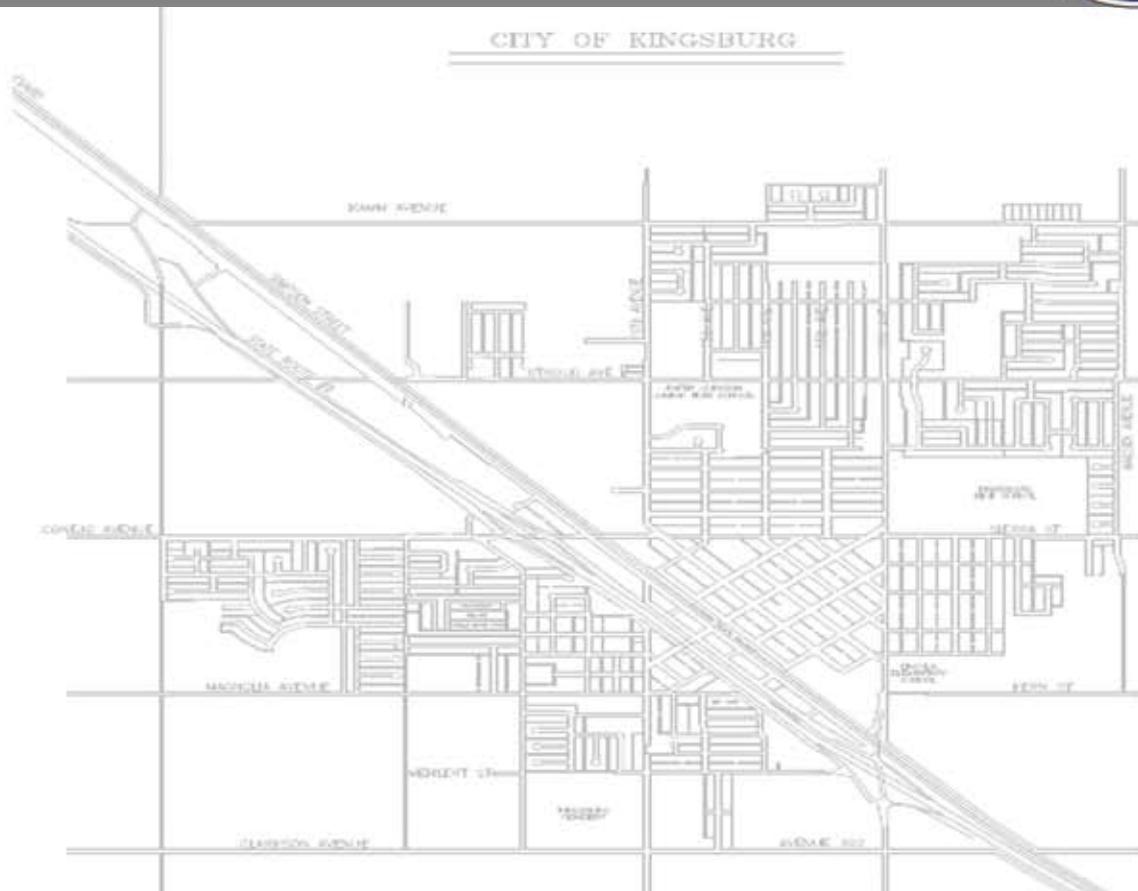




# CITY OF KINGSBURG 2009

## IMPROVEMENT STANDARDS



# SPECIFICATIONS

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SECTION ONE  
PROPOSAL REQUIREMENTS

1.01 GENERAL INFORMATION

The City Council will receive at the City Hall until the hour and day specified in the "Notice to Bidders", sealed proposals for furnishing of material, supplies, equipment and labor for performing the work as specified in the plans, special provisions and these specifications, each of which is intended to compliment the others and to be an integral part of the whole.

1.02 PROPOSAL FORM

All proposals must be made upon blank forms to be obtained from the office of the Engineer and/or at City Hall. All proposals must give the prices proposed and must be signed by the bidder with his address. If the proposal is made by an individual, his name and post office address must be shown. If made by a firm or partnership, the name and post office address of each member of the firm or partnership must be shown. All proposals shall list the bidder's state contractor license number. If made by a corporation, the proposal must indicate the state in which the corporation was incorporated and the names, titles, and business addresses of the president and the secretary, and shall also bear the corporation seal, if any.

1.03 DESIGNATION OF SUB-CONTRACTORS

Contractor shall file with his bid the name and address of each Sub-contractor who will perform more than one half of one percent of the work. Only one Sub-contractor shall be listed for each portion of the work, which portion shall be defined as to its nature and extent. Designation of Sub-contractors must be made upon blank forms furnished with the contract documents and must be signed by the bidder.

Failure of Contractor to specify a Sub-contractor shall constitute a statement that Contractor is qualified and intends to perform the work himself.

1.04 WITHDRAWAL OR MODIFICATION OF BID

Any bid may be withdrawn at any time prior to the time fixed for opening of bids. Any bid may be modified after Delivery to the City Hall, on or before the time fixed for the bid opening by submission of a written sealed supplement to the original bid marked "Supplement to (designation of original bid)". Such supplement shall clearly identify the bid item, the original bid price, and the modified price. The City Council may reject any supplemental bid which, in their opinion, does not set forth the proposed modification clearly enough to determine with definiteness and certainty the price or prices offered by the bidder.

1.05 BIDDERS GUARANTEE

No bid proposal will be considered for award unless the bidder has complied with either (1) or (2):

1. Bidders must deposit with their bid proposals a Cashier's or Certified Check or a Bidder's Bond of a corporate surety authorized to do business in the State of California and acceptable to the City and made payable to the City in the amount specified in the specifications. Such deposit shall be retained by the City as a guarantee that the bidder, if awarded all or any part of the bid, shall within ten calendar days from the date notice of award is mailed to the bidder, enter into a contract and furnish such bond or bonds as may be required by the specifications. All bid deposits will be returned when contracts have been entered into for all units awarded, or if all bids are rejected.

2. If the bidder contemplates submitting bids from time to time during a period of one year for the furnishing of certain materials, supplies or services to the City, the bidder may cover all such bids by A single Annual Bidder's Bond instead of a separate bond for each bid. If such an Annual Bidder's Bond is registered with the City, and is currently valid, it shall be deemed to accompany each and every bid submitted, provided such bond is in sufficient amount to provide the required deposit for all of the bidder's proposals then outstanding. It shall be stated upon the bid proposal that such an Annual Bidder's Bond is registered with the City.

#### 1.06 RETURN OF BIDDER'S GUARANTEES

Within ten (10) days after the award of the contract, the City will return the proposal guarantees accompanying those proposals which are not awarded any portion of the work. All other guarantees will be held until the contract has been fully executed, after which they will be returned to the respective bidders whose proposals they accompanied.

#### 1.07 CONTRACT BONDS

The Contractor shall furnish A Faithful Performance Bond in an amount equal to one hundred percent (100%) of the contract price to guarantee to the City the faithful performance of the contract by the contractor, and shall also furnish a Labor and Material Bond in an amount equal to one hundred percent (100%) of the contract price. Both bonds shall be executed by corporate sureties authorized to do business in the State of California and acceptable to the City Attorney, and shall be payable to the City.

Whenever any surety or sureties on any such bonds, or on any bonds required by law for the protection of the claims of laborers and material suppliers became insufficient or the City has cause to believe that such surety or sureties have become insufficient, A demand in writing may be made upon the Contractor by the City for additional surety, as may be necessary in the opinion of the City, considering the extent of the work remaining to be done, but said additional surety shall not cause the total to exceed two hundred percent of the anticipated cost of the work then remaining to be completed. Thereafter, no payment shall be made upon such contract to the Contractor or any assignee of the Contractor until such further bond or bonds or additional surety has been furnished.

#### 1.08 REJECTION OF PROPOSALS CONTAINING ALTERATIONS, ERASURES OR IRREGULARITIES

The right is expressly reserved to accept or reject any and all proposals, and to waive any informality in the bidding.

Proposals may be rejected if they show any alterations of form, additions, conditional or alternative bids not called for, incomplete bids, erasures or irregularities of any kind. Proposal in which the prices obviously are unbalanced may be rejected.

#### 1.09 AWARD OF CONTRACT

The award of the contract, if awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements described in the contract documents. The award, if made, will be made within thirty (30) days after the opening of the bids. All bids will be compared on the basis of the Engineer's estimate of quantities of work to be done or by any Bid Schedule or a combination of the Bid Schedules, or any other combination deemed appropriate by the City.

#### 1.10 EXECUTION OF CONTRACT

The contract shall be signed by the successful bidder and returned, together with the required bond and insurance forms within ten (10) calendar days after the bidder has received notice that the contract has been awarded. No proposal shall be considered binding upon the City until the execution of the contract.

In case of default in executing the required contract or furnishing necessary bonds within the time limitation as set forth in the preceding paragraph, the proceeds of the check or bond accompanying the bid shall become property of the City as liquidated damages.

#### 1.11 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK

No bidder shall submit a bid without first carefully examining the site of the work contemplated, the plans and specifications and the proposal forms. The submission of a bid shall be conclusive evidence that the bidder has so investigated and is satisfied as to the conditions to be encountered with regard to the character, quality, and scope of work to be performed, the quantities of materials to be furnished, and the requirements of the proposal, plans, specifications, and the contract documents.

#### 1.12 DEFINITIONS

When used in the contract documents the terms, phrases and abbreviations listed shall have the following meanings:

A.S.A. - American Standards Association (now U.S.A.S.I., U.S.A. Standards Institute) and its standard specifications.

A.S.T.M. - American Society for Testing and Materials Specifications.

A.W.W.A. - American Water Works Association and its Standard Specifications.

N.B.S. - National Bureau of Standards and its Standard Specifications.

BIDDING REQUIREMENTS - Submittals and/or actions on the part of a bidder as mandated by the contract documents in order to qualify a bid proposal.

CITY - The City of Kingsburg, California.

CONTRACT DOCUMENTS- All those documents pertaining to the description of the work and the contract for the performance of the work, including the notice inviting bids, instructions to bidders, the proposal, the specifications, change orders and any special orders or instructions to the Contractor .

CONTRACT PRICE - The total amount of money for which the contract is awarded.

CONTRACT UNIT PRICE - The Contractor's bid for a single unit of an item of work in the proposal.

DEPARTMENT OF PUBLIC WORKS- City Council acting through properly authorized agents.

DIRECTOR OF PUBLIC WORKS - Same as above.

ENGINEER- City Engineer acting either directly or through properly authorized agents, acting within scope of the particular duties entrusted to them.

OWNER- The City of Kingsburg.

DEPARTMENT OF PUBLIC WORKS - Department of Public Works.

CONTRACTOR - The person or persons, co-partnership or corporation, private or municipal, who have entered into contract for this work as party or parties of the second part, or his or her legal representatives.

LABORATORY- Any Laboratory of a public agency or a recognized commercial testing laboratory.

APPROVED, REQUIRED, DIRECTED - Approved, Required, Directed or words of similar import, refer to and indicate that the work or materials shall be "approved", "required", or "directed" by the owner or his duly authorized representative.

APPROVED EQUAL - Approved Equal or words of like import refer to and indicate material which has been approved by the Engineer as similar and equal in all respects and acceptable for use in lieu of the particular materials as specified in the contract documents. No substitute material shall be used in any of the work unless approval to use same is first obtained in writing from the Engineer. The owner reserves the right to reject any and all materials, either before or after installation that are not as specified or approved by the Engineer in writing. In all cases where proprietary articles are specified, it is the intent of the Specifications to permit the use of approved equals, unless specifically prohibited. Requests for "Approved Equal" status for proposed substitutions shall be submitted within thirty (30) day after the award of the contract. Such requests shall include .the reason for substitution (availability, price, etc.), data to substantiate the equal quality and proposed credit to the contract price for the use of such substitutions, should it be approved.

DRAWING – Plans, working drawings, etc. Which are made a part of the contract documents to facilitate completion of the project.

UTILITY – Tracks, overhead or underground wires, pipelines, conduits, ducts, or structures, sewers or storm drains owned, operated, or maintained in or across a public right-of-way or private easement.

WORK- That which is proposed to be constructed or done under the contract or permit, including the furnishing of all labor and materials.

COUNCIL - The City Council of the City of Kingsburg .

DAYS - Days shall mean consecutive calendar days unless otherwise specified.

PERSONS - Any individual, association, partnership, corporation, trust, joint venture, or other legal entity.

PLANS - The drawings, profiles, cross sections, working drawings, and supplemental drawings, or reproductions thereof, approved by the Engineer which show the locations, character, dimensions or details of the work.

**PROPOSAL** - The offer of a bidder when submitted on the proposal form, properly signed and guaranteed.

**REFERENCE SPECIFICATIONS** - Those bulletins, standards, rules, methods of analysis or test, codes and specifications of other agencies, engineering societies or industrial associations, referred to in the contract documents. These refer to the latest edition or that edition referenced, including amendments in effect and published at the time of advertising the project or issuing the permit, unless specifically referred to by edition, volume, or date.

**ROADWAY** - The portion of street reserved for vehicular use.

**SERVICE CONNECTION** - Service connections are all or any portion of the conduit, cable or duct, including meter, between a utility distribution line and an individual consumer.

**SEWER** - Any conduit intended for the reception and transfer of sewage and fluid industrial waste.

**SEWER HOUSE BRANCH** - A sewer within a public street or right-of-way, proposed to connect any parcel, lot, or part of a lot with a main sewer.

**SPECIAL PROVISIONS** - Any provisions which supplement or modify these Standard Specifications or other Standard Specifications produced by other agencies referenced.

**SPECIFICATIONS** - Standard specifications, reference specifications, special provisions, general conditions and specifications in supplemental agreements between the Contractor and the City.

**STANDARD DRAWING** - Drawings showing the details of standard structures, devices, or facilities frequently constructed by the City and adopted by the Council as the approved design.

**STATE** - The State of California

**STATE STANDARD SPECIFICATIONS** - The Standard Specifications of the State of California Business and Transportation Agency, Department of Transportation, latest edition, or that edition referenced.

**STORM DRAIN** - Any conduit and appurtenance intended for the reception and conveyance of storm water.

**STREET** - Any public road, highway, parkway, freeway, alley, walk, or right-of-way.

**SUBCONTRACTOR** - The person entering into a contract with the contractor to perform a portion of the work.

**SUPERVISION** - Where used to indicate supervision by the Contractor, shall mean the active and direct superintendence of the details of the work by the Contractor, the job Foreman, superintendent, project coordinator or other person delegated to represent the Contractor on the Job site.

Except as specifically stated in the contract, supervision by the City shall not mean active and direct superintendence of details of the work.

**SURETY** - Any individual, firm or corporation, bound with and for the contractor for the acceptable performance, execution, and completion of the work, and for the satisfaction of all obligations incurred.

### 1.13 UNIT PRICES

Excepting the items for which lump sums are called for, the unit prices inserted in the bid form by the bidder will be considered to be the bid prices for the various units of work and shall be used in the calculation of the amount due the Contractor for work performed. In case of a discrepancy between the unit price bid and the calculated total for the item, the unit price shall govern.

### 1.14 MORE THAN ONE PROPOSAL FROM A BIDDER

More than one proposal from an individual, a firm or partnership, a corporation, or an association under the same or different names, will not be considered. Reasonable ground for believing that any bidder is interested in more than one proposal for the work contemplated will cause the rejection of all proposals in which such bidder is interested. If there is reason to believe that collusion exists among the bidders, none of the participants in such collusion will be considered in future proposals.

SECTION TWO  
SCOPE OF WORK

2.01 WORK TO BE DONE

The work to be done consists of furnishing all labor, materials, methods and processes, implements, tools and machinery, except as otherwise specified, which are necessary and required construct and put in complete order for use the proposed improvements designated in the contract, and to leave the grounds in a neat and safe condition.

2.02 ALTERATIONS

By mutual consent in writing of the parties signatory to the contract, alterations, deviations, increases or decreases in quantities, additions to, or omissions from the plans and specifications may be made and shall in no way affect or invalidate the contract.

2.03 EXTRA WORK

New and unforeseen work will be classed as extra work when such work cannot be covered by any of the various items or combination of items for which there is a bid price. The Contractor shall do no extra work except upon written order from the Engineer. For such extra work the Contractor shall receive payment in accordance with the unit prices or as previously agreed upon in writing or he shall be paid on force account as set forth in Section 7.01 of these specifications.

2.04 REMOVAL OF OBSTRUCTIONS

The Contractor shall remove and dispose of all structures, debris, or other obstructions of any character including such trees as are specifically designated by the Engineer for removal if (in the sole opinion of the Engineer) such obstructions would hinder the proper completion of the work.

2.05 FINAL CLEANING UP

Upon completion and before making application for acceptance of the work, the Contractor shall clean the street or road, borrow pits, and all ground occupied by him in connection with the work, of all rubbish, excess materials, temporary structures and equipment. All parts of the work shall be left in a neat and presentable condition.

SECTION THREE  
CONTROL OF THE WORK

3.01 AUTHORITY OF THE ENGINEER

The Engineer shall decide any and all questions which may arise as to the quality or acceptability of materials furnished and work performed, and as to the manner or performance and rate of progress of the work; all questions which arise as to the interpretation of the plans and specifications; all questions as to claims and compensation.

The Engineer's decision shall be final and he shall have executive authority to enforce and make effective such decisions, and issue such orders as to cause the Contractor to carry out such decisions promptly.

3.02 ALTERATION OF PLANS

All authorized alterations affecting the requirements and information given on the approved plans shall be in writing. No changes shall be made of any plan or drawing after the same has been approved by the Engineer, except by direction of the Engineer.

Working drawings or plans for any structure not included in the plans furnished by the Engineer shall be approved by the Engineer before any work involving these plans shall be performed, unless approval be waived in writing by the Engineer.

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

3.03 CONFORMITY WITH PLANS AND ALLOWABLE DEVIATION

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

3.04 COORDINATION OF PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS

These specifications, the plans, special provisions and all supplementary documents are essential parts of the contract and a requirement occurring in one is as binding as though occurring in all.

Specifications shall govern over plans; special provisions shall govern over both specifications and plans.

3.05 INTERPRETATION OF PLANS AND SPECIFICATIONS

Should it appear that the work to be done or any matter relative thereto is not sufficiently detailed or explained in these specifications, the plans and/or the special provisions, the Contractor shall apply to the Engineer for such further explanation or interpretation as part of the contract. In the event of doubt or question relative to the true meaning of the contract documents, reference shall be made to the Engineer, whose decision thereon shall be final.

In the event of any discrepancy between any drawings and the figures written thereon, the figures shall be taken as correct.

### 3.06 SUPERINTENDENCE

Whenever the Contractor is not present on any part of the work a superintendent or foreman shall be in charge of the particular work. Instructions issued by the Engineer to the person in charge of the work shall be deemed to have been issued to the Contractor.

### 3.07 LINES AND GRADES

Surveying adequate for construction shall be performed by qualified personnel prior to the start of construction. The Contractor shall be responsible for preserving construction survey stakes and marks for the duration of their usefulness. If any construction survey stakes are lost or disturbed and need to be replaced, such replacement shall be at the expense of the Contractor.

All distances and measurements will be made and given in a horizontal plane. Stakes will be set and stationed for curbs, headers, sewers, storm drains, structures and rough grade (or flow line) indicated on a grade sheet. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be, reported to the Engineer. Any deviation from the grades as shown on the plans shall be the responsibility of the Contractor.

Grades for underground conduits will be set at the surface of the ground and the Contractor shall be responsible for transferring such grades to the bottom of the trench.

