GENERAL PROVISIONS

SECTION I - DEFINITION OF TERMS

1.01 Whenever in these specifications, or in any documents or instruments where these specifications govern, the following terms or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

(a) DISTRICT: The Riverside County Flood Control and Water Conservation District of the State of California, as created by law, also sometimes referred to as the Flood Control District, or party of the first part.

(b) BOARD OF SUPERVISORS: The Board of Supervisors of the Riverside County Flood Control and Water Conservation District as created by law, also sometimes referred to as the Board.

(c) ENGINEER: The Chief Engineer of the Riverside County Flood Control and Water Conservation District, also sometimes referred to as the Flood Control Engineer, the Chief Engineer, or the General Manager-Chief Engineer, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

(d) LABORATORY: The established laboratory of the Riverside County Road Department or laboratories authorized by the District to test materials and work involved in the contract.

(e) BIDDER: Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.

(f) CONTRACTOR: The person or persons, copartnership or corporation, private or municipal, who have entered into a contract with the District, as party or parties of the second part or his or their legal representatives.

(g) SUPERINTENDENT: The Executive representative of the Contractor, present on the work at all times during progress, authorized to receive and execute instruction from the Engineer.

(h) PLANS: The official plans, profiles, typical cross sections, general cross sections, working drawings, and supplemental drawings, or exact reproductions thereof, approved by the Engineer, which show the location, character, dimensions and details of the work to be done, and which are to be considered as a part of the contract supplementary to these specifications.

(i) SPECIFICATIONS: The directions, provisions, and requirements contained herein as supplemented by such special provisions, as may be necessary, pertaining to the method and manner of performing the work or to the quantities and qualities of materials to be furnished under the contract. The Special Provisions are specific clauses setting forth conditions or requirements peculiar to the project under consideration and covering work or materials involved in the proposal and estimate but not satisfactorily covered by these General Provisions. Supplemental agreements or contract change orders are written agreements executed by the

Contractor and by the District, covering alterations, amendments or extensions to the project, as hereinafter provided.

(j) CONTRACT: The written agreement covering the performance of the work and the furnishing of labor and materials in the construction of the work. The contract shall include the Notice to Contractors, the Proposal, Plans, Specifications, Special Provisions, and Contract Bonds, also, any and all supplemental agreements or contract change orders amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner.

(k) CONTRACT PRICE: Shall mean either the lump sum, unit price, or unit prices to be named in the contract, or the total of all payments under the contract at the lump sum, unit price, or unit prices, as the case may be.

(l) SURETY OR SURETIES: The bondsmen or party or parties, approved by the Engineer, who may guarantee the fulfillment of the contract by bond, and whose signatures are attached to said bond.

(m) RIGHT OF WAY: The whole right of way which is reserved for and secured for use in constructing the improvement.

(n) THE WORK: All the work specified in the Special Provisions, proposal and contract, or indicated on the plans as the contemplated complete improvement covered by the contract.

1.02 Wherever in the specifications or upon the plans the words directed, required, permitted, ordered, designated, prescribed, or words of like import are used, it will be understood that the direction, requirements, permission, order, designation, or prescription of the Flood Control Engineer is intended, and similarly the words approved, acceptable, satisfactory, or words of like import, shall mean approved by, or acceptable to, or satisfactory to, the Flood Control Engineer, unless otherwise expressly stated.

SECTION II - SCOPE OF WORK

2.01 WORK TO BE DONE

It is the intent of these General Provisions, Special Provisions, Detailed Specifications, and the plans herein referred to, to provide for and include all labor, power, light, water, materials, tools, scaffolding, machinery, plant transportation, insurance, permits, bonds, temporary protection, watchmen, and superintendence necessary to construct and complete all work, and to furnish all materials included in the contract, except those furnished by the District and as specifically mentioned in these specifications.

The contract documents are complementary, and the work called for by any one shall be as binding as if called for by all.

2.02 CONSTRUCTION SCHEDULE

The Contractor shall submit at such times as may be requested by the Engineer, a schedule which shall show the order and dates in which the Contractor proposes to carry on the various parts of the work; including estimated completion dates.

2.03 DRAWINGS AND SPECIFICATIONS ON THE WORK

The Contractor shall keep one copy of all drawings and specifications on the work, in good order, available to the Engineer and his representatives.

2.04 ESTIMATE OF QUANTITIES

The quantities of work to be done and the materials to be furnished under this contract are approximate only. The District is not to be held responsible for the accuracy of the estimate of quantities.

The Contractor shall judge for himself, after considering all circumstances and conditions, the costs and quantities of materials involved in the contract. The Contractor shall not at any time assert that there was any misunderstanding in regard to the depth or class of the excavations to be made, or the nature or kind or amount of materials to be furnished for the work.

The Contractor herewith agrees that he will not ask, demand, sue for, or seek to recover, for compensation in excess of the amounts payable for the various unit costs or lump sum charges for the work, as stipulated in the proposal, which he actually performs as specified.

2.05 PROTESTS

If the Contractor considers any work demanded of him to be outside of the requirements of the contract, or considers any record or ruling of the Engineer to be unfair, he shall immediately, upon such work being demanded or such record of ruling being made, ask, in writing, for written instructions covering protested items of work. Immediately on receipt of written instructions from the Engineer he shall proceed without delay to diligently perform the work in conformance with the written record or ruling. Within ten (10) calendar days after date of receipt of the written instructions or ruling, the Contractor shall file a written protest with the Engineer stating clearly and in detail the basis of his protest. Except for such protests as are made of record in the manner herein specified and within the time limit stated, the records, rulings, instructions, or decisions of the Engineer shall be final and conclusive.

2.06 ALTERATIONS

It must be distinctly understood that such reasonable alterations and modifications may be made by the Chief Engineer, as may be deemed desirable, and that this may be done without notices to the Sureties on the Contractor's bonds. If such changes result in increased or decreased quantities under the items specified in the proposal, the Contractor will be paid on the basis of actual quantities as measured by the Engineer, and such changes shall not affect the unit prices bid by the Contractor. If, however, such changes result in delay to the work, the

Contractor will be given such extension of time on the completion of his contract as the Chief Engineer may deem equitable.

2.07 EXTRA WORK

A. General

The District reserves and shall have the right, when confronted with unpredicted conditions, unforeseen events, or emergencies, to revise the details of the contemplated work, or to add work of a different character or function and have the Contractor perform such revised or added work as "Extra Work", when such extra work is considered by the Chief Engineer to be virtually appurtenant to the satisfactory completion of the project.

"Extra Work" is defined as added work of a different character or function and for which no basis for payment is prescribed; or that involving revisions of the details of the work in such manner as to render inequitable payment under items upon which the Contractor bid; or that work which is indeterminate at the time of advertising and is specifically designated as extra work in the plans and Special Provisions.

The signing of the contract by the Contractor will be deemed to be an agreement on his part to perform extra work, as and when ordered by the Chief Engineer. Notice to the Sureties on the Contractor's bonds will not be given unless the estimated total value of the contract, as changed or supplemented, shall exceed the original total bid price by more than 25 percent.

If required extra work results in delay to the work, the Contractor will be given an equivalent extension of time.

Approval of extra work shall be obtained from the Board of Supervisors before such work is authorized to be done, if:

a. For contracts with a total contract price of $250,000 or less, a change due to extra work exceeds ten percent (10%) of the original contract amount; or

b. For contracts with a total contract price of more than $250,000, a change due to extra work exceeds $25,000 plus one percent (1%) of the original contract amount in excess of $250,000; or

c. An individual change exceeds $100,000; or

d. Cumulative contract changes exceed ten percent (10%) of the original contract amount.

Extra work specially authorized by the Board of Supervisors shall not be included in the cost limitations above stated.

B. Procedure for Extra Work

1. Upon decision of the District to have extra work performed, the Chief Engineer will so inform the Contractor, acquainting him with the essential details of the new work. The Contractor shall thereupon prepare a price for said work based upon his estimate of cost and submit said price and estimate to the Chief Engineer whose approval shall be secured before work is started; excepting that the Chief Engineer may, when in the best interest of the District, order the Contractor to proceed with the extra work in advance of the submission of such prices, provided that preliminary estimates, as made by the District, show that the cost will not exceed $1,000.

2. Prices for extra work shall be prepared by the Contractor on one or both of the following methods, as requested by the District, and submitted to the Chief Engineer for approval:

a. For a stated unit price or lump sum amount based upon current prevailing fair prices for materials, labor, plant, overhead and profit.

b. On a cost basis (force account by the Contractor). The cost of all work done by the Contractor will be computed in the manner described in Section 7.03, and the compensation thus provided shall be accepted as payment in full by the Contractor, and no additional payment will be allowed for the use of small tools, superintendent's services, timekeeper's services, pickup or yard trucks, except as specifically essential to the work, nor any other overhead expenses incurred in the prosecution of the force account work.

3. Upon receipt of the Contractor's price, the Chief Engineer will make an analysis thereof and adopt one of the following procedures:

a. Accept the Contractor's price for lump sum or unit price amount in the original or amended form and direct him to proceed with the work; or direct him to perform the work on a cost plus basis.

b. Have the work performed by District's forces or separate contract, without undue interference or hindrance to the Contractor and without claim or suit by the Contractor for damages on account thereof.

c. Direct the Contractor to proceed with the work and accept payment therefor in the amount as adjudicated later in a court of law.

2.08 PAYMENT FOR EXTRA WORK

At the end of each month the Contractor shall make and deliver to the Chief Engineer a statement of the cost of the extra work completed during the current month, itemized and in a form satisfactory to the Chief Engineer. Upon verification of said statement by the Chief Engineer, the Contractor's claim for the full amount, as shown on said statement, will be added to the monthly partial payment made in accordance with Paragraph 7.06 of the General Provisions.

2.09 RIGHTS OF WAY

The District shall provide the rights of way upon which the work under this contract is to be done, except that the Contractor shall provide land required for the erection of temporary construction facilities and storage of his material, together with right of access to same. The District will not be responsible for any delay in furnishing the rights of way and such delay shall not be made the basis for a claim for additional compensation by the Contractor. However, in case the failure of the District to furnish the required rights of way delays the prosecution of the work, the time allowed for completion will be extended by a period of time equal to that lost by the Contractor due to such delay.

2.10 CLEANING UP

The Contractor shall, as directed by the Engineer, remove from the District's right of way and from all public and private property, at his own expense, all temporary structures, rubbish and waste materials resulting from his operations.

SECTION III - CONTROL OF THE WORK

3.01 AUTHORITY OF THE ENGINEER

The Engineer shall have general supervision and direction of the contract under authority of the Board of Supervisors. He has the authority to stop the work whenever such stoppage may be necessary to ensure the proper execution of the contract. The Engineer shall decide all questions which may arise as to the quality or acceptability of materials furnished, work performed, and rate or progress of the work; all questions which may arise as to the interpretation of the plans and specifications; all questions as to the acceptable fulfillment of the contract on the part of the Contractor; and all questions as to compensation.

His determination and decision thereon shall be final and conclusive; and such determination and decision, in case any question shall arise, shall be a condition precedent to the right of the Contractor to receive any money hereunder.

3.02 DETAIL DRAWINGS

The approved plans shall be supplemented by such working drawings as are necessary to control the work adequately. All authorized alterations affecting the requirements and information given on the approved plans shall be in writing. No changes shall be made of any plan or drawing after the same has been approved by the Engineer, except by his direction.

It is expressly understood, however, that approval by the Engineer of the Contractor's working drawings does not relieve the Contractor of any responsibility for accuracy of dimensions and details. It is mutually agreed that the Contractor shall be responsible for agreement and conformity of his working drawings with the approved plans and specifications.

Full compensation for furnishing all working drawings shall be considered as included in the prices paid for the various contract items of work, and no additional allowance will be made therefor.

3.03 CONFORMITY WITH PLANS AND ALLOWABLE DEVIATIONS

Finished surfaces in all cases shall conform with the lines, grades, cross-sections, and dimensions shown on the approved plans. Deviations from the approved plans and working drawings, as may be required by the exigencies of construction, will in all cases be determined by the Engineer and authorized in writing.

3.04 INTERPRETATION OF PLANS AND SPECIFICATIONS

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in these specifications and the Special Provisions, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to the same part of the contract, so far as may be consistent with the original specifications; and in the event of any doubt or questions arising respecting the true meaning of the specifications; reference shall be made to the Engineer, whose decision thereon shall be final.

In the event of any discrepancy between any drawings and the figures written thereon, the figures shall be taken as correct. The Contractor will not be allowed to take advantage of errors and omissions in the drawings and specifications. When errors or omissions are found, they will be corrected or supplied by the Engineer.

3.05 SUPERINTENDENCE

The Contractor shall keep on his work, continually during its progress, a competent Superintendent responsible for the construction of the work, and any necessary assistants; all satisfactory to the Engineer. The Superintendent shall represent the Contractor in his absence and all directions given to him shall be as binding as if given to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case.

3.06 LINES AND GRADES

The Contractor shall provide reasonable and necessary opportunities and facilities for setting points and making measurements. He shall not proceed until he has made timely demand upon the Engineer for, and has received from him, such lines and grades as may be necessary as the work progresses. The work shall be done in strict conformity with such lines and grades.

The Contractor shall carefully preserve benchmarks, reference points and stakes, and in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

3.07 INSPECTION OF WORK

The Engineer and his representatives shall at all times have access to the work during its construction, and shall be furnished with every reasonable facility for ascertaining that the stock and materials used and employed, and the workmanship, are in accordance with the requirements and intentions of these specifications. All work done and all materials furnished shall be subject to the Engineer's inspection and approval to ensure design objectives.

The inspection of the work shall not relieve the Contractor of any of his obligations to fulfill his contracts as prescribed, and defective work shall be made good and unsuitable materials may be rejected, notwithstanding that such defective work and materials have been previously overlooked by the Engineer and accepted or estimated for payment.

3.08 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

All work which has been rejected shall be remedied, or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed him for such removal or replacement. Any work done beyond the lines and grades shown on the plans or established by the Engineer, or any extra work done without written authority, will be considered as unauthorized and will not be paid for. Work so done may be ordered removed at the Contractor's expense. Upon failure on the part of the Contractor to comply forthwith with any order of the Engineer made under the provisions of this article, the Engineer shall have authority to cause defective work to be remedied, or removed and replaced, and unauthorized work to be removed and to deduct the costs for this work from any monies due or to become due the Contractor.

3.09 EQUIPMENT AND PLANT

Equipment not suitable to produce the quality of work required will not be permitted to operate on the project. Plants shall be designed and constructed in accordance with general practice for such equipment and shall be of sufficient capacity and of such character to ensure the production of sufficient material to carry the work to completion within the time limit.

The Contractor shall provide adequate and suitable equipment and plants to meet the above requirements and, when ordered by the Engineer, shall remove unsuitable equipment from the work and discontinue the operation of unsatisfactory plants. No worn or obsolete equipment shall be used, and in no case shall the maker's rating of the capacity for any equipment be exceeded.

All vehicles used to haul materials over existing highways shall be equipped with pneumatic tires.

3.10 FINAL INSPECTION

The Engineer will not make the final inspection until the work provided for and contemplated by the contract has been completed and the final cleaning up performed.

SECTION IV - CONTROL OF MATERIAL

4.01 DISTRICT FURNISHED MATERIALS

The Contractor shall furnish all materials required to complete the work, except those specified in the Special Provisions to be furnished by the District. Materials furnished by the District will be delivered to the Contractor at the points specified in the Special Provisions.

The Contractor will be held responsible for all materials so delivered to him, and deductions will be made from any monies due him to make good any shortages and deficiencies,

from any cause whatsoever, which may occur after such delivery, or for any demurrage charges due to delinquency in unloading.

4.02 SOURCE OF SUPPLY AND QUALITY OF MATERIALS

At the option of the Engineer the source of supply of each of the materials shall be approved by him before the delivery is started. Only materials conforming to the requirements of these specifications and approved by the Engineer shall be used in the work. All materials proposed for use may be inspected or tested at any time during their preparation and use. If, after trial, it is found that sources of supply which have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved material from other approved sources. No material which, after approval, subsequently becomes unfit for use shall be used in the work.

4.03 SAMPLES AND TESTS

All tests of materials furnished by the Contractor shall be made by the District in accordance with commonly recognized standards of national organizations, and such special methods and tests as are in use at the District's approved laboratory and described in the Detailed Specifications.

Field tests of materials will also be made by the Engineer when deemed necessary and these tests shall be made in accordance with standard practices of the District.

The Contractor shall furnish such samples of all materials as are requested by the Engineer without charge. No material shall be used until it has been approved by the Engineer. Samples will be secured and tested whenever necessary to determine the quality of the material.

Promptly after the approval of the contract, the Contractor shall notify the Engineer of the proposed sources of supply of all materials to be furnished by him, using a form which will be supplied by the Engineer upon request.

Whenever reference is made in these specifications to standard tests or requirements of the laboratory of the District, the American Society for Testing Materials, the American Railway Engineering Association, or the American Association of State Highway Officials, the reference shall be construed to mean the standards that are in effect at the date of these specifications with subsequent amendments, changes, or additions as thereafter adopted and published by the organization referred to.

4.04 STORAGE OF MATERIALS

Materials shall be so stored as to ensure the preservation of their quality and fitness for the work. When considered necessary by the Engineer, they shall be placed on wooden platforms or other hard, clean surfaces and not on the ground. They shall be placed under cover when so directed. Stored materials shall be so located as to facilitate prompt inspection.

4.05 DEFECTIVE MATERIALS

All materials not conforming to the requirements of these specifications shall be considered as defective and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the site of the work unless otherwise permitted by the Engineer. No rejected materials, the defects of which have been subsequently corrected, shall be used until approval in writing has been given by the Engineer. Upon failure on the part of the Contractor to comply forthwith with any order of the Engineer made under the provisions of this article, the Engineer shall have authority to remove and replace defective material and to deduct the cost of removal and replacement from any monies due or to become due the Contractor.

4.06 ASSIGNMENT OF CLAIMS

In submitting a bid on this public works project, or any subcontractor agreeing to supply goods, services, or materials, and entering a contract pursuant thereto, the Contractor and/or subcontractor do offer and agree to assign to the District all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

SECTION V - LEGAL RELATIONS AND RESPONSIBILITY

5.01 LAWS TO BE OBSERVED

(a) Compliance with Applicable Law. Reference to and/or incorporation into the Contract Documents of a particular law, statute, ordinance, rule or regulation is not, nor is it intended to be, a definitive statement of the law applicable to the Contract Documents and the accomplishment of the work. Contractor must keep informed as to all such applicable law - Federal, State, County, Municipal, District - as it affects the conduct of the work and comply with such law, including, but not limited to, having requisite licenses, obtaining necessary permits, paying necessary fees and taxes, posting notices and installing, operating and maintaining safety precautions and facilities. It is likewise Contractor's responsibility to see to it that his subcontractors also fully comply with such applicable law.

If at any time Contractor is of the opinion that there is a discrepancy or inconsistency in the plans, drawings, specifications or other Contract Documents, he shall immediately cease work involving such alleged discrepancies or inconsistencies and report the same in writing to the Chief Engineer and shall not proceed with such work until ordered so to do, and in the manner instructed by the Chief Engineer.

Contractor shall protect and defend District, its officers, agents and employees against any claim or liability arising from or based upon any alleged violation of such applicable law. See also Subsection 8.02.

(b) Labor Code - Reference is made to Chapter 1, Part 7, Division 2 of the California Labor Code (commencing with Section 1720). By this reference said Chapter 1 is incorporated herein with like effect as if it were here set forth in full. The parties recognize that said Chapter 1 deals with, among other things, discrimination, penalties and forfeitures, their disposition and enforcement, wages, working hours and securing workers' compensation insurance and directly affect the method of prosecution of the work by Contractor and subject it under certain conditions to penalties and forfeitures. Execution of the Agreement by the parties constitutes their agreement to abide by said Chapter 1. Their stipulation as to all matters which they are required to stipulate as to by the provisions of said Chapter 1, constitutes Contractor's certification that it is aware of the provisions of said Chapter 1 and will comply with them and further constitutes Contractor's certification as follows: "I am aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract." Contractor and its subcontractors shall comply with the provisions of S1777.5 of the Labor Code regarding apprentices.

Contractor shall post at each job site during the course of the work a copy of County's "Determination of Prevailing Wage Rates", copies of said Determination are available from County for this purpose.

(c) Equal Employment Opportunity

General - Contractor shall not discriminate in its recruiting, hiring, promotion, demotion or termination practices on the basis of race, religious creed, color, national origin, ancestry, sex, age or physical handicap in the performance of this Contract and shall comply with the provisions of the Government Code Section (commencing with §12900 et seq.), the Federal Civil Rights Act of 1964 (P.L. 88-352) and all amendments thereto, Executive Order No. 11246 (30 Federal Register 12319), as amended, and all administrative rules and regulations issued pursuant to said Acts and Order. See particularly 41 Code of Federal Regulation (CFR) Chapter 60.

Contractor shall require each of its subcontractors to comply with the preceding paragraph and shall include in each subcontract language similar to the preceding paragraph.

Contractor shall permit access to its records of employment, employment advertisement, application forms and other pertinent data and records by Owner and any state or federal agency having jurisdiction for the purpose of investigation to ascertain compliance with this Section.

Owner may assign an affirmative action representative to monitor Contractor and its subcontractor(s) conduct required by this Section, including the right of entry to the construction site for the purpose of obtaining information from persons performing work on the project providing such inspection does not interfere with the progress of the work.

Elsewhere in the Contract Documents specific requirements may be contained covering the same subject matter of this Section. If so, such specific requirements prevail over this Section in case of conflict.

Transactions of $10,000 or under - Contracts and subcontracts not exceeding $10,000 are exempt from the requirements of this Section. No Contractor or subcontractor shall procure supplies and/or services in less than usual quantities to avoid applicability of this Section. With respect to contracts and subcontracts for indefinite quantities, this Section applies unless the amount required in any one year under such contract will reasonably be expected not to exceed $10,000.

Transactions in Excess of $10,000 but less than $50,000 - At Owner's request, Contractor shall certify that it has in effect an affirmative action plan and agrees to comply with all state and federal laws and regulations regarding Fair Employment Practices. Contractor shall maintain a written copy of its affirmative action plan and furnish Owner a copy of the plan upon request. Owner may require Contractor to complete an Affirmative Action Compliance Report, on a form furnished by Owner, setting forth definite goals during the term of this contract.

Transactions of $50,000 or more - If Contractor has 50 or more employees and a contract for $50,000 or more, it shall develop and submit to Owner, within 30 days after award, a written affirmative action compliance program providing in detail specific steps to guarantee equal employment opportunity. Contractor shall include in its affirmative action program a table of job classifications, which table shall include but need not be limited to job titles, duties and rates of pay.

Contractor shall in each subcontract let to do a portion of the work covered hereunder, where the subcontractor involved has 50 or more employees and the subcontract is for $50,000 or more, impose in the subcontract the above requirements.

For the purpose of determining the number of employees, the average of the Contractor's or its subcontractor's employees for the 12 month period immediately prior to award, or the total number of employees Contractor or its subcontractor will have when performing this contract, whichever is higher, shall be used.

Federally Assisted Construction - If this project is a Federally assisted construction project, then the contract provisions contained 41 CFR S60-1.4(b) are incorporated herein and Contractor shall likewise incorporate said provisions in each subcontract entered into by Contractor to perform the work. Federally assisted construction is identified as such in the Notice Inviting Bids.

(d) Registration of Contractors - In order to be considered a prospective bidder must be licensed in accordance with Division 3, Chapter 9 (commencing with Section 7000) of the Business and Professions Code.

(e) Accident Prevention - Particular attention shall be given to relevant Division of Industrial Safety Construction and Electrical Safety Orders. Said Orders are contained in Title 8 of the California Administrative Code, Chapter 4, Subchapters 4 and 5. Specific attention shall be taken of the California Occupational Safety and Health Act of 1973 (commencing with Section 6300 of the Labor Code) and the Federal Occupational Safety and Health Act of 1970 (P.L. 91-596) and rules and regulations issued pursuant to said Acts. Specific reference is made to Article 6 of said Construction Safety Orders. Contractor shall submit to Engineer, who will

accept in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping of the sides of trenches, or other provisions to be made for protection of personnel during earthwork operations. In event the Contractor's plan does not conform with the shoring system requirements of Article 6, the Contractor's proposed shoring design shall be prepared and signed by a civil or structural engineer registered in the State of California.

The Contractor shall also impose the foregoing requirements on all subcontractors involved and enforce compliance therewith.

The duties here set forth are nondelegable by Contractor who shall protect and defend District, its officers, agents and employees in connection therewith. See Subsection 8.02.

5.02 CONTRACTOR'S RESPONSIBILITY

Contractor is under the absolute duty in fulfilling its contractual obligations hereunder to proceed, and cause its subcontractors to proceed, in a safe, workmanlike manner, with adequate safeguards for the protection of the public, the workmen and persons from time to time inspecting the work. If at any time Contractor finds any of its subcontractors are allowing work to proceed in an unsafe manner and contrary to the intent of these Contract Documents, Contractor shall immediately cause such action to stop and immediately take all action necessary to protect workmen, inspectors and the general public and cause the work to proceed in a safe manner.

Contractor shall protect and defend District, its officers, agents and employees in reference to acts or omissions contrary to the above. See particularly Subsection 8.02.

District may withhold funds otherwise due Contractor whenever, in its judgment, this subsection is not being complied with.

5.03 CONTRACTOR'S RESPONSIBILITY FOR WORK

Until the formal acceptance of the work by the District, the Contractor shall have the charge and care thereof and shall bear the risk of injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the nonexecution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before its completion and acceptance and shall bear the expense thereof, except for such injuries or damages as are occasioned by acts of the Federal Government and the public enemy. In case of suspension of work from any cause whatever, the Contractor shall be responsible for all materials and shall properly store them if necessary and shall erect temporary structures where necessary.

5.04 PROPERTY RIGHTS IN MATERIALS

Nothing in the contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or the soil. All such materials shall become the property of the District upon being so attached or affixed.

5.05 PERMITS AND LICENSES

The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work.

5.06 ROYALTIES AND PATENTS

The Contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated on the work, and agrees to indemnify and save harmless the Riverside County Flood Control District, the Board of Supervisors, the Flood Control Engineer, and their duly authorized representatives, from all suits at law, or actions of every nature for, or on account of, the use of any patented materials, equipment, devices, or processes.

5.07 SANITARY PROVISIONS

Necessary conveniences, properly secluded from public observation shall be provided by the Contractor where needed for the use of laborers on the work. Their location, construction and maintenance shall be subject to the approval of the Engineer, and their use shall be strictly enforced. The Contractor shall obey and enforce such sanitary regulations as may be prescribed by the State Department of Health or other authorities having jurisdiction.

5.08 PUBLIC SAFETY

The Contractor at his own expense shall furnish, erect, and maintain such fences, barriers, lights, and signs as are necessary to give adequate warning to the public at all times that the bridges, culverts, and work along public highways are under construction; and of any dangerous conditions to be encountered as a result thereof; and he shall erect such warning and directional signs and employ such flagmen as are required and maintain same throughout the construction period.

Full compensation for the work involved in carrying out the precautionary measures above specified shall be considered as included in the prices paid for the various contract items of work and no additional allowance will be made therefor.

5.09 USE OF EXPLOSIVES

When the use of explosives is necessary for the prosecution of the work, the Contractor shall use the utmost care not to endanger life or property.

All explosives shall be stored in accordance with the provisions of Division II, Part I, Chapter 3, of the Health and Safety Code of the State of California.

5.10 PROVISIONS FOR EMERGENCIES

Unusual conditions may arise on the work which will require that immediate and unusual provisions be made to protect the public from danger or loss or damage to life and property, due directly or indirectly to the prosecution of the work, and it is part of the service required of the Contractor to make such provisions and to furnish such protection.

The Contractor shall use such foresight and shall take such steps and precautions as his operations make necessary to protect the public from danger or damage, or loss of life or property, which would result from the interruption or contamination of public water supply, irrigation or other public service, or from the failure of partly completed work.

Whenever work is undertaken pursuant to the above provisions, Contractor shall promptly file with District a verified report setting forth the nature of the emergency and the action taken by the Contractor by reason of the emergency.

Whenever, in the opinion of the Engineer, an emergency exists against which the Contractor has not taken sufficient precaution for the safety of the public or the protection of utilities or of adjacent structures or property which may be injured by process of construction on account of such neglect; and whenever, in the opinion of the Engineer, immediate action shall be considered necessary in order to protect public or private, personal or real property interests, or prevent likely loss of human life or damage on account of the operations under the contract, then and in that event the Engineer may provide suitable protection to said interests by causing such work to be done and material to be furnished as, in the opinion of the Engineer, may seem reasonable and necessary.

The cost and expense of all such emergency work shall be borne by the Contractor, and if he shall not pay said cost and expense upon presentation of the bills therefor, duly certified by the Engineer, then said cost and expense will be paid by the District and shall thereafter be deducted from any amounts due, or which may become due said Contractor. Failure of the District, however, to take such precautionary measures, shall not relieve the Contractor of his full responsibility for public safety.

5.11 UNFORESEEN DIFFICULTIES

All loss or damages, except as noted in Section 8.03, arising out of the nature of the work to be done under the contract, or from any unforeseen obstructions or difficulties which may be encountered during the progress of the work and in the prosecution of the same, or from the action of the elements, or from encumbrances in the line of work, shall be sustained by the Contractor.

5.12 ACCESS TO THE WORK

Access to the work from existing roads shall be provided by the Contractor at his expense and maintained in a manner so as not to create a public nuisance. The Board of Supervisors, Flood Control District and Engineer assume no responsibility for the condition or maintenance of any existing road or structure thereon that may be used by the Contractor for performing the work under these specifications and for traveling to and from the site of the work. No direct payment will be made to the Contractor for constructing temporary roads used for construction operations or for improving, repairing, or maintaining any existing road or structure thereon that may be used by the Contractor for performance of the work under these specifications. The cost of all work described in this paragraph shall be included in the prices bid in the schedule for other items of construction work.

5.13 GUARANTEE OF WORK

All work is guaranteed by Contractor for a period of one year from the recordation of the Notice of Completion against defects resulting from the use of inferior materials, equipment, or workmanship. Upon notice from District, Contractor shall promptly remedy such defects at his expense, including payment to District of its expenses in connection with remedying such defects, otherwise District shall proceed to remedy such defects and Contractor shall upon demand reimburse District for its expenses in connection therewith.

The above one year guarantee is in addition to any specific guarantee(s) provided for elsewhere in the Contract Documents.

5.14 DAMAGES BY ACT OF GOD

If the construction of the project herein is damaged, which damage is determined to have been proximately cause by an act of God, in excess of 5% of the contract amount, provided that the work damaged is built in accordance with applicable building standards and the plans and specifications, then the District, may, without prejudice to any other right or remedy, terminate the contract.

SECTION VI - PROSECUTION AND PROGRESS

6.01 PROGRESS OF THE WORK

The Contractor shall begin the work within ten (10) calendar days after the date of the receipt by him of notice to proceed from the Chief Engineer and shall diligently prosecute the same to completion within the time limit provided in the Special Provisions.

6.02 OVERTIME WORK AND WORK AT NIGHT

It is intended that the Contractor prosecute the work on a five (5) day, forty (40) hour work week with no work on legal holidays. If the Contractor feels it is necessary to work more than the normal 40 hour work week, he will make a written request for permission from the Engineer, outlining the reasons for such request. The decision of granting permission for overtime work shall be made by the Engineer and shall be final. A condition will be imposed on the granting of a request to work overtime, requiring the Contractor to pay the District the cost incurred at overtime rates for additional inspection and engineering time required in connection with the overtime work.

When any work is performed at night, only such classes of work shall be done as can be properly inspected. Adequate light must be provided for the safety of the men and for proper inspection.

6.03 SUBCONTRACTING

Reference is made to the Subletting and Subcontracting Fair Practice Act contained in the Public Contract Code (commencing §4100). By this reference, said Act is incorporated herein with like effect as if it were here set forth in full and the parties shall abide by its terms and substitution shall be only as allowed by that Act.

Contractor shall be responsible for the acts and omissions of its subcontractors and shall make certain that at all times its subcontractors comply with the terms of the Contract Documents and applicable law insofar as such compliance relates to the work.

District reserves the right to approve all subcontractors whether or not they are required to be listed in the Contractor's Proposal. As used in this Section "subcontractor" includes any person who fabricates or manufactures any article for incorporation into the work whether or not they install or test after installation or contract to install or test after installation, but does not include suppliers of fungible goods for incorporation into the work unless such supplier also installs or tests or contracts to install or test.

The Contractor shall give his personal attention to the fulfillment of the contract and shall keep the work under his control. The Contractor shall perform with his own organization work of a value amounting to not less than 60 percent of the remainder obtained by subtracting from the total original contract value the sum of any item designated herein or in the Special Provisions as Specialty Items. The furnishing and placing of reinforcing steel, when placing is performed by the supplier, will be considered as a Specialty Item for this purpose; however, he shall be designated in the list of subcontractors. The value of the work subcontracted will be based on the contract item bid price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the Contract Unit Price. This will be determined from information submitted by the Contractor, and subject to approval by the Engineer.

Where a portion of the work which has been subcontracted by the Contractor is not being prosecuted in a manner satisfactory to the District, the subcontractor shall be removed immediately on the requisition of the Engineer and shall not again be employed on the work.

6.04 CHARACTER OF WORKMEN

If any subcontractor or person employed by the Contractor shall fail or refuse to carry out the directions of the Engineer or shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the requisition of the Engineer, and such person shall not again be employed on this work.

6.05 TEMPORARY SUSPENSION OF THE WORK

The Engineer shall have the authority to suspend the work wholly or in part, for such period as he may deem necessary, due to unsuitable weather, or to such other conditions as are

considered unfavorable for the suitable prosecution of the work, or for such time as he may deem necessary due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the contract. The Contractor shall immediately comply with the written order of the Engineer to suspend the work wholly or in part. The work shall be resumed when conditions are favorable and methods are corrected, as ordered or approved in writing by the Engineer.

6.06 TIME OF COMPLETION AND DAMAGES

The Contractor shall complete the work called for under the contract in all parts and requirements within the number of working days specified in the Special Provisions.

A working day is hereby defined as any day; except Saturdays, Sundays, and legal holidays and days on which the Contractor is specifically required by the Special Provisions to suspend construction operations; on which the Contractor is not prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with at least 60 percent of the normal labor and equipment force engaged in such operation or operations for at least five hours toward completion of such operation or operations.

The Engineer will furnish the Contractor a weekly statement showing the number of working days charged to the contract for the preceding week, the number of working days specified for completion of the contract, and the number of working days remaining to complete the contract. The Contractor will be allowed one week in which to file a written protest setting forth in what respects said weekly statement is incorrect, otherwise the statement shall be deemed to have been accepted by the Contractor as correct.

The following holidays will be considered as legal holidays: New Year's Day; Martin Luther King Jr.'s Birthday, Lincoln's Birthday; Washington's Birthday; Memorial Day; Independence Day; Labor Day; Columbus Day; Veteran's Day; Thanksgiving Day; Christmas; and such other days as are declared holidays by ordinance passed by the Board of Supervisors of Riverside County.

Contractor acknowledges that failure to perform in strict accordance with the Contract Documents and within the time limit specified in the Special Provisions will cause District to suffer special damages in addition to cost of completion of the work in accordance with the provisions of the Contract Documents. Such special damage could include, but is not limited to, lease and rental cost, additional salaries and overhead, interest during construction, attorney expense, additional engineering, inspection expense, cost of maintaining or constructing alternate facilities and injury to the property of the District or others. The daily cost to the District for inspection and superintendence by the District shall be the amount specified in the Special Provisions. The District may withhold from any money due or that may become due the Contractor under the contract, such amount as the District may elect to offset the damages incurred and any withholding or failure to withhold shall not in any way limit recovery for damages actually incurred.

It is further agreed that in case the work called for under the contract is not finished and completed in all parts and requirements within the time specified, the Board of Supervisors shall have the right to extend the time for completion or not, as may seem best to serve the interest of the District, and if it decides to extend the time limit for the completion of the contract, it shall further have the right to charge to the Contractor, his heirs, assigns or sureties and to deduct from the final payment for the work all or any part, as it may deem proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the contract, and which accrue during the period of such extension, except that cost of final surveys and preparation of final estimate shall not be included in such charges.

The Contractor shall not be assessed damages nor the cost of engineering and inspection during any delay in the completion of the work caused by acts of God or of the public enemy, acts of the District, encountering unknown utility facilities, fire, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather or delays of subcontractors due to such causes, provided that the Contractor shall notify the Engineer in writing of the causes of delay within ten (10) days from the beginning of any such delay, and his findings of the facts thereon shall be final and conclusive. Contractor shall not be assessed damages for delay in the completion of the project, when such delay was caused by the failure of the District or the owner of the utility facilities.

The term "severe weather" shall be construed to mean only such weather as is unreasonable or extraordinary and in the opinion of the Engineer, the work could not be prosecuted by the Contractor during the period throughout which such weather prevailed.

6.07 DELAYS AND EXTENSION OF TIME

If delays are caused by unforeseen causes beyond the control of either the Contractor or the District, such as war, strikes, fire, floods, or other action of the elements, such delays will entitle the Contractor to an equivalent extension of time for the completion of the contract, but the Contractor shall not be entitled to damages or additional payments over and above the contract price due to delay caused by any of the above-mentioned causes. Furthermore, if the Contractor suffers any delay caused by the failure of the District to furnish the necessary right of way or materials agreed to be furnished by it, or by failure to supply necessary plans or instructions concerning the work to be done after written request therefor has been made, the Contractor shall be entitled to an extension of time equivalent to the time lost for any of the above-mentioned reasons, but shall not be entitled to any damages for such delay.

6.08 ASSIGNMENT

The contract may be assigned only upon written consent of the District. Such written consent to sublet, assign or otherwise dispose of any portion of the contract, shall not be construed to relieve the Contractor of any responsibility for the fulfillment of the contract.

6.09 TERMINATION OF CONTRACT

Subject to all applicable provisions of these specifications and/or the contract to be entered into hereunder, the Engineer is hereby empowered to direct the time and rate of delivery of materials at the site of work and to direct the time, rate and sequence of work. If the Contractor fails to begin delivery of material and equipment or to commence work within the

time specified herein, and/or in the contract, or to maintain the rates of delivery of materials, or to execute the work in the manner and at such locations as directed by the Engineer, or fails to maintain a program of work in such a manner as will, in the judgment of the Engineer inure to interests of the District, or, if in the judgment of the Engineer, the Contractor is not carrying out the provisions of the contract in their true intent and meaning, written notice by the Chief Engineer may be served upon him and the Surety on his faithful performance bond demanding a satisfactory compliance with the contract, and with these specifications. If the Contractor and/or his Surety refuses or neglects to comply with such notice within five (5) days after receiving same, or after commencing so to do, fails to continue so to do, or has assigned or sublet the contract without the consent of the District, then the District may exclude him from the premises and take possession thereof, together with all material and equipment thereon, and may complete the work itself, either by force account or by letting the unfinished portion of the work to another Contractor or by a combination of such methods. In any event, the cost of the completion of said work shall be a charge against the Contractor and his Surety and may be deducted from any money due or becoming due from the District, and if the sums due under the contract are insufficient, said Contractor and/or his Surety shall pay to the District within five (5) days after the completion of the work all of such cost in excess of the contract price.

The Surety, in the event that it assumes part of the work, shall take the Contractor's place in this contract in all respects for that part and shall be paid by the District for all work performed by it in accordance with the terms of this contract. If the Surety assumes the entire contract, all monies remaining due the Contractor at the time of his default shall be made payable to the Surety as the work progresses, subject to the terms of the contract.

SECTION VII - PAYMENT

7.01 SCOPE OF PAYMENTS

The Contractor shall accept compensation, as herein provided, in full payment for furnishing all materials, labor, tools, and equipment necessary to the completed work and for performing all work contemplated and embraced under the contract; also for loss or damage arising from the nature of the work, or from the action of the elements, except as hereinbefore provided, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the Board of Supervisors; and for all risks of description connected with the prosecution of the work, also for all expenses incurred in consequence of the suspension or discontinuance of the work as herein specified; and for completing the work according to the plans and specifications. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material.

7.01A Measurement and Computation of Quantities - All items of the work to be paid for at a contract price per unit of measurement will be measured by the Engineer in accordance with United States Standard Measures. A ton shall mean 2,000 pounds, avoirdupois. Except as otherwise expressly provided in the specifications, the methods of measurement and computation of quantities of such items will be determined by the Engineer, taking into account the price of the item relative to its quantity and the costs of measurement.

The weights of metalwork, pipe, and other metal parts to be paid for by weight will be determined by the Engineer on the basis of handbook weights, scale weights, or manufacturer's

catalog weights, or in the absence of any of the foregoing, on the basis of estimated weights; provided, that weights of nonmetallic coatings will be excluded.

7.01B Payment at Contract Prices - The contract price for an item of the work shall include full compensation for all costs of that item, including the costs of any work, materials and equipment incidental to the item but not specifically shown or described in the drawings and specifications, subject only to such express limitations as may be stated in the specifications defining the item or prescribing payment therefor.

The contract prices shall include full compensation for all costs of any work, materials, and equipment required by the drawings and specifications at the time of contract award, but not covered by a contract price or otherwise expressly made the subject of direct payment.

7.02 PAYMENT AND COMPENSATION FOR ALTERED QUANTITIES

When alterations in plans or quantities of work are ordered and performed, the Contractor shall accept payment in full at the contract unit price for the actual quantities of work done and no allowance will be made for anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as stipulated in such agreements.

7.03 FORCE ACCOUNT PAYMENT

When extra work is to be paid for on a force account basis, compensation will be determined as follows:

7.03A Work Performed by Contractor - The Contractor will be paid for labor, materials, and equipment rental as hereinafter provided, except where agreement has been reached to pay in accordance with Section 7.03B. Only materials incorporated in the work will be paid for.

To the total computed as provided in Sections 7.03A(1), 7.03A(2) and 7.03A(3) will be added the following percentages:

Labor	-	24 percent
Materials	-	15 percent
Equipment Rental	-	15 percent

It is understood labor, materials, and equipment may be furnished by the Contractor or by the subcontractor or by others on behalf of the Contractor.

When extra work paid for on a force account basis is performed by forces other than the Contractor's organization, the Contractor shall reach agreement with such other forces as to the distribution of the payment made by the District for such work and no additional payment therefor will be made by the District.

7.03A(1) Labor - The Contractor will be paid the cost of labor for the workmen (including foremen when authorized by the Engineer), used in the actual and direct performance of the work. The cost of labor, whether the employer is the Contractor, subcontractor, or other forces, will be the sum of the following:

7.03A(1a) Actual Wages – The actual wages paid will be as published by the Director of Industrial Relations of the State of California for the region where work is performed and that are in effect at the time of award of the contract. The classification of workmen used shall not be in excess of the industry standard for the region where work is performed. Copies of the published labor rates are on file at the District office.

7.03A(1b) Labor Surcharge - To the actual wages as defined in Section 7.03A(1a), will be added a labor surcharge set forth in the Special Provisions, which labor surcharge shall constitute full compensation for all payments imposed by State and Federal laws and for all other payments made to, or on behalf of, the workmen, other than actual wages as defined in Section 7.03A(1a) and subsistence and travel allowance as specified in Section 7.03A(1c).

7.03A(1c) Subsistence and travel allowance paid to such workmen as required by collective bargaining agreements.

7.03A(2) Materials - The cost of materials incorporated in the work will be the cost to the purchaser, whether Contractor, subcontractor or other forces, from the supplier thereof, except as the following are applicable:

7.03A(2a) If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the District notwithstanding the fact that such discount may not have been taken.

7.03A(2b) If the materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier to such purchaser, the cost of such materials shall be deemed to be the price paid to the actual supplier as determined by the Engineer. No markup except for actual costs incurred in the handling of such materials will be permitted.

7.03A(2c) If the materials are obtained from a supply or source owned wholly or in part by the purchaser, payment therefor will not exceed the price paid by the purchaser for similar materials furnished from said source on contract items or on the current wholesale price for such materials delivered to the job site whichever price is lower.

7.03A(2d) If the cost of such materials is, in the opinion of the Engineer, excessive, then the cost of such materials shall be deemed to be the lowest current wholesale price at which such materials are available in the quantities concerned delivered to the job site, less any discounts as provided in Section 7.03(2a).

7.03A(2e) If the Contractor does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof, the cost shall then be determined in accordance with Section 7.03A(2d).

The District reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and profit on such materials.

7.03A(3) Equipment Rental - The Contractor will be paid for the use of equipment at the rental rates listed for such equipment in the Special Provisions, regardless of ownership and any rental or other agreement, if such may exist, for the use of such equipment entered into by the Contractor. If it is deemed necessary by the Engineer to use equipment not listed in the Special Provisions, a suitable rental rate for such equipment will be established by the Engineer. The Contractor may furnish any cost data which might assist the Engineer in the establishment of such rental rate.

The rental rates paid as above provided shall include the cost of fuel, oil, lubrication, supplies, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

Operators of rented equipment will be paid for as provided under Section 7.03A(1).

All equipment shall, in the opinion of the Engineer, be in good working condition and suitable for the purpose for which the equipment is to be used.

Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

Individual pieces of equipment or tools having a replacement value of $25.00 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.

Rental time will not be allowed while equipment is inoperative due to breakdowns.

In computing the rental time of equipment, less than 30 minutes shall be considered ½ hour.

7.03A(3a) Equipment on the Work - The rental time to be paid for equipment on the work shall be the time the equipment is in operation on the extra work being performed, and in addition, shall include the time required to move the equipment to location of the extra work and return it to the original location or to another location requiring no more time than that required to return it to its original location, except that moving time will not be paid for if the equipment is used at the site of the extra work on other than such extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the extra work on other than such extra work.

7.03A(3b) Equipment not on the Work - For the use of equipment moved in on the work and used exclusively for extra work paid for on a force account basis, the Contractor will be paid the rental rates listed in the Special Provisions or as agreed to as provided

in Section 7.03A(3) and for the cost of transporting the equipment to the location of the work and its return to its original location, all in accordance with the following provisions:

(1) The original location of the equipment to be hauled to the location of the work shall be agreed to by the Engineer in advance.

(2) The District will pay the costs of loading and unloading such equipment.

(3) The cost of transporting equipment on low bed trailers shall not exceed the hourly rates charged by established haulers.

(4) The cost of transporting equipment shall not exceed the applicable minimum established rates of the Public Utilities Commission.

(5) The rental period shall begin at the time the equipment is unloaded at the site of the extra work, shall include each day that the equipment is at the site of the extra work, excluding Saturdays, Sundays, and legal holidays unless the extra work is performed on such days, and shall terminate at the end of the day on which the Engineer directs the Contractor to discontinue the use of such equipment. The rental time to be paid per day will be in accordance with the following:

Hours Equipment is in Operation	Hours to be Paid
0	4
0.5	4.25
1	4.5
1.5	4.75
2	5
2.5	5.25
3	5.5
3.5	5.75
4	6
4.5	6.25
5	6.5
5.5	6.75
6	7
6.5	7.25
7	7.5
7.5	7.75
8	8
Over 8	hours in operation

When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation.

When daily rates are listed, payment for ½ day will be made if the equipment is not used. If the equipment is used, payment will be made for one day.

The minimum rental time to be paid for the entire rental period on an hourly basis shall not be less than 8 hours or if on a daily basis shall not be less than one day.

(6) Should the Contractor desire the return of the equipment to a location other than its original location, the District will pay the cost of transportation in accordance with the above provisions, provided such payment shall not exceed the cost of moving the equipment to the work.

(7) Payment for transporting, loading and unloading equipment, as above provided, will not be made if the equipment is used on the work in any other way than upon extra work paid for on a force account basis.

7.03B Work Performed by Special Forces or Other Special Services - When the Engineer and the Contractor, by agreement, determine that a special service or an item of extra work cannot be performed by the forces of the Contractor or those of any of his subcontractors, such service or extra work item may be performed by a specialist. Invoices for such service or item of extra work on the basis of the current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide such complete itemization. In those instances wherein a Contractor is required to perform extra work necessitating a fabrication or machining process in a fabrication or machine shop facility away from the job site, the charges for that portion of the extra work performed in such facility may, by agreement, be accepted as a specialist billing.

To the specialist invoice price, less a credit to the District for any cash or trade discount offered or available, whether or not such discount may have been taken, will be added 15 percent in lieu of the percentages provided in Section 7.03A.

7.03C Records - The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct costs of extra work paid for on a force account basis and the costs of other operations.

The Contractor shall furnish the Engineer report sheets in duplicate of each day's extra work paid for on a force account basis no later than the working day following the performance of said work. The daily report sheets shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, subcontractor, or other forces, except for charges described in Section 7.03B. The daily report sheets shall provide names or identifications and classifications of workmen, the hourly rate of pay and hours worked, and also the size, type and identification number of equipment, and hours operated.

