described in these "Technical Specifications" shall be interpreted as an action, requirement, or obligation imposed upon the Contractor unless the language clearly and unambiguously identifies another entity. For every phrase, incomplete sentence, or other language that does not identify a subject or actor, it shall be presumed that the subject and/or actor is the Contractor unless the language clearly and unambiguously identifies another entity.

1.02 INTERPRETATION

The specifications are written to the bidder before award and the Contractor after. Before award, interpret sentences written in the imperative mood as starting with "The bidder must" and interpret "you" as "the bidder" and "your" as "the bidder's." After award, interpret sentences written in the imperative mood as starting with "The Contractor must" and interpret "you" as "the Contractor" and "your" as "the Contractor's."

1.03 PUBLIC CONVENIENCE

Compliance with this section does not relieve you of your responsibility for public safety.

Construction activities must not inconvenience the public or abutting property owners. Schedule and conduct work to avoid unnecessary inconvenience to the public and abutting property owners. Avoid undue delay in construction activities to reduce the public's exposure to construction.

Where possible, route traffic on new or existing paved surfaces.

Maintain convenient access to driveways, houses, and buildings. When an abutting property owner's access across the right-of-way line is to be eliminated or replaced under the Contract, the existing access must not be closed until the replacement access facility is usable. Construct temporary approaches to a crossing and an intersecting highway.

Provide a reasonably smooth and even surface for use by traffic at all time during the excavation of a roadway and construction of an embankment. Before other grading activities, place fill at culverts and bridges to allow traffic to cross. If ordered, excavate a roadway cut in layers and construct an embankment in partial widths at a time alternating construction from one side to the other and routing traffic over the side opposite the one under construction. Install or

construct culverts on only 1/2 the width of the traveled way at a time; keep the traveled way portion being used by traffic open and unobstructed until the opposite side of the traveled way is ready for use by traffic.

Upon completion of rough grading or placing any subsequent layer, bring the surface of the roadbed to a smooth and even condition, free of humps and depressions, and satisfactory for the use of the public.

After subgrade preparation for a specified layer of material has been completed, repair any damage to the roadbed or completed subgrade, including damage caused by public use.

While subgrade and paving activities are underway, allow the public to use the shoulders. If half-width paving methods are used, allow the public to use the side of the roadbed opposite the one under construction. If enough width is available, keep open a passageway wide enough to accommodate at least 2 lanes of traffic at locations where subgrade and paving activities are underway. Shape shoulders or reshape subgrade as necessary to accommodate traffic during subgrade preparation and paving activities.

Apply a dust palliative for the prevention or alleviation of dust nuisance.

If a height differential of more than 0.04 foot is created by construction activities at a joint transverse to the direction of traffic on the traveled way or a shoulder subject to public traffic, construct a temporary taper at the joint with a slope complying with the requirements shown in the following table:

Temporary Tapers

Height differential (foot)	Slope (horizontal:vertical)	
	Taper use of 14 days or less	Taper use of more than 14 days
Greater than 0.08	100:1 or flatter	200:1 or flatter
0.04–0.08	70:1 or flatter	70:1 or flatter

For a taper on existing asphalt concrete or concrete pavement, construct the taper with minor HMA under section 39-2.07 of the 2015 Caltrans Standard Specifications.

Grind existing surfaces to accommodate a minimum taper thickness of 0.10 foot under either of the following conditions:

1. HMA material such as rubberized HMA, polymer-modified bonded wearing course, or open-graded friction course is unsuitable for raking to a maximum 0.02-foot thickness at the edge
2. Taper will be in place for more than 14 days

For a taper on a bridge deck or approach slab, construct the taper with polyester concrete under section 60-3.04B of the 2015 Caltrans Standard Specifications.

The completed surface of the taper must be uniform and must not vary more than 0.02 foot from the lower edge of a 12-foot straightedge when placed on its surface parallel and perpendicular to traffic.

If authorized, you may use alternative materials or methods to construct the required taper.

Install signs, lights, flares, Type K temporary railing, barricades and other facilities to direct traffic. Provide flaggers whenever necessary to direct the movement of the public through or around the work. Flagging must comply with section 12-1 of the 2015 Caltrans Standard Specifications.

You are required to pay for the cost of replacing or repairing all facilities installed under change order work for the convenience, direction, or warning of the public that are lost while in your custody or are damaged by your operations to such an extent as to require replacement or repair.

The Engineer may order or consent to your request to open a completed section of surfacing, pavement, or structure roadway surface for public use. You will not be compensated for any delay to your construction activities caused by the public. This does not relieve you from any other contractual responsibility.

1.04 PUBLIC SAFETY

You are responsible to provide for public safety.

Do not construct a temporary facility that interferes with the safe passage of traffic.

Control dust resulting from the work, inside and outside the right-of-way.

Move workers, equipment, and materials without endangering traffic.

Whenever your operations create a condition hazardous to the public, furnish, erect and maintain those fences, temporary railing, barricades, lights, signs, and other devices and take any other necessary protective measures to prevent damage or injury to the public.

Any fences, temporary railing, barricades, lights, signs, or other devices furnished, erected and maintained by you are in addition to those for which payment is provided elsewhere in the specifications.

Provide flaggers whenever necessary to ensure that the public is given safe guidance through the work zone. Flagging must comply with section 12-1 of the 2015 Caltrans Standard Specifications.

At locations where traffic is being routed through construction under one-way controls, move your equipment in compliance with the one-way controls unless otherwise ordered.

Use of signs, lights, flags, or other protective devices must comply with the *California MUTCD* and any directions of the Engineer. Signs, lights, flags or other protective devices must not obscure the visibility of, nor conflict in intent, meaning, and function of either existing signs, lights and traffic control devices, or any construction area signs.

Keep existing traffic signals and highway lighting in operation. Other forces within the County will perform routine maintenance of these facilities during the work.

Cover signs that direct traffic to a closed area. Except for work specified in section 12 of the 2015 Caltrans Standard Specifications, maintaining, and removing the covers on construction area signs is change order work.

Install temporary illumination such that the illumination and the illumination equipment do not interfere with public safety. The installation of general roadway illumination does not relieve you from furnishing and maintaining any protective devices.

Equipment must enter and leave the highway via existing ramps and crossovers and must move in the direction of traffic. All movements of workmen and construction equipment on or across lanes open to traffic must be performed in a manner that do not endanger the public. Your vehicles or other mobile equipment leaving an open traffic lane to enter the construction area must slow down gradually in advance of the location of the turnoff to give the traffic following an opportunity to slow down. When leaving a work area and entering a roadway carrying traffic, your vehicles and equipment must yield to traffic.

Immediately remove hauling spillage from a roadway lane or shoulder open to traffic. When hauling on roadways, trim loads and remove material from shelf areas to minimize spillage.

Notify the Engineer not less than 25 days and not more than 125 days before the anticipated start of an activity that will change the vertical or horizontal clearance available to traffic, including shoulders.

If vertical clearance is temporarily reduced to 15.5 feet or less, place low clearance warning signs in compliance with the *California MUTCD* and any directions of the Engineer. Signs must comply with the dimensions, color, and legend requirements of the *California MUTCD* and section 12-3.06 of the 2015 Caltrans Standard Specifications, except that the signs must have black letters and numbers on an orange retroreflective background. W12-2P signs must be illuminated so that the signs are clearly visible.

Pave or provide full width continuous and cleared wood walks for pedestrian openings through falsework. Protect pedestrians from falling objects and concrete-curing water. Extend overhead protection for pedestrians at least 4 feet beyond the edge of the bridge deck. Illuminate all pedestrian openings through falsework. Temporary pedestrian facilities must comply with the *California MUTCD*, Part 6, Chapter 6D, "Pedestrian and Worker Safety."

Do not store vehicles, material, or equipment in a way that:

1. Creates a hazard to the public
2. Obstructs traffic control devices

Do not install or place temporary facilities used to perform the work which interfere with the free and safe passage of traffic.

Temporary facilities that could be a hazard to public safety if improperly designed must comply with design requirements described in the Contract for those facilities or, if none are described, with standard design criteria or codes appropriate for the facility involved. Submit shop drawings and design calculations for the temporary facilities and show the standard design criteria or codes used. Shop drawings and supplemental calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State.

If you appear to be neglectful or negligent in furnishing warning devices and taking protective measures, the Engineer may direct your attention to the existence of a hazard. You must furnish and install the necessary warning devices. If the Engineer points out the inadequacy of warning

devices and protective measures, that action on the part of the Engineer does not relieve you from your responsibility for public safety or abrogate your obligation to furnish and pay for these devices and measures.

Install Type K temporary railing or other authorized protective systems under any of the following conditions:

1. Excavations: Where the near edge of the excavation is within 15 feet from the edge of an open traffic lane
2. Temporarily unprotected permanent obstacles: When the work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and you elect to install the obstacle before installing the protective system; or you, for your convenience and as authorized, remove a portion of an existing protective railing at an obstacle and do not replace such railing completely the same day
3. Storage areas: When material or equipment is stored within 15 feet of the edge of an open traffic lane and the storage is not otherwise prohibited by the Contract
4. Height differentials: When construction operations create a height differential greater than 0.15 feet within 15 feet of the edge of traffic lane

Installation of Type K temporary railing is not required if an excavation within 15 feet from the edge of an open traffic lane is protected by any of the following:

1. Steel plate or concrete covers of adequate thickness to prevent accidental entry by traffic or the public
2. Side slope where the downhill slope is 4:1 (horizontal:vertical) or less unless a naturally occurring condition
3. Barrier or railing

Offset the approach end of Type K temporary railing a minimum of 15 feet from the edge of an open traffic lane. Install the temporary railing on a skew toward the edge of the traffic lane of not more than 1 foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15-foot minimum offset cannot be achieved, the temporary railing must be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules must be installed at the approach end of the temporary railing.

Secure Type K temporary railing in place before starting work for which the temporary railing is required.

Where 2 or more lanes in the same direction are adjacent to the area where the work is being performed, including shoulders, the adjacent lane must be closed under any of the following conditions:

1. Work is off the traveled way but within 6 feet of the edge of the traveled way, and the approach speed is greater than 45 miles per hour
2. Work is off the traveled way but within 3 feet of the edge of the traveled way, and the approach speed is less than 45 miles per hour

Closure of the adjacent traffic lane is not required when performing any of the following:

1. Working behind a barrier
2. Paving, grinding, or grooving
3. Installing, maintaining, or removing traffic control devices except Type K temporary railing

Do not reduce an open traffic lane width to less than 10 feet. When traffic cones or delineators are used for temporary edge delineation, the side of the base of the cones or delineators nearest to traffic is considered the edge of the traveled way.

If a traffic lane is closed with channelizers for excavation work, move the devices to the adjacent edge of the traveled way when not excavating. Space the devices as specified for the lane closure.

Do not move or temporarily suspend anything over a traffic lane open to the public unless the public is protected.

When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal, cannot be properly completed within a work day, steel plate bridging with a non-skid surface and shoring shall be required to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:

1. Steel plates used for bridging must extend a minimum of 12" beyond the edges of the trench.
2. Steel plate bridging shall be installed to operate with minimum noise.
3. The trench shall be adequately shored to support the bridging and traffic loads.
4. Temporary paving with cold mix asphalt concrete shall be used to feather the edges of the plates at the end of each day prior to permitting traffic to drive over the plated trenches.
5. Bridging shall be secured against displacement by using adjustable cleats, shims, or other devices.
6. Approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of 2 dowels pre-drilled into the corners of the plate and drilled 2" into the pavement. Subsequent plates are butted to each other. Fine graded asphalt concrete shall be compacted to form ramps, maximum slope 8.5% with a minimum 12" taper to cover all edges of the steel plates. When steel plates are removed, the dowel holes in the pavement shall be backfilled with either graded fines of asphalt concrete mix, concrete slurry or equivalent slurry that is satisfactory to the Caltrans' representative.
7. The Contractor shall maintain the steel plates, shoring, asphalt concrete ramps, and ensure that they meet minimum specifications.
8. Unless specifically noted in the Technical Specifications, or approved by the Engineer, use of steel plate bridging shall not exceed 4 consecutive working days in any given week.

The following table shows the required minimal thickness of steel plate bridging required for a given trench width (A-36 grade steel, designed for HS20-44 truck loading per Caltrans Bridge Design Specifications Manual).

Trench Width	Minimum Steel Plate Thickness (inches)
10"	1/2

1'-11"	3/4
2'-7"	7/8
3'-5"	1
5'-3"	1-1/4

Note: For spans greater than 5'-3", a structural design by a registered civil engineer shall be prepared and submitted to the Engineer for review and approval.

All steel plates within the right of way whether used in or out of the traveled way shall be without deformation. Inspectors can determine the trueness of steel plates by using a straight edge and should reject any plate that is permanently deformed.

All steel plates used in the traveled portion of the highway shall have a surface that was manufactured with a nominal coefficient of friction (COF) of 0.35 as determined by California Test Method 342.

A Rough Road sign (W8-8) with black lettering on an orange background and Steel Plate Ahead sign (W8-24) shall be used in advance of steel plate bridging. This sign is used along with any other required construction signing.

1.05 PROPERTY AND FACILITY PRESERVATION

1.05A General

Preserve and protect:

1. Highway improvements and facilities
2. Adjacent property
3. Waterways
4. ESAs
5. Lands administered by other agencies
6. Roadside vegetation not to be removed
7. Railroads and railroad equipment
8. Nonhighway facilities, including utilities
9. Survey monuments
10. Department's instrumentation
11. Temporary work

Immediately report damage to the Engineer.

If you cause damage, you are responsible.

The County may make a temporary repair to restore service to a damaged facility.

Install suitable safeguards to preserve and protect facilities from damage.

Install temporary facilities such as sheet piling, cribbing, bulkheads, shores, or other supports necessary to support existing facilities or support material carrying the facilities.

Maintain temporary facilities until they are no longer needed.

Dispose of temporary facilities when they are no longer needed.

Excavate and backfill as necessary to remove temporary facilities. Backfill with materials of equal or better quality and to a comparable density of surrounding materials and grade surface to match the existing grade and cross slope.

1.05B Landscape

If you damage plants not to be removed:

1. Dispose of them unless the Engineer authorizes you to reduce them to chips and spread the chips within the highway at locations designated by the Engineer
2. Replace them

Replace plants with plants of the same species.

Replace trees with 24-inch-box trees.

Replace shrubs with no. 15-container shrubs.

Replace ground cover plants with plants from flats. Replace *Carpobrotus* ground cover plants with plants from cuttings. Plant ground cover plants 1 foot on center.

If a plant establishment period is specified, replace plants before the start of the plant establishment period; otherwise, replace plants at least 30 days before Contract acceptance.

Water each plant immediately after planting and saturate the backfill soil around and below the roots or the ball of earth around the roots of each plant. Water as necessary to maintain plants in a healthy condition until Contract acceptance.

1.05C Nonhighway Facilities

The County may rearrange a nonhighway facility during the Contract. Rearrangement of a nonhighway facility includes installation, relocation, alteration, or removal of the facility.

The County may authorize facility owners and their agents to enter the job site to perform rearrangement work for their facilities or to make connections or repairs to their property. Coordinate activities to avoid delays.

The locations of existing utilities where shown are based on available records and are approximate only. The Contractor shall assume sole and complete responsibility for locating or having located all underground utilities and other facilities and for protecting the same during the course of constructing the project.

Before starting installation of the pipeline and appurtenances, pothole at all locations necessary to determine the location of existing utilities and expose potential utility conflicts with the proposed work within the job site. The exposed utilities available to the County surveyors for cataloging and surveying prior to backfilling the pot holes. The Contractor shall provide a written report of material, diameter, station, offset, and elevation of the top of pipe prior to earthwork activities.

If interferences occur at locations other than shown on the Plans, the Contractor shall notify the Engineer immediately, and a method for correcting said interferences shall be supplied by the Engineer. Payment for interferences that are not shown on the Plans, nor which may be inferred from surface indications, shall be in accordance with the Special Provisions. If the Contractor

does not expose all required utilities prior to shop drawing preparation, the Contractor shall not be entitled to additional compensation for the work necessary to avoid interferences, nor for repair to damaged utilities.

Coordinate with County of San Luis Obispo during the progress of the work, as this scope of work is in preparation of Phase II of the Department of Public Works and Transportation’s Oceano Drainage Improvement Project (Contract No. 300465.08.02).

Any necessary relocations of utilities, whether shown on the Plans or not, shall be coordinated with the affected utility. During the progress of the work, utility owners will relocate or adjust their facility within 10 days’ notice. Notify the Engineer before you work within the approximate location of each utility. The days start on the notification date.

List of Utility Contacts:

AT&T	Neil Zakaria	(805) 546-7012
AT&T Legacy	Joseph Forket	(714) 963-7964
Charter Communications	Jason Moore	(805) 783-4962
The Gas Company	Claudia Turner	(805) 781-2429
Level3 Communications	Mark Bucis	(805) 722-9398
PG&E	Justin McDonald	(805) 546-1271
Qwest/Centurylink	Don Beckermann	(913) 302-1206
Sprint/Nextel	Tibor Laky	(949) 842-9315
Verizon Business/MCI	Chuck Trimble	(909) 421-3339
Pacific Crossing	Travis Nystronger	(805) 489-6263
South County Sanitation District	Jeremy Ghent	(805) 489-6666

Notify the Engineer at least 3 business days before you contact the regional notification center under Govt Code § 4216 et seq. Failure to contact the notification center prohibits excavation.

In accordance with California Government Code section 4216 et seq., when work is to be conducted in an area which is known, or reasonably known, to contain underground utilities or subsurface improvements, the Contractor shall contact Underground Service Alert of Southern California at least 2 working days, but not more than 14 days, in advance of any construction activity that will or could damage or affect any underground utility or subsurface improvement, and obtain an inquiry identification number. The Contractor shall delineate with white paint or other suitable markings the area to be excavated. The Contractor shall notify Underground Service Alert in the event of change in the Project limits or change in original work previously shown on the plans or indicated in the specifications. When all work is completed, the Contractor shall remove all markings for underground utilities. OCSD is not liable for any additional cost or damages incurred by Contractor due to a facility owner’s failure to comply with Government Code section 4216 et seq.

Subsurface installations are any underground pipeline, conduit, duct, wire, or other structure, except nonpressurized sewer lines, nonpressurized storm drains, or other nonpressurized drain

lines. "Approximate location of subsurface installations" means a strip of land not more than 24 inches on either side of the exterior surface of the subsurface installation. "Approximate location" does not mean depth. When the subsurface installation markings are no longer reasonably visible, the Contractor shall notify Underground Service Alert to remark those subsurface installations that may be affected by excavation to the extent necessary.

Before starting work that could damage or interfere with underground infrastructure, locate the infrastructure described in the Contract, including laterals and other appurtenances, and determine the presence of other underground infrastructure inferred from visible facilities such as buildings, meters, and junction boxes.

Notify the Engineer if the infrastructure described in the Contract cannot be found.

Underground infrastructure described in the Contract may be in different locations from described, and additional infrastructure may exist.

Upon discovering an underground main or trunk line not described in the Contract, immediately notify the Engineer and the infrastructure owner.

If necessary underground infrastructure rearrangement is not described in the Contract, the Engineer may order you to perform the work.

If you want infrastructure rearrangement different from that described in the Contract:

1. Notify the Engineer
2. Make an arrangement with the infrastructure owner
3. Obtain authorization for the rearrangement
4. Pay the infrastructure owner any additional cost

OCS&D does not adjust time or payment for a rearrangement different from that described the Contract.

Immediately notify the Engineer of a delay due to:

1. The presence of main line underground infrastructure not described in the Contract or in a substantially different location
2. Rearrangement different from that described the Contract

The Contractor will not be entitled to damages or additional payment for delays attributable to utility relocations or alterations if correctly located, noted, and completed in accordance with this section. The Contractor may be given an extension of time for unforeseen delays attributable to unreasonably protracted interference by utilities in performing work correctly shown on the Plans.

1.05D Survey Monuments

Protect survey monuments on and off the highway.

Pursuant to Section 8771(b) of the California Business and Professions Code, existing survey monuments that control the location of subdivisions, tracts, boundaries, roads, streets, or highways, or provide survey control that are within or adjacent to the Contractor's operations, shall be located and referenced by or under the direction of a licensed land surveyor or registered civil engineer prior

to the time when any streets, highways, other rights-of-way, or easements are improved, constructed, reconstructed, maintained, resurfaced, or relocated.

In the event that any existing survey monument is disturbed in any way by the Contractor's operations as determined by a licensed land surveyor or registered civil engineer, they shall be reset accordingly and a corner record or Record of Survey shall be submitted to the county surveyor prior to the recording of a certificate of completion for the project.

Upon discovery of a survey monument not previously identified:

1. Stop work near the monument
2. Notify the Engineer

Do not resume work near the monument until authorized.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in locating existing survey monuments by or under the direction of a licensed land surveyor or registered civil engineer, resetting any disturbed survey monument and indexing/filing a corner record or Record of Survey, shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

1.06 UNDERGROUND UTILITIES AND OTHER SUBSURFACE INSTALLATIONS

Underground utilities and subsurface installation are addressed in the Government Code section 4215 and 4216 et seq. Compliance with Government Code section 4216 et seq. is the responsibility of the Contractor and the utility operator of the subsurface installation. OCSD is not responsible for any costs or damages incurred by the Contractor resulting from any noncompliance with Government Code sections 4216 et seq.

OCSD shall only be responsible for utility conflicts to the extent required by Government Code section 4215, and only when the conflict involves an existing main trunkline or utility facility.

1.07 OCCUPATIONAL SAFETY AND HEALTH STANDARDS

1.07A General

Comply with applicable occupational safety and health standards, rules, regulations, and orders. The Occupational Safety and Health Standards Board is the only agency authorized in the State to adopt and enforce occupational safety and health standards (Labor Code § 142 et seq.).

You are the controlling employer and must ensure hazardous conditions are corrected (Labor Code § 6400).

The Engineer may notify Cal/OSHA if you fail to establish or maintain a safe and healthful workplace.

Submit copies of your Injury and Illness Prevention Program and permits required by Cal/OSHA.

1.07B Confined Space Safety

Comply with 8 CA Code of Regs § 5158 while working in a confined space.

1.08 PAYMENT SCOPE

OCSD pays you for furnishing the resources and activities required to complete the work. OCSD's payment is full compensation for furnishing the resources and activities, including, but not limited to:

1. Risk, loss, damage repair, or cost of whatever character arising from or relating to the work and performance of the work
2. PLACs and taxes
3. Any royalties and costs arising from patents, trademarks, and copyrights involved in the work

OCSD does not pay for your loss, damage, repair, or extra costs of whatever character arising from or relating to the work that is a direct or indirect result of your choice of construction methods, materials, equipment, or manpower, unless specifically mandated by the Contract.

Payment is:

1. Full compensation for all work involved in each bid item shown on the Bid Item List by the unit of measure shown for that bid item
2. For the price bid for each bid item shown on the Bid Item List or as changed by change order

Full compensation for work specified in the Standard General Conditions, these Specifications, and Divisions II and XI of the 2015 Caltrans Standard Specifications and the 2015 Caltrans Revised Standard Specifications is included in the payment for the bid items involved unless:

1. Bid item for the work is shown on the Bid Item List
2. Work is specified as change order work

Work paid for under one bid item is not paid for under any other bid item.

Payment for a bid item includes payment for all work and costs relating to that bid item under the Contract Documents, including all profit and all direct and indirect costs, including but not limited to overhead, bonds, insurance, and any other fixed or administrative costs.

If the amount of a deduction or withhold exceeds final payment, OCSD shall invoice Contractor for the difference; Contractor shall pay said invoice upon receipt.

1.09 SURFACE MINING AND RECLAMATION ACT

Imported borrow or aggregate material must come from a surface mine permitted under the Surface Mining and Reclamation Act of 1975, Pub Res Code § 2710 et seq., or from a source not subject to this act.

For the list of permitted sites, go to the Department of Conservation, Office of Mine Reclamation website:

<http://www.conservation.ca.gov/omr/>

If you import borrow or aggregate material from a surface mine not on this list, submit proof that the source is not subject to this act.

1.10 VEHICLE CODE

Under Vehicle Code § 591, OCSD determines areas within the project limits are open to public traffic. For those areas, comply with the requirements set forth in Divisions 11, 12, 13, 14 and 15 of the Vehicle Code.

Vehicle Code § 591 does not relieve you or any other person from the duty of exercising due care.

Under Vehicle Code § 23114, all trucks hauling dirt, sand, soil, or other loose materials must be covered or must maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer).

DIVISION 2 CONSTRUCTION SPECIFICATIONS

2.01 GENERAL

Construction work shall be performed in conformance with Division II of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

2.02 JOB SITE APPEARANCE

Keep the job site neat. In areas visible to the public:

1. If practicable, dispose of debris removed during clearing and grubbing concurrently with its removal. If stockpiling is necessary, dispose of weekly.
2. Furnish trash bins for debris from construction. Place debris in trash bins daily.
3. Stack forms for falsework to be reused neatly and concurrently with their removal.

If the Contractor fails to clean up as provided in the Contract Documents, OCSD may do so and they shall be entitled to reimbursement from the Contractor.

2.03 WORK SEQUENCING

Work shall be sequenced in conformance with section 10-1.02 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

Section 10-1.02A of the 2015 Caltrans Standard Specifications shall be replaced with the following:

Contractor shall review the Environmental Permit Summary Form in preparation of project work sequencing. Elements within this document, such as the nest bird season, may limit availability to perform work during specific times of the year and shall be compensated for in the project schedule to minimize project delays. Additionally, the Contractor is responsible for obtaining Encroachment Permits from SLO County and Caltrans. A condition of the County's Encroachment Permit will be compliance with the Environmental Permit for the County's Oceano Drainage Project.

2.04 TIME CONSTRAINTS

No construction activities shall be conducted below top of the banks of Arroyo Grande Creek or in other waters of the State during the winter period (November 1 – May 30).

Do not conduct construction activities on any day for which the National Weather Service has predicted at least 0.5-inch rain in a 48-hour period (Predicted Rain Event).

Construction activities within 500 feet of Arroyo Grande Creek will be halted 24 hours before the Predicted Rain Event is anticipated to begin.

After a rain event, construction activities within 500 feet of Arroyo Grande Creek may resume after the rain has ceased, the National Weather Service predicts clear weather for at least 24 hours, the County biologist has surveyed the site, and site conditions are dry enough to continue work without discharge of sediment or other pollutants from the job site.

All proposed night work is subject to approval by the Engineer and shall be in accordance with the Noise Standards as specified in Title 22.100.120 of the County Code.

2.05 MAINTAINING TRAFFIC

Traffic shall be maintained through the construction work zone in conformance with section 12-4.01 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

Nothing in these Special Provisions shall be construed as relieving the Contractor from responsibility of these sections.

The Contractor shall make all necessary arrangements to provide, at the Contractor's expense, vehicular access to driveways, parking areas, and private properties.

Driveway access restrictions may not exceed the time period strictly necessary for performing the work, which cannot be done otherwise.

The Contractor shall furnish and post signs where necessary to inform the public about closures or restrictions on streets and at parking area entrances.

Streets and roads to be posted with parking restrictions, as determined by the Engineer, shall be posted a minimum of seventy-two (72) hours in advance of construction operations with weather resistant signs. Contractor is responsible to provide for the removal of parked cars that conflict with the work. Full compensation for posting parking restrictions shall be considered as included in the prices paid for Traffic Control System.

Except as otherwise provided, the full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays, and designated legal holidays and when construction operations are not actively in progress.

Attention is directed to the General Specifications and the Caltrans Encroachment Permit attached as an appendix to these Contract Documents

2.06 ENVIRONMENTAL STEWARDSHIP

2.06A General

Attention is directed to section 14 of the 2015 Caltrans Standard Specifications, the 2015 Revised Standard Specifications, and these Technical Specifications. Additional work required for compliance with this section is excluded from the base contract and, if required, will be detailed in a contract change order.

2.06B Cultural Resources

Attention is directed to section 14-2 of the 2015 Caltrans Standard Specifications and these Technical Specifications.

If archaeological resources are discovered within or near construction limits, do not disturb the resources and immediately:

- Stop all work within a 150-foot radius of the discovery
- Secure the area
- Notify the Engineer
- Notify the County Coroner, if human remains are discovered

2.06C Biological Resources

Attention is directed to section 14-6 of the 2015 Caltrans Standard Specifications and these Technical Specifications.

This project is within or near habitat for regulated species shown in the following table:

Species Name
California red-legged frog
western pond turtle
two-striped garter snake
Steelhead
Migratory and nongame birds

A County biologist will be present at the job site to conduct preconstruction surveys in Arroyo Grande Creek and adjacent areas, conduct construction personnel training prior to site disturbance, and to monitor during grading and construction activities.

All construction personnel must receive training regarding biological resources, their habitats and legal status, and the need for conservation of the various species within the project site prior to starting work.

No pets shall be allowed at the project site.

2.06D PALEONTOLOGICAL RESOURCES

Attention is directed to section 14-6 of the 2015 Caltrans Standard Specifications and these Technical Specifications.

2.07 AIR POLLUTION CONTROL

2.07A General

Comply with air-pollution-control rules, regulations, ordinances, and statutes that apply to work performed under the Contract, including those provided in Government Code § 11017 (Public Contract Code § 10231).

Do not dispose of material by burning.

2.07B Diesel Idling

Comply with the following APCD California Diesel Idling Regulations:

1. On-road diesel vehicles shall comply with Section 2485 of Title 13 of the California Code of Regulations. This regulation limits idling from diesel-fueled commercial motor vehicles with gross vehicular weight ratings of more than 10,000 pounds and licensed for operation on highways. It applies to California and non-California based vehicles. In general, the regulation specifies that drivers of said vehicles:
 - a. Shall not idle the vehicle’s primary diesel engine for greater than 5 minutes at any location, except as noted in Subsection (d) of the regulation; and

- b. Shall not operate a diesel-fueled auxiliary power system (APS) to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than 5.0 minutes at any location when within 1,000 feet of a restricted area, except as noted in Subsection (d) of the regulation.
2. Off-road diesel equipment shall comply with the 5-minute idling restriction identified in Section 2449(d)(2) of the California Air Resources Board's In-Use off-Road Diesel regulation.
3. Signs must be posted in the designated queuing areas and job sites to remind drivers and operators of the APCD's 5-minute idling limit.

Sensitive receptors near the job site include residences and the Oceano Elementary School. Comply with the following additional Sensitive Receptor Diesel Idling Regulations:

1. Staging and queuing areas shall not be located within 1,000 feet a sensitive receptor;
2. Diesel idling within 1,000 feet of sensitive receptors shall not be permitted;
3. Use of alternative fueled equipment is recommended; and
4. Signs that specify the no idling areas must be posted and enforced at the job site.

2.07C Fugitive Dust Emissions

Manage fugitive dust emissions such that they do not exceed the APCD 20% opacity limit (APCD rule 401) and do not impact off-site areas prompting nuisance violations (APCD rule 402).

Comply with the following APCD requirements:

1. Reduce the amount of disturbed area where possible;
2. Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site. Increased watering frequency would be required whenever possible;
3. All dirt stock pile areas should be sprayed daily as needed;
4. Permanent dust control measures identified in the approved Project revegetation and landscape plans should be implemented as soon as possible, following completion of any soil disturbing activities;
5. Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading should be sown with a fast germinating, non-invasive, grass seed and watered until vegetation is established;
6. All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the APCD;
7. All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used;
8. Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site;

9. All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with CVC Section 23114;
10. Install wheel washers where vehicles enter and exit unpaved roads onto streets, or wash off trucks and equipment leaving the site;
11. Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water should be used where feasible;
12. Designate a person or persons to monitor fugitive dust emissions and enhance the implementation of the above measures as necessary to minimize dust complaints, reduce visible emissions below 20% opacity, and to prevent transport of dust offsite. Their duties shall include holidays and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the APCD Compliance Division prior to the start of any grading, earthwork or demolition.

2.07D Hydrocarbon Contaminated Soil

Additional work required for compliance with this section is excluded from the base contract and, if required, will be detailed in a contract change order.

Should hydrocarbon contaminated soil be encountered during construction activities, the APCD must be notified as soon as possible and no later than 48 hours after affected material is discovered to determine if an APCD Permit will be required.

Additional work required for compliance with this section is excluded from the base contract and, if required, will be detailed in a contract change order.

In addition, the following measures shall be implemented immediately after contaminated soil is discovered:

1. Covers on storage piles shall be maintained in place at all times in areas not actively involved in soil addition or removal;
2. Contaminated soil shall be covered with at least six inches of packed uncontaminated soil or other TPH-nonpermeable barrier such as plastic tarp. No headspace shall be allowed where vapors could accumulate;
3. Covered piles shall be designed in such a way to eliminate erosion due to wind or water. No openings in the covers are permitted;
4. The air quality impacts from the excavation and haul trips associated with removing the contaminated soil must be evaluated and mitigated if total emissions exceed the APCD's construction phase thresholds;
5. During soil excavation, odors shall not be evident to such a degree as to cause a public nuisance; and
6. Clean soil must be segregated from contaminated soil.

2.07E Portable Equipment

Portable equipment, 50 horsepower (hp) or greater, used during construction activities may require California statewide portable equipment registration (issued by the California Resources Board) or an APCD permit. Submit copies of current registration and/or APCD permit prior to using said equipment on the project.

2.07F Truck Routes

Proposed truck routes should be evaluated and selected to ensure routing patterns have the least impact to nearby residential communities and sensitive receptors, such as schools, daycare facilities, hospitals, and senior centers.

DIVISION 3 TECHNICAL SPECIFICATIONS

3.01 CONSTRUCTION SURVEYING

If necessary, construction surveying shall be performed in conformance with these Technical Specifications.

Retain the services of a Professional Licensed Land Surveyor (or pre-1982 licensed RCE) to:

1. Identify existing control points
2. Provide construction stakes or marks as necessary to establish the lines and grades as required for completion of the work. Construction stakes shall be labeled with references to plan alignment stations and offsets with stored survey point number for the set hub.
3. Maintain accurate records of locations of all new buried facilities and existing buried facilities and other buried existing facilities, piping, conduits, and structures) encountered and/or relocated during the work
4. Provide any other survey services the Contractor will need for the completion of the work under this Contract.
5. Provide construction stakes and cut sheets to the Engineer for every 50' Station, plus any additional locations as requested by the Engineer to confirm and verify orderly progression of the work. Construction stakes and cut sheets shall contain sufficient detail to fully construct the project as intended by the Contract Documents. At a minimum, stakes and cut sheets shall identify centerline, hinge points, daylight points, flow line(s), all structures within the roadway prism, and any other such detail points necessary for successful completion of the work by the Contractor and as needed by the Engineer to confirm and verify progression of the work.
6. Submit a monthly as-built survey with the monthly Application for Payment and submit a final certified as-built survey with the Final Application for Payment. As-built surveys shall be drawn at the same scale as the Project Plans indicating lines, grades, elevations, and stationing at 100-ft increments, changes in alignment or grade, structure inverts and rim elevations, and pipe inverts.

The County has CAD files containing base mapping, alignment, and profiles associated with their Oceano Drainage Project for the Contractor's convenience and reference. This information will be provided to the Contractor upon the Contractor's request, prior to construction. The Contractor should route their request through OCSD.

The County has provided survey control for their project. The Contractor's Land Surveyor shall field verify the survey control over the entire job prior to staking and prior to clearing and grubbing, if necessary, and shall notify the Engineer immediately of any conflicts that will need to be resolved.

Surveyor's ASCII files or XML files of set points shall be provided to the Engineer for reference and cross-checking when requested by the Engineer.

In the event stakes and marks are destroyed or damaged, the stakes and marks will be replaced by the Contractor's Land Surveyor at no cost to OCSD. The Contractor shall be responsible for all costs associated with setting, replacement, or restoration of construction stakes and marks.

If conflicts, discrepancies, or missing information is identified on the Project Plans, notify the Engineer immediately.

If the Contractor identifies potential conflict between top/toe of slope and the right of way boundary, the Engineer shall be notified immediately.

3.02 EXCAVATION SAFETY

Excavation safety shall be performed in conformance with these Technical Specifications

Comply with Labor Code § 6705 while excavating. For an excavation 5 feet or more in depth, submit shop drawings for a protective system. The Engineer is authorized to receive and accept the plans required under Labor Code Section 6705, and to take any other actions regarding said plans that are expressly or implicitly authorized under said statute.

The drawings must show the design and details for providing worker protection from caving ground during excavation. The submittal must allow review time and include the contents shown in the following table except the review time is 65 days for an excavation on or affecting railroad property:

Drawing Review Time and Contents

Topic	Plan not requiring a signature	Plan requiring a signature
Review time	5 business days before excavating	20 days before excavating
Contents	Drawings Calculations Material information Proprietary system information	Drawings Calculations Material information Proprietary system information Soil classification Soil properties Soil design calculations

3.03 CONSTRUCTION AREA SIGNS

Construction area signs shall be placed in conformance with section 12-3.11 of the 2015 Caltrans Standard Specifications and the 2015 Caltrans Revised Standard Specifications.

3.04 TRAFFIC CONTROL SYSTEM

Temporary traffic control shall be provided in conformance with section 12 of the 2015 Caltrans Standard Specifications, sections 1.02 and 1.03 of the General Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

The following shall replace section 12-1.04 of the 2015 Caltrans Standard Specifications:

The cost of furnishing all flaggers, including transporting flaggers and furnishing stands and towers for flaggers to provide for the passage of traffic through the work as specified in sections 7-1.03 and 7-1.04 is included in the Lump Sum amount for each Bid Item.

Section 12-4.02A(3)(a) of the 2015 Caltrans Standard Specifications shall be replaced with the following:

Submit traffic control plans for within 10 business days of receipt of the fully executed contract. The traffic control plans shall show all proposed street closures, detours, lists of

signing, delineation of striping, description of construction activity, and schedule of various phases. Traffic control plans shall be submitted within 10 business days of receipt of the fully executed contract.

Work shall not commence until the traffic control plan(s) is approved by the Engineer.

Pedestrian access shall be maintained at all times to all business, residences, and buildings adjacent to construction.

The following shall be added to section 12-4.02D of the 2015 Caltrans Standard Specifications:

Traffic Control System includes development of traffic control plans and all traffic control devices.

3.05 JOB SITE MANAGEMENT

Job site management shall be in conformance with the provisions in section 13-4 of the 2015 Caltrans Standard Specifications and the 2015 Caltrans Revised Standard Specifications.

Attention is directed to the Groundwater and On-Site Soils Assessment included in as Supplemental Project Information regarding potential for encountering groundwater.

3.06 WATER POLLUTION CONTROL

Additional work required for compliance with this section is excluded from the base contract and, if required, will be detailed in a contract change order. Possible work associated with compliance with this project may include requirements set forth in a SWPPP (if required) and the associated BMPs, etc.

3.07 TEMPORARY SOIL STABILIZATION

Temporary soil stabilization materials shall be placed in conformance with section 13-5 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and the SWPPP.

3.08 TEMPORARY SEDIMENT CONTROL

Temporary sediment control shall be installed in conformance with section 13-6 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and the SWPPP.

The all the paragraphs of section 13-6.04 of the 2015 Caltrans Standard Specifications shall be replaced with the following:

Payment for all temporary sediment control items required for the OCSD Utility Relocation shall be considered as included in the bid items of work involved and no separate payment will be made therefor.

3.09 TEMPORARY TRACKING CONTROL

Limiting and removing sediment and debris tracked onto roadway surfacing shall be in conformance with section 13-7 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and the SWPPP.

The first paragraph of section 13-7.04 of the 2015 Caltrans Standard Specifications shall be replaced with the following:

Payment for all temporary tracking control items required for the OCSD Utility Relocation shall be considered as included in the bid items of work involved and no separate payment will be made therefor.

3.10 TEMPORARY CONCRETE WASHOUTS

Temporary concrete washouts shall be installed in conformance with section 13-9 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and the SWPPP.

The first paragraph of section 13-9.04 of the 2015 Caltrans Standard Specifications shall be replaced with the following:

Payment for all temporary concrete washouts required for the OCSD Utility Relocation shall be considered as included in the additive bid items of work involved and no separate payment will be made therefor.

3.11 TEMPORARY LINEAR SEDIMENT BARRIERS

Temporary linear sediment barriers shall be installed in conformance with section 13-10 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and the SWPPP. The first paragraph of section 13-10.04 of the 2015 Caltrans Standard Specifications shall be replaced with the following:

Payment for all temporary linear sediment barrier items required for the OCSD Utility Relocation shall be considered as included in the additive bid items of work involved and no separate payment will be made therefor.

3.12 EXISTING FACILITIES

Work performed on existing facilities shall be in conformance with section 15 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

Entirely remove existing concrete sidewalk, curb, gutter, and asphalt pavement as shown on the plans.

3.13 CLEARING AND GRUBBING

Clearing and grubbing activities shall be performed in conformance with section 17-2 of the 2015 Caltrans Standard Specifications and the 2015 Caltrans Revised Standard Specifications.

Section 17-2.04 of the 2015 Caltrans Standard Specifications shall be replaced with the following:

Payment for clearing and grubbing required for the OCSD Utility Relocation shall be considered as included in the bid items of work involved and no separate payment will be made therefor.

3.14 EARTHWORK

Earthwork activities shall be performed in conformance with section 19 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

The following sentence shall be added to section 19-2.02 of the 2015 Caltrans Standard Specifications:

Excavation and reuse, or removal and disposal of the existing Redrock is included in Roadway Excavation.

The following sentence shall be added to section 19-2.03A of the 2015 Caltrans Standard Specifications.

Subject to the approval of the Engineer, the existing Redrock may be used for embankment or subgrade construction, but shall not be reused for the final surface.

The following shall be added to section 19-3.02 of the 2015 Caltrans Standard Specifications:

19-3.02K Gravel

Gravel must:

1. be free of clay or organic material
2. be suitable for the purpose intended

3/4" Gravel (Basin) shall comply with the gradation requirements shown in the following table:

Sieve Size	Percentage Passing
1"	100
3/4"	50 – 100
3/8"	0 – 25
No. 4	0 - 15

The following shall be added to section 19-3.02 of the 2015 Caltrans Standard Specifications:

19-3.03L Gravel

Place gravel material in layers by the same method specified for structure backfill.

The following sentence shall be added to section 19-7.02B of the 2015 Caltrans Standard Specifications:

Local material generated by this project from roadway excavation, structure excavation, and utility excavation may be used as structure backfill and imported borrow material if determined suitable by the Engineer.

3.15 AGGREGATE BASES

Aggregate bases shall be placed in conformance with section 26 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

The following shall be added to section 26-1.02A of the 2015 Caltrans Standard Specifications:

Redrock shall be used where indicated on the plans. Redrock shall be size 1-1/2"

Redrock material shall be subject to approval by the Engineer prior to placement and may be obtained from:

Spreafico Pit – 7940 Orcutt Road, San Luis Obispo, CA

Bianchi Quarry – 4130 Santa Rosa Creek Road, Cambria, CA

Whale Rock Quarry – 1642 Old Creek Road, Cayucos, CA

Guerra Quarry – 1890 Highway 41, Morro Bay, CA

The following sentence shall be added to section 26-1.03A of the 2015 Caltrans Standard Specifications:

A minimum of 6" of Class 2 Aggregate Base or matching existing thickness, whichever is greater, shall be placed under all asphalt concrete pavement.

3.16 ASPHALT CONCRETE

Asphalt concrete work shall be performed in conformance with section 39 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

3.17 COLD PLANING ASPHALT CONCRETE PAVEMENT

Cold planing asphalt concrete pavement shall be performed in conformance with section 39-3.04 of the 2015 Caltrans Standard Specifications and the 2015 Caltrans Revised Standard Specifications.

3.18 REMOVE BASE AND SURFACING

Removing base and asphalt concrete surfacing shall be performed in conformance with section 39-3.05 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

The existing surfacing within a trench cut shall be broken up and removed to its full depth. Trench repair shall include a 12" minimum T-section as shown on Drawings R-3 and R-3a. The saw cut shall be a neat vertical cut no less than 0.2-feet in depth. Care is to be taken to protect the surfacing that is to remain in place.

3.19 CONCRETE STRUCTURES

Concrete structures shall be constructed in conformance with section 51 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

3.20 REINFORCEMENT

Reinforcement shall be fabricated and placed in conformance with section 52 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

2015 2015 Caltrans Standard Specifications and the 2015 Caltrans Revised Standard Specifications.

3.21 CONCRETE CURBS AND SIDEWALK

Concrete curbs, concrete retaining curbs, sidewalks, and their appurtenances, such as gutter depressions, island paving, curb ramps, driveways, access ramps, and concrete swales shall be constructed in conformance with section 73 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

The following shall be added to section 73-1.03B of the 2015 Caltrans Standard Specifications:

Class 2 Aggregate Base shall be placed and compacted to 95% of maximum density for 6 inches below the elevation for curbs, gutter depressions, island paving, driveways, and curb ramps and 4 inches below the elevation for sidewalk.

3.22 LOCAL INFRASTRUCTURE

Section 77-1 of the 2015 Caltrans Standard Specifications shall be replaced with the following:

77-1 WATERLINES

77-1.01 GENERAL

Section 77-1 includes specifications for potable water pipelines and appurtenances.

Potable water pipeline installation must conform to these specifications and the American Water Works Association (AWWA) requirements.

Do not turn any valves in the OCSD water system. Contact the Engineer at least 48 hours in advance of the need, and the Engineer will coordinate with OCSD.

77-1.02 MATERIALS

77-1.02A Pipe

77-1.02A(1) Ductile Iron Pipe

Ductile iron pipe shall be centrifugally cast, ductile iron pipe, with ends joined by a method approved by the Engineer, which employs a single elongated rubber gasket to affect the joint, such as "Tyton Joint" or an approved equal. The pipe shall be minimum pressure Class 150 with bituminous coating of coal tar 1 mil thick outside, and lined inside with seal-coated cement lining of 1.6 mm minimum thickness, all conforming to applicable ASA and AWWA Specifications. Ductile iron pipe shall be encased in polyethylene material. Above-ground piping shall have flanged joints, be factory-applied epoxy-coated and blue in color.

77-1.02A(2) Steel Pipe

Shall conform to and meet the requirements of AWWA Specifications C200, with cement mortar lining and coating in accordance with AWWA Specification C205. The method used for coupling the ends of the pipe, whether mechanically couple welded, bell and spigot ends with rubber gasket or any other type, shall be approved by the Engineer prior to any use of the pipe.

77-1.02A(3) Plastic (PVC) Pipe

Shall be unplasticized Poly Vinyl Chloride (PVC) plastic class water pipe with integral bell and spigot joints or plain-end designed for joint assembly using elastomeric-gasket standard PVC couplings. The pipe shall meet the requirements of AWWA C900 "Poly Vinyl Chloride" (PVC) Pipe, and shall be furnished in cast iron (CI) equivalent outside diameters (OD). All Class 150 pipe shall meet the requirements of DR 18, and all Class 200 pipe shall meet the requirements of DR 14. All pipe shall be suitable for use as pressure conduit. Provision must be made for expansion and contraction at each joint with an elastomeric ring. The bell shall consist of an integral wall section with a solid cross-section elastomeric ring, which meets the requirements of ASTM D-1869 and E-477. The bell section shall be designed to be at least as strong as the pipe wall. Sizes and dimensions shall be as shown in this specification. Standard laying lengths shall be 20-feet for all sizes. Random lengths shall not be less than 10-feet in length. At least 85% of the pipe used shall be standard laying length. Each standard length and random length of pipe shall be factory-tested to four (4) times the class pressure of the pipe for a minimum of five (5) seconds. The integral bell shall be tested with the pipe.

77-1.02B Fittings

Bends, elbows, tees, crosses and special fittings for water mains shall be cast iron or ductile iron conforming to AWWA C-110, C-153 or approved equal.

1. Reducers. When changes in pipe size are required, eccentric reducers shall be used where appropriate to minimize air pockets.
2. Inside Lining. Fittings shall be cement-mortar lined in accordance with AWWA C-104. Fittings lined in the field will not be considered as conforming to AWWA C-104 and will not be accepted.
3. Outside Coating. The outside of cast iron or ductile iron fittings shall have a bituminous coating of coal tar approximately 1 mil thick, unless specified otherwise. The finishing coat shall be continuous and smooth. It shall be neither brittle when cold nor sticky when exposed to the sun, and shall adhere strongly to the pipe.

77-1.02C Valves and Valve Boxes

1. Valves. Valves shall open in counter-clockwise direction and shall meet the requirements of AWWA Specification C500 for gate valves and AWWA Specification C504 for butterfly valves. All valves shall be epoxy coated inside and out. The butterfly valve standard is not intended to cover valves for installation where service conditions exceed the shutoff pressures and line velocities stated in Table L of AWWA Specification C504. Gate valves shall be resilient-seated.

Air and Vacuum Release Valves. Valves shall meet or exceed the latest revision of ANSI/AWWA C512 Standard for Air Release, Air/Vacuum, and Combination Air Valves for waterworks service. All 2-inch valves shall incorporate stainless steel internal components and National Pipe Threaded (NPT) inlet. All 4-inch and 6-inch valves shall incorporate stainless steel internal components and flanged inlet. Floats, seats, and

trim materials shall be inherently corrosion-resistant and have physical properties suitable for the application. The valve manufacturer shall provide a certification stating that the valve conforms to these Standards. Air and vacuum release valves shall be as follows: All air and vacuum release valves shall be a minimum outlet size of two (2) inches.

Table 6-5: Air/Vacuum Release Valves

Pipe Diameter	Air/Vacuum Release Valve
6-12 inches	2-inch
16-20 inches	4-inch
24-36 inches	6-inch

All air and vacuum release valves shall be a minimum outlet size of two (2) inches.

2. Check Valves. All check valves shall seat readily and completely to assure water tightness. The face of the closure element and valve seat shall be bronze, composition, or other non-corrodible material which will seat tightly under all prevailing conditions of field use. Slow-closing check valves shall be used where excessive pressures or water hammer may occur, and the static operating pressure is within 20% of the pressure class or rating of the pipe. All check valves, 4-inch and larger in size, for use of distribution mains, shall be designed for a minimum of 175 psi working pressure.
3. Valve Boxes. Valve boxes shall be as shown on County of San Luis Obispo Standard Drawing No. W-3. The cover shall be marked "WATER" and shall have a loose fit in the box.

77-1.02D Hydrants

Fire hydrants shall be wet or dry barrel type, 30-inch bury, and shall meet the requirements of AWWA Specifications C502 and C503. They shall also meet the requirements set forth by the Fire District in which the improvement is located or by the Engineer in the absence of a Fire District. They shall also conform with the following requirements:

1. Outlets. In single-family residential areas, fire hydrants shall have not less than two 2.5-inch (2½") outlets which National Standard fire thread. In business, industrial, institutional, school and multifamily dwelling areas, fire hydrants shall have two 2.5-inch (2 ½") outlets with National Standard fire thread and one 4-inch (4") suction outlet with National Standard fire thread. An approved fire hydrant is the CLOW F-2060.
2. Painting Hydrants. All hydrant exteriors are to be painted chrome yellow. The tops and outlet nozzle caps are to be painted as follows, based on the results of fire flow testing specified in County of San Luis Obispo Public Improvement Standards 6.2.3 C:

Table 6-6: Painting Fire Hydrants Tops and Nozzle Caps

Hydrant Class	Color
AA (>1,500 gpm)	light blue
A (1,000-1,499 gpm)	green

B (500-999 gpm) orange	B (500-999 gpm) orange
C (<500 gpm) red	C (<500 gpm) red

Within private property, hydrant marking is to be at the discretion of the owner, as approved by the local fire protection agency. All ferrous metal parts of the hydrant shall be thoroughly cleaned, and all surfaces inside and outside shall be coated with two coats of paint. Paint used on the interior shall be compatible with potable water and shall at a minimum conform to the requirements of Federal Specification TT-C-494b. Paint used on the exterior top section shall at a minimum conform to the requirements of Federal Specification TT-P-664.