In the event that survey work is performed by crews other than those employed by the Engineer, such work shall conform to the quality and practice required by the Engineer but the professional liability for such work shall remain with the employer of the personnel performing the work. The Engineer shall be notified before the stakes are set and cut sheets will be furnished to the Engineer immediately after the setting of the grades.

### 3.08 INSPECTION

The Engineer shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge respecting the progress, workmanship, and the character of materials used and employed in the work.

Whenever the Contractor varies the period during which work is carried on each day, he shall give due notice to the Engineer so that proper inspection may be provided. Any work done in the absence of the Engineer will be subject to rejection.

The inspection of the work shall not relieve the contractor of any obligation to fulfill the contract as prescribed. Defective work shall be made good, and unsuitable materials will be rejected notwithstanding the fact that such defective work and unsuitable materials have been previously overlooked by the Engineer and accepted or included in progress payments.

Projects financed in whole or in part with funds from sources other than the City shall be subject to inspection at all times by the agency providing said funds or its authorized agent.

### 3.09 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

All work which is defective in its construction or deficient in any of the requirements of these specifications shall be remedied or removed and, replaced by the Contractor in an acceptable manner and no compensation will be allowed for such correction.

Any work done beyond the lines and grades shown on the plans or any extra work done without written authority of the Engineer will be considered as unauthorized and will not be paid for.

Upon failure on the part of the Contractor to comply immediately with any order of the Engineer made under the provisions of this article, the Engineer shall have authority to cause defective work to be removed by other parties and to deduct the costs thereof from any monies due or to become due to the Contractor.

### 3.10 FINAL INSPECTION

Whenever the work provided and contemplated by the contract shall have been satisfactorily completed and the final cleaning up performed, the Engineer will make the final inspection. Any deficiencies noted during such inspection will be corrected prior to acceptance of the project.

### 3.11 SEQUENCE OF WORK

The Engineer shall have the power to direct the order and sequence of the work to the degree necessary to insure that the construction of one part will not interfere with the proper completion of other parts. If at any time before the commencement, or during the progress of the work, the materials and appliances used or to be used appear to the Engineer as insufficient or improper for securing the quality of work required, or the required rate of progress, he may order the Contractor to increase efficiency or to improve their character and the Contractor shall conform to such order. However, the failure of the Engineer to demand any increase of such efficiency or any improvement shall not release the Contractor from his obligation to secure the quality of work or the rate of progress specified.

### 3.12 SANITARY REGULATIONS

Necessary housing accommodation shall be provided for the workmen for changing clothes and for protection during inclement weather. Toilet accommodations shall also be maintained for the use of employees on the work. The accommodations shall be in approved locations properly screened from public observation and shall be maintained in a strictly sanitary manner. The Contractor shall obey and enforce all other sanitary regulations and orders against infectious diseases and the spread of same and shall maintain at all times satisfactory sanitary conditions around all shanties, tool and supply houses, and on all other parts of the work.

### 3.13 EXISTING STRUCTURES IN RELATION TO PLANS

Where underground and surface structures are shown on the plans, the locations, depth, and dimensions of such structures are believed to be reasonably correct but are not guaranteed. Such structures are shown for the information and convenience of the Contractor but such information so given is not to be construed as a representation that such structures will, in all cases, be found or encountered just where shown or that they represent all the structures which may be encountered. It shall be the Contractor's responsibility to locate and protect or remove all structures as the case may be.

### 3.14 PROTECTION OF WORK

The Contractor must provide and maintain proper barricades, fences, or signal lights, to protect the work, persons, animals, or private property from injury.

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in accordance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

The City reserves the right to remedy any neglect on the part of the Contractor as regards the protection of the work, after twenty-four (24) hours notice in writing except in case of emergency,

when he shall have the right to remedy any neglect without notice, and in either case to deduct the cost of such remedy from remedy due the Contractor.

### 3.15 CARE OF STRUCTURES

The Contractor shall be liable for all damage done to any structure arising through his operations. He shall take care not to damage and shall maintain in good condition all sewers, drains, culverts, conduits, house services and other underground structures encountered in the performance of the work.

The Contractor shall repair all damage done to any of the said structures through his acts or neglect and shall keep them in repair during the life of this contract. He shall in all cases leave them in as good condition as they were prior to the commencement of the work.

Care shall be taken not to move, without the consent of the Engineer, any sewers, drains, culverts, water, gas, or other pipes, poles, or structures. In crossing or running parallel with such structures, Contractor shall securely hang, brace, and support such structures in place until the work is completed.

### 3.16 OMISSIONS IN PLANS AND SPECIFICATIONS

Any materials or work mentioned in the specifications and not show on the drawings or that is show on the drawings but not mentioned in the specifications shall be of the same effect as if show or mentioned in both.

Omission from the drawings or the specifications of the materials or details of work which are manifestly or obviously necessary to carry out the intent of the drawings and specifications, or which are customarily furnished or performed, shall not relieve the Contractor of his responsibility for furnishing such omitted materials or performing such omitted work but such materials or work shall be furnished or performed as if fully show or described in the drawings or specifications.

### 3.17 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the Section entitled "Public Safety" elsewhere in these special provisions, and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

All traffic cones used for night lane closures shall have reflective cone sleeves as specified in the specifications.

Unless otherwise authorized by the Contract Documents, the Contractor shall arrange his work so as to keep two-way vehicular traffic open at all times and will direct and supervise traffic as instructed by the City Engineer.

The Contractor shall also keep the Fire Department informed at all times as to the exact locations and progress of the work and shall notify them immediately of any streets closed to traffic or impassable for firefighting equipment.

### 3.18 WATERING

Payment for the application of water used in the construction shall be included in the various other bid items unless specifically called for as a separate item. If water is to be obtained from the City, the Contractor shall obtain a water meter from the Water Department to measure the amount used.

A deposit, to be determined by the Public Works Director shall be made by the Contractor at the time of taking possession of the water meter. The deposit will be refunded upon return of the water meter undamaged and in good working condition.

SECTION FOUR  
CONTROL OF MATERIALS

4.01 MATERIALS AND WORKMANSHIP - GENERAL

All materials, parts and equipment furnished by the Contractor in the work shall be new, first quality and free from defects. Workmanship shall be in accordance with generally accepted standards. Both materials and workmanship shall be subject to the approval of the Engineer. Any materials and workmanship not conforming to the requirements of these specifications shall be considered defective and will be subject to rejection. Defective work or materials, whether in place or not, shall be removed immediately from the site by the Contractor, at his expense, when so directed by the Engineer. If the Contractor fails to replace any defective or damaged work or material after notice from the Engineer, the Engineer may cause such work or materials to be replaced. The replacement expense shall be deducted from the amount to be paid to the Contractor.

Used or secondhand materials, parts and equipment may be installed only if specifically permitted in the Special Provisions or Technical Specifications.

4.02 PROTECTION OF MATERIALS

The Contractor shall provide and maintain storage facilities and employ such measures as will preserve, the specified quality, and fitness of materials to be used in the work. Stored materials shall be reasonably accessible for inspection. The Contractor shall also adequately protect new and existing work and all items of equipment for the duration of his contract.

4.03 TESTS OF MATERIALS

Before incorporation in the work, the Contractor shall submit samples of materials, as the Engineer may require, at no cost to the City. The Contractor, at his own expense, shall deliver the materials for testing to the place and at the time designated by the Engineer. Unless otherwise provided, all testing shall be performed under the direction of the Engineer. Any retesting required because of failure of materials to pass the initial test shall be done at the expense of the Contractor.

The Contractor shall notify the City in writing at least 15 days in advance of his intention to use materials for which tests are specified to allow sufficient time to perform the tests. The notice shall name the proposed supplier and source of material.

4.04 TRADE NAMES OR EQUALS

It is the intent of these specifications to permit the Contractor to supply any of the materials specified or offer an equivalent. The Engineer shall determine whether the material offered is equivalent to that specified. Adequate time shall be allowed for the Engineer to make this determination.

Whenever any particular material, process, or equipment is indicated by patent, proprietary or brand name, or by patent, proprietary or brand name of manufacturer, such wording is used for the purpose of facilitating its description and shall be deemed to be followed by the words "or equal". A listing of materials is not intended to be comprehensive, or in order of preference. The Contractor may offer any material, process, or equipment which he considers to be equivalent to that indicated. Unless otherwise authorized by the Engineer, the offer must be submitted in sufficient time before the normal use or installation of the material, process or equipment, for the Engineer to determine the equivalency and the Contractor to make any required purchases (including delivery) and to make the use or installation without delay beyond the time of such normal use or installation.

The Contractor shall, at his expense, furnish data concerning items offered by him as equivalent to those specified. He shall have the material tested as required by the Engineer to determine that the quality, strength, physical, chemical, or other characteristics, including durability, finish, efficiency, dimensions, service, and suitability are such that the item will fulfill its intended function.

Test methods shall be subject to the approval of the Engineer. Test results shall be reported promptly to the Engineer, who will evaluate the results and determine if the substitute item is equivalent. His findings shall be final. Installation and use of a substitute item shall not be made until approved by the Engineer in writing.

If a substitute offered by the Contractor is found to be not equal to the specified material, the Contractor shall furnish and install the specified material. The Specified contract completion time shall not be affected by any circumstance developing from the provisions of this subsection.

## SECTION FIVE

### LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

#### 5.01 LAWS TO BE OBSERVED

The Contractor shall keep himself fully informed of all existing State and National laws and all municipal ordinances and regulations of the City 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.

#### 5.02 HOURS OF LABOR

Eight (8) hours per day and forty hours per week shall constitute legal work hours under City contracts, and the Contractor and subcontractor shall keep accurate records showing the name of and the hours worked each calendar, day and each calendar week by, each workman employed by him on said work. Overtime shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1 1/2) times the basic rate of pay as provided in said Section. All work performed on a State or Federal legal holiday shall be subject to overtime as stated above for the entire day and the Contractor shall be liable for City incurred inspection time on said legal holiday.

#### 5.03 LABOR DISCRIMINATION

No discrimination shall be made in the employment of persons upon public works because of the race, color or religion of such persons and, every Contractor for public works violating this, section is subject to all the penalties imposed for such violation in accordance with the provisions of the Labor Code.

#### 5.04 PREVAILING WAGE

The Contractor shall comply with all Federal and State prevailing wage laws applicable to general law cities in California except as otherwise provided by duly-adopted City ordinance regulating municipal affairs.

#### 5.05 REGISTRATION OF CONTRACTORS

Before submitting bids, Contractors shall be licensed in accordance with the provisions of the Business and Professions Code.

#### 5.06 PERMITS AND LICENSES

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

#### 5.07 PATENTS

The Contractor shall assume all responsibilities arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work.

#### 5.08 PUBLIC CONVENIENCE AND SAFETY

The Contractor shall conduct his operations so as to cause the least possible obstruction and inconvenience to public traffic. Unless other existing streets are stipulated in the special provisions to be used as detours, all traffic shall be permitted to pass through the work.

Access to residences and businesses along the road or street shall be maintained and temporary crossings shall be provided and maintained in good condition. No cross or intersecting street or road shall be closed at any time without the approval of the Engineer. Pedestrian walks will be provided and maintained during construction.

The Contractor shall provide all detours, furnish and erect all signs, barriers, and lights in accordance with these specifications and the Standard Specifications of the State of California.

#### 5.09 RESPONSIBILITY FOR DAMAGE

Any contract awarded shall be expressly conditioned that the City Council, or the Engineer shall not be answerable or accountable in any manner for any loss or damage that may happen to the work or any part thereof; or for any material or equipment used in performing the work; or for injury or damage to any person or persons, either workman or the public; or for damage to adjoining property from any cause whatsoever during the progress of the work at any time before final acceptance, and the Contractor shall hold the City, the Engineer and their agents harmless there from.

#### 5.10 CONTRACTOR'S LIABILITY INSURANCE

The Contractor will indemnify and hold harmless the City, all other participating public agencies, whether or not said participating agencies are named herein, and all officers and employees of the City and said participating agencies, against any and all claims, demands, causes of action, damages (including damages to City property and property of said participating agencies) costs or liabilities (including cost of liabilities of the City employees), in law or in equity, of every kind and nature whatsoever, directly or proximately resulting from or caused by the performance of the contract, whether such performance be by the Contractor, his subcontractor or anyone directly or indirectly employed by him. The Contractor shall, at his sole risk and expense, defend any and all suits, actions or other legal proceedings which may be brought or instituted by third persons against the city, said participating agencies, their officers and employees on any such claim, demand or cause of action, and the Contractor shall pay and satisfy any judgment or decree which may be rendered against the City, said participating agencies, their officers and employees in any such suit, action or other legal proceedings. "Participating public agency" as used in this paragraph, shall mean any agency of the United States, the State of California or any City, County or District which has contributed or agreed to contribute money or services in the preparation of plans and specifications for or to defray the cost of the work, or which has jurisdiction over all or any part of the area in which the work is to be performed.

#### WORKER'S COMPENSATION INSURANCE

Before the Contract is entered into, the bidder to whom it is awarded, shall furnish the City satisfactory proof that he has taken out, for the entire period covered by the proposed Contract, full compensation insurance with an insurance carrier satisfactory to the City, for all persons whom he may employ directly or through Subcontractors in carrying out the work contemplated under this Contract, in accordance with the Labor Code. Should the Contractor fail to keep the insurance in force, the City may take out the required insurance at the Contractor is expense.

#### PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE

The Contractor shall take out and maintain, during the life of the Contract, such public liability and property damage insurance as shall provide him and any Subcontractor performing work covered by the contract from claims for property damages which may arise because of the nature of the work or from operation under the contract, whether such operations be by himself or by any Subcontractor, or anyone directly or indirectly employed by either of them, even though such damages be not caused by the negligence of the Contractor or any Subcontractor, or anyone

employed by either of them. The public liability and property damage insurance shall also directly protect the City, its officers, agents, and employees, as well as the Contractor and his Subcontractors, and all insurance policies issued hereunder shall so state. The amount of such insurance shall be as follows:

1. Contractor's liability insurance providing bodily injury or till death liability limits of not less than \$1,000,000 for each person, and \$1,000,000 for each accident or occurrence, and property damage liability limits of not less than \$500,000 for each accident or occurrence with an aggregate limit of \$1,000,000 for claims which may arise from the operations of the Contractor in the performance of the work herein provided for.

2. Automobile liability insurance covering all vehicles used in the performance of the contract providing bodily injury liability limits of not less than \$1,000,000 for each person and \$1,000,000 for each accident or occurrence, and property damage liability limits of not less than \$100,000 for each accident or occurrence, with an aggregate of not less than \$250,000 which may arise from the operations of the Contractor in performing the work provided for herein.

Before the execution of contract, the successful bidder shall file with the City a certificate or certificates of Insurance, covering the specified insurance and written with such a company or companies as may be acceptable to the City. Each such certificate shall bear an endorsement precluding the cancellation, or reduction in coverage, of any policy evidenced by such certificate, before the expiration of ten (10) days after the City shall have received notification by registered mail from the insurance carrier.

If the Contractor fails to maintain the required insurance, the City will maintain the required insurance at the Contractor's expense. Nothing herein contained shall be construed as limiting the liability of the Contractor.

#### 5.11 NO PERSONAL LIABILITY

No member of the City Council or any employee or agent of the City or any member of the governing body or any employee of any participating agency, as defined in subparagraph 10 of this section, shall be held responsible for any liability arising under this contract.

#### 5.12 CONTRACTOR'S RESPONSIBILITY FOR WORK

Until the formal acceptance of the work by the City the Contractor shall have the charge and care thereof and shall bear the risk of injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good on all damages to any portion of the work occasioned by any and all causes before final acceptance and shall bear the expense thereof.

#### 5.13 RESPONSIBILITY OF CITY

The City shall not be held responsible for the care or protection of any material or parts of the work prior to final acceptance, except as expressly provided in these specifications or the special provisions.

#### 5.14 FINAL PAYMENT TO RELEASE OWNER

The acceptance by the Contractor of the final payment shall be and shall operate as a release to the City of all claims and all liability to the Contractor for all things done or performed for or relating to the work or arising out of the work, excepting only Contractors claims, if any, for amounts withheld by the City upon final payment. No payment final or otherwise, shall operate to release the

Contractor nor his sureties from any obligation under this contract or the Contractor's bond, provided warranty as specified in Section 5.21.

#### 5.15 VERBAL STATEMENTS NOT BINDING

It is understood and agreed that the written terms and provisions of the contract documents shall supersede all prior verbal statements of the Engineer or other representatives of the Owner and such statements shall not be effective, or be construed as entering into or forming a part of, or altering in any way, whatsoever, the written agreement.

#### 5.16 AMENDMENTS TO CONTRACT

Each and every provision of law and clause required by law to be inserted in the contract shall be deemed to be inserted and the contract shall be read and enforced as though it were included therein, and if through mere mistake, or otherwise, any such provision is not inserted, or it is not correctly inserted, then upon the application of either party hereto, the contract shall forthwith be physically amended to make such insertion.

#### 5.17 ASSIGNMENT OF CONTRACT

The Contractor shall not assign the contract, or any part thereof, without the approval of the Owner, nor without the consent of surety unless the surety has waived its right to notice of assignment. All assignments of funds are subject to the prior lien for services rendered or materials supplied for the performance of the work called for in favor of all persons, firms, or corporations rendering such services or supplying materials.

#### 5.18 ACCIDENT PREVENTION

It shall be the duty of the Contractor to exercise precaution at all times for the protection of all persons and property. The safety provisions of applicable law, and building and construction codes shall be observed. Machinery, equipment and each and every potential hazard shall be guarded or eliminated in accordance with the safety provisions of the "Manual of Accident Prevention in Construction", published by the Associated General Contractors of America.

#### 5.19 OWNER'S RIGHT TO WITHHOLD CERTAIN AMOUNTS AND MAKE APPLICATION THEREOF

In addition to the payment to be retained by the City under the preceding provisions of these General Clauses, the City may withhold a sufficient amount of any payment otherwise due to the Contractor to cover (a) payments that may be past due and payable for just claims for labor or materials furnished in and for the performance of the work under this contract; (b) for defective work not remedied, and (c) for failure of the Contractor to make proper payments to his subcontractor. The City shall disburse and shall have the right to act as agent for the Contractor in disbursing such funds as have been withheld pursuant to this paragraph to the party or parties who are entitled to payment there from. The City will render to the Contractor a proper accounting of all such funds disbursed in behalf of the Contractor.

#### 5.20 REMOVAL OF TEMPORARY STRUCTURES

On or before acceptance of the work, the Contractor shall, without charge therefore, tear down and remove all buildings and other structures built by him for facilitating the carrying out of the work, and shall remove all surplus material and rubbish of all kinds from the grounds which he has occupied and shall leave the site of work clean and in good condition.

#### 5.21 GUARANTEE

The Contractor shall guarantee the proper installation and performance for all equipment and facilities for a period of one year from the date of filing the notice of completion. In the event that such facilities fail to perform properly during such one year period, they shall be repaired or replaced at Contractor expense in accordance with the instructions of the Engineer. To the extent that such facilities are out of service during the warranty period for reason of improper performance, then the warranty period shall be extended for an equivalent period of time on all portions of the project that are not operational due to such improper performance.

## SECTION SIX

### PROSECUTION AND PROGRESS

#### 6.01 SUBLETTING AND ASSIGNMENT

The Contractor shall give his personal attention to the administration of the contract and shall keep the work under his control. Subcontractors will not be recognized as such and all persons engaged in the work of construction will be considered as employees of the Contractor, and their work shall be subject to the provisions of the contract documents.