Material charges shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily report sheets, or if not available, they shall be submitted with subsequent daily report sheets. Should said vendor's invoices not be submitted within 15 days after acceptance of the work, the District reserves the right to establish the cost of such materials at the lowest current wholesale prices at which said materials are available in the quantities concerned delivered to the location of the work, less any discounts provided in Section 7.03A(2a).

Said daily report sheets shall be signed by the Contractor or his authorized agent.

The Engineer will compare his records with the daily report sheets furnished by the Contractor, make any necessary adjustments, and compile the costs of work paid for on a force account basis on daily extra work report forms furnished by the District. When these daily extra work reports are agreed upon and signed by both parties, they shall become the basis of payment for the work performed, but shall not preclude subsequent adjustment based on a later audit.

The Contractor's cost records pertaining to work paid for on a force account basis shall be open to inspection or audit by representatives of the District, during the life of the contract and for a period of not less than 18 months after the date of acceptance thereof, and the Contractor shall retain such records for that period. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor expressly guarantees that the cost records of such other forces shall be open to inspection and audit by representatives of the District on the same terms and conditions as the cost records of the Contractor. If an audit is to be commenced more than 60 days after the acceptance date of the contract, the Contractor will be given a reasonable notice of the time when such audit is to begin.

7.03D - Payment as provided above in Sections 7.03A and 7.03B shall constitute full compensation to the Contractor for performance of work paid for on a force account basis and no additional compensation will be allowed therefor.

7.04 ACCEPTANCE

The work shall be inspected for acceptance by the Engineer promptly upon receipt of notice in writing from the Contractor that the work is ready for such inspection.

The structures will not be finally accepted until the completion of the entire work under the contract.

7.05 DEDUCTIONS FROM PAYMENTS

The Riverside County Flood Control and Water Conservation District, by and through the Board of Supervisors or other appropriate District officer or officers, may at its option and at any time retain out of any amounts due the Contractor sums sufficient to cover any unpaid claims, provided that sworn statements of said claims shall have been filed in the office of the District or in the office of any other District officer or officers having jurisdiction thereover.

7.06 PARTIAL PAYMENTS

On or about the last day of each month, the Engineer shall make an estimate in writing of the total amount of work done by the Contractor to the time of such estimate and the value thereof. The District shall retain 5 percent (5%) of such estimated value of the work done as part security for the fulfillment of the contract by the Contractor. At no time shall the amount retained by the District be less than 5 percent (5%) of the total value of the work completed at the time such payments are made.

After deducting all previous payments and all sums to be kept or retained under the provisions of the contract, the District shall make monthly progress payments to the Contractor.

No such estimate or payment shall be required to be made when, in the judgment of the Chief Engineer, the work is not proceeding in accordance with the provisions of the contract.

In accordance with Public Contract Code Section 22300 and other applicable law, the Contractor may substitute securities for any monies withheld to ensure performance under the contract. Such substitution shall be made only upon a separate agreement between the District and the Contractor which contains terms and conditions in compliance with all laws applicable to monies withheld under the contract.

7.07 DELAYED PAYMENTS

All the monies due the Contractor under the contract will be paid by demand on the Treasurer of the District, prepared and approved as required by law, and it is understood that any delay in the preparation, approval and payment of these demands will not constitute a breach of contract on the part of the District.

7.08 FINAL PAYMENT

The Engineer, after the completion of the contract, shall make a final estimate in writing to the Board of Supervisors of the amount of work done thereunder, and the value of such work, and the District shall pay the entire sum so found to be due after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the contract. All prior partial estimates and payment shall be subject to correction in the final estimate and payment. The final payment shall not be due and payable until the expiration of forty-five (45) days from the date of acceptance of the work by the Board of Supervisors.

It is mutually agreed between the parties to the contract that no certificate given or payments made under the contract, except the final payment, shall be conclusive evidence of the performance of the contract, either wholly or in part against any claim of the party of the first part, and no payment shall be construed to be an acceptance of any defective work or improper materials.

And the Contractor further agrees that the payment of the final amount due under the contract, and the adjustment and payment for any work done in accordance with any alterations of the same, shall release the Riverside County Flood Control and Water Conservation District, the Board of Supervisors, and the Engineer from any and all claims or liability on account of work performed under the contract or any alteration thereof.

7.09 CLAIMS RESOLUTION

In accordance with Public Contract Code Section 20104 - 20104.6 and other applicable law, public works claims of $375,000 or less which arise between the Contractor and the District shall be resolved following the statutory procedure unless the District has elected to resolve the dispute pursuant to Public Contract Code § 10240 et seq.

1. All claims shall be submitted in writing and accompanied by substantiating documentation. Claims must be filed on or before the date of final payment unless other notice requirements are provided in the contract. "Claim" means a separate demand by the claimant for

(1) a time extension, (2) payment of money or damages arising from work done by or on behalf of the claimant and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled, or (3) an amount the payment of which is disputed by the District.

(a) Claims under $50,000. The District shall respond in writing to the claim within 45 days of receipt of the claim, or, the District may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses or claims the District may have. If additional information is needed thereafter, it shall be provided upon mutual agreement of the District and the claimant. The District's written response shall be submitted 15 days after receiving the additional documentation, or within the same period of time taken by the claimant to produce the additional information, whichever is greater.

(b) Claims over $50,000 but less than or equal to $375,000. The District shall respond in writing within 60 days of receipt, or, may request in writing within 30 days of receipt of the claim, any additional documents supporting the claim or relating to defenses or claims the District may have against the claimant. If additional information is needed thereafter, it shall be provided pursuant to mutual agreement between the District and the claimant. The District's response shall be submitted within 30 days after receipt of the further documents, or within the same period of time taken by the claimant to produce the additional information or documents, whichever is greater.

2. If the claimant disputes the District's response, or if the District fails to respond within the statutory time period, the claimant may so notify the District within 15 days of the receipt of the response or the failure to respond, and demand an informal conference to meet and confer for settlement. Upon such demand, the District shall schedule a meet and confer conference within 30 days.

3. If following the meet and confer conference, the claim or any portion thereof remains in dispute, the claimant may file a claim pursuant to Government Code § 900 et seq. and Government Code § 910 et seq. For purposes of those provisions, the time within which a claim must be filed shall be tolled from the time the claimant submits the written claim until the time the claim is denied, including any time utilized for the meet and confer conference.

4. If a civil action is filed to resolve any claim, the provisions of Public Contract Code § 20104.4 shall be followed, providing for nonbinding mediation and judicial arbitration.

SECTION VIII - GENERAL

8.01 COOPERATION BETWEEN CONTRACTORS

The Contractor shall be required to cooperate fully with all utility and public agency representatives engaged in construction, relocation, altering or otherwise rearranging any facilities interfering with the progress of the work.

Full compensation for any delay or inconvenience to the Contractor's operation due to such operations as described above shall be considered included in the unit price paid for other items of work and no additional allowance will be made therefor.

8.02 INSURANCE - HOLD HARMLESS

Contractor shall not commence work under this contract until he has obtained the insurance required hereunder and satisfactory proof of said insurance has been submitted to District and has been approved as to form by Riverside County Counsel.

Compensation Insurance - Contractor shall procure and maintain during the life of the contract Workers' Compensation Insurance as required by the State of California. Contractor shall further require each of its subcontractors to procure Workers' Compensation Insurance as required by the State while working on the project.

Liability Insurance - Contractor shall take out and maintain during the course of the work combined single limit liability insurance covering bodily injury and property damage insurance and blanket contractual coverage as to the work and obligations covered hereunder in an amount not less than $2,000,000, or the equivalent thereof. Said insurance must contain an endorsement that District, County of Riverside, and any municipal corporation in which the work is to be accomplished, are named as an additional insured as respects the work covered hereunder. Said insurance must not contain, as respects the work covered hereunder, any exclusions as to bodily injury or death or property damage arising out of blasting, explosion, or underground damage to wire, pipes, conduits, mains, sewers, tank tunnels or any similar property, i.e., the so-called "x c u" exclusions. The insurance certificate evidencing such insurance must affirmatively state that the insurance carrier(s) will give Owner thirty (30) days written notice prior to cancellation of the insurance or a reduction in coverage; must state that the "x c u" exclusions are waived or do not exist in the policy(s); and that District, County of Riverside, and any municipal corporation in which the work is to be accomplished, are named as an additional insured as respects the work covered hereunder.

In the alternate to naming Owner and County of Riverside, and any municipal corporation in which the work is to be accomplished, as additional insured, Contractor may take out and maintain during the course of the work and until acceptance by Owner, Owner's Protective Liability Insurance amount not less than $2,000,000 covering District, County of Riverside, and any municipal corporation in which the work is to be accomplished.

The cost of this insurance shall be included in the prices bid for the various items of work and no additional compensation will be made therefor.

Hold Harmless - Contractor shall hold District, County of Riverside and any municipal corporation in which the work is to be accomplished, together with the officers, agents and employees of each, free and harmless from any liability whatsoever, including wrongful death, based or asserted upon any act or omission of Contractor, its officers, agents, employees or subcontractors, relating to or in any way connected with or arising from the accomplishment of the work, whether or not in furtherance of the work; and Contractor agrees to protect and defend, including all attorney fees and other expenses, each of the foregoing bodies and persons in any legal action based or asserted upon any such acts or omissions.

Obligations - The obligations assumed by Contractor cover all obligations set forth in this Subsection and elsewhere in the Contract Documents, such as Subsections 5.01, 5.02, 5.05, 5.06, 5.08, 5.09, 5.10, 10.01, and 10.02.

8.03 PUBLIC UTILITIES

The locations of all pipelines, power lines, communication lines and other utility components known to District to exist within the limits of the work, are indicated on the drawings and may be the subject of a specific Special Provision(s). Size, location and characteristics of such utilities is based upon information made available to District - primarily from the owner of the utility in question. The exactness of such information is not guaranteed but may be assumed to have been accomplished with reasonable accuracy.

In addition to the drawings and any such provision regarding utilities, Contractor is under a duty to take into account the location of service laterals or other appurtenances which can be inferred from the presence of facilities such as buildings, meters and junction boxes in or about the limits of the work.

Unless otherwise directed by the Contract Documents, all existing utilities - where shown or described or not - shall be left in place and Contractor must conduct its operations so that such utilities are protected from damage at all times during the course of the work and the work must be accomplished so as to give such utilities proper protection and support upon completion of the work by Contractor.

If during the course of the work, Contractor discovers underground utility components not indicated in the drawings, the Special Provisions or elsewhere in the Contract Documents, Contractor must immediately notify, in writing, the Engineer and the utility company (public or private) involved, stating with exactness the condition found.

When Contractor encounters a utility not shown or described in the Contract Documents, Contractor shall cease all work which would disturb such utility and its support until given specific instructions as to how to proceed regarding such utility by Engineer. All work done by Contractor to protect existing utilities shown or described in the Contract Documents, or which can be reasonably inferred from the presence of other visible facilities, is at Contractor's expense, the cost of which is deemed included in Contractor's Proposal to do the work.

Contractor's cost of locating, repairing damage not due to the failure of Contractor to exercise reasonable care, and removing or relocating utility components and facilities not indicated in the drawings, specifications or elsewhere in the Contract Documents with reasonable accuracy, shall be paid Contractor as Extra Work as provided in Subsection 2.07 and Subsection 7.03 of the General Provisions. Compensation for idle time of equipment shall be paid as provided in Section 8-1.09, "Right of Way Delays", of the State Standard Specifications. No surcharge rates for equipment will be applied for idled equipment.

District may direct the Contractor to do such repair or relocation work as required. When such repair or relocation work is not elsewhere provided for in these Contract Documents, or reasonably inferred therefrom, a requirement of District that Contractor perform such work shall be compensated for as Extra Work pursuant to Subsections 2.07 and 7.03 of these General Provisions.

Contractor shall not be assessed liquidated damages for delay in completion of the project, if such delay is caused by failure of District, or the owner of the utility in question, to provide for removal or relocation of the utility involved.

8.04 PROTECTION OF EXISTING STREET FACILITIES

The Contractor shall be responsible for the protection of existing signs, fences, concrete curbs, gutters and other facilities which may be encountered. The replacement or repair of any facilities which the District deems necessary as a result of the Contractor's operations shall be done by the Contractor at his own expense and to the satisfaction of the Engineer.

Excavation within the street right of way shall be conducted in a manner to cause the least interruption to traffic. Where traffic must cross open trenches, the Contractor shall provide suitable bridges at street intersections and driveways. Hydrants under pressure, valve pipe covers, valve boxes, curb stop boxes, fire or police call boxes, or other utility controls shall be left unobstructed and accessible during construction.

8.05 DIVERSION AND CONTROL OF WATER

Unless otherwise provided in the Proposal, no separate payment will be made for diversion and control of surface or groundwater. All costs incidental to maintaining dry working areas shall be included in the unit prices paid for other items of work in the schedule.

8.06 DUST ABATEMENT

During the performance of all work included in the contract, the Contractor shall take the necessary precautions to save the District free and harmless from any loss or damage resulting from his operations that raise or produce dust in such amounts that will be objectionable, and/or cause damage to adjacent property or property owners.

The Contractor will be required to have a positive and continuous method of dust control which is satisfactory to the Engineer. The methods to be used for controlling dust in the

construction area and along haul roads shall be approved by the Engineer prior to starting any of the work included in the contract. All costs incidental to dust control shall be included in the unit prices paid for other items of work in the schedule.

8.07 PROJECT SIGNS

The Contractor shall erect project signs at the locations designated by the Engineer.

No separate payment will be made for erecting the project signs and all costs in connection therewith will be considered a subsidiary obligation of the Contractor.

8.08 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK

The bidder shall examine carefully the site of the work contemplated, the plans and specifications, and the proposal and contract forms therefor. The submission of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, the quantities of materials to be furnished, and as to the requirements of the proposal, plans, specifications, and the contract.

Where the District has made investigations of subsurface conditions in areas where work is to be performed under the contract, or in other areas, some of which may constitute possible local material sources, such investigations are made only for the purpose of study and design. Where such investigations have been made, bidders or Contractors may, upon request, inspect the records of the District as to such investigations subject to and upon the conditions hereinafter set forth. Such inspection of records may be made at the office of the District.

The records of such investigations are not a part of the contract and are shown solely for the convenience of the bidder or Contractor. It is expressly understood and agreed that the District assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the investigations thus made, the records thereof, or of the interpretations set forth therein or made by the District in its use thereof and there is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout such areas, or any part thereof, or that unlooked-for developments may not occur, or that materials other than, or in proportions different from those indicated, may not be encountered.

When a log of test borings showing a record of the data obtained by the District's investigation or subsurface conditions is included with the contract plans, it is expressly understood and agreed that said log of test borings does not constitute a part of the contract, represents only the opinion of the District as to the character of the materials encountered by it in its test borings, is included in the plans only for the convenience of bidders and its use is subject to all of the conditions and limitations set forth in this Section 8.08.

No information derived from such inspection of records of investigations or compilation thereof made by the District or from the Engineer, or his assistants, will in any way relieve the bidder or Contractor from any risk or from properly fulfilling the terms of the contract.

SECTION IX - WATERING

9.01 DESCRIPTION

This work shall consist of developing a water supply for all water required for the work. The application of the water shall be under the control of the Engineer at all times and shall be applied in the amounts and at the locations approved by the Engineer.

At least one mobile unit of at least 1,000-gallon capacity for applying water shall be available on the project at all times.

Water for compacting embankment material and for laying dust shall be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses with nozzles that will ensure a uniform application of water.

No separate payment or additional allowances will be made for this work and all costs in connection therewith will be considered as included in other items in the schedule.

SECTION X - PUBLIC CONVENIENCE, TRAFFIC CONTROL AND DETOURS

10.01 GENERAL

The Contractor shall so conduct his operations as to offer the least possible obstruction and inconvenience to the public and he shall have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights of the public.

Unless otherwise provided in the Special Provisions, all public traffic shall be permitted to pass through the work with as little inconvenience and delay as possible.

Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately at the Contractor's expense.

Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners.

Convenient access to driveways, houses and buildings along the line of work shall be maintained and temporary approaches to crossings or intersecting highways shall be provided and kept in good condition.

10.02 SIGNS

It shall be the responsibility of the Contractor to provide and maintain all lights, barricades and signs, both on and off the site of work, as required by the Engineer, and all such devices shall be of a type approved by him.

If, in any case, the Engineer finds it necessary to replace, add to or erect said barricades, signs, or lights, when the Contractor fails to do so when informed, the Contractor shall be billed for all costs thereof including a daily rental fee for signs.

No separate payment, unless otherwise provided for under the Special Provisions, will be made for traffic control and detour signing and all costs incidental to these items shall be included in the unit prices paid for other items of work.

10.03 MATERIALS STORAGE

Storing or stockpiling of excavated material, imported backfill material or construction materials on any street or highway will not be permitted except as approved in writing by the Engineer.

****

SPECIAL PROVISIONS

AND

DETAILED SPECIFICATIONS

SPECIAL PROVISIONS

SECTION 1 - GENERAL

1.1 Drawings and Specifications - These documents are for the construction of **Mira Loma – Beach Street Storm Drain, Stage 1**, located in the city of Jurupa Valley, Riverside County, California. This work shall conform with the contract drawings indexed on the cover sheet of the drawings included herewith.

Referenced standard drawings are available on the District web site.

The Contractor shall copy any of the referenced District standard drawings from http://www.rcflood.org.

The Contractor shall be responsible to obtain referenced standard plans/drawings of various agencies from their respective office or web site.

References made in these Special Provisions or Detailed Specifications to the "Standard Specifications" refer to the "Greenbook" Standard Specifications for Public Works Construction, current edition, including supplements. Standard Specifications of the American Society for Testing and Materials shall be designated by ASTM and the appropriate number of the standard. Unless otherwise specified, wherever the words "State Standard Specifications" are used in these Special Provisions or Detailed Specifications they shall mean the Standard Specifications of the State of California, Department of Transportation, current edition. Whenever the words "Caltrans Standards" are used they shall mean the Standard Plans of the State of California, Department of Transportation, 2006 edition.

In the event that discrepancies are encountered, the option that provides the method, item or material with the greatest strength or utility shall be chosen, as directed by the Engineer.

Requirements on the construction plans for Portland Cement Concrete are modified to the PCC Class designations, as described in Section 90-1.01 of the 2006 State Standard Specifications, as follows:

Class "A" shall mean Class "2"

Class "B" shall mean Class "3"

Class "C" shall mean Class "4"

Class "D" shall mean Class "1"

In case of conflict between the drawings and the specifications, the drawings shall govern; in case of conflict between the referenced specifications and these specifications, the latter shall govern.

SECTION 2 - TIME OF COMPLETION, DAMAGES AND LEGAL HOLIDAYS

2.1 General - The Contractor shall begin work within ten (10) calendar days after the date of receipt of Notice to Proceed from the Engineer and shall diligently prosecute the same to completion before the expiration of

TWO HUNDRED FORTY (240) WORKING DAYS

from the date of receipt of Notice to Proceed.

2.2 Damages - The Contractor and the District expressly agree that the cost to the District for inspection and superintendence of the work for this contract is **$800.00** per working day.

2.3 Legal Holidays - The Contractor will not be permitted to work on Legal Holidays (Reference Sections 6.02 and 6.06 of the General Provisions), except in cases of emergency as directed by the Engineer.

SECTION 3 - FORCE ACCOUNT PAYMENT

3.1 Labor Surcharge - Attention is directed to the provisions of Section VII, Article 7.03A (1b) of the General Provisions. The labor surcharge percentage to be applied to the actual wages paid as defined in Paragraph 7.03A (1a) will be twenty-four percent (24%).

3.2 Equipment Rental - Attention is directed to the provisions of Section VII, Article 7.03A (3) of the General Provisions. The equipment rental rates to be applied will be the rates published by the California Department of Transportation and in effect at the time of the award of the contract. A copy of said Equipment Rental Rates is on file at the District Office.

SECTION 4 - PROTECTION OF EXISTING UTILITIES

4.1 General - All existing underground utility lines, power poles and overhead wiring shall be protected in place at all times, except as noted otherwise on the plans. Any damage to utilities caused by the Contractor's operation shall be repaired or replaced at the Contractor's expense.

Prior to the commencement of any construction activities, the Contractor shall contact all utility companies and local municipalities servicing the project area to review as-built utility drawings and determine appropriate means of protecting utilities.

At the discretion of the Engineer, the Contractor may be required to verify, by potholing, the location of potentially affected utilities.

4.2 Cooperation with Utilities Relocated by Others – Some utilities will require relocation by others prior to or during construction as shown on the drawings and as specified in these specifications and Special Provisions.

Supplement to Section 8.01 of the General Provisions. The Contractor shall coordinate and cooperate with the various utilities or their contractors to ensure the work proceeds in an orderly manner.

The Contractor shall stage his work as required to accommodate the following utility construction or relocations:

(a) Southern California Edison Company – The following flexible electrical lines located at approximate:

Line A: Station 63+29 (Cedar Street)

The Contractor shall notify Southern California Edison Company in writing at least one (1) month prior to construction reaching their facility. If it is not possible to protect the electrical lines in place, the Contractor shall allow Southern California Edison Company three (3) working days to complete relocation for each of their lines.

Contact Person: Doug Pendleton
Southern California Edison Company
7951 Redwood Avenue
Fontana, CA 92336
909.357.6581

(b) AT&T – The following flexible telephone lines located at approximate:

Line A: Station 35+83 (Beach Street) catch basin interference
Station 60+52 (54th Street) north catch basin interference
Station 60+52 (54th Street) south catch basin interference
Station 63+29 (Cedar Street) catch basin interference
Station 65+40 (53rd Street) catch basin interference
Station 16+90 (58th Street) back of catch basin 78' east of main line

Line D: Station 10+81 (Beach Street) catch basin interference
Station 11+45 (Beach Street) catch basin interference

The Contractor shall notify AT&T in writing at least one (1) month prior to construction reaching their facility. If it is not possible to protect the telephone lines in place, the Contractor shall allow AT&T three (3) working days to complete relocation for each of their lines.

Contact Person: Randy Boring
AT&T
3939 E. Coronado Street
Anaheim, CA 92807
714.666.5674

(c) The Gas Company – The following flexible gas lines located at approximate:

Line A: Station 65+40 (53rd Street) catch basin interference

The Contractor shall notify The Gas Company in writing at least one (1) month prior to construction reaching their facility. If it is not possible to protect the gas lines in place, the Contractor shall allow The Gas Company three (3) working days to complete relocation for each of their lines.

Contact Person: Rose Elizondo
The Gas Company
1981 West Lugonia Avenue
Redlands, CA 92374
909.335.7584

(d) Charter Communications – The following cable TV line located at approximate:

Line A: Station 22+30 (Beach Street)

The Contractor shall notify Charter Communications in writing at least one (1) month prior to construction reaching their facility. If it is not possible to protect the cable TV line in place, the Contractor shall allow Charter Communications three (3) working days to complete relocation for each of their lines.

Contact Person: Rick Keyner
Charter Communications
7337 Central Avenue
Riverside, CA 92504
951.343.5100 ext. 417

Should any utility relocation result in delays to the Contractor's work schedule, the Contractor shall be entitled only to an equivalent extension of time for the completion of the contract, and shall not be entitled to damages due to downtime and idled equipment or additional payment over and above the agreed upon contract unit prices.

SECTION 5 - PROJECT SITE MAINTENANCE

Through all phases of construction, the Contractor shall comply with the provisions of Section 7-8 of the Standard Specifications. Before final acceptance of the work, the Contractor shall clean the work, the site of the work as well as any storage or staging areas of all falsework, temporary structures, other construction materials and equipment, excess materials and rubbish, and shall leave the work and the site in a neat and presentable condition. Such final cleanup work shall be performed within the time specified for completion of all of the work.

SECTION 6 - SPECIAL REQUIREMENTS

6.1 National Pollutant Discharge Elimination System (NPDES) – The Contractor shall comply with the requirements of Board Order No. R8-2010-0033 (NPDES No. CAS618033), NPDES Area-Wide Municipal Stormwater Permit, hereafter referred to in this Section as the "Permit", issued by the California Regional Water Quality Control Board (CRWQCB) – Santa Ana Region. This Permit regulates both stormwater and non-stormwater discharges associated with Contractor's construction activities. The Contractor shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) in accordance with Section 29 "Stormwater and Non-Stormwater Pollution Control" of the Detailed Specifications.

The Contractor's attention is directed to: 1) Section 29.2 "General Requirements" which allows the Engineer to withhold progress payments if the Contractor fails to fully implement Section 29 "Stormwater and Non-Stormwater Pollution Control" or is deemed to be in non-compliance with the provisions of the Permit; 2) Section 29.3 "PRDs Preparation and Approval" which requires that the PRDs be prepared and approved prior to the Pre-Construction meeting; and 3) Section 29.6 "SWPPP Implementation" which allows the Engineer to suspend construction operations if the Contractor fails to implement the approved SWPPP and any amendments thereto.

6.2 Sanitation - Sewage flows shall not be interrupted. Portions of the proposed sewer work will require connection to the existing sewer main, therefore, sewer line flows will need to be bypassed during construction. The Contractor shall generate, and submit to Jurupa Community Services District and the District, a "Phasing/Sewer Bypass Plan" that details the general order of construction, complete with details of where, when and how the Contractor plans to bypass the existing line work. The Contractor shall submit bypass plan two (2) weeks in advance of shutdown for coordination purposes. The upstream sewer system for this area serves approximately 170 existing residences. Precise flow measurements have not been obtained; a rough approximation of flow for this area is 45,000 gallons-per-day (average) and 185,000 gallons-per-day (peak). Should the Contractor disrupt existing sewer facilities, sewage shall be conveyed in closed conduits and disposed of in a sanitary sewer system. If pumping is required it shall be done at the expense of the Contractor. A backup pumping system with equal capacity shall be provided at all times. Sewage shall not be permitted to flow in trenches or be covered by backfill.

No extra compensation will be allowed in connection with the temporary diversion of sewage and all such costs shall be included in the various contract unit prices.

Should the Contractor's operation result in fine(s) from other agency jurisdictions or result in the Jurupa Community Services District and District's need for cleanup assistance, the payment of such fines and Jurupa Community Services District and District assistance shall be the responsibility of the Contractor.

6.3 Confined Space Compliance - The Contractor shall comply with all Cal/OSHA safety regulations including regulations concerning confined space and for maintaining a safe working environment for Contractor and District employees on the site. The Contractor shall develop and

maintain a confined space procedure specific to this contract that complies with the requirements contained in California Code of Regulations, Title 8, Section 5158, Other Confined Space Operations and the District Confined Space Procedure, SOM-18. A copy of SOM-18 can be obtained from the District office, 1995 Market Street, Riverside upon request.

Within five (5) days after the award of the contract, the Contractor shall submit three (3) copies of the procedure to the Engineer for review and approval. The Contractor shall allow five (5) working days for the Engineer to review the procedure. If revisions are required as determined by the Engineer, the Contractor shall revise and resubmit the procedure within three (3) working days of receipt of the Engineer's comments and shall allow four (4) working days for the Engineer to review the revisions. The Contractor must submit three (3) copies of the approved procedure to the Engineer prior to the pre-construction meeting.

The procedure shall provide for recording of data to develop a history of acceptable atmosphere within the confined space. That history will include:

1. Daily calibration of a direct reading confined space meter by trained personnel.

2. Daily monitoring and recording of the confined space atmosphere with a calibrated direct reading confined space meter.

3. Records of Items 1 and 2 shall be maintained onsite and copies given to the Engineer.

4. The records shall indicate if readings are of natural or mechanically enhanced ventilation.

In addition, the procedure shall include daily tours of the job site with the Engineer to ensure inlets to the confined space are free of obstruction or substances that might affect the atmosphere of the confined space.

The Contractor will be required to keep a direct reading confined space meter onsite for the duration of the contract. The meter shall be calibrated daily and shall be made available for the Engineer's use upon request.

6.4 Heavy Equipment Working Hours – To minimize potential noise impacts near residences heavy construction equipment use shall be between the hours of 7:00 a.m. - 5:00 p.m. on normal working days, unless otherwise approved by the Engineer.

6.5 Encroachment Permits – The Contractor is required to obtain an encroachment permit from the City of Jurupa Valley for work within City right of way. The City of Jurupa Valley will not require the Contractor to pay a fee for the encroachment permit. A copy of the encroachment permit shall be provided to the Engineer prior to commencement of work.

6.6 Toxic Material Disposal - Toxic materials including oil, fuel oil, gasoline, coolant, fluid filters and other contaminants shall not be discharged within the project site. All such materials shall be transported offsite and disposed of at a County approved facility.

6.7 Survey Crew - The Contractor shall notify the Engineer in writing at least 48 hours prior to new construction staking.

Survey Crews will be available Monday through Thursday from 7:00 a.m. to 3:30 p.m., with a half-hour off for lunch. If the Contractor requires the Survey Crew to work beyond the specified time mentioned above, it shall be considered as overtime and shall be paid by the Contractor at 1.5 times the Survey Crew's hourly rates.

6.8 Survey Monuments - The Contractor shall salvage and give to the District all survey monuments and wells removed during construction. The District will reset monuments after construction.

6.9 Job Trailer Site - The Contractor is required to provide a site and install an office trailer for District personnel. This trailer shall be in good condition and located in a place acceptable to the District. The trailer shall be for the sole use of the District and shall not be used by the Contractor for any activity, including storage. The Contractor shall make provisions for the privacy and security of the office, and provide air conditioning, drinking water and electrical service. The Contractor shall also provide two office chairs and a desk suitable for reviewing plans. The Contractor shall pay the monthly billings for these services. The trailer shall be fully operational and available to District personnel on the first day of work. Should the trailer or office not be available and in working condition, it is agreed by both parties at the time of entering this contract that damages in the amount of $3,000 per month shall be assessed. It is agreed that this amount may be prorated and shall be deducted from the first contract payment and any successive payments covering any period that the facilities are unavailable.

6.10 Construction Tolerances – Variation in alignment, grade and dimensions of the structures and structural components from the established alignment, grade and dimensions shown on the drawings shall be within the tolerances specified in the following:

Table A – Tolerances for Grading Unlined Channels, Levees and Access Roads		
Departure from established alignment		2 inches on tangents 4 inches on curves
Departure from established profile grade	Channel bottoms, channel sideslopes in cut and fill, levee and access road sideslopes in cut	Zero above and 3 inches below the specified grade
	Top surfaces of levees and access roads in both cut and fill, levee and access road sideslopes in fill	Zero below and 3 inches above the specified grade

Regardless of the construction tolerances specified, the excavation and grading shall be performed so that the finished surfaces are in uniform planes with no abrupt breaks in the surface.

Table B - Tolerances for Trapezoidal Concrete Lined Channels and Levees		
Departure from established alignment		2 inches on tangents 4 inches on curves
Departure from established profile grade		1 inch
Variation in thickness of lining, sideslopes and invert		5 percent of specified thickness provided average thickness is maintained
Variation from specified width of section at any height		0.0025 times specified width W plus 1 inch. 0.0025W + 1 inch
Variation from specified height of lining		0.005 times specified height H plus 1 inch. 0.005H + 1 inch
Variation in surfaces (gradual)	Invert Sideslopes	¼ inch in 10 feet ½ inch in 10 feet
Variation in surfaces (abrupt)		¼ inch

Gradual Variation tolerance shall be measured by placing a 10-foot straightedge anywhere on the finished concrete structure within 72 hours after concrete placement. The gap at any point between the straightedge and the concrete shall not exceed the specified amount.

Table C - Tolerances for Formed, Cast-in-Place Concrete Structures		
Departure from established alignment		1 inch on tangents 2 inches on curves
Departure from established profile grade		1 inch
Inside dimensions		0.005 times specified dimension
Variation from the plumb or the specified batter in the lines and surfaces of walls, piers and in arises	Exposed, in 10 feet Backfilled, in 10 feet	½ inch 1 inch
Variation in cross-sectional dimensions		Minus ¼ inch Plus ½ inch
Variation in surfaces (gradual)	Invert Soffits, Walls, Sideslopes	¼ inch in 10 feet ½ inch in 10 feet
Variation in surfaces (abrupt)		¼ inch

Table D - Tolerances for Reinforcing Steel Placement		
Variance from indicated position	Spacing between adjacent bars and the distance between layers of bars	one bar diameter nor more than one inch
Concrete cover measured perpendicular to steel in the direction of tolerance		¼ inch

6.11 Surplus Excavated Material - Any stockpiling, grading or disposal of material outside of the project limits is not covered under the District's permits and is the sole responsibility of the Contractor. Regulatory permits that may be required include, but are not limited to, Federal Clean Water Act (Sections 401 and 404), California Fish and Game Code (Section 1602) and Federal/State Endangered Species Acts. All costs to obtain these Regulatory Permits shall be borne by the Contractor.

6.12 Sewer Line Inspection - Prior to the commencement of construction, the Contractor is required to video record all sewer mains (8" diameter and larger) within the project limits. Additionally, the Contractor shall video record the sewer mains after the backfilling of the storm drain has been completed. All costs associated with this requirement shall be included in the contract price bid for Clearing and Miscellaneous Work. The Contractor is required to replace and/or repair at his own expense, any sewers damaged or misaligned as a result of his construction activities.

6.13 Pipe Order Notification - The Contractor shall submit to the District the invoice from the pipe company stating, (1) pipe order date, (2) pipe quantity, and (3) estimated date of pipe delivery within five (5) calendar days of the award of the contract.

6.14 Project Signs - Supplementing Section 8.07 of the General Provisions, the Contractor shall be required to provide two (2) new project signs. The Contractor shall install and maintain the project signs at locations specified by the Engineer, with painting and lettering as shown in Appendix "B" of these Special Provisions. The signs shall be installed as directed by the Engineer within five (5) days after District issuance of the Notice to Proceed. Upon completion of construction, the signs shall be removed.

6.15 Liability Insurance – The Contractor's attention is directed to Section 8.02, Insurance Hold Harmless, of the General Provisions. The City of Jurupa Valley, Chino Basin Desalter Authority and Jurupa Community Services District shall also be named as additional insureds with the liability insurance coverage required to be maintained by the Contractor.

6.16 Accidental Discovery – In the event that any hazardous materials, historical, archaeological, or paleontological resources are accidentally discovered within project limits, the Contractor shall immediately cease all construction or ground disturbance activity in the vicinity of find and notify the Engineer. District will provide the appropriate professional to assess the significance of the discovery and, if necessary, develop appropriate management and treatment measures. **The Contractor shall not resume construction in the affected area without Engineer's approval.**

Should any of the above mentioned discoveries result in delays to the Contractor's work schedule, the Contractor shall be entitled only to an equivalent extension of time for the completion of the contract, and shall not be entitled to damages due to down-time and idle equipment or additional payments over and above the agreed upon contract prices.

SECTION 7 - SOILS REPORT

In conjunction with the soils investigation reports prepared by Geotek dated May 13, 2009 and August 11, 2010, the Contractor's attention is directed to Article 8.08 of the General Provisions. The logs of the soil borings for these reports are included for the convenience of the bidders, in conformance with Section 8.08 of the General Provisions, as Appendix "C" of these specifications. The soils reports are on file in the District office, 1995 Market Street, Riverside and are available for review upon request.

SECTION 8 - NOT USED

SECTION 9 - PAYMENT

The contract prices shall include full compensation for all costs incurred under these Special Provisions and Detailed Specifications.

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DETAILED SPECIFICATIONS

SECTION 10 - MOBILIZATION

10.1 Description - The contract item Mobilization shall consist of expenditures for all preparatory work and operations, including but not limited to, those costs necessary for the movement of personnel, equipment, supplies and incidentals to the project site; for the establishment of all offices, buildings, construction yards and other facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site as well as the related demobilization costs anticipated at the completion of the project.

10.2 Payment - The amount credited for Mobilization on each monthly progress payment shall be equal to the total of the amounts credited for work on all the other contract items for that monthly progress payment, up to a cumulative limit of eighty percent (80%) of the lump sum price bid for Mobilization. The remaining twenty percent (20%) of the lump sum price bid for Mobilization will be paid with the final payment.

Payment of the lump sum contract price for Mobilization shall constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to completion of this item of work.

The deletion of work or the addition of extra work as provided for herein shall not affect the price paid for Mobilization.

SECTION 11 - WATER CONTROL

11.1 Description - This section covers the contract item Water Control. Watersheds and/or urban runoff areas are tributary to the project site at various locations, but do not necessarily follow the alignment of the project under current conditions. Surface water in varying quantities can be expected at any time of the year, and substantial runoff can be expected during periods of rainfall. Groundwater was indicated at the time of the soils investigation for this project. All bidders shall make their own determination regarding what the surface and/or groundwater conditions will be at the time of construction, and their impact on the bidder's operations and construction phasing.

11.2 Water Control - The contract item Water Control includes the control and/or diversion of surface runoff as well as groundwater within the work area as required to complete the work. All work shall be carried on in areas free of water. Care should be exercised so that runoff or diversion flows do not erode, undermine or otherwise damage either facilities which have been constructed or adjacent private properties. The responsibility for the protection of all existing and proposed improvements lies with the Contractor.

11.3 Measurement and Payment - The methods of controlling both surface and groundwater will be the responsibility of the Contractor. The contract lump sum price paid for Water Control shall include full compensation for all direct and indirect costs incurred under this section, and

for doing all the work involved in controlling surface runoff and groundwater within the construction area, as specified in these Detailed Specifications, and as directed by the Engineer.

Payment will be made on a basis of the percentage of the work completed on the entire project.

SECTION 12 - TRAFFIC CONTROL

12.1 Description - The contract item Traffic Control shall include labor, flagmen, lights, barricades, signs, materials, temporary bridges and equipment necessary to ensure that the vehicular and pedestrian traffic conforms to requirements as set forth in this section and as shown on the drawings.

12.2 Notification of Agencies - The Contractor shall notify the following agencies a minimum of 48 hours in advance of start of any street work and inform them of the proposed construction schedule and provide any additional pertinent information they may request:

AT&T (Randy Boring)		714.666.5674
Charter Communications(Rick Keyner)		951.343.5100 ex. 417
Chino Basin Desalter Authority	(Curtis Paxton, General Manager cpaxton@chinodesalter.org)	661.361.8400
City of Jurupa Valley Public Works		951.332.6464
Jurupa Community Services District	(Nem Ochoa, Engineering Manager nochoa@jcsd.us) (Todd Minten, Operations Manager tminten@jcsd.us) (Dan Ducasse, Sewer System Supervisor dducasse@jcsd.us) Luke Matson, Sewer System Foreman lmatson@jcsd.us) Dave Irish, Water System Supervisor dirish@jcsd.us)	951.685.7434
Jurupa Unified School District		951.360.4100
Riverside County Fire Department		951.940.6900
Riverside County Sheriff's Department		951.955.2400
Southern California Edison (Doug Pendleton)		909.357.6581
The Gas Company (Rose Elizondo)		909.335.7584
Underground Service Alert		800.227.2600
United States Postal Service		800.275.8777

The Contractor is not relieved of his responsibility of notifying the various departments and agencies mentioned above, even if their telephone numbers may have changed without notice.

The above agencies shall also be advised by the Contractor of any major change in the construction schedule that could restrict pedestrian or vehicular traffic.

12.3 Public Convenience and Access - The Contractor shall comply with the requirements of Section X of the General Provisions and shall provide continuous access to all private property. Additional provisions shall be made as necessary to protect the public and accommodate traffic with a minimum of inconvenience.

Closures or partial closures of the traveled way implemented by the Contractor shall be related to actual work being performed at the time. Closures shall not be maintained if work is not being performed. If the existing closure is not essential to the type of work being performed at the time, the traveled way shall immediately be restored to a safe condition for public use.

The Contractor shall provide temporary bridge crossings for all driveway entrances to be closed to vehicular access for any period exceeding 4 hours.

Temporary bridges shall have a minimum width of 12 feet for residential driveways and 24 feet for business driveways, and shall be designed for an AASHTO H20 truck loading. Steel plates placed over the trench shall have a minimum thickness of 1.25" and the surface shall be roughened or coated to provide a non-skid surface. For spans greater than 4 feet, a structural design shall be prepared by a Registered Civil Engineer and submitted to the District for review and approval.

The Contractor shall notify each resident in writing 3 days in advance of excavating past the affected driveway entrance. Such notice shall contain the expected day and period of time (not to exceed 4 hours) that the driveway is to be out of service. A copy of each letter shall be submitted to the Engineer.

12.4 Construction Signs and Traffic Control Plans - All construction signs, special signs, barricades, delineators, etc., shall conform with the U.S. Department of Transportation, Federal Highway Administration, "Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), Part 6, latest edition", and the MUTCD California Supplement, Part 6 along with the Uniform Sign Chart as shown on the drawing.

12.5 Flaggers - All personnel utilized as flaggers must be trained in the proper fundamentals of flagging and signaling.

12.6 Striping and Pavement Marking – Temporary and permanent striping shall be performed by the Contractor at his expense as directed by the Engineer. The Contractor shall restore the permanent striping immediately after resurfacing of the streets is completed. The Contractor shall notify the City of Jurupa Valley, Telephone: 951.332.6464 at least 48 hours prior to restriping.

All temporary traffic striping and pavement markings shall conform to Section 84 of the State Standard Specifications and shall be acceptable to the City of Jurupa Valley.

All pavement markings such as arrows, "STOP", "ONLY", reflectors, etc., shall be replaced by the Contractor using thermoplastic. Thermoplastic crosswalk, traffic stripes and

pavement markings shall conform to the provisions in Section 84-1, "General" and 84-2, "Thermoplastic Traffic Stripes and Pavement Markings" of the State Standard Specifications and these Detailed Specifications.

12.7 Payment - The contract prices paid for Traffic Control shall include full compensation for all material and labor costs incurred under this section. Contractor is advised that traffic plans as shown on the drawings may be modified as field conditions require. No additional payment shall be made for modifications to the traffic plan.

This payment will be made on a basis of the percentage of work completed on the entire project.

SECTION 13 - CLEARING AND MISCELLANEOUS WORK

13.1 Description - This section covers the contract items Clearing and Miscellaneous Work; and Extra Directed Work as required for construction of the work. All objectionable materials shall be removed and disposed of outside of the limits of the construction easements and permanent rights of way.

13.2 Clearing and Miscellaneous Work - The contract item Clearing and Miscellaneous Work includes the removal and disposal of all vegetation, trees, roots, stumps, fences, pipes, all abandoned facilities, culverts, rocks, structures, concrete and asphalt excluding those items defined specifically as excavation in the appropriate section.

Included in this item are the following:

1. The Contractor shall leave all improved parkways undisturbed where possible. When this is impractical he shall returf in kind, areas disturbed in the parkways including removing and replacing interfering portions of sprinkler systems. Sod shall be used to restore disturbed grass. All work is to be done to the satisfaction of the Engineer.

2. The temporary relocation of signs and mailboxes, and their reinstallation. Work involving mailboxes shall be coordinated with the Postal Service.

3. The stenciling and signage on top of all catch basins and drop inlets. Stenciling and signage will be provided by the District.

4. Salvage of existing Sump Pump located at Station 63+30± on Cedar Street, including all fittings, controls and miscellaneous equipment. Salvaged components will be delivered to Riverside County Transportation Department's equipment yard located at 2950 Washington Street, Riverside, California at the direction of the Engineer.

   The Contractor shall contact Stan Dery of Riverside County Transportation Department at 951.955.6785 to coordinate the shut down/abandonment of

Southern California Edison Company's line that supplies the power for the pump. A copy of the construction schedule must be provided to Riverside County Transportation Department and a minimum of forty-five (45) days prior to taking the pump out of service. It should be noted that the Contractor will be responsible for any flooding or damages in that area once the pump has been taken out of service.

5 The Contractor shall provide the property owners safe access through the construction area at all times from Station 16+90 to Station 20+44. The Contractor is responsible for all coordination and communication with the property owners, and for any time and materials necessary to provide access.

6. The Contractor shall remove and replace all in kind interfering portions of the wood fencing, chain link fencing and block wall as required for the construction of the project. This includes all labor materials and equipment necessary for the removal and replacement as shown on the drawings.

Finally, included in this item are those types of work as shown on the drawings not specified for pay under any other individual contract item.

13.3 Extra Directed Work – The contract item Extra Directed Work shall consist of necessary work that is not included in other contract bid items and not shown on the drawings, as determined by the Engineer. All Extra Directed Work shall be performed as directed by the Engineer in accordance with all applicable standards and specifications.

13.4 Payment - The contract lump sum payment for Clearing and Miscellaneous Work shall include full compensation for all material and labor costs incurred under this section and will be made on a basis of the percentage of work completed on the entire project.

Full compensation for the contract item Extra Directed Work shall be made as "Extra Work" and shall be paid pursuant to Section 2.07 of the General Provisions. The total accumulated costs for Extra Directed Work shall not exceed the amount specified in the contract bid item unless otherwise increased by change order.

SECTION 14 - EARTHWORK

14.1 Description - This section covers the contract items Excavation; Channel Excavation; Asphalt Concrete Excavation; Backfill; Controlled Low Strength Material (CLSM); and Filter Material.

14.2 General Excavation Requirements - Pipe Excavation shall be in conformance with Section 306 of the Standard Specifications. Channel Excavation shall be in conformance with Section 300-7. Access to trenches shall be in conformance with Section 306-1.1.4 and the manner of bracing excavations shall be in conformance with Section 306-1.1.6 of the Standard Specifications.

Excavation shall be kept to the minimum widths required for efficient placing of the pipe or structure and the construction of the various other concrete structures. However, for pipe placement the minimum width of trench shall be 12 inches greater than the outside diameter of the pipe. The maximum length of open trench shall be in conformance with Section 306-1.1.2 of the Standard Specifications.

In excavating for surfaces against which concrete is to be placed, care shall be exercised in removing the final lift. Upon completion of excavation for structures and pipe, surfaces against which concrete is to be placed shall be free of debris, mud or ponded water.

The foundation for all concrete structures including concrete channels and sideslopes will be inspected and tested after excavation. The subgrade shall be compacted to ninety percent (90%) relative compaction prior to the placement of concrete.

Material which will not provide a suitable foundation shall be removed and replaced with compacted select material as directed by the Engineer.

Any overexcavation shall be filled with select material compacted to ninety percent (90%) relative compaction and meeting the material requirements for backfill.

The Contractor shall remove slides and materials eroding into the work, and the slopes and grades refinished to original grades as specified.

The Contractor shall dispose of all surplus excavated material outside of the limits of the construction easements and permanent rights of way.

The removal of rock material from within the excavation paylines which requires the use of blasting or equipment beyond that normally necessary to accomplish the excavation (as determined by the Engineer) shall be paid for in accordance with Section VII, Article 7.03 of the General Provisions. The cost of removal and disposal (including trucking) of rock away from the jobsite will be paid for under the contract item Excavation and no additional compensation will be allowed.

Blasting, when necessary, as approved by the Engineer shall be in accordance with Section 19-2.03 of the State Standard Specifications.

The Contractor's attention is directed to the General Provisions, Section V, Article 5.09 on the use of explosives and Article 5.11 in regard to unforeseen difficulties.

14.3 Excavation - The contract item Excavation covers the removal of all material including asphalt, aggregate base, abandoned pipelines and concrete from within the excavation paylines as specified and as required for the construction and installation of the reinforced concrete box, junction structures, headwalls, manholes, transitions and pipe as shown on the drawings, and the disposal of all surplus material. All A.C. and P.C.C. shall be sawcut unless otherwise specified.

14.4 Channel Excavation - The contract item Channel Excavation covers all excavation and fill required to obtain the channel and access road cross sections, and the placement of material in the mandatory fill areas and areas where structures have been removed as shown on the drawings downstream of Station 16+00. All excess material shall be disposed of away from the site of the work.

Before placing any fill the subgrade shall be cleared of all vegetation and debris. All fill material placed shall be moistened and shall be free from sod, roots, brush, debris, trash and other objectionable material and shall be placed in horizontal layers not over 8 inches in depth before being compacted to ninety percent (90%) relative density. Additionally, if required, the Contractor shall obtain a grading permit for mandatory fill areas shown on the plans.

14.5 Asphalt Concrete Excavation – The contract item Asphalt Concrete Excavation covers the header cut and removal of asphalt concrete pavement to the depths and dimensions as specified and as shown on the drawings and the disposal of all surplus material.

Exclusive of this contract item is the asphalt concrete excavation within the trench excavation limits which will be measured and paid by the contract item Excavation.

Included in this contract item is the recompaction of the existing Aggregate Base to 95% relative compaction after removal of existing asphalt concrete should the Aggregate Base be exposed.

The cold planing machine shall have a cutter head at least 72 inches wide and shall be operated so as not to produce fumes or smoke.

The final cut shall result in a uniform surface conforming to the typical cross sections. The outside lines of the planed area shall be neat and uniform. The road surfacing to remain in place shall not be damaged in any way.

The material planed from the roadway surface, including material deposited in existing gutters or on the adjacent traveled way, shall be immediately removed from the work site and disposed of outside the right of way. The removal crew shall follow within 50 feet of the planer unless otherwise directed by the Engineer.

