

CITY OF SANTA CRUZ
DEPARTMENT OF PUBLIC WORKS
DEPARTMENT OF PARKS AND RECREATION
AND
WATER DEPARTMENT

2002

STANDARD
SPECIFICATIONS

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PART 1

STANDARD PROVISIONS

Whenever in these specifications and other contract documents, the following abbreviations and terms or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

ABBREVIATIONS

AASHO	American Association of State Highway Officials
AAN	American Association of Nurserymen
ACI	American Concrete Institute
AGMA	American Gear Manufacturers Association
AIEE	American Institute of Electrical Engineers
AISI	American Iron and Steel Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
AREA	American Railway Engineering Association
ASA	America Standards Association (United States of America Standards Instructions)
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Condition Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
AWS	American Welding Society
AWPA	American Wood Preserver's Association
AWWA	American Water Works Association
FS	Federal Specification
IEEE	Institute of Electrical and Electronic Engineers
NBFU	National Board of Fire Underwriters
NEMA	National Electrical Manufacturers Association
SAE	Society of Automotive Engineers
UL	Underwriters Laboratories

Article - a numbered portion of a title Section of the Specifications

Bidder - Any individual, firm, partnership, corporation or combination thereof, submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.

Council, City Council - The City Council of the City of Santa Cruz.

Contract - The written agreement covering the performance of the work and the furnishing of labor; materials, tools, and equipment in the construction of the work. The Contract shall include the Notice of Contractors, Proposal, Drawings, Specifications, Addenda, and Contract Bonds; also, any and all written supplemental agreements amending or extending the work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments, or extensions to the Contract and include Contract change orders.

Contractor - The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, who have entered into a contract with the City.

Days - Working days, unless otherwise designated.

City - The City of Santa Cruz.

Drawings - The official drawings, working drawings, detail drawings, and supplemental drawings, or reproductions thereof, which show the location, character, dimensions, and details of the work to be done, and which are to be considered as part of the Contract.

Director - The Director of Water Department or Public Works Department acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

Liquidated Damages - The amount prescribed in the specifications, pursuant to the authority of Government Code Section 14376, to be paid to the City or to be deducted from any payments due or to become due the Contractor for each day's delay in completing the whole or any specified portions of the work beyond the time allowed in the Specifications.

Plans, Constructions Plans - The Drawings which are a part of the Contract.

Proposal - The offer of the Bidder for the work when made out and submitted on the prescribed Proposal Form, properly signed and guaranteed.

Subcontractor - The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, who will perform work for the Contractor.

Specifications - The directions, provisions and requirements contained in the Standard Provisions, Special Provisions, and Technical Provisions.

Work - All the work specified, indicated, shown or contemplated in the Contract to construct the improvements, including all alterations, amendments or extensions thereto made by supplemental agreements or written orders of the Director.

State Specifications - Wherever in these Specifications reference is made to the "State Specifications," reference shall be to specifications entitled, "State of California, Department of Transportation, Standard Specifications," current edition, and which is incorporated herein and made a part hereof by reference. Where the terms "State" or the "Engineer" are used in the State Specifications, they shall be considered as meaning the "City" or "Director" as defined hereinabove.

Special Provisions - The special provisions are specific clauses setting forth conditions or requirements peculiar to the work and supplementary to the Standard Provisions and technical provisions.

SECTION 2

PROPOSAL REQUIREMENTS AND CONDITIONS

2.01 OBTAINING PLANS AND SPECIFICATIONS: Standard Specifications, Plans and Special Provisions may be obtained at the office of the Engineer, City Hall Annex, 809 Center Street, Room 201, Santa Cruz, CA 95060.

2.02 CONTENTS OF PROPOSAL FORMS - Prospective bidders will be furnished proposal forms which describe the contemplated construction and, where appropriate, show the approximate estimate of the quantities of the various kinds of work to be performed or materials to be furnished, with a schedule of items for which bid prices are asked. The unit prices or lump sum amounts bid shall include full compensation for furnishing all labor, materials, tools, and equipment and doing all work complete in place as shown on the Drawings or stipulated in the Specifications for that particular item of work.

2.03 ESTIMATED QUANTITIES - The quantities given in the Proposal are approximate only, being given as a basis for the comparison of Proposals, and the City does not, expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Director. No allowance will be made for anticipated profit on work which is deleted or decreased.

2.04 EXAMINATION OF DRAWINGS, SPECIFICATIONS, AND SITE OF WORK - The Bidder shall examine carefully the site of the work contemplated and the Proposal, Drawings, and Specifications therefor. The submission of a Proposal will be conclusive evidence that the bidder has investigated and is fully aware of the conditions and difficulties to be encountered, of the character, quality and quantities of work to be performed and materials to be furnished, and of the requirements of the Proposal, Drawings, and Specifications; as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of material, availability of labor, water, electric power, roads and uncertainties of weather, or similar physical conditions at the site; the conformation and conditions of the ground, the character and quality and quantity of surface and subsurface materials, including groundwater, to be encountered; the character of equipment and facilities needed preliminary to, and during the, prosecution of the work; and all other matters which can in any way affect the work or the cost thereof under this Contract. Any failure by the Contractor to acquaint themselves with all available information concerning these conditions will not relieve him/her from responsibility for estimating properly the difficulty or cost of successfully performing the work.

If there is any doubt as to the true meaning of any part of the plans, specifications, or other contract documents, or if discrepancies in, or omissions from, the drawings or specifications are found, a request should be made to the Director for an interpretation or correction thereof, which will be given in the form of addenda to all bidders, if time permits. Otherwise, in figuring the work, bidders shall consider that any discrepancies or conflict between drawings and specifications shall be governed by Article 5.17 of these specifications.

No payment shall subsequently be made to the Contractor because of error on his/her part or of negligence or failure to acquaint himself/herself with the existing conditions, limitations, or features of the site or requirements of the contract documents; or by reason of any estimate, tests, or representations of any officer, employee or agent of the City.

Where investigation of subsurface conditions has been made by the City in respect to foundation or other design, bidders may inspect the records of the City as to such investigation, including examination of samples and drill cores, if any. When logs of test borings showing a record of the data obtained by the City's investigation of subsurface conditions are made available, said logs represent only the opinion of the City as to the character of materials encountered in its test borings and are made available only for the convenience of bidders.

Investigations of subsurface conditions are made for the purpose of design, and the City assumes no responsibility whatever in respect to the sufficiency of test borings or accuracy of the log of test borings, of other preliminary investigations, or of the interpretation thereof. There is no guarantee expressed or implied that the conditions indicated are representative of those existing throughout the work, or any part of it, or that unforeseen developments may not occur.

Making such information available to bidders is not to be construed in any way as a waiver of the provisions of the first paragraph of this Article and bidders must satisfy themselves through their own investigations as to conditions to be encountered.

No information derived from such inspection of records or preliminary investigation made by the City, or from the Director, or from his/her assistants, or from the maps, Specifications, profiles, or Drawings will in any way relieve the Contractor from any risk or from properly fulfilling all the terms of the Contract. Records of such preliminary investigations as may have been made by the City may be inspected at the office of the Director, City Hall, Santa Cruz, California, 95060, or at such other locations as may be stated in the Notice to Contractors.

2.05 PROPOSAL FORM - The Proposal form furnished by the City, when filled out by the bidder and executed, shall be submitted as his/her Proposal. Neither the Proposal form nor any other portion of the Specifications shall be detached therefrom. Proposals submitted on forms detached shall be disregarded. All Proposals should give the prices proposed, both in writing and in figures in the respective spaces provided, and shall be signed by the bidder, who should fill out all blanks in the Proposal form as therein required. In the event of a discrepancy between writing and figures, the writing shall prevail over the figures.

A Copy of each addendum to the Specifications or drawings shall be attached securely to the Specifications containing the Proposal (refer to Article 2.12).

2.06 QUERIES ON BIDDING - Questions regarding the Specifications or Drawings or any other portion of the Contract or any addenda thereto shall be directed to the Director, at City Hall, Santa Cruz, California 95060, in writing. No interpretation of the meaning of the Specifications, Drawings, or other pre-bid documents will be made to any bidder orally.

2.07 REJECTION OF PROPOSALS - Proposals may be rejected if they show any alterations of form, additions not called for, conditional bids, incomplete bids, erasures, or irregularities of any kind. Proposals in which the prices, in the opinion of the City, are unbalanced, may be rejected.

When Proposals are signed by an agent, other than the officer or officers of a corporation authorized to sign contracts on its behalf, or a member of a partnership, a written authorization or Power of Attorney should be on file with the City prior to opening Proposals or submitted with the Proposal; otherwise, the Proposal may be rejected as irregular and unauthorized.

2.08 PROPOSAL GUARANTEE - All Proposals shall be presented under sealed cover and accompanied by one of the following forms of bidder's bond executed by an admitted surety, made payable to the City of Santa Cruz. The security shall be in an amount equal to at least 10 percent of the total contract price in the Proposal. A Proposal will not be considered unless one such form of bidder's security is enclosed with it.

A bidder's bond will not be accepted unless it substantially conforms to the bond form included with the Proposal form and is properly filled out and executed. If desired, the bond form included therein, properly filled out as directed, may be executed and used as the bidder's bond. Blanks conforming to this form may be obtained by request from the City.

2.09 WITHDRAWAL OF PROPOSALS - Any Proposal may be withdrawn at any time prior to the time fixed in the Notice to Contractors for the opening of Proposals only by written request for the withdrawal of the Proposal filed with the City Clerk. The request shall be executed by the bidder or his/her duly authorized representative. The withdrawal of a Proposal does not prejudice the right of the bidder to file a new Proposal. This article does not authorize the withdrawal of any Proposal after the time fixed in the Notice to Contractors for the opening of Proposals.

2.10 PUBLIC OPENING OF PROPOSALS - Proposals will be opened and read publicly at the time and place indicated in the Notice to Contractors.

2.11 JOINT PROPOSALS - If two or more bidders desire to bid jointly on a single project or desire to combine their assets for so doing, they shall file an affidavit of joint venture with the City in the form approved by the City Attorney and such affidavit of joint venture will be valid only for the specified project for which it is filed. If such affidavit of joint venture is not filed as aforesaid and approved by the City prior to the time for opening Proposals on the specified project for which it is submitted, a joint proposal submitted by the same bidders may be disregarded.

2.12 DISQUALIFICATION OF BIDDERS - More than one Proposal form from an individual, firm, partnership, corporation, or a combination thereof under the same or different names will not

be considered. If there is reason for believing that collusion exists among the bidders, none of the participants in such collusion will be considered for award for this Contract.

2.13 ADDENDUM - Addenda may be issued prior to opening of Proposals and shall become a part of the original Specifications and Drawings. The additions or changes contained in such addenda shall be considered by the bidder in preparation of his/her Proposal. These addenda will be sent to each prospective bidder at the address indicated in his/her application for a Proposal form. A copy of each addendum so issued shall be attached to the Specifications containing the Proposal submitted by the bidder to the City Clerk.

2.14 LIST OF SUBCONTRACTORS - The Contractor shall perform with his/her own organization and with workers under his/her immediate supervision work of a value not less than fifty percent (50%) of the value of all work embraced in the contract, except when certain items may be exempted by the Special Provisions from said fifty percent requirement.

In accordance with Chapter 2, Division 5, Title 1, of the Government Code of the State of California, Subletting and Subcontracting Fair Practices Act, each proposal shall have listed on the form provided with the proposal, (a) the name and the location of the place of business of each subcontractor who will perform work or labor or render service to the general Contractor in or about the construction of the work or improvement in an amount in excess of one-half of one percent (0.5%) of the general Contractor's total bid, and, (b) the portion of the work which will be done by each such subcontractor.

If a Contractor fails to specify a subcontractor for any portion of the work to be performed under this contract in excess of one-half of one percent of the total bid, s/he agrees to perform that portion him/herself.

2.15 COMPETENCY OF BIDDER - The bidder shall be licensed under the provisions of Chapter 9, Division 3, of the Business and Professions Code of the State of California to do the type of work contemplated in the project, and shall be skilled and regularly engaged in the general class or type of work called for under this contract.

It is the intention to award a contract only to a bidder who furnishes satisfactory evidence that s/he has the requisite experience and ability and that s/he has sufficient capital, facilities, and plans to enable him/her to prosecute the work successfully and promptly, and to complete it within the time stated in the contract.

To determine the degree of responsibility to be credited to a bidder, any relevant evidence will be considered that the bidder, or personnel guaranteed to be employed in responsible charge of the work, has satisfactorily performed other contracts of like nature and magnitude or comparable difficulty at similar rates of progress.

2.16 RELIEF OF BIDDERS - Attention is directed to the provisions of Government Code Section 14350 to 14353, inclusive, (subletting and Subcontracting Fair Practices Act), which sections are incorporated herein by this reference, concerning relief of bidders and in particular to

the requirement therein that if the bidder claims a mistake was made in his/her bid, the bidder shall give the City written notice within five (5) days after the opening of the bids of the alleged mistake, specifying in the notice in detail how the mistake occurred.

SECTION 3

AWARD AND EXECUTION OF CONTRACT

3.01 CONSIDERATION OF PROPOSALS - After the proposals have been opened and read, they will be checked for accuracy and compliance with these Specifications. If the unit price and the total amount named for any item do not agree, the unit price will be considered as representing the Bidder's intention.

The right is reserved to reject any or all proposals; to waive an irregularity in a bid or bidding procedure; and to accept one schedule of a proposal and reject another, unless the bidder specifically stipulates to the contrary.

3.02 AWARD OF CONTRACT - The award of the Contract, if it be awarded, will be to the lowest responsible bidder whose Proposal complies with the requirements prescribed and who is licensed in accordance with law. Such award, if made, will be made within 30 days after the opening of the Proposals or as specified in the proposal or Special Provisions. If the lowest responsible bidder refuses or fails to execute the Contract, the City Council may award the Contract to the second lowest responsible bidder. Such award, if made, will be made within 45 days after the opening of the Proposals. If the second lowest responsible bidder refuses or fails to execute the Contract, the City Council may award the Contract to the third lowest responsible bidder. Such award, if made, will be made within 60 days after the opening of the Proposals. The periods of time specified above within which the award of contract may be made shall be subject to extension for such further period as may be agreed upon in writing between the City and the bidder concerned.

All proposals will be compared on the basis of the City's estimate of the quantities of work to be done.

3.03 RETURN OF PROPOSAL GUARANTEES - Within ten days after the award of the Contract to the lowest responsible bidder, the City will return the proposal guarantees, other than bidder's bonds, accompanying such of the Proposals as are not to be further considered in making the award. Retained proposal guarantees will be held until the contract has been finally executed after which all proposal guarantees, except bidder's bonds and any guarantees which have been forfeited, will be returned to the bidders whose Proposals they accompany.

3.04 CONTRACT BONDS - Prior to the execution of the Contract, the Contractor shall file with the City one or more surety bonds in the amounts and for the purpose noted below, duly executed by a solvent surety company satisfactory to the City, and (s)he shall pay all premiums and costs thereof and incidental thereto. The bonds shall contain a provision that the surety thereon waives the provisions of Section 2819 of the Civil Code of the State of California. Contractor and Surety shall warrant to the City that the Surety is licensed by the California Secretary of State to conduct business in the State of California and Surety shall provide proof of its authorization to conduct business in the State of California.

Each bond must be signed by both the Contractor and the Sureties.

The "Bond for Labor and Material " shall be in an amount of 100 percent of the contract price as determined from the prices in the Proposal form, and shall inure to the benefit of persons performing labor or furnishings materials in connection with the work of the proposed contract. This bond shall be maintained in full force and effect until all work under the Contract is completed and accepted by the City, and until all claims for materials and labor have been paid.

The "Bond for Faithful Performance" shall be in an amount of 100 percent of the contract price as determined from the prices in the Proposal form, and shall be so conditioned as to insure the faithful performance by the Contractor of all work under the Contract. It shall also insure the replacing of, or making acceptable, any defective materials or faulty work.

The Faithful Performance Surety Bond shall remain in effect to guarantee the repair and replacement of defective equipment, materials and work, discovered within one (1) year, after final payment has been accepted by the Contractor and the payment to the City of all damages sustained by it on account of such defects, discovered within one (1) year, or in lieu thereof, a bond equal to ten (10) percent of the full amount of the contract, may be substituted for the faithful performance bond upon completion and final acceptance and final payment for the work performed under the contract, which shall remain in effect for a period of one (1) year to guarantee the repair and replacement and payment of damage. In all respects, the substitute bond shall satisfy the requirements and conditions of the original Faithful Performance Bond.

Should any surety or sureties be deemed unsatisfactory at any time by the City, notice will be given the Contractor to that effect, and s(he) shall forthwith substitute a new surety or sureties satisfactory to the City. No further payment shall be deemed due or will be made under this Contract until the new sureties shall qualify and be accepted by the City.