Where a portion of the work sublet by the Contractor is not being prosecuted in a manner satisfactory to the Engineer, the Subcontractor shall be removed immediately on the request of the Engineer and shall not again be employed on the work.

The contract may be assigned only upon written consent of the City.

#### 6.02 PROGRESS OF THE WORK AND TIME EXTENSIONS

The Contractor shall commence work under the contract within ten (10) working days from the date of "Notice to Proceed" and shall diligently prosecute the same to completion.

Prior to commencing work, the Contractor shall provide a proposed schedule in an acceptable form to the Engineer. Said schedule shall indicate the anticipated date upon which each major portion of the work shall begin and be completed. Failure of the Contractor to execute the work substantially in accordance with said schedule shall be evidence of unsatisfactory progress.

A working day is defined as any day, except Saturdays, Sundays, and legal holidays, and days on which the Contractor is specifically required by the special provisions to suspend construction operations and also excepting days on which the Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with at least 75 percent of the normal labor and equipment force engaged on such operation or operations for at least five (5) hours toward completion of such operation or operations. Should the Contractor prepare to begin work at the regular starting time in the morning of any day on which inclement weather or the conditions resulting from the weather prevents the work from beginning at the usual starting time and the crew is dismissed as a result thereof and the Contractor does not proceed with at least 75 percent of the normal labor and equipment force engaged in the current controlling operation or operations, the Contractor will not be charged for working day whether or not conditions should change thereafter during said day and the major portion of the day could be considered to be suitable for such construction operations.

The current controlling operation or operations is to be construed to include any feature of the work considered at the time by the Engineer which, if delayed, will delay the time of completion of the contract.

Determination of each non-working day, except Saturdays, Sundays, and legal holidays and days on which the Contractor is specifically required by the special provisions to suspend construction operations, shall be made and agreed upon during such day by conference between the Engineer and the Contractor and in the event of failure to agree, the Contractor will be allowed one week in which to file a written protest setting forth in what respects he differs from the Engineer, otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct.

### 6.03 CHARACTER OF WORKMAN

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

### 6.04 TEMPORARY SUSPENSION OF WORK

The Engineer shall have the authority to suspend the work wholly or in part, for such periods as he may deem necessary due to unsuitable weather or to such other conditions as are considered unfavorable for the suitable prosecution of the work or for such time as he may deem necessary due to the failure on the part of the Contractor to carry out orders given or to perform any provisions of the work. The Contractor shall immediately obey such order of the Engineer and shall not resume the work until ordered to do so in writing by the Engineer.

### 6.05 TIME OF COMPLETION AND LIQUIDATE DAMAGES

Time of performance is of the essence of the contract entered into pursuant to the specifications, and the City and the Contractor, by executing the contract, each agrees that actual damages to the City, and actual damages for the inconvenience and loss which will flow to the inhabitants of the City, from any delay in completion beyond the date or dates provided for the completion of the work, or portions thereof, are extremely difficult or possible to determine, and accordingly, it is agreed that the Contractor shall be liable for and shall pay to the City, the sums and rates stated in the Bidding requirements or special Provisions for each calendar day of delay in the completion of the work from the date for completion as specified in the contract or in any written extension of time granted by the City.

If the Contractor is delayed in said work by any acts or neglect of the City or its employees, or others acting under authority of the City by contractor otherwise, or by acts of God which the Contractor could not have reasonably for seen and provided for, or by weather conditions which, in the sole opinion of the Engineer as certified by him in writing, require temporary cessation of the work or any part thereof to a degree that the specified date of completion cannot be met, or if delays are caused by boycotts or like obstructive action by employee or labor organizations, or by any general lockouts or other defensive action by employers, whether general or by organizations of employers, the Contractor shall have no claim for damages against the City for any such cause of delay. Contractor shall in such cases be entitled to such extension of time for the completion as shall reasonably compensate for actual loss of time occasioned thereby, upon application to the City for such extension provided, that no extension of time shall be granted unless the Contractor shall have notified the City in writing of the condition or event which is expected to cause a delay in completion, within one week after the commencement or occurrence of the condition or event, and in the case of delay for weather conditions, shall have notified the Engineer of any such weather conditions on the first day of cessation of work on account thereof.

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

The City may conditionally accept the work and occupy and use the same if there has been such a degree of completion as shall in the City's opinion render the same safe, fit, and convenient for the

use for which it is intended. Subsequent to such conditional acceptance and occupation by the City, the City may elect to assess actual damages caused by failure of the Contractor to fully complete the work within the time specified for completion thereof.

#### 6.06 SUSPENSION OF CONTRACT

If at any time in the opinion of the Engineer, the Contractor has failed to supply an adequate working force, or material of proper quality, or has failed in any other respect to prosecute the work with diligence and force as specified in the terms of the contract, notice thereof in writing will be served upon him. Should the Contractor neglect or refuse to provide means for a. satisfactory compliance with the contract, as directed by the Engineer, within the time specified in such notice, the Engineer in any such case shall have the power to suspend the operation of the contract upon receiving notice of such suspension, the Contractor shall discontinue said work or such parts of it as the Engineer may designate upon such suspension, the Contractor's control shall terminate and thereupon the City Council or its duly authorized representative may take possession of all or any part of the Contractor's materials, tools, equipment, and appliances upon the premises and use the same for the purpose of completing said contract and hire equipment and such additional materials and supplies at the Contractor's expense as may be necessary for the proper conduct of the work and for completion thereof. The City may employ other parties to carry the contract to completion, employ the necessary workmen, substitute other machinery or materials, and purchase the materials contracted for, in such manner as the Engineer may deem proper; or the City Council may annul and cancel the contract and relate the work or any part thereof. Any excess of cost arising there from over and above the contract price will be charged against the Contractor and his sureties, who will be liable therefore. In the event of such suspension, all money due the Contractor or retained under the terms of the contract shall be forfeited to the City, but such forfeiture will not release the Contractor or his sureties from liability or failure to fulfill the contract. The Contractor and his sureties will be credited with the amount of money so forfeited toward any excess cost of completing the work by the City as above provided and the Contractor will be credited with any surplus remaining after all just claims for such completion have been paid.

#### 6.07 RIGHT-OF-WAY

The right-of-way for the work to be constructed will be provided by the City. The Contractor shall make his own arrangements and pay all expenses for additional area required by him outside of the limits of right-of-way, unless otherwise provided in the Special Provisions.

## SECTION SEVEN

### MEASUREMENT AND PAYMENT

#### 7.01 EXTRA AND FORCE ACCOUNT WORK

Extra and Force Account work shall conform to Section 9 of the Standard Specifications of the State of California.

#### 7.02 PROGRESS PAYMENTS

The City shall, on the first of each month, unless otherwise specified, cause an estimate in writing to be made by the Engineer 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. The City shall retain ten percent (10%) of such estimated value of the work done and fifty (50%) of the value of materials so estimated to have been furnished and delivered unused as aforesaid as part security for the fulfillment of the contract by the Contractor and shall monthly pay to the aforesaid, after deducting there from all previous payments and all sums to be kept or retained under the provisions of the contract. No such estimate or payment shall be required to be made when in the judgment of the Engineer the work is not proceeding in accordance with the provisions of the contract or when in his judgment the total value of the work done since the last estimate amounts to less than one thousand dollars (\$1,000).

#### 7.03 FINAL PAYMENT

The Engineer shall, after the completion of the contract make a final estimate of the amount of work done there under and the value of such work. The City, upon acceptance of the work shall pay a sum equal to ninety percent (90%) of the total value of said final estimate. The ten percent (10%) retained shall constitute the final payment and shall not be due and payable until the expiration of thirty-five (35) days from the date of filing "Notice of Completion".

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

The Contractor further agrees that the payment of the final amount due under the contract and the adjustment and payment for any work done in accordance with any alterations of the same, shall release, the City, the City Council and the Engineer from any and all claims or liability on account of the work performed under the contract or any alteration thereof.

#### 7.04 DATE OF PAYMENTS

Any payment to be made under these specifications shall not become due and payable until the date of the next regular meeting of the City Council at which time bills are allowed and ordered paid following the date of the Engineer's estimate of the work completed.

## SECTION EIGHT

### INCORPORATION OF STANDARD SPECIFICATIONS

#### 8.01 GENERAL

The work embraced herein shall be done in accordance with the appropriate provisions and construction details of the specifications entitled "State of California, Department of Transportation, Standard Specifications", latest edition, or that edition referenced insofar as the same may apply, which specifications are hereinafter referred as the Standard Specifications of the State of California and in accordance with the following provisions.

In case of conflict between the Standard Specifications of the State of California and the Standard Specifications of the City, those of the City shall take precedence over and be used in lieu of such conflicting portions.

## SECTION NINE

### CLEARING AND GRUBBING

#### 9.01 GENERAL SCOPE

Clearing and grubbing shall consist of the removal and disposal of all materials roots, existing concrete, existing paving and/or other obstructions not specified above as required the plans and specifications within the entire right-of-way or those features conflicting with work to be performed.

#### 9.02 OBSTRUCTIONS

Attention is directed to Sections 8 and 15 of the State Standard Specifications. The Contractor shall be wholly responsible for the preservation and protection of all survey monuments, underground pipes, conduits and other improvements, whether shown on the plans or not.

The Contractor shall make such investigations and examinations as are required to determine the existence and locations of all pipes, conduits, and other underground improvements and shall consult with and advise the owners of the utilities before undertaking any work that might endanger them.

At locations where lawn irrigation systems exist, the Contractor shall relocate sprinklers and private irrigation facilities outside the limits of the proposed improvements as may be directed by the Engineer. All heads and pipe, so removed, shall be salvaged and returned to their respective owners. Full compensation for relocating irrigation systems shall be considered as included in the prices paid for various other items of work and no additional allowance will be made therefore.

The City does not guarantee the accuracy or completeness of any data shown on the plans relative to the locations, sizes, dimensions, depths, and character of pipes, conduits, poles, or any other structures or utilities located above ground or underground.

The Contractor shall assume full responsibility for any damage to pipes, conduits, poles, or any other structures or utilities, and he shall not make any claim for inconvenience, delay or added cost of performing the work which may be attributed in any degree to inaccuracy of information furnished by the City relative to the locations, sizes, dimensions, depths, and character of any pipes, conduits, poles, or other structures and utilities or for failure of the City to furnish any information relative thereto.

Existing land subdivision monuments and stakes shall be fully protected from damage or displacement and they shall not be disturbed unless directed by the Engineer. Full compensation for conforming to this section shall be included in the prices paid for the various items of work and no additional allowance will be made therefore unless specifically set forth as a separate bid item.

#### 9.03 WORK IN CITY STREETS

All of the work shown on the plans and included in these specifications that is located in the public streets in the City shall be done in accordance with City Ordinances regulating the use of public streets within the City, except as otherwise provided herein.

The Contractor shall inform himself as to all regulations and requirements of the Engineer and Director of Public Works of the City and shall conduct his operations in compliance therewith.

#### 9.04 TRAFFIC CONTROL SIGNS AND STREETS SIGNS

All traffic signs and street signs within the limits of the improvements, if required, to facilitate the work, shall be removed, salvaged and stockpiled at locations designated by the Engineer. An inventory log shall be completed and submitted to the Engineer prior to removal of any traffic and/or street signs. Traffic control signs and street signs shall be replaced upon completion of the work and the cost of removal and replacement shall be included in various bid items and no separate payment will be made.

The Contractor shall install such temporary traffic control devices, as may be required, to properly control traffic in a safe manner. The cost of such installations shall be deemed included in the various bid items and no separate payment will be made therefore.

#### 9.05 REMOVING CONCRETE

Removing concrete shall conform to the provisions in Section 15 of the State Standard specifications and these special provisions.

Concrete within the right-of-way, as designated on the plans or conflicting with proposed improvements, shall be removed by the Contractor. This includes all drain wells and drainage structures.

Existing manholes to be abandoned shall be removed to within 2 feet below the finished grade and backfilled.

Where existing house foundations overlap the right-of-way, the entire foundation shall be removed. That portion beyond and outside the right-of-way shall be considered within the right-of-way.

Attention is directed to the provisions in Section 73-1.03 of the State Standard specifications, which section pertains to saw cutting.

Full compensation for removing concrete shall be included in clearing and grubbing and no further compensation will be allowed therefore.

#### 9.06 IMPORTED BORROW

Imported borrow shall be material required for backfill or embankments. It shall be taken from a location secured by the Contractor, at his expense and approved by the Engineer. Imported borrow shall be clean material free from vegetation and deleterious material and shall have no lumps or chunks over 2 inches in diameter. Such material shall have sand equivalent of no less than 20 and a minimum value of 65.

SECTION TEN  
EXCAVATION AND GRADING

10.01 SCOPE

Excavation and grading shall consist of the removal and disposal of all earth and rock existing concrete and paving as required on the plans and as hereinafter specified. This item shall also include the construction of roadway or area fills to conform to the line and grades given on the plans.

10.02 EARTHWORK

Earthwork shall conform, to the provisions in Section 19 of the State Standard Specifications and the applicable Special Provisions.

Rounding of cut slopes shall be required.

Unsuitable and surplus material shall be disposed of outside the right-of-way in accordance with the provisions in Section 7-1.13 of the State Standard Specifications.

The limits of excavation for compacting original ground as provided for in Section 19-5.03 of the State Standard Specifications shall be changed to the limits shown on the plans. Center islands shall require a minimum relative compaction of 85%, as determined by Test Method No. California 216.

10.03 STREET CONSTRUCTION

At all times during construction the Contractor shall grade to and provide safe, smooth connections between all new street construction and any adjacent existing streets and driveways, the satisfaction of the Engineer, and in accordance with the provisions of Section 7-1.08 of the State Standard Specifications.

10.04 ROADWAY EXCAVATION

Roadway excavation shall, include the removal and replacement of material required within the travel way for compaction purposes. Roadway compaction shall have a minimum relative compaction of ninety five percent {95%} as determined Test Method No. California 216. The cost of compaction will be included in the various bid items for the construction of the pavement section.

The compacting shall extend to and include all areas where concrete movements are to be constructed except that the relative compaction under concrete movements shall be not less than ninety percent {90%} as determined Test Method No. California 216. The cost of such compaction will be included in the various bid items for concrete improvements.

10.05 DUST CONTROL

The Contractor shall be responsible for applying either water or dust palliative or both for the alleviation or prevention of dust nuisance whether such nuisance result from Contractors operation or public traffic. Such dust control shall be applied when required to prevent nuisance including Saturdays, Sundays and Holidays as directed by the Engineer. No separate payment will be made for any work performed or material applied for dust control. Full compensation for such dust control will be considered as included in the price bid for the various items of work involved.

#### 10.06 MISCELLANEOUS STREET FACILITIES

The removing, reconstruction, adjusting, remodeling, and salvaging of the various street facilities shall conform to the provisions in Section 15 of the State Standard specifications revised as follows:

All manholes that are to be lowered shall be removed as directed by the Engineer, to an approximate depth of two (2) feet below finished grade and shall then be reconstructed with the proper taper to finish grade.

SECTION ELEVEN  
STREET IMPROVEMENTS

11.01 AGGREGATE SUBBASE

A. GENERAL

In the event that native material will not provide a satisfactory base for pavement an imported aggregate subbase shall be used. Aggregate subbase material shall consist of mineral aggregate, spread and compacted on a prepared subgrade or subbase in conformance with the lines, grades, and dimensions shown on the plans, standard details and as hereinafter specified.

B. MATERIALS

Aggregate subbase shall be Class 2 and shall conform to the provisions in Section 25 of the State Standard Specifications and the Special Provisions.

C. ADDITIONAL THICKNESS

In the event that soil conditions are encountered in areas not anticipated on the plans such that a satisfactory base for pavement may not be obtained, the unsatisfactory material lying below the subgrade shall be removed and the additional subbase material, as directed by the Engineer, shall be compacted in accordance with the provisions of this section. All such extra work shall be paid for on a cubic yard basis excavated as calculated by "average end area" method. The price per cubic yard shall be the same as per bid item.

D. MEASUREMENT MATERIALS

Aggregate subbase will be paid for by the ton in place and compacted. Quantities will be calculated on the basis of the dimensions shown on the plans adjusted by the amount of any changes ordered by the Engineer. No allowance will be made for aggregate subbase placed outside said dimensions unless otherwise ordered by the Engineer.

11.02 AGGREGATE BASE

A. GENERAL

Aggregate base material shall consist of mineral aggregate, spread and compacted on a prepared subgrade or subbase in conformance with the lines, grades, and dimensions shown on the plans, standard details and as hereinafter specified.

B. MATERIALS

Aggregate base shall be Class 2 and shall conform to the provisions in Section 26 of the State Standard Specifications and the Special Provisions.

C. ADDITIONAL THICKNESS

In the event that soil conditions are encountered such that a satisfactory base for pavement may not be obtained, the unsatisfactory material lying below the subgrade shall be removed and the additional subbase or untreated base material, as directed by the Engineer, shall be compacted in accordance with the provisions of this section. All such extra work shall be paid for on a cubic yard basis excavated as calculated by "average end area" method. Additional subbase or base material shall be paid for as per bid item.

#### D. MEASUREMENT OF MATERIALS

In lieu of conflicting provisions of Section 9-1.01 of the State of California Standard Specifications, the following shall apply whenever the Engineer's Estimate indicates that material is to be paid for by the ton.

The City will not furnish or compensate a weighmaster or representative to witness weighing and to check compiling of weight records.

The Contractor shall be responsible for furnishing the Engineer with a daily record of the weight of all material which is to be paid for by the ton and which had been delivered to the project site. Said record shall be certified for authenticity of scale weights by a Public Weighmaster and shall become the basis of payment for the material itemized therein.

In addition, each delivery truck shall carry to the project site a load slip for the material transported in said truck. The load slip shall be delivered to the Engineer by the driver at the time and site of delivery of the truck-load of material covered by the load slip.

Full compensation for conforming to the requirements of article shall be considered as included in the contract unit price paid for the material involved and no separate payment will be made therefore.

### 11.03 ASPHALT CONCRETE PAVEMENT

#### A. SCOPE

Asphalt Concrete Pavement shall consist of the furnishing and placing of mineral aggregate blended with bituminous binder at an approved central mixing plant, in accordance with Section 39 of the State Standard Specifications and as hereinafter specified. The item shall also include prime coat, paint binder, and seal coat.

#### B. AGGREGATE MATERIAL

Aggregate material shall conform to the specifications of Section 39-2.02 of the State Standard Specifications for  $\frac{3}{4}$  inch maximum aggregate (medium) or  $\frac{1}{2}$  inch maximum aggregate (medium). Where more than 2 inches of A.C. are required the first course shall be  $\frac{3}{4}$  inch maximum aggregate (medium), the final course shall be  $\frac{1}{2}$  inch maximum aggregate (medium). Where only 2 inches of A.C. are required, the gradation shall conform to  $\frac{1}{2}$  inch maximum aggregate (medium).

#### C. ASPHALT CONCRETE

Asphalt Concrete shall be Type A and shall conform to the provisions in Section 39 of the State Standard Specifications and the Special Provisions.

The amount of asphalt binder to be mixed with the mineral aggregate shall be between 3 percent and 7 percent by weight, of the dry mineral aggregate. The exact amount of asphalt binder to be mixed with the mineral aggregate will be determined by the Engineer.

The paving asphalt shall be AR4000 or AR8000 as determined by the Engineer.

Full compensation for furnishing and applying asphaltic paint binder as a "tack coat" to all vertical surfaces of existing pavement, curbs, gutters, and construction on joints in the surfacing against which additional material is to be placed shall be considered as included in the contract unit price paid per ton for asphalt concrete and no separate payment will be made therefore.