14.6 General Backfill Requirements - Whenever fill is specified or required (except for pipe backfill) the work shall be performed as set forth in Sections 300-4.1 to 300-4.8 of the Standard Specifications. Backfill for pipe and box shall conform to Section 306-1.3 of the Standard Specifications.

No backfill materials shall be placed against the outside walls of cast-in-place concrete structures until the concrete has developed eighty percent (80%) of its design strength. No fill or traffic will be permitted on the top of any cast-in-place concrete structure until the concrete in the structure has attained its design strength. Compressive strength will be determined by test cylinders taken by the Engineer.

Regardless of the method of densification, backfill material shall not be placed against any reinforced concrete structure until the structure has been inspected and approved for backfilling by the Engineer.

Densification of backfill will be accomplished by mechanical methods as described below. All relative compaction tests will be made by the Engineer in conformance with California Test 216. Whenever relative compaction is specified to be determined by California Test 216, the in-place density may be determined by California Test 231. The wet weight or dry weight basis and English units of measurement may be used at the option of the Engineer.

Mechanical Compaction - Backfill shall be mechanically compacted by means of tamping rollers or other mechanical tampers. Impact-type pavement breakers (stompers) will not be permitted unless otherwise approved by the Engineer.

All backfill material for structures shall be placed in uniform layers and shall be brought up uniformly on each side of the structure. The thickness of each layer of backfill shall not exceed 8 inches before compaction unless otherwise approved by the Engineer. For hand directed mechanical compactors, the thickness of each layer shall not exceed 4 inches before compaction.

Water Densification by jetting will not be allowed.

Approval to use specific methods and compaction equipment shall not be construed as guaranteeing or implying that the use of such methods and equipment will not result in damage to adjacent ground, existing improvements or improvements installed under the contract, nor shall it be construed as guaranteeing proper compaction. The Contractor shall make his own determination in this regard.

All backfill and bedding around structures and pipe shall be compacted to not less than ninety percent (90%) relative compaction. Where such material is placed under existing or proposed paved roadways, the top 3 feet, measured from the subgrade plane, shall be compacted to ninety-five percent (95%).

Trench bottoms for structures and pipe shall be graded to provide firm and uniform bearing throughout the entire length of the structures and pipe.

Controlled Low Strength Material (CLSM) shall be used for pipe bedding and shall consist of Portland cement, aggregate, water and fly ash. CLSM shall be placed to 6" above the top of the reinforced concrete pipe or as shown on the drawings.

Backfill material placed above the CLSM shall consist of either select material from the excavation or imported material, as approved by the Engineer. The soils investigation noted that the onsite soils will need to be moisture conditioned in order to achieve the desired optimum moisture content prior to use as backfill.

Backfill material placed above the bedding shall consist of either select material from the excavation or imported material, as approved by the Engineer.

14.7 Testing – District personnel shall perform compaction tests as described below. These tests represent the minimum required. Additional tests may be taken at the Engineer's discretion.

1. Mainline Trenches – A complete series of compaction tests will be taken for each 4-foot thickness of backfill placed. Each series will consist of tests taken at approximate maximum intervals of 300 feet. Each series will begin at the top of the bedding zone.

2. Connector Pipe Trenches – Compaction tests will be taken on 50% of the laterals, one test for each 4-foot of depth.

3. Any failed test will result in a retest.

When water densification is requested, sand equivalent tests representing foundation soils and proposed backfill material shall be obtained at approximate maximum intervals of 1,000 feet. Additional tests may be necessary to define limits of suitable backfill material.

14.8 Backfill - The contract item Backfill includes all backfill, and pipe and box bedding material compacted as specified around the various concrete structures and pipe within the paylines as shown on M815 of the standard drawings.

14.9 Controlled Low Strength Material (CLSM) – The contract item Controlled Low Strength Material (CLSM) covers the placement of CLSM backfill around the pipe or structure as directed by the Engineer.

CLSM shall be in conformance with Section 201-6 of the Standard Specifications.

CLSM shall be hand excavatable; a minimum of two (2) sacks of cement shall be used for each cubic yard of CLSM produced.

CLSM shall have a 28-day compressive strength between 200 to 300 psi.

14.10 Filter Material - The contract item Filter Material includes all filter material to be placed below the reinforced concrete pipe, box and various other structures but exclusive of connector pipes and catch basins.

The Contractor should note that the placing of filter material will be determined from field conditions as directed by the Engineer.

The materials for filter material shall conform to Sections 90-2.02 and 90-3.01 of the State Standard Specifications. Grading shall meet the requirements for 1" x No. 4 coarse aggregate as per Section 90-3.02 of the State Standard Specifications. The filter material shall be consolidated and the surface trimmed to final grade as directed by the Engineer.

14.11 Measurement - Excavation; Channel Excavation; Asphalt Concrete Excavation; Backfill; Controlled Low Strength Material (CLSM); and Filter Material beyond the limits established by the drawings, unless ordered in writing by the Engineer, will not be measured for payment.

The excavated material shall be measured from the ground surface existing at the start of excavation, as determined from surveyed cross sections taken by the District, to the lines, grades and dimensions shown on the drawings. Longitudinal limits of the excavations as shown on the profile drawings terminate at a vertical plane at the limits of the structure, measured along the longitudinal axis of the various structures.

Measurement for payment for the contract item Excavation will be the number of cubic yards of material excavated as shown on the drawings. Longitudinal limits of the excavations terminate at a vertical plane at the limits of pipe or structures, measured along the longitudinal axis of the pipe or structure.

Measurement for payment for the contract item Channel Excavation will be the number of cubic yards excavated as shown on the drawings or as directed by the Engineer. No measurement or payment of the fill required to obtain the channel and road cross section and the placement and compaction of material in the mandatory fill areas will be made.

Measurement for payment for the contract item Asphalt Concrete Excavation will be the number of square feet of material excavated as shown on the drawings or as directed by the Engineer.

Measurement for payment for the contract item Backfill; will be the number of cubic yards of material placed in final position as specified and within the limits of the payment lines shown on the drawings. The longitudinal limits shall terminate at a vertical plane at the limits of the pipe or structure, measured along the longitudinal axis of the various pipe or structures. Volumes occupied by structures, aggregate base, asphalt concrete and other feature for which a separate payment is made will be deducted from the gross volume.

Measurement for payment for the contract item Controlled Low Strength Material (CSLM) will be the number of cubic yards of material placed in final position as specified and within the limits of the payment lines shown on the drawings. The longitudinal limits for CLSM shall terminate at a vertical plane at the limits of the pipe or structure, measured along the longitudinal axis of the various pipe or structures. Volumes occupied by structures, aggregate base, asphalt concrete and other features for which a separate payment is made will be deducted from the gross volume.

Measurement for payment for the contract item Filter Material will be the number of cubic yards of material placed in final position as specified to the lines, grades and dimensions as shown on the drawings or as directed by the Engineer.

14.12 Payment - The contract prices paid for Excavation; Channel Excavation; Asphalt Concrete Excavation; Backfill; Controlled Low Strength Material (CLSM); and Filter Material shall include full compensation for all costs incurred under this section.

SECTION 15 - TRENCH SAFETY SYSTEM AND FALSEWORK

15.1 Description - This section covers the contract item Trench Safety System and Falsework. This item is defined as a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Trench safety systems include support systems, sloping and benching systems, shield systems and other systems that will provide necessary protection. The item includes the furnishing and implementation of the safety system as required by Section 306-1.1.6 of the Standard Specifications or as directed by the Engineer.

15.2 Trench Safety System - Excavation for any trench five (5) feet or more in depth shall not begin until the Contractor has provided to the Engineer, a detailed plan for worker protection from the hazards of caving ground during the excavation of the trench. The plan shall show the details of the design of shoring, bracing, sloping or other provisions to be made for worker protection including any design calculations done in the preparation of the plan. No such plan shall allow the use of shoring, sloping or a protective system less effective than that required by the Construction Safety Orders of the California Department of Industrial Relations, Division of Occupational Safety and Health Administration (Cal-OSHA). The plan shall be prepared and signed by an engineer who is registered as a civil engineer in the State of California, and the plan and design calculations shall be submitted for review at least two (2) weeks before the Contractor intends to begin trenching operations.

All safety plans shall reflect surcharge loadings imparted to the side of the trench by equipment and stored materials. Surcharge loads shall be monitored to verify that such loads do not exceed the design assumptions for the system.

The Contractor should not assume that only one type of trench safety system such as a shield or "trench box" will be adequate for all trenching situations encountered on a given project. The Contractor should be prepared with alternative safety system designs (such as solid sheeting) should construction circumstances dictate the use of such.

Trench safety system designs for support systems, shield systems or other protective systems whether drawn from manufacturers' data, other tabulated data or designed for this particular project must be signed by a civil engineer registered in the State of California prior to submittal to the District for review. A shoring plan for the specific use of a shield shall be prepared. Catalogs or engineering data for a product should be identified in the plan as supporting data. All specific items or applicable conditions must be outlined on the submittal.

The State of California Department of Transportation "Trenching and Shoring Manual" will be used as a guide for plan review and approval.

Also included in this item is the fencing and barricading of the open trench as required for the safety of pedestrians and vehicular traffic as directed by the Engineer.

15.3 Falsework – Falsework for the construction of a reinforced concrete box shall conform with Section 51-1.06 Falsework of the State Standard Specifications.

The Falsework plan shall be prepared and signed by an engineer who is registered as a civil engineer in the State of California, and the plan and design calculations shall be submitted for review at least 4 weeks before the Contractor intends to begin Falsework construction.

The State of California Department of Transportation "Falsework Manual" will be used as a guide for plan preparation and review.

15.4 Measurement and Payment - The contract price paid for the item Trench Safety System and Falsework shall include full compensation for all costs incurred under this section.

This payment will be made on a basis of the percentage of the work completed on the items related to trenching operations.

SECTION 16 - CONCRETE CONSTRUCTION

16.1 Description - This section includes the contract items Reinforcing Steel and the various classes of Concrete.

16.2 General Requirements - Concrete for all purposes shall be composed of Portland Cement, aggregates and water of the quantities and qualities herein specified, and in the required proportions. The ingredients are to be well mixed and brought to the proper consistency and to have a compressive strength at the age of 28 days of not less than the amount shown in the following tabulation for each type of work listed:

CONCRETE CLASS	MINIMUM SACKS CEMENT/C.Y.	TYPE OF WORK	POUNDS PER SQUARE INCH
A	6	Box, Transition Structure Nos. 1 and 3, Headwalls and Wing Walls	4000*
A	6	Catch Basins, Junction Structure Nos. 1 and 2, Manholes	3250*
B	5	Local Depressions, Encasements, Concrete Pads, Concrete Collars, Concreted Rock and Miscellaneous Concrete not otherwise specified	3000*

E	2	Controlled Low Strength Material (CLSM)	200-300 Max.

*Note: Concrete for use in structures constructed from State of California, Department of Transportation Standard Plans shall have compressive strengths as called for on those plans.

16.3 Material and Methods - All concrete materials, methods, forms and proportioning shall conform to Sections 51 and 90, and additionally, curb construction shall conform to Section 73 of the State Standard Specifications. Concrete test specimens will be made in accordance with ASTM Designation C-31 and C172. Test for concrete compressive strengths will be performed in accordance with ASTM Designation C-39. Combined aggregate grading for all concrete shall be in conformance with Section 90-3.04 of the State Standard Specifications and the following tabulation for each type of work listed:

TYPE OF WORK	COMBINED AGGREGATE GRADING
The inverts of: Reinforced Concrete Box, Junction Structures, Transition Structures and Manholes.	1-1/2" Maximum
Box Deck and Walls, Headwalls, Catch Basins, Local Depressions, Collars, Encasements and other Miscellaneous Concrete not otherwise specified.	1" Maximum
Controlled Low Strength Material (CLSM) for Concreted Rock	3/8" Maximum

Fly Ash, Class F may be substituted for cement, up to a maximum of 15 percent by weight for all concrete. Fly Ash shall meet the standards of ASTM Designation: C-618. Water reducing agents meeting ASTM Designation: C-494 will be permitted in amounts recommended by the supplier and approved by the Engineer in writing.

No other admixture shall be used in any class of concrete without written permission from the Engineer.

Supplementing Section 90-1.01 of the State Standard Specifications, prior to placement of any concrete the Contractor shall submit mix designs, for all types of concrete to be placed, to the Engineer for approval. Supplementing Section 90-6.03 of the State Standard Specifications, concrete delivered to the job site shall be accompanied by a ticket containing the weight of each of the individual ingredients in the mix.

16.4 General Reinforcing Steel Requirements - Reinforcing steel for all reinforced concrete structures shall be Grade 60 Low-Alloy or Grade 60 Billet-Steel. The reinforcing steel for use in structures constructed from State of California, Department of Transportation Standard Plans shall be of Grade 60 or as called for on those plans. Cleaning, bending, placing and spacing of reinforcement shall conform to the applicable provisions of Section 52 of the State Standard Specifications and to the drawings. The Contractor shall furnish a "Certificate of Compliance" with the specification of ASTM Designation: A-706/A or A-615/A. All splices shall conform to the requirements of A.C.I. Manual, Standard 318, latest edition. Splices requested by the Contractor for his convenience shall be subject to approval by the Engineer. Longitudinal lap shall be 16 inches minimum for #4 bars and 19 inches minimum for #5 bars.

16.5 Consistency - The consistency of the concrete shall be such as to allow it to be worked into place without segregation. Unless otherwise specified, the slump shall be 3 inches plus or minus 1 inch for all concrete, except the concrete for the cast-in-place concrete pipe which shall have a slump of 2 inches plus or minus 1 inch.

CLSM flow characteristics shall be determined by producer to meet job site conditions and shall be approved by the Engineer.

The slump test shall be performed in accordance with the requirements of ASTM Designation: C-143. Slumps greater than those specified may be cause for rejection of the concrete by the Engineer.

16.6 Placing - Supplementing Section 51-1.09 of the State Standard Specifications, concrete shall not be placed except in the presence of the Engineer. The Contractor shall give reasonable notice to the Engineer each time he intends to place concrete. Such notice shall be far enough in advance to give the Engineer adequate time to inspect the subgrade, forms, steel reinforcement and other preparations for compliance with the specifications before concrete is delivered for placing.

Formed concrete shall be placed in horizontal layers in lifts of not more than 20 inches. Hoppers and chutes, pipes and "elephant trunks" shall be used as necessary to prevent segregation of the concrete.

16.7 Form Removal and Finish - Forms shall be removed only when the Engineer has given his approval. Forms shall be removed in such a way as to prevent damage to the concrete. Supports shall be removed in a manner that will permit the concrete to take stresses due to its own weight uniformly.

Forms shall not be removed sooner than the following minimum time or strength after the concrete is placed. These times represent cumulative number of days and fractions of days, not necessarily consecutive, during which the temperature of the air adjacent to the concrete is above 50 degrees Fahrenheit. If the temperature falls below 50 degrees Fahrenheit at any time after the concrete is placed in the forms, the Engineer will advise the Contractor of additional time required before forms can be removed.

Element	Strength or Time
Reinforced Concrete Boxes Transition Structure Nos. 1 and 3	1600 psi
All other structures	16 hours

The finish on all exposed formed surfaces shall conform to Section 51-1.18B Class 1 Surface Finish of the State Standard Specifications. The exposed concrete surfaces shall be broomed in a transverse direction with a fine textured hair push broom to produce a uniform surface and eliminate float marks. Brooming shall be done when the surface is sufficiently set to prevent deep scarring. If directed by the Engineer, a fine spray of water shall be applied to the surface immediately in advance of brooming.

Exposed corners of all concrete structures shall be finished with a 3/4" chamfer.

Concrete flatwork shall match adjacent surfaces. The concrete shall be struck off and tamped or vibrated until a layer of mortar has been brought to the surface. The top surface and face of catch basins and local depressions shall be finished to match adjacent surfaces.

16.8 Curing - All concrete shall be prevented from drying for a curing period of at least seven (7) days after it is placed. Surfaces exposed to air during the curing process shall be kept continuously moist for the entire period or until curing compound is applied.

Formed surfaces shall be thoroughly wetted immediately after forms are removed and shall be kept wet until patching and repairs are completed. Water or covering shall be applied in such a way that the concrete surface is not eroded or otherwise damaged. Water for curing shall be clean and free from any substances that will cause discoloration of the concrete.

Concrete may be coated with curing compound in lieu of the continued application of moisture. The curing compound shall comply with the requirements of Section 90-7.01B of the State Standard Specifications. The curing compound shall be No. 5 White Pigmented Curing Compound conforming to the requirements of ASTM Designation: C-309, Type 2, Class B for all concrete surfaces other than for flatwork which shall be coated with a clear or translucent curing compound containing a red fugitive dye.

The curing compound shall be sprayed on the moist concrete surfaces as soon as free water has disappeared, but shall not be applied to any surface until patching, repairs and finishing of that surface are completed. The curing compound shall be thoroughly mixed immediately before applying, and shall be applied at a uniform rate of not less than one gallon per 150 square feet of surface. No separate payment will be made for the curing compound or its application.

16.9 Joints - Joints shall be made at the locations shown on the drawings, or as approved by the Engineer.

The Contractor shall construct, in one continuous concrete placing operation, all work comprised between such joints. Joints shall be kept moist until adjacent concrete is placed.

All construction joints having a keyed, stepped, or roughened surface shall be cleaned by sandblasting prior to placement of the adjacent concrete, unless otherwise directed by the Engineer.

The sandblasting operations shall be continued until all unsatisfactory concrete, laitance, coatings, stains, debris, and other foreign materials are removed. The surface of the concrete shall be washed thoroughly to remove all loose material.

Construction joints, when required, shall be located between the transverse joints and, unless otherwise specified on the plans, shall utilize 1/2 inch diameter deformed bars 30 inches long, spaced at 18-inch centers as tie bars. The construction joints shall be straight and finished in a workmanlike manner.

Transverse construction joints for reinforced concrete boxes shall be keyed construction joints. Joints shall be in a vertical plane and shall not exceed 50 feet or be less than 10 feet, in the invert, walls and deck. Transverse construction joints shall be constructed per the standard drawings unless otherwise shown on the drawings.

Surfaces of construction joints shall be cleaned as set forth in Section 51-1.13 of the State Standard Specifications.

16.10 Weepholes - Weepholes shall be constructed in accordance with the drawings and at locations directed by the Engineer. All weepholes shall be 2-1/2 inches in diameter unless noted otherwise on the drawings.

Weepholes may be formed by removable round wooden dowels, Schedule 40 PVC Pipe or greater, or by other methods acceptable to the Engineer.

All weepholes shall have a rodent screen consisting of 1/4-inch mesh, 16-gauge galvanized hardware cloth securely and permanently attached over the drain opening in a manner approved by the Engineer.

Filter material for the weepholes shall be one inch (1") nominal size crushed rock conforming to the gradation of Section 200-1.2 of the Standard Specifications. Filter material shall also meet the quality requirements of Sections 200-1.1 and 200-1.2 of the Standard Specifications.

Filter material shall be wrapped in a single layer of filter fabric as shown on the drawings or approved by the Engineer. Filter fabric shall conform to that specified for underdrains per Section 88-1.03 of the State Standard Specifications.

Filter fabric shall be furnished in protective wrapping which shall protect the fabric from ultraviolet radiation and from abrasion due to shipping and handling. The fabric shall also be ultraviolet stabilized.

The fabric shall be placed in the manner and at the locations shown on the drawings. The surface to receive the fabric shall be prepared to a smooth condition free of obstructions and debris.

The fabric shall be covered within 72 hours of its placement. Should the fabric be damaged during construction, the torn or punctured section shall be repaired or replaced as directed by the Engineer.

No separate payment will be made for the installation of the weephole, hardware cloth, filter material or filter fabric.

16.11 Class "A" Concrete, Reinforced Concrete Box - The contract item Class "A" Concrete, Reinforced Concrete Box covers the concrete incorporated in the construction of all reinforced concrete boxes.

Reinforced concrete box walls shall be constructed by placing the concrete directly against timber or steel sheeting used as the outside form and shoring. Sheeting shall be closely fitted and extend a minimum of 12 inches above the ground surface. Unless otherwise directed, all sheeting shall be removed and the void created shall be immediately backfilled with a well graded sand and thoroughly jetted to the relative densities specified in Backfill.

The Contractor has an option of forming both sides of the reinforced concrete box walls, however, due to additional loads on the box structure resulting from this trench condition, the Contractor will be required to submit an alternate box design prepared by a civil engineer registered in the State of California. All alternate box designs are subject to the approval of the Engineer and no additional payment will be made for the alternate box if approved.

If the box is constructed from State of California, Department of Transportation Standard Plans, either method of forming noted in the above paragraphs may be used without an alternate box design being submitted.

Loading and vehicular use of box deck slab shall comply with the requirements of Section 51-1.11 of the State Standard Specifications.

Also included in this item of work will be the construction of the weepholes if required in the invert slab or sides of the reinforced concrete box.

16.12 Class "A" Concrete, Wing Wall Type B - The contract item Class "A" Concrete, Wing Wall Type B covers the concrete to be used in the construction of the wing walls, exclusive of earthwork and reinforcing steel. Also included in this item of work will be the construction of weepholes in the wing walls.

16.13 Class "A" Concrete, Minor Structures - The contract item Class "A" Concrete, Minor Structures includes the complete construction of the catch basins, collars, and headwall. Included in the pay item is all earthwork and reinforcing steel required for these structures, but exclusive of the required miscellaneous iron and steel.

16.14 Class "B" Concrete, Concreted Rock – The contract item Class "B" Concrete, Concreted Rock covers the concrete to be used to "grout" or concrete the invert rock and rock slope protection as shown on the drawings.

Concrete for concreted rock shall be Class "B", and shall have a slump sufficient to allow gravity flow into the interstices of the rock with rodding and vibration. Concrete for concreted rock shall be placed in accordance with Section 72-5.04 of the State Standard Specifications except that total penetration of the rock blanket by the concrete will be required, and the outer rocks of the finished rock surface shall project approximately 9 to 12 inches from the concrete surface.

16.15 Class "B" Concrete, Miscellaneous - The contract item Class "B" Concrete, Miscellaneous includes the complete construction of the local depressions, pads, pipe plugs, sewer encasements, and any other concrete not specified. Included in the pay item is all earthwork and reinforcing steel required. The subgrade for cross gutters and driveways shall be recompacted to ninety-five percent (95%) relative compaction prior to the placement of concrete.

16.16 Transition Structures - The contract items Transition Structure Nos. 1 and 3 covers the complete construction of these various structures, exclusive of earthwork and reinforcing steel.

16.17 Junction Structures - The contract items Junction Structure Nos. 1 and 2 covers the complete construction of these structures, including reinforcing steel, exclusive of earthwork.

No separate payment will be made for Junction Structure No. 3 or Junction Structure No. 4.

16.18 Manholes - The contract items Manhole Nos. 1, 2, and 4, and Manhole No. 2 with Safety Ledge cover the complete construction of these various structures, including reinforcing steel, exclusive of earthwork and the miscellaneous iron and steel.

To prevent longitudinal migration of groundwater along the pipe trench each manhole shall have the invert poured against competent in-situ material. No filter material shall be placed below manhole structure.

The manhole rings are required and shall conform to ASTM Designation: C-478, and the drawings. The rings shall be laid up, using Type II modified cement with a 1:2 mix mortar and with 1/2-inch minimum thickness pointed joints. On completion, vertical wall section shall not be out of plumb by more than 1/2-inch in 10 feet of vertical height. The manhole rings shall also be accurately aligned. The cast iron manhole frame and cover shall be installed, with frame accurately set to finished grade of pavement, in mortar well tamped around the perimeter of frame to ensure full bearing.

16.19 Reinforcing Steel, Grade 60 - The contract item Reinforcing Steel, Grade 60 includes all reinforcing steel, with accessories, required for the construction of the reinforced concrete structures described in Sections 16.11 and 16.12.

16.20 Measurement - Measurement for payment for the contract items Class "A" Concrete, Reinforced Concrete Box; Class "A" Concrete, Wing Wall Type B; Class "A" Concrete, Minor Structures; Class "B" Concrete, Concreted Rock; and Class "B" Concrete, Miscellaneous will be the number of cubic yards placed as specified, measured to the neat lines as shown on the drawings.

Measurement for payment for the contract items Transition Structure Nos. 1 and 3, Junction Structure Nos. 1 and 2, Manhole Nos. 1, 2 and 4, and Manhole No. 2 with Safety Ledge, will be the number of each type constructed as specified.

No measurement or payment will be made for Junction Structure No. 3 and Junction Structure No. 4.

Measurement for payment for the contract item Reinforcing Steel required for the construction of the reinforced concrete structures described in the appropriate sections will be in conformance with Section 52-1.10 of the State Standard Specifications. Steel used for longitudinal laps or splices will not be measured for payment. Transverse laps or splices shown on the plans but not used, and laps or splices used for the convenience of the Contractor will not be measured for payment.

No measurement or payment will be made for dowels, tie bars, tie wires, blocks, chairs and other accessories.

16.21 Payment - The contract prices paid for the various Concrete items and reinforcing steel items shall include full compensation for all costs incurred under this section.

SECTION 17 - CONCRETE PIPE

17.1 Description - This section covers the contract items Reinforced Concrete Pipe of the various sizes as required for the work; and Concrete Flared End Section.

17.2 General Pipe Requirement - Pipe materials, manufacture and quality, shall conform to ASTM Designation: C-76 or C-655. The Engineer shall be furnished a "Certificate of Compliance" signed by the manufacturer of the pipe certifying that the pipe conforms to the ASTM requirements. All pipe and pipe material supplied by the Contractor shall be new.

The District will also require the D-load bearing strength test conforming to ASTM C497 for new pipe 48" or greater, in conformance with Sections 207-2.9.1(1) and 207-2.9.2 of the Standard Specifications as a basis for acceptance of the pipe. The test shall be performed in the presence of the Engineer.

Pipe shall be laid in a trench free of ponded water in conformance with Section 306-1.2.2, with joints in conformance with Section 306-1.2.4 of the Standard Specifications.

Pipe ends shall be cleaned and moistened prior to making up joint.

17.3 Reinforced Concrete Pipe - The contract items for the various Reinforced Concrete Pipe include the furnishing and installing of the various pipe as specified, exclusive of earthwork.

17.4 Concrete Flared End Section – The contract item Concrete Flared End Section includes the furnishing and installing of the concrete flared end section as specified, exclusive of earthwork.

17.5 Pipe on Curves - Unsymmetrical closure of pipe joints shall not exceed 1 inch pull on the outside of the curve when pull is measured at the springline on the inside of the pipe. Mortar joints on curves shall conform in strength, texture of mortar finish and tightness to the joints for straight ended pipe.

When beveled pipe is used the maximum deflection angle shall not exceed 6 degrees unless shown on the plans or approved by the Engineer.

17.6 Video Inspection – All concrete pipe with inside diameters of 30 inches or less shall be videotaped prior to final inspection. Copies of the videotapes shall be provided to the Engineer. For pipe placed within roadway area, video inspection shall be performed and the results approved by the Engineer prior to paving.

17.7 Measurement - Measurement for payment of the contract items Reinforced Concrete Pipe of the various sizes and classes will be the number of lineal feet of each class installed as specified measured along the centerline of the pipe in place including curves.

Measurement for payment for the contract item Concrete Flared End Section will be for each installation.

17.8 Payment - The contract prices paid for the Reinforced Concrete Pipe and Concrete Flared End Section shall include full compensation for all costs incurred under this section.

SECTION 18 – NOT USED

SECTION 19 - ASPHALT CONCRETE CONSTRUCTION

19.1 Description - This section covers the contract items Aggregate Base, Class 2; Asphalt Concrete Type "B"; and Temporary Resurfacing.

19.2 Aggregate Base, Class 2 - The contract item Aggregate Base, Class 2 includes furnishing and placing such material as indicated on the drawings. Aggregate Base, Class 2 shall be clean and free from roots, vegetable matter and other deleterious substances, and be of such character

that when wet it will compact to form a firm stable base. Material and placing shall be in accordance with Section 26 of the State Standard Specifications using 3/4-inch maximum size.

The aggregate base shall also have a sand equivalent value of not less than 35 when tested in conformance with California Test Method 217.

The aggregate base material shall be spread as specified in Sections 26-1.035 and 26-1.04 of the State Standard Specifications. The aggregate base material shall be compacted as specified in Section 26-1.05 of the State Standard Specifications.

19.3 Asphalt Concrete, Type "B" - The contract item Asphalt Concrete, Type "B" including furnishing and placing of such material as indicated on the drawings, covers the asphalt concrete necessary for the paving of new surface areas along with repair and resurfacing of areas damaged or removed due to construction operations.

Also included in this item is the asphalt concrete to be used for the construction of the asphalt concrete dike and asphalt concrete aprons as shown on the drawings.

The Contractor shall not place any Asphalt Concrete until all sub-grade compaction on aggregate base or native materials has been tested and approved by the Engineer

The Asphalt Concrete shall be Type "B" and shall be proportioned, mixed, spread and compacted in accordance with the applicable provisions in Section 39 of the State Standard Specifications and these Detailed Specifications. The gradation of the mineral aggregate shall be one-half inch (1/2-inch) maximum, medium for final course and three-quarter inch (3/4-inch) maximum, coarse for base course.

The Contractor shall furnish and place the asphalt concrete with all asphaltic emulsions required. The asphalt binder to be mixed with aggregate shall conform to these Detailed Specifications and shall be of the Performance Grade (PG) designated below or as determined by the Engineer:

- Grade PG 64-10 (Inland Valleys)

The amount of asphalt binder to be mixed with the mineral aggregate shall be between three percent (3%) and seven percent (7%) by weight, of the dry mineral aggregate. The exact amount of asphalt binder to be mixed with the mineral aggregate will be determined by a special mix design.

Liquid asphalt for prime coat shall conform to the provisions in Section 93, "Liquid Asphalts", of the State Standard Specifications and shall be Grade PG 64-10.

Asphalt emulsion for paint binder (tack coat) shall conform to the provisions in Section 94, "Asphaltic Emulsions", of the State Standard Specifications for the rapid-setting or slow-setting type and shall be grade PG 64-10.

Asphalt shall consists of refined petroleum or a mixture of refined liquid asphalt and refined solid asphalt, prepared from crude petroleum. Asphalt shall be:

A. Free from residues caused by the artificial distillation of coal, coal tar or paraffin.
B. Free from water.
C. Homogeneous.

The Contractor shall furnish asphalt in conformance with the State of California Department of Transportation's "Certification Program for Suppliers of Asphalt". The Department maintains the program requirements, procedures, and a list of approved suppliers at: http://www.dot.ca.gov/hq/esc/Translab/ofpm/fpmcoc.htm.

The Contractor shall ensure the safe transportation, storage, use and disposal of asphalt.

The Contractor shall prevent the formation of carbonized particles caused by overheating asphalt during manufacturing or construction.

Performance grade paving asphalt shall conform to the testing requirements in the table below:

Performance Graded Asphalt Binder

Property	AASHTO Test Method	Specification Grade		
		PG 64-10	PG 64-16	PG 70-10
Original Binder				
Flash Point, Minimum °C	T48	230	230	230
Solubility, Minimum %	T44	99	99	99
Viscosity at 135°C, Maximum, Pa·s	T316	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(Delta), kPa	T315	64 1.00	64 1.00	70 1.00
Rolling Thin Film Oven (RTFO) Test, or ASTMD2827 Mass Loss, Maximum, %	T240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T315	64 2.20	64 2.20	70 2.20
Ductility at 25°C Minimum, cm	T51	75	75	75
Pressurized Aging Vessel (PAV) Aging, Temperature, °C	R28	100	100	110

RTFO Test and PAV Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*sin(delta), kPa	 T315	 31 5000	 28 5000	 34 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, MPa Minimum M-value	 T313	 0 300 0.300	 -6 300 0.300	 0 300 0.300

Certificates of compliance shall be furnished to the Engineer certifying that the asphaltic emulsions and paving asphalts conform to the referenced standard specifications.

In lieu of the table of Section 39-6.01, asphalt concrete shall be spread and compacted in the number of layers as outlined in the table below:

Total Thickness Shown on Plans	Minimum No. of Layers	Top Layer Thickness		Next Lower Layer Thickness		All Other Lower Layer Thickness	
		Min.	Max.	Min.	Max.	Min.	Max.
0.23' or less	1	-	-	-	-	-	-
0.24' through 0.44'	2	0.10'	0.21'	0.14'	0.23'	-	-
0.45' or more	3 or more	0.10'	0.20'	0.15'	0.23'	0.20'	0.23'

Finished surfaces shall conform to the straightedge provisions in Section 39-6.03, "Compacting", of the State Standard Specifications.

Areas of the top surface of the uppermost layer of asphalt concrete pavement that do not meet the specified surface tolerances shall be brought within tolerance by abrasive grinding. Areas which have been subjected to abrasive grinding shall receive a seal coat. Areas which cannot be brought into specified tolerance by abrasive grinding shall be corrected by removal and replacement.

19.4 Temporary Resurfacing - The contract item Temporary Resurfacing is required for short reaches of the mainline and connector pipe trenches whenever excavation is made through pavement on which traffic must be allowed immediately after backfilling, only as directed by the Engineer. Otherwise the leveling course of the asphalt concrete paving may be used to open the work area to traffic until the final paving is completed. Measurement and payment of the leveling course will be made as an Asphalt Concrete item, not Temporary Resurfacing.

Temporary resurfacing shall be 2" (0.17') and in conformance with Section 306-1.5 of the Standard Specifications.

19.5 Measurement - Measurement for payment of the contract item Aggregate Base, Class 2 will be the number of cubic yards placed to the lines, grades and dimensions shown on the drawings. **No allowance will be made for aggregate base placed outside said dimensions unless otherwise ordered by the Engineer.**

Measurement for payment of the contract item Asphalt Concrete, Type "B" will be the number of tons placed to the lines, grades and dimensions shown on the drawings. The Asphalt Concrete pay quantity shall be determined by using a conversion factor of 144 pounds per cubic foot for all asphalt concrete placed within standard paylines. No measurement will be made for paint binder required for this portion of the work. All charges for asphalt emulsions are included in the price paid for Asphalt Concrete. **No allowance will be made for asphalt concrete placed outside said dimensions unless otherwise ordered by the Engineer.**

Measurement for payment of the contract item Temporary Resurfacing will be the number of tons placed as specified in Section 19.4 and as directed by the Engineer.

19.6 Payment - The contract prices paid for Aggregate Base, Class 2; Asphalt Concrete, Type "B"; and Temporary Resurfacing shall include full compensation for all costs incurred under this section.

SECTION 20 - FENCES AND GATES

20.1 Description - This section covers the contract items 6-Foot Chain Link Fence; Temporary Fencing; 3-Foot Cable Railing; and 14-Foot Double Drive Gates.

20.2 6-Foot Chain Link Fence - The contract item 6-Foot Chain Link Fence includes furnishing and installing the material required for this portion of the work as shown on the drawings and as directed by the Engineer. Included in this item is all hardware parts, posts and fittings. Also included in this item of work will be the removal and relocation, if required, of chain link fence as noted on the drawings and as directed by the Engineer.

All materials shall be new except that specified for removal and relocation and shall conform to Section 206-6 of the Standard Specifications and the drawings, with installation in conformance with Section 304-3.2. Materials salvaged shall be subject to the Engineer's approval prior to reinstallation. All posts shall be set in commercial plant quality, 4 sack per cubic yard concrete.

20.3 Temporary Fencing - The contract item Temporary Fencing shall include all labor, materials and equipment necessary for installing and removing the temporary fencing that defines the storm drain easement and the temporary construction easements as shown on the drawings. The temporary fencing shall be a 6-foot high chain link fence. Fencing materials need not be new and fence posts need not be set in concrete.

The Contractor is responsible for securing the work area at all times.

20.4 3-Foot Cable Railing – The contract item 3-Foot Cable Railing includes furnishing and installing the material required for this portion of the work. Included in this item is all hardware, parts, posts and fitting in conformance with Section 83-1.02E of the State Standard Specifications.

20.5 14-Foot Double Drive Gates - The contract item 14-Foot Double Drive Gates includes furnishing and installing the various gates as shown on the drawings, complete with all gate posts set in concrete and in conformance with Section 304-3.3 of the Standard Specifications. Padlocks are not included in this item. On completion, gates shall operate freely without wedging or binding.

20.6 Measurement - Measurement for payment for the contract item 6-Foot Chain Link Fence will be the number of lineal feet of new and relocated fence installed measured along the top of the fence parallel to the ground.

Measurement for payment for the contract item Temporary Fencing will be the number of lineal feet of fencing installed for the temporary fencing and relocations.

Measurement for payment for the contract item 3-Foot Cable Railing will be the number of lineal feet of new cable railing installed along the top of the railing parallel to the ground.

Measurement for payment for the contract item 14-Foot Double Drive Gate will be the number of pairs installed. Excavation and concrete required for fence or gate posts will not be measured for payment.

20.7 Payment - The contract price paid for 6-Foot Chain Link Fence; Temporary Fencing; 3-Foot Cable Railing; and 14-Foot Double Drive Gates shall include full compensation for all costs incurred under this section.

SECTION 21 - MISCELLANEOUS

21.1 Description - This section covers the contract items Miscellaneous Iron and Steel; Sloped Protection Barrier; Object Markers; Remodel 4-Inch House Connection; Adjust Manhole to Grade; and Adjust Valve to Grade.

21.2 Miscellaneous Iron and Steel - The contract item Miscellaneous Iron and Steel covers all ferrous metal used in the various hydraulic structures. Materials, parts and fittings shall conform with the following:

(a) Manhole Frames and Covers - Per ASTM Designation: A-48, Class 35B. Manhole frames and covers shall be minimum weight as shown on the plans, and the weight of each frame and cover shall be indicated thereon in white paint. Style and markings shall be approved by the Engineer. The castings shall be free from cracks, blowholes or other imperfections, straight, true to pattern and have a uniform finish. The castings for manholes in streets shall be thoroughly cleaned and coated with asphaltum paint of approved composition; all other castings for frames and covers shall be cleaned and galvanized. The cover shall fit firmly into the frame without rocking, with the frame accurately placed so that cover is flush with finish paving.

(b) All other Miscellaneous Metal - Per ASTM Designation: A-36.

(c) Galvanizing – Except for manhole frames and covers described above, all exposed ferrous metal shall be galvanized per Section 210.3 of the Standard Specifications.

21.3 Sloped Protection Barrier - The contract item Sloped Protection Barrier covers the furnishing and installation of the complete sloped protection barrier as shown on the drawings and as directed by the Engineer. Included shall be all materials, parts, fittings and incidentals as required for this item per APWA Standard Drawing 360.

21.4 Object Markers - The contract item Object Markers includes all materials, equipment and labor necessary to install each object marker as shown on the drawings.

The object markers shall be Rhino 1-Rail, 72" long, yellow, with a NO MOWING or CLEARING ZONE decal from Rhino Marking and Protection Systems, www.RhinoMarkers.com or approved equal.

21.5 Remodel 4-Inch House Connection - The contract item Remodel 4-Inch House Connection pertains to the removing of interfering portions of house connections and replacing with new pipe and any mainline modification required. The remodeling shall be done in accordance with the drawings, including excavation, backfill and any concrete encasement but excluding asphalt concrete or aggregate base in this item of work. Only the 4-inch house connections interfering with the RCB or pipe conduit to be constructed will be measured for payment.

21.6 Adjust Manhole to Grade – The contract item Adjust Manhole to Grade covers all labor, equipment, materials and incidentals required for the complete adjustment of all manholes within the limits of the street improvements to meet the finished street grade. Adjustments shall be performed in accordance with Section 301.1.6 of the Standard Specifications.

21.7 Adjust Valve to Grade – The contract item Adjust Valve to Grade covers all labor, equipment, materials and incidentals required for the complete adjustment of all valves within the limits of the street improvements to meet the finished street grade.

21.8 Measurement - Measurement for payment for the contract item Miscellaneous Iron and Steel will be the number of pounds used in the work as specified. Should manhole frames and covers exceed the minimum weights as shown on the drawings by more than two percent (2%) that weight in excess of the allowable two percent (2%) increase will not be measured for payment. Manhole frames and covers to be salvaged and reused will not be measured for payment.

Measurement for payment for the contract item Sloped Protection Barrier will be for each Sloped Protection Barrier installed.

Measurement for payment for the contract item Object Markers will be for each installation.

Measurement for payment for the contract item Remodel 4-Inch House Connection will be the number of lineal feet of 4-inch pipe installed. There will be no separate payment for special fittings or joint materials and modification to the main line.

Measurement for payment for the contract item Adjust Manhole to Grade shall be the number of manholes that are adjusted to meet the finished street grade.

Measurement for payment for the contract item Adjust Valve to Grade shall be the number of valves that are adjusted to meet the finished street grade.

21.9 Payment - The contract prices paid for Miscellaneous Iron and Steel; Sloped Protection Barrier; Object Markets; Remodel 4-Inch House Connection; Adjust Manhole to Grade; and Adjust Valve to Grade shall include full compensation for all costs incurred under this section.

SECTION 22 THROUGH SECTION 26 – NOT USED

SECTION 26 - STONEWORK

26.1 Description - This section covers the contract items Rock Slope Protection, 1/4-Ton Class; Filter Blanket, No. 2 Backing; and Rock Slope Protection Fabric.

26.2 General - All rock materials shall meet the quality requirements of Section 72-2.02 of the State Standard Specifications.

Rock materials shall be blocky and predominantly angular in shape. Not more than 25% of the rock shall have a length more than 2.5 times the breadth or thickness. No rock shall have a length exceeding 3.0 times its breadth or thickness. All oversize rocks, as determined by the Engineer, shall be removed.

Rock materials shall be placed on a firm dry foundation in conformance with Method B of Section 72-2.03 of the State Standard Specifications, however, additional placement effort shall be required to meet the lines and grades as shown on the drawings and to fill and chink oversize voids with selected rock to establish a stable interlock. Chinking of voids will not be required for rock specified to be concreted.

Permeable materials such as filter blankets shall be consolidated and the surface trimmed to final grade as directed by the Engineer.

26.3 Rock Slope Protection, 1/4-Ton Class - The contract item Rock Slope Protection, 1/4-Ton Class covers the rock furnished and placed as shown on the drawings as specified. Rock shall conform to 1/4-Ton Class, for Method B placement per Section 72-2.02 of the State Standard Specifications.

26.4 Filter Blanket, No. 2 Backing - The contract item Filter Blanket, No. 2 Backing covers the 9-inch filter blanket installed under the Rock Slope Protection.

26.5 Rock Slope Protection Fabric – Rock Protection Fabric placed beneath rock shall conform to Type "B" per Section 88-1.04 of the State Standard Specifications with the exception the weight in ounces per square yard shall be a minimum of 10. A six-inch minimum layer of backing material shall be placed over the fabric prior to placing rock unless otherwise shown on the plans.

26.6 Measurement - Measurement for payment for the contract item Rock Slope Protection, 1/4-Ton Class; and Filter Blanket, No. 2 Backing, shall be the number of cubic yards placed as specified.

Measurement for payment for the contract item Rock Slope Protection, Fabric shall be the number of square yards placed as specified. No measurement for payment will be made for laps required for installation or for convenience to the Contractor.

Concrete for concreted rock shall be measured and paid for as specified under the Concrete Construction Section of these Specifications, and no additional payment for labor, equipment, materials or incidentals for concreting rock will be made.

26.7 Payment - The contract prices paid for Rock Slope Protection 1/4-Ton Class; and Filter Blanket, No. 2 Backing; and Rock Slope Protection Fabric shall include full compensation for all costs incurred under this section with the exception of concrete for concreted rock which shall be measured and paid for as specified under the Concrete Construction Section of these Specifications.

SECTION 27 - DUST ABATEMENT

27.1 Description - This section covers the implementation of dust control measures necessary to prevent harm and nuisance from dust. Supplementing Section 8.06 of the General Provisions, the Contractor shall comply with all the provisions of the South Coast Air Quality Management District (SCAQMD) Rule 403 as described in Appendix "A".

27.2 Dust Abatement - The contract item Dust Abatement includes the action necessary to prevent, reduce or control dust within the work area as required to complete the work. The Contractor shall carry out proper and efficient measures to prevent his operations from producing dust in amounts damaging to property or causing a nuisance, or harm to persons living nearby or occupying buildings in the vicinity of the work. The methods to be used for controlling dust in the construction area and along haul roads shall be approved by the Engineer prior to starting any work included in this contract. The Rule 403 Implementation Handbook published by the SCAQMD contains a detailed listing of reasonably available dust control measures and is available for inspection at the District office.

27.3 Payment - The contract lump sum price paid for Dust Abatement shall include full compensation for all direct and indirect costs incurred under this section.

This payment will be made on a basis of the percentage of work completed on the entire project.

SECTION 28 - HYDROSEEDING

28.1 Description - This section covers the contract item Hydroseeding as directed by the Engineer. The outside of levee and channel embankments, cut or fill slopes, disturbed creek bottom, and all exposed or stripped areas (including TCE's) within the project limits shall be hydroseeded.

28.2 Hydroseeding - This item includes the furnishing of all materials, incidentals, labor and equipment necessary to complete the work as specified herein, and as directed by the Engineer. All hydroseeding work shall be done by fully qualified and experienced personnel.

The hydroseeding materials shall not be stored onsite without prior approval of the Engineer as to location, duration and method of storage. All debris and excess materials shall be removed on a daily basis, unless otherwise authorized by the Engineer. The Contractor shall leave the work area in a clean and finished appearance upon completion of hydroseeding.

28.3 Equipment and Materials - The equipment shall be a mobile mounted unit in a fully operational and well maintained condition, meeting the requirements of Section 20-3.04B of the State Standard Specifications. Fiber shall be produced from natural or recycled (pulp) fiber and shall meet the requirements of Section 20-2.07 of the State Standard Specifications. Stabilizing binder upon drying shall allow water and air penetration, shall be non-flammable, shall have an effective life of at least 1 year, and shall not be toxic to plants and animals.

All seed shall be delivered to the site tagged and labeled in accordance with the California Agricultural Code. Seed shall be of a quality which has a minimum pure live seed content (% of purity x % germination) as specified and weed seed shall not exceed 0.5% of the aggregate of pure live seed and other material.

A commercial Ammonium Phosphate fertilizer shall be used containing a minimum of 16% nitrogen, 20% available phosphoric acid and 0% water soluble potash, uniform in composition, dry and free flowing, pelleted or granular. All fertilizer shall be delivered in unbroken or unopened containers, labeled in accordance with applicable State regulations and bearing the warranty of the producer for the grade furnished.

28.4 Application - The Engineer shall review and approve completion of all construction and grading prior to any section being approved as ready for hydroseeding application.

The Contractor shall provide a written per load mix tabulation, ratioed to the tank capacity of the equipment to be used on the project, for review and approval by the Engineer well in advance of anticipated start of hydroseeding.

The Contractor shall provide a sample demonstration area for application by preparing one load of hydroseed mix. The demonstration areas shall be wet down thoroughly prior to

application. The Engineer shall review and approve the sample section for compliance and workmanship. Upon approval, this area shall become the sample for all remaining application. No hydroseeding shall take place during high winds or during periods of rainfall.

Areas designated for hydroseeding shall receive an application made with an overlapping fan motion to provide a full and even spread throughout the coverage area.

The hydroseed mix, per acre of coverage, shall be as follows:

2,000 lbs./acre Fiber Mulch
150 lbs./acre Environ-mend Binder
800 lbs./acre Biosol Forte 7-2-1
20 lbs./acre MycoApply Endo Mycorrhizal inoculum
57.5 lbs./acre Seed Mix as follows:

Species	Lbs/ac	P/G
Lobularia Maritima Sweet/Alyssum Sweet	1.5	98/80
Eschscholzia californica/California Poppy	3	98/75
Lasthenia glaabrata/Goldfields	1	90/85
Bromus carinatus/California Brome	15	95/80
Hordeum californicum/California Barley	10	90/80
Vulpia myuros Deawned (Festuca megalura) / Zorro Fescue	8	90/80
Plantago insularis / Plantago	6	98/75
Trifolium hirtum / Hykon Rose Clover	3	95/85

28.5 Measurement - Measurement for the contract item Hydroseeding will be made on the basis of the actual area treated to the nearest one hundredth (0.01) acre as measured by the Engineer.

28.6 Payment - The contract price paid for Hydroseeding shall include full compensation for all costs incurred under this section.

SECTION 29 – STORMWATER AND NON-STORMWATER POLLUTION CONTROL

29.1 Description – This section covers the contract items Stormwater and Non-Stormwater Pollution Control; and Non-Stormwater Discharge or Dewatering. The contract item Stormwater and Non-Stormwater Pollution Control shall include preparing, obtaining approval of, amending and implementing the Permit Registration Documents (PRDs) as required by the State Water Resources Control Board (SWRCB) and the California Regional Water Quality Control Board (CRWQCB) - Santa Ana Region. The contract item Non-Stormwater Discharge or Dewatering shall include compliance with Santa Ana Regional Water Quality Board Order No. R8-2009-0003.