All alterations, extensions of time, extra and additional work, and other changes authorized by these Specifications or any part of the Contract may be made without securing the consent of the surety or sureties on the contract bonds.

3.05 EXECUTION OF CONTRACT - The Contract shall be signed by the successful bidder and returned, together with the contract bonds, within ten days, not including Sundays and legal holidays, after the bidder has received the Contract for execution or as specified in the proposal or Special Provisions..

3.06 FAILURE TO EXECUTE CONTRACT - Failure of the lowest responsible bidder, the second lowest responsible bidder, or the third lowest responsible bidder to execute the Contract and file acceptable bonds as provided herein within ten days or as specified in the Proposal form or Special Provisions, not including Sundays and legal holidays, after such bidder has received the Contract for execution shall be just cause for the annulment of the award and forfeiture of the proposed guarantee.

3.07 CONTRACTOR'S INSURANCE -

3.07.01 General - Without limiting the responsibility of the Contractor for damages as set forth in Article 7.18, the Contractor has obtained all insurance required under this Article, and such insurance has been approved by the City, nor shall Contractor allow any Subcontractor to commence work on any Subcontract until all insurance required of Contractor has been likewise obtained by the subcontractor, and such insurance is approved by the City. Approval of the insurance by City shall not relieve or decrease the liability of Contractor hereunder.

3.07.02 - Type of Coverage - Without limiting any of the other obligations or liability of Contractor, Contractor shall provide and maintain, until the work is completed and accepted by the City, the following minimum insurance coverages, unless otherwise specified in the particular specifications.

Type of Coverage

Limits

Workers compensation and Employer's Liability, including coverage under the United States Longshoremen's and Harbor Workers' Act, where applicable.

Statutory

Comprehensive general liability which shall include, or be endorsed to include, the following:

1. Cross Liability Coverage
2. Blanket Contractual Liability Coverage
3. Contractor's Protective Liability Coverage
4. Products and Completed Operations Coverage
5. Broad Form Property Damage Coverage
6. Explosion, collapse and Underground Property Damage Liability Coverage

Bodily Injury
\$1,000,000 each
accident;
Property Damage
\$500,000 each
occurrence
\$1,000,000

Type of Coverage

Limits

Automobile Liability Insurance covering all automobiles, trucks, tractors, trailers, motorcycles, or other automotive equipment, whether owned or rented by the Contractor, or owned by employees of the Contractor.

Bodily Injury
\$1,000,000 each
accident

Property Damage
\$5000,000 each accident

3.07.03 INSURANCE PROVISION - The insurance provided by the above insurance policies shall name as additional insured the City of Santa Cruz, its officer, agents, and employees and shall be primary insurance to the full limits of liability stated above to said additional insured. If said additional insured have other insurance against the loss covered by said policy, that other insurance shall be excess insurance only. The comprehensive general liability policy shall be endorsed to provide insurance to said additional insured with respect to omissions and supervisory acts or omissions, including passive negligence with respect to said work, and shall not be subject to reduction or cancellation without thirty (30) days prior written notice to the City of Santa Cruz.

In the event the work called for in this contract is to be performed as a joint project with the State of California, or a County, or any City within a County, or other agency, or is to be performed on lands under the jurisdiction of the State of California, or a County, or any City within a County, the policy of insurance required by paragraph 3.07.02, entitled "Type of Coverage" shall name the State of California, that County, and/or that City or other agency additional insured in addition to naming City and the statement contained in paragraph 3.07.03, entitled, "Insurance Provisions," shall be modified accordingly.

SECTION 4

SCOPE OF WORK

4.01 WORK TO BE DONE - The work to be done consists of furnishing all labor, methods or processes, implements, tools, machinery, construction equipment, materials of any kind, and installed manufactured equipment, except as otherwise specified herein to be furnished by the City or from sources provided by the City, which are required to construct in a good and professional manner all the work herein provided for.

4.02 MAINTENANCE AND CLEAN-UP - Throughout the construction period, the Contractor shall keep the site of the work in a neat and clean condition, shall dispose of any surplus materials in an approved manner off the site, keep debris out of drainage ditches, and maintain proper housekeeping practices to the satisfaction of the Director.

When any material is to be disposed of outside of the easement or street or highway right-of-way, the Contractor shall first obtain written permission from the owner on whose property the disposal is to be made. Disposal must conform to grading ordinances of the jurisdiction in which the work is performed.

Upon completion of the work, and prior to requesting final inspection, the Contractor shall thoroughly clean the site of the work of all rubbish, excess materials, falsework, temporary structures, and equipment, and all portions of the work shall be left in a neat and orderly condition. The final inspection, acceptance, and final payment will not be made until this has been accomplished.

4.03 CHANGES - The City may increase or decrease quantities of work to be done under the Contract, make revisions to the Drawings or Specifications, or require the performance of extra work and furnishing of materials therefor by the Contractor as the City requires for the proper completion or construction of the whole work contemplated. The City, at its option, may furnish said materials.

The changes will be set forth in written Contract Change Orders which specify the work to be done in connection with the changes, the basis of compensation for the work, and any adjustments of contract time. Such Change Orders shall be approved by the Director.

Upon receipt of an approved Contract Change Order, or of a written authorization from the Director setting forth a description of the change and agreed upon changes in contract price, the Contractor shall proceed with the work so ordered.

In the absence of an approved Contract Change Order or written authorization, the Contractor shall not be entitled to payment for any changed or extra work or any adjustment of Contract time.

When the changes increase or decrease the cost of the work, an adjustment of the Contract price will be made as set forth in the Change Order. At the option of the City, the work which is changed may be paid for on the basis of force account.

New and unforeseen items of work will be classed as extra work when the item cannot be covered by any of the various items or combination of items for which there is a bid price. The Contractor shall do such work and furnish such materials and equipment as may be required in writing by Director, but shall do no extra work except upon written order from the Director, and in the absence of such written order, (s)he shall not be entitled to payment for such extra work. All bills for extra work done in any month shall be filed in writing with the Director before the fifteenth of the following month. For such extra work, the Contractor shall receive compensation at the prices previously agreed upon in writing, or upon a failure to agree upon prices, (s)he shall be paid on force account. If the work is done on force account, compensation shall be in accordance with Article 9.04 of these Specifications. The City reserves the right to furnish any material deemed expedient and the Contractor shall have no claim for profit on the cost of such materials. All Contractors shall have no claim for profit on the cost of such materials. All extra work shall be adjusted daily upon report sheets furnished to the Director by the Contractor and signed by both parties, which daily reports shall thereafter be considered the true record of extra work done.

4.04 PROTESTS - If the Contractor considers any work demanded of him\her to be outside of the requirements of the Contract, or considers any record or ruling or act or omissions of the Director to be unfair, s/he shall immediately, upon such work being demanded, or such record or ruling being made, ask in writing for written instructions or decision, whereupon (s)he shall proceed without delay to perform the work or to conform to the record or ruling, within 30 days after the date of receipt of the written instruction or decision, (s)he shall file a written protest with the Director stating clearly and in detail the basis of his\her 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, decisions, and acts or omissions of the Director shall be final and conclusive. Instructions and decisions of the Director contained in letters transmitting Drawings to the Contractor shall be considered as written instructions and decisions subject to protest in the manner herein described.

4.05 DUST CONTROL - During the performance of all work under this contract, the Contractor shall assume all responsibility for dust control and shall furnish all labor, equipment, and means required to carry out proper and efficient measures wherever and whenever dust control is necessary to prevent the operations from producing dust damage and nuisance to persons and property. Any claims resulting therefrom shall be borne solely by the Contractor.

Full payment for dust control shall be included in the unit price bid for other items of work and no additional allowance or direct payment will be made therefor.

SECTION 5

CONTROL OF WORK

5.01 AUTHORITY OF DIRECTOR - The Director shall decide all questions which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate or progress of the work; all questions which may arise as to the interpretation of the Drawings and Specifications; and all questions as to the acceptable fulfillment of the Contract on the part of the Contractor. His/her decision shall be final and s/he shall have authority to enforce and make effective such decision and orders which the Contractor fails to carry out promptly.

5.02 DRAWINGS TO BE FURNISHED BY THE CONTRACTOR - The Drawings listed in the Specifications shall be supplemented by the Contractor with such working drawings as may be required for the prosecution of the work and approval of equipment. Such data may include shop detail drawings, reinforcing steel details, fabrication drawings, falsework and formwork drawings, pipe layouts and similar classes of drawings, which shall be favorably reviewed by the Director before any work involving these drawings is performed. No change shall be made by the Contractor in any working drawing after it has been favorably reviewed by the Director. Drawings shall contain all required detailed information of reasonable scale with enough views to clearly show the work to be done or the item to be furnished and shall be properly checked.

Working drawings will be subject to approval insofar as the details affect the character of the finished work, but details of design will be left to the Contractor who shall be responsible for successful construction of the work and operation of the equipment.

It is expressly understood, however, that approval of the Contractor's working drawing shall not relieve the Contractor of any responsibility for accuracy of dimensions and details, or for mutual agreement of dimensions and details. It is mutually agreed, that the Contractor shall be responsible for agreement and conformity of his/her working Drawings and Specifications.

The sequence of submission of working drawings shall be such that all information is available to the Director for review of each drawing as it is received. A minimum of five prints of each working drawing shall be submitted. Three prints will be retained and the balance returned within 20 calendar days with the Director's action indicated thereon. The Contractor shall make any necessary corrections and revisions to returned Drawings and shall resubmit the Drawings in the same routine as before within 20 calendar days after receipt.

Responsibility will be upon the Contractor to furnish Drawings in sufficient time for approval action including resubmittal, without delaying construction.

The cost of furnishing all working Drawings shall be included in the Contract prices for work to which the Drawings are appurtenant.

5.03 DRAWINGS AND DATA TO BE FURNISHED BY THE CITY - The City may issue supplemental Drawings for the construction work under the Contract. These drawings will show

additional details as required for construction purposes. Installation instructions for City furnished materials will be furnished if required.

5.04 CONFORMITY WITH DRAWINGS AND ALLOWABLE DEVIATIONS - Finished work in all cases shall conform with the lines, grades, cross sections, and dimensions shown on the approved Drawings furnished by the City. Deviations from the drawings as may be required by the exigencies of construction will be determined by the Director.

5.05 MAINTENANCE & OPERATION MANUALS - For use in the subsequent operation, the Contractor shall furnish two copies of maintenance and operation instruction supplied by the manufacturer for all equipment items. They shall be bound and suitably indexed in heavy, loose leaf binders.

5.06 SUPERINTENDENCE - The Contractor shall designate in writing before starting work, an authorized representative who shall have complete authority to represent and act for the Contractor. Where the Contractor is comprised of two or more persons, partnerships or corporations, functioning on a joint venture basis, said Contractor shall designate in writing to the Director the name of their authorized representative who shall have full authority to direct the work and to whom orders will be given by the Director, to be received and obeyed by the Contractor. Said authorized representative of the Contractor shall normally be present at the site of the work at all time while work is suspended, arrangements acceptable to the Director shall be made for any emergency work which may be required.

Whenever the Contractor or his/her authorized representative is not present on any part of the work where it may be desired to give direction, orders will be given by the Director, which shall be received and obeyed by the Superintendent or foreman or authorized representative who may have charge of the particular work in reference to which the orders are given. Any order given by the Director, which shall be received and obeyed by the Superintendent or foreman or authorized representative who may have charge of the particular work in reference to which the orders are given. Any order given by the director, not otherwise required by the Specifications to be in writing, will, on request of the Contractor, be given or confirmed by the Director in writing.

5.07 LAYOUT OF WORK AND SURVEYS - All work shall be constructed to the lines and elevations shown on the contract drawings.

The City will provide only the minimum of survey crew services essential to orderly performance of the work, and City survey crews will not be available at all times for the work under these Specifications.

When the Contractor requires stakes or markers, (s)he shall notify the City of his/her requirements in a reasonable length of time in advance of starting operations that require such stakes or marks. In no event shall a notice of less than two working days be considered a reasonable length of time.

Where construction operations require removal of the City's stakes or other survey marks, the Contractor shall reference such points in an approved manner. Survey stakes or marks established by the City shall be preserved by the Contractor until (s)he is authorized to remove them, and in the

case of their unauthorized destruction or removal by the Contractor's forces, they will be replaced at the Contractor's expense. Any cost to the City of replacing survey stakes or markers will be deducted from payments due the Contractor. Such costs will include a reasonable charge for use of City supplies and equipment, plus overhead.

5.08 INSPECTION - The Director and his/her 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 materials and the work are in accordance with the requirements and intentions of the Drawings and Specifications. All work done and all materials furnished shall be subject to his inspection and approval.

The right of general supervision shall not make the Contractor an agent of the City and the liability of the Contractor for all damages to persons or to public or private property arising from the execution of the work shall not be lessened because of such general supervision.

The day-to-day inspection performed by the various inspectors employed by the City shall not constitute approval or ratification of work improperly done by the Contractor. The Director is the only person authorized to recommend acceptance or rejection of work and materials.

The presence or absence of an inspector during performance of the work shall not relieve the Contractor of any of his/her obligations to fulfill his/her Contract as prescribed. It shall be the duty of the Contractor to see that the provisions of these Specifications are complied with in detail, irrespective of the inspection given the work during its progress by the Director or his representatives. Any plan or method suggested to the Contractor by the Director or an inspector, but not specified or required, if adopted or followed in whole or in part, shall be used at the risk and responsibility of the Contractor; and the City and the Director will assume no responsibility therefor.

Defective work shall be made good, and unsuitable materials may be rejected notwithstanding that such defective work or unsuitable materials have been previously inspected by the Director or that payment therefor has been included in the progress estimate.

Projects financed in whole or part with Federal or State funds shall be subject to inspection at all times by the Federal or State Agency involved.

5.09 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORKS - All work which has been rejected shall be remedied, or removed and replaced by the Contractor in an acceptable manner at no additional cost to the City.

Any work done beyond the lines and grades shown on the Drawings or established by the City, 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, remedied, removed, replaced.

If the Contractor should fail to comply promptly with any order of the Director made under the provisions of this Article, the Director may cause rejected or unauthorized work to be remedied, removed, or replaced, and the costs thereof to be deducted from any monies due or to become due the Contractor.

If any portion of the work done or materials furnished under the contract shall prove defective or not in accordance with the specifications and contract drawings, and if the imperfection in the same shall not be of sufficient magnitude or importance to make the work dangerous or undesirable, the Director shall have the right and authority to retain the work instead of requiring it to be removed and reconstructed, but s/he shall make such deductions therefore in the payment due or to become due the Contractor as may be just and reasonable.

5.10 CONSTRUCTION EQUIPMENT AND PLANT - Only equipment and plant suited to produce the quality of work required will be permitted to operate on the work.

Plants shall be designed and constructed in accordance with general practice for such equipment and 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 plans to meet the above requirements; and, when ordered by the Director, shall remove unsuitable equipment from the work and discontinue the operation of unsatisfactory plant.

Each machine or unit of equipment shall be operated by a person experienced in handling the particular make of machine or unit of equipment in use, and shall not be operated at a speed or rate of production in excess of that recommended by the manufacturer.

The Contractor shall identify each piece of equipment, other than hand tools, by means of an identifying number plainly stenciled or stamped on the equipment at a conspicuous location. In addition, the make, model number and empty gross weight of each unit of compacting equipment shall be plainly stamped or stenciled in a conspicuous place on the unit. The gross weight shall be either the manufacturer's rated weight or the scale weight.

5.11 ALTERNATIVE CONSTRUCTION EQUIPMENT - While certain of these Specifications may provide that equipment of a particular size and type is to be used to perform portions of the work, it is to be understood that the development and use of new or improved equipment is to be encouraged

The Contractor may request, in writing, permission from the Director to use equipment of a different size or type in place of the equipment specified.

The Director, before considering or granting such request, may require the Contractor to furnish, at their expense, evidence satisfactory to the Director that the equipment proposed for use by the Contractor is capable of producing work equal to, or better than, that which can be produced by the equipment specified.

If such permission is granted by the Director, it shall be understood that such permission is granted for the purpose of testing the quality of work actually produced by such equipment and is subject to continuous attainment of results which, in the opinion of the Director, are equal to, or better than that

which can be obtained with the equipment specified. The Director shall have the right to withdraw such permission at any time the Director determines that the alternative equipment is not producing work that is equal, in all respects, to that which can be produced by the equipment specified. Upon withdrawal of such permission by the Director, the Contractor will be required to use the equipment originally specified and shall, in accordance with the direction of the Director, remove and dispose of or otherwise remedy, at his/her expense, any defective or unsatisfactory work produced with the alternative equipment.

Neither the City nor the Contractor shall have any claim against the other for either the withholding or the granting of permission to use alternative equipment, or for the withdrawal of such permission.