Aggregate for asphalt concrete placed in medians and other miscellaneous areas shall conform to the grading specified for ½ inch maximum, (medium).

#### D. SAND APPLICATIONS

Where ordered by the Engineer, sand cover shall be applied to driveways and public road approaches, and to areas where prime coat has failed to penetrate, in conformance with the provisions in Section 36 of the State Standard Specifications.

#### E. COMPACTING SMALL AREAS

At locations where miscellaneous areas are to be surfaced in accordance with the provisions in Section 39- 7.01 of the State Standard specifications and where the width of asphalt concrete to be placed is less than eight (8) feet, or the total thickness of asphalt concrete to be placed is less than 0.1 foot, the required minimum rolling equipment specified in Section 39-5.02 of the State of California Standard specifications may be reduced to one, 8 ton, 2-axle tandem roller for each 100 tons, or fraction thereof of asphalt concrete placed per hour by each asphalt paver. Areas which are inaccessible to an 8 ton 2-axle roller shall be thoroughly compacted to the lines, grades, and cross section by means of pneumatic tampers or by other methods that will produce the same degree of compaction.

#### F. FINISHING ROADWAY

Finishing roadway shall conform to the provisions of Section 22 of the State Standard Specifications and shall include transitions between pavement and bituminous surfaces at cross streets and between. payment for finishing roadway shall be included in the bid items involved and no separate payment will be made.

#### G. FOG SEAL

Fog seal shall be applied to all new asphalt concrete pavements in accordance with the requirements of Section 37 of the State Standard Specifications and payment therefore shall be included in the cost of asphalt concrete pavement unless otherwise specified.

### 11.04 CONCRETE IMPROVEMENTS

#### A. SCOPE

Portland cement concrete curb, gutter, sidewalk, driveway approaches, alley approaches and valley gutters shall be constructed complete and in place in accordance with Section 73 of the State Standard Specification, the plans, standard details and as hereinafter specified. This item shall also include the necessary base preparation.

#### B. PORTLAND CEMENT CONCRETE

Portland Cement Concrete shall have a compressive strength of 2500 psi at 28 days, and shall have a maximum slump of four (4) inches.

#### C. MIXING AND TRANSPORTING

The requirements for mixing and transporting concrete shall be as set forth in Section 90-6 of the State of California Standard Specifications.

#### D. CONSTRUCTION

Concrete curbs gutters and sidewalks shall conform to the provisions in Section 73 of the State Standard Specifications and these Specifications.

The subgrade shall be constructed true to grade and cross section, as shown on the plans or directed by the Engineer. It shall be thoroughly watered and rolled or hand tamped to obtain 90% compaction. Any unsuitable material shall be removed to a depth of not less than six (6) inches below subgrade elevation for curbs, gutters, local depressions and driveways, and three (3) inches below the sidewalks and the resulting space filled with approved earth, sand or gravel, moistened and rolled or tamped to form a firm and solid foundation.

Expansion joints for curb and gutter shall be constructed a minimum of every 48 feet and at the ends of curb returns with weakened plane joints placed every 16 feet.

Adjacent curb, gutter and sidewalk shall be monolithic. In lieu of a monolithic section the sidewalk may be doweled in accordance with the Standard Drawings.

Extruded curb or curb and gutter construction, if used, shall be in accordance with Section 73-1.06 of the State Standard Specifications using concrete with a compressive strength of 2500 psi as tested at 28 days.

Attention is also directed to Section 73-1.03 of the State Standard Specifications regarding reconstruction of existing curbs and sidewalks.

Adhesives shall not be used in place of dowels.

#### E. SIDEWALK PATTERNS

Sidewalk Patterns shall be constructed as listed below unless written permission from the Engineer has been given to modify said patterns. Commercial sidewalk pattern shall be constructed from back of curb to property line.

Residential sidewalk pattern shall be approved by Engineer as to type and width.

Planter strips shall be filled with clean topsoil level with the top of curb and sidewalk.

1. Residential pattern shall be used for property so zoned.
2. Commercial pattern shall be used for all property so zoned.
3. Commercial pattern shall be used for all property-zoned industrial unless otherwise exempt from constructing sidewalks as provided in the Municipal Code.
4. Sidewalks are not required in the RA zone except on major streets. The pattern on major streets shall be residential unless specifically designated on the plans as commercial pattern as determined by the Engineer.

#### F. TREE WELLS

All commercial sidewalks shall have provisions for trees by the construction of tree wells in accordance with the Standard Drawings unless waived by the Engineer in writing.

#### G. DRIVEWAYS

Minimum width of commercial driveways shall be 12 feet and maximum width shall be 35 feet. Minimum width of residential driveways shall be 12 feet maximum shall be 24 feet driveways shall not be closer than 3 feet to the nearest street fixture (i.e. fire hydrants, electroliers) .No residential driveway shall cover more than 40% of lot frontage. No commercial driveway shall cover more than 50% of lot frontage. Driveways on adjacent lots shall have a minimum separation of 24 feet. No driveway shall be located within three (3) feet of the adjacent property line. See Standard Drawing Nos. P-3 and P-4.

#### H. FINISH

All concrete work shall be finished with a steel trowel and given a brush finish except concrete gutter, valley gutters and approaches, which may be given a wood, float finish.

#### I. CURING

An approved curing compound shall be placed in accordance with the State Standard Specifications on all surfaces and the cost of curing compound shall be included in the various bid items.

#### J. BACKFILLING

After removal of forms, the area between the sidewalk and curb shall be cleaned of all surplus concrete and other debris and the area filled with clean earth suitable for planting.

The Contractor shall repair all excavations for gutter and shall backfill and pave with similar surfacing material thoroughly tamped into place and leveled off to meet the existing street surface and the gutter.

If more than 2 inches cut or fill is required, behind the curb, the Contractor shall construct a slope not steeper than 4:1 between the top of the curb and the adjacent property.

#### K. PROTECTING CONCRETE

Installation of any concrete facility subject to rain or freezing weather conditions shall be constructed in accordance with Section 90-8.01 of the State Standard Specifications.

#### L. ROCK POCKETS

Immediately upon stripping curb forms and prior to backfill, all rock pockets or honeycombs shall be repaired to the satisfaction of the Engineer.

#### M. CLEANING UP

During the progress of the work as may be directed by the Engineer and before acceptance and final payment, the Contractor shall remove all surplus earth and other material from the site of the work and then complete the cleanup by sweeping or washing the street or work area and leave the whole site neat and finished.

SECTION TWELVE  
DOMESTIC WATER SYSTEMS

12.01 MATERIAL

A. SCOPE

Domestic water material, including any component for the use of supplying domestic water therein, shall be supplied complete and in working condition in accordance with these specifications, any Special Provisions and the Standard Specifications of the state of California.

B. PLASTIC PIPE

Plastic pipe shall meet the requirements of AWWA C-900 Polyvinyl Chloride (PVC) Pressure Pipe, Class 150, DR 18. Provisions shall be made for expansion and contraction at each joint with an elastomeric ring. The bell shall consist of an integral wall section with a solid cross-section elastomeric ring that meets the requirements of ASTM D-1869 and E-477. The bell section shall be designed to be at least as strong as the pipe wall. Standard laying lengths shall be either 13 feet or 20 feet.

If PVC pipe is used, the Contractor shall install a 14-gage copper wire or approved metallic tape along the length of the pipeline construction to assist the City in future pipe-locating operations.

C. DUCTILE IRON PIPE

Ductile iron water pipe shall be manufactured in accordance with the requirements of ANSI A-21.50 and A-21.51. In no case shall the class of the pipe be less than AWWA Class 150. Ductile iron pipe shall be constructed with push-on or mechanical joints. Ductile iron pipe shall be furnished with a bituminous coating outside and a seal coated cement lining inside, in accordance with ANSI A-21.4 standard thickness.

All pipes shall be delivered and delivered, in all respects sound and in conformance with the above specifications. Any defective pipe shall at all times be subject to rejection regardless of whether it may have passed a previous inspection and been estimated for payment.

D. WATER PIPE FITTINGS

This item shall include the installation of water pipe fittings as required for constructing turns, laterals, and connections to other water mains.

Fittings shall be mechanical joint AWWA approved per specification C-110 or C-153, cement lined cast iron or ductile iron with bell to match the spigot of the PVC or ductile iron water main, unless otherwise noted on the drawings. Flanged fittings shall be connected with gaskets and hexagonal machine bolts and nuts made of Ni-Cad steel. Short body fittings will be allowed.

Thrust blocks shall be installed at all fittings and shall provide a minimum bearing area sufficient to withstand the forces to be generated in the pipe, but in no case shall they be less than those sizes indicated in the City of Kingsburg Standard Specifications.

In locations where tees and valves are placed and no lateral lines are installed the Contractor will be required to place thrust blocks that will be for future use.

Thrust blocks shall be constructed with Class B (5-sack) concrete, shall extend from the fitting to undisturbed soil, shall be kept clear of the joints, and shall be of such bearing area as to assure adequate resistance to the forces to be encountered. Mixing, placing, curing and proportioning of

concrete shall be in conformance with the requirements of Sections 51 and 90 of the Standard Specifications.

Full compensation water pipe fittings shall be considered as included in the contract unit price paid per lineal foot for 12-inch water main and no separate payment will be made therefore.

## E. VALVES

### 1. GATE VALVES

This item shall include the furnishing and installation of gate valves on the new water main, or on lateral lines for tie-in to existing water mains.

Gate Valves: All gate valves shall be resilient seated, Mueller No. A-2370, Clow Style 2833, AVK Series 25, or approved equal as determined by the Engineer, in accordance with AWWA C-509 specification. When fully open, the valves shall have an unobstructed passageway equal to the diameter of the pipe in which they are placed.

All valves shall be iron body, with "O" ring seals, bronze mounted, non-rising stem type, nut operated, left turn to open. Valve discs shall be cast iron with elastomeric seals bonded to the wedge. The bonding process shall meet the requirements of ASTM D-429. Exterior of the body shall be coated with asphalt varnish with a minimum thickness of 30 mils, or an approved epoxy coating system. All internal components subject to corrosion shall be protected with appropriate EPA-approved coatings.

Gate Valves: All buried valves shall be provided with a valve box. If necessary, an extension mast for the nut shall be installed to provide a distance from the top of the valve box to the nut of less than 40 inches.

All valves shall be tested in place so far as practicable under the conditions specified and any defects revealed in valves or connections under test shall be corrected. Where proper operation and utilization of equipment and facilities requires the installation of valves not shown or specified, the Contractor shall provide and install, upon approval of the Engineer, valves similar and comparable to valves specified for similar and comparable duty in other parts of the project. Additional valves shall be paid for as extra work.

In paved areas, the top two inches (2") of the collar shall normally be finished with hot-mix asphalt concrete. Under special circumstances, for valve boxes located on City streets, the Contractor may construct the concrete collar up to the surface, provided he constructs the collar with concrete containing lamp black or other material to produce a colored surface consistent with that of the street, and provided that approval of the Engineer is obtained.

Contract unit price bid per each for gate valves shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in gate valves, complete in place, including valve box and collar and all other incidental work involved, as shown on the plans, as specified in the Standard Specification and these special provisions, and as directed by the Engineer.

### 2. BUTTERFLY VALVES

All butterfly valves shall equal or exceed the requirements of the American Water Works Association Standards for butterfly valves (AWWA C-504) and shall further be Dresser, Weco or equal as approved by the Engineer.

3. VALVE END

The ends of flanged valves shall conform in dimension and drilling to ASA B16.1 for cast iron flanges and flanged fittings, Class 125. Mechanical joint gate valves shall be furnished complete with all glands, gaskets and necessary bolts.

4. VALVE BOXES

Valve Boxes shall be ten-inch (10") diameter concrete boxes with cast iron cover embossed with "Water", and shall be Brooks 3-RT, Christy G-5 or approved equal. Extensions for the valve box shall be a solid piece of 8" diameter pipe or equivalent material that shall protrude at least 4" into the valve box.

Valve boxes shall be installed with a concrete collar extending at least eight inches (8") below the top of the box. The concrete collar shall also extend a minimum of eight inches (8") beyond the outside of the valve box. Valve boxes shall be brought to grade after completion of the paving.

F. WATER METERS

1. GENERAL

Water meters shall be multi-jet type with magnetic drive and sealed registers and shall comply with AWWA Standard C708 for Cold Water Meters – Multi-Jet Type.

2. MAINCASE

Outer cases shall be made of a copper alloy equaling or exceeding AWWA standards with separate inner chambers. The maincase shall have a regulating port on the inlet side of the maincase. On sizes 5/8" thru 1", the maincase shall be provided with wrench pads to aid in the installation of the water meter. All external bolts and nuts shall be made of high strength copper alloy or stainless steel.

3. REGISTERS

Dial registers shall be straight U.S. gallons. Registers shall be entirely encased (non-repairable) in its own stainless steel housing which is rolled onto a heat-treated glass domed lens using a triple sided gasket. Water flooded registers are acceptable.

The maximum indication of the initial dial and the minimum capacity of the register shall be as follows:

Size (Inches)	Maximum Indication of Initial Dial – Gallons	Minimum Register Capacity - Gallons
5/8" x 3/4"	10	1,000,000
1"	100	10,000,000
1-1/2"	100	100,000,000
2"	100	100,000,000

#### 4. REGISTER BOXES

Register boxes and lids shall be all bronze composition, with the name of the manufacturer cast on the lids in raised letters. The serial number of the meter shall be plainly stamped on the lids and case. The lids shall be recessed and shall lap over the register box to prevent dirt from accumulating on the lens. The lens shall be extra thick tempered glass, and shall be securely held in place. The lens shall be installed within the register box so that it will prevent the ingress of water, moisture, and dirt thus providing a sealed chamber contained the register and intermediate gear train that is sealed to prevent fogging.

#### 5. MEASURING CHAMBER ASSEMBLY

The measuring chamber shall be made of a suitable synthetic polymer material which equals or exceeds AWWA standards. It shall be secured in a position in the main case in such a manner that slight distortion of the outer case will not affect the sensitivity or registration of the meter.

The measuring chamber shall be of the dry-register type with the water flow directed across the multivaned rotor proportional to the quantity of water passing through the chamber. The maincase shall have a regulating port on the inlet side of the maincase.

#### 6. INTERMEDIATE GEAR TRAIN

The intermediate gear train shall be located in the register cup and completely separated from the water passage and hermetically sealed by the register box. It shall be driven by a magnet on the inside of the case.

#### 7. STRAINERS

Each meter shall be equipped with a strainer of stainless steel or non-corrosive material. The strainer shall be of sufficient size so as to provide full protection of the inlet stream. It shall fit snugly in the maincase and shall be rigid but easily removable.

### G. WATER SAMPLING STATIONS

#### 1. GENERAL

Water sample stations shall be Eclipse No 88-2 for approved equal. Stations shall be installed on a 5-sack concrete pad, 8-inches thick by 18" square. A ball valve with lock ring shall be installed in a precast valve box within 4-feet of the pad. A separate ¾-inch water service shall be installed to serve the station in accordance with City Standard Drawing W-1.

### H. FIRE HYDRANTS

#### 1. GENERAL

Fire hydrants shall conform to the City Standard Drawings and to the Standard Specifications for fire hydrants as approved by the American Water Works Association.

Delivery classification shall be two hose and one pumper nozzle, with ASA National Standard fire hose coupling screw threads. Hose nozzle shall be for 2 ½ inch hose, and pumper nozzle shall be for 4 ½ inch hose. Fire hydrants shall be Mueller Type A-423 only, with a bury depth of 42". Drain holes shall be plugged.

## 2. EXTERIOR PAINTING

The outside of the hydrant shall be painted with one coat of safety yellow. The outside of the hydrant bury shall be covered with two coats of asphalt varnish.

## I. COPPER TUBING

### 1. GENERAL

All copper tubing shall be new and conform to A.S.T.M. Specification B88.

### 2. GRADE AND TYPE

Seamless copper tubing shall be of one grade and shall be designated type "K" as listed in above specifications.

The tubing is to be furnished in annealed 64-ft. coils. The tubes shall be clean, smooth, round, of proper dimensions, free from grooving, indentations, cracks, flaws, and scale.

The tubing shall be made of copper having a purity of at least 99.9 percent as determined by electrolytic assay except that silver may be counted as copper.

### 3. MARK

The name or trademark of the manufacturer and a symbol indicative of the type shall be permanently marked at intervals not greater than 1 1/2 feet on the tubing.

### 4. TEST

The City will make tests locally as it considers to be necessary and appropriate, and such tests will be a basis for acceptance or rejection under this section of the specifications. Should random sampling disclose any unsatisfactory tubing, the entire lot may be rejected. All rejected material shall be handled at the expense of the Contractor. The tests made shall conform to A.S.T.M. Specification B88.

## J. ANNEALED COPPER TUBING FITTINGS

### 1. GENERAL

These fittings are for use on underground service lines in the water distribution system. The fittings shall be of the A.W.W.A. flared type, and they will be used with type "K" soft annealed copper tubing. Each item shall be new and made of brass conforming to A.S.T.M. B-62.

### 2. TESTING

Each step shall be subjected to a production line test by the manufacturer, or psi air pressure while submerged in water for ten (10) seconds with the stop in both the closed and open positions without leakage. In addition, each fitting shall be designed to withstand a 300 psi hydrostatic test without top or bottom leakage or any signs of structural failure or distortion. The City will make such confirmation tests locally as are considered to be necessary and appropriate and such tests will be a basis for any rejection under this section of the specifications. Should random sampling disclose any unsatisfactory fitting, then the entire lot may be rejected. All rejected materials shall be replaced at the Contractor's expense.

#### K. VALVE BOXES AND COVERS

All valve boxes and covers shall be Christy Concrete Products, Inc. G-5 traffic valve box and lid or approved equal.

#### L. PLASTIC WATER SERVICE TUBING

All plastic tubing shall meet the requirements of SDR-9 as described in A.S.T.M. Specifications. Where plastic tubing is installed, all curb stops shall be exposed for final inspection. Any damaged or improperly located services will be rejected by the Engineer and repaired or replaced by the Contractor at no cost to the City.

### 12.02 CONSTRUCTION

#### A. HANDLING PIPE AND FITTINGS

Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe, fittings, and valves shall be carefully lowered into the trench by means of a derrick or other suitable tools or equipment in such manner as to prevent damage to the pipe or fittings. Any damage to the pipe, lining or fittings shall be repaired by the Contractor at his expense. The Contractor shall be responsible for the safety of all materials to the time of acceptance of the finished work.

#### B. CLEANING OF PIPE

All of the pipe shall be thoroughly cleaned of all dirt, rock and other debris that may be found in the interior of the pipe as stockpiled. If considered necessary by the Engineer, he may direct the Contractor to swab the pipe to clean it. At the end of each day's work each end of the pipe shall be closed by means of a special bulkhead or by other means approved by the Engineer.

#### C. PAVEMENT REMOVAL

In locations where pipe is to be laid on paved streets the amount of pavement cut or removed shall not exceed the width of trench specified. In breaking pavement, proper equipment shall be employed so that the pavement can be cut a minimum 6-inches outside the trench width to provide a clean edge. If the pavement removal is carried beyond the established lines, the Contractor shall restore said pavement at his expense.

#### D. TRENCHING

Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe, fittings, and valves shall be carefully lowered into the trench by means of a derrick or other suitable tools or equipment in such manner as to prevent damage to the pipe or fittings. Any damaged pipe or fittings shall be promptly removed from the site by the Contractor at his expense. The Contractor shall be responsible for the safety of all material until the time of acceptance of the finished work.