3. Installation. Break-away bolts shall be used to join the hydrant body to the buried section. The bolts shall conform to ASTM A307, Grade B, and shall have a tensile strength less than the shear force required to break the hydrant body. Bolts shall be filled with silicon. When installing hydrants on PVC mains, the hydrant lateral shall be made of the same material as the main. This will help protect the main from damage if the hydrant is hit during a collision and the break-away bolts do not function properly. If dry-barrel type hydrants are installed, they shall have plugs pulled and leach rock installed.

77-1.02E Blowoffs

All blowoffs shall be a minimum outlet size of 2-inches and shall be designed for a minimum operating pressure of 150 psi.

77-1.02F Water Service Connections

1. Materials. The following materials are acceptable for 3/4" and 1" service connections:
 - i. Polyvinyl Chloride, Schedule 40, ASTM D-1785-68
 - ii. Polyethylene tubing, ASTM D-2239-67 P.E. 3306 - Type II - Grade 3 (Flarable) The following materials are acceptable for 1 1/2" and larger service connections:
 - iii. All of the materials listed above for 3/4" and 1" services
 - iv. Brass Pipe - shall be seamless red brass conforming to
 - v. ASTM B-43-58
2. Sizes. Single service connections shall be minimum 3/4" inside diameter. Double service connections shall be minimum 1-inch inside diameter. (Note that Polyethylene tubing is normally specified in outside diameter.)
3. Corporation Stops. All corporation stops shall be bronze, round, with iron pipe standard (I.P.S.) thread for steel pipe, and outlet for the type of service pipe used.
4. Meter Stops. All 3/4-inch and 1-inch (curb) meter stops shall be bronze, with inlet for the type of service pipe used, and outlet for the type of service pipe or meter coupling used.

5. For 1 ½-inch and 2-inch service, a bronze curb stop valve, straight ground key curb stop, or bronze gate valve (minimum of 200 psi rated working pressure) may be used. Both inlet and outlet shall be appropriate for the type of service pipe or meter flange used. All valves shall be factory hydro-tested to 300 psi or air-tested to 100 psi under water.
6. Bronze Gate Valve. All 1 ½-inch through 3-inch gate valves shall be all bronze and comply with AWWA Standard C500.
7. Standard Service Clamps. All service clamps and straps shall be in accordance with AWWA Standards and the pipe manufacturer's recommendations.
8. Repair Service Clamps. Where no service clamp is required, and the corporation stop does not seal properly, a repair service clamp shall be used.

77-1.02G Concrete Trust Blocks

Portland cement concrete, conforming to the compressive strength requirements found in County of San Luis Obispo Public Improvement Standards Appendix C, for thrust blocks shall be produced from commercial quality aggregate and cement and shall contain not less than five (5) sacks of cement per cubic yard. Hand mixing of this concrete shall not be permitted. Plastic wrap shall be used to protect fitting connections.

77-1.02H Storage Concrete Trust Blocks

Portland cement concrete, conforming to the compressive strength requirements found in County of San Luis Obispo Public Improvement Standards Appendix C, for thrust blocks shall be produced from commercial quality aggregate and cement and shall contain not less than five (5) sacks of cement per cubic yard. Hand mixing of this concrete shall not be permitted. Plastic wrap shall be used to protect fitting connections.

77-1.03 CONSTRUCTION

77-1.03A Lines and Grades

The pipe shall be laid true to line, with no visible change in alignment at any joint, unless curved alignment is shown on the plans. No deflections shall be made at the pipe joints. When curved alignment is shown, the minimum radius of curvature and the maximum deflection at any joint shall not exceed the manufacturer's recommendation and shall be approved by the Engineer.

77-1.03B Trench Widths

The minimum trench width shall be the nominal diameter of the pipe plus 12- inches, for all pipes 36-inches in diameter or less. All pipes greater than 36-inches diameter need special consideration and approval by the Engineer. The maximum trench width shall be the nominal pipe diameter plus 16-inches. However, in any case the width shall be ample to permit the proper installation of the pipe and appurtenances. Refer to County of San Luis Obispo Standard Drawing Series U-4 for trenching and backfill requirements.

77-1.03C Excavation

1. Depth. Water mains shall be installed at a depth which will provide a minimum cover of 36-inches over the top of the pipe measured from the finished grade.
2. Excavation. Unless otherwise specified, the excavation for water mains shall be an open trench, excavated to 6-inches below the bottom of the pipe. The excavations for bells, collars, valves and fittings shall be performed by hand and the bedding material shall be hand-shaped so that the bottom segment of the pipe is firmly supported. It is the intent of these requirements to provide firm, uniform bearing for the pipe. Where the trench is in granular or sandy material, the pipe may be bedded in the native material in lieu of importing bedding material, providing it complies with the specification for bedding material. The Engineer shall determine the suitability of the native material.
3. If soft, spongy, unstable or similar other material is encountered upon which the bedding material or pipe is to be placed, additional material shall be removed below the normal trench bottom to a minimum depth of 1-foot, or as directed by the Engineer. The resulting sub-trench shall be backfilled with sand bedding material suitably densified, and be true to the designed line and grade. Upon approval of the Engineer, horizontal boring or tunneling for short distances under roads, sidewalks, other utilities, etc., will be permitted.
4. Preparation of Pavement. When the trench is in an existing paved area, refer to County of San Luis Obispo Public Improvement Standards Section 3 for sawcut and pavement reconstruction requirements.
5. De-Watering. When water is encountered, the trench shall be kept free of water until the laying and jointing of the pipe, and placing of the bedding material has been completed, inspected, and approved. No concrete footings, foundations, anchors, or thrust blocks shall be laid in water, nor shall water be allowed to rise over them until the concrete has set at least 12 hours. All water accumulating in the trench from any source whatsoever shall be removed. Waste water shall be disposed of in such a manner as will not cause any damage to public or private property and will not be a menace or inconvenience to the public. The manner employed to dispose of water pumped from an excavation shall be subject to the approval of the Engineer.
6. Excavated Material. Excavated material shall be piled in such a manner that it will not endanger the work and will offer minimum obstruction to traffic. Open trenches and waste piles shall be adequately barricaded and lighted.
7. Other Pertinent Regulations. All safety orders, rules, or recommendations of the Occupational Safety and Health Administration (OSHA) and the Division of Industrial Safety of the Department of Industrial Relations of the State of California, applicable to this work, shall be obeyed and enforced.
8. Bracing and Shoring. Trench walls shall be vertical, unless permitted otherwise by the Engineer in writing. Adequate shoring, as required by the Division of Industrial Safety of the State of California, to protect personnel, adjacent property and roadway areas shall be installed through unstable material to limit trench width to the amount specified in

these Special Provisions. If any damage does result to such improvements, the necessary repairs or reconstruction required shall be made, as directed by the Engineer.

The sheeting, shoring, and bracing shall be so arranged as not to place any stress on portions of the completed work until the general construction thereof has proceeded far enough to provide ample strength. Any damage to structures occurring through settlement, water or earth pressure, slides, caves or other causes due to failure or lack of sheeting or bracing or improper bracing, or through negligence or fault in any other manner shall be repaired immediately to the approval of the Engineer.

Where timber sheeting extends below the invert of a pipe, it shall be cut off at the top of the pipe and the upper portion removed without harming the support conditions. This requirement will not be necessary where steel sheeting is used for shoring below the invert of the pipe.

Care shall be exercised in the drawing or removing of sheeting, shoring, bracing, and timbering to prevent the caving or collapsing of the excavation faces which are being supported.

77-1.03D Laying Pipe

Pipe shall be laid in accordance with the manufacturer's specifications. All PVC pipe and fittings for water mains shall be installed in accordance with AWWA C-900. The following sequence shall be used:

1. Each section of pipe and each fitting shall be thoroughly cleaned before it is installed. All pipe, fittings, valves, etc., shall be carefully lowered into the trench by suitable tools or equipment, in such manner as to prevent damage to the pipe, lining, coating, fitting, or other appurtenances. Under no circumstances shall pipe or accessories be dropped into the trench.
2. Whenever pipe laying is discontinued for short periods, or when work is stopped at the end of the day, the open ends of all mains shall be closed with water-tight plugs or bulkheads. The plug or bulkhead shall not be removed unless or until the trench is dry.
3. Gate valves shall be set plumb, supported on a concrete base in accordance with County of San Luis Obispo Standard Drawing W-3, and properly fitted to the adjacent sections of main. A valve box shall be installed over each valve.
4. Fire hydrants shall stand plumb, with the steamer nozzle, if any, facing the street and in accordance with County of San Luis Obispo Standard Drawing W-2.
5. Ductile Iron Pipe. All ductile iron pipe shall meet the requirements of AWWA Standard C151. Any defective, damaged, or unsound pipe shall be rejected. Each section of ductile iron pipe shall be lowered into the trench by means of approved slings, and the pipeline assembled piece by piece. Where necessary to properly locate valves and fittings, the pipe shall be neatly and squarely cut to length. Field repair of cement-mortar lining shall be required. After the pipe or fitting has been lowered into the trench, all foreign matter shall be completely brushed from the bell and spigot end before assembly.

77-1.03E Bedding Material

Bedding material shall be approved by the Engineer and meet the minimum standards for sand equivalent and gradation listed below:

Sand Equivalent = 20

Table 6-7: Gradation Requirements for Bedding Material

Sieve Size Percentage Passing Sieve	Sieve Size Percentage Passing Sieve
1"	100
No. 4	80-100
No. 200	0-15

The sand equivalent of 20 shall also be required outside of the roadway. Imported sand bedding shall be used the full length of the buried pipe.

Bedding material shall be placed and compacted to 90% relative compaction on the sides and to the minimum of six (6) inches above the pipe. Water consolidation by flooding or jetting shall only be used by written permission of the Engineer. Hand tamping may be supplemented by the use of vibratory or other compaction equipment, provided that the equipment used is approved by the Engineer and does not strike, move, or damage the pipe while in the process of compacting.

77-1.03F Trench Backfill

Trench backfill shall comply with the following requirements:

1. Tracer Wire. Fourteen (14) gauge insulated copper tracer wire shall be laid in the trench above the pipe and branched to all water service laterals, fire hydrants, and air relief valves. The tracer wire shall be brought to finish grade through all meter boxes and valve access boxes. At fire hydrants, the tracer wire shall be brought to six inches above finish grade and secured to the hydrant bolt flange.
2. Warning Tape. In addition to the tracer wire, non-detectable warning tape shall be placed above the pipe and tracer wire to alert workers to the presence of the pipe and/or tracer wire during future trenching operations. The tape shall be three-inch (3") wide polyethylene, APWA uniform color-coded blue, permanently printed "CAUTION BURIED WATER LINE BELOW."
3. Placement. The tracer wire and warning tape shall be located as shown on County of San Luis Obispo Standard Details Series U-4, or as directed by the Engineer. Tracer wire and/or warning tape shall be replaced if damaged by any subsequent trenching operation.
4. Minimum Cover for Water Lines. For lines 8-inches diameter or less, the minimum soil cover over the pipe shall be 36-inches. For lines greater than 8-inches in diameter the minimum soil cover over the pipe shall be 48-inches. All trenches shall be backfilled for the full width of the trench, including joints, after pipe, fittings, appurtenances and

bedding material have been installed, and before the required pressure and leakage tests are performed.

5. Other Requirements. Trench backfill for water line installation shall also comply with the requirements of Section 5.2.7 of the County of San Luis Obispo Public Improvement Standards.

77-1.03G Connection to Existing Mains

Existing mains shall not be shut down after 10:00 a.m. for the purpose of tie-ins. No tie-ins shall be performed on standard holidays. Prior to any shutdown for a tie-in the following must be performed.

1. All Encroachment Permits and rights-of-entry shall be obtained.
2. Three (3) working days' prior notice shall be given to the OCSD and affected customers.
3. All necessary materials shall be on site and fully assembled.
4. The point of the tie-in shall be fully exposed.

Direct connection to the existing water system shall not be permitted until the newly-installed portion has passed bacteriological testing. Separation may be achieved by the installation of a blind flange or "pancake" inserted between the new and existing piping, per County of San Luis Obispo Standard Drawing W-8.

77-1.03H Service Lines

The water main shall be tapped at the service location shown, and a service line extended to the property line. Each service line shall be equipped with a corporation stop at the main and curb stop at the property line. The service line may be either laid in open cut or placed by boring or jacking. If installed by the open cut method, the trench shall be in accordance with these Special Provisions and shall be completely backfilled with sand. The water service line shall be considered as part of the main for the purpose of the hydrostatic test as specified below. When a new water main is being installed, all new water services shall be installed at that time.

77-1.04 TESTING

Pressure and leak tests shall be performed at the same time. Pressure testing against valves shall not be allowed. Separation may be achieved by the installation of a blind flange or "pancake" inserted between the new and existing piping per County of San Luis Obispo Standard Drawing W-8. The Contractor shall give the Engineer two (2) working days' notice prior to testing.

All plans for testing procedures in compliance with this section shall be provided to the Engineer for review for approval prior to beginning work.

77-1.04A Pressure and Leak Testing

After the pipeline has been laid, it shall be filled with water for a minimum of 24 hours and then subjected to a hydrostatic pressure test. Unless otherwise specified, the test pressure shall be 200 psi, or 50 psi greater than the rated pressure of the pipe (measured at the

lowest elevation of the system), whichever is greater. The pressure test will be conducted after backfilling has been completed, but before placement of permanent paving. A test shall be conducted only after all backfilling has been completed, and at least 36 hours after the last concrete thrust block or reaction backing has been cast with high-early-strength concrete, or at least seven days after the last concrete thrust block or reaction backing has been cast with standard concrete. The duration of the test shall be two (2) hours unless otherwise directed by the Engineer. All pressure gauges shall be approved by the Engineer.

During the filling of the pipe and before the application of the specified test pressure, all air shall be expelled from the pipeline – if necessary, by means of taps at points of highest elevation, and, after completion of the test, the taps shall be tightly plugged, unless otherwise specified. During the test, all exposed pipe, fittings, valves, hydrants, and PVC couplings shall be carefully examined. Any joint at which the accumulated leakage exceeds the allowable rate specified in the table below shall be rejected. All cracked or defective elements shall be removed and replaced immediately. The test shall then be repeated until the results are satisfactory to the Engineer.

Table 6-8: Allowable Leakage per 1,000 feet or 50 joints (U.S. Gallons per hour)

Nominal Pipe Size (inches)	Average Test Pressure (psi)		
	150	200	250
6	0.50	0.57	0.64
8	0.66	0.76	0.85
10	0.83	0.96	1.07
12	0.99	1.15	1.28

No pipe installation shall be accepted until or unless the leakage for the section of the line being tested is less than the rate specified in the table. In calculating the leakage, the Engineer will allow for the number of joints added to the pipeline, owing to the use of pipe lengths smaller than 20- feet, for which the data in the table applies. If the test leakage in any section is greater than that permitted, the defective joints shall be located and repaired until the leakage is within the permitted allowance.

77-1.04B Flushing and Disinfecting

After the pressure test, the system should be thoroughly flushed out and disinfected in accordance with AWWA Standard C651 and the requirements of Appendix G1 of the County of San Luis Obispo Public Improvement Standards.

Direct connection to the existing water system shall not be permitted until the newly-installed portion has passed bacteriological testing. Separation may be achieved by the installation of a blind flange or temporary blocking device inserted between the new and existing piping, per County of San Luis Obispo Public Improvement Standard Drawing W-8.

A disinfection plan shall be submitted to the Engineer for approval. Alterations or modifications of the sterilization procedures set forth herein shall be approved in writing by the County Water Quality Manager before they are implemented.

All flushing water shall be disposed of outside of the County right-of-way, or as approved by the Engineer, in conformance with Appendix G1 of the County of San Luis Obispo Public Improvement Standards.

77-1.04C Fire Flow Testing

Fire flow testing shall be conducted by the Engineer, in coordination with the applicable fire protection agency.

77-1.05 PAYMENT

Full compensation for work specified in section 77-1 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the Bid Item List. Waterline work performed under section 77-1 is designated in the Contract by size, type, quantity, or whatever information is necessary for identifying waterline work.

The length of water pipe is measured by the slope length designated by the Engineer. Pipe is measured through fittings with the final measurement rounded off to the next foot increment. Measurement will be to the inner edge of other structures to which the water is connected.

Pipe bends, tees, crosses, valves (except tapping valves and sleeves), and other branches are measured and paid for by the linear foot for the sizes of pipes involved. Bends will be measured along the centerline to the point of intersection.

Quantities of fire hydrants, services, and intersection tie-ins are determined as units from actual count.

77-2 SEWER

77-2.01 GENERAL

Section 77-2 includes specifications for sewers and appurtenances.

77-2.02 MATERIALS

All material that is to become a permanent part of any sanitary sewer or appurtenant structure shall conform to the requirements for the particular material as set forth in these Special Provisions. The Contractor shall supply all certificates of compliance, certified test results, or shall perform tests as required to assure the Engineer that the material being incorporated into the work has met the requirements as specified. Approval of the Engineer shall be required for use of material not listed in these Special Provisions.

77-2.02A Pipe

All sanitary sewer lines shall be ductile iron pipe, plastic PVC pipe or approved by the Engineer. All pipe shall be of the size, material and strength as shown on the plans. All pipe and fittings shall be marked or stamped with the trade brand name of the manufacturer, and strength or class of pipe. All pipe shall be designed to withstand all internal or external loads

applied. Supporting strength of conduits as installed to safely carry imposed gravity loads and superimposed loads (including a suitable factor of safety) shall be determined by use of the Marston formula. Additionally, the following requirements apply for specific kinds of pipe:

77-2.02A(1) Ductile Iron Pipe

All ductile iron pipe and fittings for main sewers shall conform to AWWA Standards C151 and C153. Joints shall be approved type mechanical joints. No lead joints will be allowed.

77-2.02A(2) Polyvinyl Chloride (PVC) Pipe

PVC pipe must meet at least ASTM Standard D-3034/SDR 35. Deflection tests shall be required as prescribed by the Engineer.

77-2.02B Facilities

77-2.02B(1) Manholes

Normal maximum spacing for manholes shall be 400-feet. Where the locations of two manholes are determined by intersecting lines, the distances between intervening manholes shall be approximately equal. A sewer on a curved alignment shall have manholes spaced at a maximum of 300-feet, or adjusted to fit the individual case. The maximum spacing of manholes on trunk sewer lines shall be as follows:

Table 7-2: Maximum Spacing of Sewer Manholes

Size of Trunk Sewer Line Maximum Spacing	Size of Trunk Sewer Line Maximum Spacing
12" to 24" diameter 500-feet	12" to 24" diameter 500-feet
27" to 36" diameter 600-feet	27" to 36" diameter 600-feet

The spacing of manholes on trunk sewer lines larger than 36-inches in diameter shall be determined for each individual case.

77-2.02B(2) Drop Manholes

Whenever the vertical distance between the inverts of sewer lines coming into a manhole exceeds 30-inches, a standard drop manhole shall be constructed. Designs requiring the use of drop manholes shall be avoided, and shall require prior approval by the Engineer where they cannot be avoided.

77-2.02B(3) Other Facilities

Other wastewater facilities shall conform to the following requirements:

1. Stub Lines. A flusher branch may be used in lieu of a manhole for any stub line with a length of 200-feet or less. Any line more than 200-feet in length shall have a manhole at the end.
2. Extension Lines. Lateral sewers installed to a subdivision line for future extension shall have a flusher branch at the end, if there are any house service lines attached to it, and if

it is not over 200-feet in length. Lines longer than 200-feet shall terminate in a manhole with a stub for future extension.

3. House Service Lines. In all new subdivision work, the house service lines from the sewer to the property line shall be installed at the time the sewer is constructed. Each house service line shall be referenced to the plan stationing. Minimum size of any sanitary lateral or side sewer to serve individual residences, commercial structures, etc., shall be nominal 4-inches inside diameter. Actual size of laterals larger than 4-inches shall be determined by fixture unit requirements as per the current edition of the Uniform Plumbing Code.
4. Sewer Main Cleanout. Material for sewer main cleanouts shall be provided as shown on the plans per County of San Luis Obispo Standard Drawing S-2.

77-2.02B(4) Special Facilities

All special facilities such as lift stations, force mains and treatment plants shall meet all requirements of the State Regional Water Quality Control Board, State and County Health Departments, and the County of San Luis Obispo Department of Public Works. Special structures, such as pump stations and pressure lines, shall require special considerations and approval by the Engineer. The design of all such facilities and structures shall provide for access by maintenance vehicles.

1. Lift Stations. The minimum distance from a lift station to any residence shall be 50-feet, except with advance approval of the Engineer. No lift station shall be constructed with bypasses which will bypass any effluent into any stream or watercourse. An alarm system, which meets the approval of the Engineer, shall be provided on all sewage lift stations. In addition, all lift station controls shall be coordinated and approved by the Engineer. All lift stations shall have emergency power connections.
2. Lift Station and Force Main. Whenever the design of a sanitary sewerage system includes the necessity of a sewage lift station and a force main, the following data shall be submitted for tentative approval before plans are submitted: Design computations for the pumps or ejectors, the type to be used, and a plot plan showing the dimensions of the site and its location with respect to homes or other structures. The operating velocity in the station piping and the force main shall be maintained between 4.0 fps and 6.0 fps.
3. Force Mains. Pipe used in the construction of force mains shall be either ductile iron pipe or C200 (DR14 per AWWA C900) plastic pipe.

77-2.03 CONSTRUCTION

77-2.03A Lines and Grade

All lines and grades will be set by the Contractor, and the Engineer shall be notified 24 hours in advance of the times and places at which work is to be done, in order that lines and grades may be inspected and necessary measurements made with a minimum of inconvenience and delay. All stakes and marks, once set, shall be fully protected and preserved. Flow line elevations shall be established at all changes in grade and at 50-foot intervals.

77-2.03B Trench Widths

The maximum width of trench, measured at the top of pipe, shall be governed in all cases by the size of the pipe to be installed therein. Refer to County of San Luis Obispo Standard Drawing series U-4 for trenching and backfill requirements. For pipe 36-inches in diameter or less, the trench width shall be the outside diameter of the pipe, plus 12-inches (6-inches each side of pipe).

For pipe diameters greater than 36-inches, the trench width shall be the outside diameter of the pipe, plus 16-inches (8-inches each side of pipe). The sides of the trench shall be as nearly vertical as possible in the material through which it is passing. If the width of the trench at the ground surface becomes excessive, the Engineer may require solid sheeting and bracing.

77-2.03C Excavation

Unless otherwise specified, the excavation for sewer mains shall be completed in the same manner as described for water mains in County of San Luis Obispo Public Improvement Standards Chapter 6.

77-2.03D Laying Pipe

Pipe shall be laid in accordance with the manufacturer's specifications. All PVC pipe and fittings for underground gravity sewers shall be installed in accordance with the requirements of ASTM Standard D2321 (as amended to date), Recommended Practice for Installation of Flexible Thermoplastic Sewer Pipe. The following sequence shall be used:

1. The pipe shall be laid in conformity to the prescribed line and grade, and each pipe length checked to the grade lines. Three consecutive points shown on the same rate of slope shall be used in common, in order to detect any variation from a straight grade. In case any such discrepancy exists, the work shall be stopped and the discrepancy immediately reported to the Engineer. In addition, a string line shall be used in the bottom of the trench to insure proper alignment and grade.
2. Pipe shall be laid continuously upgrade, with the bell of the pipe forward. Each length of pipe shall be laid on a firm bed and shall have a true bearing for the entire length. No wedging or blocking up of the pipe will be permitted.
3. Both bell and spigot shall be clean before the joint is made, and care shall be taken that nothing but the joint-making material enters the joints.
4. When, for any reason, pipe laying is discontinued for an hour or more, the open end of each line shall be closed with a close-fitting stopper.
5. The Contractor's attention is called to the required use of short lengths of sewer pipe to provide curves, flexibility, and prevent cracking or shearing failures. The use of short lengths of pipe is particularly required for, but not necessarily limited to, these locations:
 - (1) inlets and outlets to all manholes; and (2) vertical and horizontal curvilinear sewers.

77-2.03E Pipe to be Placed by Boring or Jacking

This work consists of placing cast iron pipe or other pipe of approved material, usually in a conductor pipe, under a paved roadway or railroad to a true line and grade as shown on the plans, by means of boring or jacking operations. The equipment and method of operation shall be approved by the Engineer before proceeding with the work, and shall meet the following requirements:

1. The excavation for the boring operation shall be kept to a minimum, but shall be of sufficient dimensions to satisfactorily complete the work. If so required, bracing and shoring shall be provided to adequately protect the workers and the roadway or railroad.
2. The conductor pipe shall be placed closely behind and in conjunction with the boring operation. The bored hole shall be not more than 2-inches in diameter larger than the conductor pipe. Guide rails shall be accurately set to line and grade so as to achieve close adherence to the line and grade shown on the plans.
3. The pipe to be placed inside the conductor pipe shall have non-rigid joints and shall be installed by the use of suitable centering devices. Sand, or other approved material, shall then be pumped into the conductor pipe to completely fill the annular space around the pipe for its full length.

77-2.03F Trench Bedding and Backfill

Trench bedding and backfill shall be placed in the same manner as described for water mains in County of San Luis Obispo Public Improvement Standards Chapter 6, including use of tracer wire and warning tape, except as follows: The non-detectable warning tape shall be 3-inch (3") wide polyethylene, APWA uniform color coded green, permanently printed "**CAUTION BURIED SEWER LINE BELOW.**"

77-2.03G Manholes

Manholes shall be watertight structures constructed by placing precast concrete sections on a poured concrete base. Poured-in-place manholes shall not be used unless specifically called for in these Special Provisions. The following requirements shall apply:

1. Temporary covers of 3/8" steel plate of sufficient size to adequately cover the opening shall be placed on the cone until the pavement is completed. Suitable locating ribs shall be welded to the underside of the cover to hold it in place during the grading and paving operations.
2. When adjusting an existing manhole to grade and the total depth of the throat from the top of the frame to the bottom of the throat exceeds 24-inches, the upper portion of the manhole shall be removed to the first full-size manhole section. The upper portion shall then be reconstructed as outlined above.
3. Manholes shall be tested for water tight integrity either jointly with testing of sewer line or as separate units, in accordance with the Testing specifications, in section 77-2.4 below. The allowable leakage for one manhole shall not exceed one (1) gallon during a two-hour test period.

77-2.03H Connection to Existing Manholes

Connections to existing manholes shall conform to the requirements of County of San Luis Obispo Standard Drawing S-1, and shall be made by coring a hole in the wall of the manhole, inserting the end of the pipe through the opening, flush with the inside wall, and packing the opening around the pipe with a non-shrink grout, thoroughly compacted to form a watertight connection. The grout shall be troweled smooth and flush with the interior surface of the manhole. A manhole adapter or water stop shall be placed on the pipe prior to placement in hole, and the pipe shall be installed as specified by the manufacturer. Channelizing of the flow through the manhole shall conform to the details shown on the County of San Luis Obispo Standard Drawings for new manholes. The Contractor shall notify the Engineer, 24 hours in advance, before any connection is made to existing structures. The Contractor shall schedule the work so that interruption of flow is held to a minimum.

77-2.03I House Service Laterals

House service laterals shall be constructed as shown on the County of San Luis Obispo Standard Drawing S-3 and S-3a, and shall conform to the following requirements:

1. If it becomes necessary to locate a house service lateral less than 100-feet from a well, it shall be constructed of a suitable material approved by the Engineer. Approved construction materials for sewer lines in critical zones are listed in Section 77-1.4 above.
2. Whenever house service laterals are to be installed as part of the contract for the construction of the lateral sewer, the use of wye or tee saddles will not be permitted.
3. That portion of any house service lateral to be placed under an existing curb and gutter and/or sidewalk shall be done by tunneling. Cutting of the existing curb and gutter and/or sidewalk will not be permitted.
4. All house service laterals shall be considered as part of the lateral sewers for purposes of the hydrostatic test as set forth in below.
5. The location of house service laterals shall be permanently indicated by embedding the letter "S" in the curb directly above the line. In new subdivisions when the house service laterals are installed, before the curb is constructed, it shall be the sewer contractor's responsibility to place the "S" in the curb after it is poured. When house service laterals are constructed in existing easements or streets where curbing does not exist, a 2-inch by 2-inch by 36-inch maximum (2"x2"x36") construction grade redwood stake shall be driven in the ground to within two inches of the surface, directly above the service line at the property line and an "S" stamped in the top. Every house service lateral shall be so marked before final acceptance will be given.

77-2.03J Sewer Main Cleanout

Sewer main cleanout shall be constructed as shown on the County of San Luis Obispo Standard Drawing S-2.

77-2.04 TESTING

Prior to final approval, all sewer lines shall be cleaned and tested for leakage by standard hydrostatic or low pressure air test, for deflection by mandrel test, and for standing water/other debris by TV inspection. All cleaning and testing shall take place after all utilities are installed, and up to, but not including the final paving is completed. Any damage to the system during final paving and cleanup shall be corrected prior to final approval.

77-2.04A Cleaning

Prior to acceptance of any sewer line by the Engineer, the sewer line shall be cleaned with a Wayne-type sewer cleaning ball under hydrostatic pressure. Any stoppage, dirt or foreign matter shall be removed from the lines. All materials and debris removed shall be collected and vacuumed out of the system at a manhole selected by the Engineer, and no debris shall be washed or otherwise deposited into the system.

77-2.04B Hydrostatic Test Procedure

A section of sewer line shall be prepared for testing by plugging the upper side of the downstream manhole and all openings in the upstream manhole except the downstream opening. Where grades are slight, two or more sections between manholes may be tested at once. Where grades are steep, and excessive test heads would result by testing from one manhole to another, test tees the full size of the main shall be installed at intermediate points so the maximum head on any section under test will not exceed 12-feet. The following sequence shall be used:

1. The section of sewer line prepared as above shall be tested by filling with water to an elevation 5-feet above the top of pipe at the upstream end of the test section, or 5-feet above the existing ground water elevation, whichever is greater. The water should be introduced into the test section four hours in advance of the official test period to allow the pipe and joint material to become saturated. The pipe shall then be refilled to the original water level.
2. At the beginning of the test, the elevation of the water in the upper manhole shall be carefully measured from a point on the manhole rim. After a period of four hours, or less with the approval of the Engineer, the water elevation shall be measured from the same point on the manhole rim and the loss of water during the test period calculated. If this calculation is difficult, enough water shall be measured into the upper manhole to restore the water to the level existing at the beginning of the test, and the amount added taken as the total leakage.
3. Should an initial test show excess leakage in a section of line, it is permissible to draw the water off and test the manholes that contained water. This test shall be made by plugging all the openings in the manholes and filling with water to the same elevation as existed during the test. The leakage from the manhole may be deducted from the total leakage of the test section in arriving at the test leakage. After the testing is complete, the manhole shall be waterproofed by grouting. Other approved waterproofing methods may be used if satisfactory to the Engineer.

4. The allowable leakage in the test section shall not exceed 500 gallons per mile, per 24 hours, per inch diameter of pipe tested at the 5-foot test head.
5. If it is necessary or desirable to increase the test head above 5-feet, the allowable leakage will be increased at the rate of 80 gallons for each foot of increase in head.
6. Test sections showing leakage in excess of that allowed shall be repaired or reconstructed as necessary to reduce the leakage to that specified above, and the line retested, after a minimum period of 24 hours during which no additional water shall be introduced into the line.

77-2.04C Air Test Procedure

Each section of sanitary sewer between two successive manholes shall be tested by plugging all pipe outlets with suitable test plugs. Air shall be slowly added until the internal pressure is raised to 4.0 pounds per square inch gauge (psig). The compressor used to add air to the pipe shall have a blowoff valve set at 5 psig to assure that at no time the internal pressure exceeds 5 psig. The internal pressure of 4 psig shall be maintained for at least two minutes to allow the air temperature to stabilize, after which the air supply shall be disconnected and the pressure allowed to decrease to 3.5 psig. The time in minutes that is required for the internal pressure to drop from 3.5 psig to 2.5 psig shall be measured and the results compared with the values tabulated below.

Table 7-3: Air Test Procedure

Pipe Diameter (inches)	Test Time (minutes)	Minimum Distance Between Manholes (feet)
8	4	340
10	5	260
12	6	230
15	7	170
18	9	150
21	10	120
24	11	110
27	13	100
30	14	90
33	16	80
36	17	70
39	18	60
42	19	50

The above tabulated values shall be used for the respective diameter pipes except where the distance between successive manholes is less than the above tabulated values, or the pipe diameter is less than 8-inches, in which case the following formula will be used to determine the test time:

$$(1) T = 0.000183 d^2 L$$

T = test time (minutes)

d = inside diameter of pipe (inches)

L = distance between successive manholes (feet)

If the pressure drop from 3.5 psig to 2.5 psig occurs in less time than the above tabulated or calculated values, the pipe shall be repaired and, if necessary, replaced and re-laid at the Contractor's expense until the joints and pipe shall hold satisfactorily under this test. The Contractor shall furnish all labor, air test equipment, and all other materials for making the required air test at its own expense. After the sewer lines have been properly backfilled to a depth where additional backfilling will not disturb the position of the pipe, all or any sections that the Engineer may select may be tested. In no case shall the required minimum backfill be less than 4-feet above the top of the pipe before subjecting the line to the test. The Contractor shall supply all equipment and material, and perform all tests as required prior to final approval.

77-2.04D Deflection Test

Following the placement and densification of backfill, and prior to the placing of permanent pavement, all pipe shall be cleaned and then mandrel measured for obstructions (deflections, joint offsets, and lateral pipe intrusions). A rigid mandrel, with a circular cross-section having a diameter of at least 95% of the specified average inside diameter, shall be pulled through the pipe by hand. The minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe. Unless otherwise permitted by the Engineer, any over-deflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe lengths shall not be reinstalled, but shall be removed from the work site. Any pipe subjected to any method or process other than removal, which attempts (even successfully) to reduce or cure any deflection, shall be uncovered, removed from the job site, and replaced with new pipe.

The mandrel used shall be:

- € effective length not less than its nominal diameter
- € fabricated of steel
- € fitted with pulling rings at each end
- € furnished in a suitable carrying case labeled with the same data as stamped or engraved on the mandrel
- € rigid, nonadjustable, with an odd number of legs (9 legs minimum)
- € stamped or engraved, on some segment other than a runner, indicating the pipe material specification, nominal size, and mandrel OD

77-2.04E TV Inspection

For wastewater collection systems, a TV inspection and report shall be required prior to acceptance.

77-2.04F Force Mains

Each section of pipe to be tested shall be slowly filled with water and all air expelled from the pipe. After the pipe has been filled, it shall be allowed to set for a period of not less than 24 hours. The pipe shall then be refilled to the original water level and subjected to a pressure of not less than 150 pounds per square inch, or the service pressure plus 50 pounds, whichever is greater, for a period of two hours. All exposed joints, bends, angles, and fittings shall be closely examined during the test. Any part of the line which proves to be defective shall be replaced and the line retested. The maximum allowable leakage shall not exceed 100 gallons per mile, per 24 hours, per inch of nominal diameter.

77-2.05 PAYMENT

Full compensation for work specified in section 77-2 and applicable engineering standards is included in the payment for other bid items unless a bid item of work is shown on the bid item list.

Sewer work performed under section 77-2 is designated in the contract by size, type, quantity, or whatever information is necessary for identifying sewer work.

The contract price paid for each sewer manhole and lateral modification shall include full compensation for furnishing all labor, materials, tools, mobilization, equipment, and incidentals for doing all the work as shown on the plans, Standard Specifications, and these Special Provisions and no additional compensation will be allowed therefor.

3.23 FENCES

Relocating existing chain link fence shall be in conformance with section 80 of the 2015 Caltrans Standard Specifications and the 2015 Caltrans Revised Standard Specifications.

3.24 ROADSIDE SIGNS

Roadside signs shall be constructed in conformance with section 82-3 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

3.25 CABLE RAILING

Cable railing shall be constructed in conformance with section 83 of the 2015 Caltrans Standard Specifications and the 2015 Caltrans Revised Standard Specifications.

3.26 GEOSYNTHETICS

Geosynthetics shall be furnished in conformance with section 96 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

The following shall be added to section 96-1.02A of the 2015 Caltrans Standard Specifications:

Use Mirafi HP570 or approved equal.

The following shall be added to section 96-1.02B of the 2015 Caltrans Standard Specifications:

Filter Fabric shall be Class B.

3.27 TEMPORARY FENCE (TYPE ESA)

Temporary Fence (Type ESA) shall be constructed in conformance with section 14 of the 2015 Caltrans Standard Specifications, the 2015 Caltrans Revised Standard Specifications, and these Technical Specifications.

**COUNTY OF SAN LUIS OBISPO
REVISED STANDARD SPECIFICATIONS
DATED 04-20-18**

The sign panel must be capable of displaying a 3-line message with at least 7 characters per line. The characters must be at least 18 inches in height where the useable shoulder area is at least 15 feet wide. To prevent encroachment onto the traveled way where the useable shoulder area is less than 15 feet wide, you may use a smaller message panel with at least 12-inch-high characters.

The message displayed on the sign must be visible from a distance of 1,500 feet and legible from a distance of 750 feet at noon on a cloudless day and during the night by persons with 20/20 vision or vision corrected to 20/20.

The characters on a sign panel may be 10 inches in height if:

1. PCMS is mounted on a service patrol truck or other incident response vehicle or used for traffic control operations on a highway facility where the posted speed limit is less than 40 mph
2. Message is legible from a distance of at least 650 feet at noon on a cloudless day and during the night by persons with 20/20 vision or vision corrected to 20/20

A matrix sign must provide a complete alphanumeric selection.

A PCMS must automatically adjust its brightness under varying light conditions to maintain the legibility of the message. The sign must be equipped with an automatic-dimming mode that automatically compensates for the influence of temporary light sources or abnormal lighting conditions. The sign must have 3 or more manual dimming modes of different intensities.

During the hours of darkness, a matrix sign not using lamps must be either internally or externally illuminated.

The controller must be an all solid-state unit containing the necessary circuitry for the storage of at least 5 preprogrammed messages. The controller must be installed at a location that allows the operator to perform all functions from a single position. The controller must have a keyboard entry system that allows the operator to generate an infinite number of additional messages in addition to the preprogrammed stored messages. The keyboard must be equipped with a security lockout feature to prevent unauthorized use of the controller.

The controller must have:

1. Nonvolatile memory that stores keyboard-created messages during periods when the power is not activated
2. Variable display rate that allows the operator to match the information display to the speed of approaching traffic
3. Screen upon which messages may be reviewed before being displayed on the sign

The flashing-off time must be adjustable from within the control cabinet.

12-3.32C Construction

Place a PCMS as far from the traveled way as practicable where it is legible to approaching traffic without encroaching on the traveled way. Where the vertical roadway curvature restricts the sight distance of approaching traffic, place the sign on or before the crest of the curvature where it is most visible to the approaching traffic. Where the horizontal roadway curvature restricts the sight distance of approaching traffic, place the sign at or before the curve where it is most visible to approaching traffic. Where practicable, place the sign behind guardrail or Type K temporary railing.

Make a taper consisting of 9 traffic cones placed 25 feet apart to delineate the location of a PCMS except where the sign is placed behind guardrail or Type K temporary railing.

When in full operation, the bottom of a sign must be at least 7 feet above the roadway in areas where pedestrians are anticipated and 5 feet above the roadway elsewhere, and the top of the sign must be not more than 14.5 feet above the roadway.

Operate the PCMS under the manufacturer's instructions.

Keep the PCMS clean to provide maximum visibility.

If multiple signs are needed, place each sign on the same side of the road at least 1,000 feet apart on freeways and expressways and at least 500 feet apart on other types of highways.

If more than one PCMS is simultaneously visible to traffic, only 1 sign may display a sequential message at any time. Do not use dynamic message displays, such as animation, rapid flashing, dissolving, exploding, scrolling, horizontal movement, or vertical movement of messages. The message must be centered within each line of the display.

You may use an additional PCMS if more than 2 phases are needed to display a message.

Display only messages shown or ordered.

Repeat the entire message continuously in not more than 2 phases of at least 3 seconds per phase. The sum of the display times for both of the phases must be a maximum of 8 seconds. If more than 2 phases are needed to display a message, use an additional PCMS.

You must be available by cell phone during activities that require a sign. Be prepared to immediately change the displayed message if ordered. You may operate the sign with a 24-hour timer control or remote control if authorized.

After the initial placement, move a sign from location to location as ordered.

When a PCMS is not in use, move it to an area at least 15 feet from the edge of the traveled way or remove it from the job site away from traffic.

12-3.32D Payment

Not Used

Add to section 12-4.02A(2):

07-21-17

Construction Zone Enhanced Enforcement Program (COZEEP): Program that provides California Highway Patrol officers to monitor the movement of traffic within the work zone.

Add between the 1st sentence and 2nd sentences in the 1st paragraph of section 12-4.02A(3)(a):

07-15-16

For a project in District 7, submit the request at least 15 days before the proposed closure date.

Add to the end of section 12-4.02A(3)(a):

07-21-17

Submit a traffic break request using LCS to show the location and time of the requested traffic break.

Replace *unauthorized closures* or in the last paragraph of section 12-4.02A(3)(b) with:

07-21-17

authorized and unauthorized closures and

Add to section 12-4.02A(3):

07-21-17

12-4.02A(3)(d) Traffic Break Schedule

Every Monday by noon, submit a traffic break request for the next week. Support for a traffic break is based on local California Highway Patrol staffing levels and may not be available for the date or time requested.

Traffic break requests are limited to the hours when a shoulder or lane closure is allowed.

Cancel a traffic break request using LCS at least 48 hours before the start time of the traffic break.

The Department notifies you through LCS of authorized and unauthorized traffic breaks.

The Department does not adjust time or payment if (1) a California Highway Patrol officer is unavailable for the requested date or time or (2) your request is not authorized.

Replace section 12-4.02C(2) with:

01-15-16

12-4.02C(2) Lane Closure System

12-4.02C(2)(a) General

The Department provides LCS training. Request the LCS training at least 30 days before submitting the 1st closure request. The Department provides the training within 15 days after your request.

LCS training is web-based or held at a time and location agreed upon by you and the Engineer. For web-based training, the Engineer provides you the website address to access the training.

With 5 business days after completion of the training, the Department provides LCS accounts and user IDs to your assigned, trained representatives.

Each representative must maintain a unique password and current user information in the LCS.

04-15-16

The project is not accessible in LCS after Contract acceptance.

01-20-17

12-4.02C(2)(b) Status Updates for Authorized Closures

Update the status of authorized closures using the LCS Mobile web page.

For a stationary closure on a traffic lane, use code:

1. 10-97 immediately before you place the 1st cone on the traffic lane
2. 10-98 immediately after you remove all of the cones from the traffic lane

For a stationary closure on the shoulder, use code:

1. 10-97 immediately before you place the 1st cone after the last advance warning sign
2. 10-98 immediately after you remove the last cone before the advance warning signs

For a moving closure, use code:

1. 10-97 immediately before the actual start time of the closure
2. 10-98 immediately after the actual end time of the closure

For closures not needed on the authorized date, use code 10-22 within 2 hours after the authorized start time.

If you are unable to access the LCS Mobile web page, immediately notify the Engineer of the closure's status.

Add to the end of section 12-4.02C(7):

07-21-17

12-4.02C(7)(d) Traffic Breaks

You may request a traffic break for special operations, such as:

1. Installation, removal, or replacement of an overhead power line or other utility cable across the highway
2. Falsework adjustment
3. Installation or removal of traffic control devices in areas without a standard-width shoulder
4. Transportation of large equipment across the highway
5. Access to median areas for workers or equipment

If the Department authorizes the traffic break, the Engineer notifies you and arranges the traffic break with the California Highway Patrol through COZEED. The duration of a traffic break must not exceed 5 minutes or as authorized.

Two California Highway Patrol officers per vehicle are required for traffic breaks occurring any time from 2200 to 0600 hours.

A minimum of 2 California Highway Patrol vehicles will be assigned to conduct a traffic break.

Place a PCMS approximately 2,000 feet upstream of the work area or as agreed upon by the Engineer. The PCMS must comply with section 12-3.32 except the PCMS must not be trailer mounted. Monitor the traffic during the traffic break. If a queue develops, reposition the PCMS truck far enough upstream of the traffic break to provide real-time notification to motorists before they approach the traffic queue.

Add to the end of section 12-4.02D:

07-21-17

The Department does not pay for furnishing, placing, relocating, and removing PCMSs used for a traffic break.

The Department deducts the full cost of COZEED support provided for the traffic break.

The hourly rate for each California Highway Patrol officer providing COZEED support is \$115. This rate includes full compensation for each hour or portion thereof that the officer provides the support. Markups are not added to any expenses associated with COZEED support.

The minimum number of hours for an officer is 4 hours, except if a closure is already in place and the Engineer authorizes your request for an on-duty officer to conduct a traffic break, the minimum number of hours for an officer is 1 hour.

For a cancellation less than 48 hours before the scheduled start time of COZEEP support, except for a cancellation due to adverse weather or extenuating circumstances, the Department deducts:

1. Minimum of \$50 per California Highway Patrol officer if the officer is notified before the start time
2. Maximum of 4 hours of pay per officer if the officer is not notified before the start time

Replace section 12-4.04 with:

04-20-18

12-4.04 TEMPORARY PEDESTRIAN ACCESS ROUTES

12-4.04A General

12-4.04A(1) Summary

Section 12-4.04 includes specifications for providing, maintaining, and removing temporary pedestrian access routes.

A temporary pedestrian access route includes temporary traffic control devices as shown except for Type K temporary railing and temporary crash cushions.

12-4.04A(2) Definitions

Reserved

12-4.04A(3) Submittals

If work activities require the closure of a pedestrian route and a temporary pedestrian access route is not shown, submit a work plan for a temporary pedestrian access route. The work plan must:

1. Describe the activities, processes, equipment, and materials that will be used to provide the temporary access route
2. Show the locations of the routes and the placement of traffic control devices for each stage of work
3. Include a time-scaled logic diagram displaying the sequence and duration of the planned activities for each stage of work
4. Be sealed and signed by an engineer who is registered as a civil engineer in the State

Submit "Temporary Pedestrian Access Route Contractor Compliance Report," within 2 business days after construction of a temporary pedestrian access route,

Submit "Temporary Pedestrian Access Route Contractor Weekly Report," within 2 business days of completing a weekly inspection.

12-4.04A(4) Quality Assurance

12-4.04A(4)(a) General

Reserved

12-4.04A(4)(b) Quality Control

Perform a review of the temporary pedestrian access route after it is constructed and document compliance on the "Temporary Pedestrian Access Route Contractor Compliance Report."

The Department will conduct a verification inspection after receiving the compliance report.

For a temporary pedestrian access route in use perform a weekly review and document compliance on the "Temporary Pedestrian Access Route Contractor Weekly Report."

12-4.04B Materials

The walkway surface must be slip resistant and surfaced with minor HMA or commercial-quality, bituminous material, commercial-quality concrete, or wood.

A handrail with a circular cross section must have an outer diameter from 1-1/4 to 2 inches. A handrail with a noncircular cross section must have a perimeter from 4 to 6-1/4 inches and a maximum cross-section dimension of 2-1/4 inches.

Fasteners must be rounded to prevent injury to a pedestrian's fingers, hands, and arms and to eliminate sharp edges that could catch on clothing.

A detectable warning surface must be on the Authorized Material List for detectable warning surfaces and match yellow color no. 33538 of FED-STD-595.

Temporary traffic control devices used to channelize pedestrians must:

1. Be free of sharp or rough edges
2. Have a continuous detectable edging at least 6 inches high and at no more than 2 inches above the walkway surface
3. Be at least 32 inches in height
4. Have smooth connection points between devices to allow for a handrail
5. Have a top and bottom surface in the same vertical plane

12-4.04C Construction

Notify the Engineer 5 business days before closing an existing pedestrian route. Do not close the route until authorized.

If work activities require the closure of a pedestrian route and a temporary pedestrian access route is not shown, provide a temporary pedestrian access route near the traveled way. You may route pedestrians using the existing sidewalk or by constructing a temporary access route.

If a bid item for a temporary pedestrian access route is not shown on the Bid Item List, then constructing a temporary pedestrian access route is change order work except, when the closure is a result of your means and methods.

Construct a temporary pedestrian access route such that:

1. Walkway surface is firm and stable and free of irregularities
2. Cross slope of the pedestrian route is at most 50:1 (horizontal:vertical)
3. Longitudinal slope of the pedestrian route is at most 20:1 (horizontal:vertical)
4. Walkway, landings, blended transitions, and curb ramps are at least 60 inches wide except where not feasible, the width must be at least 48 inches wide with a 60-by-60-inch passing space at least every 200 feet
5. Lateral joints or gaps between surfaces are less than 1/2 inch wide
6. Discontinuities in surface heights are less than 1/2 inch and beveled if greater than 1/4 inch with a slope no greater than 2:1 (horizontal:vertical)
7. Ramps have:
 - 7.1. Longitudinal slope of at most 12:1 (horizontal:vertical)
 - 7.2. Rise less than 30 inches
 - 7.3. Protective edging at least 2 inches high on each side and handrails at a height from 34 to 38 inches above the walkway surface if the rise is greater than 6 inches

8. Curb ramps have:
 - 8.1. Longitudinal slope of at most 12:1 (horizontal:vertical)
 - 8.2. Protective edging at least 2 inches high on each side if the curb ramp does not have flares and the rise is greater than 6 inches
9. Pedestrians are channelized when routed off existing pedestrian routes

Construct handrails such that they are continuous, smooth and free of sharp or rough edges.

Provide an overhead covering to protect pedestrians from falling objects and drippings from overhead structures.

If the temporary access route is next to traffic or work activities, place a temporary barrier to separate the route from vehicles and equipment.

Install a detectable warning surface at locations where a curb ramp, landing, or blended transition connects to a street. Install the warning surface such that it extends a minimum of 36 inches in the direction of travel and for the full width of the landing, blended transition, or curb ramp, excluding the flares.

Maintain the temporary pedestrian access route clear of obstructions. Do not allow traffic control devices, equipment, or construction materials to protrude into the walkway. Maintain a continuous unobstructed path connecting all pedestrian routes, parking lots, and bus stops located within the project limits.

Remove the temporary pedestrian access route when the Engineer determines it is no longer needed.

Provide a temporary pedestrian access route through falsework under section 16-2.02.

12-4.04D Payment

Not Used

Replace the last sentence in the 1st paragraph of section 12-6.03A with:

01-20-17

On multilane roadways, freeways, expressways, and 2-lane roadways with shoulders 4 feet or more in width, the temporary pavement delineation must also include edge line delineation for traveled ways open to traffic.

Replace the 1st sentence in the 3rd paragraph of section 12-6.03A with:

07-15-16

When the Engineer determines the temporary pavement delineation is no longer required for the direction of traffic, remove the temporary pavement delineation, including any underlying adhesive for temporary pavement markers, from the final layer of surfacing and from the pavement to remain in place.