Permission to use alternative equipment in place of equipment specified will only be granted where such equipment is new or improved and its use is deemed by the Director to be in furtherance of the purposes of this Article. The approval for use of particular equipment on any project shall in no way be considered as an approval of the use of such equipment on any other project.

Nothing in this Article shall relieve the Contractor of his/her responsibility for furnishing materials or producing finished work of the quality specified in these Specifications.

5.12 USE OF COMPLETED PORTIONS - The City shall have the right at any time during the progress of the work, to take over and place in service any completed or partially completed portions of the work, notwithstanding the fact that time for completion of the entire work or such portions may not have expired; but such taking possessions thereof shall not be deemed an acceptance of any other portions of the work, nor work on those portions not completed in accordance with the contract documents.

5.13 LEGAL ADDRESS OF THE CONTRACTOR - Both the address given in the proposal and Contractor's office in the vicinity of the work are hereby designated as places to either of which drawings, letters, notices, or other articles of communication to the Contractor may be mailed or delivered. The mailing or delivery at either of these places shall be deemed sufficient notice thereof upon the Contractor. Nothing herein contained shall be deemed to preclude the service of any drawing, letter, notice, article or communication to or upon the Contractor or his/her representative personally. The address named in the proposal may be changed at any time by written notice, from the Contractor to the City.

5.14 FINAL INSPECTION - When the work authorized by the Contract has been completed, the Director will make the final inspection.

5.15 ACCEPTANCE OF CONTRACT - When the Director has made the final inspection in accordance with these Specifications and determines that the Contract has been completed in all respects in accordance with the Drawings and Specifications, s/he will recommend that the City Council formally accept the Work of Improvement

5.16 COORDINATION OF SPECIFICATIONS AND DRAWINGS - The Standard Provisions, Special Provisions, Technical Provisions, Drawings, Contract Change Orders, and all supplementary documents are essential parts of the Contract, and a requirement occurring in one is as

binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of conflict, the following shall be the rules of interpretation:

Drawings shall govern over the Standard Provisions; the Technical Provisions shall govern over both the Standard Provisions and the Drawings; the Special Provisions shall govern over the Technical Provisions, the Standard Provisions and the Drawings.

Detail Drawings shall govern over general Drawings. Figures written on Drawings shall govern over the drawings themselves.

5.17 INTERPRETATION OF SPECIFICATIONS AND DRAWINGS - The work herein provided for is to be done in accordance with the Specifications and Drawings on file in the office of the City Clerk. All corrections of readily apparent errors or omissions in Specifications or Drawings may be made by the Director when such corrections are necessary for the proper fulfillment of their intention as construed by him/her. The misplacement, addition or omission of any work, letter, figure or punctuation mark which has no substantive legal effect will in no way change the due spirit, intent, or meaning of these Specifications.

Any part of the work which is not mentioned in these Specifications but is shown on the Drawings, or any part of the work not shown on the Drawings but described in these Specifications, or any part not shown on the Drawings or described in these Specifications but which is reasonably or ordinarily implied by either, shall be furnished and installed by the Contractor as if fully described in these Specifications and shown upon the Drawings.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Specifications or on the Drawings, or if the Contractor discovers any discrepancies during the course of the work between the Contract Drawings and conditions in the field, or any errors or omissions in the Contract Drawings, the Specifications, or in the layout given by stakes, points, or instructions, the bidder or Contractor shall apply in writing to the Director for such further explanations as may be necessary and shall conform to them as part of the Contract. In the event of any doubt or questions arising respecting the true meaning of the Specifications or Drawings, reference shall be made in writing to the Director, whose decision thereon shall be final. Any work done after such discovery until authorized by the Director, will be done at the Contractor's risk.

5.18 STATE SPECIFICATIONS - Where specifically required, the work set forth in these Specifications shall be accomplished in accordance with appropriate provisions of the State Specifications, Section 10 to Section 95 inclusive, insofar as they apply. Said Specifications are here in referred to as the State Specifications and are, by reference, made a part of these Specifications the same as though as set out in full. In the event of conflict between the State Specifications and the Standard, Special, or Technical Provisions of these Specifications or the Drawings, these Specifications and Drawings shall apply.

5.19 REASONABLENESS OF INTERPRETATIONS - All interpretations of these Specifications and the Drawings by the City and decisions made thereon by the Director will not be arbitrary, capricious, or unreasonable.

SECTION 6

CONTROL OF MATERIALS AND INSTALLED EQUIPMENT

6.01 FURNISHING AND QUALITY OF MATERIALS & EQUIPMENT - The Contractor shall furnish all materials and equipment required to complete the work, except materials or equipment that are designated in the Special Provisions to be furnished by the City or materials furnished by the City in accordance with Article 4.03.

Notwithstanding any prior inspection or approval, only materials and equipment conforming to the requirements of the Specifications shall be incorporated in the work.

The materials and equipment furnished and used shall be new and unused and of the highest commercial quality currently available. The materials and equipment shall be manufactured, handled, and used in a workmanlike manner to ensure completed work in accordance with the Drawings and Specifications.

The Contractor shall be required to furnish a written guaranty covering certain items of material and equipment for varying periods of time from the date of acceptance of the Work of Improvement. The material and equipment to be guaranteed, the form of guaranty, and the time limit of the guaranty are as specified in Article 9.09. Said guaranty shall be signed and delivered to the Director before Acceptance of the Work of Improvement. Upon completion of the Work of Improvement, the amounts of the Contract bonds required in Article 3.04 may be reduced to conform to the total amount of the Contract bid prices for the items to be guaranteed and this amount shall continue in full force and effect for the duration of the guaranty period.

6.02 SOURCE OF MATERIAL AND EQUIPMENT - The Contractor shall furnish a list of his/her sources of materials and equipment to the Director. The list shall be furnished on a City form and shall be furnished to the Director in sufficient time to permit proper inspection and testing of materials and equipment to be furnished from such listed sources in advance of their use. The Contractor shall furnish without charge such samples as may be required. Inspection and tests will be made and reports rendered, but it is understood that such inspection and tests shall not be considered as a guarantee of acceptance of any material or equipment which may be delivered later for incorporation in the work. No equipment or materials which, after approval, have in any way become unfit for use shall be used in the work.

The Contractor shall submit five copies of approval data for the mechanical and electrical materials, and equipment proposed for installation. The data shall be submitted in the same routine as prescribed for working drawings in Article 5.02. Approval data shall consist of complete material and equipment lists accompanied by catalog data sheets, cuts, performance curves, diagrams or similar descriptive material. Material and equipment lists shall give, in each case, the name of the manufacturer, trade name, catalog reference, size, finish, and all other pertinent data. It is intended that approval data should not include such materials as small pipe and small pipe fittings, conduit and conduit fittings, or tubing. Data submitted as specified herein for each major subdivision of mechanical and electrical work shall be bound together under a hard cover, provided with a

complete index, and properly identified on the cover. Individual sheets shall be easily removable without tearing or other damage. The Contractor shall furnish operation and maintenance manuals or instructions if required by the Technical Provisions.

At the option of the Director, the source of supply of each of the materials shall be approved by him/her before the delivery is started. All materials proposed for use may be inspected or tested at any time during their preparation and use. After trial, if it is found that sources of supply which appeared satisfactory 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 sources.

6.03 STORAGE OF MATERIALS AND EQUIPMENT - Materials and equipment shall be so stored as to ensure the preservation of their quality and fitness for the work. They shall be placed under cover when directed and shall be sorted in a manner that will facilitate prompt inspection.

6.04 DEFECTIVE MATERIALS - All materials not conforming to the requirements of the Specifications and Drawings shall be considered as defective and all such materials shall be rejected, whether in place or not. They shall be removed immediately from the site of the work, unless otherwise permitted by the Director. No rejected material, the defects of which have been subsequently corrected, shall be used unless approval in writing has been given by the Director. If the Contractor should fail to comply promptly with any order of the Director made under the provisions of this Article, the Director may cause defective materials to be removed and replaced, and the costs thereof to be deducted from any monies due or to become due the Contractor.

6.05 TRADE NAMES AND ALTERNATIVES - For convenience in designation on the Drawings or in the Specifications, certain equipment or materials to be incorporated in the work may be designated under a trade name or the name of a manufacturer and his/her catalog information. The use of alternative equipment or material which is of equal quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:

The burden of proof as to the comparative quality and suitability of alternative equipment or materials shall be upon the Contractor and s/he shall furnish, at their own expense, six copies of complete description, information and performance data showing the quality of the materials or equipment offered to those specified, and such other necessary or related information as may be required by the Director. The Director will be the sole judge as to the comparative quality and suitability of alternative equipment or materials and this decision shall be final.

The Contractor, pursuant to Government Code, Section 4380, shall have at least 35 days after award of the Contract for submission of data substantiating a request for a substitution of "or equal" item.

6.06 TESTING MATERIALS - Unless otherwise specified in the Special Provisions or Technical Provisions called for on the drawings, all tests of materials and work, for determining compliance with requirement, shall be performed in accordance with the methods in use by the laboratory of the State Department of Transportation or by nationally recognized testing organizations, at a laboratory approved by the Director.

Whenever a reference is made to a specification or test method either of the American Society of Testing Materials, the American Water Works Association, or any other authority, and the number

accompanying the specification or test method representing the year of its acceptance is omitted, the reference shall mean the specification or test method in effect on the date of the Notice to Contractors.

Whenever a specification or test method of the American Society for Testing Materials, the American Water Works Association, or any other authority, includes a test procedure or test requirements, the Contractor shall submit two copies of certified test results, unless the requirement therefore is waived. No material will be accepted until these data have been passed upon by the Director and accepted.

Samples of all materials entering into the work shall be furnished by the Contractor without charge, when requested by the Director.

Materials may be tested at any time during progress of the work.

6.07 PLANT INSPECTION - Materials and equipment which become a part of the completed work will be subject to inspection at the place of production or manufacture, at the shipping point, or at the site of the work. Materials and equipment requiring inspection at the place of production or manufacture will be designated by the Director. Where plant inspection is so designated, the Director shall be given 14 days advance notice of the start of manufacture or production. The Contractor's purchase orders for materials and equipment for which plant inspection has been designated by the Director shall bear a suitable notation advising suppliers and subcontractors of inspection requirements.

The Director or an authorized representative shall have free entry at all times to such parts of the plant as concerns the manufacture or production of materials and equipment for the City. Adequate facilities shall be furnished free of charge to make the necessary inspection.

The City assumes no obligation to inspect material or equipment at the place of manufacture or production, or at the shipping point.

6.08 CITY FURNISHED MATERIALS - Materials furnished by the City will be available at locations designated in the Special Provisions. They shall be loaded, unloaded and hauled to the site of the work by the Contractor at his/her expense. The Contractor shall be held responsible for all materials furnished to him/her, and s/he shall pay all demurrage and storage charges. The cost of handling and placing City furnished material shall be considered as included in the price paid for the Contract item involving such City furnished material.

SECTION 7

LEGAL RELATIONS AND RESPONSIBILITY

7.01 LAWS TO BE OBSERVED - The Contractor shall be kept fully informed of all existing and future State and Federal laws and County and Municipal ordinances and regulations which in any manner affect those engaged or employed in the work, or the materials used in the work, or which in any way affect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. S\he shall at all times observe and comply with, and shall cause all his/her agents and employees to observe and comply with, all such applicable exiting and future laws, ordinances, regulations, orders and decrees of bodies or tribunals having any jurisdiction of authority over the work; and shall protect and indemnify the City, the City Council, the Director and Consulting Engineer, and all of its and their officers and agents and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by him or herself or his/her employees. If any discrepancy or inconsistency is discovered in the Drawings, Specifications, or Contract for the work in relation to any such law, ordinance, regulation order, or decree, the Contractor shall forthwith report the same to the Director in writing.

7.02 LABOR DISCRIMINATION - Attention is directed to the following sections of the Labor Code:

- 1735. No discrimination shall be made in the employment of persons upon Public Works because of race, color, national origin or ancestry, or religion of such persons and every Contractor for Public Works violating this section is subject to all the penalties imposed for a violation of this chapter.
- 1420. It shall be unlawful employment practice, unless based upon a bonafide occupational qualification, or except where based upon applicable security regulations established by the United States or the States or the State of California:
 - (a) For an employer, because of the race, religious creed, color, national origin, or ancestry of any person, to refuse to hire or employ him/her or to bar or to discharge from employment such person, or to discriminate against such person in compensation or in terms, conditions or privileges of employment.

7.03 EMPLOYMENT OF LABOR - The Contractor, and all Subcontractors, must comply with the provisions of Chapter 3.10 of the Municipal Code, which is incorporated into these Contract documents by reference. Chapter 3.10 specifically requires City Contractors and sub-Contractors to make good faith efforts to hire qualified individuals who are local residents, as workers on City Public Works projects valued greater than the formal bid limit unless prohibited by State or Federal laws or regulations. It further requires the maintenance of certain records and documents necessary for the monitoring of compliance with the Chapter. Failure to comply with any of the provisions of Chapter 3.10, including the maintenance of records, shall be deemed a breach of the Contract or Subcontract and may result in the Contractor or Subcontractor being declared "non-responsible" by the City and ineligible for the award of future City contracts.

7.04 PREVAILING WAGES - In accordance with provisions of Section 1773 of the Labor Code, the City has ascertained the general prevailing rate of wages applicable to the particular craft, classification or type of workers employed on the work. These rates are set forth in the Notice to Contractors.

The Contractor shall forfeit as a penalty to the City, up to \$50 for each day, or portion thereof, for each worker paid less than the stipulated prevailing rates for any public work done under the Contract by him\her or by any subcontractor under him\her, in violation of the provisions of the Labor Code, particularly, Section 1770 through 1780 inclusive.

The work of installing, assembling, repairing or reconditioning, or other work of any nature on machinery, equipment, or tools used in or upon the work shall be considered a part of the work to be performed under the Contract any laborers, workers, or mechanics working on such machinery, equipment, or tools, shall be subject to all of the requirements relating to labor set forth in the Contract.

The construction, erection, and operation of material production, proportioning, or mixing plants from which material is used wholly on the Contract or on contracts under the supervision of the City, shall be considered a part of the work to be performed under the Contract and any laborers, workers, or mechanics working on such plants shall be subject to all of the requirements relating to labor set forth in the Contract.

7.05 HOURS OF LABOR - Eight hours labor constitutes a legal day's work. The Contractor shall forfeit as a penalty to the City up to \$50 for each worker employed in the execution of the Contract by the Contractor or by any subcontractor for each day during which such worker is required or permitted to labor more than eight hours in violation of Labor Code Sections 1810 to 1815, inclusive, except as provided for under Labor Code Section 1815.

7.06 APPRENTICES - The Contractor's attention is directed to the provisions in Section 1777.5 (Chapter 1411, Statutes of 1968) and 1777.6 of the Labor Code concerning the employment of apprentices by the Contractor or any subcontractor under him\her.

Section 1777.5, as amended, requires the Contractor or subcontractor employing tradespersons in any apprenticeship occupation to apply to the joint apprenticeship committee nearest the site of the Public Works project and which administers the apprenticeship program in that trade for a certificate of approval. The certificate will also fix the ratio of apprentices to journeymen that will be used on the performance of the Contract. The ratio of apprentices to journeymen in such cases shall not be less than one to five except:

- A. When unemployment in the area of coverage by the Joint Apprenticeship committee has exceeded an average of 15 percent in the 90 days prior to the request for certificate, or
- B. When the number of apprentices in training in the area, exceeds a ratio of one to five, or

- C. When the trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis statewide or locally, or
- D. When the Contractor provides evidence that (s)he employs registered apprentices on all of his/her contracts on an annual average of no less than one apprentice to eight journeymen.

The Contractor is required to make contributions to funds established for the administration of apprenticeship programs if (s)he employs registered apprentices or journeymen in any apprenticeship trade on such contracts and if other Contractors on the Public Works site are making such contributions.

The Contractor and any subcontractor under him/her shall comply with the requirements of Sections 1777.5 and 1777.6 in the employment of apprentices.

Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of Industrial Relations, ex-officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship standards and its branch offices.

7.07 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, except as provided in the Special Provisions.

7.08 PATENTS AND COPYRIGHTS - The Contractor shall assume all costs arising from the use of, and shall hold and save the City and the Council, its officers, agents, and employees, harmless from liability of any nature and kind, including costs and expenses, for or on account of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, equipment, device, or appliance manufactured, furnished, or used by him/her in the performance of the Contract, including their use by the City, unless otherwise specifically stipulated in the Specifications.

7.09 SANITARY FACILITIES - The Contractor shall conform to the rules and regulations pertaining to sanitary provisions as established by the State of California, the County of Santa Cruz and the City of Santa Cruz as may be applicable.

7.10 PUBLIC SAFETY - The Contractor shall, at his/her own expense, furnish, erect and maintain such fences, barriers, lights, bridges, and signs and provide such flaggers and guards as are necessary in the opinion of the Director to give adequate warning to the public of the construction and of any dangerous conditions to be encountered as a result thereof.