All pipe shall be laid in a trench excavated to grade and alignment as established by the Engineer. Except by special permission of the Engineer, the trench shall not be open for more than six hundred feet (600') in total, including excavation, construction, pipe laying, and backfilling at any one location. All excavation shall be made in accordance with the Trench Construction Safety Orders issued by the Division of Industrial Safety of the Department of Industrial Relations of the State of California. Unless otherwise provided, the width of the trench shall be equal to the outside diameter of the pipe plus a minimum of 4 inches and a maximum of 12 inches on each side of the pipe, unless provisions for shoring equipment must be made. In such case, the Contractor shall

submit to the Engineer his proposed methods of shoring. Such method shall not cause disruption of the pipe joint after assembly. Where the pipe is placed under an oiled road, the oil cake shall be excavated and removed from the site of the trench or stored in such a manner that it will not be incorporated in the backfill.

The completed trench shall be uniformly graded to a flat bottom conforming to the grade to which the pipe is to be laid. The pipe shall be laid upon sound soil cut true and even so the barrel of the pipe shall be in full bearing for its entire length. Any trench excavated below the approved grade shall be backfilled and thoroughly compacted with select native material so the barrel of the pipe will be in full bearing for its entire length. The bedding material shall be moistened sufficiently to produce plus or minus 2 percent of optimum moisture and thoroughly compacted to a minimum of 90% relative compaction by aid of mechanical or hand tampers under and on each side of the pipe.

When bell holes are required, they shall be excavated at each location where pipes are to be joined. Bell holes shall be of sufficient and adequate size to permit ease in making the joint.

The Contractor shall be responsible for the location of subsurface obstructions in the field and shall notify the Engineer immediately if changes in pipe grade are required to avoid them.

All existing gas pipes, water pipes, conduits, sewers, drains, fire hydrants, and other structures which are not, in the opinion of the Engineer, required to be changed in location shall be carefully supported and protected from injury by the Contractor and in case of injury, they shall be restored by him, without additional compensation to a satisfactory condition as determined by the Engineer or affected utility company.

The Contractor shall provide, when necessary, without additional compensation, suitable temporary channels for any water that may flow along or across the site of the work.

If all excavated material cannot be stored on the roadway in such a manner as to maintain access to property alongside of the work, the surplus material shall be removed from the work and stored until needed for backfill at which time it shall be brought back. The cost of removing and returning material shall be at the Contractor's expense.

After the trench has been excavated and prepared in accordance with the requirements of the previous paragraphs, the pipe shall then be carefully lowered into place and adjusted accurately to the required line and grade. Any blocking used to support the pipe during laying shall be removed after sufficient backfill has been placed to hold the pipe on the required line and grade. Each pipe shall have a firm bearing for its full length in the trench, except at the bell holes and field joints..

Whenever necessary to deflect the pipe from a straight line either in vertical or horizontal plane to avoid obstruction, or where long radius curves are permitted, the degree of deflection at joints shall be approved by the Engineer.

Both the gasket seat in the socket and the gasket shall be wiped clean with a cloth. A thin film of lubricant shall be applied to the inside surface of the gasket that will aid in the assembly of the joint. Sufficient force shall be applied to the entering pipe in a manner recommended by the pipe manufacturer and approved by the Engineer in order to complete the assembly of the joint.

All safety regulations of the State of California Division of Industrial Safety shall be complied with in all work.

#### E. LAYING PIPE

After the trench has been excavated and prepared in accordance with the requirements of the previous paragraphs, the pipe shall then be carefully lowered into place and adjusted accurately to

the required line and grade. Any blocking used to support the pipe during laying shall be removed after sufficient backfill has been placed to hold the pipe on the required line and grade. Each pipe shall have a firm bearing for its full length in the trench except at the bell holes and field joints.

Whenever necessary to deflect the pipe from a straight line either in vertical or horizontal plane to avoid obstructions, or where long radius curves are permitted, the degree of deflection of joints shall be approved by the Engineer.

The gasket seat in the socket and the gasket shall be wiped clean with a cloth. The gasket shall be placed in the socket with the large end entering first. It shall then be sprung into the gasket seat so that the groove fits over the head in the seat. A thin film of lubricant shall then be applied to the inside surface of the gasket that will come in contact with the entering pipe.

The plain end of the pipe to be entered shall be wiped clean and placed in proper alignment with the bell of the pipe to which it to be joined. In some cases it may be desirable to apply a thin film of lubricant to the outside of the plain end.

The joint shall then be made by exerting sufficient force on the entering pipe (by methods approved by the Engineer) so that its plain end is moved past the gasket until it makes contact with the base of the socket and has been shoved "home".

#### F. JOINT ASSEMBLIES

Plastic pipe shall have a rubber gasket type coupling. When the joint is assembled the gasket shall be compressed to form a watertight seal without the aid of internal pressures.

Each standard, random and short length of pipe shall have included with it one coupling and rubber rings, and shall be suitable for the particular size and class for which it will be used.

All fittings and valves shall be of the same profile at the bell as the coupling used with the pipe.

#### G. JOINTS AT FITTINGS

All joints into fittings shall be rubber ring, mechanical joint or lead, as required by the pipe specified in the Special Provisions.

#### H. ASSEMBLING OF MECHANICAL JOINT PIPE

The outside of the spigot and inside of the bell of mechanical joint pipe shall be thoroughly cleaned to remove oil, grit, tar (other than standard coating), and other foreign matter from the joint, and then painted with a soap solution made by dissolving one-half cup of granulated soap in 1 gallon of water. The cast iron gland shall then be clipped on the spigot end of the pipe with the lip extension of the gland toward the socket or bell end. The rubber gasket shall be painted with the soap solution and placed on the spigot end with the thick end toward the gland.

The entire section of the pipe shall be pushed forward to seat the spigot end in the bell. The gasket shall then be pressed into place within the bell, being careful to have the gasket evenly located around the entire joint. The cast iron gland shall be moved along the pipe into position for bolting, all of the bolts inserted, and the nuts screwed up tightly with the fingers. All nuts shall be tightened with a suitable torque-limiting wrench. The torque for various sized of bolts shall be as follows:

SIZE (INCHES)	RANGE OF TORQUE (FT.-LB.)
5/8	45-55
3/4	75-85
1	80-90
1-1/4	100-110

Nuts spaced 180 degrees apart shall be tightened alternately in order to produce an equal pressure on all parts of the gland.

If effective sealing is not attained at the maximum torque indicated above, the joint shall be disassembled and reassembled after thorough cleaning. Over-stressing of bolts to compensate for poor installation practice will not be permitted.

#### I. CONNECTING TO EXISTING WATERMAINS

Connection to existing water mains shall be made at the locations shown on the Plans. The Contractor will be required to perform all connecting operations during "off-hours" of water usage to cause the least amount of disruption to local users. In making the connections, a "hot" or "wet" tap may be required if so stipulated on the Plans. Hot taps shall be performed whenever possible to minimize disruption of water services. City Inspector shall be present during time of connection. All pipe ends and fittings shall be swabbed with a 1% sodium hypochlorite solution prior to installation.

If a wet tap is not constructed or required, the Contractor may be allowed to section in a piece of pipe and appropriate fittings as required. This form of tie-in may require transition and/or flexible couplings for connection to the existing main. The Contractor may be required to expose the existing pipe prior to the tie-in to verify the type and size of the existing pipe.

If the sectioning method is used, Contractor shall over-excavate the trench and construct a sump for the water. He shall also have a sump pump of such size as necessary to prevent water from flowing back into the pipe to remain. Once the connection is made, the Contractor shall flush the main from two directions prior to placing the main back in service. If contamination does occur, the Owner or Engineer may require Contractor to sterilize the main to correct the problem. Once the connection is made, the existing line shall be put back in service. The Contractor shall also flush the line through adjacent fire hydrants and services in order to expel all air from the line.

The location of existing mains has been shown based upon record information and combined with topographic survey. Since the actual location of tie-ins is not accurately known, the Contractor shall allow a reasonable amount of time, including up to two hours of labor and equipment, to locate the point of connection. Costs for this work shall be included in the price paid for connections to the existing water mains.

Tie-ins to existing water mains shall be paid for at the Contract unit price bid per each. Payment shall include the Contractor's costs for locating the point of tie-in and constructing the tie-in, including any flexible couplings and short pieces of piping required for the proper installation of the tie-in. Fittings and valves associated with the tie-in shall be paid for at the unit price bid per each.

Flexible Couplings: Flexible couplings shall be sleeve-type with the stop removed in the middle rings, and manufactured by Dresser, Smith-Blair, or approved equal. Flexible couplings shall be installed where required for transition and tie-in to existing water mains, or when required for

obtaining proper alignment for fittings. The type of pipe for the tie-in shall be verified by the Contractor prior to his ordering of the coupling.

For buried service, the couplings shall be cast iron for the standard sizes provided by the manufacturer, or fusion epoxy steel. Bolts shall be Corten steel or equal for underground installation, or as recommended by the supplier and approved by the Engineer. Above ground couplings shall be fitted with joint harness constructed in accordance with AWWA Manual M 11 for 150 psi pressure. Anchorage across the flexible couplings with bent rods will not be permitted.

Water mains must pass pressure and bacteriological tests prior to permanent connection to the mainline. Temporary connections to water mains for pressure and bacteriological tests are permitted subject to the installation of an approved reduced pressure (RP) backflow prevention device with a blow-off assembly. RP device must be tested prior to installation. An RP device may be rented from the Public Works Department subject to availability, for a monthly fee and deposit. After approval of pressure and bacteriological tests, the Contractor shall remove the RP and make permanent connections to the city water mains.

Contract unit price bid per each for connection to existing mains shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in connection to existing mains, complete in place, as shown on the plans, as specified in the Standard Specification and these special provisions, and as directed by the Engineer.

#### J. BACKFILL

All backfilling shall be done as soon and as quickly as possible, and, except by special permission from the Engineer, shall be completed for the entire trench by the end of each working day. No excavation or trench shall be left open more than twenty-four (24) hours before the installation of the pipe and the backfilling of said excavation or trench.

Select native backfill material free from lumps, hardpan, paving or other unsuitable material shall be placed in the trench simultaneously on both sides of the pipe for the full width of the trench to an elevation approximately six (6) inches above the top of the pipe. The initial backfill material shall be moistened sufficiently to produce maximum compaction and thoroughly compacted as required by aid of mechanical or hand tampers in layers not exceeding six (6) inches in thickness under and on each side of the pipe.

Additional remaining backfill shall consist of native material free from brush or any other perishable or objectionable matter that would prevent proper consolidation or that might cause subsequent settlement, and shall be slightly moistened and thoroughly compacted by the use of hydrohammer or other mechanical tamper satisfactory to the Engineer and public agency. All backfill shall be compacted to the relative compaction of 90%, except that the top 30 inches shall be compacted to 95% relative compaction.

Compaction efforts utilizing hydrohammers or mechanical or hand tampers, shall be accomplished in layers not exceeding two feet in thickness. Ponding and jetting methods of compaction will not be permitted in the top thirty inches of trench.

It shall be the sole responsibility of the Contractor to select the method utilized for trench compaction, but such method shall be subject to the review of the Engineer to satisfy his opinion that such method will produce uniform and consistent results. The Engineer assumes no responsibility for the guarantee or adequacy of such method selected by the Contractor. All compaction percentages will be determined by Test Method No. California 216 in right-of-way, and by ASTM D-1557 methods for local streets. The Contractor shall give notice to the Engineer two working days in advance when he desires the compaction tests to be taken, and samples will be taken at points selected by the Engineer and tested by a recognized laboratory at the Owner's expense. In the event that the original compaction tests do not meet the minimum acceptable compaction as set forth in this paragraph, any subsequent tests as recommended by the Engineer

will be paid for by the Contractor and will be deducted from his payment. No trench resurfacing will be permitted until the compaction tests are approved by the Engineer, with the exception of temporary surfacing.

#### K. TESTING OF PIPE

All pipe work including joints, services, connections and fittings shall be subjected to a hydrostatic pressure test of one hundred fifty (150) pounds per square inch for a period of not less than two (2) hours. Whenever the pressure drops below 120 psi, and at the end of the testing period, the line shall be restored to a pressure of 150 psi, and a measurement shall be made of the amount of water required to re-pressurize the line. The maximum allowable leakage shall be ten (10) gallons per 24 hours per mile of pipe per inch of diameter. The Contractor shall provide a suitable metering device or method that will permit measurement of the amount of leakage. Excessive leakage, failures or imperfect construction revealed by the test shall be promptly corrected by the Contractor at his sole expense.

Pressure tests shall not be made until the pipe has been backfilled and the trench compacted. Tests shall not be made until at least thirty-six hours (36) after the last concrete thrust or reaction backing has been cast with high early strength cement or at least seven (7) days after the last concrete thrust or reaction backing has been cast with standard cement.

At least 24 hours prior to the test, the line shall be slowly filled with water and all air expelled. The pipe shall be slowly brought to and held at the test pressure by means of a hand or small power pump.

All labor, equipment, power, and material required for the tests herein specified shall be adequate for the purpose and shall be furnished by the Contractor at his sole expense. All such tests shall be made in the presence of the authorized representative of the Engineer and the Owner. The Contractor shall notify the Engineer and Owner of his intention to make the tests specified in this section two (2) working days in advance of the actual tests.

Any leaks, failures, or imperfect construction revealed by such testing shall be promptly corrected by the Contractor at his sole expense, and retested until leakage is brought within the allowable limits.

#### L. CHLORINATION

Before being placed in service, all new water mains, main extensions and other portions of water transmission and distribution systems shall be cleaned and sterilized, and water passing through shall be proven safe by a bacteriological test acceptable to the Department of Public Health, County of Fresno, California, or other approved testing laboratories. Water samples shall be taken by the Owner and initial tests will be paid for by the Owner.

After sterilization the lines shall be thoroughly flushed through their extremities by means of a blowoff until all foreign or extraneous material has been removed from said mains. Flushing shall be continued until the chlorinated water is reduced to a chlorine residual of less than 0.5 parts per million. The flushed water shall be treated with a dechlorinating agent such as sulfur dioxide prior to disposal into the City's storm drainage system. Should the initial treatment prove ineffective, the chlorination shall be repeated until confirmed tests show acceptable results. Additional testing costs shall be paid for by the Contractor.

The initial dosage of chlorinating agent shall be such as to produce a chlorine residual of between fifty (50) to one hundred (100) parts of chlorine per million parts of water. The dosage of chlorine shall be confirmed by the Contractor using appropriate testing procedures. Treated water shall be retained in the lines for a sufficient time to accomplish the desired sterilization, but not less than twelve (12) hours or more than forty-eight (48) hours.

Clean water shall be retained in sterilized line for a period of not less than forty-eight (48) hours before a bacteriological test may be taken. The water sample shall test free of any bacteriological contamination. In the event that any samples show evidence of contamination, sterilization procedures shall be commenced again within 24 hours.

### 12.03 AUTOMATIC FIRE SPRINKLER SYSTEMS FIRE DEPARTMENT CONNECTION STANDARDS

- a. **Connection Type.** The fire department hose connection (FDC) for supply shall be outfitted with a two-and-one-half (2 ½") inch Siamese inlet with a National Standard Thread. Plug-style caps for fire department hose connections are prohibited. Only approved protective covers shall be used on fire department hose connections.
- b. **Check Valves.** All fire department hose connections shall be outfitted with a swing check valve for each hose connection. All swing check valves shall be installed in such a way as to be accessible for service and maintenance.
- c. **Materials.** Any above grade portion of the supply piping in the fire department connection line shall be approved metallic pipe or tube. Underground portions may be non-metallic, provided the material used is listed for fire protection service and capable of withstanding a hydrostatic pressure test of two hundred (200) psi for a minimum two (2) hours.
- d. **Size.** The size of the fire department connection for supply shall be equal to the size of the sprinkler or standpipe riser recommended, by the submitted engineered sprinkler plans from the issuing contractor.
- e. **Location.** The Fire Chief or his designate shall give final approval of the specific location of the FDC. Unless location and the design of the protected building prohibits, all FDCs shall not be attached to the building. The location of FDCs shall follow these guidelines.

Fire department connection (FDC) should be located no more than 25 feet to the curb cut of the main entrance or required fire access lane of the project site or building it serves.

Shall be located and arranged so that hose lines can be readily and conveniently attached to the inlets without interference from any nearby objects including buildings, fences, posts, or other fire department connections.

The hose connection inlets shall be arranged to face the street, driveway or fire access lane as specified by the Fire Chief or his designate.

Any fire department hose connection shall be arranged so the lowest point on the inlet connection is between eighteen (18) and thirty (30) inches above finished grade at its location.

The fire department hose connection shall be located not more than fifty (50) feet from the nearest fire hydrant.

If FDC has to install on the protected building, it shall not be placed under overhangs exceeding four (4) feet in depth.

FDC shall be on the system side of the Fire Detector Check valves.

- f. **Main Control Valves. (Fire Detector Check Valves)** All new fire sprinkler systems shall be provided with a listed post indicator valve assembly at the property line where the underground main connects to the municipal supply.

EXCEPTION No. 1: Where access to main controlling valves (Fire Detector Check Valves) can be achieved without entering the main portion of the protected premises, such as a sprinkler valve room used exclusively for fire protection systems and their related equipment. Or the OS&Y valves and/or Fire Detector Check Valves are visible from the FDC, so response personnel can ensure system is open.

EXCEPTION No. 2: Where post indicator valves are not feasible, exterior wall indicating valves may be approved by the Fire Chief or his designate.

- g. Vehicle Protection. Where fire department hose connections are subject to vehicular damage, they shall be protected as follows:

Protective posts shall:

- o be a minimum four (4) inch diameter Schedule 40 or better steel posts with the inside of the posts filled with concrete.
  - o be set at least three (3) feet deep in a concrete footing of not less than fifteen (15) inch diameter.
  - o be located at least five (5) feet from the fire department hose connection, and shall not interfere with operation of the connections.
  - o extend aboveground to a height at least equal to the top of the fire department hose connection.
  - o be of sufficient number to protect the fire department hose connection from vehicular damage.
- h. Paint Color. Where yard style fire department hose connections are installed, the entire riser and hose connections above grade shall be painted red in color, (standard safety red). Painting of the fire department hose connections shall not interfere with the operation of the swivel or cap connections.
- i. Signage. Where a FDC services only a portion of a building and/or multiple building's FDC are grouped all FDCs shall be clearly marked as to the portion of the building or building they control. Each FDC shall have a sign with letters or numbers at least 1 inch (25.4mm) in height on a plate or fitting indicating system it services. Signs shall be constructed of all weather material.

SECTION THIRTEEN

SANITARY SEWERS

13 .01 GENERAL

Sanitary sewers shall be designed and constructed in accordance with the standards of the Selma-Kingsburg-Fowler Sanitation District.

## SECTION FOURTEEN

### JACKING PIPE

#### 14.01 GENERAL

The type of pipe as shown on the plans or Special Provisions shall be jacked into place at the location and between the limits shown on the plans.

#### 14.02 MATERIALS

The pipe designated in the contract item will be determined for vertical load only. Any other facilities required or any additional reinforcement or strength of pipe required to withstand jacking pressure shall be determined and furnished by the contractor at his expense.

#### 14.03 CONSTRUCTION

Variations from plan alignments and grades shall not exceed 0.1 feet for each 100 feet of pipe jacked.

Jacking pits shall be adequately shored and braced for the work in accordance with the safety regulations of the State of California, Department of Industrial Relations, Division of Industrial Safety.

It shall be the Contractor's responsibility to provide stress transfer across the pipe joints capable of resisting the jacking forces involved.