29.2 General Requirements – All activities performed by the Contractor for this project shall conform to the requirements of the State-wide National Pollutant Discharge Elimination System

(NPDES) General Permit (Board Order No. 2009-0009-DWQ, NPDES No. CAS000002 as amended by Board Order No. 2010-0014-DWQ) for Stormwater Discharges Associated with Construction and Land Disturbance Activities, hereafter referred to as the "General Permit", issued by the SWRCB. This General Permit regulates both stormwater and non-stormwater discharges associated with Contractor's construction activities. This General Permit can be downloaded at http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

The PRDs mentioned above consist of:

1. Notice of Intent
2. Risk Assessment (Section VIII of the General Permit)
3. Site Map
4. Stormwater Pollution Prevention Plan (SWPPP) (Section XIV of the General Permit)
5. Annual Fee
6. Signed Certification Statement

Notice of Intent - The District will complete and submit the Notice of Intent.

Risk Assessment - Using the methodology in Appendix 1 of the General Permit, the District has calculated the preliminary Risk Level to be 1 based on returning disturbed areas to pre-construction conditions at the end of the day.

Site Map – The Contractor shall revise District provided site map of the project area if Contractor's Qualified SWPPP Developer (QSD) deems necessary. Site Map shall conform to requirements of General Permit Attachment A, Section B.

SWPPP – For the convenience of the Contractor and to expedite the SWPPP preparation and approval, a "90%" SWPPP Template has been prepared by the District. This SWPPP Template has been tailored to the referenced project and can be downloaded from http://rcflood.org/Documents/SWPPP_Template_1000137.pdf or obtained from the District in CD form. Winning bidder will be provided two (2) hard copies and a Word document of the "90%" SWPPP Template to amend. The Contractor shall review and amend this SWPPP Template based on the requirements of the General Permit and per the construction schedule and work plan proposed by the Contractor. The Contractor shall then submit a SWPPP certified by the Contractor's QSD which conforms to Section 29.3 for District review and approval.

The Contractor shall amend and finalize the complete "90%" SWPPP Template referenced above. The Contractor shall, at a minimum, provide and/or prepare the following:

1. Name and contact information for the Contractor's Qualified SWPPP Practitioner (QSP) and QSD
2. Contractor name and contact information
3. Contractor site contact person and emergency contact person information
4. Verification of disturbance area due to construction
5. Construction commencement date

6. Anticipated construction completion date
7. Construction Activity Schedule/Best Management Practices (BMPs) Installation Schedule
8. Name and contact information for personnel responsible for pre-storm, post-storm and storm event BMP inspections – this should be the project's QSP
9. Name of the lab responsible for testing any stormwater samples for non-visible pollutants
10. Verification of project risk level and permit type (Linear Underground/Overhead Project (LUP) or Traditional)
11. List of all subcontractors that will be working on the project
12. Review and finalize water pollution control drawings

The SWPPP shall be certified by the Contractor's QSD and implemented by the Contractor's QSP. The SWPPP shall be developed based on the format outlined in the CASQA SWPPP Template located in the California Stormwater Quality Association (CASQA) Construction BMP Handbook Portal and modified as required to meet the LUP specific requirements set forth in the General Permit Attachment A. The portal can be found on the CASQA Website: www.casqa.org. The SWPPP shall identify site specific BMPs to be implemented during and after construction to minimize the potential pollution of stormwater runoff and downstream receiving waters. The identified BMPs shall be practices designed to minimize or eliminate the discharge of pollutants from the construction site and Contractor's construction activities, including, but not limited to:

1. Good housekeeping practices for solid and sanitary/septic waste management, vehicle and equipment cleaning/maintenance, and material handling and storage.

2. Construction procedures such as stabilized construction access points, scheduling/phasing to minimize areas of soil disturbance, soil stabilization and erosion/sediment control.

The SWPPP shall also stipulate an ongoing program for monitoring and maintenance of all BMPs.

The SWPPP shall be designed to address the following objectives:

1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
2. Where not otherwise required to be under a Regional Water Board permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated;
3. Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity to the Best Available Technology/Best Conventional Technology (BAT/BCT) standard;

4. Calculations and design details as well as BMP controls for site run-on are complete and correct; and
5. Stabilization BMPs, installed to reduce or eliminate pollutants after construction, are completed.

To demonstrate compliance with requirements of the General Permit, the QSD shall include information in the SWPPP that supports the conclusions, selections, use, and maintenance of BMPs.

The Contractor shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Regional Board inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

Annual Fee – The District will pay any necessary fees.

Signed Certification Statement – The Contractor's QSD shall submit a signed certification certifying the SWPPP is a true, accurate and complete representation of the proposed project and mitigation measures.

In the event the District incurs any Administrative Civil Liability or Mandatory Minimum (fine) imposed by the CRWQCB - Santa Ana Region, as a result of Contractor's failure to fully implement the provisions of this section and permit requirements, "Stormwater and Non-Stormwater Pollution Control", the Engineer may, in the exercise of his sole judgment and discretion, withhold from payments otherwise due Contractor a sufficient amount to cover the Civil Liability. Liability for "Negligent Violations" may be in an amount up to $50,000 per day per deemed occurrence while "Knowing Violations" can result in fines as high as $250,000 and imprisonment.

Stormwater and Non-Stormwater Pollution Control work shall conform to the requirements in the latest version of the CASQA Handbook, entitled **"California Stormwater BMP Handbook – Construction" updated November 2009**. A copy of the "California Stormwater BMP Handbook – Construction", updated November 2009, hereafter referred to as the "CASQA Handbook", may be obtained from CASQA, Post Office Box 2105, Menlo Park, California 94026-2105. Telephone: 650.366.1042. Copies of the CASQA Handbook can also be downloaded from the CASQA Construction BMP Handbook Portal.

The Contractor shall be responsible for all costs and for any liability imposed by law as a result of the Contractor's failure to comply with the requirements set forth in this section, "Stormwater and Non-Stormwater Pollution Control", including but not limited to, compliance with the applicable provisions of the CASQA Handbook, General Permit, General De Minimus Permit, Federal, State and local regulations. For the purpose of this paragraph, costs and liabilities include, but are not limited to, fines, penalties and damages whether assessed against

the District or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Act.

The Contractor shall become fully informed of and comply with the applicable provisions of the CASQA Handbook, General Permit, General De Minimus Permit, and Federal, State and local regulations that govern the Contractor's activities and operation pertaining to both stormwater and non-stormwater discharges from both the project site and areas of disturbance outside the project limits during construction. The Contractor shall, at all times, keep copies of the General Permit, General De Minimus Permit, approved SWPPP and all amendments at the project site. The SWPPP shall be made available upon request of a representative of the SWRCB, CRWQCB, United States Environmental Protection Agency (USEPA) or local stormwater management agency. Requests by the public shall be directed to the Engineer.

The Contractor is solely and exclusively responsible for any arrangements made between the Contractor and other property owners or entities that result in disturbance of areas or construction activities being conducted outside limits of the designated rights-of-way and temporary construction easements as shown on the project drawings.

The Contractor shall, during work hours, allow authorized agents of the CRWQCB, SWRCB, USEPA or local stormwater management agency, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the construction site and the Contractor's facilities pertinent to the work;
2. Have access to and copy any records required to be kept as specified in the General Permit;
3. Inspect the construction site, including any offsite staging areas or material storage areas, and related soil stabilization practices and sediment control BMPs; and
4. Sample or monitor for the purpose of ensuring compliance with the General Permit.

The Contractor shall notify the Engineer immediately upon request from regulatory agencies to enter, inspect, sample, monitor or otherwise access the project site or the Contractor's records.

29.3 PRDs Preparation and Approval - The Contractor shall prepare and obtain approval of the PRDs as part of the Stormwater and Non-Stormwater Pollution Control work for this contract. The SWPPP shall include an appropriate Monitoring and Reporting Program (M&RP) as required by Section M, "Monitoring and Reporting Requirements" of Attachment A of the General Permit. A guidance document titled "Field Monitoring and Analysis Guidance" is available from the CASQA internet site in their Construction BMP Handbook Portal. The Contractor shall prepare and implement the SWPPP in accordance with the CASQA Handbook, the General Permit and these Detailed Specifications.

In case of conflict between the CASQA Handbook and these Detailed Specifications, the Detailed Specifications shall govern; in case of conflict between these Detailed Specifications and the General Permit, the latter shall govern.

Within five (5) working days after the award of the contract, the Contractor shall submit two (2) copies of the PRDs to the Engineer for review and approval. The Contractor shall allow ten (10) working days for the Engineer to review the PRDs. If revisions are required as determined by the Engineer, the Contractor shall revise and resubmit the PRDs within three (3) working days of receipt of the Engineer's comments and shall allow ten (10) working days for the Engineer to review the revisions. The Contractor shall submit four (4) hard copies and one (1) pdf copy of the approved SWPPP to the Engineer prior to the pre-construction meeting. **The Contractor must have approved PRDs prior to the pre-construction meeting.**

The SWPPP shall incorporate BMPs in each of the following categories:

1. Soil stabilization practices;
2. Sediment control practices;
3. Sediment tracking control practices;
4. Wind erosion control practices; and
5. Non-stormwater management, and waste management and disposal control practices.

Specific objectives and minimum requirements for each category of BMPs are described in the CASQA Handbook. The Contractor shall consider the objectives and minimum requirements presented in the CASQA Handbook for each of the above categories. When minimum requirements are listed for any category, the Contractor shall incorporate one or more of the listed minimum BMPs required into the SWPPP and implement them on the project to meet the pollution control objectives for the category. In addition, the Contractor shall consider other BMPs presented in the CASQA Handbook to supplement the minimum BMPs required when necessary to meet the objectives of the SWPPP and maintain compliance with the General Permit. The Contractor shall document the selection process in accordance with the procedure specified in the CASQA Handbook.

The Contractor should not assume that the minimum BMPs required for each category presented in the CASQA Handbook are adequate to meet the pollution control objectives. The Contractor may use other effective BMPs, as approved by the Engineer, in addition to the minimum as required in the CASQA Handbook to achieve the pollution control objectives.

The SWPPP shall include the following items as described in the CASQA Handbook and General Permit:

Section 1 - SWPPP Requirements:

1.1 Introduction
1.2 PRDs
1.3 SWPPP Availability and Implementation

1.4 SWPPP Amendments
1.5 Retention of Records
1.6 Required Non-Compliance Reporting
1.7 Annual Report
1.8 Changes to Permit Coverage
1.9 Notice of Termination

Section 2 - Project Information:

2.1 Project and Site Description
2.2 Permits and Governing Documents
2.3 Stormwater Run-on from Offsite Areas
2.4 Findings of the Construction Site Sediment and Receiving Water Risk Determination
2.5 Construction Schedule
2.6 Potential Construction Site Pollutant Sources
2.7 Identification of Non-Stormwater Discharges
2.8 Required Site Map Information

Section 3 - Best Management Practices:

3.1 Schedule for BMP Implementation
3.2 Erosion Control and Sediment Control
3.3 Non-Stormwater Controls, Waste and Material Management
3.4 Post-Construction Stormwater Management Measures

Section 4 - BMP Inspection and Maintenance:

4.1 BMP Inspection and Maintenance

Section 5 - Training

Section 6 - Responsible Parties and Operators:

6.1 Responsible Parties
6.2 Contractor List

Section 7 – Monitoring and Reporting Program (M&RP):

7.1 Objectives
7.2 M&RP Implementation Schedule
7.3 LUP Monitoring and Reporting Requirements
7.4 Monitoring for Non-Visible Pollutants

To ensure that the preparation, implementation, and oversight of the SWPPP is sufficient for effective pollution prevention, individuals responsible for creating, revising, overseeing, and

implementing the SWPPP should participate in applicable training programs and document such training in the SWPPP. A copy of the SWPPP should be located at the construction site.

The following notes (or notes of substantially similar intent) that address pollution prevention to the Maximum Extent Practicable during the construction phase of a project on a year-round basis need to be placed on the Stormwater and Non-Stormwater Pollution Control Drawings:

- Erosion control BMPs shall be implemented and maintained to minimize and/or prevent the entrainment of soil in runoff from disturbed soil areas on construction sites.
- Sediment control BMPs shall be implemented and maintained to prevent and/or minimize the transport of soil from the construction site.
- Stockpiles of soil shall be properly contained to eliminate or reduce sediment transport from the site to streets, drainage facilities or adjacent properties via runoff, vehicle tracking or wind.
- Appropriate BMPs for construction-related materials, wastes, spills or residues shall be implemented to eliminate or reduce transport from the site to streets, drainage facilities or adjoining properties by wind or runoff.
- Runoff from equipment and vehicle washing shall be contained at construction sites and must not be discharged to receiving waters or the local storm drain system. Washwaters or rinsate from ready mix, concrete, or cement vehicles must be handled appropriately and may not be discharged to receiving waters or any storm drain system.
- All construction contractor and subcontractor personnel are to be made aware of the required BMPs and good housekeeping measures for the project site and any associated construction staging areas.
- At the end of each day of construction activity all construction debris and waste materials shall be collected and properly disposed in trash or recycle bins.
- Construction sites shall be maintained in such a condition that a storm does not carry wastes or pollutants off the site. Discharges other than stormwater (non-stormwater discharges) are prohibited, except as authorized by an individual NPDES Permit or the State-wide General Permit for Stormwater Discharges Associated with Construction Activity. Potential pollutants include but are not limited to: solid or liquid chemical spills; wastes from paints, stains, sealants, solvents, detergents, glues, lime, pesticides, herbicides, fertilizers, wood preservatives and asbestos fibers; paint flakes or stucco fragments; fuels, oils, lubricants and hydraulic, radiator or battery fluids; concrete and related cutting or curing residues; floatable wastes; wastes from engine/equipment steam cleaning or chemical degreasing; wastes from street cleaning; and super-chlorinated potable water from line flushing and testing. During construction, disposal of such materials should occur in a specified and controlled temporary area onsite physically separated from potential stormwater runoff, with ultimate disposal in accordance with local, State and Federal requirements.

- Discharging contaminated groundwater produced by dewatering groundwater that has infiltrated into the construction site is prohibited. Discharging of contaminated soils via surface erosion is also prohibited.
- The Contractor is required to notify and obtain approval from the District ten (10) days prior to any non-stormwater discharge or dewatering associated with Contractor's construction activities.
- Construction sites shall be managed to minimize the exposure time of disturbed soil areas through phasing and scheduling of grading to the extent feasible and the use of temporary and permanent soil stabilization.
- BMPs shall be maintained at all times. In addition, BMPs shall be inspected prior to predicted storm events and following storm events.

29.4 PRD and Rain Event Action Plan (REAP) Amendments - If the scope or schedule of the project changes, the Contractor shall immediately notify the Engineer. The Engineer will determine if the Contractor will be required to recalculate the Risk Assessment. If it is determined by the Engineer that a new Risk Assessment is required, the Engineer will notify the Contractor to resubmit amended PRDs and in the case that the risk level increases, the Contractor shall comply with additional applicable requirements of the General Permit, including preparation and implementation of REAPs, M&RP, Numeric Action Level (NAL) Exceedance Reports, and annual reporting requirements. The Contractor shall also prepare amendments to the PRDs, both graphically and in narrative form, whenever there is a change in Contractor's construction activities or operations which may result in the discharge of pollutants to surface waters, groundwaters, municipal storm drain systems, or as deemed necessary by the Engineer. The Contractor shall also amend the PRDs if they are in violation of any condition of the General Permit, or has not effectively achieved the objective of reducing pollutants in stormwater discharges. Amendments shall show additional BMPs, revised Contractor's construction activities or operations, including those in areas not shown in the initially approved SWPPP, which are required on the project to effectively control water pollution.

Amendments to the PRDs shall be submitted for review and approval by the Engineer in the same manner specified for the initial approval of the PRDs. The Contractor shall date and attach all approved amendments to any of the PRDs. Upon approval of the amendment, the Contractor shall implement the approved changes, revised construction activities or operations.

29.5 Non-Compliance Reporting - If the project is in non-compliance at any time, the Contractor shall make a written report to the Engineer within two (2) calendar days of identification of non-compliance activities.

29.6 SWPPP Implementation - Upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for placing, installing, constructing, inspecting and maintaining the BMPs as well as conducting the M&RP as included in the SWPPP and any amendments thereto, and for removing and disposing of temporary BMPs. All SWPPP implementation shall be performed or supervised by a QSP. Unless otherwise directed by the Engineer or specified in these Detailed Specifications, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in accordance with Section 6.05, "TEMPORARY SUSPENSION OF THE WORK", of the General

Provisions. Requirements for installation, construction, inspection, maintenance, removal and disposal of BMPs are specified in the CASQA Construction BMP Handbook Portal and these Detailed Specifications.

The Engineer may order the suspension of construction operations if the Contractor fails to comply with the requirements of this section, "Stormwater and Non-Stormwater Pollution Control", as determined by the Engineer.

The Contractor will not be compensated for sampling and analysis work because of the Contractor's failure to properly implement, inspect, maintain and repair BMPs in the approved SWPPP and any amendments thereto, or for failing to store construction materials or wastes in watertight containers.

(a) Stormwater Pollution Control - **The Contractor shall implement soil stabilization practices and sediment control BMPs, including minimum requirements as presented in the CASQA Construction BMP Handbook Portal, on all disturbed areas of the project site throughout the duration of the project.**

Implementation of soil stabilization practices and sediment control BMPs for soil-disturbed areas, including but not limited to, rough graded access roads, slopes, channel inverts, operational inlets and outlets of the project shall be completed prior to soil disturbance. The General Permit requires BMPs to be deployed throughout the duration of the project.

The Engineer may require the Contractor, on a case-by-case basis, to reduce the active, soil-disturbed area limit of the project. The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control BMPs to protect soil-disturbed areas of the project site by maintaining an adequate quantity of soil stabilization and sediment control materials onsite to protect exposed, soil-disturbed areas and a detailed plan for the mobilization of sufficient labor and equipment to fully deploy the required BMPs prior to the onset of precipitation and for the duration of the project.

Throughout the duration of the project, soil-disturbed areas of the project site shall be considered to be inactive whenever soil disturbing activities are expected to be discontinued for a period of fourteen (14) calendar days or more. Areas that will become inactive shall be fully protected with soil stabilization practices such as covering with mulch, temporary seeding, fiber rolls, blankets, etc., within ten (10) calendar days of the discontinuance of soil disturbing activities or two (2) calendar days prior to the onset of precipitation, whichever is first to occur. Areas that will become inactive shall be fully protected with sediment control BMPs within ten (10) calendar days of the discontinuance of soil disturbing activities or two (2) calendar days prior to the onset of precipitation, whichever is first to occur.

Throughout the duration of the project, the project site shall be fully protected with soil stabilization practices and sediment control BMPs. The Contractor shall monitor the weather forecast on a daily basis. The National Weather Service forecast shall be used.

(b) Non-Stormwater Pollution Control - **The Contractor shall implement, year-round and throughout the duration of the project, BMPs included in the SWPPP for sediment tracking, wind erosion, non-stormwater management, and waste management and disposal.**

(c) Inspections and Reporting - The Contractor shall ensure that a QSP regularly inspects the construction site for BMPs identified in the SWPPP to ensure the proper implementation and functioning of BMPs. The QSP shall identify corrective actions and time frames to address any damaged BMPs or reinitiate any BMPs that have been discontinued. All repairs and design changes shall begin to be implemented within 72 hours of identification.

At a minimum, the Contractor shall inspect the construction site as follows:

1. Prior to a forecast storm;
2. After any precipitation which causes runoff capable of carrying sediment from the construction site;
3. At 24-hour intervals during extended precipitation events; and
4. At a regular interval of once every week.

The construction site inspection checklist provided in the CASQA SWPPP Template shall be used to ensure that the necessary BMPs are being properly implemented and are functioning adequately. The Contractor shall submit one copy of each site inspection record to the Engineer.

(d) Maintenance - The Contractor's QSP shall maintain construction site BMPs identified in the SWPPP to ensure the proper implementation and functioning of BMPs. If the QSP or the Engineer identifies a deficiency in the deployment or functioning of an identified BMP, the QSP shall begin implementing repairs or design changes within 72 hours of identification and complete as soon as possible. The correction of deficiencies shall be at no additional cost to the District.

(e) Training – The Contractor shall ensure that all persons responsible for implementing requirements of the General Permit shall be appropriately trained in accordance with Section VII "Training Qualifications and Certification Requirements" of the General Permit. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. All training shall be documented and included in the SWPPP as an appendix.

The Contractor shall ensure that SWPPPs are written, amended and certified by a QSD. The Contractor shall also ensure that all inspection, maintenance, repair and sampling activities shall be performed or supervised by a QSP. A QSP is a person responsible for non-stormwater and stormwater visual observations, sampling and analysis.

29.7 REAP – **The REAP is applicable to LUP Risk Level 2 construction sites only.** The Contractor shall ensure a QSP develop a REAP and submit a copy to the Engineer for review 48 hours prior to any likely precipitation event. The Contractor shall amend and implement the REAP as directed by the Engineer. If no comments are received prior to the precipitation event, the REAP shall be implemented as proposed. A likely precipitation event is any weather pattern that is forecast to have a 50% or greater probability of producing precipitation in the project area. The discharger shall ensure a QSP obtain a printed copy of the precipitation forecast information from the National Weather Service Forecast Office (e.g., enter the zip code of the project's location at http://www.srh.noaa.gov/forecast).

The Contractor's QSP shall ensure that the REAP include, at a minimum, the following site information:

a. Site Address

b. Calculated Risk Level

c. Site Stormwater Manager information including the name, company and 24-hour emergency telephone number

d. Erosion and Sediment Control Provider information including the name, company and 24-hour emergency telephone number

e. Stormwater Sampling Agent information including the name, company and 24-hour emergency telephone number

29.8 Water Quality Monitoring, Sampling and Analysis – **The Water Quality Monitoring, Sampling and Analysis is applicable to LUP Risk Level 2 construction sites only.** The Contractor's QSD shall be responsible for preparing an M&RP and implementing the monitoring, sampling and analysis requirements as described in Attachment A of the General Permit. Records of all visual observations and sampling results required by the General Permit shall be kept using the forms contained in Attachment 3 of the CASQA Construction BMP Handbook Portal. Copies of the forms shall be maintained in the SWPPP and submitted to the Engineer within 24 hours of the visual observation or sampling event.

29.9 NAL Exceedance Report - **The NAL Exceedance Report is applicable to LUP Risk Level 2 construction sites only.** The Contractor shall be responsible for submitting a NAL Exceedance Report to the Engineer in the event that any effluent sample exceeds an applicable NAL.

a. The Contractor shall submit all storm event sampling results for each discharge point to the Engineer no later than 24 hours after the conclusion of the storm event.

b. The Contractor shall certify each NAL Exceedance Report in accordance with the Special Provisions for Construction Activity.

c. The Contractor shall retain an electronic or paper copy of each NAL Exceedance Report for a minimum of three (3) years after the date the annual report is filed.

d. The Contractor shall include in the NAL Exceedance Report:

i. The analytical method(s), method reporting unit(s) and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit").

ii. The date, place, time of sampling, visual observation (inspections) and/or measurements, including precipitation.

iii. A description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

29.10 Non-Stormwater Discharge or Dewatering - **Dewatering activity should only be considered after other methods have been determined to be inadequate for storm drain construction by the Engineer.** If groundwater will be encountered during the project activities, the dewatering activity must be covered by the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant Threat to Water Quality (De Minimus Permit), Santa Ana Regional Water Quality Control Board Order No. R8-2009-0003. The Contractor shall comply with this Order, and notify and obtain approval from the Engineer fifteen (15) days prior to any non-stormwater discharging of groundwater dewatering. If an emergency or unforeseen dewatering activity that will discharge to Waters of the United States occurs, the Contractor shall contact the Engineer immediately.

When discharging groundwater from dewatering activities to surface waters, the Contractor shall comply with and implement the Monitoring and Reporting Program required under Order No. R8-2009-0003. This Order can be downloaded from http://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2009_orders.shtml. Under the Monitoring and Reporting Program, the Contractor shall prepare the monitoring report in accordance with Attachment E of the Order. The Contractor must submit the Monitoring Reports to the Engineer by the 15th day of each month following the monitoring period. The District will submit the Monitoring Reports to the Santa Ana Regional Water Quality Control Board. The Monitoring Reports shall cover the previous month's monitoring activities.

If there is any other form of non-stormwater discharge from the project to surface waters, the Contractor shall immediately contact the Engineer to determine appropriate actions required for coverage under the De Minimus Permit.

Failure of the Contractor to fully comply with this requirement may result in the suspension of construction operations and liability for any associated monitoring, fines, penalties and remediation activities related to the discharge.

29.11 Reports -

(a) Annual Report - The Contractor shall be responsible for preparing an Annual Report to meet the requirements of Section XVI of the General Permit covering the preceding period of construction from July 1st to June 30th. The Annual Report shall be structured in accordance with the CASQA Construction BMP Handbook Portal Section 1.7. The Contractor shall submit two (2) copies of the Annual Report to the Engineer by July 15th of each year for review and approval. The Contractor shall allow ten (10) working days for the Engineer to review the Annual Report. If revisions are required as determined by the Engineer, the Contractor shall revise and resubmit the Annual Report within three (3) working days of receipt of the Engineer's comments. The Contractor shall submit four (4) copies of the approved Annual Report to the Engineer prior to August 15th of each year. **The Contractor shall be responsible for providing an Annual Report to the Engineer for any construction occurring for part of the year after July 1st prior to receiving final payment on the project.**

(b) Monthly Report – The Contractor shall prepare and submit to the Engineer a Monthly Report within five (5) working days of the end of the month including:

1. All visual observation reports;
2. All sampling and analysis reports;
3. All NAL Exceedance Reports; and
4. Summary of changes to the SWPPP and or REAP based on inspection results for the preceding month.

29.12 Payment - The contract lump sum price paid for Stormwater and Non-Stormwater Pollution Control work shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising and amending the PRDs, and installing, constructing, maintaining, removing and disposing of BMPs as shown in the SWPPP, as specified in the CASQA Handbook, General Permit and these Detailed Specifications, and as directed by the Engineer.

The contract lump sum price paid for Non-Stormwater Discharge or Dewatering shall include full compensation for compliance of Section 29.10, "Non-Stormwater Discharge or Dewatering". **Contractor shall not be paid any portion of the contract lump sum if discharge of groundwater from dewatering activities to surface waters is avoided.**

Monthly payment will be made on a basis of the percentage of work completed on the entire project and subject to the submittal of a complete Monthly Report as specified in Section 29.11(b). Failure to complete or report required visual inspections, monitoring, sampling and analysis requirements, NAL Exceedance Reports, and/or other necessary follow-up actions to ensure that the project stays in compliance with the General Permit can be the basis for reducing monthly progress payments for the project. Monthly progress payments will be reduced by the amount of direct costs, overhead costs and engineering costs incurred by the Engineer to address compliance deficiencies, including costs to conduct inspections, monitoring, reporting and supplemental BMP implementation necessary to comply with the General Permit and costs incurred by the Engineer to address complaints, additional State inspections and violations and/or fines issued by the State or USEPA associated with failure to properly comply with the General Permit. Progress payment reductions can exceed the monthly percentage or total contract lump sum price for Stormwater and Non-Stormwater Pollution Control work.

Payment will be made on a basis of the percentage of work completed on the entire project.

SECTION 30 – NOT USED

SECTION 31 - UTILITIES

31.1 Description - This section covers the contract items Phasing/Sewer Bypass Plan; Remove Sewer Main; Remove Sewer Manhole; 8-Inch PVC Sewer Main; 10-inch PVC Sewer Main; 8-Inch Ductile Iron Pipe Sewer Main; 10-Inch Ductile Iron Pipe Sewer Main; Sewer Manhole 4-Foot Diameter; Sewer Manhole 5-Foot Diameter; and 4-Inch PVC House Connection.

31.2 General Requirements - The Contractor is required to closely coordinate and cooperate with the Jurupa Community Services District (JCSD) and the City of Jurupa Valley to ensure that the work proceeds in an orderly manner and that any sewer line is out of service for a minimum period of time.

The Contractor shall notify the JCSD in writing at least ten (10) working days before the relocations are started.

JCSD: 951.685.7434

Nem Ochoa, Engineering Manager (nochoa@jcsd.us)
Todd Minten, Operations Manager (tminten@jcsd.us)
Dan Ducasse, Sewer System Supervisor (dducasse@jcsd.us)
Luke Matson, Sewer System Foreman (lmatson@jcsd.us)

The Contractor shall contact and notify, with printed notices, all residents, businesses and public agencies fronting on, along or affected by the proposed work, with a minimum of two (2) notifications. The first notification shall be distributed one (1) week prior to the start of construction, the second notification shall include door hangers and "No Parking" and "Road Closure" signs posted 48-hours prior to activities fronting the property.

Sewage flows shall not be interrupted. Portions of the proposed sewer work will require connection to the existing sewer main, therefore, sewer line flows will need to be bypassed during construction. Should the Contractor disrupt existing sewer facilities, sewage shall be conveyed in closed conduits and disposed of in a sanitary sewer system. If pumping is required it shall be done at the expense of the Contractor. A backup pumping system with equal capacity shall be provided at all times. Sewage shall not be permitted to flow in trenches or be covered by backfill.

31.3 General Material and Installation Requirements – All materials, installation and testing for work within this section shall conform to JCSD Standards Manual, Section V: Basic Specifications, current edition. The Contractor may obtain the "Jurupa Community Services District Standards Manual", current edition from the Jurupa Community Services District, 11201 Harrel Street, Mira Loma, California. A reference copy is contained within Appendix "D" of these specifications; Contractor shall verify that the specifications contained within Appendix "D" are the current edition being used by JCSD. Any reference to "District" within the "Jurupa Community Services District Standards Manual" shall mean "Jurupa Community Services District" not RCFC&WCD.

31.4 Phasing/Sewer Bypass Plan – The contract item Phasing/Sewer Bypass Plan includes the preparation of a bypass plan, and installation, implementation and removal of the bypass system required for the installation of the sewer relocation.

The upstream sewer system for the area serves approximately 170 existing residences. Precise flow measurements have not been obtained; a rough approximation of flow for this area is 45,000 gallons-per-day (average) and 185,000 gallons-per-day (peak).

The Phasing/Sewer Bypass Plan shall include all the details, connections, materials, pumps, and incidentals required for each phase or stage of the sewer line relocation construction. The Contractor shall submit the Phasing/Sewer Bypass Plan to the District and JCSD for review and approval prior to the pre-construction meeting.

Included in this item are labor, materials and equipment necessary for the installation and removal for each phase or stage of the bypass system. It should be noted that prior to any excavation for the sewer line relocation, the sewer bypass must be fully operational with all backup systems in place.

31.5 Remove Sewer Main – The contract item Remove Sewer Main shall include excavation, removal and disposal of the existing 6-inch VCP sewer main and 8-inch VCP sewer main.

31.6 Remove Sewer Manhole – The contract item Remove Sewer Manhole shall include excavation, removal and disposal of the existing sewer 4-foot diameter manholes. The Contractor may NOT salvage and reuse the manhole frame and covers from removed sewer manholes.

31.7 8-Inch PVC Sewer Main - The contract item 8-Inch PVC Sewer Main covers all labor, equipment, materials and incidentals required for the construction and installation of the 8-inch

PVC pipe line, including all required earthwork and testing as shown on the drawings and as required by these specifications.

31.8 10-Inch PVC Sewer Main - The contract item 10-Inch PVC Sewer Main covers all labor, equipment, materials and incidentals required for the construction and installation of the 10-inch PVC pipe line, including all required earthwork and testing as shown on the drawings and as required by these specifications.

31.9 8-Inch Ductile Iron Pipe Sewer Main - The contract item 8-Inch Ductile Iron Pipe Sewer Main covers all labor, equipment, materials and incidentals required for the construction and installation of the 8-inch ductile iron pipe, including all required earthwork and testing as shown on the drawings and as required by these specifications.

31.10 10-Inch Ductile Iron Pipe Sewer Main - The contract item 10-Inch Ductile Iron Pipe Sewer Main covers all labor, equipment, materials and incidentals required for the construction and installation of the 10-inch ductile iron pipe, including all required earthwork and testing as shown on the drawings and as required by these specifications.

31.11 Sewer Manhole 4-Foot Diameter and Sewer Manhole 5-Foot Diameter - The contract items Sewer Manhole 4-Foot Diameter; and Sewer Manhole 5-Foot Diameter cover the complete construction of these structures including all required earthwork, pipe stubs of one pipe length or less, testing and setting of manhole rim and cover to final grade per JCSD specifications as shown on the drawings and as required by these specifications.

31.12 4-Inch PVC House Connection - The contract item 4-Inch PVC House Connection pertains to the removal of existing house connections to within 5 feet of right of way and construction with new 4-inch PVC pipe to join the new sewer main and existing house connection in a configuration that will not interfere with the construction of the new storm drain system. The construction shall be done in accordance with the plans and standard drawings, including excavation, backfill and any concrete encasement, but excluding asphalt concrete or aggregate base in this item of work.

31.13 Measurement – Measurement for payment for the contract items Remove Sewer Main; 8-Inch PVC Sewer Main; 10-Inch PVC Sewer Main; 8-Inch Ductile Iron Pipe Sewer Main; 10-Inch Ductile Iron Pipe Sewer Main; and 4-Inch PVC House Connection will be the number of lineal feet removed or installed. Measurement shall be on the basis of the horizontal lineal footage removed or constructed. Measurement will exclude the space occupied by structures constructed by the Contractor. Pipe stubs of one pipe length or less installed in the manholes are included in the measurement and payment for Manholes and will not be included in the measurement for the various pipes.

Measurement for payment for the contract item Phasing/Sewer Bypass Plan will be made on a lump sum basis, based on the percentage of work completed on this item.

Measurement for payment for the contract items Remove Sewer Manhole; Sewer Manhole 4-Foot Diameter; and Sewer Manhole 5-Foot Diameter will be the number removed or constructed.

No measurement for payment will be made for tees, wyes, clean-outs or other accessories. All associated costs will be included in the lineal feet of the facility installed.

31.14 Payment – The contract price paid for Phasing/Sewer Bypass Plan; Remove Sewer Main; 8-Inch PVC Sewer Main; 10-Inch PVC Sewer Main; 8-Inch Ductile Iron Pipe; 10-Inch Ductile Iron Pipe; 4-Foot Diameter Sewer Manhole; 5-Foot Diameter Sewer Manhole; and 4-Inch PVC House Connection shall include full compensation for all costs incurred under this section.

SECTION 32 – NOT USED

SECTION 33 – WATERLINE RELOCATION

33.1 Description - This section covers the contract items Relocate 24-Inch CML&C Waterline; Relocate 8-Inch CML&C Waterline at Station 10+20; Relocate 8-Inch CML&C Waterline at Station 16+47; and Relocate 8-Inch CML&C Waterline at Station 17+47.

33.2 General Requirements - The Contractor is required to closely coordinate and cooperate with the Jurupa Community Services District (JCSD), Chino Basin Desalter Authority (CDA) and the City of Jurupa Valley to ensure that the work proceeds in an orderly manner and that any waterline is out of service for a minimum period of time.

The Contractor shall notify the CDA and the JCSD in writing at least ten (10) working days before the 24-inch waterline relocation is started.

CDA 661.361.8400
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Todd Minten, Operations Manager (tminten@jcsd.us)
Dave Irish, Water System Supervisor (dirish@jcsd.us)

The Contractor shall notify the JCSD in writing at least ten (10) working days before the 8-inch waterline relocations are started.

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Nem Ochoa, Engineering Manager (nochoa@jcsd.us)
Todd Minten, Operations Manager (tminten@jcsd.us)
Dave Irish, Water System Supervisor (dirish@jcsd.us)

33.3 General Material and Installation Requirements – All materials, installation and testing for work within this section shall conform to JCSD Standards Manual, Section V: Basic Specifications, current edition. The Contractor may obtain the "Jurupa Community Services

District Standards Manual", current edition from the Jurupa Community Services District, 11201 Harrel Street, Mira Loma, California. A reference copy is contained within Appendix "D" of these specifications. Contractor shall verify that the specifications contained within Appendix "D" are the current edition being used by JCSD. Any reference to "District" within the "Jurupa Community Services District Standards Manual" shall mean "Jurupa Community Services District" not RCFC&WCD.

33.4 Relocate 24-Inch CML&C Waterline - The contract item Relocate 24-Inch CML&C Waterline covers all labor, equipment, materials, testing, earthwork, removal of existing waterline and incidentals required for the construction and installation of the 24-inch cement mortar lined and cement mortar coated steel waterline, including the 4-inch blow off assembly and 4-inch AR & AV assembly as shown on the drawings and as required by JCSD Specifications and these specifications. Included in this item is all the excavation and backfill required; excluding the Class II Aggregate Base and Asphalt Concrete.

33.5 Relocate 8-Inch CML&C Waterline at Station 10+20 - The contract item Relocate 8-Inch CML&C Waterline at Station 10+20 covers all labor, equipment, materials, testing, earthwork, concrete slurry, removal of existing waterline and incidentals required for the construction and installation of the 8-inch cement mortar lined and cement mortar coated steel waterline, including the 1-inch air valve assembly as shown on the drawings and as required by JCSD Specifications and these specifications. Included in this item is all the excavation and backfill required; excluding the Class II Aggregate Base and Asphalt Concrete.

33.6 Relocate 8-Inch CML&C Waterline at Station 16+47 - The contract item Relocate 8-Inch CML&C Waterline at Station 16+47 covers all labor, equipment, materials, testing, earthwork, concrete slurry, removal of existing waterline and incidentals required for the construction and installation of the 8-inch cement mortar lined and cement mortar coated steel waterline, including the 1-inch air valve assembly as shown on the drawings and as required by JCSD Specifications and these specifications. Included in this item is all the excavation and backfill required; excluding the Class II Aggregate Base and Asphalt Concrete.

33.7 Relocate 8-Inch CML&C Waterline at Station 17+47 - The contract item Relocate 8-Inch CML&C Waterline at Station 17+47 covers all labor, equipment, materials, testing, earthwork, concrete slurry, removal of existing waterline and incidentals required for the construction and installation of the 8-inch cement mortar lined and cement mortar coated steel waterline, including the 1-inch air valve assembly as shown on the drawings and as required by JCSD Specifications and these specifications. Included in this item is all the excavation and backfill required; excluding the Class II Aggregate Base and Asphalt Concrete.

33.8 Measurement and Payment - The contract lump sum prices paid for Relocate 24-Inch CML&C Waterline; Relocate 8-Inch CML&C Waterline at Station 10+20; Relocate 8-Inch CML&C Waterline at Station 16+47; and Relocate 8-Inch CML&C Waterline at Station 17+47 shall include full compensation for all costs incurred under this section except that Aggregate Base and Asphalt Concrete used for resurfacing the street will be measured and paid for under the contract items Aggregate Base, Class 2 and Asphalt Concrete, Type B.

SECTION 34 – ENVIRONMENTAL AND REGULATORY REQUIREMENTS

34.1 Accidental Cultural Resource and Hazardous Materials Discovery - In the event that any hazardous materials, historical, or archaeological resources are uncovered within project limits, the Contractor shall immediately cease all construction or ground disturbance activity in the vicinity of the find and notify the Engineer. The District will provide the appropriate professional to assess the significance of the discovery, notify the necessary agencies and, if necessary, develop appropriate management and treatment measures. **The Contractor shall not resume construction in the affected area until the Engineer has approved resumption of construction.**

Should any of the above mentioned discoveries result in delays to the Contractor's work schedule, the Contractor shall be entitled only to an equivalent extension of time for the completion of the contract, and shall not be entitled to damages due to down-time and idle equipment or additional payments over and above the agreed upon contract prices.

34.2 Paleontological Resources Monitoring - The District will retain a qualified paleontological resources specialist to be present onsite to monitor initial grading and excavation activities. In the event that potential paleontological resources are uncovered within the project limits, the Contractor shall immediately cease all construction activity in the affected area until the significance of the find(s) is determined by the paleontological resources specialist and appropriate measures, including but not limited to collection, curation, and documentation, if necessary, are completed.

Should any paleontological discovery result in delays to the Contractor's work schedule, the Contractor shall be entitled only to an equivalent extension of time for the completion of the contract, and shall not be entitled to damages due to down-time and idled equipment or additional payments over and above the agreed upon contract unit prices.

34.3 Burrowing Owl Pre-Construction Survey - The District must conduct a Burrowing Owl survey within 30 days prior to clearing or ground disturbance. Prior to any clearing or soil disturbance activities by the Contractor, the District will conduct a pre-construction presence/absence survey for Burrowing Owls. Once the District determines that Burrowing Owl is absent from the project site, the Contractor shall begin construction within 30 days of said determination or notify the Engineer that another pre-construction survey is needed. If Burrowing Owl(s) is found within the project site, the Contractor shall not conduct any construction activities within 250-feet of occupied burrows during the breeding season (February 1 through August 31). Any Burrowing Owl(s) found within the project site that cannot be avoided will be relocated by the District during the non-breeding season (September 1 through January 31).

Should Burrowing Owl result in delays to the Contractor's work schedule, the Contractor shall be entitled only to an equivalent extension of time for the completion of the contract, and shall not be entitled to damages due to down-time and idle equipment or additional payments over and above the agreed upon contract prices.

34.4 Resident Notification - The Contractor shall notify each resident adjacent to the construction in writing 3 days prior to operating heavy construction equipment near the residence. Such notice shall contain the expected work schedule and the District's contact information. The District shall alert the contractor of any noise complaints and the contractor shall incorporate any feasible and practical techniques, which minimizes the noise impacts on adjacent residences. No separate payment will be made for incorporation of these techniques.

34.5 Emergency Access - At all times during construction, emergency fire or medical vehicles shall have access through the project site.

APPENDIX "A"

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

RULE 403

(Adopted May 7, 1976) (Amended November 6, 1992)
(Amended July 9, 1993) (Amended February 14, 1997)
(Amended December 11, 1998)(Amended April 2, 2004)
(Amended June 3, 2005)

RULE 403. FUGITIVE DUST

(a) Purpose

The purpose of this Rule is to reduce the amount of particulate matter entrained in the ambient air as a result of anthropogenic (man-made) fugitive dust sources by requiring actions to prevent, reduce or mitigate fugitive dust emissions.

(b) Applicability

The provisions of this Rule shall apply to any activity or man-made condition capable of generating fugitive dust.

(c) Definitions

(1) ACTIVE OPERATIONS means any source capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, disturbed surface area, or heavy- and light-duty vehicular movement.

(2) AGGREGATE-RELATED PLANTS are defined as facilities that produce and / or mix sand and gravel and crushed stone.

(3) AGRICULTURAL HANDBOOK means the region-specific guidance document that has been approved by the Governing Board or hereafter approved by the Executive Officer and the U.S. EPA. For the South Coast Air Basin, the Board-approved region-specific guidance document is the Rule 403 Agricultural Handbook dated December 1998. For the Coachella Valley, the Board-approved region-specific guidance document is the Rule 403 Coachella Valley Agricultural Handbook dated April 2, 2004.

(4) ANEMOMETERS are devices used to measure wind speed and direction in accordance with the performance standards, and maintenance and calibration criteria as contained in the most recent Rule 403 Implementation Handbook.

(5) BEST AVAILABLE CONTROL MEASURES means fugitive dust control actions that are set forth in Table 1 of this Rule.

(6) BULK MATERIAL is sand, gravel, soil, aggregate material less than two inches in length or diameter, and other organic or inorganic particulate matter.

(7) CEMENT MANUFACTURING FACILITY is any facility that has a cement kiln at the facility.

(8) CHEMICAL STABILIZERS are any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation. The chemical stabilizers shall meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.

(9) COMMERCIAL POULTRY RANCH means any building, structure, enclosure, or premises where more than 100 fowl are kept or maintained for the primary purpose of producing eggs or meat for sale or other distribution.

(10) CONFINED ANIMAL FACILITY means a source or group of sources of air pollution at an agricultural source for the raising of 3,360 or more fowl or 50 or more animals, including but not limited to, any structure, building, installation, farm, corral, coop, feed storage area, milking parlor, or system for the collection, storage, or distribution of solid and liquid manure; if domesticated animals, including horses, sheep, goats, swine, beef cattle, rabbits, chickens, turkeys, or ducks are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing.

(11) CONSTRUCTION/DEMOLITION ACTIVITIES means any on-site mechanical activities conducted in preparation of, or related to, the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities: grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.

(12) CONTRACTOR means any person who has a contractual arrangement to conduct an active operation for another person.

(13) DAIRY FARM is an operation on a property, or set of properties that are contiguous or separated only by a public right-of-way, that raises cows or

produces milk from cows for the purpose of making a profit or for a livelihood. Heifer and calf farms are dairy farms.

(14) DISTURBED SURFACE AREA means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust. This definition excludes those areas which have:

(A) been restored to a natural state, such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby natural conditions;

(B) been paved or otherwise covered by a permanent structure; or

(C) sustained a vegetative ground cover of at least 70 percent of the native cover for a particular area for at least 30 days.

(15) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.

(16) EARTH-MOVING ACTIVITIES means the use of any equipment for any activity where soil is being moved or uncovered, and shall include, but not be limited to the following: grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to or removing from open storage piles of bulk materials, landfill operations, weed abatement through disking, and soil mulching.

(17) DUST CONTROL SUPERVISOR means a person with the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule 403 requirements at an active operation.

(18) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of any person.

(19) HIGH WIND CONDITIONS means that instantaneous wind speeds exceed 25 miles per hour.

(20) INACTIVE DISTURBED SURFACE AREA means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of 20 consecutive days.

(21) LARGE OPERATIONS means any active operations on property which contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 3,850 cubic

meters (5,000 cubic yards) or more three times during the most recent 365-day period.

(22) OPEN STORAGE PILE is any accumulation of bulk material, which is not fully enclosed, covered or chemically stabilized, and which attains a height of three feet or more and a total surface area of 150 or more square feet.

(23) PARTICULATE MATTER means any material, except uncombined water, which exists in a finely divided form as a liquid or solid at standard conditions.

(24) PAVED ROAD means a public or private improved street, highway, alley, public way, or easement that is covered by typical roadway materials, but excluding access roadways that connect a facility with a public paved roadway and are not open to through traffic. Public paved roads are those open to public access and that are owned by any federal, state, county, municipal or any other governmental or quasi-governmental agencies. Private paved roads are any paved roads not defined as public.

(25) PM_{10} means particulate matter with an aerodynamic diameter smaller than or equal to 10 microns as measured by the applicable State and Federal reference test methods.

(26) PROPERTY LINE means the boundaries of an area in which either a person causing the emission or a person allowing the emission has the legal use or possession of the property. Where such property is divided into one or more sub-tenancies, the property line(s) shall refer to the boundaries dividing the areas of all sub-tenancies.

(27) RULE 403 IMPLEMENTATION HANDBOOK means a guidance document that has been approved by the Governing Board on April 2, 2004 or hereafter approved by the Executive Officer and the U.S. EPA.

(28) SERVICE ROADS are paved or unpaved roads that are used by one or more public agencies for inspection or maintenance of infrastructure and which are not typically used for construction-related activity.

(29) SIMULTANEOUS SAMPLING means the operation of two PM_{10} samplers in such a manner that one sampler is started within five minutes of the other, and each sampler is operated for a consecutive period which must be not less than 290 minutes and not more than 310 minutes.

(30) SOUTH COAST AIR BASIN means the non-desert portions of Los Angeles, Riverside, and San Bernardino counties and all of Orange

County as defined in California Code of Regulations, Title 17, Section 60104. The area is bounded on the west by the Pacific Ocean, on the north and east by the San Gabriel, San Bernardino, and San Jacinto Mountains, and on the south by the San Diego county line.

(31) STABILIZED SURFACE means any previously disturbed surface area or open storage pile which, through the application of dust suppressants, shows visual or other evidence of surface crusting and is resistant to wind-driven fugitive dust and is demonstrated to be stabilized. Stabilization can be demonstrated by one or more of the applicable test methods contained in the Rule 403 Implementation Handbook.

(32) TRACK-OUT means any bulk material that adheres to and agglomerates on the exterior surface of motor vehicles, haul trucks, and equipment (including tires) that have been released onto a paved road and can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

(33) TYPICAL ROADWAY MATERIALS means concrete, asphaltic concrete, recycled asphalt, asphalt, or any other material of equivalent performance as determined by the Executive Officer, and the U.S. EPA.

(34) UNPAVED ROADS means any unsealed or unpaved roads, equipment paths, or travel ways that are not covered by typical roadway materials. Public unpaved roads are any unpaved roadway owned by federal, state, county, municipal or other governmental or quasi-governmental agencies. Private unpaved roads are all other unpaved roadways not defined as public.

(35) VISIBLE ROADWAY DUST means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

(36) WIND-DRIVEN FUGITIVE DUST means visible emissions from any disturbed surface area which is generated by wind action alone.

(37) WIND GUST is the maximum instantaneous wind speed as measured by an anemometer.