No material or equipment shall be stored where it will interfere with the safe passage of public traffic, and at the end of each day's work and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructions from that portion of the roadway open for use by public traffic. Spillage resulting from hauling operations along or across any public traveled way shall be removed promptly.

Whenever the Contractor's operations require one-way traffic or creates a condition hazardous to the public traffic, s\he shall provide and station competent flaggers whose sole duties shall consist of directing the movement of public traffic through or around the work.

7.11 ACCIDENT PREVENTION - The Contractor shall comply with all pertinent safety orders of the State of California, Department of Industrial Relations, Division of Industrial Safety, and U.S. Department of Labor, OSHA, and will also take or cause to be taken such additional measures as may be necessary for the prevention of accidents.

Prior to commencement of work, the Contractor shall (1) submit in writing the proposals for effectuating his/her provisions for accident prevention, and (2) meet in conference with the Director to discuss and develop mutual understandings relative to administration of an overall safety program.

During the performance of work under the Contract, the Contractor shall institute controls and procedures for the control and safety of persons visiting the job site.

The Contractor shall maintain an accurate record of, and shall report to, the Director in writing, exposure data and all accidents resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies or equipment incident to work performed under the Contract.

The Director will notify the Contractor of any noncompliance with the foregoing provisions. The Contractor shall after receipt of such notice, immediately take corrective action. If the Contractor fails or refuses to comply immediately, the matter will be referred to the proper authority. No part of the time lost due to any stop order issued by proper authority shall be made the subject or claim for extension of time for extra costs or damages by the Contractor.

Compliance with the provisions of this Article by subcontractors will be the responsibility of the Contractor.

No direct payment will be made by reason of the provisions of this Article and all costs in connection therewith shall be included in the prices paid for various contract items of work.

7.12 EXPLOSIVES AND STREAM POLLUTION - When the use of explosives is necessary for the prosecution of work, the Contractor shall not endanger life or property, and will be required to obtain a permit for use of explosives within City limits.

All explosives shall be stored in accordance with the provisions of Division XI of the Health and Safety Code, and any applicable County or local ordinances.

Attention is called to the necessity of obtaining a permit from the Department of Fish and Game of the State of California in advance of use of underwater explosives. Attention is directed to the Fish and Game Code relating to stream pollution, particularly, Section 5650.

7.13 FIRES - The Contractor shall obtain any necessary fire permits from the properly constituted authority and comply with all regulations of the County in which the work is to be performed.

7.14 INTERFERENCE WITH FIRE HYDRANTS, HIGHWAYS, AND FENCES - The Contractor shall so conduct his/her operations so as not to close or obstruct any portion of any highway, road, or street, or prevent in any way free access to fire hydrants until s\he has obtained permits therefor from the proper authorities. If any highway required to be kept open shall be rendered unsafe by the Contractor's operation s\he shall make such repairs or provide such temporary guards as shall be acceptable to the authorities having jurisdiction and to the Director. Any highway or street maintenance or repair work required by local authorities in connection with necessary operations under the Contract shall be performed by the Contractor at his/her own cost and expense. Fences subject to interference shall be maintained as effective barriers consistent with the original intent, but upon approval of the Director, they may be moved or rearranged to facilitate prosecution of the work until the work is finished, after which they shall be restored to their original or better condition.

7.15 PRESERVATION OF PROPERTY - Due care shall be exercised to avoid damage to existing improvements, utility facilities, and adjacent property. The fact that any pipe or underground facility is not shown on the drawings shall not relieve the Contractor of responsibility or ascertaining the existence of any underground improvements or facilities which may be subject to damage by reason of the operation.

Any obstruction along the line of work, such as mail-boxes or paper-boxes, posts, fences, culverts, improvements, etc., which interferes with the Contractor's operation shall be carefully removed and replaced by the Contractor as soon as possible in a satisfactory condition. Trees and shrubbery that are not to be removed, and pole lines, fences, signs, survey markers and monuments, buildings and structures, conduits, under- or above-ground pipelines, and any other improvements and facilities adjacent to the work shall be protected from injury or damage, and if ordered by the Director, the Contractor shall provide and install suitable safeguards to protect such objects from injury or damage.

If such objects are injured or damaged by reason of the Contractor's operations they shall be replaced or restored at the Contractor's expense. The facilities shall be replaced or restored to a condition as good as when the Contractor entered upon the work, or as good as required by the Specifications accompanying the work being performed under the Contract. When it becomes necessary for the Contractor to remove an existing fence as an obstruction to the work, the Contractor shall provide the necessary temporary fencing to be functionally as effective as the original for protection of livestock, equipment, or property.

Only those trees specifically designated for removal on the contract drawings shall be removed except with specific approval of the Director. Tree branches that extend over the work and must be removed, shall be cut off at the bole in a competent manner. The Contractor shall then remove other branches so that the tree will present a balanced appearance. Scars resulting from the removal of branches shall be treated with a heavy coat of an approved tree seal. The Director may make or cause to be made such temporary repairs as are necessary to restore to service any damaged facility.

The cost of such repairs shall be borne by the Contractor and may be deducted from any monies due or to become due the Contractor under the Contract.

No direct payment will be made by reason of the provisions of this article and all costs in connection therewith shall be included in the prices paid for the various contract items of work.

The Contractor, employee, and agents, shall at all times observe and comply with all conditions imposed by any instrument granting the right to enter upon property for the purpose of performing the work provided for herein, including, but not limited to, all conditions relative to the prevention and suppression of fires.

7.16 PUBLIC CONVENIENCE - Unless otherwise provided in the Special Provisions, all public traffic shall be permitted to pass through the work, and the Contractor shall so conduct operations as to offer the least possible obstruction and inconvenience to the public. The Contractor shall have under construction not greater length or amount of work than can be prosecuted properly with due regard to the rights of the public, and the Director shall be the sole judge of the length or amount of work which will afford proper convenience to the public. In addition to the requirements for furnishing facilities for public safety as specified in Article 7.10, the Contractor shall erect such warning and directional signs as may be necessary, in the opinion of the Director, for expediting the passage of public traffic through or around the work and the approaches thereto. All such signs and traffic maintenance shall be subject to the approval of the Director, and (s)he shall be notified 24 hours in advance of any disturbance of existing traffic patterns. No changes shall be made until approved by the Director.

Traffic signs, existing within the limits of the project, such as STOP signs, shall be maintained in an upright secure position, and located so as to properly control traffic, whenever it is necessary to remove them from their permanent location due to construction of the work, and shall be reinstalled in their permanent location at the earliest possible time.

Where pipelines are to be installed under the contract across certain designated streets or highways, as noted on the plans, the Contractor will only be permitted to open the trench one-half the width of the pavement at any one time so that one-way traffic can be maintained.

Construction operations shall also be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners. Water or dust palliative shall be applied if ordered by the Director for the alleviation or prevention of dust nuisance caused by the Contractor's operations. Convenient access to driveways, houses, and buildings along the line of work shall be maintained fully by the Contractor, and temporary approaches to crossings or intersecting roads or streets shall be provided and kept in good condition.

When traffic control signals are shut down as provided in Section 86-1.05 of the State Specifications, the Contractor shall control traffic by use of flaggers, as directed by the Director, at those locations set forth in the Special Provisions. No STOP signs will be permitted at these locations. The flaggers required for this operation shall be paid for by the Contractor.

All of the foregoing requirements shall apply on weekends and holidays, if considered necessary by the Director. The Director may take action as necessary to provide for public convenience and

charge the cost thereof to the Contractor if no representative of the Contractor is available to do same.

7.17 CONTRACTOR'S RESPONSIBILITY FOR WORK - Until the formal acceptance of the work, the Contractor shall have the charge and care of the work and of the materials to be used therein, and shall bear the risk of injury, loss, 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 non-execution of the work. The materials to be used in the work include both those furnished by the City and those furnished by the Contractor, including materials for which the Contractor has received partial payment as provided in article 9.06.

7.18 RESPONSIBILITY FOR DAMAGES - The City, the City Council, the Director, and all officers and employees of the City shall not be answerable or accountable in any manner, for any loss or damage that may occur to the work or any part thereof; or for any of the materials or other things used or employed in performing the work; or for injury to any person or persons, either workers or the public; for damage to property from any cause which might have been prevented by the Contractor or his/her workers, or anyone employed by him/her; against all of which injuries or damages to persons and property the Contractor having control over such work must properly guard.

The Contractor shall be responsible for any damage to any person or property resulting from defects or obstructions or from any cause whatsoever during the progress of work or at any time before its completion and final acceptance and during the period of the project guarantee. The Contractor shall assume the defense and indemnify and save harmless the City, or Director, and their officers and employees, from every expense, liability or payment by reason of injury (including death) to persons or damage to property suffered through any act or omission, including passive and/or active negligence, of the Contractor or any of his/her subcontractors, or anyone directly or indirectly employed by either of them, or from the condition of the premises while in the control of the Contractor or any of his/her subcontractors, or anyone directly or indirectly employed by either of them, or arising in any way from the work called for by this contract. Except as provided in Section 3.07, this provision shall not be deemed to require the Contractor to indemnify the City against liability for damages arising from the active negligence or willful misconduct of the City or its agents, servants or independent Contractors who are directly responsible to the City.

7.19 PAYMENT OF TAXES - The Contract prices paid for the work shall include full compensation for all taxes which the Contractor is required to pay, whether imposed by the Federal, State or local government.

7.20 COOPERATION BETWEEN CONTRACTORS - Should construction be underway by other forces or by other Contractors within or adjacent to the limits of the work specified or should work of any other nature be underway by other forces within or adjacent to said limits, the Contractor shall cooperate with all such other Contractors or other forces to the end that any unnecessary delay or hindrance to their work will be avoided. The right is reserved to perform other or additional work at or near the site (including designated material sources) at any time by the use of other forces.

When two or more Contractors are employed on related or adjacent work, or are to obtain materials from the same designated material source, each shall conduct his/her operations in such a manner as

not to cause any unnecessary delay or hindrance to the other. Each Contractor shall be responsible to the other for all damage to work, to person or property caused to the other by his/her operations, and for loss caused the other due to his/her unnecessary delays or failure to finish the work within the time specified for completion.

7.21 PROPERTY RIGHTS IN MATERIAL - 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, or after payment has been made for 80 percent of the value of materials delivered to the site of the work, whether or not they have been so attached or affixed. All such materials shall become the property of the City upon being so attached or affixed upon payment of such 80 percent of the value of materials delivered by the Contractor on the ground and not used, as provided in Article 9.06

7.22 RIGHTS IN LAND AND IMPROVEMENTS - Nothing in these Specifications shall be construed as allowing the Contractor to make any arrangements with any person to permit occupancy or use of any land, structure, or building within the limits of the Contract for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the City and any owner, former owner, or tenant of such land, structure or building.

7.23 TITLE TO MATERIALS FOUND ON THE WORK - The title to all water and to the right to the use of all water, to all soil, stone, gravel, sand, minerals, and all other materials developed or obtained in the excavation or other operations by the Contractor or any subcontractor, or any of their employees, and the right to use or dispose of the same, are hereby expressly reserved in the City and neither the Contractor, nor any subcontractor, nor any of their employees shall have any right, title, or interest in or to any part thereof; neither shall they, nor any of them, assert or make any claim thereto. The Contractor may be permitted to use in the work without charge any such materials which meet the requirements of these Specifications.

7.24 PERSONAL LIABILITY - Neither the members of the City Council, the Director, the Consulting Engineer, nor any other officer or employee of the City shall be personally responsible for any liability arising under the Contract.

7.25 TRESPASS - The Contractor shall be responsible for all damage or injury which may be caused on any property by trespass by the Contractor, any subcontractor or their employees in the course of their employment, whether the said trespass was committed with or without the consent or knowledge of the Contractor.

7.26 SUBCONTRACTING - The Contractor shall comply with Government Code Sections 4100 to 4108, inclusive, relating to subletting and subcontracting.

Space is provided in the Proposal for listing subcontractors to be employed.

In no case shall the use of subcontractors in any way alter the position of the Contractor or his/her sureties with relation to this Contract. When a subcontractor is used, the responsibility for every portion of the work shall still remain with the Contractor.

7.27 PROTECTION OF PUBLIC UTILITIES - Attention is directed to Section 4215, Chapter 3.1 to Division 5 of Title 1 of the Government Code concerning the protection of public utilities.

The Contractor will be required to work around public utility facilities that are to remain in place within the construction area or that are to be relocated and relocation operations have not been completed, and (s)he will be held liable to the owners of such facilities for any damage or interference with service resulting from his/her operations.

The exact locations of underground facilities and improvements within the construction area shall be ascertained by the Contractor before using equipment that may damage or interfere with service resulting from his/her operations. It shall be the Contractor's responsibility to notify public utilities that (s)he is working in the vicinity of their facilities.

Other forces may be engaged in moving or reconstructing utility facilities or maintaining service of utility facilities, and the Contractor shall cooperate with such forces and conduct his/her operation in such a manner as to avoid unnecessary delay or hindrance to the work being performed by such other forces.

The City owns, operates and maintains its own water distribution and sewer collection systems and will cooperate with the Contractor insofar as it is reasonable and practicable. Water, as required for City projects, may be obtained at City-owned fire hydrants provided that application is made to the Water Department and permission obtained with provision for payment.

Full compensation for conforming to the requirements of this article, not otherwise provided for, shall be considered as included in the prices paid for the various contract items of work and no additional allowance will be made therefor.

7.28 PUBLICATIONS - The Contractor shall submit and obtain written approval from the Director prior to the publication of any technical articles, descriptions, or news releases, concerning this project. Approval shall be granted providing that the City is properly acknowledge, technical innovations are properly acknowledged, and such publication is in the best interest of the City.

7.29 LANDS AND RIGHTS-OF-WAY - The City shall provide the lands rights-of-way, and easements upon which the work under this contract is to be done, and such other lands as may be designated on the contract drawings for the use of the Contractor and the Contractor shall confine his/her operations to within these limits.

The Contractor shall provide at his\her own expense any additional land and access thereto that may be required for temporary construction facilities or for storage of materials.

SECTION 8

PROSECUTION AND PROGRESS OF WORK

8.01 ASSIGNMENT - The performance of the Contract may not be assigned except upon the written consent of the City Council. Consent will not be given to any proposed assignment which would relieve the original Contractor or his/her surety of their responsibilities under the Contract.

The Contractor may assign monies due or to become due him/her under the Contract and such assignment will be recognized by the City, if given proper notice thereof, to the extent permitted by law, but any assignment of moneys shall be subject to all proper setoffs in favor of the City and to all deductions provided for in the Contract and particularly all money withheld, whether assigned or not, shall be subject to being used by the City for the completion of the work in the event that the Contractor should be in default therein.

8.02 COMMENCEMENT OF WORK - The Contractor shall not begin work until s/he has received notice to proceed from the City, and shall upon receiving notice, begin work within the time specified in the notice. After receipt of said notice, the Contractor shall provide written notice to the Director of the Contractor's intention to start work, specifying the date on which s/he intends to start at least 24 hours in advance.

8.03 WORK IN PROGRESS SCHEDULE - Unless not required by the Special Provisions, the Contractor or the bidder to whom the Contract is awarded shall, prior to beginning work, submit to the Director a practicable work schedule in the form required by the Special Provisions showing the order and dates within which the Contractor proposes to carry out the work.

8.04 TEMPORARY SUSPENSION OF WORK - The Director shall have the authority to suspend the work wholly, or in part, for such period as (s)he may deem necessary when work is being performed in unsuitable weather, or when any other conditions are considered unfavorable for the proper prosecution of the work. The Director shall also have authority to suspend the work wholly or in part because of failure on the part of the Contractor to carry out orders given or to perform any provisions of the Contract. The Contractor shall immediately comply with the written order of the Director to suspend the work wholly or in part. Work suspended wholly or in part shall be resumed by the Contractor on written order of the Director when conditions are favorable and methods corrected.

8.05 TEMPORARY SUSPENSION OF WORK FOR THE CONVENIENCE AND BENEFIT OF THE CITY - The Director may order the Contractor, in writing, to temporarily suspend all or any part of the work for such period of time as may be determined by the Director to be necessary or desirable for the convenience and benefit of the City. Where such suspension has been ordered in writing as above provided and where such suspension unreasonably delays the progress of the work, the Director and/or City Council shall make an equitable adjustment in the contract price and contract time.

8.06 SUSPENSION OF WORK BECAUSE OF CONDITIONS BEYOND CONTROL OF CITY OR CONTRACTOR - Should the work of this contract be suspended for a period of over one (1) year due to war conditions, labor conditions, legal actions, or for any other reason beyond the control of either the City or the Contractor, the work may be terminated by mutual agreement subject to the following conditions. The City shall be responsible for payment for the actual work accomplished only, based on bid prices. The pro-rated cost of such work, where not fully covered by unit costs or bid items, shall be determined by an evaluation of the work done and the bid costs.