#### 14.04 PAYMENT

Jacking pipe shall be paid for by lineal foot and such price shall include all labor, material and equipment required to install the pipe between the limits required by the plans and specifications.

SECTION FIFTEEN  
STORM DRAIN SYSTEM

15.01 HYDROLOGIC DESIGN

Drainage systems shall be designed to carry runoff created by storms of the following frequencies, and in accordance with pertinent provisions of the City of Kingsburg Master Plan for storm drainage.

A. CENTRAL COMMERCIAL AREA: 10 year return frequency.

B. OUTLYING COMMECAL AND INDSRIAL AREAS: 5 year return frequency.

C. RESIDENTIAL AREAS: 5 year return frequency.

The developer's Engineer shall submit calculations for flows in drain systems. Such design flows shall be computed by the rational formula:

$$Q = C I A$$

Where: Q = Cubic feet per second

C = Runoff coefficient

I = Intensity of rainfall, inches per hour

A = Tributary area, acres.

The values of "C" and "I" shall be obtained from the following design table and intensity curves:

TYPE OF DEVELOPMENT	RUNOFF COEFFICIENT "C"
Rural residential and single residential with lot size minimum of 12,000 square feet	0.20
Single family residential with lot size minimum of 7,000 square feet, multi-family residential with 50% coverage by structures	0.30
Multi-family residential, over 50% coverage by structures, professional office sites, transitional use	0.50
Commercial, industrial, and parking areas	0.90
Mobile home parks	0.95

## 15.02 STORM DRAIN PIPE AND APURTENANCES

### A. GENERAL

Storm drain pipe and manholes shall be furnished in accordance with the requirements established in these specifications.

### B. MATERIALS

1. Plastic pipe is permitted for pipes less than 12" in diameters and shall conform to the specifications of AWWA. Designation C900.

Couplings of the same composition as the pipe shall meet the same crushing strength requirements as the pipe. These couplings shall contain rubber gaskets.

2. Reinforced concrete pipe shall be manufactured in accordance with the requirements of A.S.T.M. Designation C 76, and shall be the Class and Type shown on the plans

Rubber gaskets joints shall conform to the requirements of A.S.T.M. Designation C 442 and shall be flexible and able to withstand expansion, contraction and settlement.

### C. EXCAVATION

All excavations shall be made in accordance with the trench construction safety orders issued by the State of California Division of Industrial Safety.

The width of trenches at approximately the level of the top of the pipe to be installed shall be not more than the outside diameter of the barrel of the pipe plus sixteen (16") inches, maximum. The above clearances shall be increased to accommodate shoring and also provide space for banding at points required.

If the Contractor is unable to maintain the trench width allowed, the Engineer shall specify the bedding requirement to compensate for the additional loading of the pipe. Such additional bedding may require crushed rock or other suitable granular bedding material or concrete encasement as necessary to obtain satisfactory pipe support.

The bottom of the trench shall be excavated or backfilled so that the barrel of the pipe shall have uniform bearing along its entire length, except for the area necessary for bell holes. All adjustment of pipe to line and grade shall be made by scraping away or filling and tamping. The use of blocks as support is forbidden. An additional depth and width shall be hand dug at joint or bell location of sufficient depth to relieve the bell of any load and to allow ample space for making the joint.

Where hardpan is encountered, it shall be removed to a depth of 4 inches below the grade of the bottom of the pipe and the space refilled with earth containing sufficient moisture to produce maximum compaction and free from lumps or unsuitable material. The imported earth shall be compacted by means of mechanical tampers to the grade of the pipe. Where a firm foundation is not encountered due to soggy, spongy or other unsuitable material, such unsuitable material under the pipe shall be removed to a depth as directed by the Engineer and replaced with a suitable material. No additional payment will be made for such excavation and/ or backfill.

Where the pipe is to be laid on sand having less than optimum moisture, as determined by the Engineer, the Contractor shall apply sufficient water and compact the sand prior to placing the pipe.

All existing gas pipes, water pipes, conduits, sewers, drains, fire hydrants, and other structures which are not in the opinion of the Engineer required to be changed in location shall be carefully

supported and protected from injury by the Contractor. In case of injury, such structures shall be restored by the Contractor without additional compensation, to as good a condition as that in which they were found.

If all excavated material cannot be stored on the roadway in such a manner as to maintain access to property adjacent to the work, the surplus material shall be removed from the work and stored until needed for backfill, at which time it shall be returned. If the surplus material is to be stored, prior approval must be obtained from the Engineer for the site to be used. The cost of removing material shall be at the Contractor's expense.

#### D. INSTALLATION OF PIPE

Proper facilities shall be provided for stringing and lowering section of pipe into the trench. The pipe shall be laid carefully to lines and grades given.

The grade line shown on the plans indicates the flow line or invert of the pipe. Unless otherwise indicated, refer to this line.

The pipe sections shall be laid commencing at the downstream or outlet end with the spigot or tongue end in direction of flow. Pipe with elliptical reinforcement shall be placed with the minor axis in a vertical position.

Contractor shall provide a laser device for setting grades. Alternative methods must be approved by the Engineer in advance of starting construction.

Each joint of pipe shall be fully pressed into place so that a uniform profile will be maintained throughout the length of the pipe. The interior of the pipe shall be kept free from dirt and other foreign material as the laying progresses.

Any pipe, which shows undue settlement or is damaged shall be taken up and replaced or relined at the Contractor's expense.

All pipe shall be laid to true line and grade. Occasional variations as follows will be permitted above grade 1/4 inch, below grade, not to exceed 1/4 inch; alignment not to exceed 2 inches if gradual and regular over a distance of 20 feet.

The Engineer, at his sole discretion, may require the inspection of a sewer line by means of a television camera prior to acceptance. If such inspection reveals faults such as broken pipe, misalignment, or improper grades, such faulty areas will be promptly removed and replaced and both the cost of the inspection and the repair of the faulty line will be at Contractor's expense. If the inspection reveals no faults in the line, then the cost of the inspection will be paid by the City.

#### E. BACKFILL

After the pipe has been laid to line and grade the trench shall be backfilled to the spring line with select native material placed by hand and compacted around the Pipe. From the spring line to one foot above the top of pipe select native material shall be placed by hand. Compaction around the pipe and to within two feet of the finished grade shall be ninety percent (90%). Select excavated material at optimum moisture and free from all rocks, hardpan, and any other lumps over 2 inches in diameter shall be used as backfill.

The method of obtaining the density requirements shall be such that the backfill material is completely compacted around the lower haunches of the pipe and the pipe's line and grade is not disturbed.

That portion of the backfill within two feet of the finish grade shall have a relative compaction of ninety-five percent (95%).

No free water will be allowed in the top 24 inches of backfill.

#### F. ALTERNATE DENSITY TEST METHOD

At the Engineer's sole discretion, the Contractor may be allowed to use California Test Method NO.231 to determine relative compaction, with the following restriction.

Under the Engineer's supervision, a density test shall be made using both California Test Method Nos. 216 and 231. The results of these tests, which shall be immediately adjacent, shall be compared, and the appropriate correction shall be applied to all further testing utilizing Method No.231.

Example: Adjacent tests yield results of 93% relative compaction by method 231 and 91% by method 216. The results of all further k tests by method 231 shall then be decreased by 2%.

At the discretion of the Engineer, further comparison tests may be required.

#### G. MANHOLES

Manholes shall be constructed in accordance with the Standard Drawings, the plans, and as specified herein or as directed by the Engineer.

Cast-in-place manhole bases shall be constructed by the use of a slip form. Hand forming of bases is forbidden.

Elliptical single-line reinforcement will not be permitted. Single-line circular reinforcement will be permitted and the minimum steel area shall equal the minimum steel area required for the inner-cage reinforcement.

Tapered sections shall conform to the requirements for pipe of the size equal to the largest internal diameter of the tapered sections.

Concrete for the base section shall have a 28-day compressive strength of 3000 psi.

The inside of the manhole shall be formed to the flow line of the storm drain.

Manholes abandoned in place shall be broken out within two feet of the finished grade. The lines entering the manhole shall be sealed with concrete and the manhole backfilled with sandy soil and

compacted to a relative compaction of 95%. The manhole frame and cover shall be delivered to the City Corporation Yard.

Where existing manholes are to be raised or lowered to meet a new street grade, they shall be left in place and marked until the street has been paved. After paving material has been compacted, the manholes shall be dug out and the ring and cover removed and lowered or raised to grade by use of concrete around the frame.

"Jiffy rings" for raising manholes will be allowed.

If existing manholes are to be removed and replaced removal shall be included in the bid price of new manholes unless otherwise specified in the Special Provisions.

The bid price of adjusting manholes to the new street grade shall include surface restoration.

#### H. THIMBLES

Thimbles shall be installed in manholes at the locations and of the size shown on the plans. All thimbles shall be sealed with a plug of a type approved by the manufacturer of the pipe for use with his product.

#### I. MEASUREMENT AND PAYMENT

Payment for laying pipe shall be per lineal foot, in place, and shall include all material, labor and equipment to trench, lay, pipe, backfill and compact the trench. Pipe will be measured from the center of manholes.

Payment for the manholes shall include full compensation for furnishing all labor, material and equipment required to complete the manhole including the cover and ring and thimbles if required by the plans.

### 15.03 STORM DRAINAGE STRUCTURES

#### A. SCOPE

This item consists of the construction of drainage inlets, outlets, and junction boxes complete and in place in conformance with the plans, specifications, the Standard specifications and Section 51 of the Standard specifications of the State of California.

#### B. MATERIALS

Concrete shall have a compressive strength of 3000 psi at 28 days. All metal parts shall be A36 structural grade steel.

Deformed steel bars of size called for in the plans and, specifications shall meet requirements of A.S.T.M. A615.

#### C. CONCRETE FORMS

The forms shall be smooth, mortar tight, true to the required lines and grade, and of sufficient strength to resist springing out of shape during the placing of the concrete. All dirt, chips, sawdust, nails, and other foreign matter shall be completely removed from forms before any concrete is deposited therein. Forms previously used shall be thoroughly cleaned of all dirt, mortar and foreign matter before being reused. Before concrete is placed in forms all inside surfaces of the forms shall be thoroughly coated with form oil.

#### D. PLACING CONCRETE

All concrete shall be used while fresh and before it has taken an initial set. Retempering any partially hardened concrete with additional water shall not be permitted.

All concrete shall be compacted by means of high frequency internal vibrators.

Mixed concrete, after being deposited, shall be consolidated until all voids are filled and free mortar appears on the surface.

## SECTION SIXTEEN

### COMPACTION TESTING REQUIREMENTS

#### 16.01 STREETS AND ALLEYS

1. Subgrade and aggregate base will be tested along the length of the street or alley at 150 foot intervals. Compaction shall be 95% relative compaction (RC) or as shown on the plans, contained in these Standard Specifications and the Special Provisions.
2. Asphalt concrete shall be tested along the length of the street or alley at 250 foot intervals. Compaction shall be 92% RC or as shown on the plans, contained in these Standard Specifications and the Special Provisions.
3. All alley approaches will be tested and shall be 95% RC.

#### 16.02 UTILITY PIPELINES

1. Pipelines shall be tested 2 feet and deeper as determined by the Engineer to within 18-inches of the pipe zone at an interval of 150 feet along the entire length of the pipeline. Compaction shall be 90% RC or as shown on the plans, contained in these Standard Specifications and the Special Provisions.
2. Each manhole will be tested within 2 feet of the barrel, 18-inches above the pipe zone for each lateral connected to the manhole. Compaction shall be 90% RC.
3. Water service laterals shall be tested for compaction at 24" below street grade. Every other lateral shall be tested and shall be a minimum 95% RC.

#### 16.03 OTHER REQUIREMENTS

The City reserves the right to change compaction specifications to accommodate any given field condition.

Contractor shall give 24-hour written notice prior to performance of compaction testing.

Compaction testing shall not be performed prior to 7:00AM or after 3:00 PM.

## SECTION SEVENTEEN

### SUBDIVISION CONSTRUCTION REQUIREMENTS

#### 17.00 GENERAL

This section sets forth requirements for construction activities associated with residential subdivisions.

#### 17.01 PRE-CONSTRUCTION MEETING

The Developer's Contractor and Engineer shall attend a pre-construction conference at City of Kingsburg Public Works with the City Engineer, Public Works Superintendent and SKF representative prior to the start of construction.

#### 17.02 SUPERVISION

The Developer must provide contact information for a single person responsible for all aspects of the construction including, but not limited to, scheduling, quality control, correspondence, etc. The contact information provided shall be as follows: Name, telephone number, fax number and mailing address. This person will be the designated contact person for after hour emergencies.

If the City deems that the Developer has not maintained a single person performing duties in accordance with this section at all times, construction activities will be suspended until such time that Developer has become compliant with all aspects of this section.

#### 17.03 COMMUNICATION

All written communication is to be directed to the City's Representative. This includes requests for design changes, requests for inspection, materials testing reports, etc. Verbal communication may be directed to the City's Representative or City Engineer.

#### 17.04 INSPECTIONS

The City's Representative will perform visits to the site on a daily basis. The Contractor is expected to be available to discuss the progress of the work and forecast work for the following work day. The City Engineer (or his Representative) will, at a minimum, perform weekly visits to the site to confirm general conformance of the work with the approved plans and public works standards.

#### 17.05 MATERIALS TESTING

The Contractor is responsible for providing materials testing and submitting reports to the City's Representative for review. Testing shall include, but not be limited to, the following:

1. Soil compaction
2. Waterline pressure testing
3. Waterline bacteriological testing
4. Storm drainage pipe (televised at City's discretion)
5. Coordinate sewer testing with SKF

#### 17.06 DESIGN CHANGES

Any change to the approved plans necessary to construct the improvements resulting from differing field conditions or other design related issues must be requested in writing to the Public Works

Superintendent a minimum 5 days prior to performing the construction activity. Absolutely no changes to the approved plans will be granted unless it is in writing from the City Engineer.

Any work performed not in accordance with the approved plans or by an approved change granted by the City Engineer will be rejected.

#### 17.07 PERMITS

The Contractor is required to obtain a city encroachment permit for any work within street right-of-way.

The Contractor is required to obtain a county encroachment permit for any work within the County of Fresno or the County of Tulare right-of-way. Contact the applicable county for further information.

The Contractor is required to obtain a permit from any public facility affected by the work, including, but not limited to, Consolidated Irrigation District, State of California Department of Transportation, Department of Fish & Game, etc.

#### 17.08 WATER SYSTEM WORK

Any requests for water system shut-downs to accommodate tie-in work must be made 48 hours in advance. The Contractor shall notify all affected residences and businesses of the system shut-down including the anticipated times of service disruptions.

#### 17.09 HOUSEKEEPING

The Contractor is expected to maintain the work area in a neat order. Any dirt or debris tracked onto City streets shall be removed at the end of each work day. The Contractor must provide for dust control throughout the length of the project. All costs to mitigate housekeeping issues by use of City forces will be borne by the Contractor.

#### 17.10 PROJECT MILESTONES

The course of the construction project shall to be performed in a sequential manner. The general phases of construction should be as follows:

1. Rough Grading
2. Underground Utilities
3. Concrete curbs, gutters and sidewalk
4. Roadway construction (aggregate base and paving)
5. Finish Work (raise MH's to grade, monumentation, striping, etc.)
6. Landscaping

The Contractor shall request an on-site inspection with both the Public Works Superintendent and City Engineer for each phase prior to beginning the next. A notice to proceed will be issued for each phase. Contractor shall not proceed with work until receipt of a notice to proceed.

#### 17.11 ENCROACHMENT PERMITS

All work within a City street shall be performed under a "no-fee" encroachment permit obtained at the Planning and Development Department of the City of Kingsburg. Traffic control plans will be required prior to issuance of any encroachment permit.

Permit applications shall be received five (5) working days prior to the proposed commencement of the work. Any work performed prior to issuance of an encroachment permit is not allowed and will subject to an immediate "stop work" notice.

#### 17.12 AS-BUILTS

The Contractor is responsible for maintaining a red-line mark-up of the plans indicating any changes in the work from that shown on the approved plans. The Contractor shall submit reproducible drawings with the as-built changes indicated prior to acceptance of the project.

The Developer's Engineer certification shall appear on the As-Built drawings.

#### 17.13 OSHA COMPLIANCE

The Contractor is solely responsible for compliance with all CAL-OSHA requirements. If the City observes practices, which in the City's opinion violate OSHA compliance, a stop-notice will be issued on the project until such time that the situation is rectified.

#### 17.14 PROGRESS REPORTS

The Contractor is responsible for submitting weekly progress reports to the City's Representative stating work completed the previous week and a projection of work anticipated the following week. Progress reports must be submitted each Friday by 5:00 PM.

## SECTION EIGHTEEN

### SUBDIVISION DESIGN STANDARDS

#### 18.01 INTRODUCTION

The following general conditions apply to all subdivisions and are applicable unless explicitly denoted in the resolution approving the tentative or final map.

#### 18.02 GENERAL

1. The applicant shall submit plans, prepared and sealed by a registered civil engineer for all improvements within the public right-of-way, subject to the review and approval of the City Engineer.
2. The applicant shall meet with City, SKF and CID personnel, as applicable, in a pre-design meeting prior to the preparation of any improvement plans.
3. A soils report shall be provided for review by the City Engineer.
4. Detailed plans for private utilities shall be prepared and provided for review and approval by the City Engineer. Such plans shall be submitted for electric, gas, telephone, cable television and other private utilities planned for the subdivision. Plans shall be submitted prior to approval of the Final Map and off-site plans.
5. All utilities interior to the subdivision shall be provided underground including PG&E transformers.
6. The applicant shall be responsible for the payment of all fees of record associated with the development process in Kingsburg, including, but not limited to, water, sewer, storm drainage, school impact, recreation and capital facilities.

#### 18.03 TRAFFIC / CIRCULATION

1. The applicant shall provide for street improvements as outlined in the resolution approving the tentative or final map.
2. A street lighting plan shall be submitted for approval by the City Engineer. All streetlights shall become the property of the City upon completion and acceptance, pursuant to PG&E's LS2C rate schedule.

#### 18.04 WATER

1. All water mains within the interior residential streets shall be a minimum of 8-inches in diameter.
2. One water sample station shall be installed for each forty lots contained within the subdivision, but not less than one sample station per subdivision.
3. All water mains shall be designed as a looped water system, including those within cul-de-sac streets.
4. Fire hydrants shall be installed at intervals of 300 feet at locations approved by the Fire Chief.

5. All lots shall be provided with a minimum 1-inch water service equipped with a water meter and meter box to City standards.

#### 18.05 STORM DRAINAGE

1. The applicant shall submit a grading and drainage plan shall be submitted for review and approval by the City Engineer.
2. Storm drainage calculations shall be prepared for retention basin and/or pipeline sizing and shall include hydraulic grade line calculations at each manhole and inlet. Calculations shall be submitted for review and approval by the City Engineer.
3. On-site grading of individual lots shall be designed to direct run-off from the front yard to the street and run-off from the backyard to the alley.
4. An NPDES permit must be obtained from the Regional Water Quality Control Board for construction sites in excess of five acres. The plan shall provide for the mitigation of soil erosion from the project site during the construction and warranty period.
5. As part of the NPDES mitigation for soil erosion, the applicant shall be responsible for street sweeping during the one-year warranty period.