(d) Requirements

(1) No person shall cause or allow the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area such that:

(A) the dust remains visible in the atmosphere beyond the property line of the emission source; or

(B) the dust emission exceeds 20 percent opacity (as determined by the appropriate test method included in the Rule 403 Implementation Handbook), if the dust emission is the result of movement of a motorized vehicle.

(2) No person shall conduct active operations without utilizing the applicable best available control measures included in Table 1 of this Rule to minimize fugitive dust emissions from each fugitive dust source type within the active operation.

(3) No person shall cause or allow PM_{10} levels to exceed 50 micrograms per cubic meter when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high-volume particulate matter samplers or other U.S. EPA-approved equivalent method for PM_{10} monitoring. If sampling is conducted, samplers shall be:

(A) Operated, maintained, and calibrated in accordance with 40 Code of Federal Regulations (CFR), Part 50, Appendix J, or appropriate U.S. EPA-published documents for U.S. EPA-approved equivalent method(s) for PM_{10}.

(B) Reasonably placed upwind and downwind of key activity areas and as close to the property line as feasible, such that other sources of fugitive dust between the sampler and the property line are minimized.

(4) No person shall allow track-out to extend 25 feet or more in cumulative length from the point of origin from an active operation. Notwithstanding the preceding, all track-out from an active operation shall be removed at the conclusion of each workday or evening shift.

(5) No person shall conduct an active operation with a disturbed surface area of five or more acres, or with a daily import or export of 100 cubic yards or more of bulk material without utilizing at least one of the measures listed in subparagraphs (d)(5)(A) through (d)(5)(E) at each vehicle egress from the site to a paved public road.

(A) Install a pad consisting of washed gravel (minimum-size: one inch) maintained in a clean condition to a depth of at least six inches and extending at least 30 feet wide and at least 50 feet long.

(B) Pave the surface extending at least 100 feet and at least 20 feet wide.

(C) Utilize a wheel shaker/wheel spreading device consisting of raised dividers (rails, pipe, or grates) at least 24 feet long and 10 feet wide to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

(D) Install and utilize a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the site.

(E) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the actions specified in subparagraphs (d)(5)(A) through (d)(5)(D).

(6) Beginning January 1, 2006, any person who operates or authorizes the operation of a confined animal facility subject to this Rule shall implement the applicable conservation management practices specified in Table 4 of this Rule.

(e) Additional Requirements for Large Operations

(1) Any person who conducts or authorizes the conducting of a large operation subject to this Rule shall implement the applicable actions specified in Table 2 of this Rule at all times and shall implement the applicable actions specified in Table 3 of this Rule when the applicable performance standards can not be met through use of Table 2 actions; and shall:

(A) submit a fully executed Large Operation Notification (Form 403 N) to the Executive Officer within 7 days of qualifying as a large operation;

(B) include, as part of the notification, the name(s), address(es), and phone number(s) of the person(s) responsible for the submittal, and a description of the operation(s), including a map depicting the location of the site;

(C) maintain daily records to document the specific dust control actions taken, maintain such records for a period of not less than three years; and make such records available to the Executive Officer upon request;

(D) install and maintain project signage with project contact signage that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earthmoving activities;

(E) identify a dust control supervisor that:

(i) is employed by or contracted with the property owner or developer;

(ii) is on the site or available on-site within 30 minutes during working hours;

(iii) has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements;

(iv) has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class; and

(F) notify the Executive Officer in writing within 30 days after the site no longer qualifies as a large operation as defined by paragraph (c)(18).

(2) Any Large Operation Notification submitted to the Executive Officer or AQMD-approved dust control plan shall be valid for a period of one year from the date of written acceptance by the Executive Officer. Any Large Operation Notification accepted pursuant to paragraph (e)(1), excluding those submitted by aggregate-related plants and cement manufacturing facilities must be resubmitted annually by the person who conducts or authorizes the conducting of a large operation, at least 30 days prior to the expiration date, or the submittal shall no longer be valid as of the expiration date. If all fugitive dust sources and corresponding control measures or special circumstances remain identical to those identified in the previously accepted submittal or in an AQMD-approved dust control plan, the resubmittal may be a simple statement of no-change (Form 403NC).

(f) Compliance Schedule

The newly amended provisions of this Rule shall become effective upon adoption. Pursuant to subdivision (e), any existing site that qualifies as a large operation will have 60 days from the date of Rule adoption to comply with the notification and recordkeeping requirements for large operations. Any Large Operation

Notification or AQMD-approved dust control plan which has been accepted prior to the date of adoption of these amendments shall remain in effect and the Large Operation Notification or AQMD-approved dust control plan annual resubmittal date shall be one year from adoption of this Rule amendment.

(g) Exemptions

(1) The provisions of this Rule shall not apply to:

(A) Dairy farms.

(B) Confined animal facilities provided that the combined disturbed surface area within one continuous property line is one acre or less.

(C) Agricultural vegetative crop operations provided that the combined disturbed surface area within one continuous property line and not separated by a paved public road is 10 acres or less.

(D) Agricultural vegetative crop operations within the South Coast Air Basin, whose combined disturbed surface area includes more than 10 acres provided that the person responsible for such operations:

(i) voluntarily implements the conservation management practices contained in the Rule 403 Agricultural Handbook;

(ii) completes and maintains the self-monitoring form documenting sufficient conservation management practices, as described in the Rule 403 Agricultural Handbook; and

(iii) makes the completed self-monitoring form available to the Executive Officer upon request.

(E) Agricultural vegetative crop operations outside the South Coast Air Basin whose combined disturbed surface area includes more than 10 acres provided that the person responsible for such operations:

(i) voluntarily implements the conservation management practices contained in the Rule 403 Coachella Valley Agricultural Handbook; and

(ii) completes and maintains the self-monitoring form documenting sufficient conservation management practices, as described in the Rule 403 Coachella Valley Agricultural Handbook; and

(iii) makes the completed self-monitoring form available to the Executive Officer upon request.

(F) Active operations conducted during emergency life-threatening situations, or in conjunction with any officially declared disaster or state of emergency.

(G) Active operations conducted by essential service utilities to provide electricity, natural gas, telephone, water and sewer during periods of service outages and emergency disruptions.

(H) Any contractor subsequent to the time the contract ends, provided that such contractor implemented the required control measures during the contractual period.

(I) Any grading contractor, for a phase of active operations, subsequent to the contractual completion of that phase of earth-moving activities, provided that the required control measures have been implemented during the entire phase of earth-moving activities, through and including five days after the final grading inspection.

(J) Weed abatement operations ordered by a county agricultural commissioner or any state, county, or municipal fire department, provided that:

(i) mowing, cutting or other similar process is used which maintains weed stubble at least three inches above the soil; and

(ii) any discing or similar operation which cuts into and disturbs the soil, where watering is used prior to initiation of these activities, and a determination is made by the agency issuing the weed abatement order that, due to fire hazard conditions, rocks, or other physical obstructions, it is not practical to meet the conditions specified in clause (g)(1)(H)(i). The provisions this clause shall not exempt the owner of any property from stabilizing, in accordance with paragraph (d)(2), disturbed surface areas which have been created as a result of the weed abatement actions.

(K) sandblasting operations.

(2) The provisions of paragraphs (d)(1) and (d)(3) shall not apply:

(A) When wind gusts exceed 25 miles per hour, provided that:

(i) The required Table 3 contingency measures in this Rule are implemented for each applicable fugitive dust source type, and;

(ii) records are maintained in accordance with subparagraph (e)(1)(C).

(B) To unpaved roads, provided such roads:

(i) are used solely for the maintenance of wind-generating equipment; or

(ii) are unpaved public alleys as defined in Rule 1186; or

(iii) are service roads that meet all of the following criteria:

(a) are less than 50 feet in width at all points along the road;

(b) are within 25 feet of the property line; and

(c) have a traffic volume less than 20 vehicle-trips per day.

(C) To any active operation, open storage pile, or disturbed surface area for which necessary fugitive dust preventive or mitigative actions are in conflict with the federal Endangered Species Act, as determined in writing by the State or federal agency responsible for making such determinations.

(3) The provisions of (d)(2) shall not apply to any aggregate-related plant or cement manufacturing facility that implements the applicable actions specified in Table 2 of this Rule at all times and shall implement the applicable actions specified in Table 3 of this Rule when the applicable performance standards of paragraphs (d)(1) and (d)(3) can not be met through use of Table 2 actions.

(4) The provisions of paragraphs (d)(1), (d)(2), and (d)(3) shall not apply to:

(A) Blasting operations which have been permitted by the California Division of Industrial Safety; and

(B) Motion picture, television, and video production activities when dust emissions are required for visual effects. In order to obtain this exemption, the Executive Officer must receive notification in writing at least 72 hours in advance of any such activity and no nuisance results from such activity.

(5) The provisions of paragraph (d)(3) shall not apply if the dust control actions, as specified in Table 2, are implemented on a routine basis for

each applicable fugitive dust source type. To qualify for this exemption, a person must maintain records in accordance with subparagraph (e)(1)(C).

(6) The provisions of paragraph (d)(4) shall not apply to earth coverings of public paved roadways where such coverings are approved by a local government agency for the protection of the roadway, and where such coverings are used as roadway crossings for haul vehicles provided that such roadway is closed to through traffic and visible roadway dust is removed within one day following the cessation of activities.

(7) The provisions of subdivision (e) shall not apply to:

(A) officially-designated public parks and recreational areas, including national parks, national monuments, national forests, state parks, state recreational areas, and county regional parks.

(B) any large operation which is required to submit a dust control plan to any city or county government which has adopted a District-approved dust control ordinance.

(C) any large operation subject to Rule 1158, which has an approved dust control plan pursuant to Rule 1158, provided that all sources of fugitive dust are included in the Rule 1158 plan.

(8) The provisions of subparagraph (e)(1)(A) through (e)(1)(C) shall not apply to any large operation with an AQMD-approved fugitive dust control plan provided that there is no change to the sources and controls as identified in the AQMD-approved fugitive dust control plan.

(h) Fees

Any person conducting active operations for which the Executive Officer conducts upwind/downwind monitoring for PM_{10} pursuant to paragraph (d)(3) shall be assessed applicable Ambient Air Analysis Fees pursuant to Rule 304.1. Applicable fees shall be waived for any facility which is exempted from paragraph (d)(3) or meets the requirements of paragraph (d)(3).

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Backfilling	01-1 Stabilize backfill material when not actively handling; and 01-2 Stabilize backfill material during handling; and 01-3 Stabilize soil at completion of activity.	✓ Mix backfill soil with water prior to moving ✓ Dedicate water truck or high capacity hose to backfilling equipment ✓ Empty loader bucket slowly so that no dust plumes are generated ✓ Minimize drop height from loader bucket
Clearing and grubbing	02-1 Maintain stability of soil through pre-watering of site prior to clearing and grubbing; and 02-2 Stabilize soil during clearing and grubbing activities; and 02-3 Stabilize soil immediately after clearing and grubbing activities.	✓ Maintain live perennial vegetation where possible ✓ Apply water in sufficient quantity to prevent generation of dust plumes
Clearing forms	03-1 Use water spray to clear forms; or 03-2 Use sweeping and water spray to clear forms; or 03-3 Use vacuum system to clear forms.	✓ Use of high pressure air to clear forms may cause exceedance of Rule requirements
Crushing	04-1 Stabilize surface soils prior to operation of support equipment; and 04-2 Stabilize material after crushing.	✓ Follow permit conditions for crushing equipment ✓ Pre-water material prior to loading into crusher ✓ Monitor crusher emissions opacity ✓ Apply water to crushed material to prevent dust plumes

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Cut and fill	05-1 Pre-water soils prior to cut and fill activities; and 05-2 Stabilize soil during and after cut and fill activities.	✓ For large sites, pre-water with sprinklers or water trucks and allow time for penetration ✓ Use water trucks/pulls to water soils to depth of cut prior to subsequent cuts
Demolition – mechanical/manual	06-1 Stabilize wind erodible surfaces to reduce dust; and 06-2 Stabilize surface soil where support equipment and vehicles will operate; and 06-3 Stabilize loose soil and demolition debris; and 06-4 Comply with AQMD Rule 1403.	✓ Apply water in sufficient quantities to prevent the generation of visible dust plumes
Disturbed soil	07-1 Stabilize disturbed soil throughout the construction site; and 07-2 Stabilize disturbed soil between structures	✓ Limit vehicular traffic and disturbances on soils where possible ✓ If interior block walls are planned, install as early as possible ✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes
Earth-moving activities	08-1 Pre-apply water to depth of proposed cuts; and 08-2 Re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction; and 08-3 Stabilize soils once earth-moving activities are complete.	✓ Grade each project phase separately, timed to coincide with construction phase ✓ Upwind fencing can prevent material movement on site ✓ Apply water or a stabilizing agent in sufficient quantities to prevent the generation of visible dust plumes

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Importing/exporting of bulk materials	09-1 Stabilize material while loading to reduce fugitive dust emissions; and 09-2 Maintain at least six inches of freeboard on haul vehicles; and 09-3 Stabilize material while transporting to reduce fugitive dust emissions; and 09-4 Stabilize material while unloading to reduce fugitive dust emissions; and 09-5 Comply with Vehicle Code Section 23114.	✓ Use tarps or other suitable enclosures on haul trucks ✓ Check belly-dump truck seals regularly and remove any trapped rocks to prevent spillage ✓ Comply with track-out prevention/mitigation requirements ✓ Provide water while loading and unloading to reduce visible dust plumes
Landscaping	10-1 Stabilize soils, materials, slopes	✓ Apply water to materials to stabilize ✓ Maintain materials in a crusted condition ✓ Maintain effective cover over materials ✓ Stabilize sloping surfaces using soil binders until vegetation or ground cover can effectively stabilize the slopes ✓ Hydroseed prior to rain season
Road shoulder maintenance	11-1 Apply water to unpaved shoulders prior to clearing; and 11-2 Apply chemical dust suppressants and/or washed gravel to maintain a stabilized surface after completing road shoulder maintenance.	✓ Installation of curbing and/or paving of road shoulders can reduce recurring maintenance costs ✓ Use of chemical dust suppressants can inhibit vegetation growth and reduce future road shoulder maintenance costs

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Screening	12-1 Pre-water material prior to screening; and 12-2 Limit fugitive dust emissions to opacity and plume length standards; and 12-3 Stabilize material immediately after screening.	✓ Dedicate water truck or high capacity hose to screening operation ✓ Drop material through the screen slowly and minimize drop height ✓ Install wind barrier with a porosity of no more than 50% upwind of screen to the height of the drop point
Staging areas	13-1 Stabilize staging areas during use; and 13-2 Stabilize staging area soils at project completion.	✓ Limit size of staging area ✓ Limit vehicle speeds to 15 miles per hour ✓ Limit number and size of staging area entrances/exists
Stockpiles/ Bulk Material Handling	14-1 Stabilize stockpiled materials. 14-2 Stockpiles within 100 yards of off-site occupied buildings must not be greater than eight feet in height; or must have a road bladed to the top to allow water truck access or must have an operational water irrigation system that is capable of complete stockpile coverage.	✓ Add or remove material from the downwind portion of the storage pile ✓ Maintain storage piles to avoid steep sides or faces

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Traffic areas for construction activities	15-1 Stabilize all off-road traffic and parking areas; and 15-2 Stabilize all haul routes; and 15-3 Direct construction traffic over established haul routes.	✓ Apply gravel/paving to all haul routes as soon as possible to all future roadway areas ✓ Barriers can be used to ensure vehicles are only used on established parking areas/haul routes
Trenching	16-1 Stabilize surface soils where trencher or excavator and support equipment will operate; and 16-2 Stabilize soils at the completion of trenching activities.	✓ Pre-watering of soils prior to trenching is an effective preventive measure. For deep trenching activities, pre-trench to 18 inches soak soils via the pre-trench and resuming trenching ✓ Washing mud and soils from equipment at the conclusion of trenching activities can prevent crusting and drying of soil on equipment
Truck loading	17-1 Pre-water material prior to loading; and 17-2 Ensure that freeboard exceeds six inches (CVC 23114)	✓ Empty loader bucket such that no visible dust plumes are created ✓ Ensure that the loader bucket is close to the truck to minimize drop height while loading
Turf Overseeding	18-1 Apply sufficient water immediately prior to conducting turf vacuuming activities to meet opacity and plume length standards; and 18-2 Cover haul vehicles prior to exiting the site.	✓ Haul waste material immediately off-site

TABLE 1
BEST AVAILABLE CONTROL MEASURES
(Applicable to All Construction Activity Sources)

Source Category	Control Measure	Guidance
Unpaved roads/parking lots	19-1 Stabilize soils to meet the applicable performance standards; and 19-2 Limit vehicular travel to established unpaved roads (haul routes) and unpaved parking lots.	✓ Restricting vehicular access to established unpaved travel paths and parking lots can reduce stabilization requirements
Vacant land	20-1 In instances where vacant lots are 0.10 acre or larger and have a cumulative area of 500 square feet or more that are driven over and/or used by motor vehicles and/or off-road vehicles, prevent motor vehicle and/or off-road vehicle trespassing, parking and/or access by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.	

Table 2
DUST CONTROL MEASURES FOR LARGE OPERATIONS

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS	
Earth-moving (except construction cutting and filling areas, and mining operations)	(1a)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR
	(1a-1)	For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas:	(1b)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.

Table 2 (Continued)

FUGITIVE DUST SOURCE CATEGORY		CONTROL ACTIONS
Earth-moving: Construction cut areas and mining operations:	(1c)	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	(2a/b)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	(2c)	Apply chemical stabilizers within five working days of grading completion; OR
	(2d)	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	(3a)	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	(3b)	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	(3c)	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	(3d)	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.

Table 2 (Continued)

FUGITIVE DUST SOURCE CATEGORY	CONTROL ACTIONS	
Unpaved Roads	(4a)	Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; OR
	(4b)	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR
	(4c)	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	(5a)	Apply chemical stabilizers; OR
	(5b)	Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR
	(5c)	Install temporary coverings; OR
	(5d)	Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities.
All Categories	(6a)	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 2 may be used.

TABLE 3
CONTINGENCY CONTROL MEASURES FOR LARGE OPERATIONS

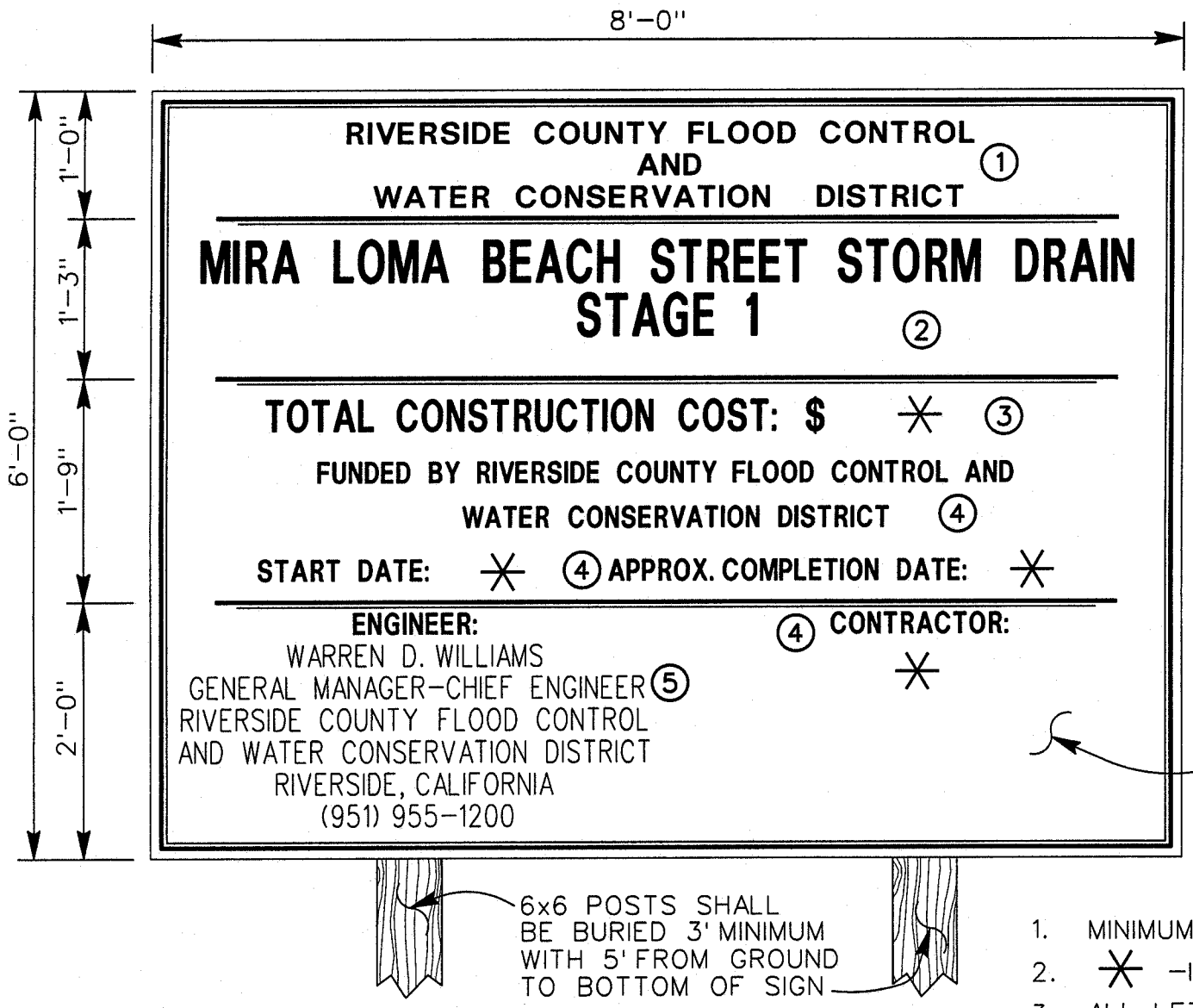
FUGITIVE DUST SOURCE CATEGORY	CONTROL MEASURES
Earth-moving	(1A) Cease all active operations; OR (2A) Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	(0B) On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR (1B) Apply chemical stabilizers prior to wind event; OR (2B) Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR (3B) Take the actions specified in Table 2, Item (3c); OR (4B) Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	(1C) Apply chemical stabilizers prior to wind event; OR (2C) Apply water twice per hour during active operation; OR (3C) Stop all vehicular traffic.
Open storage piles	(1D) Apply water twice per hour; OR (2D) Install temporary coverings.
Paved road track-out	(1E) Cover all haul vehicles; OR (2E) Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	(1F) Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

Table 4
(Conservation Management Practices for Confined Animal Facilities)

SOURCE CATEGORY	CONSERVATION MANAGEMENT PRACTICES
Manure Handling **(Only applicable to Commercial Poultry Ranches)**	(1a) Cover manure prior to removing material off-site; AND (1b) Spread the manure before 11:00 AM and when wind conditions are less than 25 miles per hour; AND (1c) Utilize coning and drying manure management by removing manure at laying hen houses at least twice per year and maintain a base of no less than 6 inches of dry manure after clean out; or in lieu of complying with conservation management practice (1c), comply with conservation management practice (1d). (1d) Utilize frequent manure removal by removing the manure from laying hen houses at least every seven days and immediately thin bed dry the material.
Feedstock Handling	(2a) Utilize a sock or boot on the feed truck auger when filling feed storage bins.
Disturbed Surfaces	(3a) Maintain at least 70 percent vegetative cover on vacant portions of the facility; OR (3b) Utilize conservation tillage practices to manage the amount, orientation and distribution of crop and other plant residues on the soil surface year-round, while growing crops (if applicable) in narrow slots or tilled strips; OR (3c) Apply dust suppressants in sufficient concentrations and frequencies to maintain a stabilized surface.
Unpaved Roads	(4a) Restrict access to private unpaved roads either through signage or physical access restrictions and control vehicular speeds to no more than 15 miles per hour through worker notifications, signage, or any other necessary means; OR (4b) Cover frequently traveled unpaved roads with low silt content material (i.e., asphalt, concrete, recycled road base, or gravel to a minimum depth of four inches); OR (4c) Treat unpaved roads with water, mulch, chemical dust suppressants or other cover to maintain a stabilized surface.
Equipment Parking Areas	(5a) Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR (5b) Apply material with low silt content (i.e., asphalt, concrete, recycled road base, or gravel to a depth of four inches).

APPENDIX "B"

PROJECT SIGNS



LETTER SCHEDULE

	SIZE	COLOR
1	2"	BLACK
2	4"	ROYAL
3	3"	ROYAL
4	2"	ROYAL
5	2"	BLACK

NOTES:

1. MINIMUM SPACING BETWEEN LINES 1".
2. ✳ -INFO. FURNISHED BY ENGINEER
3. ALL LETTERS FILLED AND CENTERED
4. THE STRIPES ARE GOLD AND BLACK ON WHITE BACKGROUND.

APPENDIX "B" PROJECT SIGN

APPENDIX "C"

LOG OF SOIL BORINGS

APPENDIX A - 1

LOGS OF EXPLORATORY BORINGS

BORINGS B-1 THROUGH B-9 (2010)

Mira Loma Storm Drain

Riverside County, California

Project No. 0531-CR3

GEOTEK

A - FIELD TESTING AND SAMPLING PROCEDURES

The Standard Penetration Test (SPT)

The SPT is performed in accordance with ASTM Test Method D 1586-99. The SPT sampler is typically driven into the ground 12 or 18 inches with a 140-pound hammer free falling from a height of 30 inches. Blow counts are recorded for every 6 inches of penetration as indicated on the log of boring. The split-barrel sampler has an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The samples of earth materials collected in the sampler are typically classified in the field, bagged, sealed and transported to the laboratory for further testing.

The Modified Split-Barrel Sampler (Ring)

The Ring sampler is driven into the ground in accordance with ASTM Test Method D 3550-84. The sampler, with an external diameter of 3.0 inches, is lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sampler is typically driven into the ground 12 or 18 inches with a 140-pound hammer free falling from a height of 30 inches. Blow counts are recorded for every 6 inches of penetration as indicated on the log of boring. The samples are removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

Bulk Samples (Large)

These samples are normally large bags of representative earth materials over 20 pounds in weight collected from the field by means of hand digging or exploratory cuttings.

Bulk Samples (Small)

These are plastic bag samples which are normally airtight and contain less than 5 pounds in weight of representative earth materials collected from the field by means of hand digging or exploratory cuttings. These samples are primarily used for determining natural moisture content and classification indices.

B - TRENCH LOG LEGEND

The following abbreviations and symbols often appear in the classification and description of soil and rock on the logs of trenches:

SOILS

USCS	Unified Soil Classification System
f-c	Fine to coarse
f-m	Fine to medium

GEOLOGIC

B: Attitudes	Bedding: strike/dip
J: Attitudes	Joint: strike/dip
C:	Contact line
.....	Dashed line denotes USCS material change
———	Solid Line denotes unit / formational change
———	Thick solid line denotes end of trench

(Additional denotations and symbols are provided on the log of trench)

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/9/2010

BORING NO.: B-1

Depth (ft)	Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Water Content (%)	Dry Density (pcf)	Others
				SM	**Older Alluvium:** Silty fine SAND (SM), light brown, dry, loose			MD
5		6 6 8	B1-1	SM	Silty f-c SAND (SM), red brown, slighlty moist, loose to medium dense	7.6	112.7	
10		5 7 8	B1-2	SM	Silty fine SAND (SM), red brown, moist to wet, medium dense	15.5	113.3	
15		50	B1-3		**Weathered Granitic Bedrock:** Excavates as Silty f-c SAND (SM), red brown to orange brown to gray mottled, wet, dense			
20		50-2"	B1-4		Excavates as Silty f-c SAND (SM), gray to black mottled, wet, dense			
					BORING TERMINATED AT 20.2 FEET			
					Groundwater encountered at 17.5 feet (Static 16.1 feet) Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/9/2010

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Undocumented Fill Soils:** Silty fine SAND (SM) with gravel, red brown to dark brown, dry, loose			
5		12 11 20	B2-1	SM/SC	**Older Alluvium:** Silty SAND(SM) to Clayey SAND (SC), red brown to orange brown, slightly moist, medium dense	8.7	126.7	
10		25 50	B2-2	SM	Silty f-m SAND (SM), light brown to orange brown, slightly moist, dense, some clay	8.6	112.9	
15		45 50-4"	B2-3	SM	Silty f-m SAND (SM) with some clay, red brown, slightly moist, dense	8.7	127.6	
▽ 20		26 50-5"			**Weathered Granitic Bedrock:** Excavates as Silty f-m SAND (SM) with some clay, orange brown mottled, slightly moist, dense			
		16 36 50	B1-4		SAME, micaceous			
25					BORING TERMINATED AT 21.5 FEET Groundwater encountered at 18.2 feet (Static 17.2 feet) Boring backfilled with soil cuttings			
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/9/2010

BORING NO.: B-3

Depth (ft)	Sample Type	Blows/ 6 in.	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					±9" Asphaltic Concrete over ±4" Aggregate Base			
				SM	**Older Alluvium:** Silty f-c SAND, red brown, moist, dense			
5	Ring	10 20 50	B3-1		SAME	8.6	129.4	
10	Ring	30 50	B3-2		SAME	11.1	125.7	
15	Ring	10 16 34	B3-3		SAME	17.0	115.8	
▽								
20	Ring	9 11 20	B3-4	SM/ML	Silt f-c SAND (SM) to fine Sandy SILT (ML), red brown, slightly moist, medium dense			
					BORING TERMINATED AT 21.5 FEET			
					Groundwater encountered at 18.2 feet (Static 16.8 feet) Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: Ring — SPT — Small Bulk — Large Bulk — No Recovery — Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/9/2010

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-4 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					±6" Asphaltic Concrete over ±4" Aggregate Base			
				SM	Older Alluvium: Silty fine SAND (SM), light brown, dry, dense			MD
5		50-4"	B4-1		SAME	3.9	120.1	
10		50-4"	B4-2		Weathered Granitic Bedrock: Excavates as Silty f-c SAND (SM), dark gray to black mottled, slightly moist, dense	2.3	106.2	
15		50-2"	B4-3		SAME	1.8	106.9	
20		50-2"	B3-4		SAME			
25		50-2"	B3-5					
					BORING TERMINATED AT 25.2 FEET No groundwater encountered Boring backfilled with soil cuttings			
30								

LEGEND

Sample type: Ring | SPT | Small Bulk | Large Bulk | No Recovery | Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/9/2010

BORING NO.: B-5

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Older Alluvium:** Silty fine SAND (SM), orange brown to red brown, slightly moist, loose to medium dense			
5		37 50-5"	B5-1	SM	Silty fine SAND (SM), orange brown to red brown, slightly moist, dense	9.1	119.0	
10		30 50-2"	B5-2		SAME, deep red brown mottled	6.5	132.0	
15		50-2"	B5-3		**Weathered Granitic Bedrock:** Excavates as Silty f-c SAND (SM), dark gray to black mottled, slightly moist, dense	2.8	103.0	
20		50-1"	B5-4		SAME			
25		50-2"	B5-5		SAME			
					BORING TERMINATED AT 25.2 FEET			
					No groundwater encountered			
					Boring backfilled with soil cuttings			
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/9/2010

BORING NO.: B-6

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
				SM	**Older Alluvium:** Silty fine SAND (SM) with some clay, deep red brown mottled, slightly moist, loose to medium dense			
5	Ring	15 32 45	B6-1		SAME	7.7	130.7	
10	Ring	16 26 38	B6-2		SAME	10.2	128.0	
15	Ring	40 50	B6-3		**Weathered Granitic Bedrock:** Excavates as Silty f-c SAND (SM), red brown to black to white mottled, slightly moist, dense	6.7	131.2	
20	SPT	50-4"	B6-4		SAME			
					BORING TERMINATED AT 20.2 FEET No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: Ring — SPT — Small Bulk — Large Bulk — No Recovery — Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/11/2010

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-7 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					±3" Asphaltic Concrete over ±5" Aggregate Base			
				SM	**Older Alluvium:** Silty f-c SAND (SM), red brown mottled, dry, dense			
5		50	B7-1	SM	Silty f-c SAND (SM), red brown mottled, slightly moist, dense	5.9	111.3	
10		50-3"	B7-2		**Weathered Granitic Bedrock:** Excavates as Silty f-c SAND (SM), dark gray to black mottled, slightly moist, dense			
15		50-1"	B7-3		SAME	2.2	83.3	
20		50-1"	B7-4		SAME			
25		50-1"	B7-5					
					BORING TERMINATED AT 25.2 FEET No groundwater encountered Boring backfilled with soil cuttings			
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/11/2010

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	BORING NO.: B-8 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					±2" Asphaltic Concrete			
					Older Alluvium:			
				SM	Silty f-m SAND (SM), red brown mottled, dry, dense			
5		7 12 16	B8-1	SM	Silty f-m SAND (SM), red brown mottled, slightly moist, dense	1.8	116.5	
10		12 11 15	B8-2	SM	Silty fine SAND (SM), red brown, slightly moist, medium dense	1.7	108.9	
15		50-5"	B8-3		SAME	4.1	99.3	
20		50-1"	B8-4		SAME			
					BORING TERMINATED AT 20.2 FEET			
					No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resistivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering, Inc.	DRILLER:	2R Drilling	LOGGED BY:	AMS
PROJECT NAME:	Beach Street Storm Drain Project	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	6/10/2010

BORING NO.: B-9

Depth (ft)	Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Water Content (%)	Dry Density (pcf)	Others
					±12" Asphaltic Concrete			
				SM	**Older Alluvium:** Clayey silty f-c SAND (SM), red brown mottled, slightly moist, medium dense			
5		5 9 12	B9-1		SAME	6.8	127.2	
10		50-4"	B9-2		**Weathered Granitic Bedrock:** Excavates as Silty f-c SAND (SM), red brown to black to white mottled, slightly moist, dense	7.5	108.0	
15		50-3"	B9-3		SAME	6.1	98.9	
20		50-2"	B9-4		SAME			
					BORING TERMINATED AT 20.2 FEET No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

APPENDIX A - 2

LOGS OF EXPLORATORY BORINGS

BORINGS B-1a THROUGH B-9a (2009)

Mira Loma Storm Drain
Riverside County, California

Project No. 0531-CR3

GEOTEK

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	**DRILLER:**	2R Drilling	**LOGGED BY:**	EHL
PROJECT NAME:	Beach Street Storm Drain	**DRILL METHOD:**	8" Hollow Stem	**OPERATOR:**	Jerry
PROJECT NO.:	0531-CR3	**HAMMER:**	Auto 140#/30"	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	4/20/2009

BORING NO.: B-1a

At the intersection of Rutile Street and 54th Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete to ~2.5", no base material			
					Weathered Granitic Bedrock: Excavates as silty medium SAND (SM), light red gray mottled, slightly moist, medium dense, highly weathered			
5		50-3"	B1-1		Excavates as silty f-c SAND (SM), light gray mottled, damp, becomes less weathered			
10		50-3"	B1-2		SAME			
15		50-3"	B1-3		SAME			
20		50-2"	B1-4		SAME - Relatively easy drilling, no corestones encountered			
					BORING TERMINATED AT 20' 2" FEET			
					No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Jerry
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	4/20/2009

BORING NO.: B-2a

On 54th Street, roughly 372' west of Cedar Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete to ~2.5", ~3/4" of soil and ~1 3/4" of additional asphaltic concrete			
				SM	**Older Alluvium:** Silty fine SAND (SM), red brown, slightly moist, loose to medium dense			
5		3 4 4	B2-1		SAME			
10		6 9 14	B2-2		SAME, medium dense			
15		8 13 23	B2-3		Becomes light red brown, damp			
20		27 50-3"	B2-4		**Weathered Granitic Bedrock:** Excavates as silty fine SAND (SM), red brown mottled, damp, hard			
					BORING TERMINATED AT 20' 9" FEET			
					No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Jerry
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	4/20/2009

BORING NO.: B-3a

On 55th Street, roughly 262' west of Beach Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 In	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete to ~3.0", no base material			
					Older Alluvium:			
				SM	Silty fine SAND (SM), red brown, slightly moist, medium dense			
5		11 12 13	B3-1		SAME			
					Weathered Granitic Bedrock:			
					Excavates as gravelly silty medium SAND (SM), light red gray mottled, slightly moist, highly weathered			
10		50-5"	B3-2		Excavates as silty medium SAND (SM), light gray mottled, slightly moist, less weathered			
15		50-5.5"	B3-3		Becomes medium to coarse grained, micaceous			
20		50-2.5"	B3-4		Relatively easy drilling, no corestones encountered			
					BORING TERMINATED AT 20' 2.5" FEET			
					No groundwater encountered Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Jerry
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	4/20/2009

BORING NO.: B-4a

On Beach Street, roughly 161' south of 56th Street

Depth (ft)	Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Dry Density (pcf)	Others
					Asphaltic Concrete to ~6.0", no base material			
					Artificial Fill:			
				SM	Silty fine SAND (SM), red brown, moist, piece of concrete			
5		8 11 13	B4-1	SM	**Older Alluvium:** Silty SAND (SM), red brown, slightly moist, medium dense			
10		10 16 24	B4-2	ML	Fine sandy clayey SILT (ML), red brown, moist, stiff			
15		27 34 50-4.5"	B4-3	SM	Clayey silty SAND (SM), red brown, moist, medium dense to dense			
▽ 20		8 16 29	B4-4		SAME, slightly more granular			
					BORING TERMINATED AT 21.5' FEET Groundwater encountered at ~19' 4" Boring backfilled with soil cuttings			
25								
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Jerry
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	4/20/2009

BORING NO.: B-5a

On Beach Street, roughly 274' north of 55th Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete to ~5.0" with ~5.0" of aggregate base			
					~16" Water Line			
					BORING TERMINATED AT 16 INCHES			
					No groundwater encountered			
					Boring backfilled with soil cuttings			
5								
10								
15								
20								
25								
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	5/7/2009

BORING NO.: B-6a

On Beach Street, ~50' South of 58th Street

Depth (ft)	Sample Type	Blows/ 6 in	Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Water Content (%)	Dry Density (pcf)	Others
					Asphaltic Concrete to ~4", no base material			
					Older Alluvium:			
				SM	Clayey silty SAND (SM), red brown, slightly moist, medium dense; becomes lighter in color with depth			
5		22 50-4"	B6-1		SAME, light red brown			
10		33 50-6"	B6-2		SAME			
15		15 30 40	B6-3		Silty SAND (SM) with clay, light to medium red brown, damp to slightly moist			
20		17 24 50	B6-4		SAME - medium to dark red brown, more clay, slightly moist to moist			
25		21 40 50	B6-5		Clayey silty f-m SAND (SM), light to dark red brown, moist to very moist			
					Perched groundwater @ 27' 10"			
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	**DRILLER:**	2R Drilling	**LOGGED BY:**	EHL
PROJECT NAME:	Beach Street Storm Drain	**DRILL METHOD:**	8" Hollow Stem	**OPERATOR:**	Miguel
PROJECT NO.:	0531-CR3	**HAMMER:**	Auto 140#/30"	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	4/20/2009

BORING NO.: B-6a continued

On Beach Street, ~50' South of 58th Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
30	■	12 17 27	B6-6	SM	Clayey silty SAND (SM), dark red brown, moist to very moist			
					BORING TERMINATED AT 31.5 FEET			
					Perched groundwater encountered at 27' 10"			
					Boring backfilled with soil cuttings			
35								
40								
45								
50								
55								
60								

LEGEND

Sample type: ■ —Ring ■ —SPT ▨ —Small Bulk ▩ —Large Bulk □ —No Recovery ▽ —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	5/7/2009

BORING NO.: B-7a

On 58th Street, ~50' east of Beach Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete to ~1.5", no base material			
					Older Alluvium:			
				SM	Clayey silty fine SAND (SM), red brown, slightly moist			
5		16 33 49	B7-1		SAME - becomes damp			
10		21 32 43	B7-2		SAME			
15								
20		22 48 50-4"	B7-3		Clayey silty f-m SAND (SM), red brown, moist			
25					Perched groundwater @ 24' 7"			
30								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	4/20/2009

BORING NO.: B-7a continued

On 58th Street, ~50' east of Beach Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 In	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
30	▓	25 50-6"	B7-4	SM	SAME - moist			
					BORING TERMINATED AT 31 FEET			
					Perched groundwater encountered at 24' 7"			
					Boring backfilled with soil cuttings			
35								
40								
45								
50								
55								
60								

LEGEND

Sample type: ▓ —Ring ▓ —SPT ⧄ —Small Bulk ⊠ —Large Bulk □ —No Recovery ▽ —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	**DRILLER:**	2R Drilling	**LOGGED BY:**	EHL
PROJECT NAME:	Beach Street Storm Drain	**DRILL METHOD:**	8" Hollow Stem	**OPERATOR:**	Miguel
PROJECT NO.:	0531-CR3	**HAMMER:**	Auto 140#/30"	**RIG TYPE:**	CME 75
LOCATION:	See Boring Location Map			**DATE:**	5/7/2009

BORING NO.: B-8a

On Beach Street, ~300' north of West 55th Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete to ~4", no base material			
				SM	**Older Alluvium:** Silty SAND (SM), red brown, slightly moist to moist			
5		16 50-4"	B8-1		SAME			
10		50-3"	B8-2		**Weathered Granitic Bedrock:** Excavates as silty medium SAND (SM), gray mottled, damp, highly weathered			
20		50-2"	B8-3		SAME			
25								
30								

LEGEND

Sample type: ---Ring ---SPT —Small Bulk ---Large Bulk ---No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	4/20/2009

BORING NO.: B-8a continued

On Beach Street, ~300' north of West 55th Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
30		50-2"	B8-4		BORING TERMINATED AT 30' 2" FEET			
					No groundwater encountered			
					Boring backfilled with soil cuttings			
35								
40								
45								
50								
55								
60								

LEGEND

Sample type: —Ring —SPT —Small Bulk —Large Bulk —No Recovery —Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY BORING

CLIENT:	K&A Engineering	DRILLER:	2R Drilling	LOGGED BY:	EHL
PROJECT NAME:	Beach Street Storm Drain	DRILL METHOD:	8" Hollow Stem	OPERATOR:	Miguel
PROJECT NO.:	0531-CR3	HAMMER:	Auto 140#/30"	RIG TYPE:	CME 75
LOCATION:	See Boring Location Map			DATE:	5/7/2009

BORING NO.: B-9a

On 54th Street, roughly 50' east of Beach Street

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/ 6 in	SAMPLES: Sample Number	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Others
					Asphaltic Concrete to ~2.5", no base material			
				SM	**Older Alluvium:** Silty SAND (SM), medium to dark brown, slightly moist to moist			
5		45 50-3"	B9-1		**Weathered Granitic Bedrock:** Excavates as silty m-c SAND (SM), gray brown mottled, damp, highly weathered			
10		50-3"	B9-2		Excavates as silty m-c SAND (SM), mottled gray, white, black, orange, damp to slightly moist			
15								
20		50-2"	B9-3		SAME			
					@23', Becomes difficult drilling, very dense			
25					@25', Refusal on hard bedrock BORING TERMINATED AT 25' FEET			
					No groundwater encountered Boring backfilled with soil cuttings			
30								

LEGEND

Sample type: Ring, SPT, Small Bulk, Large Bulk, No Recovery, Water Table

Lab testing: AL = Atterberg Limits; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

APPENDIX "D"

JURUPA COMMUNITY SERVICES DISTRICT
STANDARDS MANUAL

SECTION V

BASIC SPECIFICATIONS

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BASIC SPECIFICATIONS

SECTION A

GENERAL SPECIFICATIONS

1. REFERENCE SPECIFICATIONS

The following published reference specification shall hereby become part of these specifications.

A. State of California, Department of Transportation, "Standard Specifications", (Latest Edition).

B. "Standard Specifications for Public Works Construction", Latest Edition, published by Building News, Inc., 3055 Overland Avenue, Los Angeles, California 90034. Part l of the "Standard Specifications for Public Works Construction" shall apply to work accomplished under the contract except as herein modified.

2. CONTRACTOR'S SCHEDULE OF WORK

Within seven (7) days from the time the Contract is executed by all parties and at such other times as may be requested by the District, the Contractor shall submit to the District a detailed construction schedule which shall show the order in which the Contractor proposes to carry on the work, the dates at which the Contractor will start the several parts of the work, and the estimated dates of completion of the several parts. The District reserves the right to approve or alter the Schedule proposed by the Contractor, prior to the start of work.

The District may establish priorities for completion of certain parts of the work which may be necessary to provide certain services or which he may deem advisable in the interest of public safety and convenience.

The construction schedule and supplementary construction schedules submitted shall be consistent in all respects with the time requirements of the contract.

3. INSPECTION

All work and materials furnished under these specifications shall be subject to rigid District inspection and acceptance.

The Contractor shall notify the District at least two working days in advance of any work to be done, in order that inspection, including that of on-site materials, may be provided with a minimum of inconvenience to the District or delay to the Contractor. The Contractor shall perform construction only in the presence of an inspector unless written permission to work during the absence of an inspector has been granted by the District or inspector. Any work done in the absence of an inspector without permission shall be subject to rejection.

The District shall at all times have access to the work during its construction and shall be furnished with every reasonable facility for ascertaining that materials and workmanship are in accordance with the requirements of these Specifications.

When required, the Contractor shall notify the District a sufficient time in advance of manufacture or production of materials to be supplied, in order that the District may arrange for shop or plant inspection and testing. The District shall have access to all parts of the shop or plant where material subject to inspection is being manufactured.

All materials shipped prior to having satisfactorily passed such testing and inspection by the District shall not be used unless approved by the District.

The Contractor shall also furnish the District duplicate, certified copies of all factory and mill test reports when required by the District.

Work or materials failing to conform to these Specifications may be rejected at any time.

The District has made the necessary arrangements for inspection of Contractor's work during the District's field services' regular (i.e. 7:00 a.m. to 3:30 p.m., Monday through Friday) 40 hour work week. If the Contractor works more than an 8 hour day, a 40 hour week, and/or District observed holidays, the financial responsibility for added inspection shall be the responsibility of the Contractor. The prevailing hourly rates for inspection are on file with the District. Such prevailing rates will be applied at 1-1/2

times the regular rates for periods over 8 hours a day and/or 40 hours per week and/or District observed holidays and 2 times the regular rates for periods over 12 hours in one (1) day.

4. DEFECTIVE WORKMANSHIP AND MATERIAL

The Contractor shall promptly remove from the premises all work and materials condemned by the District as failing to conform to the contract, whether incorporated or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the contract and without expense to the District and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement and pay for reinspection costs.

If the Contractor does not remove such condemned work or materials within a reasonable time after notice, the District may remove them and store the materials at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within 10 days' time after such removal, the District may, upon thirty days' written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof after deducting all the costs and expenses that should have been borne by the Contractor.

5. SANITATION

All parts of the work shall be maintained in a neat, clean, sanitary condition. Fixed and portable toilets, which are made inaccessible to flies, shall be provided wherever needed for use of employees, and their use shall be strictly enforced. All waste and refuse from sanitary facilities provided by the Contractor or from any source related to Contractor's operations shall be taken care of in a sanitary manner, satisfactory to the District, and in accordance with the laws and regulations pertaining thereto. Contractor shall rigorously prohibit and prevent committing of nuisance within the work site area or upon the District's right-of-way or adjacent to private property. Contractor shall furnish all facilities and means for proper sanitation of the work, and shall protect and save harmless the District, its officers and employees from any liability resulting from improper or insufficient sanitation.

6. FIRST AID AND PROTECTIVE FACILITIES

First aid facilities and supplies shall be kept on the jobsite. Instructions in first aid shall be given, and Contractor shall provide emergency first aid treatment and supplies for his employees sufficient to comply with all legal requirements.

7. CONTRACTOR TO PROVIDE FACILITIES FOR EMPLOYEES

Contractor shall, at his own expense, provide all labor, materials, equipment, and facilities which may be required to carry out effectively the provisions of these specifications. Contractor shall receive no additional payment therefore, and all compensation to be received for such work shall be included in the prices bid on the Bidding Sheet.

8. POWER

The Contractor shall provide, at his own expense, all necessary power required for his operations under the contract. The Contractor shall provide and maintain in good order such modern power equipment and installation as shall be adequate, in the opinion of the District, to perform in a safe and satisfactory manner the work required by the Contract.

9. CLEANUP

THROUGHOUT ALL PHASES OF CONSTRUCTION, INCLUDING SUSPENSION OF WORK, AND UNTIL FINAL ACCEPTANCE OF THE PROJECT, the Contractor shall keep the premises occupied by him and the project site in a neat and clean condition, and free from unsightly accumulation of rubbish, excess construction materials, and excess excavated materials. The Contractor shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other cleaning methods.

Materials and equipment shall be removed from the site as soon as they are no longer necessary.

Care shall be taken to prevent spillage on haul routes. Any such spillage shall be removed immediately and the area cleaned.

Excess excavated material from the pipe trench shall be removed from the site immediately. Sufficient material may remain for use as backfill. Forms and form lumber shall be removed from the site as soon as practicable after stripping.

FAILURE OF THE CONTRACTOR TO COMPLY WITH THE DISTRICT'S CLEANUP ORDERS MAY RESULT IN AN ORDER TO SUSPEND WORK UNTIL THE CONDITION IS CORRECTED. No additional compensation or extension of time will be allowed as a result of such suspension.