Replace the introductory clause in the 1st paragraph of section 12-6.03C with:

01-20-17

On multilane roadways, freeways, expressways, and 2-lane roadways with shoulders 4 feet or more in width open to traffic where edge lines are obliterated and temporary pavement delineation to replace those edge lines is not shown, provide temporary pavement delineation for:

Replace the 2nd paragraph of section 13-1.01D(2) with:

05-06-16

Discharges from manufacturing facilities, such as batch plants and crushing plants, must comply with the discharge requirements in the NPDES General Permit for Storm Water Discharges Associated with Industrial Activities; Order No. 2014-0057-DWQ, CAS000001 (Industrial General Permit), issued by the SWRCB. For the Industrial General Permit, go to the SWRCB website.

Replace *General Industrial Permit* in the 3rd paragraph of section 13-1.01D(2) with:

05-06-16

Industrial General Permit

Add to the list in the 2nd paragraph of section 13-1.03B:

01-20-17

7. Offsite drying facilities for drying wastes before disposal

Replace item 7 in the list in the 2nd paragraph of section 13-2.01C with:

04-20-18

7. Include a copy of each permit obtained by the Department, such as the Department of Fish and Game permits, US Army Corps of Engineers permits, RWQCB 401 certifications, Docket No. ESPO-SMA 15/16-001 Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils with the DTSC (ADL Agreement), ADL Agreement notification, and RWQCB waste discharge requirements for reuse of aerially deposited lead

Add between *Unit* and *the* in the 1st sentence in the 3rd paragraph of section 13-3.01A:

01-20-17

or on federal or tribal lands

Replace the paragraph in section 13-3.01C(1) with:

01-20-17

Submit the documents shown with an X in the following table:

Submittal Requirements

Document	Risk level 1	Risk level 2	Risk level 3	EPA	Lake Tahoe Hydrologic Unit
SWPPP	X	X	X	X	X
Construction Site Monitoring Program	X	X	X	X	X ^a
Job site monitoring reports	X	X	X	X	X
Sampling and analysis plan	X	X	X	X	X
Sampling and analysis plan for nonvisible pollutants	X	X	X	X	X
Sampling and analysis plan for pH and turbidity	--	X	X	--	X
NAL reports	--	X	X	--	X
Receiving water monitoring trigger reports	--	--	X	--	--
Rain Event Action Plan	--	X	X	--	X
Annual Certification	X	X	X	X	X
Stormwater Annual Report	X	X	X	X	X

^aFor a project in the Lake Tahoe Hydrologic Unit, this program is referred to as the Construction Site Monitoring and Reporting Program

Replace item 5 in the list in the 2nd paragraph of section 13-3.01C(2)(a) with:

04-20-18

5. Include a copy of each permit obtained by the Department, such as the Department of Fish and Game permits, US Army Corps of Engineers permits, RWQCB 401 certifications, Docket No. ESPO-SMA 15/16-001 Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils with the DTSC (ADL Agreement), ADL Agreement notification, and RWQCB waste discharge requirements for aerially deposited lead reuse

Add between *Unit* and *discharges* in the 1st paragraph of section 13-3.01D(2):

01-20-17

or on federal or tribal lands

Replace the 2nd paragraph of section 13-3.01D(2) with:

09-02-16

For a project in the Lake Tahoe Hydrologic Unit, discharges of stormwater from the project must comply with the NPDES General Permit for General Waste Discharge Requirements and National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity in the Lake Tahoe Hydrologic Unit, Counties of Alpine, El Dorado, and Placer, (Order No. R6T-2016-0010 and NPDES No. CAG616002). You may view the General Permit for the Lake Tahoe Hydrologic Unit at the Construction Storm Water Program page of the SWRCB website.

Add to the end of section 13-3.01D(2):

01-20-17

A project on federal or tribal lands must comply with the permit issued by the US EPA for National Pollutant Discharge Elimination System General Permit for Discharges from Construction Activities. This permit governs stormwater and nonstormwater discharges from work activities at the job site. This permit may be viewed at the US EPA website.

Add to the beginning of section 13-3.03:

01-20-17

Post a sign or other notice at a safe, publicly accessible location close to the job site. The notice must include the NPDES tracking number and a contact name and phone number for obtaining additional project information. Locate the sign or notice such that it is visible from the part of the highway nearest the work activities.

Replace the 2nd paragraph of section 13-4.03D(3) with:

01-20-17

Collect concrete waste simultaneously with the waste-producing activity. Concrete waste includes grout, dust, debris, residue, and slurry from demolition, saw cutting, coring, grooving, or grinding activities.

Add to the end of section 13-4.03D(3):

01-20-17

Dispose of liquid residue from concrete grooving or grinding activities at an appropriately permitted disposal facility.

If authorized, you may transport liquid grooving or grinding residue to a contractor-support facility for drying.

Replace section 13-5.02C with:

01-20-17

Section 13-5.02C Temporary Mulch

Temporary mulch must comply with the specifications for wood mulch in section 20.

Replace the 1st paragraph of section 13-5.03C with:

01-20-17

Spread temporary mulch as specified for spreading wood mulch in section 20.

Replace the 2nd paragraph of section 13-8.01D(2) with:

09-02-16

For a project within the Lake Tahoe Hydrologic Unit, the design, installation, operation, and monitoring of the temporary ATS and monitoring of the treated effluent must comply with Attachment E of the NPDES General Permit for General Waste Discharge Requirements and National Pollutant Discharge Elimination

Replace *listed* in the 2nd paragraph of section 14-6.03C with:

07-21-17

regulated

Replace item 4 in the list in the 2nd paragraph of section 14-6.03D(1) with:

07-21-17

4. Immediately notify the Engineer of any take of regulated species or violation of a biological resource PLAC

Add to the list in the 3rd paragraph of section 14-6.03D(1):

07-21-17

10. Details of any take of regulated species or violation of a biological resource PLAC

Add between the 1st and 2nd sentences in the 4th paragraph of section 14-6.03D(1) with:

07-21-17

If required under PLACs, the Department sends the biologist's statement of qualifications to regulatory agencies for review and approval before hiring. Allow 30 days for the regulatory agencies' review.

07-21-17

Delete the 1st sentence of the 5th paragraph of section 14-6.03D(1).

Add between *is* and *authorized* in the last paragraph of section 14-6.03D(1):

07-21-17

approved by regulatory agencies

Add between the 2nd and 3rd sentences in the 3rd paragraph of section 14-10.01:

01-20-17

Do not perform solid waste management in the median area unless there is construction activity present. Perform solid waste management monthly during the plant establishment period.

Replace the 2nd paragraph of section 14-11.01 with:

04-20-18

If hazardous waste is or will be generated on the job site, the WPC manager must be knowledgeable of proper handling and emergency procedures for hazardous waste as demonstrated by submitting a training certificate which indicates completion of training required under 22 CA Code of Regs § 66265.16.

Replace the last paragraph of section 14-11.03 with:

01-20-17

Dispose of hazardous waste within 90 days of the start of generation. Use a hazardous waste manifest and a transporter registered with the DTSC to transport the waste to an appropriately permitted hazardous waste management facility. The transporter must have completed the California Highway Patrol's Basic Inspection of Terminals Program with a satisfactory rating.

Replace 13-mils-thick in section 14-11.05A with:

04-20-18

12-mils-thick

Replace section 14-11.08 with:

04-20-18

14-11.08 REGULATED MATERIAL CONTAINING AERIALLY DEPOSITED LEAD

Reserved

Replace section 14-11.09 with:

04-20-18

14-11.09 MINIMAL DISTURBANCE OF REGULATED MATERIAL CONTAINING AERIALLY DEPOSITED LEAD

Reserved

Replace the 2nd paragraph of section 14-11.12E with:

04-20-18

The Engineer signs the manifests as the hazardous waste generator within 5 business days of 1) receiving and accepting the analytical test results and 2) receiving your request for the generator's EPA Identification Number.

Replace the 2nd paragraph of section 14-11.13A with:

04-20-18

Any work that disturbs the existing paint system produces debris containing heavy metals in amounts that exceed the established thresholds in 8 CA Code of Regs and exposes workers to health hazards which must be addressed in your lead compliance plan. Welding, cutting, or heating the surfaces coated by the existing paint system produces toxic fumes and must be done in compliance with 8 CA Code of Regs § 1537.

Any work that disturbs the existing paint system produces debris containing heavy metals in amounts that exceed the thresholds established in 22 CA Code of Regs. This debris is a Department-generated hazardous waste.

Replace the paragraph of section 14-11.13G(1) with:

04-20-18

For bidding purposes, assume the debris is a CA hazardous waste. Assume the debris is not regulated under the Federal Resource Conservation and Recovery Act, 42 USC § 6901 et seq. Disposal of hazardous waste debris identified by test results to be regulated under the Resource Conservation and Recovery Act is change order work.

Replace the 2nd paragraph of section 14-11.13G(2) with:

04-20-18

Use a hazardous waste manifest and a transporter whose vehicles have current DTSC registration certificates when transporting hazardous waste. The Engineer provides the generator's EPA Identification Number and signs the manifests as the hazardous waste generator within 5 business days of accepting the waste characterization test results and receiving your request for the generator's EPA Identification Number.

Replace the 2nd paragraph of section 14-11.13G(3) with:

01-20-17

You may dispose of nonhazardous debris at a facility equipped to recycle the debris if you make all arrangements with the recycling facility's operator and perform any facility-required testing of the debris.

Replace section 14-11.16 with:

07-21-17

14-11.16 ASBESTOS-CONTAINING CONSTRUCTION MATERIALS IN BRIDGES

Reserved

^^

16 TEMPORARY FACILITIES

04-20-18

Replace the heading of section 16-2.03 with:

01-20-17

TEMPORARY HIGH-VISIBILITY FENCES

Replace section 16-2.03A(1) with:

01-20-17

16-2.03A(1) Summary

Section 16-2.03 includes specifications for constructing temporary high-visibility fences.

Constructing a temporary high-visibility fence includes the installation of any signs specified in the special provisions.

If selected material is used as a specified layer, spread and compact it under section 25.

If practicable and unless processing of material is required, haul selected material directly from the excavation to its final position in the roadway prism and compact it in place.

Selected material must remain in place until it can be placed in its final position unless stockpiling of selected material is ordered.

If stockpiling of selected material is ordered, excavate and stockpile the selected material until the stockpiled material is to be placed in its final position in the roadway prism. This work is change order work.

19-2.03D(2) Topsoil

Reserved

Replace the last paragraph of section 19-3.02E:

04-20-18

You may use slurry cement backfill as structure backfill only for pipe culverts.

Add to the list in the 6th paragraph of section 19-3.04:

04-20-18

3. Structure excavation more than 0.5 foot from the depth shown is a work-character change if you request an adjustment for an increased depth or the Engineer orders an adjustment for a decreased depth.

Replace section 19-4 with:

01-20-17

19-4 ROCK EXCAVATION

19-4.01 GENERAL

19-4.01A General

19-4.01A(1) Summary

Section 19-4 include general specifications for performing rock excavation.

19-4.01A(2) Definitions

flyrock: Rock that becomes airborne due to blasting.

near-field blasting: Blasting within 30 feet of a building, highway facility, or utilities.

19-4.01A(3) Submittals

Reserved

19-4.01A(4) Quality Assurance

Reserved

19-4.01B Materials

Not Used

19-4.01C Construction

Excavate rock by blasting, controlled blasting, using chemical expanders or hydraulic splitters, or another authorized method.

19-4.01D Payment

The payment quantity for any type of rock excavation is measured as specified for roadway excavation.

19-4.02 PRESPLITTING

19-4.02A General

19-4.02A(1) Summary

Section 19-4.02 includes specifications for presplitting rock to form rock excavation slopes in conjunction with blasting or controlled blasting.

19-4.02A(2) Definitions

presplitting: Establishing a free surface or shear plane in rock along the specified excavation slope by the controlled use of explosives and blasting accessories in appropriately aligned and spaced drilled holes.

19-4.02A(3) Submittals

Submit a copy of the explosive manufacturer's instructions as an informational submittal before using any column-type explosive for presplitting.

19-4.02A(4) Quality Assurance

Reserved

19-4.02B Materials

The maximum diameter of explosive used in a presplit hole must not be greater than 50 percent of the diameter of the presplit hole.

Standard cartridge explosives prepared and packaged by explosive manufacturing firms must be used in the presplit holes. The explosives must consist of one of the following:

1. Fractional portions of standard cartridges to be affixed to a detonating cord in the field
2. Solid column explosives joined and affixed to a detonating cord in the field

Stemming materials must be dry, free-running material complying with the gradation requirements shown in the following table when tested under California Test 202:

Sieve size	Percentage passing
3/8"	100
No. 8	10

19-4.02C Construction

Presplit the rock to form rock excavation slopes.

Before drilling the presplitting holes, remove overburden soil and weathered rock along the top of the excavation for a distance of at least 50 feet beyond the production hole drilling limits or to the end of the excavation. Expose fresh rock to an elevation equal to the bottom of the adjacent lift of the presplitting holes being drilled.

Drill slope holes for presplitting along the line of the planned slope. The drilled holes must be from 2-1/2 to 3 inches in diameter. Use the proper drilling equipment and techniques to ensure that no hole deviates

(1) from the plane of the planned slope by more than 12 inches or (2) from parallel to an adjacent hole by more than 67 percent of the planned horizontal spacing between holes.

The Department does not pay for drilling more than 3 feet below finished grade unless additional drilling is ordered. The additional drilling is change order work.

The length of presplit holes for an individual lift must not exceed 20 feet, unless you can demonstrate to the Engineer that you can stay within the specified tolerances and produce a uniform slope. The length of holes may then be increased to a maximum of 60 feet if authorized.

Space the presplit holes a maximum of 3 feet on centers. Adjust the spacing to produce a uniform shear face between holes.

The Engineer may order you to drill auxiliary holes along the presplit line. These holes must not be loaded or stemmed. Except for spacing, the auxiliary drill holes must comply with the specifications for presplit holes. This work is change order work.

Place the adjacent line of production holes inside the presplit lines such that you avoid damage to the presplit face.

If necessary to reduce shatter and overbreak of the presplit surface, drill the 1st line of production holes parallel to the slope line at the top of the cut and at each bench level thereafter. Immediately stop blasting activities if the presplit surface is damaged.

Do not drill production holes within 8 feet of a presplit plane unless authorized. The bottom of the production holes must not be lower than the bottom of the presplit holes.

You may use a construction working bench offset by 24 inches from the bottom of each lift to drill the next lower presplitting pattern.

Adjust the drilling to compensate for any drift of previous levels and for the offset at the start of new levels to maintain the specified slope plane.

If the drilling and blasting methods do not produce a uniform slope and shear face without overbreak and within the specified tolerances, drill, blast, and excavate in short sections, up to 100 feet, until you achieve the desired results.

If you use a fractional portion of a standard explosive cartridge, firmly affix the cartridge to a length of detonating cord equal to the depth of the drill hole. Ensure the cartridge does not slip down the detonating cord or cock across the hole and bridge the flow of stemming material. Space the cartridges along the length of the detonating cord at a maximum of 30 inches on center. Adjust the spacing as needed to achieve the desired results.

If you use a solid column-type explosive, assemble and affix the column to the detonating cord under the explosive manufacturer's instructions.

The bottom charge of a presplit hole may be larger than the line charges but must not cause overbreak. Place the top charge of the presplitting hole far enough below the collar to avoid overbreaking the surface.

Before placing the charge, clear the hole of any obstructions for the hole's entire depth. Ensure that placing of the charge does not cause caving of material from the walls of the holes.

The Engineer may order the use of stemming materials as necessary to achieve a satisfactory presplit face. Stemmed presplit holes must be completely filled to the collar.

Simultaneously detonate charges in each presplitting pattern.

The tolerances specified in section 19-2.03G do not apply to presplit surfaces of excavation slopes where presplitting is required. The presplit face must not deviate more than 1 foot from the plane passing through adjacent drill holes, except where the character of the rock is such that irregularities are unavoidable. The average plane of the completed slopes must not deviate more than 1 foot from the plan slopes. These tolerances are measured perpendicular to the plane of the slope. No portion of the slope may encroach on the roadbed.

If equally satisfactory presplit slopes are obtained, you may either presplit the slope face before drilling for production blasting or presplit the slope face and production blast at the same time, provided that the presplitting drill holes are fired with zero delay. Detonation of the production holes must be delayed from the detonation of the presplit line and must start at the row of holes farthest from the new slope line and progressing in steps to the row of holes nearest the presplit line. Detonation of the production holes must result in a minimum 50 ms delay between detonation of the presplit holes and detonation of the row of production holes nearest the presplit line. The presplitting holes must extend either to the end of the excavation or for a distance of not less than 50 feet beyond the limits of the production holes to be detonated.

19-4.02D Payment

The payment quantity for drill hole (presplitting) is the theoretical slope length determined from the elevation taken before detonating each lift and a plane 3 feet below finished grade. For holes that comply with the specified slope and tolerances, except alignment within the plane of the slope, the payment quantity is 75 percent of the theoretical slope length.

The Department does not pay for holes that do not show a hole trace for approximately 50 percent of the drilled length.

19-4.03 BLASTING

19-4.03A General

19-4.03A(1) Summary

Section 19-4.03 includes specifications for excavating rock by blasting.

Blasting activities must comply with federal, State, and local blasting regulations, including 8 CA Code of Regs Ch 4, Subchapter 7, Group 18, "Explosive Materials."

19-4.03A(2) Definitions

Reserved

19-4.03A(3) Submittals

Submit 3 copies of your blasting safety plan. The plan must include:

1. References to applicable federal, State, and local codes and regulations
2. Copies of permits required for blasting activities
3. Business name, contractor license number, address, and telephone number of the blasting subcontractor
4. Proof of current liability insurance and bonding
5. Name, address, telephone number, copies of applicable licenses, and resume of:
 - 5.1. Blaster-in-charge
 - 5.2. Personnel responsible for blast design, loading, and conducting blasting operations
 - 5.3. Safety officer for the blasting subcontractor
6. Name, address, and telephone number of the local fire station and law enforcement agencies
7. Detailed description of:
 - 7.1. Location where explosives will be stored
 - 7.2. Security measures to protect and limit access to the explosives

- 7.3. Means for transporting explosives
- 7.4. List of personnel allowed to handle the explosives
- 8. Exclusion zone and limited-entry zone for nonblast-related operations and personnel surrounding loading and blasting operations
- 9. Details of warning signals used to alert employees on the job site of an impending blast and to indicate the blast is completed and the area is safe to enter
- 10. Procedures for conducting blasting operations
- 11. Measures to protect blasting operations and personnel from lightning
- 12. Emergency evacuation procedures for areas where explosives may be present
- 13. Methods for recognizing, handling, and resolving misfires, including:
 - 13.1. Who will be notified
 - 13.2. How the blast zone will be secured until the misfire is resolved
 - 13.3. Identification of equipment that may be needed to resolve misfires
- 14. Details of signs to be used around blasting zones, including:
 - 14.1. Timing of when signs will be posted for a specific blast
 - 14.2. Name and telephone number of the person responsible for placing the signs
 - 14.3. Roadway signs for compliance with the *California MUTCD*, Chapter 6H, Typical Application 2
- 15. Traffic control details for:
 - 15.1. Loading and blasting operations
 - 15.2. Misfire event or other blast-related phenomenon that causes a transportation corridor to remain closed to the public
- 16. Description of the possible generation of noxious gas and details of the safeguards to be used to protect employees, work zones adjacent to the shot, private property, and the public
- 17. Procedure to report and resolve complaints for blast-related accidents
- 18. Copies of each SDS and manufacturer data sheets of explosives, caps, primers, initiators, and other compounds

If the plan requires revisions, the Department provides comments. Submit a revised plan after receiving the comments. Submit 3 copies of the revised blasting safety plan after authorization.

19-4.03A(4) Quality Assurance

Reserved

19-4.03B Materials

Not Used

19-4.03C Construction

You may use hydraulic splitters, pneumatic hammers, blasting, or another authorized roadway excavation method to fracture rock and construct stable final rock cut faces.

19-4.03D Payment

Not Used

19-4.04 CONTROLLED BLASTING

19-4.04A General

19-4.04A(1) Summary

Section 19-4.04 includes specifications for excavating rock by controlled blasting.

Blasting activities must comply with federal, State, and local blasting regulations, including 8 CA Code of Regs Ch 4, Subchapter 7, Group 18, "Explosives and Pyrotechnics," and 22 CA Code of Regs, Division 4.5, Ch 33, "Best Management Practices for Perchlorate Materials."

19-4.04A(2) Definitions

controlled blasting: Using explosives and blasting accessories in predetermined spaced and aligned drilled holes.

19-4.04A(3) Submittals

19-4.04A(3)(a) General

Reserved

19-4.04A(3)(b) Blasting Safety Plan

Submit 3 copies of your blasting safety plan. The plan must include:

1. References to applicable federal, State, and local codes and regulations
2. Copies of permits required for blasting activities
3. Business name, contractor license number, address, and telephone number of the blasting subcontractor
4. Proof of current liability insurance and bonding
5. Name, address, telephone number, copies of applicable licenses, and resume of:
 - 5.1. Blaster-in-charge.
 - 5.2. Personnel responsible for blast design, loading, and conducting blasting operations.
 - 5.3. Safety officer for the blasting subcontractor.
 - 5.4. Blast monitoring consultant.
 - 5.5. Blasting consultant if the project involves near-field blasting activities. Include a list of controlled blasting projects worked on by the blasting consultant.
6. Name, address, and telephone number of the local fire station and law enforcement agencies
7. Detailed description of:
 - 7.1. Location where explosives will be stored
 - 7.2. Security measures to protect and limit access to the explosives
 - 7.3. Means for transporting explosives
 - 7.4. List of personnel allowed to handle the explosives
8. Exclusion zone and limited-entry zone for nonblast-related operations and personnel surrounding loading and blasting operations
9. Details of warning signals used to alert employees on the job site of an impending blast and to indicate the blast is completed and the area is safe to enter
10. Procedures for conducting blasting operations
11. Measures to protect blasting operations and personnel from lightning
12. Emergency evacuation procedures for areas where explosives may be present
13. Methods for recognizing, handling, and resolving misfires, including:
 - 13.1. Who will be notified
 - 13.2. How the blast zone will be secured until the misfire is resolved
 - 13.3. Identification of equipment that may be needed to resolve misfires
14. Details of signs to be used around blasting zones, including:
 - 14.1. Timing of when signs will be posted for a specific blast
 - 14.2. Name and telephone number of the person responsible for placing the signs
 - 14.3. Roadway signs for compliance with the *California MUTCD*, Chapter 6H, Typical Application 2
15. Traffic control details for:
 - 15.1. Loading and blasting operations
 - 15.2. Misfire event or other blast-related phenomenon that causes a transportation corridor to remain closed to the public
16. Description of the possible generation of noxious gas and details of the safeguards to be used to protect employees, work zones adjacent to the shot, private property, and the public
17. Procedure to report and resolve complaints for blast-related accidents

18. Copies of each SDS and manufacturer data sheets of explosives, caps, primers, initiators, and other compounds

If the blasting safety plan requires revisions, the Department provides comments. Submit a revised plan after receiving comments. Submit 3 copies of the revised plan after authorization.

19-4.04A(3)(c) Controlled Blasting Plan

Submit 3 copies of your controlled blasting plan for each blast. The plan must include details on how each blast will be controlled and the following:

1. Blast identification by numerical and chronological sequence
2. Location, referenced to stationing, offset distance, date, and time of the blast
3. Drawings showing drill hole pattern, spacing, burden, and initiation sequence
4. Typical cross-sections through the zone to be blasted
5. Groundwater level, if present, within the prism to be blasted
6. Initiation-sequence diagram showing the actual firing time of each delay
7. Type of material to be blasted
8. Number of drill holes
9. Diameter, depth, and spacing of holes
10. Height or length of stemming
11. Types and characteristics of explosives, including the explosive's density, relative strength, and date of manufacture
12. Type of caps and delay periods and their date of manufacture
13. Total amount of explosives to be used
14. Total amount of explosives detonating within any 8 ms period
15. Powder factor (pounds of explosive per cubic yard of material blasted)
16. Method of firing
17. Direction and distance to nearest building or structure
18. Type of instrumentation and method for monitoring vibration and noise from the blasting activities
19. Location and placement of the instrumentation
20. Measures to limit noise and flyrock
21. Measures to limit overbreak
22. Name of the blasting subcontractor
23. Name and signature of the blaster-in-charge
24. Drawings showing the spacing and proximity of shot guards relative to the blast location

If you revise the controlled blasting plan to adjust for site conditions or the Department provides comments, submit a revised plan before starting controlled blasting. Submit 3 copies of the revised plan after authorization.

19-4.04A(3)(d) Preblast and Postblast Surveys

Submit a preblast survey of all structures, including buildings, within 330 feet of controlled blasting locations at least 15 days before starting the blasting activities. Submit the preblast survey with the controlled blasting plan.

The preblast survey must include:

1. Written report, sketches, and photographs or video with the date and time displayed on the image
2. Name of the person who performed the survey
3. Names of the property owner and occupants
4. Property address
5. Date and time of the inspection

6. Description of the structure or other improvements, including culverts and bridges
7. Detailed description of the existing condition of the walls, ceiling, and floor of each interior room, including any attic or basement
8. Detailed description of the existing condition of the foundations, exterior walls, roofs, doors, windows, and porches
9. Detailed description of the existing condition of garages, outbuildings, sidewalks, driveways, and swimming pools
10. Detailed listing of highway sign posts, light fixtures, and overhead power lines
11. Survey of wells or other private water supplies, including the total depth and existing water surface levels
12. Identification of sites conducting procedures, processes, or operations that may be sensitive to blasting activities
13. Scaled map or aerial photo showing the location of the structures and properties surveyed and the location of all proposed blasting sites

If blasting activities are suspended for 45 days or more, perform another preblast survey and submit the survey at least 15 days before resuming blasting activities.

Submit a postblast survey of the same buildings and other structures as in the preblast survey within 15 days after completing blasting activities. The postblast survey must include all items included in the preblast survey.

19-4.04A(3)(e) Vibration and Noise Monitoring Report

Submit a vibration and noise monitoring report for each controlled blast shot. The report must include:

1. Identification of the blasting seismograph used to record each blast shot
2. Name of the blast monitoring consultant
3. Distance and direction of the recording stations from the blast area
4. Type of ground at the recording station and type of material on which the instrumentation sits
5. Maximum particle velocity in each component and the resultant peak particle velocity of each shot
6. Copy of the seismograph readings with the date and signature of the blast monitoring consultant
7. Noise levels recorded in dB (C-network or Linear network) units

19-4.04A(3)(f) Video Recording

Submit a video recording of each controlled blast on a DVD or other Engineer-authorized data-storage device. Identify each video or section of the video with an index to identify each blast.

19-4.04A(3)(g) Blasting Complaint Report

Submit a report for each blasting complaint, including:

1. Name and address of the complainant
2. Date, time, and nature of the complaint
3. Dated photo or videotape of the physical damage
4. Name of the person who received the complaint
5. Record of the complaint investigation
6. Resolution of the complaint

19-4.04A(3)(h) Postblast Report

Submit a postblast report within 48 hours of a controlled blast. The report must include all data required in the controlled blasting plan for that shot and the following information:

1. Description of site conditions, loading, and time of blast

2. Description of weather conditions at time of blast including wind direction and cloud cover
3. Drillers boring record
4. Copy of vibration and noise monitoring report
5. Copy of documented complaints arising from the blast

19-4.04A(4) Quality Assurance

19-4.04A(4)(a) General

Reserved

19-4.04A(4)(b) Blaster-In-Charge for Controlled Blasting

Assign a blaster-in-charge to supervise all controlled blasting activities. The blaster-in-charge must have at least 10 years of experience in performing or supervising similar blasting activities and must be a licensed blaster.

19-4.04A(4)(c) Blast Monitoring Consultant for Controlled Blasting

Assign a blast monitoring consultant to monitor blasting-generated vibrations and noise near buildings and other structures that may be subject to damage. The monitoring consultant must be responsible for collecting and interpreting the vibration and noise data. The blast monitoring consultant must:

1. Not be employed by the blasting contractor or other subcontractor on the project
2. Have a minimum 2-year associate's degree in science or engineering
3. Have at least 5 years of documented experience in collecting and interpreting ground vibrations and noise data

19-4.04A(4)(d) Blasting Consultant for Controlled Blasting

Assign a blasting consultant to oversee near-field blasting activities. The blasting consultant must:

1. Be an engineering geologist or civil engineer who is licensed in the State
2. Have at least 10 years of experience providing specialized blasting services in near-field blasting
3. Not be employed by the blasting contractor, explosive manufacturer, or explosive distributor

19-4.04B Materials

Each seismograph used to record controlled blasting activities must be capable of:

1. Recording particle velocities for 3 mutually perpendicular components of vibration and an instantaneous resultant peak vector sum in the range generally found for controlled blasting
2. Continuously measuring, recording, and reporting vibrations along 3 primary axes
3. Measuring and recording vibration frequencies ranging from 2 to 300 Hz
4. Providing a printed record of each event showing a plot of peak particle velocity versus vibration frequencies
5. Measuring and recording airblast noise levels

The seismograph's noise transducer must be detachable from the main unit to allow its placement at elevations with a clear line of sight between the transducer and the blast.

19-4.04C Construction

19-4.04C(1) General

At least 7 days before starting or resuming controlled blasting activities, provide written notification to the occupants of the buildings within 330 feet of the blasting. Notify the occupants of pending blasting activities on the day of blasting.

Do not perform blasts within 1,200 feet of concrete placed within the previous 72 hours.

Before firing any blast, confirm that the groundwater conditions are consistent with the shot design and explosive type to be used.

Before firing any blast in areas where flyrock may result in personal injury or damage to property or the work, cover the rock to be blasted with blasting mats, soil, or other equally serviceable material to prevent flyrock.

If blasting causes flyrock, suspend blasting activities. The blasting consultant must review the job site to determine the cause of the flyrock problem and submit a revised controlled blasting plan that prevents flyrock.

Do not use drill cuttings as stemming in controlled blasting activities.

Keep vibration levels below a peak particle velocity of 2 inches per second at the nearest building, highway facility, or utility.

Limit noise from airblast overpressure levels to below 128 dB (C-scale or linear network) at the nearest building.

Control ground vibrations and noise created from blasting by using properly designed delay sequencing and charge weights for shots.

Provide 3 seismographs to record controlled blasting activities. Record each blast shot using the seismographs. Video record each blast from a safe location with a clear view of the blast area, activities, and progression.

Notify the Engineer no later than the start of the next day's work shift of any blasting complaint received.

19-4.04D Payment

Not Used

19-4.05–19-4.08 RESERVED

Replace the 7th paragraph of section 19-10.03A with:

01-20-17

Do not stockpile material on the geosynthetic or place more geosynthetic than can be covered within 72 hours.

Do not operate equipment or vehicles directly on geosynthetic, except you may operate vehicles and equipment on geogrid if one of the following conditions is met:

1. Vehicles and equipment are:
 - 1.1. Equipped with rubber tires
 - 1.2. Operated under 10 mph
 - 1.3. Operated in a manner to avoid sudden braking and sharp turns
2. At least 0.35 feet of AB has been placed, spread, and compacted on the geogrid

Replace the 2nd heading of section 19-10.03 with:

01-20-17

19-10.03B Subgrade Enhancement Geotextile

Compact the backfill in the trench to a minimum relative compaction of 90 percent. If the trench backfill settles, place additional material and compact until the backfill is level with the surrounding grade.

Ensure conduit, supply line, and joints are not moved or damaged by backfill activity.

If trenching requires the removal of:

1. Plants:
 - 1.1 Remove plants as necessary under section 20-1.03C.
 - 1.2 If plants are to remain, adjust the trench alignment to minimize damage.
 - 1.3 If the supply line location interferes with the excavation of plant holes, relocate the plant hole away from the supply line.
 - 1.4 Where authorized by the Engineer, prune trees and shrubs as necessary to complete the trenching work.
2. Turf:
 - 2.1 Do not remove a width of more than 12 inches.
 - 2.2 Replace with sod under section 20-3.02C(3)(e).
3. Groundcover:
 - 3.1 Do not remove a width of more than 6 feet.
 - 3.2 Replace groundcover with plants from flats and plant at 12 inches on center under section 20-3.02C.
 - 3.3 You may rototill existing *Carpobrotus* and *Delosperma*. Backfill for the trenches must not contain plants longer than 6 inches. No replacement of *Carpobrotus* and *Delosperma* is required if removed by rototilling.
4. Existing surface:
 - 4.1 Make a minimum 2-inch-deep saw cut along neat lines around the perimeter of the pavement to be removed at locations determined by the Engineer.
 - 4.2 Place a minimum of 2 inches of sand bedding under and on top of supply lines and conduits.
 - 4.3 Compact the backfill under the replacement surfacing to a minimum relative compaction of 95 percent.
 - 4.4 Replace the structural section to match the removed materials. The surface must have the same uniform smoothness, color, and texture as the adjacent surface.

If trenching in areas to receive new surfacing:

1. Place a minimum of 2 inches of sand bedding under and on top of supply lines and conduits.
2. Compact the backfill under the new surfacing to a minimum relative compaction of 95 percent.

Replace 86 in the 1st paragraph of section 20-2.01C(3) with:

04-15-16

87

Replace the paragraphs of section 20-2.03B with:

04-20-18

Each cam coupler assembly must consist of a cam coupler, dust cap, check valve, pipes, fittings, concrete thrust block, and valve box with woven wire cloth and gravel.

Cam couplers must be manufactured of brass or bronze and be able to withstand a working pressure of 150 psi.

04-20-18

Delete the 2nd paragraph of section 20-2.03C.

Replace section 20-2.04A(4) with:

04-15-16

Perform conductors test. The test must comply with the specifications in section 87.

Where the conductors are installed by trenching and backfilling, perform the test after a minimum of 6 inches of backfill material has been placed and compacted over the conductors.

Replace 5 in the 1st paragraph of section 20-2.04C(2) with:

07-21-17

10

Add between the 1st and 2nd paragraphs of section 20-2.04C(2):

07-21-17

Tie a 24-inch loop of wire at all changes of direction that are greater than 45 degrees. Untie the loops after all the connections are made.

Replace the 1st paragraph of section 20-2.04C(4) with:

04-15-16

Splice low voltage control and neutral conductors under section 87, except do not use Method B.

Replace the 3rd paragraph of section 20-2.05B with:

07-15-16

The impeller must be glass reinforced nylon on a tungsten carbide shaft.

Replace 86 in the 2nd paragraph of section 20-2.06C with:

04-15-16

87

Replace section 20-2.07B(5) with:

04-15-16

20-2.07B(5) PVC Pipe Conduit Sleeve

PVC pipe conduit sleeves must be schedule 40 complying with ASTM D1785.

Fittings must be schedule 80.

Replace the 9th paragraph of section 20-2.07C(1) with:

07-21-17

Place Type G pavement markers with retroreflective face facing away from the oncoming traffic under section 81-3 on paved shoulders or dikes at irrigation conduit locations where authorized.

07-21-17

Delete the 2nd paragraph of section 20-2.07C(2)(a).

Replace section 20-2.07C(3) with:

07-21-17

20-2.07C(3) PVC Pipe Conduit Sleeve

Where PVC pipe conduit sleeves 2 inches or less in outside diameter are installed under surfacing, you may install by directional boring under section 20-2.07C(2)(b).

Cap ends of conduit until used.

07-21-17

Delete the 4th and 5th paragraph of section 20-2.08C(4).

Replace sections 20-2.09B and 20-2.09C with:

07-15-16

20-2.09B Materials

20-2.09B(1) General

Swing joints must match the inlet connection size of the riser.

Where shown, a sprinkler assembly must include a check valve.

Threaded nipples for swing joints and risers must be schedule 80, PVC 1120 or PVC 1220 pipe, and comply with ASTM D1785. Risers for sprinkler assemblies must be UV resistant.

Fittings for sprinkler assemblies must be injection-molded PVC, schedule 40, and comply with ASTM D2466.

Flexible hose for sprinkler assemblies must be leak-free, non-rigid and comply with ASTM D2287, cell Type 6564500. The hose must comply with ASTM D2122 and have the thickness shown in the following table:

Nominal hose diameter (inch)	Minimum wall thickness (inch)
1/2	0.127
3/4	0.154
1	0.179

Solvent cement and fittings for flexible hose must comply with section 20-2.08B(5).

20-2.09B(2) Pop-Up Sprinkler Assemblies

Each pop-up sprinkler assembly must include a body, nozzle, swing joint, pressure reducing device, fittings, and sprinkler protector where shown.

20-2.09B(3) Riser Sprinkler Assemblies

Each riser sprinkler assembly must include a body, flexible hose, threaded nipple, nozzle, swing joint (except for a Type V riser), pressure reducing device, fittings, and riser support where shown.

20-2.09B(4) Tree Well Sprinkler Assemblies

Each tree well sprinkler assembly must include a threaded nipple, nozzle, swing joint, fittings, perforated drainpipe, and drain grate.

The perforated drainpipe must be commercial-grade, rigid PVC pipe with holes spaced not more than 6 inches on center on 1 side of the pipe.

The drain grate must be a commercially-available, 1-piece, injection-molded grate manufactured from structural foam polyolefins with UV light inhibitors. Drain grate must be black.

Gravel for filling the drainpipe must be graded such that 100 percent passes the 3/4-inch sieve and 100 percent is retained on the 1/2-inch sieve. The gravel must be clean, washed, dry, and free from clay or organic material.

20-2.09C Construction

Where shown, install a flow shut-off device under the manufacturer's instructions, unless you use equipment with a preinstalled flow shut-off device.

Where shown, install a pressure reducing device under the manufacturer's instructions, unless you use equipment with a preinstalled pressure reducing device.

Install pop-up and riser sprinkler assembly:

1. From 6-1/2 to 8 feet from curbs, dikes, and sidewalks
2. At least 10 feet from paved shoulders
3. At least 3 feet from fences and walls

If sprinkler assembly cannot be installed within these limits, the location will be determined by the Engineer.

Set sprinkler assembly riser on slopes perpendicular to the plane of the slope.

Replace the paragraph of section 20-2.10B(3) with:

07-15-16

Each check valve must be one of the following:

1. Schedule 80 PVC with a factory setting to withstand a minimum 7-foot head on risers
2. Class 200 PVC if used on a nonpressurized plastic irrigation supply line
3. Internal to the sprinkler body with a factory setting to withstand a minimum 7-foot head

07-21-17

Delete item 3 in the list in the paragraph of section 20-2.10B(4).

Replace the paragraph of section 20-2.10C(3) with:

07-15-16

Install check valves as necessary to prevent low-head drainage.

Replace the paragraph of section 20-3.01B(3) with:

04-20-18

20-3.01B(3)(a) General

Soil amendment must comply with the provisions in the Food & Agri Code and as specified in the special provisions.

Replace the paragraphs of section 20-3.01B(10) with:

07-15-16

Each plant stake for vines must be nominal 1 by 1 inch and 18 inches long.

Each plant stake for trees must be nominal 2 by 2 inches or nominal 2 inches in diameter and long enough to keep the tree in an upright position.

Replace the paragraph of section 20-3.01B(11) with:

07-15-16

Each plant tie for vines must be extruded vinyl-based tape, 1 inch wide and at least 8 mils thick.

Each plant tie for trees must be a (1) minimum 3/4-inch-wide, UV-resistant, flexible vinyl tie complying with ASTM D412 for tensile and elongation strength, or (2) lock-stitch, woven polypropylene with a minimum 900 lb tensile strength.

Add between the 7th and 8th paragraphs of section 20-3.02C(3)(b):

07-15-16

Spread the vine shoots and tie them with a plant tie to each stake above the crossing point.

Replace the 8th paragraph of section 20-3.02C(3)(b) with:

07-15-16

Tie trees to the stakes with 2 tree ties, 1 tie to each stake. Each tie must form a figure eight by crossing the tie between the tree and the stake. Install ties at the lowest position that will support the tree in an upright position. Install the ties such that they provide trunk flexibility but do not allow the trunk to rub against the stakes. Wrap each end of the tie 1-1/2 turns around the stake and securely tie or nail it to the stake.

Replace the 1st paragraph of section 20-5.02C(1) with:

07-15-16

Where edging is used to delineate the limits of inert ground cover or wood mulch areas, install the edging before installing the inert ground cover or wood mulch.

Delete *AND MULCHES* in the heading of section 20-5.03.

07-15-16

Delete *and mulches* in the paragraph of section 20-5.03A(1)(a).

07-15-16

Replace the paragraph of section 20-5.03A(3)(a) with:

Before installing inert ground cover, remove plants and weeds to the ground level.

07-15-16

Add to the beginning of section 20-5.03A(3)(b):

Excavate to the depth shown.

07-21-17

Delete *or mulch* at each occurrence in sections 20-5.03A(3)(c) and 20-5.03A(3)(d).

07-15-16

Add to the end of section 20-5.03B(2)(c):

You may use rock with superficial chipping or jagged edges if the rock is placed such that the chipped areas and jagged edges are submerged in the concrete.

07-21-17

Delete the 1st paragraph of section 20-5.03B(3).

04-20-18

Add to the 2nd paragraph of section 20-5.03B(3):

Rock that is exposed on the finished surface must be round, smooth, clean and without jagged edges or chipped areas showing.

07-21-17

Replace section 20-5.03E with:

20-5.03E Rock Mulch

Reserved

04-20-18

Replace section 20-5.04 with:

07-15-16

20-5.04 WOOD MULCH

20-5.04A General

20-5.04A(1) Summary

Section 20-5.04 includes specifications for placing wood mulch.

20-5.04A(2) Definitions

Reserved

20-5.04A(3) Submittals

Submit a certificate of compliance for wood mulch.

Submit a 2 cu ft mulch sample with the mulch source shown on the bag. Obtain authorization before delivering the mulch to the job site.

20-5.04A(4) Quality Assurance

Reserved

20-5.04B Materials

20-5.04B(1) General

Mulch must not contain more than 0.1 percent of deleterious materials such as rocks, glass, plastics, metals, clods, weeds, weed seeds, coarse objects, sticks larger than the specified particle size, salts, paint, petroleum products, pesticides or chemical residues harmful to plant or animal life.

20-5.04B(2) Tree Bark Mulch

Tree bark mulch must be derived from cedar, Douglas fir, or redwood species.

The mulch must be ground such that at least 95 percent of the material by volume is less than 2 inches long in any dimension and no more than 30 percent by volume is less than 1 inch long in any dimension.

20-5.04B(3) Wood Chip Mulch

Wood chip mulch must:

1. Be derived from clean wood
2. Not contain leaves or small twigs
3. Contain at least 95 percent by volume of wood chips with a width and thickness from 1/16 to 3/8 inch and a length from 1/2 to 3 inches

20-5.04B(4) Shredded Bark Mulch

Shredded bark mulch must:

1. Be derived from trees
2. Be a blend of loose, long, thin wood, or bark pieces
3. Contain at least 95 percent by volume of wood strands with a width and thickness from 1/8 to 1-1/2 inches and a length from 2 to 8 inches

20-5.04B(5) Tree Trimming Mulch

Tree trimming mulch must:

1. Be derived from chipped trees and may contain leaves and small twigs

2. Contain at least 95 percent by volume of material less than 3 inches long for any dimension and not more than 30 percent by volume of material less than 1 inch long for any dimension

20-5.04B(6)–20-5.04B(11) Reserved

20-5.04C Construction

Before placing wood mulch, remove plants and weeds to the ground level.

Maintain the planned flow lines, slope gradients, and contours of the job site. Grade the subgrade to a smooth and uniform surface.

Place mulch after the plants have been planted.

Place mulch in the plant basin at the rate described. Mulch must not come in contact with the plant crown and stem.

Place mulch as shown in areas outside of plant basins to a uniform thickness.

Spread mulch from the outside edge of the plant basin to the adjacent edges of shoulders, paving, retaining walls, dikes, edging, curbs, sidewalks, walls, fences, and existing plantings. If the plant is 12 feet or more from the adjacent edges of any of these elements, spread the mulch 6 feet beyond the outside edge of the plant basin.

Do not place mulch within 4 feet of:

1. Flow line of earthen drainage ditches
2. Edge of paved ditches
3. Drainage flow lines

20-5.04D Payment

The payment quantity for wood mulch is the volume measured in the vehicle at the point of delivery.

Add between *plants* and *if* in the 1st sentence of section 20-10.03C(2):

under section 20-3.01C(2) 04-20-18

Add between *prune* and *each* in the 1st paragraph of section 20-10.03C(3):

under section 20-3.01C(2) 04-20-18

^^

21 EROSION CONTROL

04-20-18

Replace the paragraph of section 21-1.01 with:

Section 21-1 includes general specifications for applying permanent erosion control measures. 01-20-17

Replace section 21-2.02C with:

04-20-18

21-2.02C Imported Topsoil

Imported topsoil must:

1. Consist of fertile, friable soil of loamy character that contains organic matter in quantities natural to the region and be capable of sustaining healthy plant life
2. Be free from deleterious substances such as litter, refuse, toxic waste, stones larger than 1 inch in size, coarse sand, heavy or stiff clay, brush, sticks, grasses, roots, noxious weed seed, weeds, and other substances detrimental to plant, animal, and human health

Replace the paragraphs in section 21-2.02K with:

04-20-18

Reserved

Replace the paragraphs in section 21-2.02Q with:

04-20-18

Reserved

Delete *and compost socks* in the 4th paragraph of section 21-2.02R.

07-21-17

Replace the 2nd sentence in the 1st paragraph of section 21-2.03B with:

07-21-17

Apply duff to the edge of the shoulder backing. When shoulder backing is absent, do not apply duff within 3 feet of the edge of pavement.

Replace section 21-2.03C with:

04-20-18

21-2.03C Imported Topsoil

Place imported topsoil after all other earthwork in an area is complete.

Spread imported topsoil to a uniform thickness.

Trackwalk imported topsoil with tracked equipment run perpendicular to slope contours. Water may be used to assist the process but must not cause erosion.

DIVISION IV SUBBASES AND BASES

23 GENERAL

01-20-17

Replace the headings and paragraphs in section 23 with:

07-15-16

23-1 GENERAL

23-1.01 GENERAL

23-1.01A Summary

Section 23 includes general specifications for constructing subbases and bases.

23-1.01B Definitions

Reserved

23-1.01C Submittals

Submit a QC plan for the types of subbases or bases where described.

23-1.01D Quality Assurance

23-1.01D(1) General

23-1.01D(1)(a) General

Take samples under California Test 125.

23-1.01D(1)(b) Test Result Disputes

You and the Engineer must work together to avoid potential conflicts and to resolve disputes regarding test result discrepancies. Notify the Engineer within 5 business days of receiving the test result if you dispute the test result.

01-20-17

If you or the Engineer dispute each other's test results, submit your test results and copies of paperwork including worksheets used to determine the disputed test results. An independent third party performs referee testing. Before the independent third party participates in a dispute resolution, it must be qualified under AASHTO resource program and the Department's Independent Assurance Program. The independent third party must have no prior direct involvement with this Contract. By mutual agreement, the independent third party is chosen from:

1. Department laboratory in a district or region not in the district or region the project is located
2. Transportation Laboratory
3. Laboratory not currently employed by you or your material producer

07-15-16

If split acceptance samples are not available, the independent third party uses any available material representing the disputed material for evaluation.

If the independent third party determines the Department's test results are valid, the Engineer deducts the independent third party testing costs from payments. If the independent third party determines your test results are valid, the Department pays the independent third party testing costs.

23-1.01D(2) Quality Control

23-1.01D(2)(a) General

Provide a QC manager when the quantity of subbase or base is as shown in the following table:

QC Manager Requirements

Subbase or base	Requirement
Stabilized soil (sq yd)	≥ 20,000
Aggregate subbases (cu yd)	≥ 20,000
Aggregate bases (cu yd)	≥ 20,000
CTB (cu yd)	≥ 10,000
Lean concrete base (cu yd)	≥ 2,000
Rapid strength concrete base (cu yd)	≥ 1,000
Lean concrete base rapid setting (cu yd)	≥ 1,000
Concrete base (cu yd)	≥ 1,000
Treated permeable bases (cu yd)	≥ 2,000
Reclaimed pavements (sq yd)	≥ 10,000

Provide a testing laboratory to perform quality control tests. Maintain sampling and testing equipment in proper working condition.

You are not entitled to compensation for the suspension of work resulting from noncompliance with quality control requirements, including those identified within the QC plan.

23-1.01D(2)(b) Quality Control Plan

The QC plan must describe the organization and procedures used to:

1. Control the production process
2. Determine if a change to the production process is needed
3. Implement a change

The QC plan must include action and suspension limits and details of corrective action to be taken if any process is outside of those limits. Suspension limits must not exceed specified acceptance criteria.

The QC plan must describe how test results will be submitted including times for sampling and testing for each quality characteristic.

23-1.01D(2)(c) Qualifications

Testing laboratories and testing equipment must comply with the Department's Independent Assurance Program.

Personnel performing sampling and testing must be qualified under the Department's Independent Assurance Program for the sampling and testing performed.

23-1.01D(3) Department Acceptance

Reserved

23-1.02 MATERIALS

Not Used

23-1.03 CONSTRUCTION

Not Used

23-1.04 PAYMENT

Not Used

23-2-23-7 RESERVED

Delete section 24-2.01D(1)(c)

Replace 250 in the 2nd sentence in the 2nd paragraph of section 24-2.01D(2)(c) with:

07-15-16

500

Add to section 24-2.01D(2):

07-15-16

24-2.01D(2)(d) Quality Control Testing

Lime stabilized soil quality control must include testing the quality characteristics at the frequencies shown in the following table:

QC Testing Frequencies

Quality characteristic	Test method	Sampling location	Minimum frequency
Ground surface temperature before adding lime and full depth ground temperature during mixing operations	--	Each temperature location	1 test per 20,000 sq ft, minimum 1 per day
Lime application rate	Calibrated tray or equal	Roadway	1 test per 40,000 sq ft, minimum 2 per day
Gradation on mixed material	California Test 202	Roadway	1 per 500 cu yd, minimum 1 per day
Moisture content	California Test 226	Roadway	1 per 500 cu yd on each layer, each day during mixing and mellowing periods, minimum 1 per day
Relative compaction	California Test 231	Roadway	1 per 500 cu yd on each layer, minimum 1 per day

Replace section 24-3 with:

07-21-17

24-3 CEMENT STABILIZED SOIL**24-3.01 GENERAL****24-3.01A Summary**

Section 24-3 includes specifications for constructing CSS by mixing basement material with cement and water.

24-3.01B Definitions

Reserved

24-3.01C Submittals

Submit cement samples under California Test 125. Include the mill analysis.

Submit a certificate of compliance under section 90-1.01C(3).

24-3.01D Quality Assurance

24-3.01D(1) General

24-3.01D(1)(a) General

Stop CSS activities and immediately notify the Engineer if either of the following occurs:

1. Any quality control test result does not comply with the specifications
2. Visual inspection shows noncompliant CSS

If CSS activities are stopped, before resuming activities:

1. Notify the Engineer of the adjustments you will make
2. Reprocess, remedy, or replace the noncompliant CSS until it complies with specifications
3. Construct a 1,000 square yard test strip of CSS demonstrating ability to comply with the specifications
4. Obtain the Engineer's authorization

24-3.01D(1)(b) Preparing Basement Material

For every 1,000 sq yd of basement material to be cement stabilized:

1. Test the relative compaction under California Test 231
2. Test the moisture content under California Test 226

24-3.01D(1)(c) Applying Cement

The Engineer determines the final application rate based on ASTM D1633, Method A, except:

1. Test specimens must be compacted under ASTM D1557, Method A or B.
2. Test specimens must be cured by sealing each specimen with 2 layers of plastic at least 4 mil thick. The plastic must be tight around the specimen. Seal all seams with duct tape to prevent moisture loss. Sealed specimens must be placed in an oven for 7 days at 100 ± 5 degree F. At the end of the curing period, specimens must be removed from the oven and air-cooled. Duct tape and plastic wrap must be removed before capping. Specimens must not be soaked before testing.