#### 18.06 LANDSCAPING / AESTHETICS

1. Street tree selection and location shall be approved by the City Engineer and shall include an average of two – fifteen gallon street trees per lot throughout the subdivision.
2. A landscape and irrigation plan shall be submitted for review and approval by the City Engineer for improvements within the public right-of-way.
3. The subdivision shall be annexed into the City's Lighting and Landscape Maintenance District.
4. Each lot shall be provided with a minimum four foot by eight foot trash enclosure with concrete slab located off of the alley.
5. Fencing improvements along the alley shall be constructed with a concrete mow strip installed at locations where the posts and rails are exterior to the lot.

#### 18.07 SEWER

1. The applicant is responsible for coordinating with SKF regarding the availability of sewer service for the proposed subdivision.
2. The applicant shall pay all fees for sewer service as required by SKF.
3. All interior residential streets shall be provided with a minimum 8-inch diameter sewer line.
4. The applicant shall submit plans and/or calculations to SKF for review and approval.

## SECTION NINETEEN

### STREET LIGHTING

#### 19.01 DEFINITIONS

Whenever in the Special Provisions and other contract documents the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as provided below:

Electrical Superintendent: Public Works Superintendent or his representative.

Engineer: Construction Management Engineer or his representative. Street lighting

Traffic Engineer: City Traffic Engineer or his representative.

Standard Specifications: State of California Department of Transportation, Standard Specifications, latest edition.

Street Lighting Poles/Standards: State of California, Department of Transportation, Standard Specifications, 1997 Edition. State Type 15 Light Standard equals City E-1 Light Standard (113km rating/70 mph rating)

#### 19.02 GENERAL

Furnishing and installing streetlights and payment therefore shall conform to the provisions in Section 86, "Signals and Lighting," of the State of California, Department of Transportation Standard Specifications and the Standard Plans, most recent version, the City of Kingsburg Public Works Standard Drawings; E-1 through E-14 as applicable; the Special Provisions and the Plans.

Streetlight work is to be performed at the locations shown on the plans.

Existing electrical systems, or approved temporary replacements thereof, shall be kept in effective operation during the progress of the work, except when shutdown is permitted.

Work or equipment not specified or shown on the plans which is necessary for the proper operation of the work in this section shall be provided and installed at no additional cost to the City.

The locations of foundations, poles, services, pull boxes and other appurtenances shown on the plans are approximate. Exact locations and grades will be established as necessary by either the Traffic Engineer and/or engineer in the field.

#### 19.03 MATERIALS

Attention is directed to Section 6, "Control of Materials," of the Standard Specifications and these Special Provisions.

All materials required to complete the work under this contract shall be furnished by the Contractor, except as noted in the following paragraph 4.00, "City-Furnished Materials."

The materials furnished and used shall be new, except such used materials as may be specifically provided for on the plans.

All work and materials shall be in full accordance with the latest rules and regulations of the National Board of Fire Underwriters, and local ordinance or State laws, the State of California

Industrial Accident Commission's Safety Orders, and Regulations of the Pacific Gas and Electric Company pertaining to service equipment and installations thereof. All work shall comply with City of Kingsburg Municipal Code as stated in Section 15.28 "National Electric Code" and National Electrical Manufacturer's Association Standards and all regulations and codes as stated in Section 86-1.02 "Regulations and Codes" of the Standard Specifications. Nothing in these plans and specifications shall be construed to permit work not complying with these codes.

#### 19.04 CITY-FURNISHED MATERIALS

Attention is directed to Section 6-1.02, "State-Furnished Material," of the Standard Specifications and these Special Provisions.

Unless otherwise provided in this section, the Contractor shall submit a written request to the Traffic Engineer for the delivery of City-furnished material at least 15 days in advance of the date of its intended use. The request shall state the quantity and type of each material.

The following items will be City-furnished materials:

NONE

#### 19.05 EQUIPMENT LIST

Equipment list and drawing shall conform to the provisions in Section 86-1.04 and these Special Provisions.

All equipment and materials that the Contractor proposes to install shall conform to these specifications and the contract plans. A list of substitute equipment and/or material, along with a written descriptive summary, describing the functions of the components which the Contractor proposes to install shall be submitted along with his bid proposal. The list shall be complete as to the name of the manufacturer, size and identifying number of each item. The list shall be supplemented by such other data as may be required.

In all cases, the judgment of the Public Works Superintendent shall be final as to whether substitute equipment and/or material recommended by the Contractor conforms to the intent of these specifications and is acceptable for use.

#### 19.06 WARRANTIES, GUARANTEES, AND INSTRUCTION SHEETS

Warranties, guarantees and instruction sheets shall conform to the provisions in Section 86-1.05, "Warranties, Guarantees and Instruction Sheets," of the Standard Specifications and these Special Provisions.

All equipment furnished shall be guaranteed to the City by the manufacturers for a period of not less than one (1) year, unless otherwise indicated, following the date of acceptance of such equipment. If any part (or parts) is (are) found to be defective in materials or workmanship within the one-year period, and it is determined by the Electrical Superintendent, or by an authorized manufacturer's representative that said part (or parts) cannot be repaired on the site, the manufacturer shall provide a replacement part (or parts) of equal kind and/or type during the repair period and shall be responsible for the removal, handling, repair or replacement and reinstallation of the part (or parts) until such time as the street lighting equipment, is functioning as specified and as intended herein; the repair period shall in no event exceed 72 hours, including acquisition of parts.

The one-year guarantee on the repaired or replaced parts shall again commence with the date of reassembly of the system.

All work done by the Contractor shall be guaranteed in writing to the Engineer for the 12 months from the date of acceptance.

#### 19.07 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

The Contractor shall notify the Engineer at least one full working day (not less than 24 hours) prior to the shutdown of any street lighting system. The Contractor may use temporary splices and wiring as approved by the Engineer to maintain existing and temporary street lighting systems.

#### 19.08 SCHEDULING OF WORK

Scheduling of work shall conform to the provisions in Section 86-1.07, "Scheduling of Work" and these special provisions.

The Contractor shall notify the Engineer at least one working day in advance of any electrical work and also at least one working day in advance of any work done intermittently to facilitate inspection.

#### 19.09 FOUNDATIONS

Foundations shall conform to the provision in Section 86-2.03, "Foundations," of the Standard Specifications and these Special Provisions.

Portland cement concrete shall conform to Section 90-10, "Minor Concrete," of the Standard Specifications and shall contain not less than 470 pounds of cement per cubic yard.

Foundation concrete shall be placed in a single pour except that pouring of the top six (6) inches may be postponed when prior approval has been obtained.

No utilities shall be permitted to run through a foundation.

Foundations shall be poured against undisturbed earth where practicable. The exposed portion shall be formed and finished to present a neat appearance. Where obstructions or other conditions prevent construction of planned foundations, the Contractor shall construct an effective foundation satisfactory to the Engineer.

The bottom of concrete foundations shall rest on firm ground. When placing the foundations, the Contractor shall place all conduit ends in their proper position, at the correct heights and shall securely hold them in position during the pouring of concrete. The conduit ends shall be capped before any concrete is poured.

Both forms and earth to be in contact with foundations shall be thoroughly moistened before placing concrete.

Anchor bolts shall be galvanized and shall extend above the finished base as needed to insure a minimum extension above the top nut of 3 threads. The maximum extension above the top nut is 1 inch. The distance below the base plate allowed for the leveling shall not be less than 1.5 times nor less than 2 times the thickness of the leveling nut. Each bolt shall be supplied with 2 nuts and 2 flat washers to facilitate leveling. The anchor bolts and conduits shall be held in place by means of a template until the concrete sets.

Poles shall not be erected until the foundation concrete has set at least seven days and shall be plumbed as directed by the Engineer. The top of concrete foundations shall be finished relative to curb or sidewalk grade as shown on the plans or as directed by the Engineer. When grouting the

base of the pole, the Contractor shall take care not to allow grout to enter or foul the conduit within the foundation. Locations shown on the plans are schematic.

#### 19.10 POLES

Poles shall conform to the provisions in Section 86-2.04, "Standard, Steel Pedestals and Posts," of the Standard Specifications and these Special Provisions.

Embedded Steel poles shall conform to PG&E specifications for pole type 35-7274.

If relocation of utilities is required, immediate notification shall be given to the appropriate utility company by the Contractor.

The Contractor may install all underground electrical components, including foundations at the site of the project; however, no streetlight poles shall be erected until underground conduit and wiring are in place.

All nuts, washers, screws and other post hardware shall be galvanized.

#### 19.11 CONDUIT

Conduit shall conform to the provisions in Section 86-2.05, "Conduit," of the Standard Specifications and these Special Provisions.

Nonmetallic-type conduit may be used on minor/local and major streets as shown on the plans. All street crossings using nonmetallic conduit shall be Schedule 80 conduit.

Rigid Conduit shall conform to Article 346 of the National Electrical Code. All conduit and fittings shall be hot dip galvanized. Each length shall bear the UL label. Installation shall conform to appropriate Articles of the Code. All conduit ends shall be threaded and joined with approved fittings. The use of threadless or set-screw type fittings is not allowed.

All couplings shall be tightened to provide a good electrical and mechanical connection throughout the entire length of the conduit run.

Conduit threads cut in the field and damaged conduit surfaces on metal conduit shall be thoroughly painted with zinc rich paint conforming to Military Specifications DOD-P-21023A.

All conduit ends shall be threaded and capped with standard conduit caps until wiring is started. When the caps are removed the threaded ends shall be provided with approved insulated hot dipped galvanized malleable iron bushings. All bushings in service pedestals and pull boxes shall have lay-in style copper lugs provided for bonding.

The size of conduit used shall be as shown on the plans.

It shall be the privilege of the Contractor, at his own expense, to use larger size conduit if desired, and where large size conduit is used, it shall be for the entire length of the run from outlet to outlet. No reducing couplings will be permitted.

All conduit shall be laid to a depth of not less than twenty-four inches nor greater than thirty-six inches below the curb grade in the sidewalk areas and from the finished surface in street areas. Conduits in sidewalk areas and parallel to the curb shall not be installed more than twenty-four inches back of curb unless approved by the Engineer.

Conduit shall be placed under existing pavement by approved jacking or boring methods. The pavement shall not be disturbed without the written permission of the engineer and then only in the event insurmountable obstructions are encountered. Excessive use of water, such that pavement might be undermined, or subgrade softened, will not be permitted.

Conduit ends terminating in pole foundations shall extend 2" vertically above the top of the foundation. Conduit in direct buried poles shall extend to within 2" of the bottom of the handhole and may not extend above the lowest part of the handhole opening.

Attention is called to Public Works Standard Drawing E-1 with regard to the requirements of conduit within the foundation. No factory 90 degree bends or fittings in the vertical rise are permitted.

Conduit in pull boxes shall not extend more than two inches inside the box wall. All conduit entering the pull box from the bottom shall be approved by the Engineer. No conduit or utility shall pass through a streetlight foundation or pull box except the conduit which terminates within the foundation or pull box.

After the installation of all conductors the ends of conduits terminating in pull boxes and service pedestals shall be sealed with approved duct seal material.

Where shown on the plans, conduit will be extended to the limits of the project for future use. The end of such conduits shall be threaded and capped.

In as much as possible, conduit shall be run in a straight line from one pull box or pole to the next maintaining a consistent setback from the curb. Any variation from this requirement shall be approved by the Engineer or Electrical Superintendent.

#### 19.12 PULL BOXES

Concrete pull boxes shall conform to the provisions in Section 86-2.06, "Pull Boxes," of the Standard Specifications and these Special Provisions.

All pull boxes shall be #3-1/2 unless otherwise noted on the plans.

All pull boxes shall be installed with extensions. The pull box lid adjacent to PG&E's service pole shall be marked 'PG&E'. All others shall be marked 'Street Light'.

Pull box lids shall not be equipped with hold down bolts.

Attention is directed to Section 86-2.06C, "Installation and Use," where pull boxes, on long runs, shall be installed and spaced at not over 200-foot intervals.

All pull boxes shall be wrapped with building paper prior to backfilling.

Should grout within existing pull-boxes be disturbed by the Contractor, it shall be restored.

#### 19.13 CONDUCTORS AND WIRING

Conductors and wiring shall conform to the provisions in Section 86-2.08, "Conductors," and Section 86-2.09, "Wiring," of the Standard Specifications and these Special Provisions.

All wiring and wiring methods shall conform to the provisions of the applicable Codes.

A minimum of three feet of slack in each conductor shall be left at each streetlight standard and in each pull box.

Delete the paragraph under number 5 in Section 86-2.09D "Splicing" which permits splicing of underground conductors.

All circuit conductors shall be stranded copper with THWN insulation and be of the gauge as shown on the plans. All conductors shall have insulation colors appropriate to their use and all applicable codes. The use of colored phase tape is not allowed. Public Works Standard Drawing E-4 details the field connections of the circuit conductors.

Conductors within the pole shall be #10 awg Type THWN stranded copper.

Splices in single conductor wire shall be limited to the load side of the service and to tap type splices located in pull boxes. These splices shall be made using either split bolts or c-tap connectors. The c-tap shall be properly sized for the wires being joined and installed with the proper tooling. The splice shall be insulated as follows: minimum 2 layers of rubber tape, 1 layer-- $\frac{1}{2}$  lapped plastic tape, 1 layer friction tape and then coated with an approved electrical sealing compound (Skotchkoate).

Should splices between existing aluminum and new copper conductors be required, the splice shall be made using a split bolt designed for that purpose. The conductors and split bolt shall have an appropriate joint compound, designed to prevent oxidation, liberally applied prior to installation.

#### 19.14 FUSED SPLICE CONNECTORS

Each streetlight shall be fused with a 5 amp KTK type fuse installed in a TRON HEB type fuse holder. The fuse and holder shall be located in the pole adjacent to the hand hole. Sufficient slack shall be provided to allow easy changing of the fuse as needed. The fuse holder shall be crimped to the wire and the crimp joints insulated as described above for tap type splices.

At service points other than pedestals, a fuse holder and fuse shall be installed in each current carrying conductors. The fuse holder shall be a TRON HEJ type with an SC fuse; 40 amp for #8 awg wire, 60 amp for #4 or #6 awg wire. The holder shall be crimped to the wire using the proper tooling and insulated as described above for tape type splices.

#### 19.15 BONDING AND GROUNDING

Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding," of the Standard Specifications and these Special Provisions.

Ground will be obtained by installation of a ground rod within the service. This ground rod shall be bonded to all metallic conduits within the service by means of a bare #8 solid copper conductor. The metallic conduits within all pull-boxes shall be bonded in a similar manner.

Within pull-boxes adjacent to streetlight standards, one end of the solid #8 bonding conductor shall be extended to and attached to the standard using the grounding point as furnished.

Within all conduits, a #8 stranded copper conductor with green THWN insulation shall be installed. It shall be connected to the ground rod at the service and connected to all pole grounding connections. Tap splices at pull boxes shall be made using either split bolts or c-taps.

#### 19.16 PAINTING

All paint shall be furnished by the Contractor. Minor touch-up painting on all material whose surface has been damaged or not protected from corrosion shall be accomplished as directed by the Engineer. Cold galvanizing zinc-rich paint, MILSPEC DOD-P-21035 A, shall be used on all damaged galvanized surfaces.

#### 19.17 SERVICE

The Service shall conform to the provisions in Section 86-2.11, "Service," of the Standard Specifications and these Special Provisions.

All services for multiple streetlight circuits shall be 120/240 volt, 3 wire single phase. This will also be required for installations that have probable expansion adjacent to the current installation. Single street light installations shall be 120 volt 2 wire.

The service pedestal for Street Light installations shall be as detailed in Public Works Standard Drawing E-13.

If designed to feed from a Combination Traffic Signal and Streetlight service pedestal is/shall be as detailed in Public Works Standard Drawing E-14. The Contractor shall be responsible for any modification necessary to existing pedestals not in conformance with the current standard. The Electrical Superintendent shall be contacted for component information as needed.

The underground service if used shall be as detailed in Public Work Standard Drawings E-3 & E-5. The conductors from the service pull box to the PG&E pull box shall be a minimum #6 awg.

#### 19.18 LUMINAIRE

The luminaire shall conform to the provisions in Section 86-6.01, "High Pressure Sodium Luminaires," of the Standard Specifications and these Special Provisions.

The luminaires shall be of the 'cobra-head' type equipped with a polycarbonate refractor and Photoelectric Control Socket.

The luminaire ballast shall be designed for 120 volt operation at 70 or 150 watts as shown on the plans and have a high power factor. The starting aid shall be of the 3-wire type.

The luminaire shall be set for a Type III Medium Cut-Off light distribution.

After installation and plumbing of the light standard, the luminaire shall be leveled on both the long and transverse axis by use of a spirit level.

The street light numbers will be installed on the poles in accordance to Public Works Standard Drawing E-11. They shall be stenciled or use adhesive backed numbers suitable for outdoor use. The numbers shall be black on a contrasting background.

#### 19.19 PHOTOELECTRIC CONTROL

Photoelectric controls (PEC) shall conform to the provisions in Section 86-6.07 "Photoelectric controls," of the Standard Specifications and these Special Provisions.

The PEC shall be a quick acting, twist lock, Type IV.

If the service pedestal is equipped with a lighting contactor and no master photo control is installed, the contractor shall install one atop the traffic signal mast arm pole adjacent to the service pedestal or atop the nearest streetlight pole. The master photo control shall be wired back to the service pedestal using three #12 AWG stranded copper wires color matched to the PEC. The PEC will be mounted using hardware manufactured for that purpose or fabricated and approved by the Electrical Superintendent.

All streetlights and safety lights fed from a pedestal equipped with a contactor shall be switched, by that contactor and their PEC's replaced with shorting caps.

#### 19.20 TRAFFIC CONTROL

Traffic control shall be provided in accordance with the State of California, "Manual of Traffic Controls for Construction and Maintenance Work Zones," latest edition. Payment shall be included in the lump sum bid for street lighting.

## SECTION TWENTY

### NPDES REGULATIONS AND COMPLIANCE

#### **DEFINITIONS**

##### The Law

The Clean Water Act is a long and complex law that regulates discharges into waters of the U.S. The goal of this legislation was to restore and maintain the chemical, physical, and biological integrity of our nation's waters by prohibiting "the discharge of any pollutant by any person." While this goal is not totally achievable, the concrete result of the law was to require that discharges of pollutants be done under a federal permit administered under the National Pollutant Discharge Elimination System (NPDES).

Initially, the Clean Water Act targeted wastewater discharges that were leaving the pipes of factories and publicly owned treatment works and dumped into waterways. Eventually, stormwater washing off urban areas from municipalities, industrial and commercial facilities, and construction sites was also recognized as a significant source of pollutants.

The ongoing discovery of the types and sources of pollution and the prioritizing and implementing of solutions have guided the growth of new regulations meant to improve the quality of the nation's waters.

##### California Stormwater Regulation and Oversight

Federal law requires that each state identify the beneficial uses of its waters. Beneficial uses can include such things as drinking, tourism, transportation, natural habitat, commercial uses, swimming, and so forth. Most states, including California, are authorized to administer the NPDES program on behalf of the EPA in order to protect the beneficial uses. In California, the authority to regulate stormwater runoff under the NPDES system has been delegated to the State Water Resources Control Board and the nine Regional Water Quality Control Boards.

Each board writes permits in a variety of categories. Different entities "ask permission" to sign on to the permits that apply to their activities and the discharges that result.

Among the different permit categories are the following: (1) permits for heavy industry such as transportation (airports and railroads, for example); permits for cities, counties, schools, prisons, etc. that have separate storm sewer systems from sanitary sewers (hence the term municipal separate storm sewer systems, or MS4s); and (3) construction sites disturbing over one acre of land. Additionally, individual permits are written for facilities with unique operations; one example would be a power company discharging thermally elevated waters used for cooling.