8.07 TERMINATION OF UNSATISFACTORY SUBCONTRACTS - When any portion of the work which has been subcontracted by the Contractor is not being prosecuted in a satisfactory manner, the subcontract for such work shall be terminated immediately by the Contractor upon written notice from the Director, and the subcontractor shall not again be employed on the type of work in which his/her performance was unsatisfactory.

8.08 CHARACTER OF WORKERS - If any subcontractor or person employed by the Contractor or subcontractor shall fail or refuse to carry out the directions of the Director or shall appear to the Director to be incompetent or to act in a disorderly or improper manner, (s)he shall be removed from the work immediately on the request of the Director, and such persons shall not again be employed on the work.

8.09 TIME COMPLETION AND LIQUIDATED DAMAGES - The Contractor shall complete all the work under the Contract within the number of days set forth in the Special Provisions or the Proposal form.

When a delay occurs due to unforeseen causes beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of nature, acts of the public enemy, governmental acts, fires, floods, epidemics, strikes (except as caused by improper acts or omissions of the Contractor), the time of completion shall be extended for a period justified by the effect of such delay on the completion of the work. A delay of a subcontractor or supplier due to the above circumstances will be taken into consideration for extensions of time of completion.

Acts of nature means an earthquake, flood, cloudburst, cyclone, or other cataclysmic phenomena of nature beyond the power of the Contractor to foresee or to make preparation in defense against, but does not include ordinary precipitation. The number of days provided for the work as set forth in the Special Provisions includes a normal amount of days for downtime due to weather according to the time of year in which the Contract will be operational.

Should any of the unforeseen circumstances as described in the preceding portion of this Article occur, the Contractor shall file written notice with the Director within the 10 days of the beginning of such delay. The notification shall be accompanied by documentary evidence to the fact and effect of the circumstances. Circumstances of which no notification has been given within 10 days of their occurrence shall not afterward be claimed as grounds for extension of time of completion. The Director will determine the facts in the matter and his/her findings shall be final and conclusive.

If the Contract is revised by a Contract Change Order and the Director determines that such revision will cause delay in completion of the work, the Change Order will provide for extension of the time of completion.

It is agreed by the parties to the Contract that in case all the work called for under the Contract in all parts and requirements is not finished or completed within the number of days as set forth in the Special Provisions, damage will be sustained by the City, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the City will sustain in the event of a reason of such delay; and it is therefore agreed that the Contractor will pay to the City the sum set forth in the Special Provisions per day for each and every day's delay in finishing the work in excess of the number of days prescribed; and the Contractor agrees to pay said liquidated damages herein provided for, and further agrees that the City may deduct the amount thereof from any monies due or that may become due to the Contractor under the Contract.

8.10 TERMINATION OF CONTRACT - If the Contractor should fail to supply sufficient workers, material, supplies, and equipment, the City shall give written notice to the Contractor, which notice shall require that the Contractor supply sufficient workers, supplies, materials, and equipment to diligently prosecute the project. If the Contractor fails to resume diligent prosecution of the work within 48 hours after such notice is delivered, the City may eject the Contractor from the job, take over all supplies, equipment and material of the Contractor on the job site, and may either obtain another Contractor to finish the project or the City may finish the project with its own forces. In such event, the Contractor shall be liable to the City for damages including but not limited to the full cost of completing the project.

8.11 RIGHT-OF-WAY DELAYS - If performance of the Contractor's work is delayed as the result of the failure of the City to acquire or provide rights-of-way, an extension of time will be granted pursuant to provisions of Article 8.09.

8.12 CONTRACTOR'S COST DATA - The City, or any of its duly authorized representatives shall, until the expiration of three years after final payment under this Contract or any subcontractor under it, have access to and the right to examine any of the Contractor's or subcontractor's payrolls, records of personnel, invoices of materials, records of plant and equipment costs, and any and all other directly pertinent books, documents, papers, and records of such Contractor or subcontractor, involving transactions related to said Contract or subcontracts. In the event State or Federal funds are involved in the financing of the project, the State or Federal Government shall have the same rights of inspection as the City.

8.13 COORDINATION WITH UTILITIES - The Contractor shall be required to coordinate the work with the removal or relocation of any utility facility by any utility company or public agency where the utility facility is shown on the plans or specified in the Special Provisions to be removed or relocated by such company or agency. It shall be the Contractor's sole responsibility to effect said coordination, and it shall be deemed, upon his/her submission of a Proposal and Schedule to do Work, that the Contractor has reviewed his/her working plans with, and coordinated any utility facility removal or relocation with, all appropriate utility companies and public agencies.

In general, the location of existing utility facilities as shown on the drawings are approximate. This information has been obtained from utility maps furnished by the various agencies involved, and the City does not guarantee either the correctness of locations or the extent of such location. Minor lines such as house water, gas and sewer facilities are not shown. It shall be the responsibility of the Contractor to ascertain the exact location of the utility facilities, and no additional compensation may be claimed for additional work involved because the actual location is different than that shown on the plans.

In the event that a utility facility is encountered which is neither shown on the plans nor specified in the Special Provisions, the Contractor shall immediately notify the City in writing. The City will either have the appropriate utility company or public agency relocate the facility, or the City will direct the Contractor to relocate the facility under the Force Account provisions of these Specifications. No additional compensation may be claimed because of the delays due to utilities encountered along the line of the work. The Contractor will not be assessed liquidated damages for delay in completion of the project, when such delay is caused by the failure of the City of the owner of the utility facility to provide for removal or relocation of existing utility facilities.

Unless otherwise indicated on the Drawings or specified in the Special Provisions, the Contractor shall maintain in service all drainage, water, gas, and sewer lines, including house services, power, lighting and telephone conduits, and any other surface or subsurface structure of facility of any nature that may be affected by the work; provided, however, that the Contractor for his/her convenience may arrange with the owner to temporarily disconnect house service lines or other facilities along the line of the work. The cost of disconnecting and restoring such utilities shall be borne by the Contractor.

The Contractor is responsible for the protection of and for any damage to any utility facility encountered on the project during the prosecution of the work. Any such damage to a utility facility shall be repaired to the satisfaction of the utility owning the same. The City reserves the right, if so requested by the owner, to permit the owner to repair such damage. All expenses of whatever nature arising from such damage shall be borne by the Contractor.

8.14 RESPONSIBILITY FOR ACCURACY - The Contractor shall obtain all necessary measurements for and from the work, and shall check dimensions, elevations, and grades for all layout and construction work and shall supervise such work, for the accuracy of all of which s/he shall be responsible. Each subcontractor shall adjust, correct, and coordinate his/her work with the work of others so that no discrepancies will result in the whole work.

Unless authorized by the Director, any work done without liens, levels, or grades established by the Director shall be done at the Contractor's risk.

8.15 TEMPORARY FACILITIES AND SERVICES - The Contractor shall be responsible for providing and maintaining the necessary storage places, field office, temporary roads, fences, guards, etc., and required utilities, such as telephone, electric, and water service, at his/her expense. No water shall be withdrawn from fire hydrants for construction purposes until the Contractor has approval of the owner for such a connection.

8.16 UNFAVORABLE WEATHER AND OTHER CONDITIONS - During unfavorable weather and other conditions, the Contractor shall pursue only such portion of the work as will not be damaged thereby. No portions of the work of which the satisfactory quality or efficiency will be affected by any unfavorable conditions shall be constructed while these conditions remain, unless the Contractor employs special means or precautions, approved by the Director to overcome them.

8.17 WEEKEND, HOLIDAY, AND NIGHT WORK - No work shall be done between the hours of 6 p.m. and 7 a.m., nor on Sundays or legal holidays except with the permission of the Director, except in case of an emergency.

It is understood, however, that two or three shift operations may be established as a regular procedure by the Contractor if (s)he first obtains written permission from the Director. Such permission may be revoked by the Director at any time if the Contractor fails to maintain adequate force and equipment for reasonable prosecution and to justify inspection of the work or fails to provide sufficient artificial light to permit the work to be carried on properly and to permit proper inspection.

The Contractor shall give the Director 24 hours prior notice of any work to be done on a Saturday with the location and type of work to be done specified; and any work done without such notice and without the supervision of an inspector may be ordered removed and replaced at the Contractor's expense.

SECTION 9

MEASUREMENT AND PAYMENT

9.01 WORK TO BE DONE WITHOUT DIRECT PAYMENT - Whenever it is specified that the Contractor is to do work or furnish materials of any class for which no price is fixed in the proposal, it shall be understood that s\he is to do such work or furnish such materials without extra charge or allowance or direct payment of any kind. The cost of doing such work or furnishing such materials is to be included in the price bid for such other items of work as s\he may consider appropriate, unless it is expressly specified in the Special Provisions that such work or materials is to be paid for as extra work.

9.02 MEASUREMENT OF QUANTITIES - Payment for all work bid at a price per unit of measurement will be based upon the actual quantities of work as measured upon completion. The City does not expressly or by implication agree that the actual amount of work or materials of any class will correspond to the estimated quantities given in the proposal. The Contractor shall make no claim for anticipated profits, for loss of profit, for damages, or for any extra payment whatever because of any difference between the amount of work actually done or materials furnished and the estimated amount.

Items bid on a "Lump Sum" or "Job" basis shall result in a complete structure, operating plant or system in satisfactory working condition with respect to the functional purposes of the installation, and no extra compensation will be allowed for anything omitted but fairly implied.

9.03 CHANGE ORDERS - When alterations in quantities of work for which unit prices are shown in the proposal are ordered and performed, the adjustment in the contract amount shall be determined on the basis of such unit prices for the actual quantities of work done.

Adjustments, if any, in the amount to be paid the Contractor by reason of any other modifications of the work as set forth in a contract change order, shall be determined by one or more of the following methods:

- a.** **Lump Sum Price.** By an acceptable lump-sum proposal from the Contractor. Said proposal shall be based on a cost estimate as to materials, equipment, and labor, to which total may be added a maximum of 15 percent for overhead, profit, and all other expenses; this 15 percent limitation shall apply for work done directly by the Contractor's organization or by his/her subcontractors, and shall be added only once.
- b.** **Unit Prices.** By unit prices fixed by agreement between the City and the Contractor.
- c.** **Force Account.** By ordering the Contractor to proceed with the work and to keep and present in such form as the Director may order, a correct account of the cost of the change, together with all vouchers therefor.

9.04 FORCE ACCOUNT WORK -

9.04.01 General - Where extra work is to be paid for on a force account basis, the extra work will be paid for at the actual necessary cost as determined by the Director, plus an allowance for superintendence, general expense, and profit. Such an allowance will be made in accordance with the following schedule:

<u>Actual Necessary Cost</u>	<u>Allowance</u>
Labor	20 Percent
Materials	15 Percent
Equipment	15 Percent

The actual necessary cost for labor, material or equipment will be computed in accordance with Articles 9.04.02, 9.04.03, and 9.04.04, respectively. Office expense, general superintendence, and other general expense will not be included in the computation of actual necessary costs.

It is understood that 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 City for such work and no additional payment therefor will be made by the City.

The Contractor shall furnish the Director daily report sheets covering the direct costs of labor and materials and charges for equipment, whether furnished by the Contractor, subcontractor, or other forces and said report sheets shall be signed by the Contractor or his/her authorized agent. The daily report sheets shall provide names or identifications and classifications of workers, and hours worked; size, type and identification number of equipment, and hours operated. Material charges shall be substantiated by valid copies of vendor's invoices.

The Director will make any necessary adjustments and compile the costs of force account work on daily extra work report forms furnished by the City. When these 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.

9.04.02 Labor - The cost of labor used in performing the work by the Contractor, a subcontractor, or other forces will be the sum of the following:

- a. The actual wage paid which shall include any employer payments to, or on behalf of, workers for fringe benefits including health and welfare, pension, vacation, and similar purposes.
- b. To the actual wages, as defined in Article 9.04.02 - A, will be provided a percentage set forth in the Special Provision, which percentage shall constitute full compen-

sation for all payment imposed by State and Federal laws including, but not limited to, compensation insurance, and social security payments.

- c. The amount paid for subsistence and travel required by collective bargaining agreements.

At the beginning of the Contract and as later requested by the Director, the Contractor shall furnish the Director three copies of a certificate from the insurance company showing labor compensation rates.

9.04.03 Materials - The cost of materials used in performing the work will be the cost to the purchaser, whether Contractor, subcontractor, subcontractor, or other forces, from the supplier thereof, except as the following are applicable:

- a. Cash or trade discounts available to the purchaser shall be credited to the City notwithstanding the fact that discounts may not have been taken.
- b. In materials secured by other than a direct purchase and direct billing to the purchase, the cost shall be deemed to be the price paid to the actual supplier as determined by the Engineer. Markup except for actual costs incurred in the handling of such materials will not be allowed.
- c. Payment for materials from sources owned wholly or in part by the purchaser for similar materials from said sources on Contract items or the current wholesale price for such materials delivered to the job site, whichever price is lower.
- d. If, in the opinion of the Director, the cost of materials is excessive, or the Contractor does not furnish satisfactory evidence of the cost of such materials, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the job site less cash or trade discounts.

The City reserves the right to furnish materials for the work and no claim shall be made by the Contractor for costs and profit on such materials.

9.04.04 Equipment - The allowance made for such equipment used on force account work shall be determined from the latest schedule of equipment rental rates in use at the date hereof by the California State Transportation Department and incorporate herein by reference the same as though set out in full. Equipment shall be in good operating condition when starting work covered by the order. Rental time will not be allowed while equipment is inoperative due to breakdowns. Allowance for equipment ownership expense for use of items of equipment not listed with the Board shall be established in conformance with the items listed.

When extra work is ordered, the Contractor shall furnish a complete description of each item of equipment to be used on such extra work, listing the make, model, size, capacity, mounting, type of power and cost.

Allowance determined in accordance with this Article include all costs of operating equipment such as servicing labor and equipment, labor and parts for minor field repairs, fuel, oil, grease, and supplies, but not operating crew labor. No additional payment or allowance will be made in extra work orders for these items other than operating labor in addition to the amounts allowed for equipment use.

The Compensation for idle time of equipment will be determined in the same manner as presented in Article 8.11 - Right-of-Way Delays.

When equipment is obtained for the extra work from beyond the limits of the Contract, in addition to the rental rates paid while the equipment is actually in use on the work, the City will pay the cost of loading, unloading, and transporting to and from work subject to the following conditions:

- a. The point from which the equipment is to be transported shall be agreed to by the Director in advance.
- b. Transportation on low bed trailers shall not exceed rates of established haulers or applicable minimum rates of the Public Utilities Commission.
- c. Saturdays, Sundays, and Holidays will not be paid for unless directed by the Director.
- d. The City will pay an amount not to exceed the charge for moving the equipment to the work if the equipment is returned to a location other than from which it was obtained.
- e. Payment for transportation, loading, and unloading will not be made if the equipment is used on the work under the Contract in any other way than upon extra work paid for on a force account

9.05 DEDUCTIONS FROM PAYMENTS - The City, by and through the City Council, may at its option and at any time, retain out of any amounts due the Contractor, sums sufficient to cover claims filed pursuant to Section 1181 et seq. of the Code of Civil Procedure.

9.06 PARTIAL PAYMENT - At monthly intervals, as fixed by the City, the Contractor will prepare an estimate in writing of the total amount of work done and the acceptable materials furnished and delivered by the Contractor on the ground and not used, to the time of such estimate, and the value thereof. Acceptable materials shall be those materials which will become a part of the finished construction work. The basis for partial payments of lump sum or other unit Contract items will be determined by agreement between the Director and the Contractor. The City shall retain 10 percent of such estimated value of work done and 20 percent of the value of the materials so estimated to have been furnished and delivered and unused as aforesaid and shall pay at the established monthly intervals to the Contractor, while carrying on the work, the balance not retained as aforesaid, after deducting therefrom all previous payments and all sums to be kept or retained under the provisions of the Contract. However, at any time after 50 percent of the work has been completed, if the City finds that satisfactory progress is being made, the City may make any of the

remaining progress payments in full for actual work completed, or may withhold any amount up to 10 percent thereof, as the City may find appropriate based on the Contractor's progress. No such estimate of payment shall be required to be made when, in the judgment of the Director the work is not proceeding in accordance with the provisions of the Contract, or when in his/her judgment the total value of the work done since the last estimate amounts to less than \$500. No such estimate or payment shall be considered to be an acceptance of any defective work or improper materials. All progress estimates and payments shall be subject to correction in the final estimate.