The application rate is ordered as pounds of cement per square yard of basement material to be stabilized.

Before applying cement, measure and record the air temperature and in situ moisture content of the basement material to be stabilized.

The Engineer verifies the application rate using a calibrated tray or equal once per 40,000 sq ft of stabilized basement material, or twice per day, whichever is greater.

24-3.01D(2) Quality Control

24-3.01D(2)(a) General

Reserved

24-3.01D(2)(b) Mixing

During mixing operations, measure and record the air temperature for the basement material to be stabilized.

For each day of mixing, test the in-place moisture content under California Test 231, Part 1, Section E and verify moisture content under California Test 226. Sample immediately after mixing.

After mixing, maintain the in-place moisture of the basement material to be stabilized within a range of 1 percent below to 2 percent above the optimum moisture determined under California Test 216.

Determine in-place moisture content under California Test 231. During compaction and finish grading, add water to the surface to prevent drying until the next layer of mixed material is placed, or until you apply curing treatment.

24-3.01D(2)(c) Compaction

After compaction, determine in-place wet density under California Test 231 and moisture content under California Test 226, at the same locations. Perform one test per 1,000 sq yd of CSS. Test in 0.50-foot depth intervals from the bottom of the CSS layer regardless of the layer thickness. Convert wet density to dry density and calculate relative compaction under California Test 216 on a dry density basis.

24-3.01D(2)(d) Quality Control Testing

Cement stabilized soil quality control must include testing the quality characteristics at the frequencies shown in the following table:

QC Testing Frequencies

Quality characteristic	Test method	Sampling location	Minimum frequency
Air temperature before adding cement to basement material	--	Each temperature location	1 test per 20,000 sq ft, minimum 1 per day
Moisture content of basement material before adding cement	California Test 226	Roadway	1 per 1000 sq yd per layer, minimum 1 per day
Cement application rate	Calibrated tray or equal	Roadway	1 test per 20,000 sq ft, minimum 2 per day
Gradation on mixed material	California Test 202	Roadway	1 per 1000 sq yd per layer, minimum 1 per day
Moisture content of mixed material	California Test 226	Roadway	1 per 1000 sq yd per layer, minimum 1 per day
Moisture content of compacted material at time of relative compaction testing	California Test 231	Roadway	1 per 1000 sq yd per layer, minimum 1 per day
Relative compaction	California Test 231	Roadway	1 per 1000 sq yd per layer, minimum 1 per day

24-3.02 MATERIALS

Cement must comply with section 90-2.01A, Type II or Type V portland cement.

24-3.03 CONSTRUCTION

24-3.03A General

Remove standing water from the basement material.

Apply cement at air temperatures above 40 degrees F and rising. Do not apply cement to frozen basement material.

During compaction and finish grading, add water to the surface to prevent drying until the next layer of mixed material is placed, or until you apply curing treatment.

Do not scarify surfaces of intermediate or final layers of CSS.

24-3.03B Applying Cement

Apply cement uniformly over the area to be stabilized using a vane spreader.

Do not apply dry cement in windy conditions that will result in dust outside the treatment area.

24-3.03C Mixing

You may mix cement and the basement material off the job site.

Complete initial mixing work within 30 minutes of the application of cement.

After mixing, maintain the in-place moisture of the basement material to be stabilized within a range of 1 percent below to 2 percent above the optimum moisture.

Before compaction, the CSS, except rock, must within the percentage passing limits for the sieve sizes shown in the following table:

Sieve sizes	Percentage passing
2"	100
3/4"	98-100
No. 4	55-100

24-3.03D Compaction

Complete initial compaction of a layer within 2 hours of initial mixing of cement.

Complete all compaction of a layer within 4 hours of mixing of cement.

Compact the CSS to at least 97 percent relative compaction.

24-3.03E Finish Grading

Maintain the moisture content of the CSS to within a range of 1 percent below and 2 percent above the optimum moisture content through the entire finish grading operation.

Finish rolling of trimmed surfaces must be performed within 2 hours of completion of compacting.

The finished surface of the CSS must not vary more than 0.05 foot above or below the grade established by the Engineer unless the CSS is to be covered by material paid for by the cubic yard, in which case the finished surface may not vary above the grade established by the Engineer.

Fill areas of finished CSS that are lower than the grade established by the Engineer with material specified for the subsequent layer.

24-3.03F Curing

24-3.03F(1) General

Choose the method of curing and apply the chosen cure method on the same day as completing compaction and any trimming and finish grading.

Do not trim CSS after curing.

24-3.03F(2) Subsequent Pavement Layer

For CSS you may cure by placing a subsequent pavement layer over the finished CSS.

You may place subsequent pavement layers any time after finish grading if the CSS is sufficiently stable to support the required construction equipment without marring or permanently distorting the surface.

24-3.04 PAYMENT

The Department does not adjust the unit price for an increase or decrease in cement quantity.

The Department does not pay for subsequent layer material used to fill low areas of cement stabilized soil.

QC Testing Frequencies

Quality characteristic	Test method	Sampling location	Minimum frequency
R-value	California Test 301	Stockpiles, transportation units, windrows, or roadways	1 test before beginning work and every 2000 cu yd thereafter ^a
Aggregate gradation	California Test 202	Stockpiles, transportation units, windrows, or roadways	1 per 500 cu yd but at least one per day of placement
Sand equivalent	California Test 217	Stockpiles, transportation units, windrows, or roadways	
Relative compaction	California Test 231	Roadway	1 per 500 sq yd on each layer

^aAdditional R-value frequency testing will not be required when the average of 4 consecutive sand equivalent tests is 4 or more above the specified operating range value.

Add between the 2nd and 3rd paragraphs of section 25-1.01D(3):

07-15-16

The Engineer takes aggregate subbase samples for R-value, aggregate gradation, and sand equivalent from any of the following locations:

1. Windrow
2. Roadway

07-15-16

Delete for each noncompliant test result in the 4th paragraph of section 25-1.01D(3).

07-15-16

Delete *a* in the 5th paragraph of section 25-1.01D(3).

Add to the end of section 25:

07-21-17

25-2-25-10 RESERVED

^^

26 AGGREGATE BASES

07-21-17

Add to the beginning of section 26:

07-21-17

26-1 GENERAL

Replace *Reserved* in section 26-1.01C with:

07-15-16

Submit an aggregate base QC plan.

Replace *Reserved* in section 26-1.01D(1) with:

07-15-16

Aggregate samples must not be treated with lime, cement, or chemicals before testing for durability index. Aggregate from untreated reclaimed processed AC, PCC, LCB, or CTB is not considered treated.

Replace *Reserved* in section 26-1.01D(2) with:

07-15-16

26-1.01D(2)(a) General

Reserved

26-1.01D(2)(b) Quality Control Plan

Reserved

26-1.01D(2)(c) Qualifications

Reserved

26-1.01D(2)(d) Quality Control Testing

AB quality control must include testing the quality characteristics at the frequencies shown in the following table:

QC Testing Frequencies

Quality characteristic	Test method	Sampling location	Minimum frequency
R-value	California Test 301	Stockpiles, transportation units, windrows, or roadways	1 test before starting work and every 2,000 cu yd thereafter ^a
Aggregate gradation	California Test 202	Stockpiles, transportation units, windrows, or roadways	1 per 500 cu yd but at least one per day of placement
Sand equivalent	California Test 217	Stockpiles, transportation units, windrows, or roadways	
Durability index ^b	California Test 229	Stockpiles, transportation units, windrows, or roadways	1 per project
Relative compaction	California Test 231	Roadway	1 per 500 sq yd on each layer

^aAdditional R-value frequency testing will not be required when the average of 4 consecutive sand equivalent tests is 29 or greater for Class 2 AB or 25 or greater for Class 3 AB.

^bApplies if section 26-1.02 contains an applicable requirement for durability index

Add between *requirements*, and *and* in the 1st paragraph of section 26-1.01D(3):

07-15-16

durability,

Add between the 2nd and 3rd paragraphs of section 26-1.01D(3):

07-15-16

The Engineer takes aggregate base samples for R-value, aggregate gradation, sand equivalent, and durability index from any of the following locations:

1. Windrow
2. Roadway

07-15-16

Delete the 3rd paragraph of section 26-1.01D(3).

Add to the end of section 26:

07-21-17

26-2-26-10 RESERVED

27-1.01D(1)(b) Road-Mixed Cement Treated Base Moisture Content

Just before initial compaction the moisture content of the completed mixture must be at least the optimum moisture content less 1 percent. The moisture content is determined under California Test 226 and optimum moisture content is determined under California Test 312.

27-1.01D(1)(c) Plant-Mixed Cement Treated Base Moisture Content

At the point of delivery to the work, the moisture content of the completed mixture must be at least the optimum moisture content less 1 percent. The moisture content is determined under California Test 226 and optimum moisture content under California Test 312.

27-1.01D(2) Quality Control

27-1.01D(2)(a) General

Reserved

27-1.01D(2)(b) Quality Control Plan

Reserved

27-1.01D(2)(c) Qualifications

Reserved

27-1.01D(2)(d) Quality Control Testing

CTB quality control must include testing the quality characteristics at the frequencies shown in the following table:

QC Testing Frequencies

Quality characteristic	Test method	Sampling location	Minimum frequency
Aggregate gradation	California Test 202 modified	Stockpiles, plant, transportation units, windrow, or roadway	1 per 500 cu yd but at least one per day of placement
Sand equivalent	California Test 217	Stockpiles, plant, transportation units, windrow, or roadway	
R-value ^a	California Test 301	Stockpiles, plant, transportation units, windrows, or roadway	1 test before starting work and every 2000 cu yd thereafter ^b
Optimum moisture content	California Test 312	Plant, transportation units, windrow, or roadway	1 per day of placement
Moisture content	California Test 226	Roadway	1 per 500 cu yd but at least one per day of placement
Cement content	California Test 338	Windrows or roadway	1 per 1000 cu yd but at least one per day of placement
Relative compaction	California Test 312 or 231	Roadway	1 per 2000 sq yd but at least one per day of placement
Compressive strength ^c	California Test 312	Windrow or roadways	1 per day of placement

^aR-value is required for Class B CTB only

^bAdditional R-value frequency testing will not be required while the average of 4 consecutive sand equivalent tests is 4 or more above the specified operating range value.

^cCompressive strength is required for Class A CTB only when specified

27-1.01D(3) Department Acceptance

The Department's acceptance testing includes testing the CTB quality characteristics shown in the following table:

CTB Requirements for Acceptance

Quality characteristic	Test method
Aggregate gradation	California Test 202 modified
Sand equivalent	California Test 217
R-value ^a	California Test 301
Optimum moisture content	California Test 312
Moisture content	California Test 226
Cement content	California Test 338
Relative compaction	California Test 312 or 231
Compressive strength ^b	California Test 312

^aR-value is required for Class B CTB only

^bCompressive strength is required for Class A CTB only when specified

The Engineer takes samples for aggregate gradation and sand equivalent from any of the following locations:

1. Plant

28-1.01D(2)(b) Quality Control Plan

Reserved

28-1.01D(2)(c) Qualifications

Reserved

28-1.01D(3) Department Acceptance

Reserved

Add to section 28-2.01C(1):

07-15-16

Submit a lean concrete base QC plan.

Replace the headings and paragraphs in section 28-2.01D with:

07-15-16

28-2.01D Quality Assurance

28-2.01D(1) General

28-2.01D(1)(a) General

The molds for compressive strength testing under ASTM C31 or ASTM C192 must be 6 by 12 inches.

If the aggregate gradation test results, sand equivalent test results or both comply with the contract compliance requirements but not the operating range requirements, you may continue placing LCB for the remainder of the work day. Do not place additional LCB until you demonstrate the LCB to be placed complies with the operating range requirements.

28-2.01D(1)(b) Qualifications

Field qualification tests and calculations must be performed by an ACI certified "Concrete Laboratory Technician, Grade I.

28-2.01D(1)(c) Aggregate Qualification Testing

Qualify the aggregate for each proposed aggregate source and gradation. The qualification tests include (1) a sand equivalent and (2) an average 7-day compressive strength under ASTM C39 of 3 cylinders manufactured under ASTM C192 except cure cylinders in molds without lids after initial curing.

For the compressive strength test, the cement content for each cylinder must be 300 lb/cu yd. The 7-day average compressive strength must be at least 610 psi. The cement must be Type II portland cement.

LCB must have from 3 to 4 percent air content during aggregate qualification testing.

28-2.01D(1)(d) Field Qualification Testing

Before placing LCB, you must perform field qualification testing and obtain authorization for each mix design. Retest and obtain authorization for changes to the authorized mix designs.

Notify the Engineer at least 5 business days before field qualification. Perform the field qualification at the job site or an authorized location.

Field qualification testing includes tests for compressive strength, air content, and penetration or slump.

For compressive strength field qualification testing:

1. Prepare 12 cylinders under ASTM C31 except final cure cylinders in molds without lids from a single batch.
2. Perform 3 tests; each test consists of determining the average compressive strength of 2 cylinders at 7 days under ASTM C39. The average compressive strength for each test must be at least 530 psi

If you submitted a notice to produce LCB qualifying for a transverse contraction joint waiver, manufacture additional specimens and test the LCB for compressive strength at 3 days. Prepare the compressive

strength cylinders under ASTM C31 except final cure cylinders in molds without lids at the same time using the same material and procedures as the 7-day compressive strength cylinders except do not submit 6 additional test cylinders. The average 3-day compressive strength for each test must be not more than 500 psi.

28-2.01D(2) Quality Control

28-2.01D(2)(a) General

Reserved

28-2.01D(2)(b) Quality Control Manager

Reserved

28-2.01D(2)(c) Quality Control Testing

Test the LCB under the test methods and at the locations and frequencies shown in the following table:

LCB Sampling Location and Testing Frequencies

Quality characteristic	Test method	Sampling location	Minimum sampling and testing frequency
Sand equivalent	ASTM D2419	Source	1 per 500 cubic yards but at least 1 per day of production
Aggregate gradation	ASTM C136		
Air content	ASTM C231	Job site	
Penetration ^a	ASTM C360		
Slump ^a	ASTM C143		
Compressive strength	ASTM C39 ^b		

^aTest for either penetration or slump

^bPrepare cylinders under ASTM C31 except final cure cylinders in molds without lids.

28-2.01D(3) Department Acceptance

The Department accepts LCB based on compliance with the requirements shown in the following table:

LCB Requirements for Acceptance

Quality characteristic	Test method	Requirement
Compressive strength (min, psi at 7 days)	ASTM C39 ^a	530 ^b

^aCylinders prepared under ASTM C31 except final cure cylinders in molds without lids.

^bA compressive strength test represents up to (1) 1,000 cu yd or (2) 1 day's production if less than 1,000 cu yd.

Replace section 28-2.01D(4) in item 3 of the 5th paragraph in section 28-2.03D with:

07-15-16

section 28-2.01D(1)(c)

Replace the 1st paragraph in section 28-2.03F with:

07-15-16

After finishing LCB, cure LCB with pigmented curing compound under section 90-1.03B(3) and 40-1.03I. Apply curing compound:

1. In 2 separate applications
2. Before the atmospheric temperature falls below 40 degrees F

3. At a rate of 1 gal/150 sq ft for the first application
4. At a rate of 1 gal/200 sq ft for the second application

Replace *Reserved* in section 28-3.01C(3) with:

07-15-16

Submit a rapid strength concrete base QC plan.

Replace the headings and paragraphs in section 28-3.01D with:

07-15-16

28-3.01D Quality Assurance

28-3.01D(1) General

28-3.01D(1)(a) General

At the preconstruction meeting be prepared to discuss the project specifications and methods of performing each item of work. Items discussed must include the processes for:

1. Production
2. Transportation
3. Placement
4. QC plan, if specified in the special provisions
5. Contingency plan
6. QC sampling and testing
7. Acceptance criteria

Beams for modulus of rupture testing must be fabricated and tested under California Test 524. The beams may be fabricated using an internal vibrator under ASTM C31. For each test, 3 beam must be fabricated and the test results averaged. No single test represents more than that day's production or 130 cu yd, whichever is less.

For early age testing, beams must be cured so the monitored temperatures in the beams and the test strip are always within 5 degrees F. The internal temperatures of the RSC base and early age beams must be monitored and recorded at intervals of at least 5 minutes. Thermocouples or thermistors connected to strip-chart recorders or digital data loggers must be installed to monitor the temperatures. Temperature recording devices must be accurate to within ± 2 degrees F. Until early age testing is completed, internal temperatures must be measured at 1 inch from the top, 1 inch from the bottom, and no closer than 3 inches from any edge.

For other age testing, beams must be cured under California Test 524 except beams must be placed into sand at a time that is the earlier of either from 5 to 10 times the final set time, or 24 hours.

RSC base must have an opening age modulus of rupture of not less than 400 psi and a 7-day modulus of rupture of not less than 600 psi.

28-3.01D(1)(b) Preconstruction Meeting

Reserved

28-3.01D(1)(c) Test Strip

Reserved

28-3.01D(2) Quality Control

28-3.01D(2)(a) General

Reserved

28-3.01D(2)(b) Quality Control Manager

Reserved

28-3.01D(2)(c) Quality Control Testing

Test the rapid strength concrete base under the test methods and at the locations and frequencies shown in the following table:

Rapid Strength Concrete Base Sampling Location and Testing Frequencies

Quality characteristic	Test method	Sample Location	Minimum testing frequency ^a
Cleanness value	California Test 227	Source	1 per 500 cubic yards but at least 1 per shift
Sand equivalent	California Test 217		
Aggregate gradation	California Test 202		
Air content	California Test 504	Job site	1 per 130 cu yd but at least 1 per shift
Yield	California Test 518		1 per shift
Slump or penetration	ASTM C143 or California Test 533		1 per 2 hours of placement
Density	California Test 518		1 per shift
Aggregate moisture meter calibration ^b	California Test 223 or California Test 226		1 per shift
Modulus of rupture	California Test 524		1 per 130 cu yd but at least 1 per shift

^aTest at the most frequent interval.

^bCheck calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

Notify the Engineer at least 2 business days before any sampling and testing. Submit testing results within 15 minutes of testing completion. Record inspection, sampling, and testing on the forms accepted with the QC plan and submit them within 48 hours of completion of each day of production and within 24 hours of 7-day modulus of rupture tests.

During the placement of RSC base, fabricate beams and test for the modulus of rupture:

1. At opening age
2. At 7 days after placing the first 30 cu yd
3. At least once every 130 cu yd
4. Within the final truckload

Opening age tests must be performed in the presence of the Engineer.

28-3.01D(3) Department Acceptance

The Department accepts RSC base based on compliance with the requirements shown in the following table:

RSC Base Requirements for Acceptance

Quality characteristic	Test method	Requirement
Modulus of rupture (min, psi at 7 days)	California Test 524	600

The Engineer adjust payment for RSC base for the 7-day modulus of rupture as follows:

1. Payment for a base with a modulus of rupture of 600 psi or greater is not adjusted.

2. Payment for a base with a modulus of rupture of less than 600 and greater than or equal to 550 psi is reduced by 5 percent.
3. Payment for a base with a modulus of rupture of less than 550 and greater than or equal to 500 psi is reduced by 10 percent.
4. Payment for a base with a modulus of rupture of less than 500 psi is not adjusted and no payment is made. Remove and replace this base.

Add to section 28-4.01C(1):

07-15-16

Submit a lean concrete base rapid setting QC plan.

Replace the headings and paragraphs in section 28-4.01D with:

07-15-16

28-4.01D Quality Assurance

28-4.01D(1) General

28-4.01D(1)(a) General

For compressive strength testing, prepare 6 cylinders under California Test 540. Test cylinders must be 6 by 12 inches. As an alternative to rodding, a vibrator may be used under California Test 524. Test cylinders under California Test 521 and perform 3 tests with each test consisting of 2 cylinders. The test result is the average from the 2 cylinders.

28-4.01D(1)(b) Field Qualification

Before placing lean concrete base rapid setting, you must perform field qualification testing and obtain authorization for each mix design. Retest and obtain authorization for changes to authorized mixed designs.

Proposed mix designs must be field qualified before you place the base represented by those mix designs. The technician performing the field test must hold current ACI certification as a Concrete Field Testing Technician-Grade I.

Notify the Engineer at least 5 days before field qualification. Perform field qualification within the job site or a location authorized.

Field qualification testing includes compressive strength, air content, and penetration or slump in compliance with the table titled "Lean Concrete Base Rapid Setting Requirements."

Field qualification must comply with the following:

1. Test for compressive strength at opening age and 7 days of age
2. At opening age, the compressive strength for each test must be at least 180 psi and the average strength for the 3 tests must be at least 200 psi
3. At 7 days age, the compressive strength for each test must be at least 600 psi and the average strength for the 3 tests must be at least 725 psi

28-4.01D(2) Quality Control

28-4.01D(2)(a) General

Reserved

28-4.01D(2)(b) Quality Control Manager

Reserved

28-4.01D(2)(c) Quality Control Testing

Test the base under the test methods and at the locations and frequencies shown in the following table:

LCB Rapid Setting Sampling Location and Testing Frequencies

Quality characteristic	Test method	Sampling location	Minimum sampling and testing frequency
Sand equivalent	ASTM D2419	Source	1 per 500 cu yd, minimum 1 per day of production
Aggregate gradation	ASTM C136		
Air content	ASTM C231	Job site	1 per 4 hours of placement work, plus one in the last hour of placement work
Penetration ^a	ASTM C360		
Slump ^a	ASTM C143		
Compressive strength	California Test 521		

^aTest either penetration or slump

During placement of lean concrete base rapid setting, fabricate cylinders and test compressive strength for opening age and 7 days. Opening age tests must be performed in the presence of the Engineer.

28-4.01D(3) Department Acceptance

The Department accepts LCB rapid setting based on compliance with the requirement shown in the following table:

LCB Rapid Setting Requirements for Acceptance

Quality characteristic	Test method	Requirement
Compressive strength (min, psi at 7 days)	California Test 521 ^a	725

^aCylinders made under California Test 540

Replace the 2nd and 3rd paragraphs in section 28-4.03A with:

07-15-16

Concrete paving operations with equipment not supported by the base may start before opening age. Do not open pavement for traffic before opening age of the LCB rapid setting.

Any other paving operations must start after the final set time of the base. The base must have a compressive strength of at least 450 psi under California Test 521 before:

1. Placing HMA
2. Placing other base material
3. Operating equipment on the base

Replace *Reserved* in section 28-5.01C with:

07-15-16

Submit a concrete base QC plan.

Replace the headings and paragraphs in section 28-5.01D(2) with:

07-15-16

28-5.01D(2) Quality Control**28-5.01D(2)(a) General**

Reserved

28-5.01D(2)(b) Quality Control Manager

Reserved

28-5.01D(2)(c) Quality Control Testing

Test the concrete base under the test methods and at the locations and frequencies shown in the following table:

Concrete Base Sampling Location and Testing Frequencies

Quality characteristic	Test method	Sample location	Minimum testing frequency ^a
Cleanness value	California Test 227	Source	1 per 500 cubic yards but at least 1 per shift
Sand equivalent	California Test 217		
Aggregate gradation	California Test 202		
Air content	California Test 504	Job site	1 per 500 cu yd but at least 1 per shift
Yield	California Test 518		1 per shift
Slump or penetration	ASTM C143 or California Test 533		1 per 2 hours of placement
Density	California Test 518		1 per shift
Aggregate moisture meter calibration ^b	California Test 223 or California Test 226		1 per shift
Modulus of rupture	California Test 524		1 per 500 cu yd but at least 1 per shift

^aTest at the most frequent interval.

^bCheck calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

28-5.01D(3) Department Acceptance

The Department accepts a concrete base based on compliance with the requirements shown in the following table:

Concrete Base Requirements for Acceptance

Quality characteristic	Test method	Requirement
Modulus of rupture (min, psi at 28 days)	California Test 523	570

Acceptance for the modulus of rupture is on a lot basis. The Department provides the molds and machines for the modulus of rupture acceptance testing. Provide any material and labor the Engineer may require for the testing.

^^

29 TREATED PERMEABLE BASES

07-15-16

Replace the headings and paragraphs in section 29-1.01 with:

07-15-16

29-1.01 GENERAL

29-1.01A Summary

Section 29-1 includes general specifications for constructing treated permeable bases.

29-1.01B Definitions

Reserved

29-1.01C Submittals

Submit a treated permeable base quality control plan.

29-1.01D Quality Assurance

29-1.01D(1) General

Reserved

29-1.01D(2) Quality Control

29-1.01D(2)(a) General

Reserved

29-1.01D(2)(b) Quality Control Plan

Reserved

29-1.01D(2)(c) Qualifications

Reserved

29-1.01D(3) Department Acceptance

Reserved

Replace the headings and paragraphs in section 29-2.01D with:

07-15-16

29-2.01D Quality Assurance

29-2.01D(1) General

The Engineer determines the asphalt content of the asphalt mixture under California Test 382. The bitumen ratio, pounds of asphalt per 100 lb of dry aggregate, must not vary more than 0.5 lb of asphalt above or below the quantity designated by the Engineer. Samples used to determine the bitumen ratio are obtained from trucks at the plant or from the mat behind the paver before rolling. If the sample is taken from the mat behind the paver, the bitumen ratio must not be less than the quantity designated by the Engineer, less 0.7 lb of asphalt per 100 lb of dry aggregate.

29-2.01D(2) Quality Control

29-2.01D(2)(a) General

Reserved

29-2.01D(2)(b) Quality Control Testing

ATPB quality control must include testing the quality characteristics at the frequencies shown in the following table:

QC Testing Frequencies

Quality characteristic	Test method	Sampling location	Minimum frequency
Gradation	California Test 202	Stockpiles or plant	1 for every 4 hours of production but at least one per day of placement
Cleanness value	California Test 227	Stockpiles or plant	1 for every 4 hours of production but at least one per day
Percentage of crushed particles	California Test 205	Stockpiles or plant	1 test before production and one every 5,000 cu yd thereafter
Los Angeles rattler loss at 500 rev	California Test 211	Stockpiles or plant	1 test before production and one every 5,000 cu yd thereafter
Film stripping	California Test 302	Plant	1 test before production and one every 5000 cu yd thereafter
Asphalt content of the asphalt mixture	California Test 382	Plant, transportation units, windrows, or roadway	1 for every 4 hours of production but at least one per day

29-2.01D(3) Department Acceptance

The Department accepts ATPB based on aggregate gradation, cleanness value, percent of crushed particles, Los Angeles rattler, film stripping and asphalt content requirements specified in section 29-2.02 and section 29-2.01D(1).

The Engineer takes samples for aggregate gradation, cleanness value, percent of crushed particles, Los Angeles rattler, and film stripping from the plant.

The Engineer takes samples for asphalt content of the asphalt mixture from any of the following locations:

1. Plant
2. Truck
3. Windrow
4. Roadbed

Replace the headings and paragraphs in section 29-3.01 with:

07-15-16

29-3.01 GENERAL

29-3.01A Summary

Section 29-3 includes specifications for constructing cement treated permeable bases.

29-3.01B Definitions

Reserved

29-3.01C Submittals

Reserved

30 RECLAIMED PAVEMENT

07-15-16

Replace *section 30-1.01C(2)(c)* in the 1st paragraph of section 30-3.01C(2)(c) with:

07-15-16

section 30-1.01C(3)(c)

Replace the table in section 30-3.02A with:

07-15-16

FDR—Foamed Asphalt Quality Characteristic Requirements

Quality characteristic	Test method	Requirement
Moisture content before HMA paving	California Test 226	< 50% of OMC
Asphalt binder expansion ratio (min, %)	Note a	10
Asphalt binder half-life (seconds, min)		12
Gradation (% passing)	California Test 202	
Sieve Size:		
3 inch		100
2 inch		95-100
1-1/2 inch		85-100
Moisture content	California Test 226	
Maximum		OMC
Minimum		OMC - 2%
In-place wet density (lb/cu ft)	California Test 216	Report only
Relative compaction (min, %)	California Test 231	98
Indirect dry tensile strength (psi) ^b	California Test 371	90% of mix design value
Indirect wet tensile strength (psi) ^b	California Test 371	90% of mix design value
Tensile strength ratio (%)	California Test 371	90% of mix design value

^aTest at the foaming temperature and percentage of foaming water by dry weight of FDR—foamed asphalt material designated in the mix design. To test asphalt binder expansion ratio and half-life, use a pail of known volume and a dipstick calibrated for the pail. From the inspection nozzle on the asphalt binder spray bar, inject foamed asphalt into the pail without exceeding the pail's capacity. With the dipstick, immediately measure and record the level of foamed asphalt in the pail. Record the half-life in seconds from the time the injection of foamed asphalt in the pail is turned off to half the dip stick reading after peak. Calculate the expansion ratio as the volume of the foamed asphalt upon injection divided by the volume of the unfoamed asphalt binder.

^bFrom material passing the 1-inch sieve, compact 6 specimens under California Test 304, Part 2. Cure the specimens at 100 °F for 72 hours and allow the specimens to cool to room temperature. Test 3 specimens for dry tensile strength under California Test 371. Test 3 specimens for wet tensile strength under California Test 371 after moisture conditioning.

Replace section 30-4.01D(3) in the 2nd paragraph of section 30-4.01D(1) with:

07-15-16

section 30-4.01D(4)

Within 2 business days after each day of profiling, submit the profile information to the Engineer and to the Department's secure file sharing system. After submitting the profile information to the Department's file sharing system, send a notification of your electronic submittal to the Engineer and to the above electronic mailbox address with the names of the files submitted.

For each surface with inertial profile smoothness requirements, the profiling information must include:

1. Raw profile data for each lane
2. ProVAL ride quality analysis report for the Mean Roughness Index of each lane in a PDF file. Report the following:
 - 2.1. Listing of Mean Roughness Index values for 0.1-mile segments or portions thereof
 - 2.2. Inputs, including the specified Mean Roughness Index threshold and fixed segment length
 - 2.3. Raw profile data name selections
 - 2.4. Areas exempt from inertial profile smoothness
3. ProVAL ride quality analysis report for the International Roughness Index of the left and right wheel paths of each lane in a PDF file. Report the following:
 - 3.1. Listing of areas of localized roughness
 - 3.2. Inputs, including the specified area of the localized roughness threshold and continuous segment length
 - 3.3. Raw profile data name selections
 - 3.4. Areas exempt from inertial profile smoothness
4. GPS data file for each lane. Submit the data file in GPS eXchange file format.
5. Manufacturer's recommended calibration and verification test results for the inertial profiler.
6. Inertial profiler's calibration and verification test results, including results for bounce, block, and the distance measurement instrument.
7. Completed Pavement Smoothness Inertial Profiler Submittal Record.

Submit Asphalt Concrete Pavement Smoothness Corrections Information or Concrete Pavement Smoothness Corrections Information with your final profiling information submittal.

Submit the raw profile data in an unfiltered electronic pavement profile file format. Use the following file-naming convention:

YYYYMMDD_TTCCRRR_EA_D_L_W_B_E_X_PT.PPF

where:

YYYY = year

MM = month, leading zero

DD = day of month, leading zero

TT = district, leading zero

CCC = county, 2- or 3-letter abbreviation as shown in section 1-1.08

RRR = route number with no leading zeros

EA = Contract number, excluding the district identification number, expressed as 6 characters

D = traffic direction, *NB*, *SB*, *WB*, or *EB*

L = lane number from left to right in the direction of travel

W = wheel path, *L* for left, *R* for right, or *B* for both

B = beginning station to the nearest foot, such as 10+20, or beginning post mile to the nearest hundredth, such as 25.06 with no leading zero

E = ending station to the nearest foot, such as 14+20, or ending post mile to the nearest hundredth, such as 28.06 with no leading zero

X = profile operation, *EXIST* for existing pavement, *INTER* for after prepaving smoothness correction, *MILL* for after milling, *PAVE* for after paving, and *CORR* for after final surface pavement correction, and *FINAL* for completed pavement documentation of compliance.

PT = type of pavement surface profiled, such as Type A HMA, RHMA-G, OGFC, JPCP, or CRCP

If you are submitting multiple inertial profiler data files, compress the files into a .ZIP file format and submit them using the file-naming convention TT_EA_X_YYYYMMDD.zip.

07-21-17

36-3.01C(3)(b) Smoothness Corrective Grinding Plan

At least 2 business days before performing corrective grinding for areas of localized roughness or areas exceeding the specified thresholds for the Mean Roughness Index, submit a corrective grinding plan as an informational submittal.

The corrective grinding plan must include:

1. Grinder manufacturer make and model
2. Grinder wheelbase in feet, measured from the front centerline to the back centerline of the single wheel or tandem wheel spread
3. Grinder head position in feet, measured relative to the centerline of the front single wheel or the front tandem wheel spread
4. Tandem wheel spreads in feet, for rear and front wheels as applicable
5. Tabular listing of the planned corrective grinding, including:
 - 5.1. Start and stop locations in stationing to the nearest foot
 - 5.2. Width of grind, such as left half lane, right half lane, or full width lane
 - 5.3. Corresponding grinder head depths to the nearest 0.01 inch
 - 5.4. Direction of grind, up to 2 passes per grind location, such as forward, reverse, forward-forward, reverse-reverse, forward-reverse, reverse-forward
 - 5.5. Distance from start or stop locations to the nearest semipermanent reference point
6. Forecasted improvement in terms of the Mean Roughness Index and area of localized roughness values

36-3.01C(4) Straightedge Measurements

Within 2 business days of measuring smoothness with a straightedge, submit a list of the areas requiring smoothness correction or a report stating there are no areas requiring smoothness correction. Identify the areas requiring smoothness correction by:

1. Location number
2. District-County-Route
3. Beginning station or post mile to the nearest 0.01 mile
4. For correction areas within a traffic lane:
 - 4.1. Lane direction, *NB*, *SB*, *EB*, or *WB*
 - 4.2. Lane number from left to right in the direction of travel
 - 4.3. Wheel path, *L* for left, *R* for right, or *B* for both
5. For correction areas not within a traffic lane:
 - 5.1. Identify the pavement area, such as shoulder, weigh station, or turnout

- 5.2. Direction and distance from the centerline, *L* for left or *R* for right
6. Estimated size of correction area

36-3.01D Quality Assurance

36-3.01D(1) General

Reserved

36-3.01D(2) Certifications

The inertial profiler must display a current certification decal showing the expiration date.

The operator must be certified for each model of inertial profiler operated.

The certifications issued by the Department for the inertial profiler and operator must not be more than 12 months old.

36-3.01D(3) Quality Control

36-3.01D(3)(a) General

Reserved

36-3.01D(3)(b) Smoothness

36-3.01D(3)(b)(i) General

Test pavement smoothness using an inertial profiler except use a 12-foot straightedge for the pavement at:

1. Traffic lanes less than 1,000 feet in length, including ramps, turn lanes, and acceleration and deceleration lanes
2. Horizontal curves with a centerline radius less than the following and within the superelevation transition of such curves:
 - 2.1. 150 feet for asphalt concrete pavements
 - 2.2. 300 feet for Portland cement concrete pavements
3. Areas within 12.5 feet of manholes
4. Shoulders
5. Weigh-in-motion areas
6. Miscellaneous areas such as medians, gore areas, turnouts, and maintenance pullouts

Where inertial profiler testing is required:

1. Determine the pavement smoothness for each traffic lane by obtaining the International Roughness Index for the left and right wheel paths in an individual lane
2. Determine the Mean Roughness Index and areas of localized roughness using FHWA's engineering software ProVAL

Where OGFC is required, test the pavement smoothness of the final HMA or concrete pavement surface before placing OGFC and after placing OGFC.

36-3.01D(3)(b)(ii) Inertial Profiler Calibration and Verification Tests

Notify the Engineer at least 2 business days before performing calibration and verification testing of the inertial profiler.

Conduct the following calibration and verification tests in the Engineer's presence each day before profiling:

1. Block test to verify the accuracy of the height sensor under California Test 387

2. Bounce test to verify the combined accuracy of the height sensor and accelerometer under California Test 387
3. Distance measurement instrument test to verify the accuracy of the distance measuring instrument under California Test 387
4. Manufacturer's recommended tests

Conduct a cross-correlation verification test of the inertial profiler in the Engineer's presence before performing the initial profiling. A verification test must be performed at least annually. Conduct 5 repeat runs of the inertial profiler on an authorized test section. The test section must be a 0.1-mile segment of existing concrete pavement if you are measuring new concrete pavement or existing asphalt concrete pavement if you are measuring new asphalt concrete pavement. Where micro-milled asphalt concrete surfaces are to be measured, the cross-correlation verification test may be performed on the initial 0.1-mile section of milled asphalt concrete surface. Calculate a cross-correlation to determine the repeatability of your device under California Test 387 using a ProVAL profiler certification analysis with a 3-foot maximum offset. The cross-correlation must be a minimum of 0.92.

36-3.01D(3)(b)(iii) Performing, Analyzing, and Collecting Data

Operate the inertial profiler under the manufacturer's instructions and AASHTO R 57 at 1-inch recording intervals using a minimum 4-inch line laser sensor.

Establish semipermanent reference points for aligning inertial profiler runs and locating potential corrective grinding. Place semipermanent reference points at a frequency of 0.5 mile or less along the edge of the traffic lane or roadway. Maintain semipermanent reference points until Department acceptance testing is completed.

Collect profiling data under AASHTO R 57 and analyze it using 250 mm and International Roughness Index filters.

While collecting the profile data to determine the International Roughness Index values, record semipermanent reference points and the beginning and end of the following locations in the raw profile data:

1. Bridge approach slabs
2. Bridges
3. Culverts visible on the roadway surface
4. Railroad crossings
5. At-grade intersections
6. Project limits
7. Change in pavement type

Profile the left and right wheel paths of each lane.

Determine the Mean Roughness Index for 0.1-mile fixed sections using the ProVAL ride quality analysis with a 250 mm filter. Calculate the Mean Roughness Index of each lane. A partial section equal or less than 0.05-mile length is to be included with the previous or the subsequent segment forming up to a 0.15-mile length. A partial section greater than 0.05 mile, but less than 0.10 mile, is a separate segment. Sections must comply with the Mean Roughness Index specifications for a full section. A weighted average calculation will be used for those partial sections that have been combined with previous or subsequent segments.

Determine the areas of localized roughness using ProVAL with the average International Roughness Index values for each wheel path using a 25-foot continuous interval and a 250 mm filter.

36-3.01D(4) Department Acceptance

The Department accepts pavement surfaces for smoothness based on compliance with the smoothness specifications for the type of pavement surface specified.

For areas that require pavement smoothness determined using a 12-foot straightedge, the pavement surface must not vary from the lower edge of the straightedge by more than:

- 1. 0.01 foot when the straightedge is laid parallel with the centerline
- 2. 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane
- 3. 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

Pavement located within 12.5 feet of the ends of bridges, approach slabs, culverts visible on the roadway surface, railroad crossings, at-grade intersections, and transverse surface joints with existing pavement must comply with Mean Roughness Index and 12-foot straightedge requirements. The requirements for areas of localized roughness do not apply to these areas.

For each 0.1-mile section, your International Roughness Index values must be within 10 percent of the Department's International Roughness Index values. The Engineer may order you to recalibrate your inertial profiler equipment and reprofile. If your results are inaccurate due to operator error, the Engineer may disqualify your inertial profiler operator.

36-3.02 MATERIALS

Not Used

36-3.03 CONSTRUCTION

Notify the Engineer of the start location by station and start time at least 2 business days before each day of profiling.

Before profiling, remove foreign objects from the pavement surface and mark the beginning and ending station on the pavement shoulder. The stationing must be the same when profiling more than one surface.

36-3.04 PAYMENT

Not Used

^^

37 BITUMINOUS SEALS

01-20-17

Replace section 37 with:

07-15-16

37 SEAL COATS

37-1 GENERAL

37-1.01 GENERAL

37-1.01A Summary

Section 37-1 includes general specifications for applying seal coats.

37-1.01B Definitions

Reserved

37-1.01C Submittals

At least 10 days before the preconstruction meeting submit a list of participants in the preconstruction meeting. Provide each participant's name, employer, title, and role in the production and placement of the seal coats.

At least 10 days before starting seal coat activities, submit the names of the authorized laboratories for quality control testing.

For each delivery of asphalt binder or asphaltic emulsion to the job site, submit a certificate of compliance and a copy of the specified test results.

For a seal coat that uses crumb rubber modifier, submit a Crumb Rubber Usage Report form monthly and at the end of project.

37-1.01D Quality Assurance

37-1.01D(1) General

For aggregate testing, quality control laboratories must be in compliance with the Department's Independent Assurance Program to be an authorized laboratory. Quality control personnel must be qualified under the Department's Independent Assurance Program.

01-20-17

For emulsion testing, quality control laboratories must participate in the AASHTO re:source proficiency sample program.

07-15-16

37-1.01D(2) Preconstruction Meeting

Hold a preconstruction meeting within 5 days before start of seal coat work at a mutually agreed time and place with the Engineer and your:

1. Project superintendent
2. Project foreman
3. Traffic control foreman

Make arrangements for the conference facility. Preconstruction meeting participants must sign an attendance sheet provided by the Engineer. Be prepared to discuss:

1. Quality control testing
2. Acceptance testing
3. Seal coat placement
4. Proposed application rates for asphaltic emulsion or asphalt binder and aggregate.
5. Training on placement methods
6. Checklist of items for proper placement
7. Unique issues specific to the project, including:
 - 7.1. Weather
 - 7.2. Alignment and geometrics
 - 7.3. Traffic control requirements
 - 7.4. Haul distances
 - 7.5. Presence and absence of shaded areas
 - 7.6. Any other local conditions
8. Contingency plan for material deliveries, equipment breakdowns, and traffic handling

9. Who in the field has authority to adjust application rates and how adjustments will be documented
10. Schedule of sweepings

37-1.02 MATERIALS

Not Used

37-1.03 CONSTRUCTION

37-1.03A General

If seal coat activities affect access to public parking, residential property, or commercial property, post signs at 100-foot intervals on the affected streets. Signs must display *No Parking – Tow Away*. Signs must state the dates and hours parking or access will be restricted. Notify residents, businesses, and local agencies at least 24 hours before starting activities. The notice must:

1. Describe the work to be performed
2. Detail streets and limits of activities
3. Indicate dates and work hours
4. Be authorized

Asphaltic emulsion or asphalt binder for seal coats may be reheated if necessary. After loading the asphaltic emulsion or asphalt binder into a truck for transport to the job site, do not heat asphaltic emulsion above 160 degrees F and asphalt rubber binder above 425 degrees F. During reheating, circulate or agitate the asphaltic emulsion or asphalt binder to prevent localized overheating.

Except for fog seals, apply quick setting Grade 1 asphaltic emulsions at a temperature from 75 to 130 degrees F and apply quick setting Grade 2 asphaltic emulsions at a temperature from 110 to 185 degrees F.

You determine the application rates for asphaltic emulsion or asphalt binder and aggregate and the Engineer authorizes the application rates.

37-1.03B Equipment

A self-propelled distributor truck for applying asphaltic emulsion or asphalt binder must be equipped with:

1. Pressure-type system with insulated tanks with circulating unit
2. Spray bars:
 - 2.1. With minimum length of 9 feet and full-circulating type
 - 2.2. With full-circulating-type extensions if needed to cover a greater width
 - 2.3. Adjustable to allow positioning at various heights above the surface to be treated
 - 2.4. Operated by levers such that 1 or all valves may be quickly opened or closed in one operation
3. Devices and charts to provide for accurate and rapid determination and control of asphaltic emulsion or asphalt binder quantities being applied. Include an auxiliary wheel type meter that registers:
 - 3.1. Speed in ft/min
 - 3.2. Trip by count
 - 3.3. Total distance in feet
4. Distribution system:
 - 4.1. Capable of producing a uniform application of asphaltic emulsion or asphalt binder in controlled quantities ranging from 0.02 to 1 gal/sq yd of surface and at a pressure ranging from 25 to 75 psi
 - 4.2. Pumps that spray asphaltic emulsion or asphalt binder within 0.02 gal/sq yd of the set rate
 - 4.3. With a hose and nozzle for application of asphaltic emulsion to areas inaccessible to the spray bar

- 4.4. With pressure gauges and a thermometer for determining temperatures of the asphaltic emulsion or asphalt binder

You may use cab-controlled valves for the application of asphaltic emulsion or asphalt binder. The valves controlling the flow from nozzles must act positively to provide a uniform unbroken application of asphaltic emulsion or asphalt binder.

Maintain distributor and storage tanks at all times to prevent dripping.

37-1.04 PAYMENT

Not Used

37-2 CHIP SEALS

37-2.01 GENERAL

37-2.01A General

37-2.01A(1) Summary

Section 37-2.01 includes general specifications for applying chip seals.

37-2.01A(2) Definitions

Reserved

37-2.01A(3) Submittals

At least 15 days before starting placement of chip seal, submit:

1. Samples for:
 - 1.1. Asphaltic emulsion chip seal, two 1-quart wide mouth plastic containers with screw top lid of asphaltic emulsion
 - 1.2. Polymer modified asphaltic emulsion chip seal, two 1-quart wide mouth plastic containers with screw top lid of polymer modified asphaltic emulsion
 - 1.3. Asphalt rubber binder chip seal, two 1-quart cans of base asphalt binder
 - 1.4. Asphalt rubber binder chip seal, five 1-quart cans of asphalt rubber binder
2. Asphaltic emulsion, polymer modified asphaltic emulsion, asphalt binder or asphalt rubber binder data as follows:
 - 2.1. Supplier and Type/Grade of asphaltic emulsion or asphalt binder
 - 2.2. Type of modifier used including polymer or crumb rubber or both
 - 2.3. Percent of crumb rubber, if used as modifier
 - 2.4. Copy of the specified test results for asphaltic emulsion or asphalt binder
3. 50 lb of uncoated aggregate
4. Aggregate test results for the following:
 - 4.1. Gradation
 - 4.2. Los Angeles Rattler
 - 4.3. Percent of crushed particles
 - 4.4. Flat and elongated particles
 - 4.5. Film stripping
 - 4.6. Cleanness value
 - 4.7. Durability
5. Vialit test results

Submit quality control test results for the quality characteristics within the reporting times allowance after sampling shown in the following table:

Quality Control Test Result Reporting

Quality characteristic	Maximum reporting time allowance
Los Angeles Rattler loss (max, %)	48 hours
Percent of crushed particles (min, %)	48 hours
Flat and elongated particles (max by weight at 3:1, %)	48 hours
Film stripping (max, %)	48 hours
Durability (min)	48 hours
Gradation (percentage passing)	24 hours
Cleanness value (min)	24 hours
Asphaltic emulsion spread rate (gal/sq yd)	24 hours

Within 3 days after taking asphaltic emulsion or asphalt binder quality control samples, submit the authorized laboratory's test results.

37-2.01A(4) Quality Assurance

37-2.01A(4)(a) General

Reserved

37-2.01A(4)(b) Quality Control

37-2.01A(4)(b)(i) General

Reserved

37-2.01A(4)(b)(ii) Aggregate

All tests must be performed on uncoated aggregate except for film stripping which must be performed on precoated aggregate.

For aggregate, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Aggregate Quality Control Requirements

Quality characteristic	Test method	Minimum sampling and testing frequency	Location of sampling
Los Angeles Rattler loss (max, %) At 100 revolutions At 500 revolutions	California Test 211	1st day of production	See California Test 125
Percent of crushed particles Coarse aggregate (min, %) One-fractured face Two-fractured faces Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve) One fractured face	AASHTO T 335	1st day of production	See California Test 125
Flat and elongated particles (max by weight at 3:1, %)	ASTM D4791	1st day of production	See California Test 125
Film stripping (max, %)	California Test 302	1st day of production	See California Test 125
Durability (min)	California Test 229	1st day of production	See California Test 125
Gradation (% passing)	California Test 202	2 per day	See California Test 125
Cleanness value (min)	California Test 227	2 per day	See California Test 125

37-2.01A(4)(b)(iii) Chip Seals

For a chip seal, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Chip Seal Quality Control Requirements

Quality characteristic	Test method	Minimum sampling and testing frequency	Location of sampling
Asphaltic emulsion binder spread rate (gal/sq yd)	California Test 339	1 per day per distributor truck	Pavement surface

37-2.01A(4)(c) Department Acceptance

Department Acceptance shall not apply to identified areas where the existing surfacing before application of chip seal, contains defective areas as determined by the Engineer and Contractor. At least 7 days before starting placement of the chip seal, the Contractor shall submit a written list of existing defective areas, identifying the lane direction, lane number, starting and ending highway post mile locations, and defect type. The Engineer must agree on which of the identified areas are defective.

Defective areas are defined as one of the following:

1. Areas with wheel path rutting in excess of 3/8 inch when measured by placing a straightedge 12 feet long on the finished surface perpendicular to the center line and measuring the vertical distance between the finished surface and the lower edge of the straightedge
2. Areas exhibiting flushing

For a chip seal, acceptance is based on visual inspection for the following:

1. Uniform surface texture
2. Raveling, which consists of the separation of the aggregate from the asphaltic emulsion or asphalt binder
3. Flushing, which consists of the occurrence of a film of asphaltic material on the surface of the chip seal.
4. Streaking, which consists of alternating longitudinal bands of asphaltic emulsion or asphalt binder without uniform aggregate retention, approximately parallel with the lane line.

Areas of raveling, flushing or streaking that are greater than 0.5 sq ft shall be considered defective and must be repaired.

Raveling and streaking must be repaired by placing an additional layer of chip seal over the defective area.

For asphaltic emulsion or asphalt binder, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics specified.

For aggregate, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Chip Seal Aggregate Acceptance Criteria

Quality characteristic	Test method	Requirements
Los Angeles Rattler loss (max, %)		
At 100 revolutions	California Test 211	10
At 500 revolutions		40
Percent of crushed particles:	AASHTO T 335	
Coarse aggregate (min, %)		
One-fractured face		95
Two-fractured faces		90
Fine aggregate (min, %)		
(Passing No. 4 sieve and retained on No. 8 sieve)		
One fractured face		70
Flat and elongated particles (max by weight at 3:1, %)	ASTM D4791	10
Film stripping (max, %)	California Test 302	25
Durability (min)	California Test 229	52
Gradation (% passing by weight)	California Test 202	Aggregate Gradation table shown under Materials for the chip seal type specified.
Cleanness value (min)	California Test 227	80

If test results for the aggregate gradation do not comply with specifications, you may remove the chip seal represented by these tests or request that it remain in place with a payment deduction. The deduction is \$1.75 per ton for the aggregate represented by the test results.

If test results for aggregate cleanness value do not comply with the specifications, you may remove the chip seal represented by these tests or you may request that the chip seal remain in place with a payment deduction corresponding to the cleanness value shown in the following table:

Chip Seal Cleanness Value Deductions

Cleanness value	Deduction
80 or over	None
79	\$2.00 /ton
77-78	\$4.00 /ton
75-76	\$6.00 /ton

If the aggregate cleanness value is less than 75, remove the chip seal.

37-2.01B Materials

37-2.01B(1) General

Reserved

37-2.01B(2) Asphaltic Emulsions and Asphalt Binders

Reserved

37-2.01B(3) Aggregate

37-2.01B(3)(a) General

Aggregate must be broken stone, crushed gravel, or both.