The Contractor shall not discharge smoke, dust, or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority.

Upon completion of work and before the final estimate is submitted, the Contractor shall, at his own expense and cost, satisfactorily dispose of or remove from the vicinity of the work all plants, buildings, rubbish, unused materials, concrete forms, and other equipment and materials belonging to him or used under his direction during the construction, and in the event of his failure to do so, the same may be removed and disposed of by the District at the Contractor's expense.

10. UTILITIES AND EASEMENTS

The plan portion of each sheet indicates the general location of underground utilities as shown on available records. No attempt has been made to show service connections other than those services improved as part of the contract work. The plans also indicate the location of public right-of-way lines and easements that will be acquired by the District. It shall be the Contractor's responsibility to conduct all his operations within the rights-of-way and easements as shown on these plans.

11. RELATIONSHIP WITH OTHER GOVERNMENTAL AGENCIES

Where the pipeline and structures are constructed within the rights of way under the jurisdiction of other governmental agencies, Contractor shall comply with all requirements of said agencies.

Where the same subject matter is covered by the specifications of two or more agencies, the specifications more restrictive on the Contractor shall govern in all cases.

12. EXPOSURE OF UTILITIES IN ADVANCE OF WORK

It shall be the Contractor's responsibility to determine the exact location and depth of all utilities and service connections. He shall also determine the type, material, and condition of any utility which may be affected by or affect the work. The Contractor shall have all utility companies field locate all underground lines before start of construction.

In order to provide sufficient lead time to resolve unforeseen conflicts, order materials and take other appropriate measures to ensure that there is no delay in work, the CONTRACTOR SHALL POTHOLE ALL UTILITY MAINS THAT MUST BE CROSSED OR CLOSELY PARALLELED PRIOR TO ANY CONSTRUCTION. CONTRACTOR SHALL THEN IMMEDIATELY PROVIDE THE LOCATION AND DEPTH OF THE "POTHOLED" UTILITIES TO THE ENGINEER. The Contractor shall expose all service connections before excavation in the area. All cost incurred in exposing utilities shall be borne by the Contractor.

THE DISTRICT RESERVES THE RIGHT TO MAKE MINOR ADJUSTMENTS IN PIPELINE ALIGNMENT AND GRADE, ALL AT NO ADDITIONAL COST TO THE DISTRICT.

Failure of the Contractor to comply with these provisions will result in an order to suspend work until these provisions are complied with, and no additional compensation or extension of time will be allowed as a result of such suspension. Payment per bid item or spread.

13. ADVANCE NOTIFICATION OF AGENCIES

It shall be the Contractor's responsibility to determine and notify those agencies requiring advance notification for inspection or other purposes before beginning construction in any area of concern to said Agency. A minimum of two working days advance notice shall be given to the various agencies before beginning construction in the area unless specific advance times and requirements are stated in these detailed specifications or required by the Agency.

14. CROSSING, PROTECTION AND/OR RELOCATION OF UTILITIES

A. General

Utilities for the purpose of these specifications shall be considered as including, but not limited to, and irrespective of ownership; Pipelines (including irrigation mains), conduits, transmission lines, and appurtenances of "Public Utilities" (as defined in the Public Utilities Act of the State of California) and those of private industry, business, or individuals solely for their own use or for use of their tenants; and storm drains, sanitary sewer, street lighting, traffic signal systems, duct banks, telephone cable, transmission cables, and completely buried structures.

The District has made an earnest effort to locate and indicate on the drawings all utilities which exist within the limits of the work. However, the accuracy and completeness of the utilities indicated on the drawings are not guaranteed. If utilities are shown in profile, the depth indicated is based on general practice and is not guaranteed at any specific location. No attempt has been made to show service connections on the plans. It shall be the responsibility of the Contractor to determine the exact location of all utilities and their service connections. The Contractor shall have the utility companies field locate their utilities before excavation. The Contractor shall verify with each utility company the extent to which they will field locate their utilities. Where required, field location by Contractor forces shall be included in the contract price for which such work is appurtenant thereto and no additional allowance will be made therefore. The Contractor shall make his own investigation as to the location and type of existing utilities and their appurtenances and service connections which may be affected by the contract work, and shall notify the District as to any utility located by him which has been incorrectly shown or omitted from the drawings.

B. Utilities Shown on Plans

Where utilities cross or parallel the pipeline trench but do not conflict with the permanent work to be constructed, the Contractor shall protect the utility in place unless otherwise indicated on the plans. The Contractor shall notify the utility owner at least two working days in advance of the crossing or parallel

construction and will coordinate the construction schedule with the utility service requirements.

Unless otherwise provided in the specifications, full compensation for crossing or paralleling of utilities shown on the plans shall be included in the contract unit price for which such work is appurtenant thereto and no additional allowance will be made therefore. Said various contract prices shall include all labor, materials, tools and equipment necessary or incidental to the work.

C. Special Water/Sewer Crossings

At the locations shown on the plans or if the vertical separation between the outside of the sewer pipe and the outside of existing water pipes at crossings is less than one (1) foot, and when directed by the District, the Contractor shall provide the construction required per the detail shown on the plans and per the California Department of Public Health Water/Sewer Special Construction Requirements. The special construction will be deleted at locations shown if the vertical separation of the waterline above the sewerline is 1 foot or greater.

The District hereby reserves the right to increase or decrease this item from the quantity shown on the Proposal forms without altering the unit price bid per each. Payment will be made in accordance with the unit bid price provided on the Bidding Sheet; in the event no item for said special construction work is designated on the Bidding Sheet, Contractor shall be paid under the "Extra Work" provisions of the Contract Appendix.

D. Relocation of Utilities by the Contractor for His Own Convenience

The temporary relocation or the alteration of any utility desired by the Contractor solely for his own convenience in the performance of the contract work, to a position or condition other than that provided for in the specifications or shown on the drawings, shall be the Contractor's own responsibility, and he shall make all arrangements with the property owners regarding such work. Any costs of such work for the Contractor's own convenience shall be absorbed in the unit prices or included in the lump sum amounts bid for the various contract items.

E. Service Connections

Compensation for service connection crossings (not shown on the Plans) shall be included in the contract price for which such work is appurtenant thereto and no additional allowance will be made therefore.

F. Utility Conflicts with Proposed Improvements

If a utility, whether shown on the plans or not, should intersect the proposed improvement at grade anywhere along the line of the improvement, the Contractor shall immediately notify the District. The Contractor may be advised to continue with the construction, leaving sufficient "gap" in his construction as determined by the District as may be necessary to accommodate resolution of the conflict, to be completed after the conflict has been resolved. In addition, the Contractor shall notify the District in writing, stating the nature of the conflict, location by schedule, sheet number, name of the street or location of easement and the station at which the conflict occurred. The District shall, within a reasonable time, make the necessary arrangements to resolve the conflict. Completion of the gap after the resolution of conflict shall not be just cause for additional compensation. Such completion of the "gap" shall be started within three working days after the Contractor has been notified of resolution of the conflict and completed in a workmanlike manner within reasonable time thereafter. When directed or approved by the District, changes in line or grade of any structure being built may be made in order to avoid utilities. Any additional costs because of such changes will be paid for as "Extra Work".

When a utility shown on the plans conflicts with the proposed improvements, the District will arrange for the relocation or alteration of said utility or require the Contractor to do same as "Extra Work". Work required in connection with unknown utilities will be performed and paid for as specified in the following paragraphs.

G. Unknown Utilities Disclosed During Contract Work

(Not including service connection)

In the event that a utility is disclosed or installed subsequent to the award of contract, such utility not being indicated on the drawings, the alteration, relocation or proper support and protection shall be done and paid for as follows:

(1) When said utility is found to occupy the space required to be occupied by a part of the permanent works to be constructed under the Contract, the District will arrange for the relocation or alteration of said utility, or require the Contractor to do same as "Extra Work".*

(2) When the said utility is found to lie parallel to the permanent work and within the trench prism defined by the minimum allowable trench excavation consistent with safety and the rules, orders and regulations of local, State and Federal agencies having jurisdiction; the District will arrange for the relocation, protection or alteration of said utility, or require the Contractor to do same as "Extra Work".*

(3) When said utility is more or less parallel with, and any portion of it does not lie within the trench prism specified hereinabove, the Contractor shall advise the District thereof, and in cooperation with the District of the utility, provide and place the necessary support, if any, for proper protection to ensure continuous and safe operation of the utility. All costs of such work shall be borne by the Contractor.

(4) Utilities found to cross the excavation but not intercepting the permanent works to be constructed, then the Contractor will be required to protect the existing facility in place and construct the proposed facility under the unknown utility.

Compensation for such crossings will be at a unit price per each in accordance with the proposal therefore. The number of such crossings is estimated and the District hereby expressly reserves the right to add to the number shown or decrease from the number shown or to totally delete the item for unknown utility crossings at no change in the unit price per each. The time extension for such crossings shall be determined by the District

*For District contracted work.

and shall be added to the total time for completion allowed and for which no liquidated damages will be assessed.

(5) Upon disclosing a utility in the course of excavation that was not indicated on the drawings or marked in the field, the Contractor shall protect it in place. However, he shall immediately investigate if it is abandoned. The Contractor will be compensated at the bid unit price for unknown utility crossings only for the initial crossing of abandoned lines; and only if he did protect the abandoned utility in place.

H. Responsibility of the Contractor

The Contractor shall be held responsible for all costs for the repair of any and all damage to the contract work or to any utility (whether previously known or disclosed during the work), as may be caused by his operations. Utilities not shown on the drawings to be relocated or altered by others, shall be maintained in place by the Contractor.

At the completion of the contract work, the Contractor will leave all utilities and appurtenances in a condition satisfactory to the utility owners and the District.

15. PROTECTION OF FACILITIES OTHER THAN UTILITIES

It shall be the Contractor's responsibility to protect in place or remove and replace to original condition all existing facilities. The existing natural and man-made features and elevations on the plans are shown by topography. The topography shown is not guaranteed complete. It shall be the Contractor's responsibility to familiarize himself with the conditions of proposed work and to identify by field investigation those features, whether or not shown on the plans, which require removal and replacement or protection in place. These features include, but are not limited to, fences, cross gutters, roads, sidewalks, driveways, curbs and gutters, power poles, signs, drainage structures, trees, landscaping, etc.

The Contractor shall repair all existing structures which may be damaged as a result of the work under the contract. Reconstruction shall be of the same type and material as the existing facility and shall be of equal quality or better than the original work.

Full compensation for complying with these requirements shall be considered as included in the price bid for the various items of work, and no additional compensation shall be made therefore.

16. GROUND WATER

Contractor shall investigate the possibility of ground water prior to submitting bid and shall assume all cost and liabilities incurred, should a ground water problem arise.

17. CONSTRUCTION WATER

The Contractor shall make all arrangements to furnish all construction water, all at no cost to the District, unless otherwise stated in the Special Requirements herein.

Bidder should contact District prior to submitting bid for further information regarding District's policy on construction water.

18. WATER SUPPLY FOR COMPACTION AND DUST CONTROL

Contractor shall furnish and apply all water necessary for compaction and dust abatement purposes.

He shall apply water to construction areas where dust conditions so warrant, as directed by the District.

The water supply and payment of fees shall be the responsibility of the Contractor, unless otherwise stated in the Special Requirements herein.

Full compensation for complying with these requirements shall be considered as included in the price bid for the various items of work, and no additional compensation shall be made therefore.

19. TRAFFIC CONTROL

It shall be the Contractor's responsibility to maintain traffic warning signs, barricades, flagmen, and other traffic control devices as required to maintain two-way traffic, and as required by agencies having jurisdiction over the roadways in the work area. It shall be the responsibility of the Contractor to investigate with various agencies having jurisdiction over the right-of-way in work area to determine the extent of traffic control that may be required by each agency.

Also, it shall be the Contractor's responsibility to provide all traffic control devices to ensure a safe working environment for any associated project work such as survey, geotechnical and materials testing, etc... that is required.

Full compensation for compliance with those provisions shall be considered as included in the bid unit price for various items, and no other compensation shall be made therefore.

20. ACCESS TO ADJACENT PROPERTIES

Contractor shall at all times provide access to the properties in the area of work, unless otherwise approved by District. The Contractor shall be responsible for providing 24 hours notice to properties that will not have access. It shall be the responsibility of the Contractor to provide such temporary structures in the area of work to provide reasonable access to the properties. At least one (1) lane on cross streets shall be available at all times for use of vehicles and emergency equipment.

Full compensation for compliance with these provisions shall be considered as included in the bid unit price for various items, and no other compensation shall be made therefore.

21. STAKING OF LINE AND GRADE*

The District will provide offset line and grade stakes at ground level and will furnish cut sheets therefore. The Contractor shall be responsible for transfer of such offset line and grade into the trench for construction of the work and for the accuracy of such transfer. Cost of such transfer will be included in the unit prices bid for the work and no extra compensation will be made to the Contractor.

The Contractor shall inform the District a reasonable time in advance (at least three working days) as to his need for additional grades and lines, in order that the same may be furnished and all necessary measurements made for record and payment with the minimum of inconvenience to the District or of delay to the Contractor.

The Contractor shall examine carefully all construction stakes and by visual inspection of stakes, string lines and headers set therefrom, interpret and confirm that the line and grade information is in accordance with the Plans. If there is an apparent error

* For District contracted work.

or lack of understanding as to what is meant by the staking, the Contractor shall request an interpretation of staking before proceeding with any work.

The Contractor shall preserve bench marks, survey stakes, and points set for lines, grades, or measurement of the work in their proper places until authorized by the District to remove them. In case of their destruction or removal by him or his employees or agents, they shall be replaced at the Contractor's expense.

22. PROTECTION OF SURVEY MONUMENTS

It shall be the Contractor's responsibility to protect all of the existing survey monuments. Removal of such monuments or displacement thereof shall require their resetting per the existing type of monument. The cost of resetting such monuments shall be the financial responsibility of the Contractor. Contractor is advised that resetting of monuments must be done by a registered civil engineer or licensed land surveyor. Should the Contractor anticipate removal of any survey monuments, he shall include the cost of resetting of the same in the various items of work.

23. RECORD DRAWINGS

The Contractor SHALL PROVIDE, and keep up-to-date, a complete "as-built" record set of blueline prints, which shall be corrected daily and show every change from the original Drawings and Specifications and the exact "as-built" locations, measurements, sizes, and kinds of equipment. Prints for this purpose shall be obtained from the Engineer at cost. This set of Drawings shall be kept on the work site and shall be used only as a record set. The Engineer shall require that these drawings be presented monthly for review prior to any progress payment being made. At the completion of construction, the Contractor shall deliver said record set of prints to the District and will be required to certify the accuracy of the Record Drawings.

24. RESEEDING

Where cultivated and maintained ground covers in lawns, parkways or easements have been removed for installation of pipelines, the Contractor shall restore or replace such ground cover in kind by reseeding or resodding, after the backfill in the trench or excavation has been consolidated and the construction area graded and cleared of rocks and other objectionable material as required by these specifications. After reseeding or resodding the areas shall be covered with a suitable mulch.

Where natural vegetation has been removed for installation of pipelines, after the installation, compaction, grading and clearing has been completed, the Contractor shall reseed such areas in accordance with Section 25 - "Erosion Control" of these Basic General Specifications.

All costs to the Contractor for restoration, replacement, reseeding or resodding shall be absorbed in his bid for the applicable unit prices per linear foot of pipe and no other compensation will be made therefore.

25. EROSION CONTROL

A. General

The Contractor shall provide erosion control measures as defined herewith on all areas where the natural vegetation has been disturbed by the construction of the facilities. If a ground cover other than natural vegetation has been disturbed, this section does not apply and the Contractor shall replace said ground cover in kind.

B. Preparation

After the backfill has been compacted and the pipe line tested, the Contractor shall remove and dispose of rocks and debris from the area to be reseeded. No seeding shall be performed during windy weather or when the ground is too wet or in an untillable condition. The fertilizer and seed shall be spread before the straw cover material is applied. Commercial fertilizer shall not be applied until after the seed has been sown.

C. Material

Materials shall consist of the following: Seed - The seed shall consist of the following mixture: Crested wheatgrass, 47 percent; Intermediate Wheatgrass, 27 percent; Wimmera Ryegrass, 13 percent; Blando Ryegrass, 13 percent. The seed shall be spread at the rate of 100 pounds per acre and shall be applied by the use of a "Cyclone Seed Sower" or equal. Fertilizer - The fertilizer shall be Ammonium Phosphate (16-20-0) spread at the rate of 300 pounds per acre and shall be applied by the use of a "Cyclone Seed Sower" or equal. Mulch - After the application of the seed and fertilizer, new straw (stable bedding straw shall not

be used) shall be uniformly spread at the approximate rate of four tons per acre. The straw shall then be "Mulched" into the ground by use of a "wire" roller or other approved equipment.

D. Protection for Steep Slopes

In cases where the grade over the pipe line exceeds 25 percent slope the Contractor shall provide additional erosion control measures to stabilize the backfill material. The Contractor shall submit to the Engineer for his approval, special engineering details of the method to be used.

Full compensation for complying with the requirements of this section shall be included in the unit price per linear foot of pipe installed and no other compensation shall be made therefore. Bidder's attention is specifically called to the fact that the responsibility of determining the amount and the type of erosion protection shall rest with the prospective bidder.

26. CONTRACTOR'S SUBMITTALS

Whenever called for in these Specifications or on the Drawings, or where required by the District, the Contractor shall furnish to the District for review 7 copies of each submittal at no expense to the District. Copies of all shop drawings shall be submitted, accompanied by a letter of transmittal, and shall be addressed to the District.

The letter of transmittal, shall give a list of the numbers of the drawings submitted. All drawings must be marked with the name of the project and the name of the Contractor and be numbered consecutively. All drawings must be complete in every respect.

Revisions indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Drawings and Specifications and shall not be taken as the basis of claims for extra work.

It is considered reasonable that the Contractor shall make a complete and acceptable submittal to the District by the second submission of a submittal item. The District reserves the right to withhold monies due the Contractor to cover additional costs of review beyond the second submission.

Approval of shop drawings will be general and shall not relieve the Contractor from the responsibility for proper fitting and construction of the work, nor from furnishing the material and work required which may not be indicated in the shop drawings when approved; neither does it relieve him from responsibility for errors in shop drawings.

Example submittals include, but are not limited to the following:

A. All materials provided by the Contractor

B. All appurtenances provided by the Contractor

C. Miscellaneous

(1) Pothole information for utilities

(2) Copies of permits required to be obtained by the Contractor

(3) SWPPP

(4) Schedule of construction (with key milestones provided)

(5) Waterline filling, disinfection, and flushing procedures

(6) Sewer bypass plan

(7) Safety program

27. RESPONSIBILITY FOR MATERIAL FURNISHED BY THE DISTRICT

The Contractor's responsibility for material furnished by the District shall begin upon the Contractor's acceptance at the point of delivery to him. All material shall be examined by the Contractor and District. The Contractor shall immediately (upon delivery) notify the District of any material the Contractor perceives to be defective in manufacture or otherwise damaged. Should the District concur that the material should not be utilized the material will be replaced by the District. Material furnished by the District in good condition and accepted by the Contractor which is later discovered to have been damaged, shall be replaced by the Contractor at his expense. The Contractor shall be responsible for the safe storage of all materials until they have been incorporated in the completed project.

28. ERRORS OR DISCREPANCIES NOTED BY CONTRACTOR

If the Contractor, either before commencing work or in the course of the work, finds any discrepancy between these Specifications and drawings, or between either of

them and the physical conditions at the site of the work, or finds any error or omission in any of the drawings or in any survey, he shall promptly notify the Engineer in writing of such discrepancy, error or omission.

29. HANDLING AND STORAGE OF MATERIALS

All materials shall be handled in such a manner as to prevent damage and, in the case of water system work, maintain sanitary conditions. All materials for use in the work shall be stored by the Contractor in such a manner as to prevent damage from exposure to the elements, admixture of foreign materials or from any other cause. The Contractor shall be entirely responsible for damage or loss by weather or other causes as to work under the Contract

30. GEOTECHNICAL SERVICES

All construction operations should be observed by a representative of the geotechnical engineer. The presence of the geotechnical engineer's field representative will be for the purpose of providing observation and field testing, and will not include any supervising or directing of the actual work of the contractor, his employees, or agents. Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the contractor in any way for defects discovered in his work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the contractor. CONTRACTOR TO PROVIDE SAFE ACCESS FOR GEOTECHNICAL IN CONFORMANCE WITH OSHA STANDARDS AT NO ADDITIONAL COST TO THE DISTRICT.

Dependent upon the circumstances of each particular project, as determined by the District, geotechnical services may include full time monitoring and testing or part time, periodic monitoring and testing.

31. EARTHWORK

A. General

Earthwork shall conform to the requirements of the Agency having jurisdiction, but shall not be less than herein specified. Earthwork shall be performed in accordance with the requirements of Section 19 of the Specifications

entitled: "State of California, Department of Transportation, Standard Specifications", Latest Edition, insofar as the same may apply and except as herein modified.

All excavations and embankments required to complete the work as specified herein shall be unclassified and made to the lines and grades shown upon the plans, or as staked in the field. (ALL EXCAVATION SHALL BE UNCLASSIFIED AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY PRIOR TO SUBMITTING HIS PROPOSAL TO FAMILIARIZE HIMSELF WITH THE CONDITIONS THAT HE MAY ENCOUNTER DURING CONSTRUCTION.) Excavated materials not required for fill, embankments or backfills shall become the property of the Contractor, and shall be disposed of at his own expense.

All excavations shall be protected and supported as required for safety and in the manner set forth in the rules, orders and regulations prescribed by the Division of Industrial Safety of the State of California.

All trenches and excavations shall be backfilled overnight and on weekends and holidays. Barriers shall be placed at each end of all excavations, and at such places as may be necessary along excavations from sunset each day to sunrise of the next day until such excavation is entirely refilled. (BACKFILL SHALL BE COMPLETE AND STREETS OPEN TO TRAFFIC BY 5:00 P.M. UNLESS OTHERWISE APPROVED BY THE DISTRICT.)

No excavated material shall be deposed on private property unless written permission of the Property Owner thereof is secured by the Contractor, or specifically provided for on these plans and in these specifications. Copies of said written permission, duly signed by the Property Owners of the private property involved, shall be furnished the District by the Contractor before any excavated material is placed outside the limits of the established right-of-way. Free access must be provided to all driveways, watergates, hydrants, etc.

Any water which may be encountered or may accumulate in the excavation shall be pumped out or otherwise removed as necessary to keep the bottom of the excavation free and clear of water during the progress of the work.

B. Clearing and Grubbing

Areas where construction is to be performed shall be cleared of all rubbish and other objectionable material of any kind, which, if left in place, would interfere with the proper performance or completion of the contemplated work, would impair its subsequent use or form obstructions therein. Trees and other landscaping, unless otherwise specifically identified on the plans for removal, shall not be destroyed, and such measures as are necessary shall be taken by the Contractor for the protection thereof. Organic material from clearing and grubbing operations will not be incorporated in excavation backfill.

It shall be the Contractor's responsibility to remove and dispose of all excess material resulting from clearing and grubbing operations at his own expense. The Contractor shall make his own arrangements for disposal sites at his own expense, at which said material may be wasted. Full compensation for clearing and grubbing shall be included in the contract unit price for which such work is appurtenant thereto, and no additional allowance will be made therefore.

C. Grading Along Pipeline

The Contractor shall perform all grading to provide a working pad along the pipeline. The pad grade shall follow the existing ground grade as nearly as possible. If unnecessary excessive overcutting occurs during this operation, the Contractor may be required to replace all such overcut material and recompact to 90%, or to do other remedial work as directed by the District, all at no cost to the District.

D. Trench Excavation

(1) General

Excavation for water/sewer pipe, fittings, and appurtenances shall be in open trench to the depth and in the direction necessary for the proper installation of the same as shown upon the plans or as otherwise directed by the District. Trench banks shall be kept as near vertical as is safe, and where necessary shall be properly braced and sheeted, in accordance with the provisions of the Section herein entitled "Trench and Excavation Shoring". The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. For

sewer pipe, at each joint the bottom of the trench shall be recessed in such a manner as to relieve the bell or coupling of all load.

Where the excavation has been made deeper than necessary, the Contractor shall furnish crushed rock, sand, or other material approved by the District for bedding to provide uniform support under the lower third of the depth of the pipe barrel. The cost of the material and labor to place and compact to achieve a firm and stable foundation herein specified shall be included in the unit price bid for the size of pipe laid thereon.

(2) Limit of Excavation

Except with specific approval of the Engineer, no more than 500 feet of open trench shall be excavated in advance of laying of pipe.

(3) Tunneling

Tunneling will be permitted only where native earth is of such firmness that it will remain in its original position, without sloughing off, throughout the work of excavation and backfilling; if sloughing occurs, the roof of the tunnel shall be broken down and the trench excavated as an open trench as herein specified.

(4) Trench Widths

(a) Water

As stated elsewhere in these Specifications, all trenches shall have vertical sides, unless District may designate otherwise. Trench width shall be such that ample working room shall be provided on either side of pipe, provided that width of ditch measured at top of pipe shall not exceed 3 pipe diameters or 3', whichever is greater. In the event of caveins of trench sides where aforesaid width is exceeded, District may, at his discretion, require Contractor to use concrete or other means of special backfill for a vertical distance of not less than 1/4 the outer pipe diameter. The cost of the labor and material to provide the concrete cradle, if

required, shall be the responsibility of the Contractor, and no additional compensation will be made therefore.

(b) Sewer

The maximum allowable trench width, at the top of the pipe, is the outside diameter of the barrel plus ten (10) inches on either side of the exterior of the pipe barrel. Where the trench width at the top of the pipe is wider than ten (10) inches on either side of the exterior of the pipe barrel, the pipe shall be backfilled from the bottom of the trench to a level one-fourth (1/4) of the diameter above the center of the pipe with 3/4-inch crushed rock or as directed by the District. The cost of the labor and material to provide crushed rock encasement, if required, shall be the responsibility of the Contractor, and no additional compensation will be made therefore.

(5) Blasting

Use of explosives on the work shall be subject to approval of the District. All operations involving handling, storage and use of explosives shall be conducted with every precaution prescribed by Construction Safety Orders of Division of Industrial Safety, State of California, and by local laws and regulations. Only competent, reliable persons working under experienced supervision shall be permitted to use explosives. Contractor will be held responsible for and shall make good any damage caused by blasting or otherwise resulting from disposition or use of explosives on the work. Contractor shall obtain, at no additional cost to the District, blasting permit(s) that may be required.

(6) Grading for Pipeline Appurtenances

The Contractor shall perform all rough and fine grading to provide a graded area, sloped to drain, extending 3' minimum radially outside the limits of each air valve or blow-off installation as directed by the District in the field to assure accessibility.

The Contractor shall perform all rough and fine grading to provide a graded area, sloped to drain, extending 4' minimum radially outside the limits of each complete fire hydrant installation to assure accessibility. The location and elevation of graded pad for each fire hydrant installation will be directed by the District in the field.

E. Trench and Excavation Shoring

Pursuant to Section 6705 of the Labor Code of the State of California, in advance of any excavation pursuant to this contract, Contractor shall submit to the District for his acceptance a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer. Nothing in this provision shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the "Construction Safety Orders". Reference shall also be made to the rules, orders, and regulations of the Division of Industrial Safety of the State of California, latest edition, and the U.S. Department of Labor, Safety and Health Standards for Construction, latest edition.

FULL COMPENSATION FOR COMPLYING WITH THESE REQUIREMENTS SHALL BE CONSIDERED TO BE INCLUDED WITHIN THE CONTRACT UNIT OR LUMP SUM BID PRICES PAID FOR THE VARIOUS ITEMS ON THE BIDDING SCHEDULE, AND NO ADDITIONAL ALLOWANCE WILL BE MADE THEREFORE.

F. Pipe Bedding

(1) General

(a) Water

Normal bedding without crushed rock or concrete cradle shall be used unless otherwise shown on Drawings or ordered by District. For normal bedding of pipe, bottom of trench shall be excavated uniformly to grade as indicated on the Standard Drawings.

Trench bottom shall be given a final trim such that each pipe section when first laid will be continuously in contact with ground along extreme bottom of pipe. At each joint in the water pipe, the bottom of the trench shall be recessed in such a manner as to relieve the bell of the pipe of all load. Rounding out trench to form a cradle for pipe will not be required.

(b) Sewer

All pipe bedding shall be of the type indicated on the plans and shall be in accordance with the pipe bedding Standard Drawings included in these Specifications.

Bedding shall be sand, gravel or crushed aggregate having a minimum sand equivalent of not less than 30 or having a coefficient of permeability greater than 0.001 centimeters per second. (COMPENSATION FOR BEDDING MATERIAL AS INDICATED ON THE PLANS SHALL BE INCLUDED IN THE CONTRACTOR'S BID FOR THE APPLICABLE UNIT PRICES PER LINEAR FOOT OF PIPE AND NO ADDITIONAL COMPENSATION WILL BE MADE THEREFORE.) Minimum compaction for all pipe bedding shall be 90% relative compaction.

Where native material is acceptable for bedding as approved by the Engineer (sand equivalent of 30 or greater) the trench bottom shall be graded to provide smooth, firm and stable foundation at every point throughout the length of the pipe. At each joint in the pipe, the bottom of the trench shall be recessed in such a manner so that the load will be carried uniformly throughout the length of pipe, including the bell or collar.

(2) Unstable Material

Where material at the bottom of the trench is found to be unstable, soft, or spongy, such material shall be removed to a depth as determined by the Engineer and replaced with Special Crushed Rock Bedding as specified in Section 1-G herein.

(3) Rock

Where rock is encountered, it shall be removed below grade, and the trench backfilled with suitable material to provide a compacted earth cushion with a thickness under the pipe of not less than 1/2-inch per inch of nominal diameter of the pipe to be installed, with a minimum allowable thickness of 6-inches. Where a special bedding class is indicated on the plans, the depth indicated on the Standard Drawing shall be increased to that stated herein, all at no additional cost to the Owner.

CONTRACTOR SHALL RECEIVE NO ADDITIONAL COMPENSATION FOR ABOVE MENTIONED WORK.

G. Special Crushed Rock Bedding

When groundwater is encountered in the excavation, or when soft, spongy and unstable material is encountered in the bottom of the trench, and when approved by the District, the material in the bottom of the trench shall be removed to a depth directed by the District and replaced with well graded 3/4-inch maximum crushed rock bedding as specified below. The crushed rock bedding shall be installed and compacted as shown on the Standard Drawing attached to these Specifications, or with no standard drawing place crushed rock bedding 8" min. thickness (90% min. compaction) under bottom of pipe. The 3/4-inch maximum crushed rock material shall be approved by the District before use.

Crushed rock shall be the product of crushing rock or gravel. Fifty percent of the particles retained on a 3/8-inch sieve shall have their entire surface area composed of faces resulting from fracture due to mechanical crushing. Not over 5% shall be particles that show no faces resulting from crushing. Less than 10% of the particles that pass the 3/8-inch sieve and are retained on the No. 4 sieve shall be waterworn particles. Gravel shall not be added to crushed rock. Crushed rock shall have the following gradation:

Sieve Sizes	3/4-inch Max Crushed Rock % Passing
1"	100
3/4"	90-100
1/2"	30-60
3/8"	0-20
No. 4	0-5
No. 8	--

Special Crushed Rock Bedding, where ordered by the District, shall be paid for at the unit price per ton complete in place, if Bidding Sheet so indicates, otherwise total cost of special crushed rock bedding shall be borned by the Contractor.

Payment for trench width for Special Crushed Rock Bedding shall be limited to a maximum width of three (3) outside pipe diameters or the actual width, whichever is less. Any trench excavation beyond the maximum width limit shall be filled and compacted with crushed rock per the Standard Drawing, and the COST OF THE ADDITIONAL BEDDING SHALL BE BORNE BY THE CONTRACTOR.

THE DISTRICT RESERVES THE RIGHT TO INCREASE OR DECREASE THIS ITEM WITHOUT CHANGE IN UNIT PRICE OF THIS ITEM OR ANY OTHER ITEM.

H. Trench Backfill and Compaction Requirements

(1) General Requirements (Water)

All excavations shall be backfilled with compacted material to level of original ground surface, unless otherwise shown on Drawings or ordered by District. Materials used for backfill shall be imported or

selected excavated material and shall be placed as shown on Drawings or as specified in these Specifications or any specifications made a part hereof by reference, or as directed by District. Backfill materials shall not be dropped directly on structures or pipeline, and all materials placed within 6" of pipe or structure shall be free from rocks or boulders larger than 2" maximum dimension and from unbroken masses of earthy materials which might lodge and thereby cause unfilled pockets in excavations.

(2) Backfill Procedure (Water)

Material used in backfilling first layer shall be cohesionless, sandy loam, sandy, or sandy gravel material obtained from required excavation or from approved borrow areas. It shall not contain any rocks or other hard material detrimental to good bedding of pipe or that might be damaging to protective pipe coating. Trench shall be filled to 6" over top of pipe and flooded, jetted, and poled to secure adequate saturation and permitted to stand and settle before placing next layer; balance of trench shall be filled with material from excavation in layers not exceeding 3' in depth. Each layer shall be flooded, poled, and jetted, taking care not to disturb underlying layer, before placing succeeding layer, and Contractor shall at all times protect pipe against flotation.

Contractor shall understand that procedure for backfill outlined hereinabove is general and that conditions may be encountered where, due to a change in type of soil, methods specified hereinabove, particularly flooding, may result in leaving therein areas of dry, uncompacted backfill material adjacent to pipe and that when, in the opinion of District, soil type encountered does not permit adequate backfill compaction by flooding, Contractor will be required to jet all backfill compaction as District may direct or as specified elsewhere in these Specifications or any specifications made a part hereof by reference.

Along road or street right of way, ENTIRE TRENCH SHALL BE BACKFILLED AS PRESCRIBED BY AGENCY HAVING JURISDICTION. In no event shall backfill material be compacted to a density of less than that of surrounding undisturbed soil. All trench

backfill shall be compacted to 90% of maximum density as determined by ASTM D 1557-91, if so required by District and unless greater compaction is prescribed by agency having jurisdiction.

(3) Pipe Protection (Water)

Before backfilling, conductor tubes, if used, shall be strutted sufficiently to prevent distortion while compacting backfill. All struts shall be removed after compacting backfill. After insertion of pipe, conductor tubes shall be grouted with either dry sand or cement grout, at District's option.

Before backfilling, mortar-lined and coated steel pipe, 30" diameter and larger, shall be either filled with water or braced with studs sufficiently to prevent distortion while compacting backfill. All bracing shall be removed after compacting backfill.

(4) Pipe Zone (Sewer)

After the sewer pipe has been laid and inspected as herein specified, the trench shall be backfilled from the level of the bedding shown on the Standard Drawings, to a height of one (1) foot above the top of the pipe with specially selected and carefully compacted material which shall be clean, fine earth or sand, free from large stones or lumps. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe. Minimum compaction for all pipe zone material shall be 90% relative compaction.

(5) Procedure Above Pipe Zone (Sewer)

From the top of the pipe zone backfill to ground surface, the material for backfill may contain stones ranging in size up to 6-inches in diameter, in quantity not exceeding 40 percent of the volume when said coarse materials are well distributed throughout the finer materials so as to eliminate voids and the specified compaction may be attained. Rocks greater than 2-1/2 inches in any dimension will not be permitted in backfill placed within one foot of pavement subgrade.

(6) Compaction Above Pipe Zone (Water & Sewer)

Relative compaction in all streets and easements, public and private, from the pipe zone to the bottom of base material shall be 90% (95% to within 12 inches of the bottom of the base material). The base material shall be the thickness required and compacted to 95% relative compaction.

(7) Compaction Tests

The compaction test, as required by the District, that meets the required compaction, shall be paid for directly to the testing laboratory by the District. The minimum District requirements are as follows: Compaction tests shall be made at intervals not greater than 150' and one (1) test every 2' maximum vertical increment of trench backfill. Additionally at least 50% of all service laterals shall be tested. The tests shall be made in accordance with a combination of the Sand Cone Method (ASTM D1556) and nuclear gauge testing methodology at rates (i.e. 1 sand cone method to "10" nuclear gauge tests) specified by the District and at varying depths.

It should be noted that dependent upon the circumstance of each project (e.g. quantity of earthwork involved), compaction testing could be administered on a full time basis.

It shall be the Contractor's responsibility to pay for all compaction tests that indicate insufficient compaction in the area where the Contractor has previously indicated that compaction was completed.

The Contractor shall provide, at his own expense, all labor and equipment necessary for all compaction test holes. Choice of location of all tests will be made by the District. The aforementioned labor and equipment shall be readily available to perform the necessary work when required. Should the contractor not be ready to perform such work in support conducting the compaction test, and standby charges are incurred by the District for such a delay, the contractor shall be responsible for payment of said standby charges.

It shall be the Contractor's responsibility to advise the District two working days prior to requiring compaction tests.

(8) Compaction Requirements under Agency Permit

Where the permit of a governing agency sets forth requirements for compaction more stringent than those stated herein, the Contractor shall adhere to the Agency requirements.

(9) Excess Excavated Material

The Contractor shall make the necessary arrangements for and shall remove and dispose of all excess or unsuitable material. All costs for the disposal of excess or waste material shall be borne by the Contractor.

It is the intent of these specifications that all surplus material not required for backfill shall be disposed of by the Contractor outside the limits of the public rights-of-way.

Excavated material shall not be deposited on private property unless written permission from the Property Owner thereof is secured by the Contractor. Copies of said written permission, duly signed by the Property Owner of the private property, shall be furnished to the District by the Contractor before such material is placed on private property.

(10) Imported Backfill Material

Whenever the excavated material is, in the opinion of the District, unsuitable for backfill, the Contractor shall arrange and furnish imported backfill material. Such backfill material shall comply with the requirements of pipe bedding in Section 31.F.(1) herein.

Full compensation for disposing of unsuitable material, as well as for providing suitable material as herein specified, shall be paid for at unit price per ton of such material delivered and placed in accordance with backfill requirements, if Bidding Sheet so indicates, otherwise total cost of Imported Backfill Material shall be borne by the Contractor.

Contractor is hereby notified that the actual quantity of imported backfill material specified herein cannot be determined at this time. The District is anticipating a condition that may not exist; therefore, the quantities are fictitious for the purpose of comparing bids and the District reserves the right to reduce, to totally delete, or increase, the quantity of imported backfill material required without any consideration for adjustment in unit price of this item or any other item if the material is not needed or the final quantities are substantially different from those shown on the bidding schedule.

I. Structure Excavation and Backfill

Structure excavation shall include the removal of all material of whatever nature necessary for the construction of foundations and other structures in accordance with the plans.

In operating compacting equipment near structures, care shall be used to prevent the displacement of, or injury to, the structure. Backfill shall be carried up evenly on all sides in accordance with the soils engineer's recommendations.

No backfilling shall be done until concrete is thoroughly set and is safe to withstand the load.

All excavation shall be unclassified and it shall be the Contractor's responsibility prior to submitting his proposal to familiarize himself with the conditions that he may encounter during construction.

Full compensation for complying with the above requirements for structure excavation and backfill shall be considered as included in the lump sum bid for a structure, and no other compensation shall be made therefore.

J. Control of Water

The Contractor shall provide and maintain at all times during construction, ample means and devices with which to promptly remove and dispose of all water entering the excavations or other parts of the work. No concrete footings or floors shall be laid in water nor shall water be allowed to rise over them until the concrete or mortar has set at least eight hours. Water shall not be allowed to rise

unequally against walls for a period of 28 days. Ground water shall not be allowed to rise around pipe installations until jointing compound in the joints has set.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction. Water shall be disposed of in such a manner as not to be a menace to the public health.

Dewatering for structures and pipe lines shall commence when ground water is first encountered, and shall be continuous until such times as water may be allowed to rise in accordance with the provisions of this Section.

K. Payment

Payment for earthwork and for conforming to all of the provisions of these specifications, unless otherwise specified herein and itemized in the bid schedule, shall be considered to be included in the contract unit or lump sum prices paid for the various items of work wherein earthwork is required, and no additional allowance will be made therefore.

06/06/2011

BASIC SPECIFICATIONS
SECTION B

WATER PIPELINE MATERIALS SPECIFICATIONS

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JUNIPA
COMMUNITY SERVICES DISTRICT

BASIC SPECIFICATIONS

SECTION B

WATER PIPELINE MATERIALS SPECIFICATIONS

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BASIC SPECIFICATIONS

SECTION B

WATER PIPELINE MATERIALS SPECIFICATIONS

1. GENERAL

A. Alternate Pipeline Materials

Where alternate pipeline materials are allowed by the District, the Contractor shall select such materials and construction methods as will result in a satisfactory completed project. All pipe materials shall be new and unused unless otherwise specified. Materials and strength of pipe shall be as shown on the plans or as specified herein.

B. Contractor Furnished Materials

The Contractor shall furnish (excepting materials specifically listed in the Special Requirements to be furnished by the District) and install all pipe, fittings, supports, bolts, nuts, gaskets, jointing materials, appurtenances, auxiliary piping and connections to equipment in accordance with the drawings and specifications, all as required for a complete and workable piping system.

C. Exposed Piping Supports

All exposed piping shall be adequately supported with devices of appropriate design unless otherwise approved by Engineer, the support shall conform to the Standard Drawing A-5 or as shown on the Drawings.

D. Piping Sizes

Pipe sizes are nominal inside diameter unless otherwise noted. All sizes and types of pipe are noted on the Drawings, and specified herein. Where pipe is lined, the nominal diameter shall be the inside diameter of the cement mortar lining, except for wrought iron pipe.

E. Dissimilar Metals

All dissimilar metals shall be insulated from one another with approved insulating flange sets or unions.

F. Material Identification

All pipe and fittings delivered to the job site shall be clearly marked to identify the manufacturer's name, material, class, and thickness. All material shall be new and free of blemishes. Acceptance of pipe and accessories by the District will be based on load bearing tests, and inspection of the complete products as specified hereinafter. Acceptance of installed piping will be based on inspection and leakage tests as specified hereinafter.

2. WELDED STEEL PIPE, CML & CMC

Shop fabricated pipe with machine-applied lining and coating, dye-check shop welding performed after hydrostatic testing of cylinders, pipe per AWWA C200, steel plate per ASTM A1011/A1011M, 12 ga. minimum, minimum yield 33,000 psi, cement mortar coating and lining per AWWA C205; produced by a "District Approved Manufacturer". Design stress shall not exceed 16,500 psi. Each pipe section shall be provided, prior to delivery, with temporary plastic end covers, with exposed steel shopcoated, 40' maximum joint lengths, lap weld bell x plain end spigot, or rubber gasket bell x rubber gasket spigot (as indicated on the Drawings and/or Bidding Sheet), including rubber gaskets and gasket lubricant. Pipe furnished herein shall be the product of an organization which has had not less than ten (10) years successful experience in the manufacture of pipelines of the type specified or comparable; and the total pipeline shall be the product of one company, or more than one integrated company, in business for the design and manufacture of all pipeline materials required herein.

The minimum steel plate thicknesses utilized for water pipeline shall be as shown below:

JURUPA COMMUNITY SERVICES DISTRICT
MINIMUM WATER PIPELINE THICKNESS

Nominal Pipe Diameter	Minimum Cylinder Diameter	Class 150 Minimum Plate Thickness	Minimum Cement Mortar Lining Thickness	Minimum Cement Mortar Coating Thickness
6"	6-5/8" O.D.	0.1046"	5/16"	3/4"
8"	8-5/8" O.D.	0.1046"	5/16"	3/4"
12"	12-3/4" O.D.	0.1046"	5/16"	3/4"
16"	17-3/8" O.D	0.1046"	3/8"	3/4"
18"	19-3/8" O.D	0.1046"	3/8"	3/4"
20"	21-3/8" O.D.	0.1345"	1/2"	3/4"
24"	25-3/8" O.D.	0.1345"	1/2"	3/4"
30"	31-3/8" O.D.	0.1426"	1/2"	3/4"
36"	37-3/8" O.D.	0.1699"	1/2"	3/4"

NOTES

1. Steel thicknesses indicated hereon are minimum; and design steel thickness shall be determined from the pressure imposed (Class, the design stress of the steel and the O.D. of the cylinder). The minimum acceptable yield strength of the steel shall be 33,000 psi. Design stress shall not exceed 16,500 psi regardless of yield strength of steel.

2. All materials shall conform with AWWA Specifications C200 (Steel Pipe CML/CMC, Section C205)

3. DUCTILE IRON WATER PIPE

Ductile Iron Water Pipe shall be used only where specifically approved by District; and shall comply with ANSI A21.51 rubber gasket push-on type joint bell and spigot, conforming to ANSI A21.11 manufactured in sections of 18 feet or 20 feet. Fittings shall be rubber gasket push-on manufactured in accordance with ANSI A21.10. Where indicated on the Project Drawings, restrained joints shall mean the use of T.R. Flex Pipe as manufactured by U.S. Pipe or approved equal. All ductile iron pipe shall be provided with double polyethylene encasement for the entire length of the pipeline, per AWWA C105.

Unless otherwise specified, the interior of the Ductile Iron Water Pipe and fittings shall be lined with a uniform thickness of cement mortar "double thickness" then sealed with a bituminous coating in accordance with AWWA C104 (latest). The outside surfaces of D.I.P. and fittings shall be coated with a bituminous coating in accordance with ANSI A21.6 or ANSI A21.51.

Standard pressure class for Ductile Iron Water Pipe shall be based on internal pressures and external loadings. Unless otherwise noted, minimum design pressure class shall be 150 psi. Ductile Iron Pipe thickness Class 53 shall be used where flanged or Victaulic-type pipe joints are specified or indicated on the plans.

All service connections made to the Ductile Iron Pipe shall be a brass double service strap type.

4. POLYVINYLE CHLORIDE (PVC) PIPE

PVC pipe shall conform to the latest revision of AWWA C900 unless otherwise specified herein.

All rubber rings shall be furnished by the pipe manufacturer. These rubber rings (elastomeric gaskets) shall be manufactured to conform to the requirements of ASTM F477.

This specification includes polyvinyl chloride (PVC) pipe of the following classes/working water pressures: Class 150 (DR-18)/working pressure 150 psi and Class 200 (DR-14)/working pressure 200 psi.

All PVC pipe shall be twenty (20) foot laying lengths and have cast iron outside diameters (C.I.O.D.'s).

AWWA C900 PVC pipe shall be Class 150 minimum or as specified on approved drawings.

PVC pipe shall be installed within one year of its manufactured date. Pipe older than one year shall not be delivered to the construction site.

The District shall require the manufacturer to submit a certificate stating that all pipe has been manufactured and tested in accordance with this specification.

The Contractor shall submit test results showing the physical properties of the materials used in the manufacture of the rubber gaskets, if required by the District. All rubber gaskets furnished under this specification shall be subject to inspection and/or test by the District. Any gasket found to be unsatisfactory by the District shall be immediately replaced by the Contractor, at no expense to the District.

All pipe furnished under these specifications shall be the product of an organization which has had not less than three (3) years of successful experience in the manufacture of pipe of the type specified. The total pipeline shall be the product of one company (or integrated companies) in the business for the design and manufacture of the pipeline materials required herein; unless otherwise approved in writing by the District.

All pipe to be supplied under these specifications must have the following markings on the pipe barrel: Nominal size and O.D. base (for example, 8" C.I.O.D.); dimension ratio number; AWWA pressure class; and manufacturer's name or trademark and production record code.

Joints

Unless otherwise specified or shown, all joints of PVC pipe shall be with elastomeric gasket bell ends. Solvent welded joints will not be allowed. The bell ends shall be an integral thickened bell. The minimum wall thickness of the bell, at any point, between the ring groove and the pipe barrel shall conform to the dimension ratio requirements of AWWA C900.

Pipe Outlets 2 Inches and Smaller

Outlet connections to PVC water mains two (2) inches and smaller shall be bronze service saddles with double stainless steel straps designed specifically for C.I.O.D. PVC pipe. No single strap saddles or full circle saddles are allowed.

Pipe Outlets Larger Than 2 Inches

Outlets in C900 PVC pipe larger than two(2) inches shall be accomplished through the use of ductile fittings.

For outlets to be installed after initial pipeline construction, a tapping saddle may be used subject to advanced written approval by the District.

Ductile Iron Fittings for PVC

Manufacturers of ductile iron fittings proposed to be furnished under the specification must be approved by the District. Ductile iron fittings shall be American made. Manufacturers of ductile iron fittings, which seek District approval, must conform with District procedures concerning approved manufactured materials.

This specification covers ductile iron fittings for use with AWWA C900 polyvinyl chloride (PVC) pipe including tees, crosses, elbows, reducers, and related special fittings. Cast iron fittings are not permitted.