9.07 FINAL PAYMENT - As soon as practicable after completion of the work, the Director will prepare in writing and furnish to the Contractor the final estimate of the quantities of work done and all payments due under the Contract, which estimate will show deductions for prior payments and any other amounts to be retained, under Article 9.06. The amount determined due, less the amount retained will be paid. This retained amount will not be due or payable until 35 days after the completion of the work and the filing of Notice of Completion and Acceptance in the manner provided by law and until after the Contractor has furnished the City a release by all claims by the Contractor against the City arising by virtue of the Contract except such claims in definite amounts as the Contractor may specifically exempt from the operation of the release.

At the earliest practicable time after having filed a claim, either during the performance of the work or after its completion as specified in the foregoing paragraph, it shall be the responsibility of the Contractor to submit in writing the basis for each claim, reference to the applicable provisions of the Specifications, the method of computation of the amount claimed due, and all other factual data pertaining thereto. Failure to submit such information and details within the 90 days after filing said claims will be sufficient cause for denying the claims. No claim will be considered where there has been a failure to comply with the requirements of Article 4.04.

9.08 SCOPE OF PAYMENT - Payment for all items of work at the unit or lump sum price shall be considered as full compensation for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the items of work, and no additional allowance will be made therefor.

9.09 GUARANTEE - Should any failure of the work occur within a period of one year after acceptance of the project by the City, which can be attributed to faulty materials, poor work, or defective equipment, or should discovery be made within this period of any non-compliance with the Plans and Specifications, the Contractor shall promptly make the needed repairs, replacement, or installation at his/her expense.

The City is hereby authorized to make such repairs if the Contractor fails to make or undertake with due diligence the aforesaid repairs within ten days after s/he is given written notice of such failure; provided, however, that in case of emergency where, in the opinion of the Director, delay would cause serious loss or damages, or a serious hazard to the public, the repairs may be made, or lights, signs, and barricades erected without prior notice to the Contractor, and the Contractor shall pay the entire costs thereof.

Unless otherwise set forth in the Special Provisions, as a condition precedent to the acceptance of the Contract, the Contractor shall furnish a corporate surety bond, of an acceptable surety company

authorized to do business in the State of California, to protect the City against the results of such faulty materials, poor work, or defective equipment and to guarantee the Contractor's responsibility as outlined above, for period of one year after completion and acceptance of the project by the City. Said bond shall be a sum not less than ten (10%) of the Contract amount.

SECTION 10

STANDARD SPECIFICATIONS

TECHNICAL PROVISIONS

CITY OF SANTA CRUZ

CONSTRUCTION OF CONCRETE CURBS, GUTTERS, SIDEWALKS AND VALLEY GUTTERS

10.01. GENERAL: Concrete curbs, gutters, sidewalks, valley gutters and drive-ways shall conform accurately to the form and dimensions shown on the Standard Detail drawings of the City of Santa Cruz. They shall be placed in the locations and at the grades shown on the drawings. All forms shall be inspected by the City Engineer or his/her duly authorized representative and approval obtained before placing concrete. Inspection shall continue through the pouring and finishing process. Any work done without prior approval of the City Engineer or his/her representative shall be subject to rejection for that reason. No construction shall commence until construction drawings have been signed by the City Engineer.

Where the plans provide for reconstruction of existing curb and sidewalk, and the limit of new work specified does not fall on a scoring line, the entire section shall be removed and the new curb and sidewalk shall joint the old curb and sidewalk at the first scoring line beyond said specified limit.

10-02. MATERIAL -

a. Portland Cement Concrete - Portland Cement concrete shall conform to requirements for Class "A" concrete mixed and placed as provided in the State Standard Specifications with the modifications specified below. Concrete shall have maximum size aggregate of 1 1/2 inches. Should the quantity of ingredients designated to produce a cubic yard of finished concrete result in a yield greater than one cubic yard, the relative proportion of fine and coarse aggregate shall be changed as necessary to maintain constant the quantity of Portland Cement in each cubic yard of concrete.

All concrete within the City Right-of-way shall contain not less than 564 pounds of Portland Cement per cubic yard of concrete.

Where transit mixers are used, the mixing period shall be continuous from the time the water is introduced, but in no case less than 3 minutes. The revolving drum on transit mixers shall rotate at not less than 14 or more than 18 revolutions per minute to produce peripheral speed of approximately 200 feet per minute. Where transit mixers are used, adequate provision must be made for preventing delays in delivery and placing concrete. A delay of more than 60 minutes between the time water is introduced into the mix and the time concrete is placed

in the forms will be considered reasonable cause for rejection of the work. Concrete so placed shall be removed from the forms and disposed of by the Contractor.

The amount of water required for the proper consistency of concrete shall be determined by the slump test ASTM Serial Designation D138-32T. Maximum slump of the concrete shall not exceed 4 inches. The determination of the amount of water to be added and regulation of the water control equipment, shall be under the supervision of the City Engineer. The intent of this requirement is to place the control of the mixing water solely under the control of the City Engineer or his representative. No changes in water shall be made without the full knowledge of the City Engineer or his/her representative.

The Contractor shall furnish without charge such materials and equipment as may be required for testing the concrete during process of the work.

b. Expansion Joint Material - Expansion joint material shall be asphalt felt or asphalt-fibre not less than 3/8 inch thick precut to conform accurately to the finished concrete section and subject to the approval of the City Engineer. Joints shall be spaced as defined in Article 10-05.

c. Reinforcing Steel - Reinforcing rods and wire mesh, when called for on the plans or standard details, shall conform to the requirements for reinforcing steel in the State Standard Specifications.

d. Catch Basins - Materials and construction of catch basins are specified in Section 11 as portions of storm drain. Sections of vertical curb must be placed adjacent to the catch basins in conformity with standard details. It is preferable to leave out a section of curb and gutter to accommodate the catch basin and place this section after construction of the catch basin. The flow line of the gutter shall be depressed 2" at the catch basin. The depression to begin eight feet from the catch basin to form along transition.

10-03. SUB-GRADE PREPARATION- The subgrade shall be constructed true to grade and cross section, as shown on the plans or as directed by the City Engineer. It shall be thoroughly watered and rolled or hand tamped until hard and solid. Not more than 3/4 inch thickness of loose soil may be filled on top of undisturbed soil. Sand or sandy gravel must be used for fills thicker than 3/4 inch. Soft or spongy material shall be removed, and all adobe material shall be excavated two inches below subgrade elevation, and in both cases, the resulting space shall be filled with sand or sandy gravel approved by the City Engineer. The fill material shall be watered thoroughly and rolled or tamped until firm and solid.

The completed subgrade shall be tested for grade and cross section by means of a template extending the full depth of the sidewalk or gutter and supported between side forms. The subgrade shall be inspected and approved by the City Engineer or his/her representative prior to placing concrete. The subgrade and forms shall be thoroughly watered in advance of placing concrete.

10.04. FORMING - Adjacent curb, gutters and sidewalks may be placed separately or as one unit (monolithically). However, if the Contractor does not show that they are competent to finish the

monolithic unit to proper form and grade, the City Engineer may require that the gutter and sidewalk be placed separately. If placed separately, the back edge of the curb shall be formed so as to provide a keyway or #4 rebar dowels at 4 feet or center to prevent settlement of the sidewalk. Said keyway to be approved by the Engineer prior to placing concrete. The depth of forms may conform to nominal finished lumber widths; however, the concrete thickness must be the full dimension shown on the details. Therefore, some excavation may be required below the bottom of form lumber to provide the full concrete thickness. Lumber used for forms must be surfaced on the side placed next to the concrete and shall have a true smooth upper edge. Form lumber shall not be less than 1-5/8 inches thick after being surfaced. Warped forms and forms not having a smooth, straight upper edge shall not be used. Benders or thick planks, rigidly placed, may be used on curves, grade changes or for curb returns.

All forms must be carefully set to proper alignment and grade and shall be rigidly held in place by the use of steel or wooden stakes not more than 5 feet apart. Clamps, spreaders and braces shall be used where required to insure rigidity in the forms.

The forms on the face of vertical curbs shall not be removed in less than two hours nor more than six hours after the concrete has been placed. All forms shall remain in place for 12 hours after the concrete is placed. All forms shall be cleaned thoroughly each time they are used and coated with a light oil as often as necessary to prevent the concrete from adhering to them.

10.05. EXPANSION JOINTS - An expansion joint shall be placed at the end of rounded corner and approximately every forty feet therefrom for curb, gutter, and sidewalk. Joints in sidewalk adjacent to curbing shall fall opposite those in the curbing. Expansion joints shall be placed at right angles to the direction of the street. Expansion joints shall not be placed in driveways. Score marks weakened planes shall be provided at ten foot intervals between expansion joints.

10-06. PLACING AND FINISHING CONCRETE - Concrete shall be placed in such a manner as to prevent separation of large aggregate or the formation of rock pockets. It shall be spaded and tamped or vibrated until thoroughly compacted. At the end of each day's run, or if, for any reason, work would be terminated, the joint shall be vertical and square-ended and come to the point of an expansion joint. Should a delay of more than 30 minutes occur between batches, the new concrete shall be worked into the old to assure a uniform joint.

In constructing curb, entrances shall be provided for garages or driveways to replace former facilities or provide access for further driveways. The vertical curbs shall be depressed to one inch above the gutter flow line.

Particular care must be taken to assure a final cross section conforming to the standard details. Due to flat grades allowed, all slopes must be checked before final finishing by flowing water. The City Engineer or his/her representative must be present during the flowing water test. Any high spots or depressions revealed by the flowing water test must be corrected during finishing to prevent standing water on the finished section.

All surfaces shall be finished with a steel trowel in a manner satisfactory to the City Engineer. The surface so produced shall be sufficiently uniform and smooth so as to not produce more than 1/4" deviation from a ten foot straight edge placed upon the surface.

No concrete shall be placed or finished in the rain. It shall be the Contractor's responsibility to schedule operations so that concrete will not be placed or finished in the rain.

After the concrete is finished, a curing compound shall be applied to all exposed surfaces. The curing material shall be subject to the approval of the City Engineer.

10.07. CLEAN-UP - All forms shall be removed after the specified period of curing. Backfill materials shall be placed sufficient to protect the concrete from being undermined or washed out during winter storms. Broken or spilled concrete must be removed and disposed of and the site left in a neat and orderly condition. Broken sections of concrete must be replaced by removing the existing concrete back to scoremarks and replacing an entire section.

Small openings in existing concrete surfaces must be made by using a concrete saw to create a square and uniform edge. The portions of concrete replaced must be finished to conform with existing surfaces.

10.08 MEASUREMENT AND PAYMENT - Concrete will be measured and paid for in the units called for in the proposal. Normally curb, gutter and sidewalk will be paid for by the lineal foot, measured along the centerline of the cross section. Vertical curbs will be measured along the face of the curb. The quantities for payment will be measured in the field after construction by the City Engineer or his/her representative and a representative of the Contractor. All work must be completed, repairs made and cleanup finished before the final payment. Progress and final payments shall be made as outlined in the general provisions.

Reasonable access must be provided for property owners during construction and the Contractor shall plan and conduct the work so as to cause a minimum of inconvenience to the general public and adjacent property owners..

SECTION 11

CONSTRUCTION OF SANITARY SEWERS, STORM DRAINS AND APPURTENANCES

11.01 GENERAL - Sanitary sewers, storm drains, manholes, catch basins, cleanouts and service connections shall conform accurately to the drawings and standard details of the City of Santa Cruz. The City Engineer or representative will inspect the installation of all pipelines and facilities and must approve them prior to backfilling. Any facilities installed or backfilled prior to approval or without the City Engineer's knowledge are subject to rejection for that reason.

No construction shall commence until construction drawings have been signed by the City Engineer.

Pursuant to Section 6422 of the "Labor Code" of the State of California, and these Specifications, before the excavation of any trench or trenches, four feet or more in depth, where the estimated contract expenditure is twenty-five thousand dollars (\$25,000) or more, the Contractor shall submit 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, established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer. No excavation shall be started until said plan has been approved by the City Engineer.

When the estimated contract expenditure is less than twenty-five thousand dollars (\$25,000) the above mentioned shoring plan may be required at the discretion of the City Engineer prior to or during the course of construction.

11.02 MATERIAL -

- a. **Sanitary Sewers** shall be vitrified clay or plastic lined asbestos-cement unless otherwise specified in the plans or specifications. No sanitary sewer covered by this specification shall be subjected to a pump pressure head.
 1. **Vitrified Clay Sewer Pipe** shall conform to A.S.T.M. Designation C-278 for Extra Strength Clay Sewer Pipe. Joints shall be interlocking, resilient mechanical compression type formed on the pipe at the factory and made of Plastic (polyvinylchloride) to specifications established by the National Clay Research Corporation. "Wedge-Lock" joints made by the Pacific Clay Products Company and "Speed-Seal" joints made by Gladding McBean Company conform to the above specifications.
 2. **Plastic Lined Asbestos-Cement Nonpressure Sewer Pipe** shall conform to the requirements of the National Sanitation Foundation Criteria C-7 Asbestos-Cement sewer pipe shall conform to A.S.T.M. Designation C-428-63T, Type 11 Class 2400 for 14-inch and smaller diameter pipe, and Class 3300

for 16-inch and larger diameter pipe. Plastic lining shall be lining formed from a thermoplastic or thermo setting polymer system. The ends of the pipe shall be accurately machined to accommodate a joint coupling. The coupling shall consist of an asbestos-cement sleeve and two solid rubber rings, and shall be suitable in size and design for the pipe with which it is to be used. The coupling shall be factory applied to one end of each standard length of pipe.

3. **Standard Strength Clay Sewer Pipe**, when specified, shall conform to A.S.T.M. Designation C-13.
 4. **Concrete Sewer pipe**, when specified, shall conform to A.S.T.M Designation..
- b. **Storm Drains** shall be reinforced concrete pipe until otherwise specified in the plans and specifications.
1. **Reinforced Concrete Sewer and Drainage Pipe** shall conform to A.S.T.M. Designation C-76, Class 111.
 2. **Galvanized Corrugated Metal Pipe**, when specified, shall conform to A.A.S.H.O. Designation M-36 and shall be asbestos bonded and bituminous lined and coated. The gauge shall be as shown on the plans but in no case lighter than 16 gauge.
 3. **Smooth Lined Corrugated Metal Pipe**, when specified, shall be equal to "Smooth-Flow" pipe as manufactured by the Armco Drainage and Metal Products Company, Inc., of Berkeley, California, utilizing asbestos-bonded metal.
- c. **Double Rubber Gasketed Reinforced Concrete Pipe, Lock-joint Reinforced Concrete Pipe or Reinforced Concrete Cylinder Pipe** shall be as manufactured by the American Pipe and Construction Company of Hayward, California, or equal, in the opinion of the City Engineer.
- d. **Cast-in-place Concrete Pipe** may be used only where specified on the plans. Materials and construction of the cast-in-place pipe shall conform to Sections 11-02 (n) and 11-04 (b) for cast-in-place concrete pipe.
- e. **Iron Castings** shall conform with A.S.T.M. Designation A-48 (grade 30) for grey iron castings. Frames and covers shall be of the dimensions and weights shown on the plans and Standard details and the weight of each frame and cover shall be indicated thereon in white paint. The castings shall be free from cracks, blow holes or other imperfections straight, true to pattern and have a professional finish.

- f. **Manholes**, shall conform to City of Santa Cruz Standard Details and be fabricated from pre-cast concrete manhole sections conforming to A.S.T.M. Designation C-76, Class II.
- g. **Manhole frames and covers** shall conform to the Standard Manhole and Cover Details of the Standard Specifications of the City of Santa Cruz. The bottom rim of the cover and the seat shall be a matched set, so milled that the cover will set evenly and firmly on the frame. Where manhole covers occur in sidewalk surfaces, the covers shall conform to the above in dimension and weight but shall have a surface formed to provide a nonslip level walking surface approved by the City Engineer.
- h. **Flusher Branches** shall conform to the City of Santa Cruz Standard Detail "Standard Flusher Branch."
- i. **Concrete for manhole bases and other structures** shall conform to the State Standard Specifications for Type B concrete and shall be composed of maximum 1 1/2" aggregate and 5 sack per cubic yard of cement. Maximum slump of the concrete shall not exceed 4 inches.
- j. **Concrete for Cast in Place Concrete Pipe.** Concrete mixes shall be designed on the basis of the concrete attaining a strength at 28 days of at least 3000 P.S.I. provided that at least 6 sacks (94 pounds each) of Portland Cement shall be used per cubic yard of concrete. During pouring, the Contractor shall prepare 2 Standard 6" x 12" test cylinders for each 75 cubic yards or portions thereof poured each day. Casting, handling and curing of all cylinders shall be in accordance with A.S.T.M. Designation C-39.

The pipe shall be constructed of Class A concrete conforming to the provisions in Section 90 of the State Standard Specifications.

The combined aggregates shall conform to the specified grading limits for the 3/4" maximum size for pipe diameters 48 cubic inches or less and for the 1 1/2 maximum size for pipe diameters over 48 inches.

The allowance for slump shall not exceed 3 inches as determined by the Slump Test, A.S.T.M. Serial Designation D138-32t.