Aggregate must comply with the requirements shown in the following table:

Chip Seal Aggregate Requirements

Quality characteristic	Test method	Requirements
Los Angeles Rattler loss (max, %) At 100 revolutions At 500 revolutions	California Test 211	10 40
Percent of crushed particles Coarse aggregate (min, %) One-fractured face Two-fractured faces Fine aggregate (min, %) (Passing No. 4 sieve and retained on No. 8 sieve) One fractured face	AASHTO T 335	95 90 70
Flat and elongated particles (max by weight at 3:1, %)	ASTM D4791	10
Film stripping (max, %)	California Test 302	25
Durability (min)	California Test 229	52
Gradation (% passing by weight)	California Test 202	Aggregate Gradation table shown under Materials for the chip seal type specified.
Cleanness value (min)	California Test 227	80

The authorized laboratory must conduct the Vialit test using the proposed asphaltic emulsion or asphalt binder and aggregate for compliance with the requirements shown in the following table:

Chip Retention Requirements

Quality characteristic	Test method	Requirement
Chip retention (%)	Vialit test method for aggregate in chip seals, French chip (Modified) ^a	95

^aThe asphaltic emulsion or asphalt binder must be within the field placement temperature range and application rate during specimen preparation. For asphalt binder cure the specimen for first 2 hours at 100 °F.

37-2.01B(3)(b) Precoated Aggregate

Precoating of aggregate must be performed at a central mixing plant. The plant must be authorized under the Department's *MPQP*.

When precoating aggregate, do not recombine fine materials collected in dust control systems.

Precoated aggregate must be preheated from 260 to 325 degrees F. Coat with any of the asphalts specified in the table titled "Performance Graded Asphalt Binder" in section 92. The asphalt must be from 0.5 to 1.0 percent by weight of dry aggregate. You determine the exact asphalt rate for precoating of aggregate.

Do not stockpile precoated aggregate.

37-2.01C Construction

37-2.01C(1) General

For chip seals on 2-lane, 2-way roadways, place a W8-7 (LOOSE GRAVEL) sign and a W13-1 (35) plaque at 2,000-foot maximum intervals along each side of the traveled way where aggregate is spread on a traffic lane and at public roads or streets entering the chip seal area. Place the 1st W8-7 sign in each direction where traffic first encounters the loose aggregate, regardless of which lane the aggregate is spread on. A W13-1 (35) plaque is not required where the posted speed limit is less than 40 mph.

For chip seals on freeways, expressways, and multilane conventional highways, place a W8-7, (LOOSE GRAVEL) sign and a W13-1 (35) plaque at 2,000-foot maximum intervals along the outside edge of the traveled way nearest to the lane worked on, at on ramps, and at public roads or streets entering the chip seal area. Place the 1st W8-7 sign where the aggregate starts with respect to the direction of travel on that lane. A W13-1 (35) plaque is not required where the posted speed limit is less than 40 mph.

Pilot cars must have cellular or radio contact with other pilot cars and personnel in the work zone. The maximum speed of the pilot cars conveying or controlling traffic through the traffic control zone must be 15 mph on 2-lane, two-way highways and 25 mph on multilane divided and undivided highways. Pilot cars must only use traffic lanes open to traffic.

On the days that closures are not allowed, you may use a moving closure to maintain the seal coat surface. The moving closure is only allowed during daylight hours when traffic will be the least inconvenienced and delayed. The Engineer determines the hours for the moving closure.

Maintain signs in place at each location until the final sweeping of the chip seal surface for that location is complete. Signs may be set on temporary portable supports with the W13-1 sign below the W8-7 sign or on barricades with the W13-1 sign alternating with the W8-7 sign.

Schedule chip seal activities so that the chip seals are placed on both lanes of the traveled way each work shift.

If traffic is routed over a surface where a chip seal application is intended, the chip seal must not be applied to more than half the width of the traveled way at a time, and the remaining width must be kept free of obstructions and open to traffic until the previously applied width is ready for traffic use.

Wherever maintenance sweeping of the chip seal surface is complete, place permanent traffic stripes and pavement markings within 10 days.

If you fail to place the permanent traffic stripes and pavement markings within the specified time, the Department withholds 50 percent of the estimated value of the chip seal work completed that has not received permanent traffic stripes and pavement markings.

37-2.01C(2) Equipment

Equipment for chip seals must include and comply with the following:

1. Aggregate haul trucks must have:
 - 1.1. Tailgate that discharge aggregate
 - 1.2. Device to lock onto the rear aggregate spreader hitch
 - 1.3. Dump bed that will not push down on the spreader when fully raised
 - 1.4. Dump bed that will not spill aggregate on the roadway when transferred to the spreader hopper
 - 1.5. Tarpaulin to cover precoated aggregate when haul distance exceeds 30 minutes or ambient temperature is less than 65 degrees F
2. Self-propelled aggregate spreaders must have:
 - 2.1. Aggregate hopper in the rear
 - 2.2. Belt conveyor that carries the aggregate to the front
 - 2.3. Spreading hopper capable of providing a uniform aggregate spread rate over the entire width of the traffic lane in 1 application.
3. Self-propelled power brooms must:
 - 3.1. Not be steel-tined brooms on emulsion chip seals
 - 3.2. Be capable of removing loose aggregate adjacent to barriers that prevent aggregate from being swept off the roadway, including curbs, gutters, dikes, berms, and railings
4. Pneumatic or foam filled rubber tired rollers must:
 - 4.1. Be an oscillating type at least 4 feet wide
 - 4.2. Be self-propelled and reversible
 - 4.3. Have tires of equal size, diameter, type, and ply
 - 4.4. Carry at least 3,000 lbs of load on each wheel
 - 4.5. Have tires with an air pressure of 100 ± 5 psi or be foam filled

37-2.01C(3) Surface Preparation

Before applying chip seals, cover manholes, valve and monument covers, grates, or other exposed facilities located within the area of application, using a plastic or oil resistant construction paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with enough control points to relocate the facilities after the application of the chip seal.

Immediately before applying chip seals, clean the surface to receive a chip seal by removing any extraneous material affecting adhesion of the chip seal with the existing surface and drying. Use self-propelled power brooms to clean the existing pavement.

37-2.01C(4) Placement

37-2.01C(4)(a) General

Schedule the operations so that chip seals are placed on both lanes of the traveled way each work shift. At the end of the work shift, the end of the chip seals on both lanes must generally match.

37-2.01C(4)(b) Applying Asphaltic Emulsions or Asphalt Binders

Prevent spraying on existing pavement not intended for chip seals or on previously applied chip seals using a material such as building paper. Remove the material after use.

Align longitudinal joints between chip seal applications with designated traffic lanes.

For asphaltic emulsion or asphalt binder, overlap longitudinal joints by not more than 4 inches. You may overlap longitudinal joints up to 8 inches if authorized.

For areas not accessible to a truck distributor bar apply:

1. Asphaltic emulsions by hand spraying
2. Asphalt binders with a squeegee or other authorized means

You may overlap the asphaltic emulsion or asphalt binder applications before the application of aggregate at longitudinal joints.

Do not apply the asphaltic emulsion or asphalt binder unless there is sufficient aggregate at the job site to cover the asphaltic emulsion or asphalt binder.

Discontinue application of asphaltic emulsion or asphalt binder early enough to comply with lane closure requirements. Apply to 1 lane at a time and cover the lane width entirely in 1 operation.

37-2.01C(4)(c) Spreading Aggregates

37-2.01C(4)(c)(i) General

Prevent vehicles from driving on asphaltic emulsion or asphalt binder before spreading aggregate.

Spread aggregate within 10 percent of your determined rate.

Spread aggregate at a uniform rate over the full lane width in 1 application. Apply to 1 lane at a time.

Sweep excess aggregate at joints before spreading adjacent aggregate.

Operate the spreader at speeds slow enough to prevent aggregate from rolling over after dropping.

If the spreader is not moving, aggregate must not drop. If you stop spreading and aggregate drops, remove the excess aggregate before resuming activities.

37-2.01C(4)(c)(ii) Precoated Aggregate Application

During transit, cover precoated aggregate with tarpaulins if the ambient air temperature is below 65 degrees F or the haul time exceeds 30 minutes.

When applied, precoated aggregate must be from 225 to 325 degrees F.

37-2.01C(4)(d) Finishing

37-2.01C(4)(d)(i) General

Remove piles, ridges, or unevenly distributed aggregate. Repair permanent ridges, bumps, streaks or depressions in the finished surface. Spread additional aggregate and roll if aggregate is picked up by rollers or vehicles.

Chip seal joints between adjacent applications of a chip seal must be smooth, straight, uniform, and completely covered.

A coverage is 1 roller movement over the entire width of lane. A pass is 1 roller movement parallel to the chip seal application in either direction. Overlapping passes are part of the coverage being made and are not part of a subsequent coverage. Do not start a new coverage until completing the previous coverage.

Before opening to traffic, finish the chip seals in the following sequence:

1. Perform initial rolling consisting of 1 coverage with a pneumatic-tired roller
2. Perform final rolling consisting of 2 coverages with a pneumatic-tired roller
3. Sweep excess aggregate from the roadway and adjacent abutting areas
4. Apply a flush coat if specified
5. Remove covers from the facilities

37-2.01C(4)(d)(ii) Traffic Control With Pilot Car

For 2-lane 2-way roadways under 1-way traffic control, upon completion of final rolling, traffic must be controlled with pilot cars and routed over the new chip seal for a period of 2 to 4 hours before opening the lane to traffic not controlled with pilot cars.

For multilane roadways, when traffic is controlled with pilot cars, a maximum of 1 lane in the direction of travel must be open to traffic. Traffic must be controlled with pilot cars and be routed on the new chip seal surface of the lane for a minimum of 2 hours after completion of the initial sweeping and before opening the lane to traffic not controlled with pilot cars. Once traffic controlled with pilot cars is routed over the chip seal at a particular location, continuous control must be maintained at that location until the chip seal placement and sweeping on adjacent lanes to receive a chip seal is completed.

37-2.01C(4)(d)(iii) Sweeping

Sweeping must be performed after the chip seal has set and there is no damage or dislodging of aggregate from the chip seal surface. As a minimum, sweeping is required at the following times:

1. On 2-lane 2-way roadways, from 2 to 4 hours after traffic, controlled with pilot cars, has been routed on the chip seal
2. On multilane roadways, from 2 to 4 hours after aggregate have been placed
3. In addition to previous sweeping, perform final sweeping immediately before opening any lane to public traffic, not controlled with pilot cars

37-2.01C(4)(d)(iv) Excess Aggregate

Dispose of excess aggregate. If ordered, salvaging and stockpiling of excess aggregate is change order work.

37-2.01C(4)(e) Chip Seal Maintenance

Perform sweeping on the morning following the application of aggregate on any lane that has been open to traffic not controlled with pilot cars and before starting any other activities.

Chip seal surfaces must be maintained for 4 consecutive days from the day aggregate is applied. Maintenance must include sweeping to maintain a surface free of loose aggregate and to prevent formation of corrugations. Sweeping must not dislodge aggregate set in asphaltic emulsion or asphalt binder.

After 4 consecutive days, excess aggregate must be removed from the paved areas.

37-2.01D Payment

If there is no bid item for traffic control system, furnishing and using a pilot car is included in the various items of the work involved in applying the chip seal.

The payment quantity for precoated aggregate is the weight measured after the aggregate is preheated and precoated with asphalt binder.

If recorded batch weights are printed automatically, the payment quantity for aggregate is the weight determined from the printed batch weights if:

1. Total weight for the precoated aggregate per batch is printed
2. Total asphalt binder weight per batch is printed
3. Zero tolerance weight is printed before weighing the first batch and after weighing the last batch for each truckload
4. Time, date, mix number, load number, and truck identification are correlated with a load slip
5. Copy of the recorded batch weights is certified by a licensed weighmaster

37-2.02 ASPHALTIC EMULSION CHIP SEALS

37-2.02A General

37-2.02A(1) Summary

Section 37-2.02 includes specifications for applying asphaltic emulsion chip seals. An asphaltic emulsion chip seal includes applying an asphaltic emulsion, followed by aggregate, and then a flush coat.

A double asphaltic emulsion chip seal is the application of an asphaltic emulsion followed by aggregate, applied twice in sequence and then a flush coat.

37-2.02A(2) Definitions

Reserved

37-2.02A(3) Submittals

Immediately after sampling, submit two 1-quart plastic containers of asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

37-2.02A(4) Quality Assurance

37-2.02A(4)(a) General

Reserved

37-2.02A(4)(b) Quality Control

37-2.02A(4)(b)(i) General

Reserved

37-2.02A(4)(b)(ii) Asphaltic Emulsions

Circulate asphaltic emulsion in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart samples in a plastic container with lined sealed lid for acceptance testing.

For asphaltic emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphaltic Emulsion

Quality characteristic	Test method	Minimum sampling and testing frequency	Sampling location
Saybolt Furol Viscosity, at 25 °C (Saybolt Furol seconds)	AASHTO T 59	Minimum 1 per day per delivery truck	Distributor truck
Sieve Test (%)			
Storage stability, 1 day (%)			
Residue by distillation (%)			
Particle charge ^a			
Tests on Residue from Distillation Test:			
Penetration, 25 °C	AASHTO T 49	Minimum 1 per day per delivery truck	Distributor truck
Ductility	AASHTO T 51		
Solubility in trichloroethylene	AASHTO T 44		

^aIf the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

37-2.02A(4)(c) Department Acceptance

Aggregate acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Aggregate Gradation Acceptance Criteria

Quality characteristic	Test method	Requirement		
		3/8"	5/16"	1/4"
Gradation (% passing by weight)	California Test 202	3/8"	5/16"	1/4"
Sieve size:		--	--	--
3/4"		100	--	--
1/2"		85-100	100	100
3/8"		0-15	0-50	60-85
No. 4		0-5	0-15	0-25
No. 8		--	0-5	0-5
No. 16		--	0-3	0-3
No. 30		0-2	0-2	0-2

37-2.02B Materials

37-2.02B(1) General

Reserved

37-2.02B(2) Asphaltic Emulsions

Reserved

37-2.02B(3) Aggregate

Aggregate gradation for an asphaltic emulsion chip seal must comply with the requirements shown in the following table:

Asphaltic Emulsion Chip Seal Aggregate Gradation

Quality characteristic	Test method	Requirement		
Gradation (% passing by weight)	California Test 202	3/8"	5/16"	1/4"
Sieve size:				
3/4"		--	--	--
1/2"		100	--	--
3/8"		85-100	100	100
No. 4		0-15	0-50	60-85
No. 8		0-5	0-15	0-25
No. 16		--	0-5	0-5
No. 30		--	0-3	0-3
No. 200	0-2	0-2	0-2	

37-2.02C Construction

37-2.02C(1) General

Reserved

37-2.02C(2) Asphaltic Emulsions

Asphaltic emulsions must be applied within the application rate ranges shown in the following table:

Asphaltic Emulsion Application Rates

Aggregate gradation	Application rate range (gal/sq yd)
3/8"	0.30-0.45
5/16"	0.25-0.35
1/4"	0.20-0.30

For double asphaltic emulsion chip seals, the asphaltic emulsions must be applied within the application rates shown in the following table:

Asphaltic Emulsion Application Rates

Double chip seals	Application rate range (gal/sq yd)
1st application	0.30-0.45
2nd application	0.20-0.30

When applied, the temperature of the asphaltic emulsions must be from 130 to 180 degrees F.

Apply asphaltic emulsions when the ambient air temperature is from 65 to 110 degrees F and the pavement surface temperature is at least 80 degrees F.

Do not apply asphaltic emulsions when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

37-2.02C(3) Spreading Aggregates

Aggregate must be spread within the spread rate ranges shown in the following table:

Aggregate Spread Rates

Aggregate gradation	Spread rate range (lb/sq yd)
3/8"	20–30
5/16"	16–25
1/4"	12–20

For double asphaltic emulsion chip seals, aggregate must be spread within the spread rate ranges shown in the following table:

Aggregate Spread Rates

Double chip seal	Spread rate range (lb/sq yd)
1st application	23–30
2nd application	12–20

Remove excess aggregate on the 1st application before the 2nd application of asphaltic emulsion.

You may stockpile aggregate for asphaltic emulsion chip seals if you prevent contamination. Aggregate must have a damp surface at spreading. If water visibly separates from the aggregate, do not spread. You may re-dampen aggregate in the delivery vehicle.

Spread aggregate before an asphaltic emulsion sets or breaks.

Do not spread aggregate more than 2,500 feet ahead of the completed initial rolling.

37-2.02D Payment

Not Used

37-2.03 POLYMER MODIFIED ASPHALTIC EMULSION CHIP SEALS

37-2.03A General

37-2.03A(1) Summary

Section 37-2.03 includes specifications for applying polymer modified asphaltic emulsion chip seals. A polymer modified asphaltic emulsion chip seal includes applying a polymer modified asphaltic emulsion, followed by aggregate, and then a flush coat.

A double polymer modified asphaltic emulsion chip seal is the application of a polymer modified asphaltic emulsion followed by aggregate, applied twice in sequence and then a flush coat.

37-2.03A(2) Definitions

Reserved

37-2.03A(3) Submittals

Immediately after sampling, submit two 1-quart cans of polymer modified asphaltic emulsion taken in the presence of the Engineer. A sample must be submitted in an insulated shipping container.

37-2.03A(4) Quality Assurance

37-2.03A(4)(a) General

Reserved

37-2.03A(4)(b) Quality Control

37-2.03A(4)(b)(i) General

Reserved

37-2.03A(4)(b)(ii) Polymer Modified Asphaltic Emulsions

Circulate polymer modified asphaltic emulsions in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart samples for acceptance testing.

For polymer modified asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Polymer Modified Asphaltic Emulsion

Quality characteristic	Test method	Minimum sampling and testing frequency	Sampling location
Saybolt Furol Viscosity, at 50 °C (Saybolt Furol seconds)	AASHTO T 59	Minimum 1 per day per delivery truck	Distributor truck
Settlement, 5 days (max, %)			
Storage stability test, 1 day (max, %)			
Sieve test (max, %)			
Demulsibility (min, %)			
Particle charge			
Ash content (max, %)			
Residue by evaporation (min, %)	California Test 331		
Tests on residue from evaporation test:			
Penetration, 25 °C	AASHTO T 49	Minimum 1 per day per delivery truck	Distributor truck
Penetration, 4 °C, 200g for 60 seconds	AASHTO T 49		
Ductility, 25 °C (min, mm)	AASHTO T 51		
Torsional recovery (min, %)	California Test 332		
Ring and Ball Softening Point (min, °F)	AASHTO T 53		

37-2.03A(4)(c) Department Acceptance

Aggregate acceptance is based on the Department’s sampling and testing for compliance with the requirements shown in the following table:

Aggregate Gradation Acceptance Criteria

Quality characteristic	Test method	Requirement		
		3/8"	5/16"	1/4"
Gradation (% passing by weight)	California Test 202	3/8"	5/16"	1/4"
Sieve size:				
3/4"		--	--	--
1/2"		100	--	--
3/8"		85–100	100	100
No. 4		0–15	0–50	60–85
No. 8		0–5	0–15	0–25
No. 16		--	0–5	0–5
No. 30		--	0–3	0–3
No. 200		0–2	0–2	0–2

37-2.03B Materials

37-2.03B(1) General

Reserved

37-2.03B(2) Polymer Modified Asphaltic Emulsions

A polymer modified asphaltic emulsion must include elastomeric polymer.

A polymer modified asphaltic emulsion must be Grade PMRS2, PMRS2h, PMCRS2, or PMCRS2h. Polymer content in percent by weight does not apply.

A polymer modified asphaltic emulsion must comply with section 94 and the quality characteristic requirements in the following table:

Polymeric Asphaltic Emulsion

Quality characteristic	Test method	Requirement
Penetration, 4 °C, 200g for 60 seconds (min)	AASHTO T 49	6
Ring and Ball Softening Point (min, °F)	AASHTO T 53	135

37-2.03B(3) Aggregate

The aggregate gradation for a polymer modified asphaltic emulsion chip seal must comply with the requirements shown in the following table:

Asphaltic Emulsion Chip Seal Aggregate Gradation

Quality characteristic	Test method	Requirement		
Gradation (% passing by weight)	California Test 202	3/8"	5/16"	1/4"
Sieve Size				
3/4"		--	--	--
1/2"		100	--	--
3/8"		85–100	100	100
No. 4		0–15	0–50	60–85
No. 8		0–5	0–15	0–25
No. 16		--	0–5	0–5
No. 30		--	0–3	0–3
No. 200		0–2	0–2	0–2

37-2.03C Construction

Polymer modified asphaltic emulsions must be applied within the application rate ranges shown in the following table:

Polymer Modified Asphaltic Emulsion Application Rates

Aggregate gradation	Application rate range (gal/sq yd)
3/8"	0.30–0.45
5/16"	0.25–0.35
1/4"	0.20–0.30

For double polymer modified asphaltic emulsion chip seals, polymer modified asphaltic emulsions must be applied within the application rates shown in the following table:

Polymer Modified Asphaltic Emulsion Application Rates

Double application	Application rate range (gal/sq yd)
1st application	0.30–0.45
2nd application	0.20–0.30

Apply polymer modified asphaltic emulsions when the ambient air temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 80 degrees F.

Do not apply polymer modified asphaltic emulsions when weather forecasts predict the ambient air temperature will fall below 39 degrees F within 24 hours after application.

Aggregate must be spread within the spread rate ranges shown in the following table:

Aggregate Spread Rates

Chip seal type	Spread rate range (lb/sq yd)
3/8"	20–30
5/16"	16–25
1/4"	12–20

For double chip seals, aggregate must be spread within spread rate ranges shown in the following table:

Aggregate Spread Rates

Double application	Spread rate range (lb/sq yd)
1st application	23–30
2nd application	12–20

Remove excess aggregate on the 1st application before the 2nd application of asphaltic emulsion.

You may stockpile aggregate for the polymer modified asphaltic emulsion chip seals if you prevent contamination. Aggregate must have damp surfaces at spreading. If water visibly separates from the aggregate, do not spread. You may redampen aggregate in the delivery vehicle.

Spread aggregate before the polymer modified asphaltic emulsion sets or breaks.

Do not spread aggregate more than 2,500 feet ahead of the completed initial rolling.

37-2.03D Payment

Not Used

37-2.04 ASPHALT RUBBER BINDER CHIP SEALS

37-2.04A General

37-2.04A(1) Summary

Section 37-2.04 includes specifications for applying asphalt rubber binder chip seals.

An asphalt rubber binder chip seal consists of applying asphalt rubber binder followed by heated aggregate precoated with asphalt binder followed by a flush coat.

37-2.04A(2) Definitions

crumb rubber modifier: Combination of ground or granulated high natural scrap tire crumb rubber and scrap tire crumb rubber derived from waste tires described in Pub Res Code § 42703.

descending viscosity reading: Subsequent viscosity reading at least 5 percent lower than the previous viscosity reading.

high natural scrap tire crumb rubber: Material containing 40 to 48 percent natural rubber.

scrap tire crumb rubber: Any combination of vehicle tires or tire buffing.

37-2.04A(3) Submittals

At least 5 business days before use, submit the permit issued by the local air district for asphalt rubber binder field blending equipment and application equipment. If an air quality permit is not required by the local air district for producing asphalt rubber binder, submit verification from the local air district that an air quality permit is not required.

For each delivery of asphalt rubber binder ingredients to the job site, submit a certificate of compliance with a copy of the specified test results.

Submit a certified volume or weight slip for each delivery of asphalt rubber binder ingredients and asphalt rubber binder.

Submit a SDS for each asphalt rubber binder ingredient and the asphalt rubber binder.

At least 15 days before use, submit:

1. Samples of each asphalt rubber binder ingredient:
 - 1.1. 2 lbs of scrap tire crumb rubber
 - 1.2. 2 lbs of high natural scrap tire crumb rubber
 - 1.3. Two 1-quart cans of base asphalt binder
 - 1.4. Two 1-quart cans of asphalt modifier
2. Asphalt rubber binder formulation and data as follows:
 - 2.1. For asphalt modifier, include:
 - 2.1.1. Source of asphalt modifier
 - 2.1.2. Type of asphalt modifier
 - 2.1.3. Percentage of asphalt modifier by weight of asphalt binder
 - 2.1.4. Percentage of combined asphalt binder and asphalt modifier by weight of asphalt rubber binder
 - 2.1.5. Test results for the specified quality characteristics
 - 2.2. For crumb rubber modifier, include:
 - 2.2.1. Each source and type of scrap tire crumb rubber and high natural scrap tire crumb rubber
 - 2.2.2. Percentage of scrap tire crumb rubber and high natural scrap tire crumb rubber by total weight of asphalt rubber binder
 - 2.2.3. Test results for the specified quality characteristics
 - 2.3. For asphalt rubber binder, include minimum reaction time and temperature

Immediately after sampling, submit five 1-quart cans of asphalt rubber binder taken in the presence of the Engineer. Sample must be submitted in insulated shipping containers.

Submit notification 15 minutes before each viscosity test or submit a schedule of testing times.

Submit the log of asphalt rubber binder descending viscosity test results within 1 business day after sampling.

Submit asphalt rubber binder quality control viscosity test results within 1 business day after sampling.

37-2.04A(4) Quality Assurance

37-2.04A(4)(a) General

The equipment used in producing asphalt rubber binder and the equipment used in spreading asphalt rubber binder must be permitted for use or exempted by the local air district.

37-2.04A(4)(b) Quality Control

37-2.04A(4)(b)(i) General

Reserved

37-2.04A(4)(b)(ii) Asphalt Modifiers

For asphalt modifiers, the authorized laboratory must perform quality control sampling and testing at the specified frequency for the following quality characteristics:

Asphalt Modifier for Asphalt Rubber Binder		
Quality characteristic	Test method	Frequency
Viscosity	ASTM D445	1 per shipment
Flash point	ASTM D92	
Molecular Analysis:		
Asphaltenes	ASTM D2007	1 per shipment
Aromatics	ASTM D2007	

37-2.04A(4)(b)(iii) Crumb Rubber Modifiers

Sample and test scrap tire crumb rubber and high natural scrap tire crumb rubber separately.

Perform quality control sampling and testing at the specified frequency for the following quality characteristics:

Crumb Rubber Modifier		
Quality characteristic	Test method	Frequency
Scrap tire crumb rubber gradation	California Test 385	1 per 10,000
High natural scrap tire crumb rubber gradation	California Test 385	1 per 3,400 lb
Wire in CRM	California Test 385	1 per 10,000 lb
Fabric in CRM	California Test 385	
CRM particle length	--	
CRM specific gravity	California Test 208	
Natural rubber content in high natural scrap tire crumb rubber	ASTM D297	1 per 3,400 lb

37-2.04A(4)(b)(iv) Asphalt Rubber Binders

For asphalt rubber binders, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphalt Rubber Binder Quality Control Requirements

Quality characteristic	Test method	Sampling location	Frequency
Descending viscosity ^a at 375 °F (Pa•s x 10 ⁻³)	ASTM D7741	Reaction vessel	1 per lot ^b
Viscosity at 375 °F (Pa•s x 10 ⁻³)	ASTM D7741	Distribution truck	15 minutes before use per lot ^b
Cone penetration at 25 °C (0.10 mm)	ASTM D217	Distribution truck	1 per lot ^b
Resilience at 25 °C (% rebound)	ASTM D5329		
Softening point (°C)	ASTM D36		

^aStart taking viscosity readings at least 45 minutes after adding crumb rubber modifier and continue taking viscosity readings every 30 minutes until 2 consecutive descending viscosity readings have been obtained and the final viscosity complies with the specification requirement.

^bA lot is defined in the *MPQP*.

Retain samples from each lot. Test samples for cone penetration, resilience, and softening point for the first 3 lots and if all 3 lots pass, the testing frequency may be reduced to once for every 3 lots.

If QC test results indicate that the asphalt rubber binder does not comply with the specifications, take corrective action and notify the Engineer.

37-2.04A(4)(c) Department Acceptance

37-2.04A(4)(c)(i) General

Reserved

37-2.04A(4)(c)(ii) Asphalt Modifiers

The Department accepts asphalt modifier based on compliance with the requirements shown in the following table:

Asphalt Modifier for Asphalt Rubber Binder

Quality characteristic	Test method	Requirement
Viscosity at 100 °C (m ² /s x 10 ⁻⁶)	ASTM D445	X ± 3 ^a
Flash point (min, °C)	ASTM D92	207
Molecular Analysis:		
Asphaltenes (max, % by mass)	ASTM D2007	0.1
Aromatics (min, % by mass)	ASTM D2007	55

^aThe symbol "X" is the asphalt modifier viscosity.

37-2.04A(4)(c)(iii) Crumb Rubber Modifiers

Scrap tire CRM and high natural CRM are sampled and tested separately.

The Department accepts scrap tire CRM and high natural CRM based on compliance with the requirements shown in the following table:

Crumb Rubber Modifier for Asphalt Rubber Binder

Quality characteristic	Test method	Requirement
Wire in CRM (max, %)	California Test 385	0.01
Fabric in CRM (max, %)	California Test 385	0.05
CRM particle length (max, in)	--	3/16
CRM specific gravity	California Test 208	1.1–1.2
Natural rubber content in high natural CRM (%)	ASTM D297	40.0–48.0

The Department accepts CRM gradation based on the requirements shown in the following table:

Crumb Rubber Modifier Gradation Requirements

Quality characteristic	Test method	Requirement			
		Scrap tire crumb rubber		High natural scrap tire crumb rubber	
Gradation (% passing by weight) Sieve size:	California Test 385	Operating range	Contract compliance	Operating range	Contract compliance
No. 8		100	100	--	--
No. 10		95–100	90–100	100	100
No. 16		35–85	32–88	92–100	85–100
No. 30		2–25	1–30	25–95	20–98
No. 50		0–10	0–15	6–35	2–40
No. 100		0–5	0–10	0–7	0–10
No. 200		0–2	0–5	0–3	0–5

If a test result for CRM gradation does not comply with the specifications, the Department deducts the corresponding amount for each gradation test as shown in the following table:

Material	Gradation test result ^a	Deduction
Scrap tire crumb rubber	Operating range < TR < Contract compliance	\$250
Scrap tire crumb rubber	TR > Contract compliance	\$1,100
High natural scrap tire crumb rubber	Operating range < TR < Contract compliance	\$250
High natural scrap tire crumb rubber	TR > Contract compliance	\$600

^aTest Result = TR

Each gradation test for scrap tire crumb rubber represents 10,000 lb or the quantity used in that day's production, whichever is less.

Each gradation test for high natural scrap tire crumb rubber represents 3,400 lb or the quantity used in that day's production, whichever is less.

37-2.04A(4)(c)(iv) Asphalt Rubber Binders

For Department acceptance testing, take a sample of asphalt rubber binder in the Engineer's presence every 5 lots or once a day, whichever is greater. Each sample must be in five 1-quart cans with an open top and friction lid.

For an asphalt rubber binder, acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Asphalt Rubber Binder

Quality characteristic	Test method	Requirement
Cone penetration at 25 °C (0.10 mm)	ASTM D217	25–60
Resilience at 25 °C (% rebound)	ASTM D5329	18–50
Softening point (°C)	ASTM D36	55–88
Viscosity at 375 °F (Pa•s x 10 ⁻³) ^a	ASTM D7741	1,500–2,500

^aPrepare sample for viscosity test under California Test 388.

37-2.04A(4)(c)(v) Precoated Aggregate

The Department accepts precoated aggregate based on compliance with the requirements shown in the following table:

Precoated Aggregate Gradation Acceptance Criteria

Quality Characteristic	Test method	Requirement
1/2" gradation (% passing by weight) Sieve size:	California Test 202	
3/4"		100
1/2"		85–90
3/8"		0–30
No. 4		0–5
No. 8		--
No. 200		0–1
3/8" gradation (% passing by weight) Sieve size:	California Test 202	
3/4"		100
1/2"		95–100
3/8"		70–85
No. 4		0–15
No. 8		0–5
No. 200		0–1

37-2.04B Materials

37-2.04B(1) General

Reserved

37-2.04B(2) Asphalt Binders

Asphalt binder used as the base binder for asphalt rubber binder must comply with the specifications for asphalt binder. Do not modify asphalt binder with polymer.

37-2.04B(3) Asphalt Modifiers

An asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon. An asphalt modifier must comply with the requirements shown in the following table:

Asphalt Modifier for Asphalt Rubber Binder

Quality characteristic	Test method	Requirement
Viscosity at 100 °C (m ² /s x 10 ⁻⁶)	ASTM D445	X ± 3 ^a
Flash point (min, C.L.O.C., °C)	ASTM D92	207
Molecular analysis:		
Asphaltenes by mass (max, %)	ASTM D2007	0.1
Aromatics by mass (min, %)	ASTM D2007	55

^aX denotes the proposed asphalt modifier viscosity from 19 to 36. A change in X requires a new asphalt rubber binder submittal.

37-2.04B(4) Crumb Rubber Modifiers

The CRM to be used must be on the Authorized Materials List for crumb rubber modifier.

The CRM must be ground or granulated at ambient temperature.

Scrap tire crumb rubber and high natural scrap tire crumb rubber must be delivered to the asphalt rubber binder production site in separate bags.

Steel and fiber must be separated. If steel and fiber are cryogenically separated, it must occur before grinding and granulating. Cryogenically-produced CRM particles must be large enough to be ground or granulated.

The CRM must be dry, free-flowing particles that do not stick together. A maximum of 3 percent calcium carbonate or talc by weight of CRM may be added. The CRM must not cause foaming when combined with the asphalt binder and asphalt modifier.

The CRM must comply with the requirements shown in the following table:

Crumb Rubber Modifier for Asphalt Rubber Binder

Quality characteristic	Test method	Requirement
Wire in CRM (max, %)	California Test 385	0.01
Fabric in CRM (max, %)	California Test 385	0.05
CRM particle length (max, in)	--	3/16
CRM specific gravity	California Test 208	1.1–1.2

The CRM must comply with the requirements shown in the following table:

Crumb Rubber Modifier Requirements

Quality characteristic	Test method	Requirement	
		Scrap tire crumb rubber	High natural scrap tire crumb rubber
Acetone extract (%)	ASTM D297	6.0–16.0	4.0–16.0
Rubber hydrocarbon (min, %)		42.0–65.0	50.0
Natural rubber content (%)		22.0–39.0	40.0–48.0
Carbon black content (%)		28.0–38.0	--
Ash content (max, %)		8.0	--

Scrap tire crumb rubber gradation must comply with the gradation requirements shown in the following table:

Scrap Tire Crumb Rubber Gradation

Quality characteristic	Test method	Requirement		
		Gradation limit	Operating range	Contract compliance
Gradation (% passing by weight) Sieve size:	California Test 385			
No. 8		100	100	100
No. 10		98–100	95–100	90–100
No. 16		45–75	35–85	32–88
No. 30		2–20	2–25	1–30
No. 50		0–6	0–10	0–15
No. 100		0–2	0–5	0–10
No. 200		0	0–2	0–5

High natural scrap tire crumb rubber gradation must comply with the gradation requirements shown in the following table:

High Natural Scrap Tire Crumb Rubber Gradation

Quality characteristic	Test method	Requirement		
		Gradation limit	Operating range	Contract compliance
Gradation (% passing by weight) Sieve size:	California Test 385			
No. 10		100	100	100
No. 16		95–100	92–100	85–100
No. 30		35–85	25–95	20–98
No. 50		10–30	6–35	2–40
No. 100		0–4	0–7	0–10
No. 200		0–1	0–3	0–5

37-2.04B(5) Asphalt Rubber Binders

An asphalt rubber binder must be a combination of:

1. Asphalt binder
2. Asphalt modifier
3. Crumb rubber modifier

Asphalt rubber binder blending equipment must be authorized under the Department's *MPQP*.

The blending equipment must allow the determination of weight percentages of each asphalt rubber binder ingredient.

An asphalt rubber binder must be 79 ± 1 percent by weight asphalt binder and 21 ± 1 percent by weight of CRM. The minimum percentage of CRM must be 20.0 percent and lower values must not be rounded up.

The CRM must be 75 ± 2 percent by weight scrap tire crumb rubber and 25 ± 2 percent by weight high natural scrap tire crumb rubber.

An asphalt modifier and asphalt binder must be blended at the production site. An asphalt modifier must be from 2.5 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder. The asphalt rubber binder supplier determines the exact percentage.

If blended before adding CRM, the asphalt binder must be from 375 to 440 degrees F when an asphalt modifier is added and the mixture must circulate for at least 20 minutes. An asphalt binder, asphalt modifier, and CRM may be proportioned and combined simultaneously.

The blend of an asphalt binder and an asphalt modifier must be combined with the CRM at the asphalt rubber binder production site. The asphalt binder and asphalt modifier blend must be from 375 to 440 degrees F when the CRM is added. Combined ingredients must be allowed to react at least 45 minutes at temperatures from 375 to 425 degrees F except the temperature must be at least 10 degrees F below the flash point of the asphalt rubber binder.

After reacting, the asphalt rubber binder must comply with the requirements shown in the following table:

Asphalt Rubber Binder

Quality characteristic	Test method	Requirement
Cone penetration at 25 °C (0.10 mm)	ASTM D217	25–60
Resilience at 25 °C (% rebound)	ASTM D5329	18–50
Softening point (°C)	ASTM D36	55–88
Viscosity at 375 °F (Pa•s x 10 ⁻³) ^a	ASTM D7741	1,500–2,500

^aPrepare sample for viscosity test under California Test 388.

Maintain asphalt rubber binder at a temperature from 375 to 415 degrees F.

Stop heating unused asphalt rubber binder 4 hours after the 45-minute reaction period. Reheating asphalt rubber binder that cools below 375 degrees F is a reheat cycle. Do not exceed 2 reheat cycles. If reheating, the asphalt rubber binder must be from 375 to 415 degrees F before use.

During reheating, you may add CRM. The CRM must not exceed 10 percent by weight of the asphalt rubber binder. Allow added CRM to react for at least 45 minutes. Reheated asphalt rubber binder must comply with the specifications for asphalt rubber binder.

37-2.04B(6) Precoated Aggregate

Before precoating with asphalt binder, aggregate for an asphalt rubber binder chip seal must comply with the gradation requirements shown in the following table:

Asphalt Rubber Binder Chip Seal Aggregate Gradation

Quality characteristic	Test method	Requirement	
Gradation (% passing by weight)	California Test 202	1/2"	3/8"
Sieve size:			
3/4"		100	100
1/2"		85–90	95–100
3/8"		0–30	70–85
No. 4		0–5	0–15
No. 8		--	0–5
No. 200	0–1	0–1	

37-2.04C Construction

37-2.04C(1) General

Reserved

37-2.04C(2) Equipment

Distributor trucks must be equipped with:

1. Mixing and heating unit
2. Observation platform on the rear of the truck for an observer on the platform to see the nozzles and unplug them if needed

37-2.04C(3) Asphalt Rubber Binder Application

Apply the asphalt rubber binder when the ambient temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply the asphalt rubber binder unless enough aggregate is available at the job site to cover the asphalt rubber binder within 2 minutes. Intersections, turn lanes, gore points, and irregular areas must be covered within 15 minutes.

Do not apply asphalt rubber binder when pavement is damp or during high wind conditions. If authorized, you may adjust the distributor bar height and distribution speed and use shielding equipment during high wind conditions.

When applied, the temperature of the asphalt rubber binder must be from 385 to 415 degrees F.

Apply the asphalt rubber binder at a rate from 0.55 to 0.65 gal/sq yd. You may reduce the application rate by 0.050 gal/sq yd in the wheel paths.

37-2.04C(4) Precoated Aggregate Spreading

Spread aggregate at a rate from 28 to 40 lb/sq yd. Do not spread aggregate more than 200 feet ahead of the completed initial rolling.

37-2.04C(5) Rolling and Sweeping

Perform initial rolling within 90 seconds of spreading aggregate. If authorized for final rolling, you may use a steel-wheeled roller weighing from 8 to 10 tons in static mode only.

Perform a final sweeping before Contract acceptance. The final sweeping must not dislodge aggregate.

37-2.04D Payment

Asphalt rubber binder is measured as specified for asphalt binder.

37-2.05 STRESS ABSORBING MEMBRANE INTERLAYERS

37-2.05A General

Section 37-2.05 includes specifications for placing stress absorbing membrane interlayers (SAMI).

Comply with section 37-2.04 except a flush coat is not required.

Traffic must not be allowed on a SAMI.

37-2.05B Materials

For a SAMI, aggregate must comply with the 3/8-inch gradation.

37-2.05C Construction

If a SAMI is overlaid in the same work shift, section 37-2.01C(4)(e) does not apply.

Final sweeping is not required for a SAMI.

37-2.05D Payment

Not Used

37-2.06 MODIFIED ASPHALT BINDER CHIP SEALS

Reserved

37-2.07 SCRUB SEALS

Reserved

37-3 SLURRY SEALS AND MICRO-SURFACINGS

37-3.01 GENERAL

37-3.01A General

37-3.01A(1) Summary

Section 37-3.01 includes general specifications for applying slurry seals and micro-surfacings.

37-3.01A(2) Definitions

Reserved

37-3.01A(3) Submittals

At least 15 days before starting placement of a slurry seal or micro-surfacing, submit:

1. Samples for:
 - 1.1. Asphaltic emulsion slurry seal, two 1-quart wide mouth plastic containers with screw top lid of asphaltic emulsion
 - 1.2. Polymer modified asphaltic emulsion slurry seal, two 1-quart wide mouth plastic containers with screw top lid of polymer modified asphaltic emulsion
 - 1.3. Micro-surfacing, two 1-quart wide mouth plastic containers with screw top lid of micro-surfacing emulsion
2. Asphaltic emulsion, polymer modified asphaltic emulsion, or micro-surfacing emulsion data as follows:
 - 2.1. Supplier and Type/Grade of asphaltic emulsion
 - 2.2. Type of modifier polymer for polymer modified asphaltic emulsion or micro-surfacing emulsion
 - 2.3. Copy of the specified test results for asphaltic emulsion, polymer modified asphaltic emulsion, or micro-surfacing emulsion
3. 50 lb of aggregate
4. Aggregate test results for the followings:
 - 4.1. Gradation
 - 4.2. Los Angeles Rattler
 - 4.3. Percent of crushed particles
 - 4.4. Sand equivalent
 - 4.5. Durability

At least 10 days before starting placement of a slurry seal or micro-surfacing, submit a laboratory report of test results and the proposed mix design from an authorized laboratory. The authorized laboratory must sign the laboratory report and mix design.

The report must include:

1. Test results used in the mix design compared with specification requirements
2. Proportions based on the dry weight of aggregate, including ranges, for:

- 2.1. Aggregate
- 2.2. Water
- 2.3. Additives
- 2.4. Mineral filler
- 2.5. Slurry seal emulsion or micro-surfacing emulsion residual asphalt content
3. Recommended changes to the proportions based on heating the mixture to 100 degrees F and mixing for 60 seconds, if atmospheric temperatures during application will be 90 degrees F or above, for:
 - 3.1. Water
 - 3.2. Additives
 - 3.3. Mineral filler
4. Quantitative moisture effects on the aggregate's unit weight determined under ASTM C29M

If the mix design consists of the same materials covered by a previous laboratory report, you may submit the previous laboratory report that must include material testing data performed within the previous 12 months for authorization.

If you change any of the materials in the mix design, submit a new mix design and laboratory report at least 10 days before starting slurry seal or micro-surfacing work.

Submit a certificate of compliance as specified for asphaltic emulsion in section 94-1.01C with each shipment of asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion.

Submit quality control test results for the quality characteristics within the reporting times allowance after sampling shown in the following table:

Quality Control Test Reporting Requirements

Quality characteristic	Maximum reporting time allowance
Los Angeles Rattler loss (max, %)	2 business days
Percent of crushed particles (min, %)	2 business days
Durability (min)	2 business days
Resistance of fine aggregate to degradation by abrasion in the Micro-Deval Apparatus (% loss by weight)	2 business days
Gradation (% passing by weight)	48 hours
Sand equivalent (min)	48 hours
Moisture content (%)	48 hours

Within 3 days after taking asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion quality control samples, submit the authorized laboratory's test results.

37-3.01A(4) Quality Assurance

37-3.01A(4)(a) General

Your authorized laboratory must be able to perform International Slurry Surfacing Association tests and mix design.

37-3.01A(4)(b) Quality Control

37-3.01A(4)(b)(i) General

Reserved

37-3.01A(4)(b)(ii) Aggregate

For aggregate, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Aggregate Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Location of sampling
Los Angeles Rattler loss (max, %) At 500 revolutions	California Test 211	1st day of production	See California Test 125
Percent of crushed particles (min, %)	AASHTO T 335	1st day of production	See California Test 125
Sand equivalent (min)	California Test 217	1 per working stockpile per day	See California Test 125
Resistance of fine aggregate to degradation by abrasion in the Micro-Deval Apparatus (% loss by weight)	ASTM D7428	1 per working stockpile per day	See California Test 125
Gradation (% passing by weight)	California Test 202	1 per working stockpile per day	See California Test 125
Moisture content, from field stockpile (%)	AASHTO T 255 ^a	1 per working stockpile per day	See California Test 125

^aTest aggregate moisture at field stockpile every 2 hours if you are unable to maintain the moisture content to within a maximum daily variation of ± 0.5 percent.

37-3.01A(4)(b)(iii) Slurry Seals and Micro-surfacings

Reserved

37-3.01A(4)(c) Department Acceptance

Slurry Seal and micro-surfacing acceptance is based on:

1. Visual inspection for the following:
 - 1.1. Uniform surface texture throughout the work limits.
 - 1.2. Marks in the surface:
 - 1.2.1. Up to 4 marks in the completed slurry seal or micro-surfacing surface that are up to 1 inch wide and up to 6 inches long per 1000 square feet of slurry seal or micro-surfacing placed.
 - 1.2.2. No marks in the completed slurry seal or micro-surfacing surface that are over 1 inch wide or 6 inches long.
 - 1.3. Excessive raveling consisting of the separation of the aggregate from the asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion.
 - 1.4. Bleeding consists of the occurrence of a film of asphaltic material on the surface of the slurry seal or micro-surfacing.
 - 1.5. Delaminating of slurry seal or micro-surfacing from the existing pavement.
 - 1.6. Rutting or wash-boarding.
2. Department's sampling and testing for compliance with the requirements for aggregate shown in the following table:

Aggregate Gradation Acceptance Criteria

Quality characteristic	Test method	Requirements		
Gradation (% passing by weight) Sieve Size:	California Test 202	Type I	Type II	Type III
3/8"		--	100	100
No. 4		100	94-100	70-90
No. 8		90-100	65-90	45-70
No. 16		60-90	40-70	28-50
No. 30		40-65	25-50	19-34
No. 200		10-20	5-15	5-15

An aggregate gradation test represents 300 tons or 1 day's production, whichever is less.

If test results for aggregate gradation do not comply with the specifications, you may remove the slurry seal or micro-surfacing represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts:

1. \$1.75 per ton of slurry seal for each noncompliant aggregate gradation
2. \$2.00 per ton of micro-surfacing for each noncompliant aggregate gradation

37-3.01B Materials

37-3.01B(1) General

Additional water must not cause separation of the asphaltic emulsion, polymer modified asphaltic emulsion or micro-surfacing emulsion from the aggregate before placement.

You may use an additive that does not adversely affect the slurry seal or micro-surfacing.

37-3.01B(2) Aggregate

Aggregate must be rock dust. Aggregate must be free from vegetable matter, deleterious substances, caked or clay lumps, and oversized particles.

Aggregate for a slurry seal and micro-surfacing must comply with the gradations shown in the following table:

Aggregate Gradation

Quality characteristic	Test method	Requirements		
Gradation (% passing by weight) Sieve size:	California Test 202	Type I	Type II	Type III
3/8"		--	100	100
No. 4		100	94-100	70-90
No. 8		90-100	65-90	45-70
No. 16		60-90	40-70	28-50
No. 30		40-65	25-50	19-34
No. 200		10-20	5-15	5-15

37-3.01C Construction

37-3.01C(1) General

Before applying slurry seals or micro-surfacings, cover manholes, valve and monument covers, grates, and other exposed facilities located within the area of application using plastic or oil resistant construction

paper secured by tape or adhesive to the facility being covered. Reference the covered facilities with enough control points to relocate the facilities after application of the slurry seals or micro-surfacings.

37-3.01C(2) Proportioning

Proportion slurry seal and micro-surfacing ingredients in compliance with the authorized mix design.

37-3.01C(3) Mixing and Spreading Equipment

37-3.01C(3)(a) General

Mixing and spreading equipment for slurry seals and micro-surfacings must proportion the asphaltic emulsions, water, aggregate, and any additives by volume and mix them in continuous pug mill mixers.

Introduce emulsions into the mixer with a positive displacement pump. If you use a variable-rate pump, the adjusting unit must be sealed in its calibrated position.

Introduce water into the mixer through a meter that measures gallons.

Choose a truck mounted mixer-spreader or continuous self-loading mixer spreader.

37-3.01C(3)(b) Truck Mounted Mixer Spreaders

Truck mounted mixer spreaders must comply with:

1. Rotating and reciprocating equipment must be covered with metal guards.
2. Proportion aggregate using a belt feeder with an adjustable cutoff gate. The Engineer verifies the height of the gate opening.
3. Belt feeder must have a depth monitor device. The depth monitor device must automatically shut down power to the belt feeder when the aggregate depth is less than 70 percent of the target depth.
4. Separate monitor device must detect the revolutions of the belt feeder. This device must automatically shut down power to the belt feeder if it detects no revolutions. If the belt feeder is an integral part of the equipment's drive chain, the monitor device is not required.
5. Aggregate belt feeder must be connected directly to the drive on the emulsion pump. The aggregate feeder drive shaft must have a revolution counter reading the nearest 0.10 revolution for micro-surfacing, and nearest 1 revolution for slurry seal.
6. Emulsion storage must be equipped with a device that automatically shuts down power to the emulsion pump and aggregate belt feeder when the level of stored emulsion is lowered. To allow for normal fluctuations, there may be a delay of 3 seconds between detection of low emulsion storage levels or low aggregate depths and automatic power shut down.
7. Emulsion storage must be located immediately before the emulsion pump.
8. Emulsion storage tank must have a temperature indicator at the pump suction level. The indicator must be accurate to ± 5 degrees F.
9. No-flow and revolution warning devices must be in working condition. Low-flow indicators must be visible while walking alongside the equipment.

37-3.01C(3)(c) Continuous Self-Loading Mixer Spreaders

Continuous self-loading mixer spreaders must be automatically sequenced and self-propelled. The mixing machine must deliver each material to a double shafted mixer and discharge the mixed material on a continuous flow basis. The mixing machines must have sufficient storage capacity to maintain a continuous supply of material to the proportioning controls. The mixing machine operators must have full control of forward and reverse speeds during placement.

37-3.01C(3)(d) Spreader Boxes

The spreader boxes used to spread slurry seals and micro-surfacings must be:

1. Capable of spreading the slurry seal or micro-surfacing a minimum of 12 feet wide and preventing the loss of slurry seal or micro-surfacing.
2. Equipped with flexible rubber belting on each side. The belting must contact the pavement to prevent the loss of slurry seal or micro-surfacing from the box.
3. Equipped to uniformly apply the slurry seal or micro-surfacing on superelevated sections and shoulder slopes. Micro-surfacing spreader box must be equipped with reversible motor driven augers.
4. Equipped with a series of strike-off devices at its rear.
 - 4.1. The leading strike off device must be:
 - 4.1.1. Fabricated of a suitable material such as steel or stiff rubber
 - 4.1.2. Designed to maintain close contact with the pavement during spreading
 - 4.1.3. Capable of obtaining the specified thickness
 - 4.1.4. Capable of being adjusted to the various pavement cross sections
 - 4.2. The final strike-off device must be:
 - 4.2.1. Fabricated of flexible material that produces a uniform texture in the finished surface
 - 4.2.2. Cleaned daily and changed if longitudinal scouring occurs in the slurry seal or micro-surfacing
5. Clean and free of slurry seal or micro-surfacing at the start of each work shift.