All fittings for use with PVC C900 pipe shall be cast-iron outside diameter (C.I.O.D.) push-on or mechanical joint fittings with the exception of fittings with valves which shall be push-on or mechanical joint by flange. Ductile iron fittings shall be classified as "compact ductile iron fittings" and shall be produced in strict accordance with ANSI/AWWA A21.53/C153. Unless otherwise specified, the interior of the ductile iron fitting shall be lined with a uniform thickness of cement mortar "double thickness" then sealed with a bituminous coating in accordance with AWWA C104 (latest). The outside surfaces of the DIP fittings shall be coated with a bituminous coating in accordance with ANSI A21.6 or ANSI A21.51.

All ductile iron fittings shall be double polyethylene encased at the time of installation. Double Polyethylene encasement and installation shall be accordance with AWWA C105.

Restrained System

Restrained joints shall be provided by a clamping ring and an additional ring designed to seat on the bell end of the pipe. The rings shall be connected with T-Head bolts or rods. Restraining devices shall provide full (360 degree) support around the circumference of the pipe. No point loading shall be permitted. Restraint of mechanical joint fittings shall be provided by a clamping ring installed on the PVC pipe and connected to the mechanical joint fitting with T-Head bolts or rods. All restraint devices for PVC pipe shall have a water working pressure rating equivalent to the full rated pressure of the PVC pipe on which they are installed, with a minimum 2:1 safety factor in any nominal pipe size. In addition, restraining devices shall meet or exceed requirements of UNI-Bell B-13 "Recommended Performance Specification for Joint Restraint Devices for Use with PVC Pipe." Restraining devices shall be approved by the District.

All buried steel parts shall be sand blasted in accordance with the coating manufacturer's technical data sheet for "submerged" service and coated with two-coat epoxy. Epoxy shall be Tnemec Series 66 or approved equal. All bolts and connecting hardware shall be of high strength low alloy material in accordance with ANSI/AWWA C111/A21.11. Buried steel parts shall be covered with grease and wrapped with visqueen.

Locator Wire

Locator wire shall be installed over all PVC waterlines, non-ferrous services and pipelines. Locator wire shall be 14-1 solid insulated copper wire (UF), in a continuous strand, placed on top of pipe and secured with tape. Locator wire shall be brought to the surface at all appurtenances (i.e. fire hydrants, water services, air valves, blowoffs, valve cans, etc.), thus providing continuous "looping" between the appurtenances and the water main. All splices to locator wire shall be made with direct bury connectors.

After all trench backfill operations are complete, the Contractor shall pay for and conduct the first conductivity test to confirm that the wire is continuous. After the installation of all other underground facilities, the Contractor shall pay for and conduct the second conductivity test to re-confirm that the wire is continuous. The conductivity tests shall only be performed with a District representative present. The Contractor shall be responsible for all costs to confirm, locate, and repair any breaks in the locator wire identified in the conductivity test. In addition, the Contractor shall reimburse the District for all costs to retest repaired sections of the wire. The Contractor is advised to use care in the installation and backfilling operations to prevent damage to the wire.

Splices shall be made at locations approved by the District. The wire connecting device shall be an underground electrical wire connector to splice and effectively moisture-seal the conductors. Wire connectors shall be approved by the District and shall be UL listed and CSA certified for direct burial splices.

Tracer Wire for Non-Metallic Pipelines

Copper tracer wire shall be installed with all non-metallic pipelines just below the horizontal centerline of the pipe, for the purpose of providing a continuous signal path for electronic pipe locators used to determine pipe alignment after installation. The copper wire shall be #12 Cu. with HMWPE insulation. The wire shall be electrically continuous throughout the entire piping system including adjacent fire hydrant assemblies. At

hydrants, the wire shall be extended up the bury to an at grade enclosure. At cul-de-sacs, the wire shall be placed in the same trench with the last long side service lateral and extended into the meter box. All splices shall be wrapped with PVC tape and the wire shall be tied to the pipe at 10 foot intervals with plastic adhesive tape. The Contractor shall perform the initial electrical continuity. All subsequent testing required, due to failure of the tracer wire to be electrically continuous, shall be at the expense of the Contractor.

Polyethylene Water Service Pipe (PVC Mains Only)

One (1) inch diameter polyethylene water service pipe shall only be allowed to be used under the following conditions: (1) where soil conditions are extremely corrosive to copper water service pipe, and (2) only as authorized in writing by the District.

All polyethylene pipe and tubing furnished under these specifications shall conform to all applicable requirements of the latest revision of AWWA C901. Polyethylene water service pipe shall be iron pipe size and supplied by a District approved manufacturer.

The PE pipe or tubing shall be marked in accordance with ASTM D2239 for IPS pipe sizes. It shall also carry the seal of the National Sanitation Foundation (NSF).

Pressure Rating: The PE pipe and tubing shall be rated for use with water at 73.4°F at a maximum working pressure of 200 psi, based on ASTM D2837.

Dimensions: For iron pipe sizes (IPS), the standard inside dimension ratio (SIDR) shall be SIDR 7 with the average inside diameter, minimum wall thickness and respective tolerances for any cross section as specified in ASTM D2239.

Minimum Burst Pressure: The minimum burst pressure at 73.4°F determined in accordance with ASTM D1599 latest revision, shall be 630 psi. The time of testing of each specimen shall be between 60 and 70 seconds.

Sustained Pressure: The PE pipe and tubing shall not fail, balloon, burst or weep as defined in ASTM D1598, latest revision, when tested in accordance with Section 7.6 of ASTM D2239.

5. WELDED STEEL FITTINGS

All bends, reducers, increasers, tees, crosses, wyes, and other special fittings, except as specifically noted on the Drawings, shall be constructed of cement mortar lined steel pipe with coating as specified for balance of pipeline, and shall be shop fabricated in accordance with the latest revision of AWWA C208. (as modified below).

ELBOWS

Angle	0-22 1/2°	22 1/2°-45°	45°-67 1/2°	67 1/2°-90°
No. Pieces	2	3	4	5

NOTE: At the break point angles (i.e. 22 1/2°, 45°, and 67 1/2°) the Contractor shall use the elbow with the largest number of pieces.

All fittings shall have a steel cylinder thickness equal to or greater than the specified wall thickness of the pipeline, but not less than 10 gauge. The minimum radius for all bends shall not be less than 2.5 times the nominal diameter of the pipelines. Where simulated weld bells are used for lap-welded fittings, the bell plate thickness shall be 1/4".

Special fittings shall be fabricated from machine cement mortar lined and machine outside coated. The individual parts of the fittings shall be cut from the pipe, welded together, and the coating and lining of shop joints shall be hand applied to provide a finished cement mortar lined and finished outside coated joint comparable to the mechanically applied lining and coating detailed herein.

Specials and fittings fabricated from cylinders that have been hydrostatically tested in accordance with these specifications shall be tested by the dye-check method, or approved equal, prior to the lining and coating of said material. Contractor shall submit fabrication drawings for all AWWA shop fabricated fittings to the District for approval prior to construction.

6. DUCTILE IRON FITTINGS

Bends, Tees, Crosses, Reducers, Bushings, Adapters, Caps, and Plugs; ANSI/AWWA C110-(latest), minimum 250 psi rated working pressure, cement mortar lining shall be "double thickness" in accordance with AWWA C104-(latest), flange ends

(F) shall conform in dimensions and drilling to ANSI B16.1 for cast-iron flanges and flanged fittings for 125 lb., produced by a "District Approved Manufacturer". Short body pattern is acceptable. Properly fitting rubber gasket joint fittings are also acceptable. Fittings shall be double polyethylene encased per AWWA C105.

7. AWWA GATE VALVES

All resilient seat gate valves shall meet the requirements of AWWA C509-(latest) for rubber seated gate valves and shall be tested bubble-tight. In addition, RS Gate Valves shall be furnished with the following items:

- Valve body and bonnet shall be fusion bonded epoxy coated inside and out (10 mils nominal thickness) and meet all requirements of AWWA C550.
- Low zinc bronze stems.
- All stainless steel body hardware. Resilient seat gate valves shall be produced by a "District Approved Manufacturer".

8. RUBBER SEATED BUTTERFLY VALVES

Butterfly valves shall conform to the latest revision of AWWA C504 and the following:

- Butterfly valves and operators shall be Class 150B, constructed for direct burial and have flanged ends to mate A.S.A. 150 lb. steel flanges.
- Butterfly valves shall be furnished with operators of the traveling nut or worm gear type, self-locking in any position, and sealed, gasketed, and lubricated to withstand a submersion in water to 10 psi. The valve shall open by counter-clockwise rotation of a 2 inch square AWWA operating nut.
- The operator shall be capable of meeting the torque requirements for opening and closing the valve against:
  - -- 150 psi upstream and 0 psi downstream pressure.

-- Maximum inlet-outlet flow rate of 12 FPS, normal flow rate of 6 FPS, and shall be provided with AWWA stops capable of absorbing up to 300 foot-pounds of input torque without damage to the valve or operator.

- Butterfly valves shall have Buna N seat bonded or mechanically retained, without use of metal retainers or other devices located in the flow stream, to the body and have a disc seating edge of ni-crome or stainless steel. All internal mountings or working parts shall be stainless steel.

- Butterfly valves shall have the shaft V-type self-adjusting packing. The shaft shall not be exposed between the valve body and the operator.

- Butterfly valves shall be furnished with records of tests specified in AWWA C504, Section 2.3 and Section 5. All valves shall be furnished with Certified drawings and parts list of the valve and operator. An affidavit of compliance to AWWA C504 shall be furnished for all valves. Five (5) sets of the above information shall be furnished to the District.

- Butterfly valves shall have their internal and external surfaces (except flange faces, stainless steel and rubber surfaces) epoxy coated, to meet all requirements of AWWA C550. All butterfly valves shall be lined (holiday free) with a minimum of 10 mils (2-5 mil coats) of Keysite 750, (white); or DeVoe Bar-Rust No. 235 (white). The epoxy lining shall be applied at the valve manufacturer's plant in accordance with the coating manufacturer's application specifications.

- Approved butterfly valves shall be produced by a "District Approved Manufacturer".

9. COPPER TUBING

Copper tubing shall conform to the requirements of the "Specifications for Seamless Copper Water Tube" (ASTM Designation B88) and shall be Type K. As required by the District, copper tubing shall be installed with a 6 mil (minimum) polyethylene sleeve "Polywrap C" by Northtown Company or District approved equal.

10. BLACK STEEL PIPE

Black steel pipe shall conform to the requirements of the ASTM A53/A53M and shall be "Standard Weight" (Type S) unless otherwise designated. Black steel pipe shall not be cement-mortar lined, for sizes up to 3" diameter but shall have fusion bonded epoxy lining and coating. Pipe/fittings sizes 4" and greater shall be cement mortar lined and outside cement mortar coated; cement mortar lined and outside bare; or bare steel, as designated on the Drawings or Specifications.

Unless otherwise shown, black steel pipe, 3 inches in diameter and smaller, shall be joined with malleable iron screwed fittings. Black pipe 4" and greater shall be joined with standard weight welding fittings produced by a "District Approved Manufacturer".

11. RED BRASS PIPE

Brass pipe and fittings shall conform to the requirements of the "Specifications for Seamless Red Brass Pipe, Standard Sizes" (ASTM Designation B43). As required by the District, brass pipe shall be installed with a 6 mil (minimum) polyethylene sleeve "Polywrap C" by Northtown Company or District approved equal.

12. STAINLESS STEEL PIPE

Stainless steel pipe shall be Type 316 welded, full finished, and shall conform to the "Specification for Seamless and Welded Austenitic Stainless Steel Pipe (ASTM A312/A312M).

13. INSULATING UNIONS

Where dissimilar pipe materials are joined, suitable insulating unions shall be installed. Insulating unions shall be produced by a "District Approved Manufacturer".

14. PRESSURE GAUGES

Except as otherwise provided in these specifications, pressure gauges shall be 4-inch diameter dials, liquid filled, AISI 316 stainless steel case, have stainless steel elements, and 1/2-inch bottom connection. Accuracy shall be 0.5% of full scale. In all cases the normal operating pressure of the system to which the gauge is attached shall be

within the middle 1/3 of the gauge range. Gauges shall read in pounds per square inch for pressure. Gauge shall be produced by a "District Approved Manufacturer."

15. PRESSURE REGULATING VALVES

A. General

Regulating valve shall be a diaphragm actuated, single seated, hydraulically operated globe-type valve. The valve body shall be ductile iron or stainless steel. It shall have two operating chambers sealed from each other by a flexible synthetic rubber fully-supported diaphragm. The valve disc shall be resilient with a rectangular cross section and shall be retained on three sides. Valve bodies and all necessary parts shall be a size and type suitable for use with pressure as specified and include all necessary fittings for correct pilotry and connections. The model numbers shall be as indicated on the Drawings.

Regulating valves shall be subject to hydrostatic test of not less than twice the maximum pressure rating. Pressure rating (Class) shall be as indicated on the Drawings.

B. Pump Control Valves

Control of valve operation shall be by means of an externally mounted, four-way, solenoid pilot valve. Self-cleaning strainers shall be used to protect the control system. Valve shall utilize line pressure for operation. A Limit-switch shall be installed to be adjustable over entire valve travel. Valve shall be equipped with a built-in lift type check feature to prevent reverse flow. It shall operate independently of the solenoid control. Solenoid valve shall operate on 120 VAC.

C. Pressure Relief Valves

The Pressure Relief Valve shall maintain constant upstream pressure by by-passing or relieving excess pressure, and shall maintain close pressure limits without causing surges. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating

operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. There shall be no pistons operating the valve or pilot controls. All necessary repairs shall be possible without removing valve from the line. The pilot control shall be a direct-acting, adjustable, spring-loaded, diaphragm valve, designed to permit flow when controlling pressure exceeds spring setting. The pilot control system shall operate such that as excess line pressure is dissipating the main valve shall gradually close to a positive, drip-tight seating.

D. Rate of Flow Control Valves

The valve shall maintain a constant rate of flow regardless of fluctuations in upstream pressure. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. There shall be no pistons operating the valve or pilot controls. All necessary repairs shall be possible without removing valve from the line.

The pilot control shall be a direct-acting diaphragm valve designed to close when the actuating differential increases beyond the spring setting. The actuating differential pressure shall be produced by a thin-edge orifice plate installed in an orifice flange located downstream of the valve.

E. Pressure Reducing/Pressure Sustaining Valves

This valve shall maintain a constant downstream pressure regardless of fluctuations in demand. When the upstream pressure becomes equal to the spring setting of the pressure sustaining control, the valve throttles to maintain a constant inlet pressure. If the downstream pressure is greater than the upstream pressure the valve closes automatically to prevent return flow.

The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line

pressure. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. All necessary repairs shall be possible without removing valve from the line.

The pressure reducing pilot control shall be a direct-acting, adjustable, spring-loaded, normally open diaphragm valve, which closes when downstream pressure exceeds the spring setting.

The pressure sustaining pilot control shall be a direct-acting, adjustable, spring-loaded, normally closed diaphragm valve which opens when upstream pressure exceeds the spring setting. The control system shall include a strainer orifice assembly and an adjustable opening speed control.

F. Altitude Valves

The altitude valve shall maintain a constant downstream pressure regardless of fluctuations in demand and shall also close tight when a pressure reversal occurs. It shall be a hydraulically-operated, pilot-controlled, diaphragm type globe or angle valve. The main valve shall have a single removable seat and a resilient disc. The stem shall be guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. No external packing glands are permitted, and there shall be no pistons operating the main valve or any pilot controls.

The pilot control shall be a direct-acting, adjustable, spring-loaded, normally open diaphragm valve, designed to permit flow when controlled pressure is less than the spring setting.

A system of auxiliary check valves shall be used to admit downstream pressure into the main valve cover chamber if pressure reversal occurs. This must result in positive closing of the main valve.

G. Coatings

All regulating valves shall have all wetted ferrous parts epoxy coated. The epoxy shall be thermo-setting, approved for potable water.

All coated surfaces shall be coated with 12 miles of fusion bonded epoxy and be visually and electrically examined for defects. The coating shall be holiday free with a low voltage wet sponge test per AWWA C550.

H. Options

Additional required options to be furnished with the valves shall be indicated on the Drawings utilizing the appropriate model numbers and/or catalog designations.

16. FLOW METERS

A. Service Flow Meters

Service flow meters for 5/8" through 1" diameters shall be displacement type, cold-water meters in accordance with AWWA C700, Latest; produced by a "District Approved Manufacturer". Service flow meters for 1 1/2", 2", and 3" diameters shall be turbine type cold-water meters in accordance with AWWA C701, latest; produced by a "District Approved Manufacturer". Service flow meters 4" diameter and larger shall be produced by a "District Approved Manufacturer" with all bronze turbine by-pass meter. All meters shall be equipped with Radio Reads.

Unless otherwise specified on Drawings and/or on the Bidding Sheet, subsequent to payment of fees and the purchase of the meters through the District, the District will furnish all service meters that are less than or equal to 3" diameter for installation by the Contractor. Meters 4" diameter and larger shall be furnished and installed by the Contractor in accordance with District Standards and Specifications.

B. Tube Flow Meters

Unless otherwise approved by District, all flow meters for wells, pump stations, pressure reducing stations and similar installations shall be propeller type tube meters in accordance with AWWA C704.

The manufacturer of the meters to be furnished by the bidder will be stated on the Drawings and shall be produced by a "District Approved Manufacturer" with flanged ends. Inasmuch as meters require an in-service review over an

extended period of time for evaluation by the District for acceptance, it is necessary that proposed meters other than those specified must be submitted for evaluation well in advance of proposed use.

The Contractor shall guarantee all materials and workmanship of items furnished under these specifications to be free from defects for a period of one (1) year after final completion and acceptance of the entire contract work. The Contractor shall, at his own expense, repair or replace all defective materials or workmanship supplied by him found to be deficient with respect to any provisions of this specification.

The meter pressure rating shall be 150 psi or 300 psi as indicated on Drawings. Unless otherwise indicated, all meters shall be furnished with local mechanical register and a transmitter capable of providing 4-20mA and/or 0-2 VDC output. The transmitter shall be produced by a "District Approved Manufacturer". The meter shall also be furnished with optional straightening vanes and "Over-Run" Bearing Assembly. A register extension shall be provided when indicated on Drawings. All meters shall be furnished with certified calibration test results (5-point certification record).

17. PROTECTO WRAP

For specified outside wrapped steel pipelines and/or where specifically directed by the District, outside pipe wrapping shall be Protecto Wrap No. 200 cold applied pipe tape, or 310 butyl rubber tape with Protecto universal water based primer, or as produced by a "District Approved Manufacturer".

18. PRECAST CONCRETE VAULTS

All precast concrete manhole sections shall be manufactured in a plant especially designed for that purpose. All units will conform to the design shown on the drawings, and all work shall be conducted under strict plant controlled supervision.

Design loads shall consist of dead load, live load, impact, and in addition, loads due to water table, and any other loads which may be imposed upon the structure.

Live loads shall be for H-20 and/or H-20-S16 per AASHTO Standard Specifications for Highway Bridges with revisions. Design wheel load shall be 16 kips.

The live load shall be that loading which produces the maximum shears and bending moments in the structure. All reinforcing steel shall be intermediate or hard grade billet steel conforming to ASTM A615/A615M/A706/A706M. Bars other than 1/4" round, or smaller, shall be deformed in accordance with ASTM A615/A615M.

All vaults shall have a 2 piece torsion hinged cover specified for traffic loads where required. The effort necessary to lift the cover shall not exceed OSHA requirements. Cover shall be provided with a 6" x 6" meter reading lid located directly over the meter register. Also, cover shall be provided with a safety chain capable of limiting the travel of the cover. Precast sections shall be joined with a plastic joint sealing compound. The preformed cold-applied ready-to-use plastic joint sealing compound shall be produced by a "District Approved Manufacturer".

Vaults shall be located outside of sidewalk areas. The dimension from the top of the vault to the centerline of the piping within the vault shall not exceed 5'.

19. FUSION BONDED EPOXY COATING

Wherever fusion-bonded epoxy coating is specified on steel piping or equipment for potable water, the coating system shall consist of one coat of Scotchkote 134; Tnemec Series 104 or District approved equal. Minimum dry film thickness shall be 12.0 mils. Surface preparation shall be SSPC-10. Coating shall be in accordance with NSF-61. Method of application shall be electrostatic spray method heat fusion per coating manufacturer's specifications.

Submit manufacturer's data sheets for review and approval, including: method of application; minimum and maximum DFT; recommended surface preparation; application instructions and curing requirements, etc.

20. NSF COMPLIANCE

All materials in contact with domestic water shall comply with the applicable provisions of California Title 22 Regulations Related to Drinking Water, including NSF 60 and 61 certifications; all at no additional cost to the District. Additionally, Contractor shall provide the District with a written "Affidavit of Compliance" with the California Drinking Water Regulations as part of the submittal approval process. District will provide copies of the Contract Documents and related project information to the California Department of Public Health for their approval.

The live load shall be that loading which produces the maximum shears and bending moments in the structure. All reinforcing steel shall be intermediate or hard grade billet steel conforming to ASTM A615/A615M/A706/A706M. Bars other than 1/4" round, or smaller, shall be deformed in accordance with ASTM A615/A615M.

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06/06/2011

BASIC SPECIFICATIONS
SECTION C

WATER PIPELINE CONSTRUCTION SPECIFICATIONS

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WATER PIPELINE CONSTRUCTION SPECIFICATIONS

1. WATER PIPE INSTALLATION

A. General

The Contractor shall furnish and install all water pipeline material required for the construction of the water pipeline and appurtenances as herein specified and shown on the Drawings. All pipeline material shall be installed per manufacturer's published recommendations and per the applicable published standards for the particular material being installed unless otherwise modified herein. In case of any conflict, the most stringent and highest requirement shall govern, and the Contractor shall adhere to said requirement, all at no additional cost to the District.

B. Installation

Pipe shall be accurately laid to alignment and grade shown on Drawings or established by District. Each section of pipe shall be lowered into trench in a manner that will prevent injury to pipe, coating, or joints and shall be carefully bedded to provide continuous bearing and prevent uneven settlement. Inside of pipe shall be clean and free from foreign material of any kind before being installed. Contractor will lay pipe units with bell ends in direction of laying, unless otherwise ordered by District or set forth in these Specifications and Drawings.

C. Handling

Contractor may find it necessary to move or haul pipe during progress of the work. Dropping or bumping of pipe will not be permitted, and all damaged pipe will be rejected. Rejected pipe may be repaired if permitted by District, and such repairs shall be subject to approval of District. If pipe is damaged beyond repair through Contractor's hauling or moving program, Contractor shall, at his own expense, replace the pipe. After District and/or material supplier has

delivered pipe to Contractor in good order and condition on the job, it shall be Contractor's responsibility to keep it in good condition, and he shall repair or replace, at his own expense, any pipe damaged from any cause after delivery.

Contractor shall take all necessary precautions to prevent pipe from floating due to water entering trench from any source, shall assume full responsibility for any damage due to this cause, and shall, at his own expense, restore and replace pipe to its specified condition and grade if it is displaced due to floating. Contractor shall maintain inside of pipe free from foreign materials and in a clean, sanitary condition until its acceptance by District.

At all times when work of installing pipe is not in progress, all openings into pipe and ends of pipe in trench shall be tightly closed to prevent entrance of animals and foreign materials.

D. Joints (CML/CMC Pipelines)

(1) Type of Joints and Bonding Requirements

Water pipeline joints shall be constructed in accordance with District Standards. All rubber gasket joints shall be bonded (in the field) per District standard. Where indicated on the Drawing, Contractor shall install insulation flange kits in accordance with District requirements.

(2) Field Joints - Cement Mortar Lining

Mortar shall be Hubs all patch quickset non shrink commercial grout or a District approved equal packaged dry mortar mix consisting of one part cement and three parts sand. Quantity of water shall be sufficient so that when mortar is firmly compressed into a ball shape, it will hold its shape without slump. Mortar shall be mixed separately for each joint to be patched.

Special care should be taken to avoid damage to lining or coating during lowering pipe into trench.

(3) Field Joints - Cement Mortar Coating

Outside field joints are required to be coated with cement-mortar. This shall be accomplished by wrapping a canvas or paper diaper around the joint. The diaper is held on each side by steel strapping. Cement mortar shall be composed of 1 part cement and not more than 3 parts sand and mixed to a consistency of thick cream. The top of the pour must be covered with a protective material, such as cloth or paper.

E. Curved Alignment

Laying pipe on curved alignment with unsymmetrical closure of spigot into bell rings shall be permitted as recommended by pipe manufacturer. For the purpose of reducing angular deflection at pipe joints and for closure sections, Contractor shall be permitted to install pipe sections of less than standard length.

Closing courses and short sections of pipe shall be fabricated and installed by Contractor as found necessary in the field. Where closing pieces are required, Contractor shall make the necessary measurements and shall be responsible for their correctness.

F. Manufacturer Access

Pipe manufacturer shall have free access to the work during laying operations and testing. Any improper act on the part of Contractor which pipe manufacturer may observe shall be reported to District.

G. Allowable Variations in Pipeline Alignment

The pipeline alignment, as shown on the Plans, was determined from record land net data and interference information obtained from contacting the various utilities, along with conducting a field check during design. After the award and prior to the commencement of construction, it will be necessary to review the pipeline alignment shown on the Drawings, just prior to Contractor's trenching for verification of field conditions regarding interference facilities. Contractor and, Engineer and District shall field-review each section of the proposed pipeline to verify the alignment for trenching purposes. The

specifications provide that the District may vary pipe alignment (ALL AT NO ADDITIONAL COST TO THE DISTRICT).

H. Pipeline Cover

Pipeline cover as shown on the attached Standard Drawings and/or the Design Drawings, is hereby defined to be Design Cover over pipeline. Therefore, should field conditions determined at time of construction show that any pipe grade changes are required, District reserves the right to authorize said changes in pipeline grades, and Contractor shall trench and lay pipeline accordingly, ALL AT NO ADDITIONAL COST TO THE DISTRICT.

All pipeline within public roadways shall be installed with no less than 48" of cover below road grade (or projected existing road grade, in case of embankments) unless otherwise shown on the Drawings or approved by the Engineer.

I. PVC Waterlines

(1) Bedding Pipe

Each section of pipe shall be lowered into the trench in a manner that will prevent injury to the pipe, or joints and shall be carefully bedded to provide continuous bearing and prevent uneven settlement. The inside of the pipe shall be clean and free from foreign material of any kind before being installed.

For PVC pipe and ductile iron pipe with mechanical joints, the gasket shall be placed in the groove of the bell. Lubricate the spigot end into the bell and force into position per manufacturer's recommendation.

(2) Laying and Jointing PVC C900

Trenches shall be in a reasonably dry condition when the pipe is laid. Necessary facilities shall be provided for lowering and properly placing the pipe sections in the trench without damage. The pipe shall be laid carefully to the lines and grades given and the sections shall be closely jointed to form a smooth flow line. Where no grades are given, pipe shall be laid in a smooth continuous grade between connections to

other mains, blowoffs and/or air release valves with a minimum cover of 48". Immediately before placing each section of pipe in final position for jointing, the bedding for the pipe shall be checked for firmness and uniformity of surface.

(3) Field Hydrostatic Test (PVC)

For convenience of testing, the pipeline may be divided into sections and each section tested separately.

All pipe shall be tested under a pressure 1-1/2 times the pressure rating of the pipe, but not less than 150 psi. Maximum test pressure shall not exceed that determined by the District.

If any leakage is evidenced in the testing of the pipeline, the various sections of the pipeline shall be isolated for testing between available valves, or between bumpheads located as approved by the District. The maximum allowable leakage for PVC pipe shall be six (6) gallons per day per mile of pipe per inch of pipe inside diameter. If the leakage exceeds this amount, the section being tested will be considered defective. The Contractor shall determine the points of leakage, make the necessary repairs and perform another test. This procedure shall be continued until the leakage in each section falls below the allowable maximum for that section of pipeline.

Leakage shall be determined by metering the water injected into the pipeline while under the required pressure. The Contractor shall submit to District before allowed to test the gate and meter used so that these devices may be tested by District.

The Contractor shall provide all calibrated meters for measurement of leakage, all bumpheads or skillets, piping, calibrated gages, pumps and other equipment, all water not furnished by District, and all power and labor necessary for the performance of pressure tests satisfactory to the District. The Contractor shall furnish all necessary equipment and labor to fill each section of pipeline tested and for pumping the water from one test section to another as may be necessary for obtaining and maintaining the

required water pressure and for filling the entire pipeline with water after the conclusion of the testing, as hereinafter provided.

The Contractor, at his own expense, shall do any excavation necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed, shall replace such excavated material, and shall make all repairs necessary to meet the required water tightness after which the test shall be repeated until the pipe meets the test requirements. All tests shall be made in the presence of the District. After the pipe has successfully met all test requirements specified herein, the entire pipeline shall be filled with water and so maintained until the completion of the contract unless otherwise ordered by the District.

(4) Thrust Restraint

Thrust restraint shall be accomplished by the use of restrained joints as specified herein. Thrust blocks will not be allowed for PVC pipelines.

J. Measurement and Payment

(1) Pipe

Contractor shall understand that pipeline lengths are approximate and are to be used for establishing unit bid prices and extensions for comparison of bids. UNLESS OTHERWISE STATED IN THE "SPECIAL REQUIREMENTS", payments shall be based upon said unit bid prices applied to the net centerline pipeline length (station difference - or length shown on drawings) installed by Contractor and shall include all specials, tees, bends, fittings, etc., except when shown otherwise on Bidding Sheet.

The District shall approve pipeline length used for payment purposes. The District reserves the right to increase or decrease the amount of pipeline indicated on Drawings and Bidding Sheet, with no change in Contractor's unit bid price.

Contractor shall include under pipeline unit bid prices, all costs to completely perform all contract work, including but not limited to, the construction of thrust blocks, locator wire along non-metallic pipelines, shoring methods and materials, and supplying barricades or other safety devices, except costs which are specifically required to be included under separate bid item numbers on Bidding Sheet.

(2) Pipeline Appurtenances

All pipeline appurtenances, including air valve installations, blowoff installations, fire hydrant installations, main line valve installations, side outlet valve installations, blind flange installations, valve marker installations, guard post installations, slope protection cut-off wall installations, slope protection cut-off ditch installations, pedestal mounted terminal housing installations for direct burial cable used and for cathodic protection use, specified connections, specified appurtenances, etc., are shown in detail on Standard Drawings attached in back of these Specifications or are described in the Specifications and/or Drawings. Contractor shall understand and agree that District may elect to eliminate all or a portion of said installations and that he shall receive payment in amount bid therefore, only for those installations he actually constructs.

2. WELDING SPECIFICATIONS

A. General

All welding operators shall be qualified under the Standard Qualification Procedure of the American Welding Society and all applicable provisions of the latest edition of "Structural Welding Code" (ANSI/AWS D1.1) published by the American Welding Society are incorporated into this Specification. Contractor shall adhere to all Cal-OSHA, American Welding Society, American National Standards Institute and local agency safety regulations (including fire) regarding all welding operations.

The District shall have the right at any time to call for and witness making of test specimens by any welder in accordance with these Specifications, and the expense of such tests shall be borne by Contractor.

The provisions of these sections do not apply to the fabrication of pipe or special fittings in conflict with AWWA Standard Specifications for pipe.

All hand welding in both shop or field shall be done by welders certified in accordance with ASA B31.1 latest (AWWA C206-latest).

All welds shall be made by an electric shielded arc method of welding.

Plates shall be held in correct position. Abutting edges shall be properly prepared. Each deposited layer of welded metal shall be thoroughly cleaned before additional metal is applied to its surface. Finished weld bead shall be central to the seam, and the finished joint shall be free from depressions, undercut edges, burrs, irregularities resulting from welding, other than normal bead necessary.

All welds shall be a type that will produce complete fusion with base metal and shall be free from cracks, oxides, and gas pockets within the limits set forth under these Specifications. If the automatic welding machine does not obtain a fusion weld that will penetrate through to the inside of the pipe and protrude beyond the contour of the plate surface, an inside pass shall be made in the root of the groove on the inside of the pipe. Chipping out of the weld in the root of the groove will be required when deemed necessary by the District.

If welding is stopped for any reason, special care shall be taken when welding is resumed to obtain complete penetration between welded metal, plate, and welded metal previously deposited, and if flux is used, it must be redistributed before work is resumed.

The height of the outside weld bead above the contour of the plate surface shall be measured and shall be not less than 1/16-inch. Heights of the outside weld bead above the contour of the plate surface exceeding 1/8-inch shall be removed by grinding or chipping.

Welds found deficient in dimensions but not in quality shall be enlarged by additional welding after thorough cleaning of the surface of previously deposited metal and adjoining plate. However, if work performed since making a deficient weld has rendered the weld inaccessible or has caused new conditions which would make such reinforcement dangerous or ineffective, the original

conditions shall be restored by removal of welds, members, or both, before enlarging the deficient weld, or the deficiency shall be compensated by additional work as prescribed by the District.

Welds considered by the District to be deficient in quality or made contrary to any mandatory provision of these Specifications shall be removed by chipping or melting and shall be remade. The weld metal shall be removed throughout its depth to expose clean base metal, but if a strictly local deficiency, the weld need not be removed throughout its entire length, provided that sufficient amount shall be removed to insure that sound weld metal only remains. A cracked weld shall be removed throughout its length.

When removing part or all of a weld by cutting or chipping, such cutting or chipping shall not extend into the base metal beyond the depth of weld penetration. When removing part or all of a weld by melting, care shall be taken not to burn or otherwise injure the base metal. After the melting operation, burned metal shall be removed to clean, sound metal.

Overheated weld metal and any overheated base metal adjoining same shall be removed and replaced by new weld metal properly applied. However, if the plate is so badly or extensively injured by overheating that it cannot satisfactorily be replaced by weld metal, such additional work as prescribed by the District shall be performed, all at his own expense, with no additional compensation.

All longitudinal, spiral and girth seams of straight pipe sections, and special sections when practicable, shall be welded with an automatic welding machine. If requested, sample welds shall be submitted to the District for testing in accordance with these Specifications. Approval of such tests shall be required prior to welding of pipe.

Hand welding will be permitted only when it is impracticable to use an automatic welding machine.

Fillet welds shall have full penetration into the corner. Excessive cutting back of the edges of fillet welds is a defect and shall be repaired. Butt welds shall be made by adding weld metal to both sides of the joint, and the underside of the weld in groove shall be chipped out, removing all slag and unsound metal,

containing a clean surface for the application of weld metal; in making butt and fillet welds, weld metal shall be deposited in successive layers, so there will be as many passes as there are complete multiples of 1/8-inch in the plate thickness, provided there shall be a minimum of two passes.

B. Field Welded Pipe Joints

Welded field joints in steel pipe shall be lapwelded unless otherwise shown. Welders shall be certified in accordance with the American Standard Code for Pressure Piping (ASA B31.l) or the "Standard for Field Welding of Steel Water Pipe Joints" (AWWA C206). The welding of each such field joint shall be performed at a time when the temperature is approximately the lowest during the 24-hour day, and after at least 150 linear feet of pipe have been laid and the joints have been welded ahead of said joint. In all hand welding, the metal shall be deposited in successive layers so that there will be at least as many passes or beads in the completed weld as indicated in the following table:

Plate Thickness Inches	Fillet Weld Minimum Number of Passes
3/16	2
l/4	2
5/16	3
3/8	3
13/32	3
7/16	4
15/32	4
l/2	4
More than l/2	1 for each l/8 of an inch

Each pass, except the finish one, shall be thoroughly bobbed or peened to relieve shrinkage stresses and to remove dirt slag, or flux, before the succeeding bead is applied. Each pass shall be thoroughly fused into the plates at each side of the welding groove or fillet, and shall not be permitted to pile up in the center of the weld. Under-cutting along the side will not be permitted.

3. PAINTING SPECIFICATIONS

The Contractor shall provide all labor, material, and equipment necessary for completion of all painting work specified in these Specifications and Drawings.

The Contractor shall deliver all painting materials to the work site in the original containers with seals unbroken and unmutilated and with labels attached. All paints and coatings shall be in compliance with all South Coast Air Quality Management District requirements including volatile organic chemicals (VOC). Containers shall not be opened until after they have been inspected by the District.

Material for prime coat shall be produced by a "District Approved Manufacturer".

Material for finish coat shall be automotive grade synthetic industrial enamel, produced by a "District Approved Manufacturer" unless specifically stated otherwise in these Specifications or Drawings.

The Contractor shall submit a color chart to the District, who will select the finish colors.

All work shall be done by thoroughly qualified painters in a neat, workmanlike manner. All work which shows carelessness or lack of skill in the execution or is defective due to any other cause will be rejected and repainted to the satisfaction of the District, at the expense of the Contractor.

Unless otherwise specified, paint shall be applied by brush or spray.

Paint shall be applied only on thoroughly clean, dry surfaces. Paint shall not be applied in extreme heat, cold, damp, or humid weather or in dust or smoke-laden air.

All exposed iron and steel work, including piping and valves, etc., shall be prime painted at the shop. After installation, said materials shall be cleaned and all welds, tool marks, etc., shall be touched up with primer and given two coats of finish enamel.

Prepared material shall be used without cutting or addition of any material whatsoever, except as directed by the manufacturer and approved by the District. Each coat must be thoroughly dry before application of the next coat.

If brushes are used, they shall have sufficient body and length of bristle to spread the paint in a uniform coat. Paint shall be evenly spread and thoroughly brushed out and with no residual brush marks remaining. On surfaces which are inaccessible for brushing, the paint shall be applied by spray or by sheepskin daubers or other means necessary to obtain a proper thickness of paint as approved by the District.

If a spray method is used, the operator shall be thoroughly qualified in the use of the equipment required. Air compressors employed in spray painting shall be equipped with a suitable trapping device to keep water, oil, and other impurities from entering the air lines. Runs, sags, thin areas, or other imperfections in the paint coat shall be considered as cause for rejection, and the Contractor shall be required to make all necessary corrections to the satisfaction of the District.

Paint materials shall be kept sealed or covered when not in use. Oily rags or waste shall be kept in covered containers and disposed of at frequent intervals.

The Contractor shall be held responsible for protecting freshly painted surfaces from accumulation of dust, dirt, water, or other foreign materials, whatever the cause or source. Any damaged surfaces shall be wiped clean, sanded, or stripped to a clean, dry condition and repainted to the satisfaction of the District.

The Contractor shall protect all parts of the work site against disfigurement by his operations. Tarps and cloths shall be placed where required to protect floors and equipment from spatter and droppings. Electric switchplates, lighting fixtures, hardware, glass, vehicles, etc., shall be removed, covered or otherwise protected from disfigurement by the painting operations. The Contractor shall clean or otherwise restore any spattered surfaces to the satisfaction of the District.

4. CONCRETE WORK

A. General

Concrete shall be composed of portland cement, natural aggregates, and water proportioned to produce required strength and well mixed into required consistency.

Portland cement concrete for thrust blocks, cradles, encasements, and structures shall be composed of portland cement, fine aggregate, coarse aggregate and water proportioned and mixed in accordance with the requirements of Section 90 of the State of California Department of Transportation Standard Specifications, except as may be herein modified.

Concrete for cradles and encasements, and all other concrete structures, shall be constructed to the lines and grades and in accordance with the design shown in the details on the plans.

Prior to placing any concrete, the Contractor shall submit to the District the design mix proposed to be used. Said mix shall set forth the weights of cement, sand, coarse aggregate and the amount of water to be used. (Source of supply shall also be furnished to the District.) The proposed mix shall be approved by the District prior to placing any concrete.

B. Portland Cement Concrete Classification

Concrete Class	Compressive Strength @ 28 days (psi)	Sacks of Cement/CY
"A"	3,500	6
"B"	2,500	5
"C"	2,000	4
"D"	4,000	7

The amount of free water used in concrete shall not exceed 312 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cement in excess of 564 per cubic yard.

5. PAVEMENT REMOVAL AND REPLACEMENT

A. General

Pavement removal and replacement for all public roads, including aggregate base and temporary paving where required, shall comply with all the requirements of the agency issuing the Encroachment Permit. In roads established under formation of a special road district, the specifications of the Encroachment Permit shall apply. Any private roads and streets, including driveways, in which the surface is removed or damaged, shall be restored to the original grade and crown by the Contractor. Removed or damaged sections shall be restored with the type of improvements (or better) conforming to that which existed at the time the Contractor entered upon the work.

It shall be the responsibility of the bidder to satisfy himself as to the existing pavement sections prior to submitting his bid.

Full compensation for temporary and permanent resurfacing, including the replacement of base material as required, shall be included in the unit bid price for pavement removal and replacement per linear foot of mainline trench. Any required pavement removal and replacement for services, fire hydrants, air valves, or other appurtenances shall be considered included in the bid price for the various items, and no additional compensation shall be made therefore.

B. Pavement Cutting

Pavement shall be cut to a straight edge parallel to the pipe alignment prior to excavation. Method of pavement cutting shall be as specified by the Agency having jurisdiction. Under no circumstances shall excavation be started prior to scoring of pavement. If the adjacent pavement is disturbed during the Contractor's operation, the pavement shall be recut on a straight line to remove the damaged pavement before resurfacing. Portland cement concrete pavement and sidewalk shall be saw cut. Pavement cutting shall be considered included in the bid price for pavement removal, disposal, and replacement, and no additional compensation shall be made therefore.

C. Asphalt Concrete Cap

Where required by the agency issuing the Encroachment Permit or other agency having jurisdiction, an asphalt concrete cap shall be placed along the length of the trench. The installation of the asphalt concrete cap shall be in accordance with the specifications and policies of the agency having jurisdiction. Where the asphalt concrete cap is not specifically stated in the applicable permit or on the drawings, and when directed by the District, the minimum cap shall be a grinded 0.10-foot thick, 12-foot wide section centered over the center of the trench, or the traveled way, and pulled with a "Barber Greene" or equivalent.

Full compensation for placement of asphalt concrete cap, where required, shall be included in the unit bid price per linear foot of mainline trench. Any required asphalt concrete cap for house connection laterals or other appurtenances shall be considered included in the bid price for the various items, and no additional compensation shall be made therefore.

6. STEEL FLANGES, BOLTS, NUTS AND GASKETS*

Flanges for steel pipe shall conform to requirements for ASA 150-lb. flanges and flanged fittings or ASA 300-lb. flanges and flanged fittings, as noted on Drawings. All flanges shall be forged steel welding-neck or slip-on flanges. Dimensions and drilling of flanges for steel pipe shall conform to ASA 150 or 300, respectively, steel pipe flanges and flanged fittings, and all flanges shall be attached with bolt holes straddling vertical axis of pipe, unless otherwise shown on Drawings. Flanges and their attachment to pipe shall conform to applicable requirements of latest edition of API-ASME Code for Unfired Pressure Vessels. Welding-neck flanges shall be bored to same inside diameter as adjoining pipe.

Bolts shall be heavy hexhead machine per ASTM A307, Grade B. Nuts shall be heavy hex and conform to ASTM A563 (ASME B18.2.2). Washers shall be provided on both nut and bolt sides and shall be of the same material as the nuts. Studs with nuts on both ends shall be furnished wherever close clearances make removal and replacement of fixed head bolts difficult. Bolts and studs shall be of such lengths that not less than two or more than four threads shall project through nut when nut is drawn tight. All bolts, studs, or cap screws used in tapped holes shall be of sufficient length to provide an engagement of length of threaded portion of not less than nominal diameter of bolt for steel nor less than one and one-half times the diameter for cast iron fittings.

Unless stainless steel nuts and bolts are used, each steel/iron type fitting below grade shall be equipped with at least one (1) sacrificial zinc anode cap. Said cap shall be "protecto-cap" or District approved equal.

Slip-on flanges shall be welded along the inner seam surrounding the pipe diameter as well as along the outside pipe and flange interface.

Gaskets for flanged joints shall be 1/16 inch thick compressed non-asbestos sheet, produced by a "District Approved Manufacturer". Flat-faced flanges shall be provided with full face gaskets with bolt holes prepunched. Raised-face flanges shall be provided with ring gaskets.

* Flanges shall be as per Specifications, except that at the option of the Contractor A.S.A. 150-lb. flanges may be changed to Class "E" steel plate flanges per Table 3 of AWWA C207-01.

7. ELBOWS, SIDE OUTLETS, TEES, BUTTSTRAPS, CROSSES

For steel pipe, all elbows, side outlets, top outlets, tees, crosses, etc., shall be furnished by the Contractor and shall be shop fabricated in accordance with AWWA C208 (latest); except the minimum radius for all bends shall not be less than 2.5 times the nominal diameter of the pipelines. Whenever the Contractor must perform minor amounts of field fabrication, he will be required to do all fabrication in a manner such that the lining and wrapping/coating may be repaired by hand to a quality equal to the shop applied lining and wrapping/coating. Buttstraps, shearrings, etc. shall be per the applicable Standard Drawings, the Drawings, or applicable AWWA Standards or Manuals.

Service outlets shall be constructed in accordance with the Standard Drawing.

Wherever collar reinforcement is required, both the collar and the plain-end of the flanged x p.e. (plain-end) outlet shall be preshaped to mate with curvature of the main line pipeline, and both the collar and the flanged x p.e. (plain-end) outlet shall be welded into place.

All collar and wrapper reinforcing shall be in accordance with the Standard Drawing and with the following reinforcement guides:

A. District's Standard for Outlet Reinforcement.

B. Steel Pipe, Design and Installation, AWWA Manual M-ll, latest.

C. An equal pipeline manufacturer's reinforcing guide, as approved by Engineer.

D. API-ASME Code for Unfired Pressure Vessels for Petroleum liquids and gases.

If case of conflict, the highest and most stringent standard shall govern.

8. TACKWELDED AND WELDED JOINTS - INSTALLATION

All rubber gasket joints shall be bond welded in accordance with the District standards, unless an alternate method is approved by the District.

The pipe manufacturer shall direct the Contractor on the method of welding the fully welded joints, or the cut-to-fit joints, in order that the joints shall not pull apart or leak when subjected to design pressures stated herein.

9. CONNECTIONS TO EXISTING WATER SYSTEM

Unless otherwise stated in the Special Requirements, Contractor shall furnish and install connections to the existing water systems at locations shown on Drawings. Prior to connecting to the existing water system, the Contractor shall "pothole" the connection location(s) and provide this information along with "Shop Drawings" of the proposed fitting(s) to the District for approval prior to the fabrication of said fitting(s). The Contractor shall perform all work required including any necessary field measurements, cuts-to-fit, temporary connections, and field fabrications to meet existing conditions.

Contractor shall install the proposed pipelines about 3' to 4' short of the connection points to the existing pipelines. Hydro-static/leakage tests SHALL NOT be performed against closed valves that separate the proposed system from the existing system.

Connections SHALL NOT be made between existing District pipelines and proposed pipelines until successful hydrostatic/leakage and disinfection testing of the proposed pipelines has been completed. Upon successful completion of the hydrostatic/leakage and disinfection testing and only upon approval by the District, final connections can be made to the existing pipelines. The pipeline material and appurtenances utilized to make the final connections shall be "swabbed" with a high strength chlorine solution. Minimum dosage in parts per million (ppm) to be determined by District.

Contractor shall construct all said connections so that any down-time of existing water systems, due to connection work, shall occur during normal working hours as directed by District.

Contractor shall cooperate with District in scheduling said connections.

District will operate all existing valves necessary for Contractor to accomplish said connection work.

10. FILLING, TESTING, AND CHLORINATION

The Contractor shall fill all contract pipelines (through an approved and certified backflow device furnished by the Contractor) with construction water and may obtain said construction water through hydrants, blow-offs, etc.

The Contractor shall hydrostatically test all contract pipelines, as detailed in the Basic Specifications, to at least 150% of the specified pipe class.

The Contractor shall chlorinate all contract pipelines, as detailed in the Basic Specifications.

Payment by the District to the Contractor for all filling, testing, and chlorination work required under these Specifications SHALL BE INCLUDED IN THE BID PRICES FOR PIPELINE CONSTRUCTION PER THE BIDDING SHEET.

11. PROTECTION OF DOMESTIC WATER MAINS FROM CONTAMINATION

The Contractor shall protect all domestic water mains from contamination by any existing septic tank and/or leach line facilities, etc., which may be adjacent to the jobsite, and payment to the Contractor for any special construction required shall be made per the Extra Work Provisions of the Contract Appendix herein. Said special construction shall be approved by the District and the State Health Department.

12. FIELD HYDROSTATIC TEST AND LEAKAGE TEST

Upon completion of laying, jointing and backfilling, and after pipe lengths comprising the line ARE NOT LESS THAN 14 DAYS OLD, and prior to resurfacing, pipeline, including all appurtenances (e.g. fire hydrants, services, air valves, etc...) shall be hydrostatically tested. Prior to performing the test, the section of pipeline to be tested shall be filled with water and placed under a slight pressure for at least 48 hours. Required test pressure shall then be applied and maintained for a 4-hour period. Water required to maintain test pressure shall be measured by meter or other means acceptable to District. Contractor shall provide all necessary thrust restraint required for the hydrostatic testing.

THE MEASURED LEAKAGE SHALL NOT EXCEED 10 GALLONS PER INCH DIAMETER PER MILE PER 24 HOURS. Should leakage exceed this amount, the section being tested will be considered defective and Contractor shall determine points of leakage, make necessary repairs, and conduct a second test. This procedure shall be continued until leakage equals or is less than the allowable mini-mum. Note: No leakage is allowed for welded steel pipe with fully welded joints.