An air-entraining agent shall be added to the concrete in conformance with the provisions in Section 90-4.03 of the State Standard Specifications.

The minimum wall thickness for the various sizes of pipe shall conform to the following table:

<u>Internal Diameter</u>	<u>Minimum Wall Thickness</u>
24"	2 1/2"
27"	3"
30"	3"
33"	3 1/2"
36"	3 1/2"
42"	4"
48"	5"
54"	5 1/2"
60"	6"
66"	6 1/2"
72"	7"

Pipemaking Equipment - The Pipe shall be constructed with equipment specially designed for constructing cast-in-place monolithic concrete pipe. The equipment shall place the concrete around the full circumference of the pipe in one operation. The equipment shall be acceptable to the Engineer and the Contractor may be required to furnish evidence of successful operation on other work of the equipment that is proposed to be used. Equipment not suitable to produce the quality of work required for the pipeline will not be permitted to operate on the work.

Curing and protecting concrete - The Concrete forming the pipe shall be cured by backfilling over the pipe as specified herein or by the application of pigmented curing compound as provided for concrete pavement in Section 90-701B of the State Standard Specifications. Hand spraying of the compound will be permitted. During the curing period following the placement of the concrete, the ends of the pipeline shall be covered with canvas. The inside surface of pipe need not be cured. If the Contractor elects to cure the pipe by backfilling, the backfill material shall be placed to an approximate depth of 0.5 foot over the top of the pipe. Such backfill shall be placed immediately after the concrete has hardened sufficiently to prevent injury to the pipe during backfilling operations. Only soft, damp and loose material shall be used for backfill.

The concrete pipe shall be protected as provided in Section 90-8 of the State Standard Specifications.

11.03. MOVING EXISTING UTILITIES - The Contractor shall notify the utility company before proceeding with construction and shall be familiar with the underground pipes, ducts or manholes. The Contractor shall be responsible for damage to, or damage resulting from, disturbance of underground or overhead utilities.

The location of utilities shown on the plans are approximate only and shall not be taken as final. The cost of relocating existing utilities will normally be borne by the individual utility company.

Sufficiently early notice must be given prior to construction to allow ample time for the required changes.

11-04. (a) TRENCH EXCAVATION: Except where otherwise specifically authorized in these specifications or where indicated on the drawing, all pipe sewer shall be laid in open trenches. All trenches shall be excavated vertically and shall be of sufficient width to provide free working space on either side of the pipe, and in no case shall such space be less than six (6) inches. Where bracing and shoring is necessary, additional width of trench will be permitted. In any case there shall be sufficient space between the pipe and side of the trench for thorough compaction and backfill around the pipe.

The trench shall conform to the lines and grades designated on the drawings. The sub-grade for pipe sewers shall be understood to be the exterior bottom of the pipe. The sub-grade shall be excavated to a level section and to such elevations as will give true flow line elevation when pipe barrels are laid on top of the sub-grade. Bell holes shall be excavated to a sufficient depth to permit the entire barrel of the pipe to be supported on undisturbed material. Whenever the bottom of the trench is excavated below the bottom of the pipe, said fill shall be used to bring the trench up to grade. In cases where the excavated material is satisfactory, in the opinion of City Engineer, this material may be used to bring the trench up to grade by compacting with a pneumatic tamper in layers not exceeding four (4) inches thick. When the bedding material encountered is rock, the trench shall be excavated and an additional 4 inches below grade and the trench refilled and compacted as specified above.

Where excavation in tunnels is required or permitted, the tunnels shall be driven from shafts located at the places where manhole and other structures are shown on the line of said tunnels and at such other points as may be selected and approved by the City Engineer. Where tunnels are made, they shall be cut to a height of at least two (2) feet above grade of the sewer.

When mud or other soft or spongy material is encountered, it shall be removed and the space filled with crushed rock or other material approved by the City Engineer.

The Contractor shall be responsible for the removal of all material from slides or cave-ins and shall be required to restore and repair, at their own expense, all sidewalks, paving pipes or structure of any type which may be damaged or destroyed as a result of the operations.

Material excavated from the trenches shall be kept in compact piles so placed as to cause least possible interference with street or sidewalk traffic. Excess material not required for backfill shall be removed and disposed of immediately to a location as approved by the City Engineer.

The Contractor shall provide for and maintain surface drainage; also maintain sewers, storm drains, water and gas pipes, and shall carefully protect all poles lines, conduits, buildings and other surface and subsurface structures.

The Contractor shall provide adequate roadway crossings over trenches to all driveways or streets cut off by excavation until such time as the excavation is backfilled.

The Contractor shall furnish, install and operate such pumps or other devices as may be necessary for removing water from trenches during construction and until permission is obtained from the City Engineer to cease pumping.

Sufficient bracing and shoring shall be installed and maintained at all times during construction to insure safety for workers and to protect and facilitate the work. All such bracing and shoring shall be removed during backfilling except in cases where impractical or unsafe.

The maximum length of open trench ahead of pipe installation shall not exceed three hundred (300) feet in normal well sustained earth and the distance shall be much less in marshy or sloughing soils, as advised by the City Engineer. The length of trench unfilled after pipe is laid shall not exceed five hundred (500) feet.

b. **Trenches for cast-in-place concrete pipe** shall be excavated to lines and grades established by the owner or subdivider's engineer. The bottom of the trench shall be leveled by hand excavation to as not vary by more than .02 feet from the correct grade. When the trench is graded the Contractor shall call the City Engineer for a grade check. The City Engineer will check the grade by using a level and level rod. No pipe shall be placed without the approval of the trench grade by the City Engineer. No pipe shall be laid when the soil in the bottom of the trench is saturated such that the machine will sink into the ground while laying pipe. The rounded bottom of the trench shall be hand-excavated to conform to a template conforming to the dimensions of the pipe machine.

All water which may have entered the trench, shall be removed before constructing the pipe. All surfaces which concrete is to be placed shall be free of standing water, mud, and debris.

Surfaces against which concrete is to be placed shall be thoroughly moistened with water, if necessary, so that moisture will not be drawn from the freshly placed concrete.

The concrete shall be placed in one operation around the full circumference of the pipe by means of a traveling form. When metal forms are used they shall be of sufficient strength to withstand vibrating or tamping for concrete and to permit workers to walk on the form without causing springing or bulging at any point.

The forms shall be lapped so that the lap ridges in the interior of the pipe shall face downstream in the direction of flow.

The concrete shall be vibrated, rammed, tamped or worked with suitable appliances until the concrete has been consolidated to the maximum practicable density, free of rock pockets, and closes snugly against all surfaces of forms. The concrete shall completely fill the forms.

When placing operations cease for any reason, the end of the pipe shall be left rough with a slope of approximately 45 degrees. The ends of the pipeline shall be covered with canvas.

Construction joints shall be clean and damp before continuing pipe making operations. Cleaning construction joints shall consist of removing all laitance, loose or defective concrete, coatings and any other deleterious materials

After the removal of forms, the inside of the pipe will be inspected and any required repairs shall be made. All porous and fractured concrete shall be removed by chipping openings into the concrete pipe as directed by the Engineer. The chipped openings and any holes cut in the pipe for inspection or to facilitate removing the forms shall be repaired by filling with concrete or dry patching mortar.

The flow line grade of the finished pipe shall not vary more than 1/2 inch from the planned gradeline.

The finished surface of the concrete pipe shall be substantially free of fractures, cracks and surface roughness.

11.05 PIPE LAYING, STORM DRAINS & SANITARY SEWERS: All pipe shall be laid continuously up-hill commencing at the lowest manhole or outlet of the system, thence from manhole to manhole, with the socket end up-grade. When two storm sewers of different sizes meet, the pipe shall be laid so that the crowns of the pipe are at the same elevation and the invert of the largest pipe shall be dropped below the invert of the smaller pipe unless the plans show otherwise at a specific location. Batter boards shall be installed directly above the pipe location and string lines stretched between the batter boards. The strings shall be elevated above the pipe line several feet above the pipe so that the string will have the same slope as the pipeline. The string shall be used for checking the elevation of the bottom of the trench and the invert of each length of pipe as it is laid. Another string line shall be installed in the bottom of the trench beside the pipeline to be used for aligning each length of pipe as it is installed in the trench.

The surface of the trench shall be shaped so as to support the pipe accurately to line and grade. Wedging or blocking of pipes will not be permitted. The face of the spigot ends and of all shoulders or sockets must be true and brought into fair contact and all lumps and excrescences of said faces shall be cut away before the pipe is lowered into the trench. When work ceases for any reason, the unfinished end of the pipe shall be securely closed with a plug or cover to prevent entrance of debris.

11.06. JOINTS: (a) Clay sewer pipe plastisol and asbestos-cement non-pressure sewer pipe joints shall be lubricated with an approved soap solution, positioned, and pressed together until the pipe length snap together and lock to form a water tight joint. Care shall be taken to keep the bell and spigot joining clean and dry prior to joining the pipe. Bell holes shall be provided such that not of the pipe's weight rests on the bell.

Careful inspection of each joint shall be made and none of the joints covered until approved by the City Engineer or an authorized representative.

(b) **Joining and Concrete Tongue and Groove Pipe.** Proper facilities shall be provided for lowering the sections of pipe into the trench. The pipe shall be laid carefully to the lines and

grades given on the drawings, the sections fully and closely jointed by means of stiff cement, enough to form a durable watertight joint.

The Cement mortar shall be such that it will adhere readily to the pipe and can be easily squeezed out at the joints. Admixtures not in excess of ten (10) percent by volume of the cement may be added, but if hydrated or quicklime is used, the amount shall not exceed five (5) percent. All mortar shall be used within (30) minutes after mixing with water and all parts of the pipe to be in contact with mortar shall be washed clean and thoroughly wetted to insure proper bond.

The first pipe (downstream) shall be bedded to establish line and grade with the groove upstream. A shallow excavation shall be made underneath the pipe at the joint and the resulting space filled with mortar, into which the end of the second pipe beds when laid. The groove end of the first pipe shall be thoroughly cleaned with a wet brush and a layer of soft mortar applied to the lower half of the groove. The tongue end of the second pipe shall be thoroughly cleaned with a wet brush and while in a horizontal position, a layer of soft mortar shall be applied to the upper half of the tongue. The tongue end of the second pipe shall be then inserted into the groove end of the first pipe until the mortar is squeezed out on the interior and exterior surfaces. The interior surface of the pipe at the joint shall be brushed smooth, and the exterior of the joint shall be completely filled. For pipes 24" inside diameter and smaller, a band of mortar shall be carefully applied to each joint completely around the pipe and joining the mortar placed in the excavation beneath the joint. The bond shall be carefully shaped and smoothed. For pipes 27" and larger, the interior joints shall be filled from inside the pipe with mortar applied not less than 12 hours after the pipe has been placed. The completed exterior pipe joints shall be immediately protected from air and sun with an initial covering of moist earth, sand, canvas, burlap or curing compound. If not backfilled at once, the initial covering shall be kept moist for at least forty-eight (48) hours. An approved curing compound may be applied as a substitute for backfilling. In order to prevent the mortar from setting up too rapidly, the ends of the pipe shall be covered in such a manner as to prevent the flow of air during the time the mortar is in a plastic condition.

The interior of the pipe shall be kept free from dirt, excess mortar, and other foreign material as the pipe laying progresses and left clean at the completion of the culvert. Any pipe which is not in true alignment or which shows any undue settlement after laying, or is damaged, shall be taken up and relaid at the Contractor's expense.

(c) Jointing of pipes not herein specifically described shall be done strictly in accordance with manufacturer's specifications and instructions of the City Engineer.

11-07. BACKFILLING: Unless State Highway Provisions are to be adhered to through encroachment permits, the following methods will be used: After the pipe and appurtenances have been properly constructed and inspected and the Engineer has finished locating the fittings and wye branches, soil shall be deposited into the trench with hand-shovels to a depth of two-thirds of the pipe. The soil shall then be hand-rammed under the pipe with bent steel bars approved by the City Engineer. After the initial backfilling has been inspected and approved by the City Engineer, the pipe shall covered to a depth of approximately six inches with soil, free from rocks or large lumps and this layer shall be compacted by using hand tampers.

The remainder of the Trench shall be backfilled by one of the following methods:

(a) **Trenches within the roadway** at right angles, diagonally, or longitudinal shall be backfilled with sand or sandy gravel and flooded with water. It is the intent of this procedure to attain 90% relative compaction to within 2.0 feet of the finish grade surface and 95% relative compaction in the remainder. Relative compaction to be measured by Test Method No. California 216. It may be necessary to use alternate compaction methods if this degree of compaction is not attained.

(b) **Trenches in easements outside of roadway** and sidewalk areas shall be backfilled with soil to within one foot of the top. The backfilled trench shall be jetted and flooded with water until after standing for 5 minutes, water will show on the surface. More water shall then be added until at least 4 inches of water is standing in the trench and then the remainder of the trench shall be backfilled with soil. The backfill shall be carried up to the natural surface of the ground, carefully leveled and smoothed. Jetting shall be performed by using a steel pipe at least 2 inches in diameter and long enough to reach to the bottom of the trench. The jetting pipe shall be shoved down into the trench at maximum 4-foot intervals along the trench. Extreme care shall be taken to prevent damaging the pipe during the jetting operation. It is the intent of this procedure to attain 85% relative compaction. Relative compaction to be measured by Test Method No. California 216. It may be necessary to use alternate compaction methods if this degree of compaction is not attained.

Any storm sewer mains with less than two and one-half (2 1/2) feet of cover or sanitary sewers with less than three (3) feet of cover from the top of the pipe to roadway surfaces shall be completely encased in concrete. Storm drain laterals and sanitary sewer services shall be encased in concrete when the cover is less than two (2) feet.

11-08. RESTORATION OF PAVEMENTS AND OTHER STRUCTURES: All street pavements, sidewalks, curbs, gutters or other structures, cut, removed or in any way damaged by the Contractor in connection with the construction work shall be replaced or restored. It is the intent of these specifications that sidewalks, curbs, gutters or other structure restorations shall be of the same type and dimensions as the original structure or as shown on the plans. The standard restoration of streets within the traveled way shall be 6 inches of aggregate base and 2 inches of asphalt concrete surfacing conforming to the City of Santa Cruz Standard Specifications for Construction of Streets, Section 12. Prior to placing asphalt concrete, the edges of abutting pavement shall be carefully cleaned and painted with asphaltic emulsion. The finished pavement surface shall be rolled flush with abutting pavement. Where no paving of any kind exists, no repaving will be required unless called for on the plans.

Where pavement is concrete or concrete covered by asphalt, concrete pavement shall be replaced to the elevation, lines and grades of the existing concrete. All Portland cement concrete shall be Class A, six sack concrete. Expansion joints shall be as directed by the Engineer. Prior to replacement all existing edges shall be neatly saw-cut to provide a uniform line.

11-09. MANHOLES: Manholes shall be constructed from pre-cast concrete manhole sections as specified in Section 1 (C) of these standards and as shown on the City of Santa Cruz Standard Detail "Standard Manhole."

Manhole bases must be constructed with particular care in order to maintain a constant channel section at a uniform slope through the manhole. If possible, the channels shall be formed by leaving the sewer pipes in place and pouring a base to a depth of one-half (1/2) the diameter of the pipe. The remainder of the concrete base within the manhole shall be sloped down toward the pipe channel at a slope of approximately two (2) inches per foot in order that a person will be able to stand upon it. When the concrete base is set sufficiently, but not sooner than twenty-four (24) hours after pouring, the top half of the sewer pipe shall be broken away and the entire bottom of the manhole plastered smooth with Portland Cement mortar. If it is not possible to leave the sewer pipes in place, the channel shall be formed by shaping the concrete base to the proper cross section.

Pre-cast manhole sections shall be set level and in proper alignment with adjacent sections. Before a pre-cast section is placed, the joint shall be thoroughly cleaned and moistened and Portland Cement mortar placed in the joint so that when the section is dropped into position the mortar will be squeezed out all around. All joints shall be filled with mortar and smoothed. The lower 2 feet of the manhole may be formed and poured in place.

Adjusting sections of concrete pipe may be used above the taper section of concrete manholes not to exceed 18 inches.

Drop inlet connections shall be installed wherever the elevation of the invert of the entering sewer is two (2) feet or more above the invert of the main sewer. Drop inlet connection pipes shall be the same size as the entering sewer pipes.

Manhole frames and covers shall be provided for each manhole. The top of the frame and the cover shall be installed in the same plane as the finished surface of the roadway.

11-10. FLUSHER BRANCHES: Flusher branches shall conform to the City of Santa Cruz Standard Detail "Standard Flusher Branch." They shall be installed where shown on the drawings. Pipe and jointing shall be the same as that specified for the straight pipe with which they are installed. Riser pipes shall be the same size as the straight pipe with which they are installed.