37-3.01C(3)(e) Shoulder Equipment

Spread the slurry seal or micro-surfacing on shoulders with a device such as an edge box that forms clean and straight joints and edges.

37-3.01C(3)(f) Equipment Calibration

Equipment calibration must comply with the *MPQP*. Notify the Engineer at least 5 business days before calibrating.

If the Department authorizes a truck or continuous mixer spreader, its calibration is valid for 6 months provided you:

1. Use the same truck or continuous mixer spreader verified with a unique identifying number
2. Use the same materials in compliance with the authorized mix design
3. Do not perform any repair or alteration to the proportioning systems

Calibrate the adjustable cut-off gate settings of each truck or continuous mixer spreader on the project to achieve the correct delivery rate of aggregate and emulsion per revolution of the aggregate feeder under the *MPQP*.

Checks must be performed for each aggregate source using an authorized vehicle scale.

Individual checks of the aggregate belt feeder's delivery rate to the pug mill mixer must not vary more than 2 percent from the average of 3 runs of at least 3 tons each.

Before using a variable-rate emulsion pump, the pump must be calibrated and sealed in the calibrated condition under the *MPQP*.

Individual checks of the emulsion pump's delivery rate to the pug mill mixer must not vary more than 2 percent from the average of 3 runs of at least 500 gal each.

37-3.01C(4) Surface Preparation

Immediately before applying slurry seals or micro-surfacings, clean the surface to receive slurry seals or micro-surfacings by removing any extraneous material affecting adhesion of the slurry seal or micro-surfacing with the existing surface. Use self-propelled power brooms or other methods such as flushing to clean the existing pavement.

37-3.01C(5) Placement

37-3.01C(5)(a) General

If truck-mounted mixer-spreaders are used, keep at least 2 operational spreaders at the job site during placement.

Spread slurry seals and micro-surfacings uniformly and do not spot, rehandle, or shift the mixture. However in areas inaccessible to spreading equipment, spread the slurry seal or micro-surfacing mixtures with hand tools or other authorized methods. If placing with hand tools, lightly dampen the area first.

You may fog the roadway surface with water ahead of the spreader box. The fog spray must be adjusted for pavement:

1. Temperature
2. Surface texture
3. Dryness

You determine the application rates for slurry seals or micro-surfacings and the Engineer authorizes the application rates. Spread within 10 percent of authorized rate.

The mixtures must be uniform and homogeneous after spreading, and there must not be separation of the emulsion and aggregate after setting.

37-3.01C(5)(b) Weather Conditions

Only place slurry seals or micro-surfacings if both the pavement and air temperatures are at least 50 degrees F and rising. The expected high temperature must be at least 65 degrees F within 24 hours after placement.

Do not place slurry seals or micro-surfacings if rain is imminent or the air temperature is expected to be below 36 degrees F within 24 hours after placement.

37-3.01C(5)(c) Joints

Transverse and longitudinal joints must be:

1. Uniform
2. Straight
3. Neat in appearance
4. Without material buildup
5. Without uncovered areas

Transverse joints must be butt-type joints.

Prevent double placement at transverse joints over previously placed slurry seals or micro-surfacings.

Place longitudinal joints:

1. On centerlines, lane lines, edge lines, or shoulder lines
2. With overlaps not more than 4 inches

You may request other longitudinal joint patterns if they do not adversely affect the slurry seals or micro-surfacings.

The maximum difference between the pavement surface and the bottom edge of a 12-foot straightedge placed perpendicular to the longitudinal joint must be 0.04 foot.

37-3.01C(5)(d) Finished Surfaces

Finished slurry seals or micro-surfacings must be smooth and free of irregularities such as scratch or tear marks. You may leave up to 4 marks that are up to 1 inch wide and 6 inches long per 75 linear feet of slurry seal or micro-surfacing placed. Do not leave any marks that are over 1 inch wide or 6 inches long.

37-3.01C(5)(e) Maintenance Sweeping

Sweep the slurry seals or micro-surfacings 24 hours after placement without damaging the slurry seals or micro-surfacings. For 4 days afterwards, sweep the slurry seals or micro-surfacings daily unless determined otherwise by the Engineer.

37-3.01C(5)(f) Repair of Early Distress

The slurry seals or micro-surfacings must not show bleeding, raveling, separation, or other distresses for 15 days after placing. If bleeding, raveling, delaminating, rutting, or wash-boarding occurs after placing the slurry seals or micro-surfacings, make repairs using an authorized method.

37-3.01D Payment

Not Used

37-3.02 SLURRY SEALS

37-3.02A General

37-3.02A(1) Summary

Section 37-3.02 includes specifications for applying slurry seals.

Applying a slurry seal consists of spreading a mixture of asphaltic emulsion or polymer modified asphaltic emulsion, aggregate, additives, and water on a surface or pavement.

37-3.02A(2) Definitions

Reserved

37-3.02A(3) Submittals

Immediately after sampling, submit two 1-quart wide mouth plastic containers of asphaltic emulsion or polymer modified asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping containers.

37-3.02A(4) Quality Assurance

37-3.02A(4)(a) General

Reserved

37-3.02A(4)(b) Quality Control

37-3.02A(4)(b)(i) General

Take samples of asphaltic emulsion and polymer modified asphaltic emulsion from the tank truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer take two 1-quart samples in wide mouth plastic containers with lined, sealed lids for acceptance testing.

37-3.02A(4)(b)(ii) Asphaltic Emulsion

For asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphaltic Emulsion

Quality characteristic	Test method	Minimum sampling and testing frequency	Sampling location
Saybolt Furol Viscosity, at 25 °C (Saybolt Furol seconds)	AASHTO T 59	Minimum 1 per day per delivery truck	Delivery truck
Sieve Test (%)			
Storage stability, 1 day (%)			
Residue by distillation (%)			
Particle charge ^a			
Tests on Residue from Distillation Test:			
Penetration, 25 °C	AASHTO T 49	Minimum 1 per day per delivery truck	Delivery truck
Ductility	AASHTO T 51		
Solubility in trichloroethylene	AASHTO T 44		

^aIf the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

37-3.02A(4)(b)(iii) Polymer Modified Asphaltic Emulsion

For polymer modified asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Polymer Modified Asphaltic Emulsion

Quality characteristic	Test method	Minimum sampling and testing frequency	Sampling Location
Tests on emulsion:			
Saybolt Furol Viscosity at 25 °C (Saybolt Furol seconds)	AASHTO T 59	Minimum 1 per day per delivery truck	Delivery truck
Sieve test (%)	AASHTO T 59		
Storage stability after 1 day (%)	AASHTO T 59		
Residue by evaporation (min, %)	California Test 331		
Particle charge	AASHTO T 59		
Tests on residue by evaporation:			
Penetration at 25 °C	AASHTO T 49	Minimum 1 per day per delivery truck	Delivery truck
Ductility at 25 °C (min, mm)	AASHTO T 51		
Torsional recovery (min, %)	California Test 332		
Or Polymer content based on residual asphalt (min, %)	California Test 401		

37-3.02A(4)(c) Department Acceptance

For a slurry seal asphaltic emulsion and polymer modified asphaltic emulsion, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics specified.

Aggregate acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Aggregate Acceptance Criteria

Quality characteristic	Test method	Requirement
Los Angeles Rattler loss (max, %) At 500 revolutions	California Test 211 ^a	35
Percent of crushed particles (min, %)	California Test 205	95
Durability (min)	California Test 229	55
Sand equivalent (min)		
Type I	California Test 217	45
Type II		55
Type III		60

^aCalifornia Test 211 must be performed on the source aggregate before crushing.

A sand equivalent test represents 300 tons or 1 day's production, whichever is less.

If test results for sand equivalent do not comply with the specifications, you may remove the slurry seal represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts \$1.75 per ton of slurry seal for each noncompliant sand equivalent test.

37-3.02B Materials

37-3.02B(1) General

Reserved

37-3.02B(2) Asphaltic Emulsions

An asphaltic emulsion must comply with the requirements in Section 94. The asphaltic emulsion must be Grade CQS1h.

37-3.02B(3) Polymer Modified Asphaltic Emulsions

A polymer modified asphaltic emulsion must:

1. Consist of an elastomeric polymer mixed with an asphaltic material uniformly emulsified with water and an emulsifying or stabilization agent.
2. Use either neoprene polymer or butadiene and styrene copolymer. The polymer must be homogeneous and milled into the asphaltic emulsion at the colloid mill.
3. Be Grade PMCQS1h and must comply with the requirements shown in the following table:

Polymer Modified Asphaltic Emulsion Requirements

Quality characteristic	Test method	Requirement
Tests on emulsion:		
Saybolt Furol Viscosity at 25 °C (Saybolt Furol seconds)	AASHTO T 59	15–90
Sieve test (%)	AASHTO T 59	0–0.3
Storage stability after 1 day (%)	AASHTO T 59	0–1
Residue by evaporation (min, %)	California Test 331	60
Particle charge	AASHTO T 59	Positive
Tests on residue by evaporation:		
Penetration at 25 °C	AASHTO T 49	40–90
Ductility at 25 °C (min, mm)	AASHTO T 51	400
Torsional recovery (min, %)	California Test 332	18
Or		
Polymer content based on residual asphalt (min, %)	California Test 401	2.5

37-3.02B(4) Aggregate

Aggregate must comply with the quality characteristic requirements shown in the following table:

Aggregate Requirements

Quality characteristic	Test method	Requirement
Los Angeles Rattler loss (max, %) At 500 revolutions	California Test 211 ^a	35
Percent of crushed particles (min, %)	California Test 205	95
Durability (min)	California Test 229	55
Sand equivalent (min)		
Type I	California Test 217	45
Type II		55
Type III		60

^aCalifornia Test 211 must be performed on the source aggregate before crushing. The aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

37-3.02B(5) Slurry Seal Mix Design

The slurry seal mix design, using project source aggregate, an asphaltic emulsion, and set-control agents if any, must comply with the requirements shown in the following table:

Slurry Seal Mix Design Requirements

Quality characteristic	Test method ^a	Requirement
Consistency (max, mm)	Technical Bulletin 106	30
Wet stripping	Technical Bulletin 114	Pass
Compatibility	Technical Bulletin 115	Pass ^b
Cohesion test, within 1 hour (min, kg-mm)	Technical Bulletin 139	200
Wet track abrasion (max, g/m ²)	Technical Bulletin 100	810

^aTest methods are by the International Slurry Surfacing Association.

^bMixing test must pass at the maximum expected air temperature at the job site during placement.

The mix design must have the percent of asphaltic residue, based on percentage by weight of the dry aggregate, within the ranges shown in the following table:

Slurry seal type	Residue range
Type I	10–16
Type II	7.5–13.5
Type III	6.5–12.0

Determine the exact percentage based on the design asphalt binder content and the asphalt residual content of the asphaltic emulsion furnished.

37-3.02C Construction

37-3.02C(1) General

Reserved

37-3.02C(2) Proportioning

After proportioning, slurry seal mixtures must be workable.

37-3.02C(3) Mixing and Spreading Equipment

Reserved

37-3.02C(4) Placement

The slurry seal spread rates must be within the ranges shown in the following table:

Slurry seal type	Application range (lb of dry aggregate/sq yd)
Type I	8–12
Type II	10–18
Type III	20–25

Within 4 hours after placement, slurry seals must be set enough to allow traffic without pilot cars. Protect slurry seals from damage until it has set and will not adhere or be picked up by vehicle tires. Slurry seals must not exhibit distress from traffic such as bleeding, raveling, separation or other distresses.

37-3.02D Payment

The payment quantity for slurry seal is the weight determined by combining the weights of the aggregate and asphaltic emulsion or polymeric asphaltic emulsion. The payment quantity for slurry seal does not include the weights of the added water and set-control additives.

37-3.03 MICRO-SURFACINGS

37-3.03A General

37-3.03A(1) Summary

Section 37-3.03 includes specifications for applying micro-surfacings.

Applying a micro-surfacing consists of spreading a mixture of a micro-surfacing emulsion, water, additives, mineral filler, and aggregate on the pavement.

37-3.03A(2) Definitions

Reserved

37-3.03A(3) Submittals

Immediately after sampling, submit two 1-quart wide mouth plastic containers of micro-surfacing emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

37-3.03A(4) Quality Assurance

37-3.03A(4)(a) General

Reserved

37-3.03A(4)(b) Quality Control

37-3.03A(4)(b)(i) General

Reserved

37-3.03A(4)(b)(ii) Micro-surfacing Emulsions

Take samples from the truck tank at mid load from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take two 1-quart wide mouth plastic containers for acceptance testing.

For a micro-surfacing emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the quality characteristics shown in the following table:

Micro-Surfacing Emulsion

Quality characteristic	Test method	Minimum sampling and testing frequency	Sampling location
Tests on emulsion:			
Saybolt Furol Viscosity, at 25°C (Saybolt Furol seconds)	AASHTO T 59	Minimum 1 per day per delivery truck	Delivery truck
Storage stability, 1 day (max, %) ^a			
Sieve test (max, %)			
Residue by evaporation (min, %)	California Test 331	Minimum 1 per day per delivery truck	Delivery truck
Tests on residue from evaporation test:			
Penetration at 25 °C	AASHTO T 49	Minimum 1 per day per delivery truck	Delivery truck
Softening point (min, °C)	AASHTO T 53		

^aStorage stability test will be run if the storage exceeds 48 hours

37-3.03A(4)(c) Department Acceptance

For micro-surfacing emulsions, acceptance is based on the Department’s sampling and testing for compliance with the requirements shown in the following table:

Micro-surfacing Emulsion Acceptance Criteria

Quality characteristic	Test method	Requirement
Tests on emulsion:		
Saybolt Furol Viscosity at 25 °C (Saybolt Furol seconds)	AASHTO T 59	15–90
Sieve test (%)	AASHTO T 59	0.30
Storage stability, 1 day (max, %)	AASHTO T 59	0–1
Settlement ^a , 5 days (max, %)	ASTM D244	5
Residue by evaporation (min, %)	California Test 331	62
Tests on residue by evaporation:		
Penetration at 25 °C	AASHTO T 49	40–90
Softening point (min, °C)	AASHTO T 53	57

^aSettlement test on emulsion is not required if used within 48 hours of shipment.

Acceptance of aggregate, except mineral filler, is based on the Department’s sampling and testing for compliance with the requirements shown in the following table:

Aggregate Acceptance Criteria

Quality characteristic	Test method	Requirement
Los Angeles Rattler loss (max, %) At 500 revolutions	California Test 211 ^a	35
Percent of crushed particles (min, %)	California Test 205	95
Durability (min)	California Test 229	65
Sand equivalent (min)	California Test 217	
Type II		65
Type III		65

^aCalifornia Test 211 must be performed on the aggregate before crushing. The aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

An aggregate sand equivalent test represents 300 tons or 1 day's production, whichever is less.

If the test results for aggregate sand equivalent do not comply with the specifications, you may remove the micro-surfacing represented by the test results or request it remain in place with a payment deduction. If your request is authorized, the Department deducts \$2.00 per ton of micro-surfacing for each noncompliant aggregate sand equivalent test.

37-3.03B Materials

37-3.03B(1) General

Reserved

37-3.03B(2) Micro-surfacing Emulsions

A micro-surfacing emulsion must be a homogeneous mixture of asphalt, an elastomeric polymer and an emulsifier solution.

Add an elastomeric polymer modifier to asphalt or emulsifier solution before emulsification. An elastomeric polymer solid must be a minimum of 3 percent by weight of the micro-surfacing emulsion's residual asphalt.

A micro-surfacing emulsion must comply with the requirements shown in the following table:

Micro-surfacing Emulsion Requirements

Quality characteristic	Test method	Requirement
Tests on emulsion:		
Saybolt Furol Viscosity at 25 °C (Saybolt Furol seconds)	AASHTO T 59	15–90
Sieve test (%)	AASHTO T 59	0.30
Storage stability, 1 day (max, %)	AASHTO T 59	0–1
Settlement ^a , 5 days (max, %)	ASTM D244	5
Residue by evaporation (min, %)	California Test 331	62
Tests on residue by evaporation:		
Penetration at 25 °C	AASHTO T 49	40–90
Softening point (min, °C)	AASHTO T 53	57

^aSettlement test on emulsion is not required if used within 48 hours of shipment.

37-3.03B(3) Aggregate

Aggregate must comply with the quality characteristic requirements shown in the following table:

Aggregate Requirements

Quality characteristic	Test method	Requirement
Los Angeles Rattler loss (max, %) At 500 revolutions	California Test 211 ^a	35
Percent of crushed particles (min, %)	California Test 205	95
Durability (min)	California Test 229	65
Sand equivalent (min)	California Test 217	
Type II		65
Type III		65

^aCalifornia Test 211 must be performed on the source aggregate before crushing. The aggregate supplier must certify that the crushed aggregate being used on the project is manufactured from the source aggregate complying with the LA rattler requirements.

37-3.03B(4) Mineral Fillers

If a mineral filler is used, it must be type I or type II Portland cement. A mineral filler used during mix design must be used during production.

37-3.03B(5) Micro-Surfacing Mix Designs

The micro-surfacing mix design must have the material proportion limits shown in the following table:

Micro-surfacing Mix Design Proportion Limits

Material	Proportion limits
Micro-surfacing emulsion asphalt residual content (% of dry weight of aggregate)	5.5–10.5
Water and additives	As Required
Mineral filler (% of dry weight of aggregate)	0–3

The micro-surfacing mix design must comply with the requirements shown in the following table:

Micro-surfacing Mix Design Requirements

Quality characteristics	Test method ^a	Requirement
Wet cohesion At 30 minutes (set) (min, kg-cm) At 60 minutes (traffic) (min, kg-cm)	Technical Bulletin 139	12 20
Excess asphalt (max, g/m ²)	Technical Bulletin 109	540
Wet stripping (min, %)	Technical Bulletin 114	90
Wet track abrasion loss 6-day soak (max, g/m ²)	Technical Bulletin 100	810
Displacement Lateral (max, %) Specific gravity after 1000 cycles of 57 kg (max)	Technical Bulletin 147A	5 2.10
Classification compatibility (min, grade points)	Technical Bulletin 144	(AAA, BAA) 11
Mix time at 25 °C (min)	Technical Bulletin 113	Controllable to 120 seconds

^aTest methods are by the International Slurry Surfacing Association.

37-3.03B(6) Tack Coats

If there is a bid item for tack coat, you must coat the pavement surface with an asphaltic emulsion mixed with additional water before applying a micro-surfacing. The maximum ratio of water to asphaltic emulsion must be 2 to 1. Apply the tack coat at a rate from 0.08 to 0.15 gal/sq yd. The exact rate must be authorized.

You determine the grade of slow-setting or quick setting asphaltic emulsion to be used.

37-3.03C Construction

37-3.03C(1) General

Reserved

37-3.03C(2) Proportioning

Field conditions may require adjustments to the proportions within the authorized mix design during construction.

37-3.03C(3) Mixing and Spreading Equipment

37-3.03C(3)(a) General

Reserved

37-3.03C(3)(b) Scratch Course Boxes

Spread the scratch courses with the same type of spreader box used to spread micro-surfacings except use an adjustable steel strike-off device instead of a final strike-off device.

37-3.03C(3)(c) Wheel Path Depression Boxes

Each wheel path depression box must have adjustable strike-off device between 5 and 6 feet wide to regulate depth. The wheel path depression box must also have devices such as hydraulic augers capable of:

1. Moving the mixed material from the rear to the front of the filling chamber
2. Guiding larger aggregate into the deeper section of the wheel path depression
3. Forcing the finer material towards the outer edges of the spreader box

37-3.03C(4) Test Strips

If micro-surfacing placement will require more than 1 day, you must construct a test strip. The test strip must be:

1. From 300 to 450 feet long
2. The same as the full production micro-surfacing
3. On 1 of the application courses specified at an authorized location
4. At the same time of day or night the full production micro-surfacing is to be applied

If multiple application courses are specified, you may construct test strips over 2 days or nights.

The Engineer evaluates the test strip after traffic has used it for 12 hours. If the Engineer determines the mix design or placement procedure is unacceptable, make modifications and construct a new test strip for the Engineer's evaluation.

37-3.03C(5) Placement

37-3.03C(5)(a) General

Reserved

37-3.03C(5)(b) Repair Wheel Path Depressions

If repairing wheel path depressions is shown in plans, fill wheel path depressions and irregularities with micro-surfacing material before spreading micro-surfacing. If the depressions are less than 0.04 foot deep, fill with a scratch course. If the depressions are 0.04 foot deep or more, fill the depressions using a wheel path depression box.

Spread scratch courses by adjusting the steel strike-off of a scratch course box until it is directly in contact with the pavement surface.

Spread micro-surfacings with a wheel path depression box leaving a slight crown at the surface. Use multiple applications to fill depressions more than 0.12 foot deep. Do not apply more than 0.12 foot in a single application.

Allow traffic to compact each filled wheel path depression for a minimum of 12 hours before placing additional micro-surfacings.

37-3.03C(5)(c) Micro-surfacing Pavement Surfaces

The micro-surfacing spread rates must be within the ranges shown in the following table:

Micro-surfacing type	Application range (lb of dry aggregate/sq yd)
Type II	10–20
Type III ^a	20–32
Type III ^b	30–32

^aOver asphalt concrete pavement

^bOver concrete pavement and concrete bridge decks

Within 2 hours after placement, micro-surfacings must be set enough to allow traffic without pilot cars. Protect the micro-surfacings from damage until it has set and will not adhere or be picked up by vehicle tires. Micro-surfacings must not exhibit distress from traffic such as bleeding, raveling, separation or other distresses.

37-3.03D Payment

The payment quantity for micro-surfacing is the weight determined by combining the weights of the aggregate and micro-surfacing emulsion. The payment quantity for micro-surfacing does not include the weights of added water, mineral filler, and additives.

37-3.04 RUBBERIZED AND MODIFIED SLURRY SEALS

Reserved

37-4 FOG SEALS AND FLUSH COATS

37-4.01 GENERAL

37-4.01A General

37-4.01A(1) Summary

Section 37-4.01 includes general specifications for applying fog seals and flush coats.

37-4.01A(2) Definitions

Reserved

37-4.01A(3) Submittals

At least 15 days before use, submit:

1. Sample of asphaltic emulsion in two 1-quart plastic container with lined, sealed lid
2. Asphaltic emulsion information and test data as follows:
 - 2.1. Supplier
 - 2.2. Type/Grade of asphalt emulsion
 - 2.3. Copy of the specified test results for asphaltic emulsion

37-4.01B Materials

Not Used

37-4.01C Construction

37-4.01C(1) General

Reserved

37-4.01C(2) Weather Conditions

Only place a fog seal or flush coat if both the pavement and ambient temperatures are at least 50 degrees F and rising. Do not place a fog seal or flush coat within 24 hours of rain or within 24 hours of forecast rain or freezing temperatures.

37-4.01D Payment

Not Used

37-4.02 FOG SEALS

37-4.02A General

37-4.02A(1) Summary

Section 37-4.02 includes specifications for applying fog seals.

Applying a fog seal includes applying a diluted slow-setting or quick setting asphaltic emulsion.

37-4.02A(2) Definitions

Reserved

37-4.02A(3) Submittals

Immediately after sampling, submit two 1-quart plastic container of asphaltic emulsion taken in the presence of the Engineer. Samples must be submitted in insulated shipping container.

37-4.02A(4) Quality Assurance**37-4.02A(4)(a) General**

Reserved

37-4.02A(4)(b) Quality Control**37-4.02A(4)(b)(i) General**

Reserved

37-4.02A(4)(b)(ii) Asphaltic Emulsions

Circulate asphaltic emulsions in the distributor truck before sampling. Take samples from the distributor truck at mid load or from a sampling tap or thief. Before taking samples, draw and dispose of 1 gallon. In the presence of the Engineer, take asphalt emulsion sample in two 1-quart plastic container with lined, sealed lid.

For asphaltic emulsions, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphaltic Emulsion

Quality characteristic	Test Method	Minimum sampling and testing frequency	Sampling location
Saybolt Furol Viscosity, at 25 °C (Saybolt Furl seconds)	AASHTO T 59	Minimum 1 per day per delivery truck	Distributor truck
Sieve Test (%)			
Storage stability, 1 day (%)			
Residue by distillation (%)			
Particle charge ^a			
Tests on Residue from Distillation Test:			
Penetration, 25 °C	AASHTO T 49	Minimum 1 per day per delivery truck	Distributor truck
Ductility	AASHTO T 51		
Solubility in trichloroethylene	AASHTO T 44		

^aIf the result of the particle charge is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

37-4.02A(4)(b)(iii) Asphaltic Emulsion Spread Rates

For fog seals, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Fog Seal Quality Control Requirements

Quality characteristic	Test method	Minimum sampling and testing frequency	Location of sampling
Asphaltic emulsion spread rate (gal/sq yd)	California Test 339	2 per day	Pavement surface

37-4.02A(4)(c) Department Acceptance

Fog seal acceptance is based on:

1. Visual inspection for the following:
 - 1.1. Uniform surface texture throughout the work limits
 - 1.2. Flushing consisting of the occurrence of a film of asphaltic material on the surface
 - 1.4. Streaking consisting of alternating longitudinal bands of asphaltic emulsion approximately parallel with the lane line
2. The Department's sampling and testing for compliance with the requirements for the quality characteristics specified in section 94 for asphaltic emulsion
3. Department's sampling and testing for compliance with the requirements for fog seal shown in the following table:

Fog Seal Acceptance Criteria

Quality Characteristic	Test Method	Requirement
Asphaltic emulsion spread rate (gal/sq yd)	California Test 339	TV ± 10%

37-4.02B Materials

You determine the grade of slow-setting or quick setting asphaltic emulsion to be used.

37-4.02C Construction

Apply asphaltic emulsions for fog seals at a residual asphalt rate from 0.02 to 0.06 gal/sq yd.

If additional water is added to the asphaltic emulsions, the resultant mixture must not be more than 1 part asphaltic emulsion to 1 part water. You determine the dilution rate.

If the fog seals become tacky, sprinkle water as required.

If fog seals and chip seals are on the same project, the joint between the seal coats must be neat and uniform.

37-4.02D Payment

The Department does not adjust the unit price for an increase or decrease in the asphaltic emulsion quantity.

37-4.03 FLUSH COATS

37-4.03A General

37-4.03A(1) Summary

Section 37-4.03 includes specifications for applying flush coats.

Applying a flush coat includes applying a fog seal coat followed by sand.

37-4.03A(2) Definitions

Reserved

37-4.03A(3) Submittals

At least 15 days before use, submit:

1. Proposed target X values for sand gradation.
2. Gradation test results for sand

Submit quality control test results for sand gradation within 2 business days of sampling.

37-4.03A(4) Quality Assurance

37-4.03A(4)(a) General

Reserved

37-4.03A(4)(b) Quality Control

For sand, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Sand Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Location of sampling
Gradation (% passing by weight)	California Test 202	1 per day	See California Test 125

37-4.03A(4)(c) Department Acceptance

Flush coat acceptance is based on fog seal acceptance and the following:

1. Visual inspection for uniform application of sand.
2. Sand acceptance is based on the Department's sampling and testing for compliance with the requirements shown in the following table:

Sand Gradation Acceptance Criteria

Quality characteristic	Test method	Requirement
Gradation (% passing by weight)	California Test 202	
Sieve size:		
3/8"		100
No. 4		93-100
No. 8		61-99
No. 16		X ± 13
No. 30		X ± 12
No. 50		X ± 9
No.100		1-15
No. 200	0-10	

NOTE: "X" is the gradation that you propose to furnish for the specific sieve size.

37-4.03B Material

37-4.03B(1) General

Reserved

37-4.03B(2) Sand

Sand must be free from deleterious coatings, clay balls, roots, bark, sticks, rags, and other extraneous material.

Sand for a flush coat must comply with the gradations shown in the following table:

Sand Gradation

Quality characteristic	Test method	Requirement
Gradation (% passing by weight)	California Test 202	
Sieve size:		
3/8"		100
No. 4		93-100
No. 8		61-99
No. 16		X ± 13
No. 30		X ± 12
No. 50		X ± 9
No.100		1-15
No. 200	0-10	

NOTE: "X" is the gradation that you propose to furnish for the specific sieve size.

Fine aggregate sizes must be distributed such that the difference between the total percentage passing the No. 16 and No. 30 sieves is from 10 to 40, and the difference between the percentage passing the No. 30 and No. 50 sieves is from 10 to 40.

37-4.03C Construction

37-4.03C(1) General

During flush coat activities, close adjacent lanes to traffic. Do not track asphaltic emulsion on existing pavement surfaces.

Apply sand immediately after applying asphaltic emulsions.

Spread sand aggregate with a mechanical device that spreads sand at a uniform rate over the full width of a traffic lane in a single application. Spread sand at a rate from 2 to 6 lb/sq yd. You determine the application rates for sand and the Engineer authorizes the application rate.

37-4.03C(2) Sweeping

Sweep loose sand material remaining on the surface 24 hours after application.

37-4.03D Payment

The Department does not adjust the unit price for an increase or decrease in the sand cover (seal) quantity.

37-5 PARKING AREA SEALS

37-5.01 GENERAL

37-5.01A Summary

Section 37-5 includes specifications for applying parking area seals. Sealing a parking area consists of spreading a mixture of asphaltic emulsion, aggregate, polymer, and water.

37-5.01B Definitions

Reserved

37-5.01C Submittals

At least 15 days before starting placement, submit a 20 lb sample of the aggregate to be used.

At least 10 days before starting placement, submit:

1. Name of the authorized laboratory to perform testing and mix design.

2. Laboratory report of test results and a proposed mix design. The report and mix design must include the specific materials to be used and show a comparison of test results and specifications. The mix design report must include the quantity of water allowed to be added at the job site. The authorized laboratory performing the tests must sign the original laboratory report and mix design.
3. Manufacturer's data for oil seal primer and polymer.

If the mix design consists of the same materials covered by a previous laboratory report, you may submit the previous laboratory report that must include material testing data performed within the previous 12 months for authorization.

If you request substitute materials, submit a new laboratory report and mix design at least 10 days before starting placement.

Submit a certificate of compliance for the parking area seal material.

Immediately after sampling, submit two 1-quart plastic containers of parking area seal taken in the presence of the Engineer. Samples must be submitted in insulated shipping containers.

37-5.01D Quality Assurance

37-5.01D(1) General

Reserved

37-5.01D(2) Quality Control

37-5.01D(2)(a) General

Reserved

37-5.01D(2)(b) Asphaltic Emulsions

For an asphaltic emulsion, the authorized laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphaltic Emulsion			
Quality characteristic	Test Method	Minimum sampling and testing frequency	Sampling location
Saybolt Furol Viscosity, at 25 °C (Saybolt Furol seconds)	AASHTO T 59	Minimum 1 per day per delivery truck	Distributor truck
Sieve Test (%)			
Storage stability, 1 day (%)			
Residue by distillation (%)			
Particle charge ^a			
Tests on Residue from Distillation Test			
Penetration, 25 °C	AASHTO T 49	Minimum 1 per day per delivery truck	Distributor truck
Ductility	AASHTO T 51		
Solubility in trichloroethylene	AASHTO T 44		

^aIf the result of the particle char is inconclusive, the asphaltic emulsion must be tested for pH under ASTM E70. Grade QS1h asphaltic emulsion must have a minimum pH of 7.3. Grade CQS1h asphaltic emulsion must have a maximum pH of 6.7.

37-5.01D(2)(c) Sand

For sand, the authorized laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Sand Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Location of sampling
Gradation (% passing by weight)	California Test 202	One per project	See California Test 125

37-5.01D(2)(d) Parking Area Seals

For a parking area seal, the authorized laboratory must perform quality control sampling and testing at the specified frequency for the following quality characteristics:

Parking Area Seal Requirements

Quality characteristic	Test method	Frequency
Mass per liter (kg)	ASTM D244	One per project
Cone penetration (mm)	California Test 413	
Nonvolatile (%)	ASTM D2042 ^a	
Nonvolatile soluble in trichloroethylene (%)		
Wet track abrasion (g/m ²)	ASTM D3910	
Dried film color	--	
Viscosity (KU) ^b	ASTM D562	

^aWeigh 10 g of homogenous material into a previously tarred, small can. Place in a constant temperature oven at 165 ± 5 °C for 90 ± 3 minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight.

^bKrebs units

37-5.01D(3) Department Acceptance

Parking area seal acceptance is based on:

1. Visual inspection for:
 - 1.1. Uniform surface texture throughout the work limits
 - 1.2. Marks in the surface:
 - 1.2.1. Up to 4 marks in the completed parking area seal that are up to 1 inch wide and up to 6 inches long per 1,000 square feet of parking area seal placed.
 - 1.2.2. No marks in the completed parking area seal surface that are over 1 inch wide or 6 inches long.
 - 1.2. Raveling consisting of the separation of the aggregate from the asphaltic emulsion
 - 1.3. Bleeding consisting of the occurrence of a film of asphaltic material on the surface of the parking area seal
 - 1.4. Delaminating of the parking area seal from the existing pavement
 - 1.5. Rutting or wash-boarding
2. The Department's sampling and testing of aggregate for compliance with 100 percent passing no. 16 sieve under California Test 202
3. The Department's sampling and testing for compliance with the requirements shown in the following table:

Parking Area Seal Acceptance Criteria

Quality characteristic	Test method	Requirement
Mass per liter (min, kg)	ASTM D244	1.1
Cone penetration (mm)	California Test 413	340–700
Nonvolatile (min, %)	ASTM D2042 ^a	50
Nonvolatile soluble in trichloroethylene (%)		10–35
Wet track abrasion (max, g/m ²)	ASTM D3910	380
Dried film color	--	Black
Viscosity (min, KU) ^b	ASTM D562	75

^aWeigh 10 g of homogenous material into a previously tared, small ointment can. Place in a constant temperature oven at 165 ± 5 °C for 90 ± 3 minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight.

^bKrebs units

37-5.02 MATERIALS

37-5.02A General

Aggregate must be clean, hard, durable, uncoated, and free from organic and deleterious substances. One hundred percent of the aggregate must pass the no. 16 sieve.

Asphaltic emulsion must be either Grade SS1h or CSS1h, except the values for penetration at 25 degrees C for tests on residue from distillation must be from 20 to 60.

Polymer must be either neoprene, ethylene vinyl acetate, or a blend of butadiene and styrene.

Oil seal primer must be a quick-drying emulsion with admixtures. Oil seal primer must be manufactured to isolate the parking area seal from pavement with residual oils, petroleum grease, and spilled gasoline.

Crack sealant must comply with section 37-6.

Water must be potable and not separate from the emulsion before the material is placed.

37-5.02B Mix Design

The proposed mix design for a parking area seal must comply with the requirements shown in the following table:

Parking Area Seal Mix Design Requirements

Quality characteristic	Test method	Requirement
Mass per liter (min, kg)	ASTM D244	1.1
Cone penetration (mm)	California Test 413	340–700
Nonvolatile (min, %)	ASTM D2042 ^a	50
Nonvolatile soluble in trichloroethylene (%)		10–35
Wet track abrasion (max, g/m ²)	ASTM D3910	380
Dried film color	--	Black
Viscosity (min, KU) ^b	ASTM D562	75

^aWeigh 10 g of homogenous material into a previously tarred, small ointment can. Place in a constant temperature oven at 165 ± 5 °C for 90 ± 3 minutes. Cool, reweigh, and calculate nonvolatile components as a percent of the original weight.

^bKrebs units

A parking area seal must contain a minimum of 2 percent polymer by volume of undiluted asphaltic emulsion.

37-5.02C Proportioning

Parking area seal ingredients must be mixed at a central plant. The plant must include mechanical or electronic controls that consistently proportion the ingredients. Mix an asphaltic emulsion with the other ingredients mechanically.

Store the parking area seal in a tank equipped with mixing or agitation devices. Keep stored materials thoroughly mixed. Protect stored materials from freezing conditions.

37-5.03 CONSTRUCTION

37-5.03A General

Request that the Engineer shut off the irrigation control system at least 5 days before placing the seal. Do not water plants adjacent to the seal at least 24 hours before and after the seal coat placement.

37-5.03B Surface Preparations

If cracks in the existing pavement are from 1/4 to 1 inch wide, treat the cracks under section 37-6. Do not place the parking area seals until the Engineer determines that the crack treatments are cured.

If cracks in the existing pavement are greater than 1 inch wide, the Engineer orders the repair. This work is change order work.

After any crack treatment and before placing parking area seals, clean the pavement surface, including removal of oil and grease spots. Do not use solvents.

If cleaning the pavement with detergents, thoroughly rinse with water. Allow all water to dry before placing parking area seals.

You must seal oil and grease spots that remain after cleaning. Use an oil seal primer and comply with the manufacturer's instructions.

If the existing pavement has oil and grease spots that do not come clean and sealing is insufficient, the Engineer orders the repair of the pavement. This work is change order work.

Before placing the parking area seals, dampen the pavement surface using a distributor truck. Place the seal on the damp pavement but do not place it with standing water on the pavement.

37-5.03C Placement

If adding water at the job site based on the manufacturer's instructions for consistency and spreadability, do not exceed 15 percent by volume of undiluted asphaltic emulsion.

Place the parking area seals in 1 or more application. The seals must be uniform and smooth, free of ridges or uncoated areas.

If placing in multiple applications, allow the last application to thoroughly dry before the subsequent application.

Do not allow traffic on the parking area seals for at least 24 hours after placement.

Do not stripe over the parking area seals until it is dry.

37-5.04 PAYMENT

The payment quantity for parking area seal is the weight determined by combining the weights of the aggregate and asphaltic emulsion. The payment quantity for parking area seal does not include the added water and set-control additive.

37-6 CRACK TREATMENTS

37-6.01 GENERAL

37-6.01A Summary

Section 37-6 includes specifications for treating cracks in asphalt concrete pavement.

37-6.01B Definitions

Reserved

37-6.01C Submittals

If your selected crack treatment material is on the Authorized Material List for flexible pavement crack treatment material, submit a certificate of compliance including:

1. Manufacturer's name
2. Production location
3. Brand or trade name
4. Designation
5. Batch or lot number
6. Crack treatment material type
7. Contractor or subcontractor name
8. Contract number
9. Lot size
10. Shipment date
11. Manufacturer's signature

If your selected crack treatment material is not on the Authorized Material List for flexible pavement crack treatment material, submit a sample and test results from each batch or lot 20 days before use. Testing must be performed by an authorized laboratory and test results must show compliance with the specifications. Test reports must include the information specified for the certificate of compliance submittal. Each hot-applied crack treatment material sample must be a minimum of 3 lb and submitted in a silicone release container. Each cold-applied crack treatment material sample must be a minimum of 2 quarts and submitted in a plastic container.

At least 10 days before the start of work, submit sand gradation test results under California Test 202.

Submit the following with each delivery of crack treatment material to the job site:

1. Manufacturer's heating and application instructions
2. Manufacturer's SDS
3. Name of the manufacturer's recommended detackifying agent

37-6.01D Quality Assurance

37-6.01D(1) General

Hot-applied crack treatment material must be sampled at least once per project in the Engineer's presence. Collect two 3-pounds-minimum samples of crack treatment material from the dispensing wand into silicone release boxes.

Cold-applied crack treatment material must be sampled at least once per project in the Engineer's presence. Collect 2 samples of crack treatment material from the dispensing wand into 1-quart containers.

37-6.01D(2) Quality Control

Reserved

37-6.01D(3) Department Acceptance

Crack treatment acceptance is based on:

1. Visual inspection for uniform filling of cracks throughout the work limits including:
 - 1.2. Crack treatment is not more than a 1/4 inch below the specified level
 - 1.3. Sealant failures
 - 1.4. Crack re-opening
 - 1.5. Crack overbanding is less than 3 inches wide
2. The Department's sampling and testing for compliance with the requirements shown in the following table:

Crack Treatment Acceptance Criteria

Quality characteristic ^a	Test method ^b	Requirement				
		Type 1	Type 2	Type 3	Type 4	Type 5
Softening point (min, °C)	ASTM D36	102	96	90	84	84
Cone penetration at 77 °F (max)	ASTM D5329	35	40	50	70	90
Resilience at 77 °F, unaged (%)	ASTM D5329	20–60	25–65	30–70	35–75	40–80
Flexibility (°C) ^c	ASTM D3111	0	0	0	-11	-28
Tensile adhesion (min, %)	ASTM D5329	300	400	400	500	500
Specific gravity (max)	ASTM D70	1.25	1.25	1.25	1.25	1.25
Asphalt compatibility	ASTM D5329	Pass	Pass	Pass	Pass	Pass
Sieve test (% passing)	See note d	100	100	100	100	100

^aCold-applied crack treatment material residue collected under ASTM D6943, Method B and sampled under ASTM D140 must comply with the grade specified.

^bExcept for viscosity, cure each specimen at a temperature of 23 ± 2 °C and a relative humidity of 50 ± 10 percent for 24 ± 2 hours before testing.

^cFor the flexibility test, the specimen size must be 6.4 ± 0.2 mm thick by 25 ± 0.2 mm wide by 150 ± 0.5 mm long. The test mandrel diameter must be 6.4 ± 0.2 mm. The bend arc must be 180 degrees. The bend rate must be 2 ± 1 seconds. At least 4 of 5 test specimens must pass at the specified test temperature without fracture, crazing, or cracking.

^dFor hot-applied crack treatment, dilute with toluene and sieve through a no. 8 sieve. For cold-applied crack treatment, sieve the material as-received through a no. 8 sieve. If the manufacturer provides a statement that added components passed the no. 16 sieve before blending, this requirement is void.

37-6.02 MATERIALS

37-6.02A General

Reserved

37-6.02B Crack Treatment Material

A crack treatment material must comply with the requirements shown in the following table:

Crack Treatment Material

Quality characteristic ^a	Test method ^b	Requirement				
		Type 1	Type 2	Type 3	Type 4	Type 5
Softening point (min, °C)	ASTM D36	102	96	90	84	84
Cone penetration at 77 °F (max)	ASTM D5329	35	40	50	70	90
Resilience at 77 °F, unaged (%)	ASTM D5329	20–60	25–65	30–70	35–75	40–80
Flexibility (°C) ^c	ASTM D3111	0	0	0	-11	-28
Tensile adhesion (min, %)	ASTM D5329	300	400	400	500	500
Specific gravity (max)	ASTM D70	1.25	1.25	1.25	1.25	1.25
Asphalt compatibility	ASTM D5329	Pass	Pass	Pass	Pass	Pass
Sieve test (% passing)	See note d	100	100	100	100	100

^aCold-applied crack treatment material residue collected under ASTM D6943, Method B and sampled under ASTM D140 must comply with the grade specifications.

^bExcept for viscosity, cure each specimen at a temperature of 23 ± 2 °C and a relative humidity of 50 ± 10 percent for 24 ± 2 hours before testing.

^cFor the flexibility test, the specimen size must be 6.4 ± 0.2 mm thick by 25 ± 0.2 mm wide by 150 ± 0.5 mm long. The test mandrel diameter must be 6.4 ± 0.2 mm. The bend arc must be 180 degrees. The bend rate must be 2 ± 1 seconds. At least 4 of 5 test specimens must pass at the specified test temperature without fracture, crazing, or cracking.

^dFor hot-applied crack treatment, dilute with toluene and sieve through a no. 8 sieve. For cold-applied crack treatment, sieve the material as-received through a no. 8 sieve. If the manufacturer provides a statement that added components passed the no. 16 sieve before blending, this requirement is void.

A crack treatment material must be delivered to the job site with the information listed below. If crack treatment material is delivered to the job site in containers, each container must be marked with the following information.

1. Manufacturer's name
2. Production location
3. Brand or trade name
4. Designation
5. Crack treatment trade name
6. Batch or lot number
7. Maximum heating temperature
8. Expiration date for cold application only

Hot-applied crack treatment must be delivered to the job site premixed in cardboard containers with meltable inclusion liners or in a fully meltable package.

Cold-applied crack treatment must have a minimum shelf life of 3 months from the date of manufacture.

37-6.02C Sand

Sand applied to tacky crack treatment material must be clean, free of clay, and comply with the gradation shown in the following table:

Sand Gradation

Quality characteristic	Test method	Requirement
Gradation (% passing by weight)		
Sieve size:		
No. 4	California Test 202	100
No. 50		0-30
No. 200		0-5

37-6.03 CONSTRUCTION

Treat cracks from 1/4 to 1 inch in width for the entire length of the crack. Fill or repair cracks wider than 1 inch as ordered. Filling cracks wider than 1 inch is change order work.

If treating cracks on a traffic lane adjacent to a shoulder, treat the cracks on the shoulder.

For hot-applied crack treatment material, rout cracks or saw cut to form a reservoir.

Cracks must be clean and dry before treating. Before treating, blast cracks with oil-free compressed air at a pressure of at least 90 psi.

If the pavement temperature is below 40 degrees F or if there is evidence of moisture in the crack, use a hot air lance immediately before applying crack treatment. The hot air lance must not apply flame directly on the pavement.

Heat and apply hot-applied crack treatment material under with the manufacturer's instructions.

Apply cold-applied crack treatment material with a distributor kettle, a piston, or a diaphragm barrel pump that can deliver from 50 to 75 psi. The application line must have a pressure gauge and a filter. The pressure in the application line must not exceed 20 psi. The pressure gauge must have a regulator. Use a high-pressure hose with a 1/2-inch NPT swivel connection and a dispensing wand.

Apply crack treatment with a nozzle inserted into the crack. Fill the crack flush. If after 2 days the crack treatment is more than 1/4 inch below the specified level, the sealant fails, or the crack re-opens, re-treat the crack.

Immediately remove crack treatment material that is spilled or deposited on the pavement surface.

Before opening to traffic, apply sand or the manufacturer's recommended detackifying agent to tacky crack treatment material on the traveled way.

Sweep up excess sand before opening to traffic.

37-6.04 PAYMENT

The payment quantity for crack treatment is the length measured in lane miles along the edge of each paved lane parallel to the pavement's centerline. The payment for a lane includes crack treatment of the adjacent shoulder.

37-7-37-10 RESERVED

^^

39 ASPHALT CONCRETE

04-20-18

Replace *SP-2* at each occurrence in section 39 with:

MS-2

01-15-16

Replace the 3rd paragraph of section 39-2.01A(1) with:

07-15-16

WMA technologies must be on the Authorized Material List for WMA authorized technologies.

Add between the 3rd and 4th paragraphs of section 39-2.01A(1):

04-15-16

For HMA that uses asphalt binder containing crumb rubber modifier, submit a Crumb Rubber Usage Report form monthly and at the end of the project.

Replace the table in the 4th paragraph of section 39-2.01A(1) with:

07-21-17

Test method	Year of publication
AASHTO M 17	2011 (2015)
AASHTO M 323	2013
AASHTO R 30	2002 (2015)
AASHTO R 59	2011 (2015)
AASHTO T 27	2014
AASHTO T 49	2014
AASHTO T 59	2013
AASHTO T 96	2002 (2010)
AASHTO T 164	2014
AASHTO T 176	2008
AASHTO T 209	2012
AASHTO T 269	2014
AASHTO T 275	2007 (2012)
AASHTO T 283	2014
AASHTO T 304	2011
AASHTO T 305	2014
AASHTO T 308	2010
AASHTO T 312	2014
AASHTO T 313	2012 (2016)
AASHTO T 315	2012 (2016)
AASHTO T 324	2014
AASHTO T 329	2013
AASHTO T 335	2009
ASTM D36/D36M	2014 ^{e1}
ASTM D92	2012b
ASTM D217	2010
ASTM D297	2013
ASTM D445	2014
ASTM D1856	2009 (Reapproved 2015)
ASTM D2007	2011
ASTM D2074	2007 (Reapproved 2013)
ASTM D2995	1999 (Reapproved 2009)
ASTM D4791	2010
ASTM D5329	2009
ASTM D7741/D7741M	2011 ^{e1}
Asphalt Institute MS-2	7th edition (2015)

Replace items 1 and 2 in the 1st paragraph of section 39-2.01A(3)(b)(i) with:

07-21-17

1. Mix design documentation on a Contractor Hot Mix Asphalt Design Data form dated within 12 months of the submittal for the JMF verification.
2. JMF verification on a Caltrans Hot Mix Asphalt Verification form and the Contractor Hot Mix Asphalt Design Data form that was submitted for the JMF verification, if applicable.

Replace the 2nd paragraph of section 39-2.01A(3)(b)(i) with:

04-20-18

The Contractor Hot Mix Asphalt Design Data form must identify the AASHTO resource accredited lab responsible for the mix design and show documentation on aggregate quality.

Add to item 8 in the 4th paragraph of section 39-2.01A(3)(b)(i):

07-15-16

, except lime supplier and source

Replace the 1st paragraph of section 39-2.01A(3)(c) with:

04-20-18

At least 5 business days prior to the pre-paving meeting, submit a QC plan for HMA.

Replace the headings and paragraphs of section 39-2.01A(3)(i) with:

01-15-16

39-2.01A(3)(i) Reserved

Replace section 39-2.01A(3)(j) with:

04-20-18

39-2.01A(3)(j) Tack Coat

Prior to applying tack coat, submit calculations for the minimum spray rate required to achieve the minimum residual rate.

Replace the 2nd sentence in the 3rd paragraph of section 39-2.01A(4)(b) with:

01-15-16

Submit 3 parts and keep 1 part.

07-21-17

Delete item 3 in the 5th paragraph of section 39-2.01A(4)(b).

Replace the 8th paragraph of section 39-2.01A(4)(b) with:

04-20-18

If the Engineer's test results on plant-produced samples do not show compliance with the specifications, the Engineer notifies you. Submit a JMF adjusted after verification failure based on your testing unless the Engineer authorizes reverification without adjustments. Engineer authorized reverification without adjustment is not JMF adjusted after verification failure. A JMF adjusted after verification failure may include a change in:

1. Asphalt binder content TV up to ± 0.20 percent from the OBC value submitted on the Contractor Hot Mix Asphalt Design Data form
2. Aggregate gradation TV within the TV limits specified in the aggregate gradation table

Replace the 10th paragraph of section 39-2.01A(4)(b) with:

04-20-18

For each HMA type and aggregate size specified, the Engineer verifies up to 2 proposed JMF submittals including a JMF adjusted after verification failure. Do not resubmit any of the 2 proposed submittals including a JMF adjusted after verification failure that failed verification on any other Caltrans projects. If you submit more than 2 JMFs for each type of HMA and aggregate size, the Engineer deducts \$3,000 from payments for each verification exceeding this limit. This deduction does not apply to verifications initiated by the Engineer or if a JMF expires while HMA production is stopped longer than 30 days.

Replace *AASHTO Materials Reference Laboratory* in the paragraph of section 39-2.01A(4)(f)(i) with:

01-20-17

AASHTO re:source

Add between the 1st and 2nd paragraphs of section 39-2.01A(4)(h)(i):

04-20-18

Condition each at-the-plant sample of HMA mixture for AASHTO 324 and AASHTO 283 in compliance with sections 7.1.2, 7.1.3, and 7.1.4 of AASHTO R 30. Condition each at-the-plant sample of HMA mixture when composite aggregate absorption factor is greater than 2.0 percent as indicated by the JMF in compliance with sections 7.1.2, 7.1.3, and 7.1.4 of AASHTO R 30.