Contractor shall provide calibrated meters for measurement of leakage, necessary bulkheads, piping, gauges, pumps, power, and labor, and do and furnish everything necessary for making all tests required, at his own expense, and shall furnish to District copies of all tests performed. The District will provide the pressure gauge to be utilized for pressure testing purposes.

All pipe shall be pressure tested to at least 150% of the pipe class rating; i.e. Class 150 = 225 psi test pressure, as measured near the low point of the section of pipe being tested.

The hydrostatic test shall be conducted on sections of pipeline as directed by District. CONTRACTOR SHALL RECEIVE NO ADDITIONAL COMPENSATION OTHER THAN THAT STATED IN BIDDING SHEET FOR TESTING LINES. CONTRACTOR SHALL PAY THE DISTRICT FOR INSPECTION TIME FOR ALL RETESTS.

Care shall be taken to see that all air vents are open during filling. After section has been completely filled, it shall be allowed to stand under slight pressure for a sufficient length of time to allow escape of air from any air pockets. During this period all fittings, specials, manholes, and connections shall be examined for leaks. If any are found, they shall be stopped, using a method approved by District. REQUIRED TEST PRESSURE SHALL THEN BE APPLIED AND MAINTAINED FOR THE 4-HOUR PERIOD. Contractor, at his own expense, shall do all excavation necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed and shall replace such excavated material and shall make all repairs necessary to meet the required water tightness, after which test shall be repeated until pipe meets test requirements. ALL TESTS SHALL BE MADE IN THE PRESENCE OF DISTRICT OR HIS REPRESENTATIVE. After pipe has successfully met test requirements, as specified, entire pipe shall be filled with water and so maintained until completion of the contract, unless otherwise ordered by District.

Pipe manufacturer and Contractor shall be responsible for any defects in materials and workmanship in manufacture and installation of pipe which may be revealed by such test and shall pay all costs of materials, labor, or other costs incidental to making necessary repairs or replacements resulting from such defects, in accordance with these Specifications.

13. DISINFECTING PIPELINES

Contractor shall furnish all equipment, labor, material, and water for proper disinfection of pipelines. Disinfection shall be accomplished by chlorination after lines have been tested for leakage but before they have been connected to existing system. Prior to chlorination, mains shall be thoroughly flushed out. The new mains shall be cleaned and flushed prior to disinfection. The flushing velocity to be obtained for pipes 12-inches and smaller in diameter shall not be less than 2.5 feet per second. The Contractor shall make the necessary arrangements to attain the minimum velocity. The Contractor shall take due precaution in providing for adequate drainage from the site.

Contractor shall submit filling, disinfection and flushing procedures to District for review. It is the responsibility of the Contractor to dispose of the flushed water from the project area. The Contractor is responsible for any damage as a result of flushing operations. This includes but not limited to: dechlorination of chlorinated water, obtaining written approval from adjacent property owners affected by flushing operations, safety, protection of storm drain inlets, etc. Contractor shall obtain discharge permit for De Minimus water flows from the California Regional Water Quality Control Board as detailed in these specifications.

The flushed water shall have a residual chlorine content not to exceed 0.10 mg/l prior to discharging into the storm drain system. The flushing operation shall be in accordance with the California Regional Water Quality Control Board requirements. Dechlorination prior to flushing is required. The cost of said dechlorination shall be the responsibility of the Contractor.

The Contractor shall provide adequate drainage from the site.

The entire pipeline, including all valves, fittings, hydrants, service laterals, and other accessories, shall be disinfected in accordance with the specifications provided herein.

A chlorine gas-water mixture shall be applied with a solution-feed chlorinating device. Chlorinating agent shall be applied at locations selected by District and as prescribed by him. DOSAGE APPLIED TO WATER WITHIN PIPELINE SHALL BE AT LEAST 50 PPM.

Chlorinated water shall be retained in pipeline long enough to destroy all non-spore-forming bacteria. This period shall be at least 24 hours. After chlorine-treated water has been retained for required time, CHLORINE RESIDUAL AT PIPE EXTREMITIES AND AT OTHER REPRESENTATIVE POINTS SHALL BE AT LEAST 25 PPM. Pump bowl assemblies shall not be exposed to harmful chlorine dosages and/or detention times.

Following chlorination, all disinfection water shall be thoroughly flushed from the pipeline.

Should initial treatment fail to produce satisfactory disinfection of the pipeline as evidenced by the chlorine residual and/or the bacteriological test results, the chlorination procedure shall be repeated until acceptable results are obtained. Contractor shall use caution in discharging any highly chlorinated water, and shall be responsible for obtaining any necessary permission and permits from regulatory agencies. If required, the Contractor shall apply a reducing agent to the solution to neutralize residual chlorine or chloramines remaining in the water at his expense.

Bacteriological tests required by the Health Department shall be taken by the District, and conducted by a laboratory selected by and paid by the District (paid for by the Developer for private projects). All costs for any retesting that may be required shall be paid by the Contractor. All retesting shall conform to District requirements.

Unless otherwise specified herein, minimum requirements for disinfection and bacteriological testing of new pipelines shall be in accordance with ANSI/AWWA C651 except as modified herein; and the location and number of all tests shall be determined by the District, with approval by the State Health Department. A minimum of two (2) consecutive passing bacteria samples (absent for Coliform, absent for e. coli, and HPC≤ 300) are required by the District. The first set of samples shall be taken 24 hours after pipeline is completely flushed and water in said pipeline has been at rest without any water flows. The second set of samples shall be taken 24 hours after first set of samples were taken and water in said pipeline has been at rest without any water flows. No

connections to District's existing water system shall be made until certified test results, in writing for both sets of samples are provided to District for review and approval.

Once District provides approval for connections to District water system, Contractor can make connections. One sample will be taken immediately following completion of connection and energizing of existing line and connection within the vicinity of the connection and second sample taken 24 hours later in same location. This procedure shall be repeated at all proposed connection locations.

14. CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, SANTA ANA REGION PERMIT

Contractor shall channel (using sandbags or other means) flushing flow. Contractor shall protect all property from flooding and other damage during flushing operations. Contractor shall post "flooding ahead" signs in streets as required and as directed by the District. Because of demand on existing water system, the District may require Contractor to flush the pipeline over several days, in the evenings, weekends, or holidays.

Contractor shall not allow any discharges from the construction site which may have an adverse effect on receiving waters of the United States.

Discharged water shall meet chlorine residual levels established by the appropriate State Water Quality Control Board. Dechlorination prior to flushing may be required, the cost of which shall be paid by the Contractor.

15. STEEL CASING

Steel casing shall be butt welded of sheets conforming to ASTM Specification A283/A283M or A53/A53M and shall be constructed at the location shown on the plans or as directed by the District. Construction may be by open trench. If the Contractor elects to install the casing pipe by jacking, the provisions of these specifications for jacked steel casing pipe shall apply. However, payment shall be at the bid unit price for steel casing.

The casing pipe shall have a steel thickness not less than 1/4 inch. It shall be the Contractor's responsibility for selecting a size of casing, at or above the minimum

specified, in order that the installation may be done with a sufficient degree of accuracy. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne by the Contractor.

Carrier pipe conforming to these specifications for the designated pipe shall be installed within the casing pipe to the lines and grades shown on the plans. The carrier pipe shall be supported on Advanced Products & Systems Casing Spacers and Insulators or District approved equal. The ends of the steel casing shall be sealed with brick and mortar with a weephole installed at lower end for drainage. The annular space between the steel casing and carrier pipe shall be left empty unless grouting is specified by the Engineer or on the plans.

Measurement for payment for casing pipe, excluding carrier pipe within said casing, shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for steel casing pipe will be at the contract unit price per linear foot for steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, steel casing pipe, shoring, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The water carrier pipe will be paid for under the bid item for pipe.

16. JACKED STEEL CASING

Jacked steel casing shall be butt welded of sheets conforming to ASTM Specification A283/A283M and shall be constructed in accordance with the provisions of Section 306-2 of the "Standard Specifications for Public Works Construction", Latest Edition, except as herein specified.

The casing pipe shall have a steel thickness not less than 3/8 inch. The casing pipe shall be a minimum of 20 feet in length to a maximum of 40 feet in length. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne solely by the Contractor.

Steel casing pipe of the minimum size and thickness specified shall be installed in place by jacking and boring methods without the use of water or air at the locations shown on the plans, and to grades required to install carrier pipe. If the bore casing is equal to or exceeds 18-inches in diameter and the length of the bore exceeds 80-feet in length, the contractor shall bore using a track machine, unless otherwise directed by the District.

The carrier pipe shall be supported on Advanced Products & Systems Casing Spacers and Insulators or District approved equal. The ends of the steel casing shall be sealed with brick and mortar with a weephole installed at lower end for drainage. The annular space between the steel casing and carrier pipe shall be left empty unless grouting is specified by the Engineer or on the plans.

Voids, if developed outside the casing and within limits for boring or jacking, from any cause such as removal of rocks encountered in boring, shall be filled with lean grout forced in under pressure by insertion of a grout pipe outside of the casing. The lean grout shall consist of one part of portland cement to not more than four parts of sand by volume, placed at low pressure. Grout pressure is to be controlled so as to avoid deformation of the casing. Sand for grout to be placed outside the casing shall be of such fineness that 100% will pass a No. 8 sieve and no less than 35% will pass a No. 50 sieve.

Measurement for payment for casing pipe excluding carrier pipe within said casing shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for jacked steel casing pipe will be at the contract unit price per linear foot for jacked steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, boring, jacking, steel casing pipe, shoring*, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The water carrier pipe will be paid for under the bid item for pipe.

* Shoring shall be by steel shield from top of bore pit excavation to bottom, unless otherwise directed by Engineer.

17. CORROSION PROTECTION

Where indicated on the Drawings, cathodic protection test stations and/or flange insulation kits with test stations shall be constructed in accordance with the applicable District Standards. Payment for installation of cathodic protection test stations and/or flange insulation kits with test station shall be per the unit bid price indicated on the Bidding Sheet for each installation, and no additional compensation shall be made therefore.

18. TAPPING

Connections to existing pipelines shall be made with the installation of tees or wrappers as designated on the plans. The connection sequence shall be as follows: The existing pipeline shall be drained; the tee or wrapper with valving shall be installed; and District approval of the connection shall occur prior to the re-filling of the existing pipeline.

In certain instances, and only where approved in writing by the District, wet tapping will be allowed as follows:

A. Water Mains

Where connections to existing water mains are made by wet tapping, the Contractor shall perform all required excavation and shall furnish the tapping saddle and gate valve. The District, or a District authorized contractor (Kopel or approved equal), will install the tapping saddle and gate or plug valve and make the wet tap. The Contractor shall pour the thrust block, backfill, complete all compaction of backfill, make closure, set the gate "can" and cover, make all necessary pavement repairs and complete the installation in accordance with the Plans and these Standards.

B. Water Laterals

Where connections to existing water mains are made by wet tapping, the Contractor shall furnish and install all necessary material and perform all required hand and machine excavation, backfill and pavement repair. The District or a District authorized Contractor will perform the actual wet tapping only.

19. VIDEO INSPECTION (CML/CMC WATERLINES)

Upon completion of the installation and backfill of the water pipeline, appurtenances, services, etc. and prior to filling the pipeline with water for the pressure test, the Contractor shall notify the District that the pipeline system is ready for video inspection. Said notification shall be made at least five (5) working days in advance of the actual video inspection date. The video inspection will be made by a video inspection company approved by the District and hired by the Contractor Video Inspection shall be made in the presence of the District or his representative. Prior to the video inspection, the contractor shall be responsible to provide the following items:

A. Clean water pipelines free of all dirt, rock, debris, etc.

B. Labor and equipment necessary to excavate the pipeline and provide camera access ports. Access ports shall not exceed 1000 feet in spacing and shall be located at all bends in excess of 22°. Also, labor and equipment necessary to repair the access ports to the satisfaction of the District.

C. Driveable truck access to each access port within the system to be videoed.

D. Provide all traffic control methods required.

Should any of the aforementioned items not be in compliance by the time the video inspection is to occur, the Contractor shall be subject to compensating the District for all costs incurred.

Full compensation to the Contractor for complying with the above requirements shall be considered as included in the contract lump sum provided for such work and no additional allowance will be made therefore.

Upon completion of the video for the subject waterlines, the Contractor shall reconnect the piping and backfill all access ports. The video inspection company will provide the District with the DVD (video file format to be viewable on a standard DVD player/computer and/or as approved by the District) and a written report detailing the condition of the interior of the mainline and joints.

Subsequent to review of the DVD and report by the District, the District will notify the Contractor that he may then proceed with the filling, testing, and disinfection of the pipeline; or the District will provide a list of corrective measures that must occur prior to acceptance.

Should remedial activities be necessary, the reconstruction methodology shall be approved by the District prior to commencement of the work. Upon completion of the remedial construction, the Contractor shall once again notify the District that the waterlines are ready for a video inspection. The District reserves the right to re-video any portions of the water system they determine may have been affected by the reconstruction work activities. Further, all related costs including but not limited to reconstruction materials, labor, equipment, video inspection, District and other agency inspection, and administrative costs shall be borne by the contractor.

VIDEO INSPECTION COMPANY REQUIREMENTS

(Closed Circuit Television Inspection - CCTV)

1. Rotating lens camera with articulating head.

2. Scanning capabilities of 360°.

3. Operative in 100% humidity conditions.

4. Lighting for the camera shall minimize reflective glare.

5. Lighting and camera quality shall be suitable to provide clear, in focus picture of the entire periphery of the pipe for all conditions.

6. Camera focal distance shall be adjustable through a range from 6" to infinity.

7. Remote reading distance (footage) counter shall be accurate to one percent (1%) over the length of the particular section being inspected.

8. The camera, television monitor, and other components of the color video system shall be capable of producing a minimum of 350 line resolution.

9. Documentation consisting of a DVD (video file format to be viewable on a standard DVD player/computer and/or as approved by the District) and a written report detailing the condition of the mainline and joints shall be submitted to the District inspector immediately following the video inspection. Each disc shall be labeled with the project or subdivision name, number and pipe run numbers it contains. Each disc shall be delivered in a plastic case.

10. <u>All video equipment used for domestic water systems shall be certified for domestic waterline inspection only and shall never have been utilized in a non-potable system</u>.

11. The CCTV camera operator shall stop at each defect and pipe joint and televise the entire joint with the pan and tilt feature on the head of the camera, initially, in a complete counterclockwise direction followed by a complete clockwise direction. If a defect is found, the CCTV operator will "home up" the camera

prior to defining the defect and determining it's size and location. The CCTV operator will also stop and record any questionable item such as a stain, crack, paint mark, shadow found or character change in a pipe being inspected. In other words, the CCTV operator must stop, record and note anything questionable no matter how minor. The Engineer, as defined by JCSD Standard Specifications, not the CCTV operator, will decide if a questionable items is a "problem event" when that Engineer reviews the video inspection.

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SEWER PIPELINE MATERIALS SPECIFICATIONS

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SEWER PIPELINE MATERIALS SPECIFICATIONS

1. GENERAL

Where alternate pipeline materials are allowed by the District, the Contractor shall select such materials and construction methods as will result in a satisfactory completed project. All pipe materials shall be new and unused unless otherwise specified. Materials and strength of pipe shall be as shown on the plans or as specified herein.

2. GRAVITY MAINS

A. Vitrified Clay Pipe (VCP)

(1) General

Vitrified clay pipe and fittings shall be extra strength and shall conform in every respect with the requirements of the specifications and standards of the National Clay Pipe Institute and Sections 207-8 of the "Standard Specifications for Public Works Construction", Latest Edition, for the size of pipe indicated upon the plans. Vitrified clay pipe shall be of the best quality, vitrified, homogeneous in structure, thoroughly burned throughout the entire thickness, free from cracks or other imperfections and must give a clear metallic ring when struck with a hammer.

(2) Joints

Joints in vitrified clay pipe shall be made using a factory-made mechanical compression joint, consisting of a plastic material (Polyurethane), or a factory applied rubber coupling, and shall be produced by a District Approved Manufacturer and shall conform with the requirements of Section 208.2.2 Type "D" Joints and Section 208.2.3 Type "G" Joints of the "Standard Specifications for Public Works Construction", Latest Edition. Note the requirements in Section 11.G.2.

(3) Microtunneling or optional Casing Carrier Pipe

VCP Pipe shall meet the above requirements indicated in 2.A.(1) General and ASTM C1208, "Vitrified Clay Pipe and Joints for Use in Jacking, Sliplining and Tunnels."

B. Polyvinyl Chlorine (PVC) Plastic Pipe (4" to 12" Dia.)

PVC solid wall pipe shall meet the requirements of ASTM Designation D-3034, SDR 35.

C. Acrylonitrile-Butadiene-Styrene (ABS) (4" & 6" Dia.)

Acrylonitrile-Butadiene-Styrene (ABS) solid wall pipe shall meet the requirements of ASTM designation D-2751, SDR 23.5 or 35.

D. Ductile Iron Pipe (DIP)

Ductile iron pipe shall comply with the provisions of Section 207-9 of the Standard Specifications for Public Works Construction", Latest Edition. All pipe/fittings shall be coated inside and outside per ANSI Standard A21.6 - (latest edition) unless otherwise noted. Ductile iron pipe shall be compression (slip) joint, conforming with ANSI A21.11 and A21.51, latest, and have a standard thickness class (minimum CL 50) based on internal pressures and external loadings as supported by engineering calculations signed by a professional engineer registered in the State of California. All ductile iron pipe shall be provided with double polyethylene encasement for the entire length of the pipeline, per AWWA Standard C105. The minimum bedding class shall be Class "C" per the Owners specifications and standards.

Where restrained joints are required, ductile iron pipe/fittings shall be U.S. Pipe TR flex restrained joint or equal, conforming with ANSI A21.11 and A21.51, latest.

Unless otherwise specified, all ductile iron pipe shall be cement-mortar lined with a minimum thickness of 1/8" per ANSI A21.4 and then sealed with a

bituminous coating in accordance with ANSI A21.6 or ANSI A21.51. The cement used for lining shall be Type V cement conforming to the specifications of ASTM designation C150.

The weight, class or nominal thickness, and casting period shall be shown on each pipe/fittings. The manufacturer's mark, the year in which the pipe/fitting was produced and the letters "DI" or "DUCTILE" shall be cast or stamped on the pipe.

3. FORCE MAINS

A. Polyvinyl Chloride Plastic Pipe (PVC), (4" to 12" Dia.)

The pipe to be used shall be rubber gasket joint polyvinyl chloride pressure pipe, Class 150, conforming to AWWA C900-(latest), outside dimensions of cast-iron pipe, plain end x gasket bell ends.

Fittings shall be cast iron ANSI/AWWA C101(latest), 250 psi rated working pressure, cement mortar lining with Type 5 cement conforming to the specifications of ASTM designation C150, mechanical joint ends (MT) to fit Class 150 and 200 PVC - C900 pipe, flange ends (F) shall conform in dimensions and drilling to ANSI B16.1 for cast-iron flanges and flanged fittings for 125 lb.

Locator wire shall be installed over all PVC force mains. Locator wire shall be 14-1 solid insulated copper wire (UF), in a continuous strand, placed on top of pipe and secured with tape. Locator wire shall be brought to the surface at all appurtenances (i.e. sewer air valves, sewer cleanouts, etc.), thus providing continuous "looping" between the appurtenances and the water main. All splices to locator wire shall be made with direct bury connectors.

B. Ductile Iron Pipe (DIP)

See previous specification under Gravity Mains.

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SEWER PIPELINE CONSTRUCTION SPECIFICATIONS

1. SEWER PIPE INSTALLATION

A. General

The Contractor shall furnish and install all sewer pipeline material required for the construction of the sewer and appurtenances as herein specified and shown on the Drawings. All pipeline material shall be installed per manufacturer's published recommendations and per the applicable published standards for the particular material being installed unless otherwise modified herein. In case of any conflict, the most stringent and highest requirement shall govern, and the Contractor shall adhere to said requirement, all at no additional cost to the District.

B. Installation of Pipelines

Pipe laying shall proceed up-grade with the spigot ends of bell-and-spigot pipe pointing in the direction of the flow. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with the adjoining pipe, following manufacturer's instructions for the specific jointing method being used. Any pipe which exceeds 1/2-inch from true alignment, settlement, or joint offset after laying shall be taken up and relayed at the Contractor's expense. The SAG measuring device shall be approved by the District. The SAG measuring device shall have a scale to measure the depth of flow to the invert of the pipe and shall be placed in front of the camera. The Contractor shall clean the pipe by balling.

Notwithstanding prior factory or yard inspection, the District shall have the right to reject any damaged or defective pipe found on the job which in his opinion will affect the durability of the installation, and the District may order its removal from the work.

C. Sewer Constructed on Radius

Whenever portions of the proposed sewer construction are to be installed on the radius of a curve, the minimum radius and installation of the pipe shall be in accordance with the manufacturer's recommendations.

D. Cleaning

Before final acceptance of sewer facilities or prior to putting any sewer into service, all sewer facilities shall be visually checked and all foreign objects, materials or obstructions removed from the facilities. The District shall require that the facilities be cleaned by flushing, balling, rodding or other means so that the materials may be removed from the system.

E. Plastic Sewer Systems

(1) General

These provisions establish the requirements for the use of plastic pipe (i.e. PVC, ABS) for house lateral and main line sewer construction. Use is limited to those projects which are approved in writing by the District.

Plastic pipe may only be used where indicated on plans approved by the District. Where plastic pipe is used, one type shall be used between consecutive manholes and shall include the house laterals in that system. When pipe and fittings are fabricated by the same manufacturer, contractor will not be allowed to use fittings from other manufacturers.

Plastic pipe shall not be used for sewers serving industrial areas, or areas that, in the opinion of the District, are likely to be rezoned to industrial zones.

(2) Care & Handling

Pipe shall be stored at the jobsite in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage or deformation to bell ends of the pipe. If pipe is to be exposed to direct sunlight for more than 14 days, pipe must be covered with an opaque material while

permitting adequate air circulation above and around the pipe to prevent excessive heat accumulation.

If pipe is strung along trench prior to installation, string only pipe to be used within a 24-hour period; all pipe is to be laid on a flat surface. The interior as well as all sealing surfaces of pipe, fittings, and other accessories shall be kept free from dirt and foreign matter. Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease. Solvent cement when used shall be stored in tightly sealed containers away from excessive heat.

(3) Mandrel Test of ABS & PVC Pipe

Following the placement and densification of backfill and prior to the placing of permanent pavement, all main line pipe shall be cleaned and then mandrelled to measure for obstructions (deflections, joint offsets and lateral pipe intrusions). A rigid mandrel, approved by the Engineer, 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.

Ninety-five (95%) of the specified average inside diameter for flexible plastic pipe taken from the appropriate ASTM requirements are as follows:

	ABS Solid Wall (ASTM D-2751) SDR		PVC Solid Wall (ASTM D-3034) SDR
Pipe Nominal Dia.	23.5	35	35
4"	3.69"	3.69"	3.69"
6"	5.51"	[illegible]	5.45"
8"	[illegible]	N/A	7.28"
10"	N/A	N/A	9.08"
12"	N/A	N/A	10.79"

F. Measurement and Payment

Unless specifically otherwise provided for in these Specifications, full compensation for the work required for a complete installation of sewer pipeline

shall be considered included in the bid unit price per linear foot of pipe, and no other compensation shall be made therefore.

Measurement for payment of pipe shall be on the basis of the horizontal linear footage constructed by the Contractor, complete in place. Measurement will exclude the space occupied by structures constructed by the Contractor. Pipe stubs of one pipe length or less installed in manholes shall be included in the price for manholes and will not be included in the measurement for pipe.

Where excavation depth breakdowns are indicated on the Bidding Sheet, the depths (sewer invert to ground surface) shall be determined by the cut sheets prepared by the survey crew.

Where the offset stake elevation varies more than 0.5 feet from the pipe centerline elevation (at the ground surface), the survey crew will take elevation shots to determine the actual cut from ground surface to invert of pipe. Using this procedure, the payment depth will be based upon average depth between 25 foot interval stations.

The District reserves the right to revise pipeline grades, and the Contractor shall trench and lay accordingly. Payment for said grade revisions shall be based upon the unit bid price for the appropriate size and depth category, and no additional compensation shall be made therefore.

G. Payments to Contractor for Completed Work

NO PARTIAL PAYMENT SHALL BE GIVEN TO THE CONTRACTOR FOR CONSTRUCTION OF THE SYSTEM UNTIL THE PORTION OF THE SYSTEM FOR WHICH THE PAYMENT IS TO BE MADE HAS BEEN TESTED AND THE ENGINEER HAS CERTIFIED THAT THE SYSTEM IS SUBSTANTIALLY COMPLETED AND READY FOR USE.

Consideration for partial payment may be given prior to the Contractor completing the permanent pavement (excluding AC Cap), provided the delay of placing the permanent paving was, in the opinion of the Engineer, due to causes beyond the control of the Contractor.

The Engineer may establish priorities for completion of certain parts of the work which may be necessary to provide certain services or which he may deem advisable in the interests of public safety and convenience.

2. MANHOLES

A. General

The manholes shall be constructed in accordance with the Standard Drawing, and at the locations shown on the plans. All concrete used in the manholes shall be Class "A" Concrete, as provided in Section 5 of these Basic Construction Specifications, unless otherwise indicated herein.

B. Precast Concrete Sections

Precast manhole sections shall conform to the size, shape, form and details shown on the Standard Drawing. The precast cylinder units and precast eccentric top sections shall meet the strength requirements for "Precast Reinforced Concrete Manhole Risers and Tops", ASTM C478. The Contractor shall submit shop draw-ings of the precast manhole he proposes to use. Each manhole section shall be set in a bed of grout to make a watertight joint and shall be neatly pointed on the inside and shall be set perfectly plumb. Sections of various heights shall be used in order to bring the top of the manhole ring and cover to the elevation shown on the plans.

Precast concrete rings are to be joined with a minimum thickness of one-half inch (1/2") of portland cement mortar. Mortar for joining ring section shall be com-posed of not less than one (1) part portland cement to two (2) parts of clean, well-graded sand of such size that all will pass a No. 8 sieve. Mortar sand shall conform to the strength requirements specified for mortar strength under ASTM C87.

C. Manhole Bases

Manhole bases shall be constructed of Class "A" concrete poured against native undisturbed material and to the form and dimensions shown on the Standard Drawing. If the Contractor over-excavates beyond the vertical

dimensions shown on the Standard Drawing, the depth of concrete below the invert of the pipe shall be increased to greater than the 9" minimum as required to meet undisturbed material; all at no additional cost to the District.

Concrete shall be poured to a level ring-section seating surface, with the base centered over the sewer intersection unless otherwise specified. A metal forming ring shall be used to form a level joint groove in the manhole base. The groove will receive the first precast section to form a watertight joint.

Concrete shall be allowed to reach sufficient compressive strength prior to the installation of the precast manhole sections.

Connections of plastic sewer pipe to a manhole shall be watertight. All PVC or other flexible pipes entering or leaving concrete structures, including manholes, shall have a rubber sealing gasket, as supplied by the pipe manufacturer, firmly seated perpendicular to the pipe axis, around the pipe exterior and cast into the structure as a water stop. Additional requirements may be imposed by the District for manhole connections in projects constructed in areas of high or potentially high groundwater.

Precast manhole bases WILL NOT be allowed.

D. Manhole Frames and Covers

Manhole frames and covers shall be in accordance with the Standard Drawing. All frames and covers shall be traffic strength and shall be monogrammed according to the agency having jurisdiction.

The elevations at which manhole frames and covers are to be set shall conform to the requirements set forth on the plans, but in all cases shall be governed by the District in the field. Manholes shall not be constructed to final grade until final paving has been completed. Where the cover is in existing pavement or in the traveled way of the existing road shoulder, it is to be placed flush with the existing surface. Where the cover is in unpaved areas, it shall be set per the Standard Drawing.

Manhole frames shall be set at the required grade and shall be securely attached to the top precast manhole shaft unit with a grout bed and filled as shown

on the Standard Drawing. After the frames are securely set in the place provided herein, covers shall be installed and all necessary cleaning and scraping of foreign materials from the frames and covers shall be accomplished to ensure a fine satisfactory fit. All costs of setting and securing manhole frame and cover sets in place as herein provided, including all necessary concrete work, shall be considered as included in applicable contract unit prices and no additional allowance will be made therefore.

E. Standard Manholes

Standard manholes shall be constructed in accordance with the Standard Drawing and at the locations shown on the plans. Materials and construction of standard manholes shall conform in all respects to the applicable provisions of these specifications.

Standard manholes shall be either four-(4)-foot, five-(5)-foot, or six-(6)-foot diameter as shown on the plans. Full compensation for a complete installation of standard manholes shall be paid for at bid unit price per each and no other compensation will be made therefore.

F. Testing of Manholes

(1) Ground Water Conditions - Infiltration Test

All manholes in areas where ground water exists over the top of the pipe shall be water tested. All pumping of ground water shall be discontinued for at least three (3) days, after which the manhole shall be tested for infiltration. The inlet(s) and outlet of each manhole shall be plugged. Any infiltrated water shall be collected in the manhole and measured.

(2) Dry Conditions - Exfiltration Test

Where no ground water exists, approximately one (1) of every ten (10) manholes, as directed by the District, shall be water tested. Each manhole shall be filled with water 4 feet 0 inches above flowline of the manhole with the inlet(s) and outlet of each manhole plugged.

(3) Allowable Leakage

The maximum leakage rate for each type test shall be ten (10) gallons per hour per manhole. Test to be for a minimum of thirty (30) minutes. Where test results indicate that the allowable leakage is exceeded, the Contractor shall make the necessary repairs in order to reduce the leakage to acceptable limits.

3. SEWER LATERALS

A. General

The sewer laterals shall be constructed as shown on the Standard Drawing. Sewer laterals of the size called for on the plans shall be installed at approximately the locations shown on the plans. The exact location will be determined in the field by the District or private developer. The Contractor shall field reference each lateral connection with a surface marker. The marker shall be as specified on the Standard Drawing.

B. Materials

All sewer laterals shall be constructed of the same material as the sewer main to which it shall be connected; and shall meet the requirements of the section of these specifications entitled "Basic Pipeline Materials Specifications."

C. Tees and Wyes

Tees and wyes shall be of the same material as the sewer main and the longitudinal barrel of the tee or wye shall be of the same size as the sewer main. Tees or wyes of the size called for on the plans shall be installed at approximately the locations shown on the plans. The exact location will be determined in the field by the District or private developer. A suitable plug shall be provided and installed prior to backfilling operations to ensure a watertight joint.

D. Construction

All sewer laterals shall be installed per the Standard Drawing. In no case shall any lateral be constructed at less than two percent (2%) slope unless shown

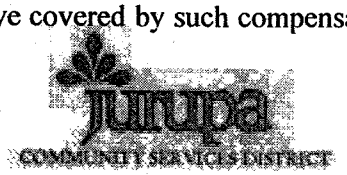
on plans. The sewer lateral shall be constructed a minimum distance of five (5) feet horizontally from existing water services.

Unless otherwise approved by the District, any required saddle connections to existing mains shall be made with an approved sewer tapping machine. The Contractor shall submit to the District his proposed method for tapping, including manufacturer's tapping equipment descriptions, etc.

E. Payment

Sewer laterals shall be paid for at the unit price per foot bid, measured in a horizontal plane along the centerline of the sewer lateral from the centerline of the main sewer to the property line. Said prices per linear foot shall be considered full compensation for furnishing all pipe and fittings, other materials, equipment and labor necessary to install the pipe; including clearing and grubbing, pavement removal and replacement, placement of bedding in the locations shown on the plans in accordance with the Standard Drawings and specifications, removal and/or replacement of existing interfering improvements; and all other work pertinent to installing the sewer lateral complete in place and for which no additional compensation shall be made therefore.

In payment for tees and wyes, compensation shall be made for each tee and wye installed at the unit price bid, excepting for tees and wyes installed for cleanouts, compensation for which shall be included in the price per cleanout. The portion of the tee or wye covered by such compensation shall be considered to be the branch portion.



4. TESTS FOR LEAKAGE IN SEWER

A. General

All the tests for exfiltration from, and infiltration into the system shall be in accordance with Section 306-1.4 of the "Standard Specifications for Public Works Construction", Latest Edition, except as modified herein. The method of testing and testing equipment shall be approved by the District.

The Contractor shall, at his own expense, furnish all materials for making the tests required under the direction of the District.

If the leakage or infiltration, as shown by the tests, exceeds the standard set forth in said section, Contractor shall, at no additional cost to the District, make the necessary repairs by methods approved by the Engineer to correct the deficiencies. All tests must be completed before the street or trench is resurfaced with permanent pavement replacement, but after complete installation and trench compaction of all facilities within a particular section between manholes.

Full compensation for testing shall be included in the bid price of various items of work, and no other compensation shall be made therefore.

B. Air Testing

The Contractor shall test all sewers by means of the air test specified herein, unless otherwise directed by the District. The air test shall be in accordance with Section 306-1.4 of the Standard Specifications for Public Works Construction, Latest Edition, except as herein modified.

Air shall be introduced into the pipeline until 3-1/2 psi gauge pressure has been reached, at which time the flow of air to the pipe shall be shut off. After the temperature has stabilized the air pressure shall be permitted to drop and, when the internal pressure has reached 3.0 psi gauge, the time lapse required for the air pressure to drop to 2.0 psi gauge shall be measured. The time lapse (in seconds) required for the air pressure to decrease from 3.0 to 2.0 psi (gauge) shall not be less than that given in the following table:

Sewer Pipe Dia.	Minimum Time Lapse (Seconds)
8"	140
10"	170
12"	200
15"	260
18"	310
21"	360
24"	410
27"	460
30"	510
33"	560
36"	610

If the time lapse exceeds that shown in the table, the pipe shall be presumed to be within acceptable limits; if the time lapse is less, the Contractor shall make the necessary corrections to reduce the leakage to acceptable limits by repair methods approved by the District.

C. Water Infiltration Test

Where ground water conditions are encountered and the water level prior to any pumping or dewatering operations is above the top of the proposed sewer pipe, then the Water Infiltration Test shall be used in lieu of the air test specified in Section 5-B of these Basic Specifications. The Water Infiltration Test shall be in accordance with Section 306-1.4.3 of the Standard Specifications for Public Works Construction, Latest Edition, except as herein modified.

The infiltration shall not exceed 0.0016 gallons per hour per foot of sewer, per inch of pipe diameter. The test shall be run for a minimum period of two (2) hours. The Contractor shall furnish all labor, materials, equipment required for the infiltration test, at no additional cost to the District.

If ground water conditions are such that the ground water level is between the flow line of the proposed sewer pipe and the top of the pipe, both the air test and the water infiltration test shall be conducted at no additional cost to the District. In such a case, the section of pipe being tested shall be deemed acceptable only if it passes both the air test and the water infiltration test.

D. Force Main Pressure Test

Field hydrostatic test and leakage test shall be performed in accordance with all provisions of Section C12, (Water Pipeline Construction Specifications) with the following modifications.

The test pressure at the location of the testing equipment shall be computed on the basis of the relative elevations of the test gauge and the lowest point in the section being tested, and shall result in a pressure of 150 percent of the design pressure at the lowest point in said section. The test pressure at the highest point in the test section shall be not less than 120 percent of design pressure. The test pump and gauge shall be connected to the force main at a location other than the highest point in the line, to facilitate release of air from the high point.

THE MEASURED LEAKAGE SHALL NOT EXCEED 2 GALLONS PER INCH DIAMETER OF PIPE PER 1000 FEET OF PIPE PER 24 HOURS. Should leakage exceed this amount, the section being tested will be considered defective and Contractor shall determine points of leakage, make necessary repairs, and conduct a second test. This procedure shall be continued until leakage equals or is less than the allowable minimum.

5. CONCRETE WORK

A. General

Concrete shall be composed of portland cement, natural aggregates, and water proportioned to produce required strength and well mixed into required consistency, Type II-V for all concrete in contact with wastewater.

Portland cement concrete for manhole bases, cradles, encasements, thrust blocks and structures shall be composed of portland cement, fine aggregate, coarse aggregate and water proportioned and mixed in accordance with the requirements of Section 90 of the State of California Department of Transportation Standard Specifications, except as may be herein modified.

Concrete for manhole bases, cradles and encasements, and all other concrete structures, shall be constructed to the lines and grades and in accordance with the design shown in the details on the plans.

Prior to placing any concrete, the Contractor shall submit to the District the design mix proposed to be used. Said mix shall set forth the weights of cement, sand, coarse aggregate and the amount of water to be used. (Source of supply shall also be furnished to the District.) The proposed mix shall be approved by the District prior to placing any concrete.

B. Portland Cement Concrete Classification

Concrete Class	Compressive Strength @ 28 days (psi)	Sacks of Cement/CY
"A"	3,500	6
"B"	2,500	5
"C"	2,000	4
"D"	4,000	7

The amount of free water used in concrete shall not exceed 312 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cement in excess of 564 per cubic yard.

Additional cement and a modified concrete mix, as approved by Engineer, will be required for situations requiring pumping of concrete.

C. Class "B" Concrete Encasement

Class "B" concrete shall be used for unreinforced concrete encasements that may be required by unforeseen field conditions. The quantity shown on the proposal is an estimate. The District hereby reserves the right to reduce this item to a small percentage of that shown on the proposal forms, delete it or increase it, without altering the unit price bid for cubic yard of concrete.

The unit price bid for cubic yard of concrete shall include furnishing all materials and labor and equipment to properly place the concrete as may be required, and no other compensation shall be made therefore.

D. Reinforced Concrete Encasement

At the locations shown on the plans, and in accordance with the detail shown on the plans and/or Standard Drawing, and these Basic Specifications, the Contractor shall construct reinforced concrete encasement around the sewer carrier pipe. Concrete for reinforced concrete encasement shall be Class "A". Reinforcing steel (unless otherwise indicated) shall be No. 4 bar, billet steel having minimum yield point of 60,000 psi, formed and spaced as shown on the plans or the Standard Drawing.

Payment for reinforced concrete encasement shall be at the unit price per cubic yard of concrete for the section as shown on the plans or Standard Drawing, and no other compensation will be made therefore.

6. PAVEMENT REMOVAL AND REPLACEMENT

A. General

Pavement removal and replacement for all public roads, including aggregate base and temporary paving where required, shall comply with all the requirements of the agency issuing the Encroachment Permit. In roads established under formation of a special road district, the specifications of the Encroachment Permit shall apply. Any private roads and streets, including driveways in which the surface is removed or damaged, shall be restored to the original grade and crown by the Contractor. Removed or damaged sections shall be restored with the type of improvements (or better) conforming to that which existed at the time the Contractor entered upon the work.

It shall be the responsibility of the bidder to satisfy himself as to the existing pavement sections prior to submitting his bid.

Full compensation for temporary and permanent resurfacing, including the replacement of base material as required, shall be included in the unit bid price for pavement removal and replacement per linear foot of mainline trench. Any required pavement removal and replacement for manholes, house connection laterals, or other appurtenances shall be considered included in the bid price for the various items, and no additional compensation shall be made therefore.

B. Pavement Cutting

Pavement shall be cut to a straight edge parallel to the pipe alignment prior to excavation. Method of pavement cutting shall be as specified by the Agency having jurisdiction. Under no circumstances shall excavation be started prior to scoring of pavement. If the adjacent pavement is disturbed during the Contractor's operation, the pavement shall be recut on a straight line to remove the damaged pavement before resurfacing. Portland cement concrete pavement and sidewalk shall be saw cut. Pavement cutting shall be considered included in the bid price for pavement removal, disposal and replacement, and no additional compensation shall be made therefore.

C. Asphalt Concrete Cap

Where required by the agency issuing the Encroachment Permit or other agency having jurisdiction, an asphalt concrete cap shall be placed along the length of the trench. The installation of the asphalt concrete cap shall be in accordance with the specifications and policies of the agency having jurisdiction. Where the asphalt concrete cap is not specifically stated in the applicable permit or on the drawings, and when directed by the District, the minimum cap shall be a grinded 0.10-foot thick, 12-foot wide section centered over the center of the trench or the traveled way, and pulled with a "Barber Greene" or equivalent.

Full compensation for placement of asphalt concrete cap, where required, shall be included in the unit bid price per linear foot of mainline trench. Any required asphalt concrete cap for house connection laterals or other appurtenances shall be considered included in the bid price for the various items, and no additional compensation shall be made therefore.

7. CONNECTIONS TO EXISTING MANHOLES

The Contractor shall make connections to existing manholes at the location and elevation shown on the plans and as verified in the field by the Contractor. Where new flow-through channels have to be cut in the existing manhole base, they shall be cut so that the resulting section is smooth and conforms to the intended shape. Deviation from form and grade shall not be greater than 1/4 inch. The channel surface shall be smoothed with epoxy mortar.

The new V.C.P. sewer shall be firmly embedded in epoxy grout where it joins the existing manhole.

Payment for connections to existing manholes shall be included in the contract price paid for the various items of work wherein connections to existing manholes are required, and no additional allowance will be made therefore.

8. TEMPORARY HANDLING OF SEWAGE

Certain work in connection with tying into existing sewers and manholes, may require the temporary handling of sewage either by temporary bypass lines, pumping, bulkheading at low flows, or other means, to be approved by the District. Sewage so diverted shall be handled in a manner such that all sewage shall be contained and properly disposed of so as not to create a public nuisance or health hazard. No extra compensation will be allowed in connection with the temporary diversion of sewage, and all such costs shall be included in the various contract unit prices.

Should the Contractor's operation result in fine(s) from other agency jurisdictions or result in the District's need for cleanup assistance, the payment of such fines and District assistance shall be the responsibility of the Contractor.

9. STEEL CASING

Steel casing shall be butt welded of sheets conforming to ASTM Specification A283/A283M and shall be constructed at the location shown on the plans or as directed by the District. Construction may be by open trench. If the Contractor elects to install the casing pipe by jacking, the provisions of these specifications for jacked steel casing pipe shall apply. However, payment shall be at the bid unit price for steel casing.

The casing pipe shall have a steel thickness not less than 1/4 inches. It shall be the Contractor's responsibility for selecting a size of casing, at or above the minimum specified, in order that the installation may be done with a sufficient degree of accuracy. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified, shall be borne by the Contractor.

Carrier pipe conforming to these specifications for the designated pipe shall be installed within the casing pipe to the lines and grades shown on the plans. The carrier pipe shall be supported on either Advanced Products & Systems Casing Spacers and Insultators, Redwood skids with stainless steel banding materials or District approved equal. The ends of the steel casing shall be sealed with brick and mortar with a weephole installed at lower end for drainage. The annular space between the steel casings and carrier pipe shall be left empty unless grouting is specified by the Engineer or on the plans.

Measurement for payment for casing pipe, excluding carrier pipe within said casing, shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for steel casing pipe will be at the contract unit price per linear foot for steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, steel casing pipe, shoring, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The carrier pipe will be paid for under the bid item for pipe.

10. JACKED STEEL CASING

Jacked steel casing shall be butt welded of sheets conforming to ASTM Specification A283/A283M and shall be constructed in accordance with the provisions of Section 306-2.6 of the "Standard Specifications for Public Works Construction", Latest Edition, except as herein specified.

The casing pipe shall have a steel thickness not less than 3/8 inch. The casing pipe shall be a minimum of 20 feet in length to a maximum of 40 feet in length. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne solely by the Contractor.

Steel casing pipe of the minimum size and thickness specified shall be installed in place by jacking and boring methods without the use of water or air at the locations shown on the plans, and to grades required to install carrier pipe. If

the bore casing is equal to or exceeds 18-inches in diameter and the length of the bore exceeds 80-feet in length, the contractor shall bore using a track machine, unless otherwise directed by the District.

The carrier pipe shall be Extra Strength VCP or Microtunneling Jacking Pipe and be supported on either Advanced Products & Systems Casing Spacers and Insulators, Redwood skids with stainless banding materials or approved equal. The ends of the steel casing shall be sealed with brick and mortar with a weephole installed at lower end for drainage. The annular space between the steel casing and carrier pipe shall be left empty unless grouting is specified by the Engineer or on the plans.

Voids, if developed outside the casing and within limits for boring or jacking, from any cause such as removal of rocks encountered in boring, shall be filled with lean grout forced in under pressure by insertion of a grout pipe outside of the casing. The lean grout shall consist of one part of portland cement to not more than four parts of sand by volume, placed at low pressure. Grout pressure is to be controlled so as to avoid deformation of the casing. Sand for grout to be placed outside the casing shall be of such fineness that 100% will pass a No. 8 sieve and no less than 35% will pass a No. 50 sieve.

Measurement for payment for casing pipe excluding carrier pipe within said casing shall be made along the centerline of the casing pipe between the limits shown on the plans and/or staked in the field.

Payment for jacked steel casing pipe will be at the contract unit price per linear foot for jacked steel casing pipe placed in accordance with these plans and specifications. Payment shall be full compensation for furnishing all labor, excavation, backfill, boring, jacking, steel casing pipe, shoring*, equipment, services, transportation, sand cement, concrete, all grouting operations described herein, and other appurtenant items of labor and material required to complete the work. The sewer carrier pipe will be paid for under the bid item for pipe.

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* Shoring shall be by steel shield from top of bore pit excavation to bottom, unless otherwise directed by Engineer.

11. VIDEO INSPECTION

Upon successful completion of the final leakage test for the sewer and after base rock placement and compaction is complete, the contractor shall notify the District that the pipeline system is ready for video inspection. Said notification shall be made at least five working days in advance of the actual video inspection date. The video inspection will be made by a video inspection company approved by the District and hired by the Contractor. Video inspection shall be made in the presence of the District or his representative. Prior to the video inspection, the contractor shall be responsible to provide the following items:

A. Clean sewer pipelines free of all dirt, rock, debris, etc.

B. Water source with an adequate amount water, pipe, hose, etc. to place enough water in the pipelines to evaluate pipeline alignment "SAGS".

C. Driveable truck access to each manhole within the system to be videoed.

D. Provide all traffic control methods required.

Should any of the aforementioned items not be in compliance by the time the video inspection is to occur, the contractor shall be subject to compensating the District for all costs incurred.

Full compensation to the contractor for complying with the above requirements shall be considered as included in the contract lump sum provided for such work and no additional allowance will be made therefore.

Upon completion of the video for the subject sewerlines, the video inspection company will provide the District with the DVD (video file format to be viewable on a standard DVD player/computer and/or as approved by the District) and a written report detailing the condition of the interior of the mainline and joints. Subsequent to review of the DVD and report by the District, the District will notify the Contractor that he may then proceed with completion of the project; or the District will provide a list of corrective measures that must occur prior to acceptance.

Should remedial activities be necessary, the reconstruction methodology shall be approved by the District prior to commencement of the work. Upon completion of the remedial construction, the contractor shall once again notify the District that the sewerlines are ready for a video inspection. The District reserves the right to re-video any portions of the sewer system they determine may have been affected by the reconstruction work activities. Further, all related costs including but not limited to reconstruction materials, labor, equipment, video inspection, District and other agency inspection, and administrative costs shall be borne by the contractor.

VIDEO INSPECTION COMPANY REQUIREMENTS

(Closed Circuit Television Inspection - CCTV)

1. Rotating lens camera with articulating head.

2. Scanning capabilities of 360°.

3. Operative in 100% humidity conditions.

4. Lighting for the camera shall minimize reflective glare.

5. Lighting and camera quality shall be suitable to provide clear, in focus picture of the entire periphery of the pipe for all conditions.

6. Camera focal distance shall be adjustable through a range from 6" to infinity.

7. Remote reading distance (footage) counter shall be accurate to one percent (1%) over the length of the particular section being inspected. Provide depth gauge for SAG measurement acceptable to District.

8. The camera, television monitor, and other components of the color video system shall be capable of producing a minimum of 350 line resolution.

9. Documentation consisting of a DVD (video file format to be viewable on a standard DVD player/computer and/or as approved by the District) and a written report detailing the condition of the pipeline and joints shall be submitted to the District inspector immediately following the video inspection. Each disc shall be labeled with the project or subdivision name, number and pipe run numbers it contains. Each disc shall be delivered in a plastic case.

10. <u>All video equipment used for domestic sewer systems shall be certified for domestic sewerline inspection only.</u>

11. The CCTV camera operator shall stop at each defect and pipe joint and televise the entire joint with the pan and tilt feature on the head of the camera, initially, in a complete counterclockwise direction followed by a complete clockwise

direction. If a defect is found, the CCTV operator will "home up" the camera prior to defining the defect and determining it's size and location. The CCTV operator will also stop and record any questionable item such as a stain, crack, paint mark, shadow found or character change in a pipe being inspected. In other words, the CCTV operator must stop, record and note anything questionable no matter how minor. The Engineer, as defined by JCSD Standard Specifications, not the CCTV operator, will decide if a questionable items is a "problem event" when that Engineer reviews the video inspection.