11-11. SANITARY SEWER LATERALS: Sanitary sewer laterals shall be installed for all lots served by the sewer. Laterals shall be constructed of vitrified clay pipe conforming to the requirements of section 11-02 (a) of these specifications when the laterals are under streets, curbs and gutters or sidewalks with roadway right-of-way. Installation thereof shall conform to the City of Santa Cruz Standard Detail "Standard Sanitary Sewer Lateral."

Cleanout wye branches or tees shall be installed at the property line as shown on the detail drawing.

All new laterals shall extend beyond the property line, and shall be marked and located as directed by the Engineer.

The minimum slope for laying house laterals shall be 1/8 inch per foot of lateral.

Connections of all house sewer laterals to sewers shall be subject to the approval of the Director of Public Works and none shall be covered until such approval is given.

11-12. CATCH BASINS: Catch basins shall be constructed in conformity with City of Santa Cruz Standard Details for the catch basin specified on the plans. If no particular basin is specified, a single Type B catch basin will be required. The top of the catch basin frame shall be installed level with the top of curb. The flow line of the gutter adjacent to the catch basin shall drop off two (2) inches within the last eight (8) feet of gutter leading to the catch basin.

It is preferable to place the curb, gutter and sidewalk up to within 8 feet on each side of the catch basin, place the frame, then form and place the remaining curb, gutter and sidewalk.

The bottom of the catch basin must be sloped sufficiently and finished smoothly to prevent standing water at the bottom.

11-13. SANITARY SEWERS LEAKAGE TEST: Sewers shall be tested by the Contractor for tightness when completed and ready for service by either of the following methods as specified by the City Engineer:

(a) **Low Pressure Air Test.** Before this test is performed, the pipe installation shall be cleaned in the following manner:

The Contractor shall furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the Contractor be used without a tag line; or a rope or cord may be fastened to the ball to enable the Contractor to know and control its position at all times. The ball shall be placed in the last cleanout or manhole on the pipe to be cleaned, and water shall be introduced behind it. The ball shall pass through the pipe with only the force of water impelling it. All debris flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris, or a damaged pipe shall stop the ball, the Contractor shall remove the obstruction.

TEST: The Contractor shall furnish test plugs, an air compressor, and personnel for conducting the acceptance test under the direction of the City. The City shall furnish the test gauge, stopwatch, and the supervision of the test.

Immediately following the pipe-cleaning described, the pipe installation shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease from 3.5 to 2.5 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe.

The pipeline shall be considered acceptable, when tested at an average pressure of 3.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe, if: (1) the total rate of air loss from any section tested in its entirety between manhole and cleanout

structures does not exceed 2.0 cubic feet per minute, or (2) the section under test does not lose air at a rate greater than 0.003 cubic feet per minute, per square foot of internal pipe surface.

The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe is not less than that computed by either of the following equations; the equation which gives the shorter time shall govern:

$$t_q = 0.011 d_1^2 L_1 + 0.011 d_2^2 L_2 + \dots + 0.011 d_n^2 L_n$$

$$\bar{K} = \text{total } K, \text{ where } K = 0.011 d^2 L$$

$$t_q = \text{total } K \text{ divided by total } C, \text{ where } C = 0.0003882 dL, \text{ and}$$

$$\text{total } C = 0.0003882 d_1 L_1 + 0.0003882 d_2 L_2 + \dots + 0.0003882 d_n L_n$$

If the pipe installation fails to meet these requirements, the Contractor shall determine at their own expense, the source or sources of the leakage and shall repair or replace all defective materials or workmanship. The completed pipe installation shall meet the requirements of this test.

(b) Hydraulic Test. A section of line shall be prepared for testing by plugging the upper side of the downstream manhole and all openings in the next upstream manhole except the downstream opening. Where grades are steep and excessive test heads would result by testing from one manhole to another, the Engineer shall specify the method to be used so that the maximum head of any section under test will not exceed 12 feet. Branch sewers running from wye branches on the mains shall be plugged at their upper end if the test head would cause them to overflow.

A section of sewer line prepared for testing, as above, shall be tested by filling with water to an elevation of four feet above the invert at the midpoint of the test section, or four feet above the existing ground water elevation, whichever is greater. The water should be introduced into the test section at least four hours in advance of the official test period to allow the pipe and joint material to become saturated with water. At the beginning of the test the elevation of the water in the upper manhole shall be carefully measured from a point on the manhole rim. After a period of one hour or less with the approval of the Engineer, the water elevation shall be measured from the same point on the manhole rim and the loss of water during the test period calculated. If this calculation is difficult, enough water shall be measured into the upper manhole to restore the water to the level existing at the beginning of the test. Should an initial test show excess leakage in a section of line, it is permissible to draw the water off and test the manhole that contained water. This test shall be made by plugging all the openings in the manhole and filling with water to the same elevation as existed during the testing. The leakage from the manhole may be deducted from the total leakage of the test section in arriving at the test leakage. After the testing is complete, the manhole shall be waterproofed by grouting and/or painting the interior with approved waterproofing agent.

The allowable leakage in the test section shall not exceed 500 gallons per day per inch diameter per mile of line at the above four-foot test head. If it is necessary or desirable to increase the test head

above four feet, the allowable leakage will be increased to compensate for the additional leakage due to the increased head.

Sewer sections showing leakage in excess of that allowed shall be relaid or reconstructed as necessary to reduce the leakage as specified above.

All tools, material and appurtenances required for testing the sewers as specified shall be furnished by the Contractor, and no additional compensation shall be provided.

11-14. MEASUREMENT AND PAYMENT: All cost of furnishing, installing backfilling, testing and resurfacing shall be included in the price paid per foot or unit. After construction, pipelines shall be measured by the City Engineer or representative of the City and a representative of the Contractor. Sewers will be measured along the axis of the line and in a horizontal plane. Mainlines shall be measured continuously through all wye branches and manholes except that said measurement shall be taken to the center only of manholes at the ends of the lines.

Final payment will not be made until sanitary sewer installations have passed the above described leakage test and all work and cleanups completed to the satisfaction of the City Engineer.

11-15. MARKING SEWER LATERALS: Where sewer laterals are installed, the location of the lateral shall be marked on the curb immediately above the lateral. An "S" approximately 4 inches high shall be formed into the concrete. The marking shall be done by the Contractor, and the improvements will not be accepted by the City until the marking is completed. The subdivider shall give the City a map showing the location of the sewer laterals with distances from lot lines. This map must also be supplied before acceptance of the subdivision improvements.

SECTION 12

CONSTRUCTION OF STREETS

12-01. GENERAL: All street construction, reconstruction, and maintenance work performed by contractors in the City of Santa Cruz shall conform to these specifications. All necessary site preparation, clearing and grubbing and cleanup necessary for completion of the street construction shall be included in prices paid for items described herein.

Street sections shall conform to the City of Santa Cruz Standard Detail drawing "Standard Street Sections" unless an amended cross section is included upon the approved construction drawings. No Construction shall commence until construction drawings have been signed by the City Engineer.

12-02. MATERIALS:

(a) **Aggregate** Base shall conform to the requirements of the Section entitled Aggregate Bases (Class 2) of the State Standard Specifications except as herein modified. Aggregate grading shall conform to the requirements for 1 1/2 inch maximum size. The Contractor's attention is drawn to the requirements for grading and sand equivalent.

Samples of material must be submitted to the City Engineer for testing and approved prior to use.

(b) **Soil Sterilant** shall be applied to all areas to be paved prior to application of prime coat. Polybor chlorate or approved equal shall be applied to the areas at a rate of approximately 1800 pounds per acre, or as recommended by the manufacturer. To facilitate application, it may be dissolved in water and washed into the surface by further application of water under the direction of the Engineer.

(c) **Prime Coat** shall be applied after subgrade preparation is completed in conformance with Section 39-4.02 of the State Standard Specifications.

(d) **Asphalt Concrete Surfacing** shall conform to the requirements of the section entitled Asphalt Concrete of the State Standard Specifications except as herein modified. Type "B" asphalt concrete surfacing shall be used with a maximum aggregate size of 1/2 inch for the top layer of 2 inches or less. For surfaces greater than 2 inches in depth, the asphalt concrete shall be placed in two layers, the bottom layer of which may be 3/4 inch maximum aggregate. It shall conform to medium grading. Asphalt shall be AR-8000 grade paving asphalt. The percentage of asphalt will be determined by the City Engineer, the percentage being slightly higher than normally used by the Division of Highways.

Aggregate samples must be submitted to the City Engineer for testing and approved prior to use.

(e) **Seal Coat Materials** shall conform to the requirements of the section entitled "Bituminous Seals" of the State Standard Specifications except as herein modified. The particular type of seal coat, size and amount of material shall be as specified on the plans or special conditions.

A "Fog Seal Coat" shall be applied to all new asphalt concrete surfaces. The bituminous binder for the fog seal shall be S.S.I mixing type asphalt emulsion mixed with equal parts water by volume.

12-03. ROADWAY EXCAVATION: Excavations shall conform to the lines, grades and cross sections shown on the plans and standard details and no payment will be made for quantities in excess of those shown. The tops of excavation slopes and the ends of excavation slope shall be rounded as directed by the City Engineer.

In rock excavation or a mixture of rock and earth excavations, such material shall be loosened and broken up for the full width of the roadbed so that no ribs or solid projections will be within six inches of the graded surface.

When roadway excavation is not included in the price paid per square foot or for other items of the proposal and when a bid item is included per cubic yard for roadway excavation, quantities will be computed by the method of average end areas and centerline distances. Correction for curvature will not be applied to quantities within the roadway prism as indicated on the cross sections.

Full cost of embankment construction shall be included in the price paid for roadway excavation or the items within which roadway excavation is included. Embankment consists of placing, wetting, and compacting in fill areas, the suitable material from excavation or borrow are specified or approved by the City Engineer. Prior to placing embankment material, the area shall be cleared of all trees, stumps, decayed or vegetable matter, grass, weed, or other objectionable material and shall be disked or plowed to the satisfaction of the City Engineer. Embankment shall be placed in successive horizontal layers of not more than 8 inches in depth. Each layer shall be spread uniformly, wetted to optimum moisture content and compacted with a tamping or three wheeled power roller adequate in the opinion of the City Engineer to produce the required degree of compaction.

Excepting that portion of the subgrade within 2.0 feet of the finished grade, the embankment shall be compacted to a relative compaction of 95% when tested in accordance with California Test Method No. 216. Compaction tests shall be performed by a recognized soil testing laboratory, approved by the City Engineer.

Where sewer or drainage pipes are to be installed in new embankment, the embankment shall be constructed to a minimum of one foot above the proposed top of pipe before trenching and installation of the pipe.

Full compensation for haul and overhaul shall be considered included in the price paid for roadway excavation and no additional allowance will be made therefore.

12-04. SUBGRADE PREPARATION: When the road bed has been constructed to the required grade and cross section and it is in relatively smooth and even condition it will be ready for preparation of subgrade. Compaction shall be performed by means of power rollers equipped with smooth steel lined wheels. The rollers may be of the three-wheeled type or the three-axle type. Rollers shall weigh not less than 12 tons and shall deliver a compression on the rear wheels of not

less than 325 pounds per linear inch of the width. Compactors, other than specified above such as rubber tired compacting rollers or vibrating rollers may be used only with prior approval of the City Engineer.

The City Engineer will inspect all compacted subgrade and must approve it prior to placing base rock. Base rock placed upon sections of subgrade not approved shall be removed and the subgrade compacted and approved. When ready for inspection the City Engineer shall follow a three-wheeled roller, as specified above, or a loaded truck of 12 tons capacity or larger, along all portions of the completed subgrade. No appreciable indentation shall be made by the truck or roller tires in the completed subgrade. Any spots in the subgrade which show appreciable settlement under the roller or truck tires shall be removed, dried out, recompact and retested until satisfactory. If the existing material cannot be made to pass the above described inspection, it shall be removed and suitable materials replaced, compacted and tested. The finished subgrade immediately prior to placing subsequent material thereon shall have a relative compaction of not less than ninety-five (95) percent for a depth of 2.0 feet, below the finished grade, as determined by Test Method No. California 216.

Particular care must be taken in compaction of areas around existing manholes, water valve covers and other objects. Where normal roller compaction will not suffice, these areas shall be compacted by mechanical hand compaction equipment satisfactory to the Engineer. The finished subgrade shall not vary more than 0.05 feet above or 0.10 feet below the theoretical grade.

12-05. COMPACTING AGGREGATE BASE: As specified above, no aggregate base rock shall be placed prior to approval of the subgrade by the City Engineer. Aggregate base rock shall be placed, compacted and tested with the same equipment and methods specified above for subgrade preparation, excepting that untreated base shall not be compacted in layers thicker than 6 inches compacted thickness. As specified for subgrade, the City Engineer must inspect and approve all areas prior to placing surfacing.

Particular care must be taken to assure sufficient moisture content at all times to prevent segregation of large aggregate. Compacted areas showing substantial segregation of aggregate must be relaid and compacted.

Aggregate base, once in inspected and approved, must be protected from segregation by traffic. The Contractor shall, whenever possible, prevent any traffic upon the aggregate base. Areas once approved, but which are torn up by traffic, must be recompact prior to surfacing.

12-06. PREPARING EXISTING ASPHALT SURFACING: Where asphalt concrete is to be placed as an overlay blanket on top of existing asphalt concrete or seal coated asphalt surfaces, the Contractor shall prepare the surface as herein specified. The Contractor shall remove weeds and undesirable matter in cracks in the existing pavement by hand with square pointed shovels or other tools. The streets shall be swept thoroughly with a power broom to remove all dirt and debris. As an alternative to sweeping, the Contractor may wash the streets with a fire hose using water supplied at fire hydrants. Arrangements must be made with the Water Department for use of the fire hydrants. The Contractor must notify the Director of Public Works of the City several days prior to beginning work in order to facilitate removal of trash and clippings from the streets by City forces.

A tack coat of mixing type asphaltic emulsion shall be applied immediately ahead of laying asphalt concrete. The emulsion shall be applied in accordance with State Standard Specifications, section 94-1.03, and as required by the City Engineer but not to exceed 0.10 gallons per square yard of street surface. Cost of the tack coat will be considered as included in the price paid for asphalt concrete surfacing.

A coating of asphaltic emulsion shall be applied to the edges of existing asphaltic or concrete surfaces adjacent to the newly applied surfacing.

12-07. PLACING ASPHALT CONCRETE SURFACING: The thickness of the asphalt concrete surfacing shown on the plans or standard detail shall be considered the minimum thickness to be applied at any point on the street and sufficient thickness must be allowed prior to compacting to provide the necessary thickness after compaction.

Mixing, transporting, placing and compacting asphalt concrete surfacing shall conform to the requirements of Section 37 of the State Standard Specifications except as herein modified.

The mixture shall be laid upon a dry surface and never while it is raining. Unless permitted by the City Engineer, the mixture shall be spread by means of a mechanical self-powered paver with a tamping bar and distributing screws to provide a well distributed compacted surface.

Sufficient personnel shall be provided so that irregularities can be filled and leveled to the satisfaction of the City Engineer. When permitted to spread asphalt concrete by hand, sufficient well equipped rakers and shovelers must be available to provide a level and uniform finished joints.

The roller shall make its first pass with the heavy wheel forward whenever possible. The joint between strips of paving shall be rolled carefully to assure a uniform density at the finished joint.

A "Fog Seal" shall be applied to all new plant-mixed surfaces, the cost of the Fog Seal shall be included in the price paid for the asphalt concrete surfacing.

12-08. APPLYING SEAL COATS: Fog Seals to be applied to new asphalt concrete surfaces shall be applied in amounts approved by the City Engineer. The amounts of emulsified asphalt shall be approximately .035 gallons per square yard of surface for a total of .070 gallons of emulsion and water mixture per square yard of surfacing.

All seal coats, including the Fog Seal shall be applied in conformity with Section 37 of the State Standard Specifications except as herein modified.

Particular attention must be given to the temperature of the existing surface to which the seal coat is to be applied. Seal coating shall not begin early in the morning when the pavement surface is cold without permission from the City Engineer. Care must be taken to assure immediate application of rock chips or sand after spreading the asphalt.

12-09. MEASUREMENT AND PAYMENT: When rock or asphalt concrete is paid for by the ton, certified weight slips shall be collected by the City Engineer from each truck delivering

material. At the completion of each day's operations, the Contractor shall submit a list of all weight slips sent with a total tonnage delivered for the day. The tonnages shall be checked by the City Engineer against the weight slips sent with a total tonnage delivered for the day. The tonnages shall be checked by the City Engineer against the weight slips and a final daily tonnage determined.

When quantities are measured by the square foot in place, the City Engineer and Contractor shall measure the completed areas in the field after completion to determine the final quantities. Cost of soil sterilant, emulsified asphalt prime coats and fog seal applied shall be included in the prices paid for the asphalt concrete paving.