04-20-18

Delete section 39-2.01A(4)(h)(ix)

Replace the 5th paragraph of section 39-2.01A(4)(i)(i) with:

04-20-18

The Engineer conditions each at-the-plant sample of HMA mixture for AASHTO 324 and AASHTO 283 in compliance with sections 7.1.2, 7.1.3, and 7.1.4 of AASHTO R 30. The Engineer conditions each at-the-plant sample of HMA mixture when composite aggregate absorption factor is greater than 2.0 percent as indicated by the JMF in compliance with sections 7.1.2, 7.1.3, and 7.1.4 of AASHTO R 30.

07-21-17

Delete the 6th paragraph of section 39-2.01A(4)(i)(i).

Add between *single* and *test* in the 7th paragraph of section 39-2.01A(4)(i)(i):

07-15-16

aggregate or HMA

Replace *Engineer may accept* in the introductory clause of the 3rd paragraph of section 39-2.01A(4)(i)(ii) with:

07-21-17

Engineer must accept

Replace the table in section 39-2.01A(4)(i)(iii) with:

04-20-18

HMA Pavement Smoothness Acceptance Criteria

HMA thickness	Mean Roughness Index requirement
> 0.25 foot	60 in/mi or less
≤ 0.25 foot	75 in/mi or less

Note: These requirements do not apply to the OGFC surface. Smoothness requirements for OGFC are specified in section 39-2.04A(4)(c)(iii).

Replace *AASHTO Materials Reference Laboratory* in the 2nd paragraph of section 39-2.01A(4)(i)(iv) with:

01-20-17

AASHTO re:source

Replace the 1st paragraph of section 39-2.01B(2)(a) with:

07-21-17

The HMA mix design must comply with the superpave HMA mix design as described in *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute.

Replace the 1st paragraph of section 39-2.01B(2)(b) with:

07-15-16

If the proposed JMF indicates that the aggregate is being treated with dry lime or lime slurry with marination, or the HMA with liquid antistripping, then testing the untreated aggregate under AASHTO T 283 and AASHTO T 324 is not required.

If HMA treatment is required or being used by the Contractor, determine the plasticity index of the aggregate blend under California Test 204.

Add between *aggregate* and *with dry lime* in the 3rd and 4th paragraphs of section 39-2.01B(2)(b):

07-15-16

blend

Replace the 9th through 11th paragraphs of section 39-2.01B(8)(a) with:

07-15-16

HMA must be produced at the temperatures shown in the following table:

HMA compaction	Temperature (°F)
HMA	
Density based Method	≤ 325 305–325
HMA with WMA technology	
Density based Method	240–325 260–325

Replace section 39-2.01B(11) with:

07-21-17

39-2.01B(11) Miscellaneous Areas and Dikes

For miscellaneous areas and dikes:

1. Choose the aggregate gradation from:
 - 1.1. 3/8-inch Type A HMA aggregate gradation
 - 1.2. 1/2-inch Type A HMA aggregate gradation
 - 1.3. dike mix aggregate gradation
2. Choose asphalt binder Grade PG 64-10, PG 64-16 or PG 70-10.
3. Minimum asphalt binder content must be:
 - 3.1. 6.40 percent for 3/8-inch Type A HMA aggregate gradation
 - 3.2. 5.70 percent for 1/2-inch Type A HMA aggregate gradation
 - 3.3. 6.00 percent for dike mix aggregate gradation

If you request and the Engineer authorizes, you may reduce the minimum asphalt binder content.

Aggregate gradation for dike mix must be within the TV limits for the specified sieve size shown in the following table:

Sieve size	Target value limit	Allowable tolerance
1/2"	100	--
3/8"	---	95 - 100
No. 4	73–77	TV ± 10
No. 8	58–63	TV ± 10
No. 30	29–34	TV ± 10
No. 200		0 - 14

For HMA used in miscellaneous areas and dikes, sections 39-2.01A(3), 39-2.01A(4), 39-2.01B(2), 39-2.01B(4)(c), and 39-2.01B(5)–(10) do not apply.

Replace item 4 in the 2nd paragraph of section 39-2.01C(1) with:

07-15-16

4. For method compaction:
 - 4.1. The temperature of the HMA and the HMA produced with WMA water injection technology in the windrow does not fall below 260 degrees F
 - 4.2. The temperature of the HMA produced using WMA additive technology in the windrow does not fall below 250 degrees F

Add to the list in the 7th paragraph of section 39-2.01C(1):

07-21-17

4. Marks
5. Tearing
6. Irregular texture

07-15-16

Delete item 3 in the 8th paragraph of section 39-2.01C(1).

Replace the 1st paragraph of section 39-2.01C(2)(c) with:

07-21-17

For method compaction, each paver spreading HMA must be followed by at least one of each of the following 3 types of rollers:

1. Breakdown roller must be a vibratory roller specifically designed to compact HMA. The roller must be capable of at least 2,500 vibrations per minute and must be equipped with amplitude and frequency controls. The roller's gross static weight must be at least 7.5 tons.
2. Intermediate roller must be an oscillating-type pneumatic-tired roller at least 4 feet wide. Pneumatic tires must be of equal size, diameter, type, and ply. The tires must be inflated to 60 psi minimum and maintained so that the air pressure does not vary more than 5 psi.
3. Finishing roller must be a steel-tired, 2-axle tandem roller. The roller's gross static weight must be at least 7.5 tons.

Replace *planing* in the 3rd paragraph of section 39-2.01C(3)(d) with:

07-21-17

planing

Replace *0.20 foot* in item 2 in the list in the 1st paragraph of section 39-2.01C(3)(e) with:

04-20-18

0.25 foot

Replace 39-2.01A(3)(m)(iv) in the 6th paragraph of section 39-2.01C(3)(e) with:

01-15-16

36-3.01C(3)

Replace 2.06 in the 4th paragraph of section 39-2.01C(3)(f) with:

07-15-16

2.05

Replace section 39-2.01C(3)(g) with:

07-21-17

39-2.01C(3)(g) Geosynthetic Pavement Interlayer

Where shown, place geosynthetic pavement interlayer over a coat of asphalt binder and in compliance with the manufacturer's instructions. Do not place the interlayer on a wet or frozen surface. If the interlayer, in compliance with the manufacturer's instructions, does not require asphalt binder, do not apply asphalt binder before placing the interlayer.

Before placing the interlayer or asphalt binder:

1. Repair cracks 1/4 inch and wider, spalls, and holes in the pavement. This repair is change order work.
2. Clean the pavement of loose and extraneous material.

If the interlayer requires asphalt binder, immediately before placing the interlayer, apply asphalt binder at a rate specified by the interlayer manufacturer; at 0.25 ± 0.03 gal per square yard of interlayer; or at a rate that just saturates the interlayer; whichever is greater. Apply asphalt binder the width of the interlayer plus 3 inches on each side. At an interlayer overlap, apply asphalt binder on the lower interlayer the same overlap distance as the upper interlayer.

If asphalt binder tracked onto the interlayer or brought to the surface by construction equipment causes interlayer displacement, cover it with a small quantity of HMA.

If the interlayer placement does not require asphalt binder, apply tack coat prior to placing HMA at the application rates specified under section 39-2.01C(3)(f) based on the condition of the underlying surface on which the interlayer was placed.

Align and place the interlayer with no overlapping wrinkles, except a wrinkle that overlaps may remain if it is less than 1/2 inch thick. If the overlapping wrinkle is more than 1/2 inch thick, cut the wrinkle out and overlap the interlayer no more than 2 inches.

Overlap the interlayer borders between 2 to 4 inches. In the direction of paving, overlap the following roll with the preceding roll at any break.

You may use rolling equipment to correct distortions or wrinkles in the interlayer.

Before placing HMA on the interlayer, do not expose the interlayer to:

1. Traffic, except for crossings under traffic control and only after you place a small HMA quantity
2. Sharp turns from construction equipment
3. Damaging elements

Pave HMA on the interlayer during the same work shift. The minimum HMA thickness over the interlayer must be 0.12 foot including at conform tapers.

Add to the end of section 39-2.01C(15)(b):

07-15-16

The compacted lift thickness must not exceed 0.25 foot.

Add between *rectangles* and *with* in the 4th paragraph of section 39-2.01C(16):

04-15-16

, half the lane width,

Add between *to* and *the* in item 1 of the 4th paragraph of section 39-2.01C(16):

04-15-16

and along

Delete *coat* in the 5th paragraph of section 39-2.01C(16).

07-15-16

Replace 37 in the 5th paragraph of section 39-2.01C(16) with:

07-15-16

37-4.02

Replace section 39-2.02A(3)(b) with:

01-15-16

The JMF must be based on the superpave HMA mix design as described in *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute.

Replace the 1st paragraph of section 39-2.02C with:

04-20-18

Where the pavement thickness shown is 0.30 foot or greater, you may place Type A HMA in multiple lifts not less than 0.15 foot each. If placing Type A HMA in multiple lifts:

1. Table in Section 39-2.02B(4)(b) does not apply
2. Aggregate gradation must comply with the requirements shown in the following table:

Aggregate Gradation Requirements

Type A HMA lift thickness	Gradation
0.15 to less than 0.20 foot	1/2 inch
0.20 foot to less than 0.25 foot	3/4 inch
0.25 foot or greater	3/4 inch or 1 inch

3. Apply a tack coat before placing a subsequent lift

4. The Engineer evaluates each HMA lift individually for compliance

Add between the 1st and 2nd paragraphs of section 39-2.02C:

07-15-16

If the ambient air temperature is below 60 degrees F, cover the loads in trucks with tarpaulins. If the time for HMA discharge to truck at the HMA plant until transfer to paver's hopper is 90 minutes or greater and if the ambient air temperature is below 70 degrees F, cover the loads in trucks with tarpaulins, unless the time from discharging to the truck until transfer to the paver's hopper or the pavement surface is less than 30 minutes. The tarpaulins must completely cover the exposed load until you transfer the mixture to the paver's hopper or the pavement surface.

Replace the table in the 2nd paragraph of section 39-2.02C with:

07-15-16

Minimum Ambient Air and Surface Temperatures

Lift thickness (feet)	Ambient air (°F)		Surface (°F)	
	Unmodified asphalt binder	Modified asphalt binder	Unmodified asphalt binder	Modified asphalt binder
Type A HMA and Type A HMA produced with WMA water injection technology				
<0.15	55	50	60	55
≥0.15	45	45	50	50
Type A HMA produced with WMA additive technology				
<0.15	45	45	50	45
≥0.15	40	40	40	40

07-15-16

Delete the 3rd paragraph of section 39-2.02C.

Add between HMA and placed in the 1st sentence of the 4th paragraph of section 39-2.02C:

07-15-16

and Type A HMA produced with WMA water injection technology

Add between the 4th and the 5th paragraphs of section 39-2.02C:

07-15-16

For Type A HMA produced with WMA additive technology placed under method compaction, if the asphalt binder is:

1. Unmodified, complete:
 - 1.1 1st coverage of breakdown compaction before the surface temperature drops below 240 degrees F
 - 1.2 Breakdown and intermediate compaction before the surface temperature drops below 190 degrees F
 - 1.3 Finish compaction before the surface temperature drops below 140 degrees F

- 1.4 You may continue static rolling below 140 degrees F to remove roller marks.
- 2. Modified, complete:
 - 2.1. 1st coverage of breakdown compaction before the surface temperature drops below 230 degrees F
 - 2.2. Breakdown and intermediate compaction before the surface temperature drops below 170 degrees F
 - 2.3. Finish compaction before the surface temperature drops below 130 degrees F
 - 2.4. You may continue static rolling below 130 degrees F to remove roller marks.

Replace the 2nd paragraph of section 39-2.03A(3)(b) with:

01-15-16

The JMF must be based on the superpave HMA mix design as described in *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute.

Replace the requirement in the row for *Voids in mineral aggregate on plant produced HMA* in the 2nd table in section 39-2.03A(4)(e)(i) with:

01-15-16

18.0-23.0

Add before the 1st paragraph of section 39-2.03A(4)(e)(ii)(C):

04-15-16

CRM used must be on the Authorized Materials List for Crumb Rubber Modifier.

CRM must be a ground or granulated combination of scrap tire crumb rubber and high natural scrap tire crumb rubber, CRM must be 75.0 ± 2.0 percent scrap tire crumb rubber and 25.0 ± 2.0 percent high natural scrap tire crumb rubber by total weight of CRM. Scrap tire crumb rubber and high natural scrap tire crumb rubber must be derived from waste tires described in Pub Res Code § 42703.

Replace the row for *Hamburg wheel track* in the table in section 39-2.03B(2) with:

01-15-16

Hamburg wheel track (min, number of passes at the inflection point)	AASHTO T 324 (Modified) ^d	
Binder grade:		
PG 58		10,000
PG 64		12,500
PG 70		15,000

Replace *AASHTO R 35* in the 4th paragraph of section 39-2.03B(2) with:

07-21-17

superpave HMA mix design as described in *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute

Replace *RHMA-G* in the 3rd and 5th paragraphs of section 39-2.03C with:

07-15-16

RHMA-G and RHMA-G produced with WMA water injection technology

Add between the 3rd and 4th paragraphs of section 39-2.03C:

01-20-17

Spread and compact RHMA-G produced with WMA additive technology at an ambient air temperature of at least 50 degrees F and a surface temperature of at least 50 degrees F.

Add between the 5th and 6th paragraphs of section 39-2.03C:

07-15-16

For RHMA-G produced with WMA additive technology placed under method compaction:

1. Complete the 1st coverage of breakdown compaction before the surface temperature drops below 260 degrees F
2. Complete breakdown and intermediate compaction before the surface temperature drops below 230 degrees F
3. Complete finish compaction before the surface temperature drops below 180 degrees F
4. You may continue static rolling below 140 degrees F to remove roller marks

Replace 39-2.03A(4)(b)(ii) in the 1st sentence of section 39-2.04A(4)(b)(ii) with:

01-20-17

39-2.03A(4)(c)(ii)

Replace the 6th and 7th paragraphs of section 39-2.04C with:

07-15-16

For HMA-O and HMA-O produced with WMA water injection technology:

1. With unmodified asphalt binder:
 - 1.1. Spread and compact only if the atmospheric temperature is at least 55 degrees F and the surface temperature is at least 60 degrees F.
 - 1.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
 - 1.3. Complete all compaction before the surface temperature drops below 200 degrees F.
2. With modified asphalt binder, except asphalt rubber binder:
 - 2.1. Spread and compact only if the atmospheric temperature is at least 50 degrees F and the surface temperature is at least 50 degrees F.
 - 2.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
 - 2.3. Complete all compaction before the surface temperature drops below 180 degrees F.

For HMA-O produced with WMA additive technology:

1. With unmodified asphalt binder:

- 1.1. Spread and compact only if the atmospheric temperature is at least 45 degrees F and the surface temperature is at least 50 degrees F.
- 1.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 230 degrees F.
- 1.3. Complete all compaction before the surface temperature drops below 190 degrees F.
2. With modified asphalt binder, except asphalt rubber binder:
 - 2.1. Spread and compact only if the atmospheric temperature is at least 40 degrees F and the surface temperature is at least 40 degrees F.
 - 2.2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 230 degrees F.
 - 2.3. Complete all compaction before the surface temperature drops below 170 degrees F.

Replace *RHMA-O* and *RHMA-O-HB* in the 8th paragraph of section 39-2.04C with:

07-15-16

RHMA-O and RHMA-O produced with WMA water injection technology, and RHMA-O-HB and RHMA-O-HB produced with WMA water injection technology

Add between the 8th and 9th paragraphs of section 39-2.04C:

07-15-16

For RHMA-O produced with WMA additive technology and RHMA-O-HB produced with WMA additives technology:

1. Spread and compact if the ambient air temperature is at least 45 degrees F and the surface temperature is at least 50 degrees F
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 270 degrees F
3. Complete all compaction before the surface temperature drops below 240 degrees F

Add to the 2nd paragraph of section 39-2.05A(3)(b):

01-15-16

The material transfer vehicle must receive HMA directly from the truck.

Replace *Table 6.1* at each occurrence in the table in section 39-2.05B(2) with:

01-15-16

Table 8.1

Replace *SP-2 Asphalt Mixture* in the 1st footnote in the table in the 2nd paragraph of section 39-2.05B(2)(b) with:

01-15-16

MS-2 Asphalt Mix Design Methods

you with the bearing acceptance criteria curves for any piles represented by the dynamically monitored piles.

Replace the 7th paragraph of section 49-1.01D(4) with:

04-20-18

Piles to be dynamically monitored must:

1. Have an additional length of 2 times the largest cross-sectional dimension of the pile plus 2 feet.
2. Be available to the Department at least 2 business days before driving.
3. Be safely supported at least 6 inches off the ground in a horizontal position on at least 2 support blocks. If ordered, rotate the piles on the blocks.
4. Be positioned to provide safe access to the entire pile length and circumference for the installation of anchorages and control marks for monitoring.

07-15-16

Delete *business* in item 6 in the list in the 8th paragraph of section 49-1.01D(4).

Add to the list in 9th paragraph of section 49-1.01D(4):

07-15-16

3. Cut pile to the specified cut-off elevation after bearing acceptance criteria is provided by the Department

04-15-16

Delete the 3rd paragraph of section 49-1.03.

04-15-16

Delete the 2nd paragraph of section 49-1.04.

01-15-16

Delete the 4th paragraph of section 49-2.01C(5).

Replace item 3 in the list in the 2nd paragraph of section 49-3.01A with:

07-15-16

3. CISS concrete piles

Add between *undisturbed material* and *in a dry* in the 1st paragraph of section 49-3.01C:

07-15-16

, casing, or steel shell

Replace the 2nd and 3rd paragraphs of section 49-3.01C with:

07-15-16

Place and secure reinforcement. Securely block the reinforcement to provide the minimum clearance shown between the reinforcing steel cage and the sides of the drilled hole, casing, or steel shell.

Steel shells, casings, and drilled holes must be clean and free of debris before reinforcement and concrete are placed.

Replace *dewatered* in the 4th paragraphs of section 49-3.01C with:

07-15-16

drilled

Add to section 49-3.02A(1):

07-15-16

Permanent steel casing and driven steel shell must comply with section 49-2.02.

Replace the paragraph of section 49-3.02A(2) with:

07-15-16

dry hole: A drilled hole that requires no work to keep it free of water.

dewatered hole: A drilled hole that:

1. Accumulates no more than 12 inches of water at the bottom during a 1 hour period without any pumping from the hole.
2. Has no more than 3 inches of water at the bottom immediately before placing concrete.
3. Does not require temporary casing to control the groundwater.

Replace item 8 in the list in the 1st paragraph of section 49-3.02A(3)(b) with:

07-15-16

8. Drilling plan and sequence
9. Concrete sequence and placement plan
10. If inspection pipes are required, methods for ensuring the inspection pipes remain straight, undamaged, and properly aligned during concrete placement

Replace section 49-3.02A(3)(c) with:

04-20-18

49-3.02A(3)(c) Inspection Pipe and Reinforcing Cage Coupler Log

If inspection pipes are required, submit a log of the locations of inspection pipe couplers and pile reinforcing cage couplers as an informational submittal within 2 business days of completion of concrete placement in the hole.

Replace 1 business day in the paragraph of section 49-3.02A(3)(d) with:

07-15-16

2 business days

Add to section 49-3.02A(3)(d):

07-15-16

The log must:

1. Show the pile location, tip elevation, cutoff elevation, dates of excavation and concrete placement, total quantity of concrete placed, length and tip elevation of any casing, and details of any hole stabilization method and materials used.
2. Include an 8-1/2 by 11 inch graph of concrete placed versus depth of hole filled as follows:
 - 2.1. Plot the graph continuously throughout concrete placement. Plot the depth of drilled hole filled vertically with the pile tip at the bottom and the quantity of concrete placed horizontally.
 - 2.2. Take readings at each 5 feet of pile depth, and indicate the time of the reading on the graph.

Add after the sentence in the paragraph of section 49-3.02A(3)(e):

07-15-16

Allow 10 days for the review.

Replace the 3rd sentence in the paragraph of section 49-3.02A(3)(f) with:

07-15-16

Allow 10 days for the review and analysis of this report.

Add after *rejected pile* in the 1st sentence in the 1st paragraph of section 49-3.02A(3)(g):

07-15-16

to be mitigated

07-15-16

Delete the 2nd paragraph of section 49-3.02A(3)(g).

Replace item 3 in the list in the 3rd paragraph of section 49-3.02A(3)(g) with:

07-15-16

3. Step by step description of the mitigation work to be performed, including drawings if necessary. If the *ADSC Standard Mitigation Plan* is an acceptable mitigation method, include the most recent version. For the most recent version of the *ADSC Standard Mitigation Plan*, go to:
<http://www.dot.ca.gov/hq/esc/geotech/ft/adscmitplan.htm>

Replace the 2nd sentence in the paragraph of section 49-3.02A(3)(i) with:

07-15-16

Allow 10 days for the review.

Add to section 49-3.02A(3):

07-15-16

49-3.02A(3)(j) Certifications

If synthetic slurry is used, submit as an informational submittal the names and certifications of your employees who are trained and certified by the synthetic slurry manufacturer.

04-20-18

49-3.02A(3)(k) Slurry Test Record

If slurry is used, submit a slurry test record as an informational submittal within 2 business days of completion of concrete placement in the hole.

Add after *excavated hole* in the 1st sentence in the 3rd paragraph of section 49-3.02A(4)(c):

07-15-16

lined with plastic

Replace the 1st paragraph of section 49-3.02A(4)(d)(i) with:

07-15-16

Section 49-3.02A(4)(d) applies to CIDH concrete piles except for piles (1) less than 24 inches in diameter or (2) constructed in dry or dewatered holes.

Replace *gamma-gamma logging* in the 2nd paragraph of section 49-3.02A(4)(d)(i) with:

07-15-16

GGL

Replace the 1st sentence in the 3rd paragraph of section 49-3.02A(4)(d)(i) with:

07-15-16

After notification by the Engineer of pile acceptance, fill the inspection pipes and cored holes with grout.

Replace *gamma-gamma logging* in section 49-3.02A(4)(d)(ii) with:

07-15-16

GGL

Replace the 3rd and 4th paragraphs of section 49-3.02A(4)(d)(iii) with:

07-15-16

The Department may perform CSL to determine the extent of the anomalies identified by GGL and to further evaluate a rejected pile for the presence of anomalies not identified by GGL. The pile acceptance test report will indicate if the Department intends to perform CSL and when the testing will be performed. Allow the Department 20 additional days for a total of 50 days to perform CSL and to provide supplemental results.

If authorized, you may perform testing on the rejected pile.

07-15-16

Delete the 8th paragraph of section 49-3.02A(4)(d)(iii).

Add to the end of section 49-3.02A(4)(d)(iii):

07-15-16

If the Engineer determines it is not feasible to repair the rejected pile, submit a mitigation plan for replacement or supplementation of the rejected pile.

Add to section 49-3.02A(4):

07-15-16

49-3.02A(4)(e) Certifications

If synthetic slurry is used, your employees who will be providing technical assistance in the slurry activities must be trained and certified by the synthetic slurry manufacturer to show their competency to perform inspection of slurry operations.

Replace section 49-3.02B(4) with:

07-15-16

49-3.02B(4) Reserved

Replace *near* in the 3rd, 4th, and 5th paragraphs of section 49-3.02B(6)(b) with:

07-15-16

within 2 feet of

Replace *twice per shift* in item 2 in the 3rd paragraph of section 49-3.02B(6)(b) with:

07-15-16

every 4 hours

07-15-16

Delete the 7th and 8th paragraphs of section 49-3.02B(6)(b).

07-15-16

Delete the 3rd paragraph of section 49-3.02B(6)(c).

Replace *near* in item 2 in the 4th paragraph of section 49-3.02B(6)(c) with:

07-15-16

within 2 feet of

Replace item 5 in the 4th paragraph of section 49-3.02B(6)(c) with:

07-15-16

5. After final cleaning and immediately before placing concrete.

Replace section 49-3.02B(9) with:

07-15-16

49-3.02B(9) Inspection Pipes

Inspection pipes must be schedule 40 PVC pipe complying with ASTM D1785 with a nominal pipe size of 2 inches.

Watertight PVC couplers complying with ASTM D2466 are allowed to facilitate pipe lengths in excess of those commercially available.

Add to the beginning of section 49-3.02C(1):

07-15-16

Unless otherwise authorized, drilling the hole and placing reinforcement and concrete in the hole must be performed in a continuous operation.

Replace the 5th paragraph of section 49-3.02C(2) with:

07-15-16

If slurry is used during excavation, maintain the slurry level at a height required to maintain a stable hole, but not less than 10 feet above the piezometric head.

Replace the 1st sentence in the 9th paragraph of section 49-3.02C(2) with:

07-15-16

Remove water that has infiltrated the dewatered hole before placing concrete, as required for dewatered hole.

Replace the 1st sentence in the 10th paragraph of section 49-3.02C(2) with:

07-15-16

If authorized, to control caving or water seepage, you may enlarge portions of the hole, backfill the hole with slurry cement backfill, concrete, or other material, and redrill the hole to the diameter shown.

Replace the 4th paragraph of section 49-3.02C(3) with:

07-15-16

Remove the temporary casing during concrete placement. Maintain the concrete in the casing at a level required to maintain a stable hole, but not less than 5 feet above the bottom of the casing, to prevent displacement of the concrete by material from outside the casing.

Replace the 5th paragraph of section 49-3.02C(4) with:

07-15-16

For a single CIDH concrete pile supporting a column:

1. If the pile and the column share the same reinforcing cage diameter, this cage must be accurately placed as shown
2. If the pile reinforcing cage is larger in diameter than the column cage:
 - 2.1. Maintain a clear horizontal distance of at least 3.5 inches between the two cages, if the concrete is placed under dry conditions
 - 2.2. Maintain a clear horizontal distance of at least 5 inches between the two cages if the concrete is placed under slurry
 - 2.3. The offset between the centerlines of the two cages must not exceed 6 inches

Replace the paragraphs in section 49-3.02C(5) with:

04-20-18

For acceptance testing, install and test vertical inspection pipes as follows:

1. Log the location of the inspection pipe couplers and pile reinforcing cage couplers with respect to the plane of pile cutoff.
2. Cap each inspection pipe at the bottom. Extend the pipe from 3 feet above the pile cutoff to the bottom of the reinforcing cage. Provide a temporary top cap or similar means to keep the pipes clean before testing. If pile cutoff is below the ground surface or working platform, extend inspection pipes to 3 feet above the ground surface or working platform.
3. If any changes are made to the pile tip, extend the inspection pipes to the bottom of the reinforcing cage.
4. Install inspection pipes in a straight alignment and parallel to the main reinforcement. Securely fasten inspection pipes in place and provide protective measures to prevent misalignment or damage to the inspection pipes during installation of the reinforcement and placement of concrete in the hole. Construct CIDH concrete piles such that the relative distance of inspection pipes to vertical steel reinforcement remains constant.
5. After concrete placement is complete, fill inspection pipes with water to prevent debonding of the pipe.
6. Provide safe access to the tops of the inspection pipes.
7. After placing concrete and before requesting acceptance testing, test each inspection pipe in the Engineer's presence by passing a rigid cylinder through the length of pipe. The rigid cylinder must:
 - 7.1 Be 1-1/4-inch diameter by 4.5-foot long
 - 7.2 Weigh 12 pounds or less
 - 7.3 Be able to freely pass down through the entire length of the pipe under its own weight and without the application of force
8. When performing acceptance testing, inspection pipes must provide a 2-inch-diameter clear opening and be completely clean, unobstructed, and either dry or filled with water as authorized.
9. After acceptance testing is complete, completely fill the inspection pipes with water.

07-15-16

If the rigid cylinder fails to pass through the inspection pipe:

1. Completely fill the inspection pipes in the pile with water immediately.
2. Core a nominal 2-inch-diameter hole through the concrete for the entire length of the pile for each inspection pipe that does not pass the rigid cylinder. Coring must not damage the pile reinforcement.
3. Locate cored holes as close as possible to the inspection pipes they are replacing and no more than 5 inches clear from the reinforcement.

Core holes using a double wall core barrel system with a split tube type inner barrel. Coring with a solid type inner barrel is not allowed.

Coring methods and equipment must provide intact cores for the entire length of the pile.

Photograph and store concrete cores as specified for rock cores in section 49-1.01D(5).

The coring operation must be logged by an engineering geologist or civil engineer licensed in the State and experienced in core logging. Coring logs must comply with the Department's *Soil and Rock Logging, Classification, and Presentation Manual* for rock cores. Coring logs must include core recovery, rock quality designation of the concrete, locations of breaks, and complete descriptions of inclusions and voids encountered during coring.

The Department evaluates the portion of the pile represented by the cored hole based on the submitted coring logs and concrete cores. If the Department determines a pile is anomalous based on the coring logs and concrete cores, the pile is rejected.

Replace item 2 in the list in the 2nd paragraph of section 49-3.02C(7) with:

07-15-16

2. Extend at least 5 feet below the construction joint. If placing casing into rock or a dry hole, the casing must extend at least 2 feet below the construction joint.

Add to the beginning of section 49-3.02C(9):

07-15-16

49-3.02C(9)(a) General

Replace the 2nd sentence of the 3rd paragraph of section 49-3.02C(9) with:

04-15-16

Do not vibrate the concrete.

Add after *concrete pump* in the 8th paragraph of section 49-3.02C(9):

07-15-16

and slurry pump

Replace item 3 in the list in the 11th paragraph of section 49-3.02C(9) with:

07-15-16

3. Maintain the slurry level at a height required to maintain a stable hole, but not less than 10 feet above the piezometric head.

Replace the 13th paragraph of section 49-3.02C(9) with:

07-15-16

Maintain a log of concrete placement for each drilled hole.

Replace 14th and 15th paragraphs of section 49-3.02C(9) with:

07-15-16

If a temporary casing is used, maintain concrete placed under slurry at a level required to maintain a stable hole, but not less than 5 feet above the bottom of the casing. The withdrawal of the casing must not cause contamination of the concrete with slurry.

The equivalent hydrostatic pressure inside the casing must be greater than the hydrostatic pressure on the outside of the casing to prevent intrusion of water, slurry, or soil into the column of freshly placed concrete.

Remove scum, laitance, and slurry-contaminated concrete from the top of the pile.

Add to section 49-3.02C(9):

07-15-16

49-3.02C(9)(b) Mineral Slurry

Remove any caked slurry on the sides or bottom of hole before placing reinforcement.

If concrete is not placed immediately after placing reinforcement, the reinforcement must be removed and cleaned of slurry, the sides of the drilled hole must be cleaned of caked slurry, and the reinforcement again placed in the hole for concrete placement.

49-3.02C(9)(c) Synthetic Slurry

A manufacturer's representative must:

1. Provide technical assistance for the use of their material
2. Be at the job site before introduction of the synthetic slurry into the drilled hole
3. Remain at the job site until released by the Engineer

After the manufacturer's representative has been released by the Engineer, your employee certified by the manufacturer must be present during the construction of the pile under slurry.

Replace the heading of section 49-3.03 with:

07-15-16

CAST-IN-STEEL SHELL CONCRETE PILING

Replace the 1st paragraph of section 49-3.03A(1) with:

07-15-16

Section 49-3.03 includes specifications for constructing CISS concrete piles consisting of driven open-ended or closed-ended steel shells filled with reinforcement and concrete.

Add to the end of section 49-3.03A(1):

07-15-16

CISS concrete piles include Class 90 Alternative V and Class 140 Alternative V piles.

Add to section 49-3.03A(3):

01-15-16

Submit a Pile and Driving Data Form under section 49-2.01A(3)(a) if specified in the special provisions.

Replace the paragraph of section 49-3.03D with:

07-15-16

Furnish piling is measured along the longest side of the pile from the specified tip elevation shown to the plane of pile cutoff.

Replace section 49-4.03 with:

01-15-16

49-4.03 CONSTRUCTION

49-4.03A General

Reserved

49-4.03B Drilled Holes

Drill holes for steel soldier piles into natural foundation material. Drilled holes must be accurately located, straight, and true.

Furnish and place temporary casings or tremie seals where necessary to control water or to prevent caving of the hole.

Before placing the steel soldier pile, remove loose materials existing at the bottom of the hole after drilling operations have been completed.

Do not allow surface water to enter the hole. Remove all water in the hole before placing concrete.

If temporary casings are used, they must comply with section 49-3.02C(3).

49-4.03C Steel Soldier Piles

Plumb and align the pile before placing concrete backfill and lean concrete backfill. The pile must be at least 2 inches clear of the sides of the hole for the full length of the hole to be filled with concrete backfill and lean concrete backfill. Ream or enlarge holes that do not provide the clearance around steel piles.

Maintain alignment of the pile in the hole while placing backfill material.

Add to the list in the 6th paragraph of section 51-1.01A:

7. Drainage inlets 07-15-16
8. Pipe culvert headwalls and endwalls for a pipe with a diameter of less than 5 feet 01-20-17

Add to section 51-1.01B:

07-21-17
age of break: Age in hours, determined by your testing, at which RSC attains its minimum specified compressive strength.

Delete the 1st paragraph of section 51-1.01C(5).

01-20-17

Delete the 5th item in the list in the 4th paragraph of section 51-1.01C(5).

01-20-17

Replace section 51-1.01D(2)(b) with:

07-21-17

51-1.01D(2)(b) Rapid Strength Concrete

51-1.01D(2)(b)(i) General

Reserved

51-1.01D(2)(b)(ii) Prequalification of Mix Design

Prequalify RSC under section 90-1.01D(5)(b) before use. Prequalification of an RSC mix design includes determining the opening age and attaining the specified minimum 28-day compressive strength.

Determine the opening age of the RSC mix design as follows:

1. Fabricate at least 5 test cylinders to be used to determine the age of break.
2. Immediately after fabrication of the 5 test cylinders, store the cylinders in a temperature medium of 70 ± 3 degrees F until the cylinders are tested.
3. Determine the age of break to attain an average strength of the 5 test cylinders.
4. Opening age is the age of break plus 1 hour.

The average strength of the 5 test cylinders must be at least the minimum specified compressive strength. Not more than 2 test cylinders may have a strength of less than 95 percent of the minimum specified compressive strength.

If compressive strength tests performed in the field show that the RSC has attained the minimum specified compressive strength, you may open the lane to traffic at the age of break. Perform the compressive strength tests under the specifications for sampling and testing cylinders in section 90-1.01D(5)(a). If you choose to use this option, notify the Engineer before starting construction.

51-1.01D(2)(b)(iii) Mock-ups

Reserved

Replace the 1st sentence in the 3rd paragraph of section 51-1.01D(3)(b)(iii) with:

01-20-17

If portions of completed deck surfaces or approach slabs have a coefficient of friction of less than 0.35, those portions must be ground or grooved parallel to the center line to produce a coefficient of friction of not less than 0.35.

Add to section 51-1.02I:

07-15-16

Metal frames, covers, grates, and other miscellaneous iron and steel used with drainage inlets must comply with section 75-2.

Add to section 51-1.03B:

07-15-16

You may use PC drainage inlets as an alternative to CIP drainage inlets.

Add between the 10th and 11th paragraphs of section 51-1.03C(2)(a):

07-15-16

For drainage inlets, extend the outside forms at least 12 inches below the top of the inlet. You may place concrete against excavated earth below this depth except:

1. You must use full-depth outside forms or other protection when work activities or unstable earth may cause hazardous conditions or contamination of the concrete.
2. You must increase the wall thickness 2 inches if placing concrete against the excavated surface. The interior dimensions must be as shown.

Add to section 51-1.03C(2)(b):

07-15-16

For drainage inlets, remove exterior forms to at least 12 inches below the final ground surface. Exterior forms below this depth may remain if their total thickness is not more than 1 inch.

Add to the end of section 51-1.03D(1):

07-21-17

If using a mobile volumetric mixer, before each work shift and after each time the mixer is washed out, discharge at least 2 cubic feet of RSC into a concrete waste container before placing RSC into the work.

Replace the 1st paragraph of section 51-1.03E(5) with:

01-20-17

For drill and bond dowel (chemical adhesive), install dowels under the chemical adhesive manufacturer's instructions.

Add to the list in the 2nd paragraph of section 51-1.03F(2):

07-15-16

4. Interior and top surfaces of drainage inlets

Replace the paragraphs of section 51-1.03F(5)(b)(i) with:

01-20-17

Except for bridge widenings and bridge decks to be covered with an overlay, texture roadway surfaces of bridge decks, approach slabs, and sleeper slabs, and other roadway surfaces of concrete structures longitudinally by grinding and grooving or by longitudinal tining.

For bridge widenings, texture the roadway surfaces longitudinally by longitudinal tining.

For bridge decks that are to be covered with an overlay, texture the deck using a burlap drag or broom device that produces striations either parallel or transverse to the centerline. If these structures are opened to traffic before the overlay is placed, the deck surface must meet the coefficient of friction requirement in section 51-1.01D(3)(b)(iii).

Replace the 3rd paragraph of section 51-1.03F(5)(b)(ii) with:

01-20-17

Grind and groove the deck surface to within 18 inches of the toe of the barrier as follows:

1. Grind the surface under section 42-3. Grinding must not reduce the concrete cover on reinforcing steel to less than 1-3/4 inches.
2. Groove the ground surfaces longitudinally under section 42-2. The grooves must be parallel to the centerline.

Replace the 2nd sentence of the 3rd paragraph in section 51-1.03F(5)(b)(iii) with:

01-20-17

Grooves must be from 1/8 to 3/16 inch deep after concrete has hardened.

Replace the 8th paragraph of section 51-1.03H with:

07-21-17

Section 90-3.03 does not apply to curing RSC for bridge decks. Cure bridge decks constructed with RSC as follows:

1. Immediately after strike-off, continually mist the deck with water using atomizing nozzles. Continue misting until the concrete reaches a compressive strength of at least 2000 psi.
2. After misting, apply curing compound no. 1 to the deck under section 90-1.03B(3).

Repair any damage to the film of the curing compound with additional curing compound. Repairing damaged curing compound after the deck is opened to traffic is not required.

Add to section 51-1.04:

07-15-16

The payment quantity for structural concrete, drainage inlet is the volume determined from the dimensions shown for CIP drainage inlets.

Replace the 2nd paragraph of section 51-2.02D(2)(a) with:

07-21-17

Bolts, nuts, and washers must comply with ASTM F3125, Grade A325.

Add to section 51-4.01C(1):

07-15-16

For PC drainage inlets, submit field repair procedures and a patching material test sample before repairs are made. Allow 10 days for the Engineer's review.

Add to section 51-4.01C(2)(a):

07-15-16

For drainage inlets with oval or circular cross sections, submit shop drawings with calculations. Shop drawings and calculations must be sealed and signed by an engineer who is registered as a civil engineer in the State. Allow 15 days for the Engineer's review.

Add to section 51-4.01D(3):

07-15-16

The Engineer may reject PC drainage inlets exhibiting any of the following:

1. Cracks more than 1/32 inch wide
2. Nonrepairable honeycombed or spalled areas of more than 6 square inches
3. Noncompliance with reinforcement tolerances or cross sectional area shown
4. Wall, inlet floor, or lid less than minimum thickness
5. Internal dimensions less than dimensions shown by 1 percent or 1/2 inch, whichever is greater
6. Defects affecting performance or structural integrity

Add to section 51-4.02C:

07-15-16

Materials for PC drainage inlets must comply with the following:

1. Preformed flexible joint sealant must be butyl-rubber complying with ASTM C990
2. Resilient connectors must comply with ASTM C923
3. Sand bedding must comply with section 19-3.02F(2)
4. Bonding agents must comply with ASTM C1059/C1059, Type II

Add to section 51-4.02D:

07-15-16

51-4.02D(8) Drainage Inlets

PC units for drainage inlets must be rectangular, round, or oval in cross section, or any combination. Transitions from a rectangular grate opening to a round or oval basin must be made in not less than 8 inches. Provide means for field adjustment to meet final grade, paving, or surfacing.

If oval or circular shape cross-sections are furnished, they must comply with *AASHTO LRFD Bridge Design Specifications, Sixth Edition with California Amendments*.

Wall and slab thicknesses may be less than the dimensions shown by at most 5 percent or 3/16 inch, whichever is greater.

Reinforcement placement must not vary more than 1/2 inch from the positions shown.

Add to section 51-4.03:

07-15-16

51-4.03H Drainage Inlets

Repair PC drainage inlet sections to correct damage from handling or manufacturing imperfections before installation.

Center pipes in openings to provide a uniform gap. Seal gaps between the pipe and the inlet opening with nonshrink grout under the grout manufacturer's instructions. For systems designated as watertight, seal these gaps with resilient connectors.

Match fit keyed joints to ensure uniform alignment of walls and lids. Keys are not required at the inlet floor level if the floor is precast integrally with the inlet wall. Seal keyed joint locations with preformed butyl rubber joint sealant. You may seal the upper lid and wall joint with nonshrink grout.

Clean keyed joint surfaces before installing sealant. Joint surfaces must be free of imperfections that may affect the joint. Use a primer if surface moisture is present. Use a sealant size recommended by the sealant manufacturer. Set joints using sealant to create a uniform bearing surface.

Flat drainage inlet floors must have a field-cast topping layer at least 2 inches thick with a slope of 4:1 (horizontal:vertical) toward the outlet. Use a bonding agent when placing the topping layer. Apply the bonding agent under the manufacturer's instructions.

Add to section 51-5.03D(1):

01-20-17

Approach slab (aggregate base) includes using AB to fill voids that remain after removing subsealing material or CTB beneath existing approach slabs.

Add to section 51-5.03E:

07-21-17

If using magnesium phosphate concrete, modified high-alumina-based concrete, or portland-cement-based concrete complying with section 51-1.02C to construct the paving notch extension, allow 1 hour between placing the paving notch extension concrete and placing the approach slab concrete.

Replace *Reserved* in section 52-6.01B with:

07-21-17

group: Set of 5 or fewer consecutive lots after the 1st lot.

Replace *Reseved* in section 52-6.01C(2)(a) with:

07-21-17

Reserved

Replace *Reseved* in section 52-6.01C(3)(a) with:

07-21-17

Reserved

Replace the 2nd paragraph of section 52-6.01C(4)(b) with:

07-21-17

Each QC test report must include:

1. Group number, lot number, and location
2. Bar size
3. Splice type
4. Mechanical splice length
5. Location of fracture
6. Physical condition of splice test sample
7. Notable defects
8. Total measured slip
9. Ultimate tensile strength of each splice
10. The following for ultimate butt splices:
 - 10.1. Location of visible necking area
 - 10.2. Largest measured strain

Replace the paragraph in section 52-6.01C(6)(c) with:

07-21-17

For each bar size of each coupler model type of service splice or ultimate butt splice to be used in the work, submit a splice prequalification report that includes:

1. Copy of the manufacturer's product literature giving complete data on the splice material and installation procedures
2. Names of the operators who will be performing the splicing
3. Descriptions of the positions, locations, equipment, and procedures that will be used in the work
4. Certified test results from the authorized laboratory for the prequalification splice test samples
5. Certifications from the fabricator for operator and procedure prequalification
6. Manufacturer's QC Process Manual

Add between the 2nd and 3rd paragraphs of section 52-6.01D(1):

07-21-17

Before starting service or ultimate butt splicing activities, select the lots that constitute each group for QA testing.

Replace the last paragraph of section 52-6.01D(1) with:

07-21-17

Section 11-2 does not apply to resistance-butt-welded splices.

Replace the 2nd paragraph of section 52-6.01D(2)(b) with:

07-21-17

For each bar size of each splice coupler model type to be used, each operator must prepare 4 prequalification splice test samples.

Replace the last paragraph of section 52-6.01D(2)(b) with:

07-21-17

Splice test samples and testing must comply with the QC testing requirements specified in section 52-6.01D(4)(b) for the type of splice to be used in the work.

Replace the 1st paragraph of section 52-6.01D(3)(a) with:

07-21-17

Prepare splice test samples under California Test 670.

Replace the 4th paragraph of section 52-6.01D(3)(a) with:

07-21-17

When preparing or removing splice test samples for QC testing, concurrently prepare or remove 4 Department acceptance splice test samples from the same lot during:

1. 1st QC test
2. 1 QC test from each group, randomly selected by the Engineer

Add to section 52-6.01D(3)(a):

07-21-17

If splices from a lot will be encased in concrete prior to receiving passing Department acceptance test results, you must prepare additional samples selected by the Engineer from the same lot for additional Department acceptance testing. You may prepare the samples as specified for service splice test samples in section 52-6.01D(4)(b)(iii). The Department will test service splice test samples as specified for service splices and ultimate butt splice test samples as specified for ultimate butt splices.

Replace item 3 in the list in the 2nd paragraph of section 52-6.01D(4)(b)(i) with:

04-20-18

3. At a laboratory on the Authorized Laboratories List for testing reinforcing steel splices

Add to the list in the 5th paragraph of section 52-6.01D(4)(b)(i):

07-21-17

4. Group number of each lot

Add between the 1st and 2nd paragraphs of section 52-6.01D(5):

07-21-17

If a Department acceptance test result does not comply with the material and QA requirements, the Department rejects all splices in the lot and the group.

For the other lots in the rejected group that pass QC testing, you may request the Engineer to perform additional Department acceptance testing for additional splice samples. If a Department acceptance splice test result complies with the material and QA requirements, the Department accepts all splices in that lot.

If a lot of splices is rejected, prepare a splice rejection mitigation report for that rejected lot as specified in section 52-6.01D(4)(b)(i).

If the QC and the Department acceptance test results have different compliance determinations, the Department will sample and test all subsequent lots until QC and the Department acceptance test compliance determinations are consistent for 2 consecutive lots before resuming sampling and testing of 1 lot from every group.

Replace the paragraph in section 52-6.02B(3) with:

07-21-17

Ultimate butt splice test samples must demonstrate necking as either of the following:

1. Except for 30-inch and smaller diameter hoops, for *Necking Option I* as specified in California Test 670, the test sample must fracture in the reinforcing bar outside of the affected zone and show visible necking. For 30-inch and smaller diameter hoops, the test sample must show visible necking at fracture at any location.
2. For *Necking Option II* as specified in California Test 670, the largest measured strain must be at least:
 - 2.1. 6 percent for no. 11 and larger bars
 - 2.2. 9 percent for no. 10 and smaller bars

Replace the 3rd paragraph of section 52-6.03B with:

01-15-16

For uncoated and galvanized reinforcing bars complying with ASTM A615/A615M, Grade 60, ASTM A706/A706M, or ASTM A767/A767M, Class 1, the length of lap splices must be at least:

1. 45 diameters of the smaller bar spliced for reinforcing bars no. 8 or smaller
2. 60 diameters of the smaller bar spliced for reinforcing bars nos. 9, 10, and 11

56-1.01D(2) Quality Control

56-1.01D(2)(a) General

Reserved

56-1.01D(2)(b) Nondestructive Testing

56-1.01D(2)(b)(i) General

Perform NDT of steel members under AWS D1.1 and the requirements shown in the following table:

Nondestructive Testing for Steel Standards and Poles

Weld location	Weld type	Minimum required NDT
Circumferential splices around the perimeter of tubular sections, poles, and arms	CJP groove weld with backing ring	100% UT or RT
Longitudinal seam	CJP or PJP groove weld	Random 25% MT
Longitudinal seam within 6 inches of a circumferential splice	CJP groove weld	100% UT or RT
Welds attaching base plates, flange plates, pole plates, or mast arm plates to poles or arm tubes	CJP groove weld with backing ring and reinforcing fillet	t ≥ 5/16 inch: 100% UT and 100% MT t < 5/16 inch: 100% MT after root weld pass and final weld pass
	External (top) fillet weld for socket-type connections	100% MT
Hand holes and other appurtenances	Fillet and PJP welds	MT full length on random 25% of all standards and poles

NOTE: t = pole or arm thickness

Nondestructive Testing for Overhead Sign Structures

Weld location	Weld type	Minimum required NDT
Base plate to post	CJP groove weld with backing ring and reinforcing fillet	100% UT and 100% MT
Base plate to gusset plate	CJP groove weld	100% UT
Circumferential splices of pipe or tubular sections	CJP groove weld with backing ring	100% UT or RT
Split post filler plate welds	CJP groove weld with backing bar	100% UT or RT
Longitudinal seam weld for pipe posts	CJP groove weld	t < 1/4 inch: 100% MT t ≥ 1/4 inch: 100% UT or RT
	PJP groove weld	Random 25% RT
Chord angle splice weld	CJP groove weld with backing bar	100% UT or RT
Truss vertical, diagonal, and wind angles to chord angles	Fillet weld	Random 25% MT
Upper junction plate to chord (cantilever type truss)	Fillet weld	Random 25% MT
Bolted field splice plates (tubular frame type)	CJP groove weld	100% UT and 100% MT
Cross beam connection plates (lightweight extinguishable message sign)	Fillet weld	Random 25% MT
Arm connection angles (lightweight extinguishable message sign)	Fillet weld	100% MT
Mast arm to arm plate (lightweight extinguishable message sign)	CJP groove weld with backing ring	t ≥ 5/16 inch: 100% UT and 100% MT t < 5/16 inch: 100% MT after root weld pass and final weld pass
Post angle to post (lightweight extinguishable message sign)	Fillet weld	100% MT
Hand holes and other appurtenances	Fillet and PJP welds	MT full length on random 25% of all sign structures

NOTE: t = pole or arm thickness

56-1.01D(2)(b)(ii) Ultrasonic Testing

04-20-18

For UT of welded joints with any members less than 5/16 inch thick or tubular sections less than 13 inches in diameter, the acceptance and repair criteria must comply with Clause 9.27.1 of AWS D1.1.

07-15-16

For UT of other welded joints, the acceptance and repair criteria must comply with Table 6.3 of AWS D1.1 for cyclically loaded nontubular connections.

After galvanization, perform additional inspection for toe cracks along the full length of all CJP groove welds at tube-to-transverse plate connections using UT.

When performing UT, use an authorized procedure under AWS D1.1, Annex S.

56-1.01D(2)(b)(iii) Radiographic Testing

The acceptance criteria for radiographic or real time image testing must comply with AWS D1.1 for tensile stress welds.

56-1.01D(2)(b)(iv) Longitudinal Seam Welds

The Engineer selects the random locations for NDT.

Grind the cover pass smooth at the locations to be tested.

If repairs are required in a portion of a tested weld, perform NDT on the repaired portion and on 25 percent of the untested portions of the weld. If more repairs are required, perform NDT on the entire weld.

56-1.01D(3) Department Acceptance

Reserved

Replace section 56-2.01D(2)(b) with:

Reserved

07-15-16

Replace the 2nd sentence of the 1st paragraph of section 56-2.02F with:

Manufactured pipe posts must comply with one of the following:

07-15-16

Add to the list in the 1st paragraph of section 56-2.02F:

4. ASTM A1085, Grade A

07-15-16

Replace the 2nd paragraph of section 56-2.02F with:

You may fabricate pipe posts from structural steel complying with ASTM A36/A36M, ASTM A709/A709M, Grade 36, or ASTM A572/A572M, Grades 42 or 50.

07-15-16

Delete the last sentence in the 1st paragraph of section 56-2.02K(2).

07-15-16

Delete the 3rd paragraph of section 56-2.02K(2).

07-15-16

Replace the 2nd paragraph of section 56-2.02K(4) with:

07-15-16

Safety cable at walkways must not be kinked, knotted, deformed, frayed, or spliced.

Replace the 1st sentence of the paragraph in section 56-2.02K(5) with:

07-15-16

The edges of handholes and other large post and arm openings must be ground smooth.

Replace the heading of section 56-3 with:

07-15-16

56-3 STANDARDS, POLES, PEDESTALS, AND POSTS

Replace the paragraph in section 56-3.01A with:

07-15-16

Section 56-3 includes general specifications for fabricating and installing standards, poles, pedestals, and posts.

Replace section 56-3.01B(2)(b) with:

07-15-16

Standards with handholes must comply with the following:

1. Include a UL-listed lug and 3/16-inch or larger brass or bronze bolt for attaching the bonding jumper for non-slip-base standards.
2. Attach a UL-listed lug to the bottom slip base plate with a 3/16-inch or larger brass or bronze bolt for attaching the bonding jumper for slip-base standards.

Replace the 1st sentence of the 3rd paragraph of section 56-3.01C(2)(a) with:

07-15-16

After each standard, pole, pedestal, and post is properly positioned, place mortar under the base plate.

Replace the 2nd sentence of the 4th paragraph of section 56-3.01C(2)(a) with:

07-15-16

The top of the foundation at curbs or sidewalks must be finished to curb or sidewalk grade.

Replace the 10th paragraph of section 56-3.01C(2)(a) with:

07-15-16

Except when located on a structure, construct foundations monolithically.

Replace the 13th paragraph of section 56-3.01C(2)(a) with:

07-15-16

Do not erect standards, poles, pedestals, or posts until the concrete foundation has cured for at least 7 days.

Replace the 14th paragraph in section 56-3.01C(2)(a) with:

07-15-16

The Engineer selects either the plumbing or raking technique for standards, poles, pedestals, and posts. Plumb or rake by adjusting the leveling nuts before tightening nuts. Do not use shims or similar devices. After final adjustments of both top nuts and leveling nuts on anchorage assemblies have been made and each standard, pole, pedestal, and post on the structure is properly positioned, tighten nuts as follows:

1. Tighten leveling nuts and top nuts, following a crisscross pattern, until bearing surfaces of all nuts, washers, and base plates are in firm contact.
2. Use an indelible marker to mark the top nuts and base plate with lines showing relative alignment of the nut to the base plate.
3. Tighten top nuts following a crisscross pattern:
 - 3.1. Additional 1/6 turn for anchor bolts greater than 1-1/2 inches in diameter.
 - 3.2. Additional 1/3 turn for other anchor bolts.
 - 3.3. Tightening tolerance for all top nuts is $\pm 1/8$ turn.

Replace the 1st sentence of the 4th paragraph of section 56-3.01C(2)(b) with:

07-15-16

If shown, use sleeve nuts on Type 1 standards.

Add to section 56-3.01C(2)(b):

07-15-16

Spiral reinforcement must be continuous above the bottom of the anchor bolts. The top termination must be either:

1. 1'-6" lap beyond the end of pitch with a 90-degree hook extending to the opposite side of the cage,
or
2. 1'-6" lap beyond the end of pitch with 2 evenly spaced authorized mechanical couplers

Replace the 1st sentence of the paragraph in section 56-3.02A(4)(b) with:

07-15-16

For cast slip bases for standards and poles with shaft lengths of 15 feet or more, perform RT on 1 casting from each lot of a maximum of 50 castings under ASTM E94.

Replace the 2nd paragraph of section 56-3.02B(1) with:

07-15-16

Material for push button posts, pedestrian barricades, and guard posts must comply with ASTM A53/A53M or ASTM A500/A500M.

Add to section 56-3.02B(1):

07-15-16

Steel pipe standards and mast arms must be hot dip galvanized after manufacturing. Remove spikes from galvanized surfaces.

Replace the 2nd paragraph of section 56-3.02B(2) with:

07-15-16

HS anchor bolts, nuts, and washers must comply with section 55-1.02D(1) and the following:

1. Bolt threads must be rolled
2. Hardness of HS anchor bolts must not exceed 34 HRC when tested under ASTM F606
3. Galvanization must be by mechanical deposition
4. Nuts must be heavy-hex type
5. Each lot of nuts must be proof load tested

Replace the 8th paragraph of section 56-3.02B(2) with:

07-21-17

HS cap screws for attaching arms to standards must comply with ASTM F3125 Grade A325 or ASTM A449, and the mechanical requirements in Grade A325 after galvanizing. Coat threads of cap screws with a colored lubricant that is clean and dry to the touch. The lubricant color must contrast the zinc coating color on the cap screw such that the presence of the lubricant is visually obvious. The lubricant must be insoluble in water or the fastener components must be shipped to the job site in a sealed container.

Replace the 2nd sentence of the 9th paragraph of section 56-3.02B(2) with:

07-15-16

During manufacturing, properly locate the position of the luminaire arm on the arm plate to avoid interference with the cap screw heads.

Add to section 56-3.02B(3)(a):

07-15-16

Steel having a nominal thickness greater than 2 inches that is used for tube-to-transverse plate connections must have a minimum CVN impact value of 20 ft-lb at 20 degrees F when tested under ASTM E23.

Add to section 56-3.02B(3)(c):

07-15-16

The length of telescopic slip-fit splices must be at least 1.5 times the inside diameter of the exposed end of the female section.

For welds connecting reinforced handholes or box-type pole plate connections to a tubular member, the start and stop points must be at points located on a longitudinal axis of symmetry of the tube coinciding with the axis of symmetry of the hand hole or pole plate.

Replace the table in the 1st paragraph of section 56-3.02C with:

07-15-16

Standard type	Torque (ft-lb)
15-SB	150
15-SBF	150
30	150
31	200

Replace the 1st sentence of the 2nd paragraph of section 56-3.02C with:

07-15-16

Bolted connections attaching signal or luminaire arms to standards, poles, and posts are considered slip critical.

Add to section 56-3.06B:

07-15-16

Manufacture the mast arm from standard pipe, free from burrs. Each mast arm must have an insulated wire inlet and wood pole mounting brackets for the mast arm and tie-rod cross arm. Manufacture tie rod from structural steel and pipe.

07-15-16

Delete the 2nd paragraph of section 56-3.06C.

Replace the 1st sentence of the 3rd paragraph of section 56-3.06C with:

07-15-16

Mount the mast arm for luminaires to provide a 34-foot mounting height for a 165 W LED luminaire and a 40-foot mounting height for a 235 W LED luminaire.

^^

59 STRUCTURAL STEEL COATINGS

04-20-18

Replace *Type S* in the 2nd paragraph of section 59-1.02A with:

01-15-16

Type M or Type S

60 EXISTING STRUCTURES

04-20-18

Replace section 60-3.02A with:

04-20-18

60-3.02A(1) General

60-3.02A(1) Summary

Section 60-3.02 includes specifications for (1) repairing concrete deck surfaces and (2) preparing concrete deck surfaces to receive an overlay or a deck treatment.

60-3.02A(2) Definitions

Reserved

60-3.02A(3) Submittals

Submit a work plan for chip seal removal. Include:

1. Description of equipment for chip seal removal
2. Procedure for residual chip seal removal from the deck after grinding or micro milling operations
3. Procedure for chip seal removal next to bridge rails, undulations, or drains

60-3.02A(4) Quality Assurance

Reserved

Add between the 5th and 6th paragraphs of section 60-3.02C(1):

04-20-18

Micro milling equipment must:

1. Have a minimum concrete removal depth of 0.04 inch
2. Provide a surface relief of at most 0.045 inch
3. Provide a 5/32-inch grade tolerance
4. Produce consistent depth of texture in the finished surface

Micro milling equipment must have:

1. 3 or 4 riding tracks
2. Automatic grade control system with electronic averaging and 3 sensors on each side
3. Conveyor system that leaves no debris on the bridge
4. Drum that operates in an up-milling direction
5. Bullet tooth tools with polycrystalline diamond enhanced cutting tips
6. Maximum tool spacing of 0.20 inch
7. Maximum operating weight of 66,000 lb
8. Maximum track unit weight of 6,000 lb/ft
9. New tooth tools at the start of the work

Produce the finished surface using 2 passes of the micro milling equipment.

Add to section 60-3.02C(1):

04-20-18

Dust must not be blown into the air while blowing the deck.

Replace the 2nd paragraph of section 60-3.02C(2) with:

04-20-18

Before removing concrete, clean the deck surface by vacuuming, then blow the deck clean with high-pressure air.

Replace the 3rd paragraph of section 60-3.02C(2) with:

04-20-18

Remove the deck surface by micro milling or high-pressure water jetting.

Replace the paragraphs in section 60-3.02C(4) with:

04-20-18

Where shown, remove bituminous chip seals, bituminous slurry seals, and polymer chip seals entirely from bridge decks by grinding or micro milling. Remove no more than 1/4 inch of concrete deck surface.

Grinding must comply with section 42-3.

Any residual chip seals and other foreign materials remaining in the bridge deck after the grinding or micro milling operation must be removed by other authorized means.

Replace the 1st paragraph of section 60-3.02C(6) with:

04-20-18

Before placing rapid setting concrete patches, abrasive blast clean the contact surfaces of existing concrete and reinforcing steel. Remove at least 1/8 inch of concrete and all foreign material. Immediately before placing new concrete, clean surfaces by vacuuming and (1) pressure jetting or (2) other authorized means to remove debris.

Replace the 2nd paragraph of section 60-3.02C(7) with:

04-20-18

Perform the following activities in the order listed:

1. Abrasive blast the deck surface with steel shot. Steel shot must comply with SSPC-AB 3. Recycled steel shot must comply with SSPC-AB 2.
2. Clean the deck surface by vacuuming.
3. Blow the deck surface clean using high-pressure oil-free air.

Replace the last paragraph of section 60-3.02C(7) with:

04-20-18

If the deck surface becomes contaminated or you allow traffic on the clean deck before placing the deck treatment or overlay, abrasive blast clean the contaminated area, clean the deck by vacuuming, and blow the deck surface clean using high-pressure oil-free air.

Replace the 1st paragraph of section 60-3.03B(1)(c) with:

04-20-18

Submit a work plan for applying the methacrylate resin treatment. Include in the plan:

1. Schedule of work for the test area and for each bridge
2. Procedure for storing and handling resin components and absorbent material
3. Description of equipment for applying resin
4. Range of gel time and final cure time for resin
5. Description of absorbent material to be used
6. Description of equipment for applying and removing excess sand and absorbent material
7. Procedure for removing resin from the deck and equipment to be used
8. Procedure for avoiding spills or discharges of methacrylate, including materials and equipment
9. Procedure for cleaning up spills or discharges of methacrylate, including materials and equipment
10. Procedure for preventing resin from dripping from the structures
11. Procedure for disposing of excess resin and containers

Replace the 4th paragraph of section 60-3.03B(1)(d) with:

04-20-18

The Engineer performs friction testing of the treated test area under California Test 342. After completion of the test area, allow 10 days for the Engineer to perform the testing.

Replace the table in the 2nd paragraph of section 60-3.03B(2) with:

04-20-18

Quality characteristic	Test method	Requirement
Volatile content ^a (max, %)	ASTM D2369	30
Viscosity ^a (max, cP, Brookfield RV with UL adaptor , 50 RPM, at 25 °C)	ASTM D2196	25
Specific gravity ^a (min, at 25 °C)	ASTM D1475	0.90
Flash point ^a (min, °C)	ASTM D3278	82
Vapor pressure ^a (max, mm Hg, at 25 °C)	ASTM D323	1.0
Tack-free time (max, minutes) except Sample 50 ± 5g Test 2 ± 0.05g in 55 ± 5 mm diameter disposable aluminum weighing dish	ASTM C679	400
PCC-saturated surface-dry bond strength (min, psi, at 24 hours and 70 ± 2 °F)	California Test 551	500

^aPerform test before adding the initiator.

Replace the 9th paragraph of section 60-3.03B(3) with:

04-20-18

Traffic or equipment is not allowed on the treated surface until you have verified that the following requirements have been met and the opening of the treated surface to traffic and equipment is authorized:

1. Treated deck surface is tack free and not oily
2. Sand cover adheres and resists brushing by hand
3. Excess sand and absorbent material has been removed
4. No material will be tracked beyond the limits of treatment by traffic

Replace the 1st paragraph of section 60-3.04B(1)(c) with:

04-20-18

Submit a work plan for the placement of the deck overlay. Include the following in the work plan:

1. Schedule of overlay work for each bridge and a schedule of work for any trial overlays
2. Method for storage and handling of methacrylate resin and polyester concrete components
3. Description of equipment for applying methacrylate resin
4. Description of equipment for measuring, mixing, placing, and finishing the polyester concrete overlay
5. Method for isolating expansion joints and drainage
6. Cure time for polyester concrete
7. Description of equipment for applying sand
8. Method for avoiding spills or discharges of methacrylate and polyester concrete, including materials and equipment
9. Method for cleaning up spills or discharge of methacrylate and polyester concrete, including materials and equipment
10. Procedure for preventing resin from dripping from the structures
11. Method for disposal of excess methacrylate resin, polyester concrete, and containers

Replace the 3rd paragraph of section 60-3.04B(1)(c) with:

04-20-18

Submit test samples of methacrylate resins, polyester resins, and aggregates with a certificate of compliance and manufacturer's test results at least 15 days before use.

Replace the 4th paragraph of section 60-3.04B(1)(d) with:

04-20-18

The Engineer performs friction testing of the trial overlay under California Test 342. After completion of the trial overlay, allow 10 days for the Engineer to perform the testing.

Add to the section 60-3.04B(1)(d):

04-20-18

Place polyester concrete overlay on:

1. Portland cement concrete no sooner than 28 days after concrete placement
2. Portland cement based RSC no sooner than 14 days after concrete placement and your test results for prequalification of RSC show that the concrete attained at least 3,500 psi compressive strength
3. RSC using hydraulic cement other than portland cement no sooner than 3 days after concrete placement and your test results for prequalification of RSC show that the concrete attained at least 3,500 psi compressive strength

4. Magnesium phosphate based rapid setting concrete patch material no sooner than 3 days after final set
5. Modified high alumina based rapid setting concrete patch material no sooner than 30 minutes after final set

Replace the 3rd paragraph of section 60-3.04B(3)(b) with:

04-20-18

Clean the deck by vacuuming, then blow the deck clean with high-pressure oil-free air. Dust must not be blown into the air while blowing the deck.

04-20-18

Delete the 6th paragraph of section 60-3.04B(3)(b).

Replace the 3rd paragraph of section 60-3.04B(3)(c) with:

04-20-18

Finishing equipment for polyester concrete must:

1. Have grade control capabilities resulting in a roadway surface that meets the smoothness requirements of section 51-1.01D(3)(b)(ii) and is capable of adjusting for a variable thickness overlay along and across the existing deck surface. The use of fixed height skid-supported strike off equipment is not allowed.
2. Be used to consolidate the polyester concrete.
3. Have a 12-foot minimum paving width.
4. Be self-propelled and equipped with automatic screed controls and sensing devices that control the thickness, longitudinal grade, and transverse screed slope. Advancing the finishing equipment with winches or a pulling device is not allowed.

07-15-16

Delete the 2nd sentence in the 11th paragraph of section 60-3.04B(3)(c).

Replace the 4th paragraph of section 60-4.02C(1) with:

04-20-18

Clean prepared areas of dust and loose and deleterious materials by vacuuming, abrasive blast cleaning, and using high-pressure oil-free air. Re-blast contaminated areas before starting concrete placement activities. Dust must not be blown into the air while blowing the deck.

Replace the 1st paragraph of section 60-4.02C(2) with:

04-20-18

Abrasive-blast clean concrete surfaces to be refinished. Clean blast-cleaned surfaces by vacuuming, then blow them clean using high-pressure oil-free air. Dust must not be blown into the air while blowing the deck.

64-3.01D Quality Assurance

Reserved

64-3.02 MATERIALS

64-3.02A General

Not Used

64-3.02B Slotted Plastic Pipes

Slotted plastic pipe must be one of the following or equal:

Slotted Plastic Pipe

12" diameter	18" diameter
Zurn Z888-12	Zurn Z888-18
ACO Qmax 350	ACO Qmax 365
ADS Duraslot-12	ADS Duraslot-18

64-3.02C Concrete Backfill

Concrete for concrete backfill for slotted plastic pipe must comply with the specifications for minor concrete. You may use RSC instead of minor concrete for concrete backfill.

If RSC is used for concrete backfill, the RSC must:

1. Contain at least 590 pounds of cementitious material per cubic yard
2. Comply with section 90-3.02A, except section 90-1 does not apply
3. Comply with section 90-2

64-3.02D Heel-Resistant Grates

Heel-resistant grate must:

1. Be designed to carry traffic loadings
2. Comply with ADA requirements
3. Be constructed of steel or cast iron
4. Be provided by the same manufacturer of the slotted plastic pipe
5. Comply with the manufacturer's instructions

64-3.02E Bar Reinforcement

Bar reinforcement must comply with ASTM A615/A615M, Grade 60 or ASTM A706/A706M, Grade 60.

64-3.02F Miscellaneous Metal

Ductile iron, nuts, bolts, and washers must comply with section 75.

64-3.02G Grout

Grout must be non-shrink grout complying with ASTM C1107/C1107M.

64-3.02H Curing Compound

Non-pigmented curing compound must comply with ASTM C309, Type 1, Class B.

64-3.02I End Caps

End cap must:

1. Be provided by the same manufacturer of the slotted plastic pipe
2. Prevent concrete backfill from entering the pipe

64-3.03 CONSTRUCTION

64-3.03A General

Cover the grate slots with heavy-duty tape or other authorized covering during paving and concrete backfilling activities to prevent material from entering the slots.

64-3.03B Preparation

Pave adjacent traffic lanes before installing slotted plastic pipes.

Excavation must comply with section 19-3.

64-3.03C Installation

Lay and join slotted plastic pipes under the pipe manufacturer’s instructions.

Lay pipes to line and grade with sections closely jointed and adequately secured to prevent separation during placement of the concrete backfill. If the pipes do not have a positive interlocking mechanism like a slot and tongue connection, secure the sections together with nuts, bolts, and washers before backfilling.

The top of slotted plastic pipes must not extend above the completed surface. Position the pipes so that the concrete backfill is flush with the surrounding grade and above the top of the grate from 1/8 to 1/4 inch.

Place channels with the male and female ends facing each other.

Place lateral support bar reinforcement on both sides of the grate slots. The support bar reinforcement must run the full length of the slots.

Anchor heel-resistant grates to the concrete backfill under the manufacturer’s instructions.

64-3.03D Concrete Backfill

Wherever minor concrete is used for concrete backfill for slotted plastic pipe, do not allow traffic on top of the backfill within 7 days of placement.

Wherever RSC is used for concrete backfill for slotted plastic pipe, do not allow traffic on top of the backfill before the required cure time of 2,000 psi is achieved.

Place concrete backfill where shown.

Consolidate the concrete backfill with high-frequency internal vibrators.

Texture the concrete backfill surface with a broom or burlap drag to produce a durable skid-resistant surface.

Apply a non-pigmented curing compound to the exposed concrete backfill surface whenever the atmospheric temperature is 90 degrees F or greater after placement.

64-3.03E Transition Fittings

Use transition fittings to connect slotted plastic pipes to drainage inlets. The transition fittings must be supplied by the same pipe manufacturer.

Where welds are required in transition fittings, welds must comply with the pipe manufacturer’s instructions. The completed welds must not have visible pinholes. Fill the gaps around the pipes in the inlet structure wall with non-shrink grout where the pipes connect to an existing drainage structure. Install the grout under the pipe manufacturer’s instructions.

Cut the pipes as shown after the grout used to seal the transition fitting has cured for at least 24 hours.

64-3.04 PAYMENT

Slotted plastic pipe is measured along the centerline of the pipe and parallel with the slope line. If the pipe is cut to fit a structure or slope, the payment quantity is the length of pipe necessary to be placed before cutting, measured in 2-foot increments.

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70 MISCELLANEOUS DRAINAGE FACILITIES

04-20-18

Replace section 70-6 with:

04-20-18

70-6 GRATED LINE DRAINS

70-6.01 GENERAL

70-6.01A Summary

Section 70-6 includes specifications for installing grated line drains.

Use only 1 type of grated line drain.

70-6.01B Definitions

Reserved

70-6.01C Submittals

Submit the following:

1. Certificate of compliance for the grated line drains from the manufacturer
2. Documentation of the channel discharge capacity
3. Inspection report of the completed grated line drain

70-6.01D Quality Assurance

Reserved

70-6.02 MATERIALS

70-6.02A General

Grated line drain must be on the Authorized Material List for grated line drains and must have (1) a channel discharge capacity equal to or greater than the capacity shown and (2) the minimum slope shown.

Line drain sections must be either non-sloped uniform depth sections from 4-7/16 to 12 inches or pre-sloped sections with a minimum continuous 0.6 percent slope with graduated depths from 4-7/16 to 12 inches.

Concrete backfill must comply with the specifications for minor concrete.

In freeze-thaw areas, add an air entraining admixture at a rate to achieve an air content of 4 ± 1.5 percent in the freshly mixed concrete.

Reinforcing bars must be Grade 60 and comply with section 52. Mechanical splice couplers must be commercial-quality double-sleeve type with friction locking screws for use with Grade 60 steel.

70-6.02B Line Drain Channel

Line drain channel may be monolithic polymer concrete, fiberglass, high density polyethylene, or cast-in-place using expanded polystyrene form. End caps must be provided by the line drain manufacturer.

Drain channel sections must not have side extensions. The interior surface of the line drain channel must be smooth below the level of the frame, grate, and associated connections.

70-6.02C Line Drain Frames and Grates

Grated line drain frames and grates must comply with section 75-2 except grates must be ductile iron. Frames and grates include bolts, nuts, frame anchors, connector cover and other connecting hardware. Steel frame must be galvanized under section 75-1.

Frames and grates must comply with AASHTO M306 and be classified heavy duty traffic rated with a transverse proof-load strength of 25,000 pounds.

Frames and grates must be anchored into the body of the line drain or concrete backfill. Grates must be non-removable.

Steel anchoring rods and shear studs, if used, must comply with ASTM A1044.

Steel cover plate must comply with ASTM A36 and be galvanized under section 75-1.02B. Except for grates installed within designated pedestrian paths of travel, grate design must accept inflow of runoff through openings consisting of a minimum of 60 percent of the total top surface area of the grate. Individual openings or slots must have a dimension not greater than 2 inches measured in the direction of the grated line drain flow line.

Grates installed within designated pedestrian paths of travel must be certified as conforming to the provisions of the ADA.

70-6.03 CONSTRUCTION

Excavation and backfill must comply with section 19-3.

Grated line drains must be installed in trenches excavated to the lines and grades established by the Engineer. Grade and prepare the bottom of the trench to provide a firm and uniform bearing throughout the entire length of the grated line drain.

Installation of grated line drains and joints must comply with the manufacturer's instructions.

Install grated line drains with sections closely jointed and secured such that no separation of the line drains occur during backfilling.

The frame or grate must not extend above the level of the surrounding concrete backfill.

Connect grated line drains to new or existing drainage facilities as shown. Drill and bond dowels must comply with section 51-1.03E(5).

Place concrete backfill in the trench as shown. Place against undisturbed material at the sides and bottom of the trench in a manner that prevents (1) floating or shifting of the grated line drain and (2) voids or segregation in the concrete.

Immediately remove foreign material that falls into the trench before or during concrete placement. Prevent material from entering the grated line drain during construction.

Where necessary, construct and compact earth plugs at the ends of the concrete backfill to contain the concrete within the trench.

Place a 1/2-inch isolation joint where grated line drain is placed in PCC pavement. Isolation joint must comply with section 40-1.

Contraction and expansion joints must comply with section 73-2.

Secure frame and grate or line drain wall to the surrounding concrete backfill with steel anchoring rods as shown. Alternative securing methods must provide a minimum pullout resistance of 685 lb/ft of length of grated line drain frame.

DIVISION VIII MISCELLANEOUS CONSTRUCTION

72 SLOPE PROTECTION

07-21-17

Add to section 72-1.04:

07-21-17

Payment for rock slope protection fabric is not included in the payment for rock slope protection.

Replace the 1st and 2nd paragraphs of section 72-2.02B with:

07-15-16

For method A and B placement and the class of RSP described, comply with the rock gradation shown in the following table:

Rock Gradation

Nominal RSP class by median particle diameter ^b		Nominal median particle weight W ₅₀ ^{c,d}	d ₁₅ ^c (inches)		d ₅₀ ^c (inches)		d ₁₀₀ ^c (inches)	Placement
Class ^a	Diameter (inches)		Min	Max	Min	Max	Max	Method
I	6	20 lb	3.7	5.2	5.7	6.9	12.0	B
II	9	60 lb	5.5	7.8	8.5	10.5	18.0	B
III	12	150 lb	7.3	10.5	11.5	14.0	24.0	B
IV	15	300 lb	9.2	13.0	14.5	17.5	30.0	B
V	18	1/4 ton	11.0	15.5	17.0	20.5	36.0	B
VI	21	3/8 ton	13.0	18.5	20.0	24.0	42.0	A or B
VII	24	1/2 ton	14.5	21.0	23.0	27.5	48.0	A or B
VIII	30	1 ton	18.5	26.0	28.5	34.5	48.0	A or B
IX	36	2 ton	22.0	31.5	34.0	41.5	52.8	A
X	42	3 ton	25.5	36.5	40.0	48.5	60.5	A
XI	46	4 ton	28.0	39.4	43.7	53.1	66.6	A

^aFor RSP Classes I–VIII, use Class 8 RSP fabric. For RSP Classes IX–XI, use Class 10 RSP fabric.

^bIntermediate or B dimension (i.e., width) where A dimension is length and C dimension is thickness.

^cd%, where % denotes the percentage of the total weight of the graded material.

^dValues shown are based on the minimum and maximum particle diameters shown and an average specific gravity of 2.65. Weight will vary based on specific gravity of rock available for the project.

Replace the table in section 72-2.02C with:

07-15-16

Fabric Class

Class	Largest rock gradation class used in slope protection
8	Classes I–VIII
10	Classes IX–XI

Replace 3-1/4-inch-vertical and 5-1/4-inch-horizontal mesh in the 4th paragraph of section 80-3.02C with:

04-20-18

3-1/2-inch-vertical and 5-inch-horizontal mesh

Replace section 80-4 with:

07-15-16

80-4 WILDLIFE EXCLUSION FENCES

80-4.01 GENERAL

80-4.01A General

Section 80-4 includes specifications for constructing wildlife exclusion fences.

Constructing a wildlife exclusion fence includes the installation of any signs specified in the special provisions.

80-4.01B Materials

Each T post must:

1. Comply with ASTM A702
2. Be metal and have an anchor plate
3. Be painted black or galvanized

80-4.01C Construction

Not Used

80-4.01D Payment

Not Used

80-4.02 DESERT TORTOISE FENCES

80-4.02A General

Section 80-4.02 includes specifications for constructing desert tortoise fences.

80-4.02B Materials

80-4.02B(1) Permanent Desert Tortoise Fences

80-4.02B(1)(a) General

Each wire tie and hog ring for a permanent desert tortoise fence must comply with section 80-2.02F.

Each hold down pin must:

1. Be U-shaped, with 2 minimum 6-inch long legs
2. Have pointed ends
3. Be at least 11-gauge wire
4. Be galvanized
5. Be commercial quality

80-4.02B(1)(b) Hardware Cloth

The hardware cloth must:

1. Comply with ASTM A740
2. Be welded or woven galvanized steel wire fabric

3. Be made of at least 14-gauge wire
4. Be 36 inches wide

80-4.02B(1)(c) Barbless Wire

The barbless wire must:

1. Comply with ASTM A641/A641M
2. Be at least 14-gauge wire
3. Have a Class 1 zinc coating

80-4.02B(1)(d) Posts

Each post must:

1. Comply with ASTM F1083
2. Be standard weight, schedule 40 steel pipe with a nominal pipe size of 1 inch
3. Be galvanized steel fence post conforming to ASTM A702

80-4.02B(2) Temporary Desert Tortoise Fences

The materials for a temporary desert tortoise fence must comply with section 80-4.02B(1), except the hardware cloth must be made of at least 16-gauge wire.

80-4.02C Construction

80-4.02C(1) General

Extend the hardware cloth a minimum of 24 inches above the ground.

Plumb the posts and pull the hardware cloth taut. Correct any alignment issues.

80-4.02C(2) Permanent Desert Tortoise Fences

Excavate the ground to form a trench before installing the posts and hardware cloth. Embed the posts at maximum 5-foot intervals into the ground. If T posts are used, use 5-foot lengths and embed the posts to match the above-ground height shown for the posts.

Securely fasten the hardware cloth to the posts with wire ties and to barbless wire with hog rings as shown. Pass the wire ties through the hardware cloth. Encircle the posts and barbless wire with the ties and tie them by twisting a minimum of 3 complete turns.

Bend the twisted ends of the ties down to prevent possible snagging. Close hog rings with their ends overlapping.

Bury the hardware cloth a minimum of 12 inches into the ground. Install the cloth in 1 continuous piece. You may cut the cloth into shorter segments if authorized.

Overlap the hardware cloth segments at posts, with a minimum overlap of 6 inches centered at a post. Wire tie the overlapped cloth to posts as shown. Prevent fraying by threading barbless wire along the vertical edges of the hardware cloth on either side of the post or use 3 equally spaced hog rings (6 hog rings per location) along each wire cloth edge.

Where bedrock or caliche substrate is encountered, use the bent hardware cloth detail if authorized. Transitions from buried-to-bent or bent-to-buried configuration must occur at a post location with a minimum 6-inch overlap of the hardware cloth as shown. The maximum spacing for hold down pins is 24 inches on center. Anchor in place with hold down pins the beginning and end corners of the hardware cloth placed on the ground.

Add to the list in the 1st paragraph of section 84-2.01C:

07-21-17

4. Material data sheet for thermoplastic primer

Add between the 1st and 2nd paragraphs of section 84-2.01C:

04-20-18

For each lot or batch of thermoplastic, submit a manufacturer's certificate of compliance with test results for the tests specified in section 84-2.01D. The date of test must be within 1 year of use.

Add to the end of section 84-2.01D:

04-20-18

Each lot or batch of thermoplastic must be tested under California Test 423 for:

1. Brookfield Thermosel viscosity
2. Hardness
3. Yellowness index, white only
4. Daytime luminance factor
5. Yellow color, yellow only
6. Glass bead content
7. Binder content

During the installation of thermoplastic traffic stripes or markings at the job site, apply a test stripe of the thermoplastic on suitable material in the presence of the Engineer. The test stripe must be at least 1 foot in length. The test stripe will be tested for yellow color, daytime luminance factor, and yellowness index requirements.

Replace the list in the 1st paragraph of section 84-2.03C(2)(a) with:

07-21-17

1. To all roadway surfaces except for asphaltic surfaces less than 6 months old
2. At a minimum rate of 1 gallon per 300 square feet
3. To allow time for the thermoplastic primer to dry and become tacky prior to application of the thermoplastic

Replace 0.20 lb of thermoplastic per foot of 4-inch-wide solid stripe in the 2nd paragraph of section 84-2.03C(2)(b) with:

07-21-17

0.36 lb of thermoplastic per foot of 6-inch-wide solid stripe

Replace 0.13 lb of thermoplastic per foot of 4-inch-wide solid stripe in the 2nd paragraph of section 84-2.03C(2)(c) with:

07-21-17

0.24 lb of thermoplastic per foot of 6-inch-wide solid stripe

Replace 0.38 lb of thermoplastic per foot of 4-inch-wide solid stripe in the 2nd paragraph of section 84-2.03C(2)(e) with:

07-21-17

0.57 lb of thermoplastic per foot of 6-inch-wide solid stripe

Replace 4-inch-wide yellow stripes at each occurrence in section 84-2.03C(3)(a) with:

07-21-17

6-inch-wide yellow stripes

Replace 4-inch-wide yellow stripes at each occurrence in section 84-2.04 with:

07-21-17

6-inch-wide yellow stripes

Add to the beginning of section 84-8.03A:

07-15-16

Select the method and equipment for constructing ground-in indentations.

Replace the 1st paragraph of section 84-8.03A with:

07-15-16

Do not construct rumble strips:

1. On structures, approach slabs, or concrete weigh-in-motion slabs
2. At intersections
3. Bordering two-way left turn lanes, driveways, or other high-volume turning areas
4. Within 6 inches of any concrete pavement joint

Add between the 2nd and 3rd paragraphs of section 84-8.03A:

07-15-16

Modify rumble strip spacing to avoid locating a groove on a concrete pavement joint.

Replace the 3rd paragraph of section 84-8.03A with:

07-15-16

Indentations must comply with the dimensions shown and not vary more than:

1. 10 percent in length
2. 0.06 inch in depth
3. 10 percent in width
4. 1 inch in center-to-center spacing between rumble strips

Add to the end of section 84-8.03A:

07-15-16

The noise level created by the combined grinding activities must not exceed 86 dBA when measured at a distance of 50 feet at right angles to the direction of travel.

Break rumble strips before and after intersections, driveways, railroad crossings, freeway gore areas, and freeway ramps. Place breaks and break distances as shown. You may adjust breaks and the break distances as needed at low-volume driveways or other locations if authorized.

07-15-16

Delete *new* in the 1st paragraph of section 84-8.03B.

07-15-16

Add to the end of section 84-8.03B:

Remove grinding residue under section 13-4.03E(7).

Replace the 1st paragraph of section 84-8.03C with:

07-15-16

Construct rumble strips in the top layer of HMA and asphalt concrete surfacing by the ground-in method.

Add between the 2nd and 3rd paragraphs of section 84-8.03C:

07-15-16

Dispose of the removed material.

07-15-16

Delete the 2nd paragraph of section 84-8.03C.

Replace 37-2 in the 3rd paragraph of section 84-8.03C with:

07-15-16

37-4.02

Replace section 84-8.04 with:

07-15-16

The payment quantity for any type of rumble strip is the length measured by the station along the length of the rumble strip without deductions for gaps between indentations.

3. Concrete temperature monitoring and recording system details
4. Temperature sensor types and locations
5. Measures to ensure compliance with maximum temperature and temperature gain requirements, including maximum concrete temperature at discharge and controlling enclosure temperature

Replace the list in the 3rd paragraph of section 90-4.01C(3) with:

01-20-17

1. Concrete plants
2. Material sources
3. Material testing procedures
4. Testing laboratory
5. Procedures and equipment
6. Systems for tracking and identifying PC concrete members
7. QC personnel
8. Methods for controlling internal concrete temperature

Add to the list in the 2nd paragraph of section 90-4.01C(4):

01-20-17

7. Daily temperature data for internally monitored tier 1 PC concrete members

Replace *Temperature* in the 2nd table in the 5th paragraph of section 90-4.01D(2)(c) with:

01-20-17

Temperature at time of mixing

Add to section 90-4.01D(2):

01-20-17

90-4.01D(2)(d) Temperature Monitoring

90-4.01D(2)(d)(i) General

At a minimum, provide temperature monitoring devices as shown in the following table:

Temperature Monitoring Requirements

Component	Steam curing	Other curing methods
Tier 1 PC bridge components except piling and deck panels	1 internal temperature sensor for each individually cast member; 1 internal temperature sensor for every 100 feet of bed length for continuously cast elements ^a	1 internal temperature sensor for each individually cast member; 1 internal temperature sensor for every 100 feet of bed length for continuously cast elements ^a
PC piling, deck panels, and PS pavement	1 enclosure temperature sensor for every 200 feet of bed length for continuously cast elements	Not required
Other PC components	1 enclosure temperature sensor for every 200 feet of bed length for continuously cast elements	Not required

^aMembers not instrumented are represented by the nearest internal temperature probe.

Temperature monitoring devices must provide an accurate, continuous, permanent record of the temperature during curing activities.

90-4.01D(2)(d)(ii) Tier 1 Bridge Components

Except for piling and deck panels, provide a temperature monitoring and recording system during concrete placement and curing for tier 1 PC bridge components. The system must consist of temperature sensors connected to a data acquisition system. The system must be capable of recording, printing, and downloading temperature data to a computer. Temperature sensors must be accurate to within ± 2 degrees F.

Position each internal concrete temperature sensor as shown in the following table:

Internal Concrete Sensor Locations	
PC component	Sensor location
Wide flange, 'I', and bulb tee girders	6–8 inches below top surface along center line at midpoint
Other girder shapes	6–8 inches below top surface along center line of stem at midpoint
Deck slabs	Center of element at mid-depth
Other elements	Position sensor to provide maximum concrete cover

Record temperature readings automatically at least every 15 minutes. You may discontinue temperature recording (1) when the maximum internal concrete temperature is falling for a minimum of 1 hour, or (2) immediately before stress transfer to the concrete.

Do not allow the ends of temperature sensors to come into contact with concrete supports, forms, or reinforcement.

Correct equipment failures in temperature control and monitoring and recording systems immediately.

Add to section 90-4.01D(3):

01-20-17

For tier 1 PC bridge components that are monitored for internal temperature, the Engineer rejects components if at any temperature sensor (1) the maximum internal concrete temperature exceeds 165 degrees F, or (2) the internal temperature gain exceeds 40 degrees F per hour. If the maximum internal concrete temperature is from 161 to 165 degrees F, the Engineer reduces payment for furnish PC concrete member by a percentage equal to 2 times the difference of the maximum measured temperature in degrees F minus 160.

Add between the 3rd and 4th paragraphs of section 90-4.02:

01-20-17

For tier 1 PC concrete members with internal temperature monitoring:

1. Maximum internal concrete temperature must not exceed 165 degrees F at any temperature sensor
2. Maximum temperature gain must not exceed 40 degrees F per hour at any temperature sensor

Replace the 5th paragraph of section 90-4.02 with:

01-20-17

Portland cement based repair material must be on the Authorized Material List for precast portland cement based repair material.

Replace the 4th item in the list in the 2nd paragraph of section 90-4.03 with:

01-20-17

4. Steam at the jets must be at low pressure and in a saturated condition. Steam jets must not impinge directly on the concrete, test cylinders, or forms. During application of the steam, the temperature rise within the enclosure must not exceed 40 degrees F per hour. Except for internally monitored components, the curing temperature throughout the enclosure must not exceed 150 degrees F. Maintain the curing temperature at a constant level for the time necessary to develop the required transfer strength. Cover control cylinders to prevent moisture loss and place them in a location where the temperature is representative of the average enclosure temperature.

01-20-17

Delete the 5th item in the list in the 2nd paragraph of section 90-4.03.

Add to section 90-4.03:

01-20-17

For internally monitored tier 1 PC bridge components with a maximum internal concrete temperature of 161 to 165 degrees F, the following apply:

1. Do not apply curing compound
2. Cure an additional 7 days using the water cure method
3. After 7 days apply a silane waterproofing treatment under the following conditions:

- 3.1. Silane waterproofing treatment selected for use must be on the Authorized Material List for silane reactive penetrating sealers
- 3.2. Concrete surfaces must be completely dry when silane is applied
- 3.3. Apply a single application of undiluted silane under the manufacturer's application instructions until surfaces are saturated

Replace section 90-9 with:

07-15-16

90-9 RETURNED PLASTIC CONCRETE

90-9.01 GENERAL

90-9.01A Summary

Section 90-9 includes specifications for incorporating returned plastic concrete (RPC) into concrete.

RPC must be used only where the specifications allow its use. Do not use RPC in pavement or structural concrete.

90-9.01B Definitions

returned plastic concrete (RPC): Excess concrete that is returned to a concrete plant in a plastic state and that has not attained initial set.

hydration stabilizing admixture (HSA): Extended set retarding admixture that controls and predictably reduces the hydration rate of the cementitious material.

90-9.01C Submittals

Submit the following with the weighmaster certificate:

1. Weight or volume of RPC
2. Type, brand, and dosage of HSA
3. Time of adding HSA
4. Copy of the original weighmaster certificate for the RPC
5. Temperature of RPC

When requested, submit the HSA manufacturer's instructions, including dosage tables.

90-9.01D Quality Assurance

The material plant producing concrete containing RPC must be authorized under the MPQP.

For volumetric proportioning of RPC:

1. The volumetric container must be imprinted with manufacturer's name, model number, serial number, the as-calibrated volume and date of the last calibration. Cross sectional dimensions of the container must remain the same as those during its calibration.
2. The device must be re-calibrated monthly and at any time when the container shape has been deformed from its original condition or there is evidence of material build-up on the inside of the device.
3. The device must be held in a level condition during filling. Fill the device to the measure or strike-off line. Each measurement must be filled to within 1.0% of the device as-calibrated volume.
4. The device interior must be cleaned after each measurement to maintain a zero condition.

For weight proportioning, proportion RPC with a weigh hopper attached to the plant at a position which allows the addition of the RPC to the mixer truck with the conventional PCC ingredients. The plant process controller must control the proportioning of RPC to within 1.0% of its target weight.

90-9.02 MATERIALS

90-9.02A General

The quantity of RPC added to the concrete must not exceed 15 percent.

The cementitious material content of the RPC must be at least that specified for the concrete that allows the use of RPC.

Water must not be added to the RPC after batching, including in the truck mixer.

Use HSA for controlling and reducing the hydration rate of RPC.

Incorporate RPC by mixing into the concrete before arriving at the jobsite.

90-9.02B Returned Plastic Concrete

The RPC must not exceed 100 degrees F at any time.

If HSA is not used, RPC must be incorporated into the concrete before attaining initial set or within 4 hours after batching of RPC, whichever is earlier.

If HSA is used:

1. Add HSA to RPC within 4 hours after original batching.
2. Measure and record the time, dosage of HSA, and temperature of RPC when HSA is added.
3. Mix the RPC under the HSA manufacturer's instructions after adding HSA or at least 30 revolutions, whichever is greater.
4. Incorporate RPC into the concrete within 4 hours after adding HSA.

RPC must not contain:

1. Accelerating admixture
2. Fiber
3. Pigment
4. Lightweight aggregate
5. Previously returned RPC
6. Any ingredient incompatible with the resultant concrete

90-9.02C Hydration Stabilizing Admixture

HSA must comply with ASTM C494 admixture Type B or Type D.

HSA must have a proven history of specifically maintaining and extending both plasticity and set.

HSA dosage must comply with the manufacturer's instructions.

90-9.02D Production

Proportion concrete containing RPC under section 90-2.02E.

Proportion RPC by weight or by volume.

90-9.03 CONSTRUCTION

Not Used

Replace section 96-1.02R with:

04-20-18

96-1.02R Geomembrane

Geomembrane must be:

1. Polyethylene or polypropylene
2. Water resistant
3. Unreinforced or scrim reinforced

Cushion fabric must be nonwoven.

Geomembrane and cushion fabric must comply with the requirements shown in the following tables:

Unreinforced Geomembrane

Quality characteristic	Test method	Requirement		
		Class A	Class B	Class C
Thickness, smooth (min, mil)	ASTM D5199	20	20	20
Thickness, textured (min, mil)	ASTM D5994			
Tensile break strength (min, lb/in)	ASTM D6693 Type IV	75	65	55
Puncture resistance (min, lb)	ASTM D4833	45	40	35
Tear resistance (min, lb)	ASTM D1004	20	15	10
Carbon black content (%)	ASTM D4218	2-3		

Scrim Reinforced Geomembrane

Quality characteristic	Test method	Requirement		
		Class A	Class B	Class C
Thickness, smooth (min, mil)	ASTM D5199	20	20	20
Thickness, textured (min, mil)	ASTM D5994			
Tensile break strength (min, lb)	ASTM D7004	250	200	150
Puncture resistance (min, lb)	ASTM D4833	45	40	35
Tear resistance (min, lb)	ASTM D5884	55	55	55
Ply adhesion (min, lb)	ASTM D6636	20	20	20
Carbon black content (%)	ASTM D4218	2-3		

Cushion Fabric

Quality characteristic	Test method	Requirement					
		10	12	16	24	32	60
Mass per unit area (oz/sq yd)	ASTM D5261	10	12	16	24	32	60
Grab tensile break strength (min, lb)	ASTM D4632	230	300	370	450	500	630
Grab tensile break elongation (min, %)	ASTM D4632	50					
Puncture strength (min, lb)	ASTM D6241	700	800	900	1100	1700	2400
Trapezoidal tear strength (min, lb)	ASTM D4533	95	115	145	200	215	290
UV resistance (min, %)	ASTM D7238	70					

OCEANO COMMUNITY SERVICES DISTRICT

OCEANO DRAINAGE UTILITY RELOCATION PROJECT

**OCEANO, CA
CONTRACT NO. 2019-02**

EXHIBIT "E"

PERFORMANCE AND PAYMENT BONDS

PERFORMANCE BOND

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

Oceano Community Services District
1655 Front Street
Oceano, CA 93445
Attention: General Manager

CONSTRUCTION CONTRACT

Effective Date of Agreement:

Amount:

Description: Oceano Drainage Utility Relocation Project, Oceano, Ca, Contract No. 2019-02

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement of the Construction Contract*):

Amount:

Modifications to this Bond Form: None See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

(Seal)
Contractor's Name and Corporate Seal

(Seal)
Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers, (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:
 - 3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or
 - 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
 - 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the

Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
 - 7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.
12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
14. Definitions
 - 14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
 - 14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

- 14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
- 14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.
15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
16. Modifications to this Bond are as follows:
17. The effective date of this Bond shall be the same date as the Effective Date of the Construction Contract.

END OF SECTION

PAYMENT BOND

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

Oceano Community Services District
1655 Front Street
Oceano, CA 93445
Attention: General Manager

CONSTRUCTION CONTRACT

Effective Date of Agreement:

Amount:

Description: Oceano Drainage Utility Relocation Project, Oceano, Ca, Contract No. 2019-02

BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement of the Construction Contract*):

Amount:

Modifications to this Bond Form: None See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

(Seal)
Contractor's Name and Corporate Seal

(Seal)
Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers, (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the

performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. Definitions
 - 16.1 Claim: A written statement by the Claimant including at a minimum:
 1. The name of the Claimant;
 2. The name of the person for whom the labor was done, or materials or equipment furnished;
 3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 4. A brief description of the labor, materials, or equipment furnished;
 5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 7. The total amount of previous payments received by the Claimant; and
 8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

- 16.2 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 16.3 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
- 16.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 16.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
18. Modifications to this Bond are as follows:
19. The effective date of this Bond shall be the same date as the Effective Date of the Construction Contract.

ENDOFSECTION

OCEANO COMMUNITY SERVICES DISTRICT

OCEANO DRAINAGE UTILITY RELOCATION PROJECT

**OCEANO, CA
CONTRACT NO. 2019-02**

EXHIBIT "F"

INSURANCE REQUIREMENTS

INSURANCE REQUIREMENTS

INDEMNIFICATION

To the fullest extent permitted by law, CONTRACTOR shall indemnify, defend and hold harmless the District and its officers, agents, employees, and volunteers from and against all claims, demands, damages, liabilities, loss, costs, and expense (including attorney's fees and costs of litigation) of every nature arising out of or in connection with Contractor's performance or attempted performance of work hereunder or its failure to comply with any of its obligations contained in the agreement, except such loss or damage which was caused by sole negligence or willful misconduct of the District.

INSURANCE COVERAGE

Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, its agents, representatives, or employees.

MINIMUM SCOPE AND LIMIT OF INSURANCE

Coverage shall be at least as broad as:

1. Commercial General Liability (CGL); Insurance Services Office (ISO) Form CG 0001 covering CGL on an "occurrence" basis for bodily injury and property damage, including products-completed, operations, personal injury and advertising injury, with limits no less than \$1,000,000 per occurrence. If a general aggregate limit applies either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: ISO Form Number CA 0001 covering, Code 1 (any auto), or if Contractor has no owned autos, Code 8 (hired) and 9 (non-owned), with limit no less than \$1,000,000 per accident for bodily injury and property damages.
3. Worker Compensation insurance as required by the State of California, with Statutory Limits, and Employer's Liability insurance with limit of no less than \$1,000,000 per accident for bodily injury or disease. If Contractor will provide leased employees, or is an employee leasing or temporary staffing firm or a professional employer organization (PEO), coverage shall also include an Alternate Employer Endorsement (providing scope of coverage equivalent to ISO policy form WC 00 03 O1 A) naming the District as the Alternate Employer, and the endorsement form shall be modified to provide that District will receive not less than thirty (30) days advance written notice of cancellation of this coverage provision. If applicable to Contractor's operations, coverage also shall be arranged to satisfy the requirements of any federal workers or workmen's compensation law or any federal occupational disease law.
(Not required if Contractor provides written verification it has no employees)

If the contractor maintains higher limits than the minimums shown above, the District requires and shall be entitled to coverage for the higher limits maintained by the contractor.

OTHER INSURANCE PROVISIONS

The insurance policies are to contain, or be endorsed to contain, the following provisions:

Additional Insured Status:

The District, its officers, officials, employees, and volunteers are to be covered as insureds on the auto policy with respect to liability arising out of automobiles owned, leased, hired or borrowed by, or on behalf of the Contractor; and on the CGL policy with respect to liability arising out of work or operations performed by or on behalf of the Contractor including materials, parts, or equipment furnished in connection with such work or operations. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance (at least as broad as ISO Form CG 20 10, 11 85 or both CG 20 10 and CG 23 37 forms if later revisions used).

Primary Coverage

For any claims related to this contract, the Contractor's insurance coverage shall be primary insurance as respects the District, its officers, officials, employees, and volunteers. Any insurance of self-insurance maintained by the District, its officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

Notice of Cancellation

Each insurance policy required above shall state that coverage shall not be canceled, except after thirty (30) days prior written notice (10 days for non-payment) has been given to the District.

Failure to Maintain Insurance

Contractor's failure to maintain or to provide acceptable evidence that it maintains the required insurance shall constitute a material breach of the Contract upon which the District immediately may withhold payments due to Contractor, and/or suspend or terminate this Contract. The District, at its sole discretion, may obtain damages from Contractor resulting from said breach.

Waiver of Subrogation

Contractor hereby grants to District a waiver of any right to subrogation which any insurer of said Contractor may acquire against the District by virtue of the payment of any loss under such insurance. Contractor agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation, but this provision applies regardless of whether or not the District has received a waiver of subrogation endorsement from the insurer.

Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the District. The District may require the Contractor to provide proof of ability to pay losses and related investigation, claim administration, and defense expenses within the retention.

Acceptability of Insurers

Insurance is to be placed with insurers with a current A.A. Best's rating of no less than A:VII, unless otherwise acceptable to the District.

Claims Made Policies

If any of the required policies provide coverage on a claims-made basis:

1. The Retroactive Date must be shown and must be before the date of the contract or the beginning of contract work;
2. Insurance must be maintained and evidence of insurance must be provided for at least five (5) years after completion of the contract of work;
3. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a Retroactive date prior to the contract effective date, the Contractor must purchase "extended reporting" coverage for a minimum of five (5) years.

Separation of Insured's

All liability policies shall provide cross-liability coverage as would be afforded by the standard ISO (Insurance Services Office, Inc.) separate of insured's provision with no insured versus insured exclusions or limitation.

Verification of Coverage

Contractor shall furnish the District with original certificates and mandatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by the District before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Contractor's obligation to provide them. The District reserves the right to required complete, certified copies of all required insurance policies, including endorsements required by these specifications, at any time.

Certificates and copies of any required endorsements shall be sent to:

Oceano Community Services District
P.O. Box 599
Oceano, CA 93475-0599

Subcontractors

Contractor shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein.

Special Risks or Circumstances

District reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.