The law requires that it be the owners who seek coverage under the appropriate permit. The owner is then responsible for workers on the property.

**Permits for Municipalities** Permits for municipalities are tailored for that particular urban area while following a standard template meant to insure that all municipal permits address common concerns.

For the time being, smaller and more rural municipalities are allowed to operate without gaining permit coverage.

### Permits for Construction Sites

Statewide, all construction sites having an acre or more of disturbance are required to gain coverage under one General Construction Permit, which is based on the commonalities that construction projects share. The site conditions and information specific to each project are addressed in a document called a Stormwater Pollution Prevention Plan (SWPPP).

### Fines

Significant monetary fines exist for those who do not comply with stormwater rules. Anyone contributing to environmental pollution may end up sharing a part of the fine. Regulators prefer to be "compliance assistants," but when they respond to a citizen's complaint of an illegal discharge, their mindset may be instead that "the learning curve is over." They may decide that fines are necessary "to put an end to this stuff." Instances of fines have been increasing, as has been the inclusion of lower-tier subcontractors in the citation process.

### The Process

Landscape contractors will probably discover that two different permits regulate their activities: a municipal MS4 permit and a construction permit. MS4 permits require that the municipality monitor commercial operations for activities that may be contributing to pollution, such as restaurants washing greasy mats and allowing the wash water to flow to the storm drain, auto parts stores allowing customers to change their oil in the parking lot so that the rain carries spilled oil to the gutter, and landscape contractors storing broken bags of fertilizer without protective cover, thus allowing the eventual migration of nutrients to the creeks, lakes and ocean.

Contractors must monitor their operations yard, vehicles, and jobsites for ways to eliminate or reduce activities and practices that contribute to pollution.

Landscape contractors who work on projects disturbing one acre or more are required to operate under the State General Construction Permit. Site-specific guidance is contained in the project's SWPPP. The SWPPP is required to be onsite for review and adherence.

Information on SWPPPs is outlined below.

While California enforces the federal Clean Water Act, it is free to add regulations that are stricter. Additionally, local ordinances may also exist that are far stricter than federal or state laws. Every landscape contractor should contact the local jurisdictions where they work to find out which local rules may apply. Make sure to check the local municipality's stormwater web page or call the stormwater manager.

### The Methods

In addition to identifying the beneficial uses of the state's waters, California maintains a program of identifying which pollutants are impacting the waters and the human activities that contribute those pollutants. The state determines, for example, that agriculture contributes sediment, pesticides, nutrient runoff, etc., that livestock operations contribute bacteria, that transportation departments contribute heavy metals from brake wear and hydrocarbons from oil drips, and so forth.

It's at this point that solutions are developed for preventing pollution releases into our waters.

Public sector interests such as the EPA and private sector interests such as home building associations have developed products and practices to minimize or eliminate pollutant discharges. These are called Best Management Practices, or BMPs.

### Best Management Practices (BMPs)

Some examples of product BMPs are silt fence, erosion control blankets, hydroseeding, gravel bags at drain inlets, and storage containers for preventing rain from coming in contact with chemicals. These are sometimes referred to as structural BMPs.

Non-structural BMPs are good habits, practices, or strategies. Some examples are doing routine vehicle maintenance under controlled shop conditions rather than on a construction site, educating employees on stormwater issues upon hire and as jobsite issues arise, scheduling soil disturbing activities for the dry season or between storms, and stabilizing the ground as soon as possible to prevent erosion from rain and wind.

BMPs are also divided into categories of temporary and permanent. An example of a temporary BMP would be the temporary straw applications that are used until permanent sod is installed. An example of a permanent BMP would be a grassy swale that receives stormwater from a new parking lot and commercial building roof before it flows into a creek. As stormwater moves through the swale, some pollutants in the runoff may be trapped in the grass. Additionally, some of this runoff will filter into the soil, thus recharging the groundwater table and protecting the creek from increased levels of erosive runoff. Temporary and permanent BMPs are increasingly required on new projects.

Generally, regulators do not require that specific BMPs be used, although operators are obligated to select the BMPs that will be most effective for their operations. Selecting BMP solutions can be challenging, as one site may differ greatly from the next. While regulators emphasize actual results over the use of specific BMPs, through time certain BMPs have gained acceptance in the stormwater industry for delivering results and are now expected to be standard procedure. One example of a BMP that should be standard procedure is not placing a portable toilet on top of a drain inlet; a 50-foot buffer zone should be used in case of leaks or spills during servicing, etc.

To this end, many different agencies and associations across the country have developed manuals of BMPs. Sharing and borrowing generally are common. This has improved industry practices and minimized the need to "re-invent the wheel."

BMP documents typically include the following:

1. a description
2. typical applications
3. limitations
4. specifications
5. inspection, maintenance, and repair requirements

### Landscape-specific BMPs

For landscape contractors, the operations yard and the construction site are the usual areas of concern.

At the operations yard, the following BMPs are typically employed:

1. **Material Usage:** Keeping chemicals, auto fluids, etc. under cover of roof or tarp, elevated if flowing rainwater may come in contact with them, and contained on the perimeter in case spills occur. Having a spill response plan and materials (absorbents) available and staff trained in their use is another part of the BMP.
2. **Waste Management:** Proper disposal of wastes, using dumpsters with lids that are kept closed, preventing rain from leaching pollutants from materials stored in truck beds.
3. **Equipment and Vehicle Maintenance:** Preventing spills, repairing leaking equipment, etc.
4. **Education is a BMP too:** Training your people. On a construction site that disturbs one acre or more, landscape crews must be familiar with the SWPPP and the BMPs for that site. The SWPPP is the master plan and is usually composed of a binder and drawings. The binder will include required forms, site info, inspection reports, responsible persons, all the subcontractors on site, the selected BMPs, etc. The drawings will show locations for each BMP.

If the landscape contractor is the prime contractor on the site, her or she should inform the subcontractors and obtain their signatures verifying that they have read and understand the SWPPP. If the landscape contractor is a subcontractor on the site, he or she should be sure to review the SWPPP permit as well as the existing site conditions before commencing work. In summary, landscape contractors are responsible for their operations; they should be proactive and not assume that others are responsible for taking the lead on pollution prevention and permit compliance.

The following is a list of required, but not limited to, BMPs to be included as part of the project SWPPP:

1. **Stockpile Management:** Covering stockpiles and protecting from storm flow erosion at the base. This includes keeping materials out of the gutter flow zone.
2. **Street Sweeping:** Sweeping at day's end or more often if needed since sediments can migrate off site via vehicle tires.
3. **Material Usage:** Same as for the operations yard.
4. **Erosion Control:** Quality landscaping is erosion control. If the landscape is not finished, stabilize exposed soil with straw, blankets, plastic sheeting, etc.
5. **Wind Erosion Control:** Use water or physical cover (blankets, etc.) to prevent wind erosion. The local air quality district and the neighbor with a clean pool frown on such erosion. Contact the local agency for additional requirements.
6. **Sediment Control:** Preventing erosion is not always possible on an active site with exposed soil, so sediment control measures are used. Gravel bags, fiber rolls, silt fence, sediment ponds and so forth are meant to remove sediment that has mixed with water. A common misconception is that these measures filter out sediment as water passes through them. While some amount of filtering may occur, all good filters clog. So these measures primarily are meant to work by ponding the water. Successful installation means building a water retaining structure. Heavier sediments, such as sand, settle out of the water. The longer water can stand still behind a straw roll, the better the chance that sediments will separate from the water with which they became mixed.
7. **Non-stormwater Discharge:** If it doesn't rain and there is a discharge, it is a non-storm discharge. It is very common on construction sites to have significant amounts of runoff leaving new landscapes that are

being over-watered by irrigation systems that also need adjustment. This runoff can go unnoticed during non-rainy days even though pollutants are picked up en route to the gutter.

8. Non-structural:

a. Scheduling: Avoid working on disturbed soils in the rain if you cannot prevent sediment-laden discharge from leaving the site.

b. Protecting Existing Vegetation: Limit the areas to be disturbed and protect the roots of heritage trees. Use fencing (orange) to protect environmentally sensitive areas.

c. Education: Inform your field and office staff concerning stormwater issues. When the person answering your phone knows key words and concepts, your company image grows. Here are some other important guidelines for preventing pollution:

1. Locate and protect discharge points on the property (drain inlets, gutters flowing off site) and keep operations away from them or keep a buffer zone in case spills occur. Do not store soils, materials, etc. in the gutter where flows will carry off material. Don't use leaf blowers to push debris into drain inlets.

2. Become knowledgeable in the proper selection and installation of products and materials for erosion and sediment control. Misunderstanding and misapplication is incredibly common and reflects poorly on the industry. The resulting pollutant discharges might be worse than having done nothing!

3. Don't damage the BMPs that others have installed. Use them where appropriate. Cement washouts are not a place to throw solid waste, including concrete rubble.

4. Use appropriate irrigation designs to reduce the potential for erosion and pollution runoff.

5. Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of chemicals and training of applicators and pest control advisors:

a) Follow manufacturers' recommendations and label directions.

b) Where practicable, use pesticides only if there is an actual pest control problem (not on a regular preventative schedule). When possible, use less toxic chemicals that will get the job done in the minimum amount necessary.

c) Never apply chemicals during or immediately before predicted rain or wind events, or anytime when wind exceeds five miles per hour.

d) Do not mix or prepare chemicals for application near storm drains.

e) Do not apply any chemicals directly to surface waters unless the application is approved and permitted by the state. Do not spray within 100 feet of open waters.

f) Apply methods to minimize off-target application (e.g. spray drift), including consideration of alternative application techniques.

g) Sweep pavement and sidewalks if chemicals are spilled. Do not hose spills down the gutter.

- h) Store all chemicals in closed, labeled containers and keep them off the ground.
- i) Properly dispose of used chemical containers.

SECTION TWENTY-ONE  
LANDSCAPE DESIGN GUIDELINES

21.01 General Planting Requirements

- A. There shall be a minimum of one (1) shrub per one hundred (100) square feet and one (1) tree per five-hundred (500) square feet exclusive of street trees located within the parkway area.
- B. Turf shall not exceed ten percent (10%) of the total landscape area.
- C. Turf shall not be planted on slopes greater than 4:1, and in areas less than 4' wide.
- D. The tree planting shall consist of a mixture of evergreen, deciduous and flowering trees, with low to moderate water use. Use of high water use trees is subject to approval.
- E. Root barrier shall be installed anywhere that a tree is within 10' of a hard surface.
- F. Trees shall be a minimum seventy five percent (75%) 24" box and twenty five percent (25%) 15-gallon container.
- G. Trees must be set back from all utilities and drive approaches as noted:
  - (a) Utilities - Trees must be a minimum of ten (10') from any light standard, fire hydrant and utility structures.
  - (b) Drive Approaches - Trees must be a minimum of ten feet (10') from any driveway aprons.
- H. Shrubs shall be a minimum of eighty percent (80%) 5-gallon container and twenty percent (20%) 1-gallon containers.
- I. Groundcover may be installed from 1-gallon containers, plugs or flats.
- J. A minimum of two-inch (2") depth of bark mulch shall be placed in the landscape areas.
- K. All utilities, trash enclosures, maintenance staging areas, etc. shall be screened from view.
- L. Parking areas
  - 1. The parking area and parked cars shall be adequately screened from view from the street frontage with landscape.
  - 2. Parking rows shall not exceed forty feet in length without the addition of a "planter finger" or "island". All parking rows shall terminate with a planter or island that is a minimum of five-foot (5') wide.
  - 3. A minimum of one "finger planter", five feet in width shall be provided at every eight stalls adjacent to the building or street frontage.
  - 4. Interior shrub planting shall not exceed 30" in height.
  - 5. Landscape areas shall be designed with walkways to encourage pedestrian circulation through the parking areas.
  - 6. Landscape areas shall be designed to discourage pedestrians from crossing any landscape areas to reach building entrances or parked vehicles.
- M. Approved Plant List- Please refer to "A Guide to Estimating Irrigation Water Needs of Landscape Plantings in California" for a list of very Low, Low and Medium water use trees, shrubs, vines and groundcovers appropriate for our region. The use of High water use plant material is not recommended. This information can be found on the internet at the following website: (<http://www.owue.water.ca.gov/docs/wucols00.pdf>).

## 21.02 Landscape within City Right of Way Requirements

Special attention should be given to the planning and design of areas that are to be maintained by the City and/or are within the public right-of-way. These areas should utilize drought tolerant planting material, planting material that is low maintenance and utilize water conservation techniques without compromising the aesthetics of the design.

- The street tree should be of the same species for each street to promote consistency and area identity.
- Trees and shrubs should be chosen to provide varying texture, color and form.
- The landscaping should be consistent with the architectural theme.
- Shrub plantings should consist of layers of planting of varying heights.

### A. General Streetscape Requirements

1. There shall be a minimum of one (1) shrub per ten (10) square foot and one (1) tree per four-hundred (400) square foot, exclusive of street trees located within the parkway area.
2. With the exception of street trees and median island trees, the minimum tree size is 15-gallon container.
3. Shrubs shall be a minimum of eighty percent (80%) 5-gallon container and twenty percent (20%) 1-gallon containers.
4. Groundcover may be installed from 1-gallon containers, plugs or flats.
5. All shrub areas shall be installed with groundcover unless the landscape is installed with container plantings that will fill in within one year.
6. All shrub areas shall be installed with minimum two-inch (2") depth of bark mulch.
7. Turf may be allowed within the parkway area but not in the median island areas.
8. All planting shall be drought tolerant and low maintenance.
9. Six-inch (6") wide concrete headers shall be installed between turf and shrub areas.
10. Turf shall not be installed on slopes that exceed a 4:1 ratio.

### B. Street Tree Requirements

1. Street trees should be spaced according to the mature canopy size of the tree, but in no circumstance should the spacing exceed thirty feet (30') on center without City approval.
2. Street trees shall be minimum twenty four inch (24") box size with minimum 1 ¼" caliper. Trees shall be between eight (8') to twelve (12)' height with a minimum two foot (2') wide spread.
3. Trees shall be standard trunk, not multi-trunk.
4. All street trees within ten feet (10') of walks, curbs, or other hardscape areas shall be installed with a linear root barrier ten feet (10') in length by twenty-four inch (24") in depth installed against the hardscape area centered on the tree trunk.
5. Trees shall be located per the sight distance requirements established by the City Engineer at intersections. Unless otherwise determined by the City Engineer, street trees shall not be closer than twenty-five (25') to the back of curb return.

6. Street trees shall be located no less than five feet (5') from curbs, sidewalks and other hardscape areas, unless they are located in parkways. Trees within parkways shall be centered in the parkway.
7. Street trees shall be located no less than ten feet (10') from utility poles and light standards, fire hydrants, utility structures and driveway aprons.
8. Trees that may exceed twenty feet (20') vertical height at maturity shall not be located under utility lines.

C. Median Island Planting Requirements

1. There shall be a minimum of one (1) shrub per ten (10) square foot and one (1) tree per four-hundred (400) square foot
2. Median island trees shall be minimum seventy-five percent (75%) 24" box size and twenty-five percent (25%) 15-gallon container sizes.
3. Shrubs shall be a minimum of eighty percent (80%) 5-gallon container and twenty percent (20%) 1-gallon containers.
4. Groundcover may be installed from 1-gallon containers, plugs or flats.
5. All shrub areas shall be installed with groundcover unless the landscape is installed with container plantings that will fill in within one year.
6. All shrub areas shall be installed with minimum 2" depth of bark mulch.
7. Turf is not allowed in the median islands.
8. All planting shall be drought tolerant and low maintenance.
9. All trees shall be installed with a linear root barrier ten feet (10') in length by twenty-four inch (24") in depth installed against the hardscape area centered on the tree trunk.
10. Median island trees shall consist of a variety of tree species of varying form, texture and color. Flowering and canopy trees are encouraged.
11. Trees shall be located per the sight distance requirements established by the City Engineering Department. Trees shall not be installed adjacent to a turn pocket.
12. Shrubs located adjacent to the turn pocket shall not exceed eighteen inches (18") in height. Larger shrubs are permitted at a distance of twenty feet (20') from the beginning of the turn pocket, but shall not exceed thirty inches (30") in height.
13. Turf is not permitted in median islands.
14. An eighteen-inch (18") wide hardscape edge shall be installed along the entire length of the median island adjacent to the curb for maintenance. The hardscape band shall consist of either colored, stamped concrete, or concrete pavers, to match the architectural theme of the project.

21.03 General Irrigation Requirements

- A. All landscape areas shall be provided with an approved irrigation system that meets the requirements of this section. Specific site conditions and proposed landscape materials will determine the design of the irrigation system. The irrigation system shall deliver water efficiently and uniformly. All equipment shall be designed for installation per manufacturer's recommendation, and conform to Uniform Plumbing Codes and all local regulations.

- B. The irrigation design shall provide adequate “head-to-head” and sufficient water for the continued healthy growth of all proposed plantings with a minimum of waste or overspray on adjoining areas.
- C. The distribution of uniformity of an installed sprinkler system shall meet or exceed seventy percent (70%).
- D. Automatic irrigation controllers are required with separate programs for each landscape area with a different irrigation need. Controllers shall be capable of controlling the operating time for each circuit, the starting time and daily schedule of operation. Each controller must be able to accommodate multiple schedules and contain fourteen (14)-day minimum clocks; percentage switches; repeat cycles; the ability to schedule by the day of the week; and rain sensing override devices. A watering schedule shall be placed in each controller.
- E. Soil moisture sensing devices are suggested in representative areas of the landscape plan.
- F. Bubblers are recommended for trees and shrubs. Root watering systems are recommended.
- G. Soil types and percolation rate shall be considered when designing irrigation systems. All irrigation systems shall be designed to avoid runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent areas, walks, roadways, or structures. The water application rate shall attempt to match the infiltration rate of the soil. Repeat cycles shall be utilized in an effort to avoid runoff.
- H. No overhead spray irrigation will be allowed within twenty-four inches (24”) of any hard surface. Area must be irrigated with drip or subsurface irrigation.
- I. Sprinkler heads: Sprinkler heads shall be selected for proper area coverage, precipitation rate, operating pressure, adjustment capability, and ease of maintenance. Heads or emitters shall have matched precipitation rates within ten percent (10%) for each control valve circuit.
- J. Above ground risers are not allowed next to sidewalks, driveways, or curbs and are discouraged anywhere people can easily access; these sprinklers must be the pop-up type. In areas less than six feet wide, drip emitters and bubblers are recommended.
- K. Rain sensing override devices: Rain sensing override devices are required on all irrigation systems.
- L. Back-up System: The irrigation system shall be installed with a back-up system should an operating valve fail to shutoff or a break in the mainline occurs. The backup system should either consist of a normally open master valve with flow meter or a normally closed master valve. On large irrigation systems, a normally open master valve with flow meter will be required.
- M. Piping: Plastic (PVC) mainline piping requires placement not less than 18” below final grade and minimum twenty-four inches (24”) below finish surface of streets, with lateral lines requiring 12” depth. Other piping shall be considered for drip or temporary irrigation. All irrigation piping under streets or flatwork shall be sleeved with schedule 40 PVC minimum two (2) times the diameter of the pipe enclosed.
- N. Water meters: Landscape irrigation systems shall be on a separate water meter.
- O. Backflow prevention shall be installed and maintained per local code.

#### 21.04 General Landscape Maintenance

- A. Landscapes of commercial or industrial projects shall be carefully and competently maintained to ensure water efficiency and high quality appearance.
- B. A watering schedule encased in plastic shall be kept inside each controller (with reduced as-built plans showing hydro-zones).
- C. Using these standards and guidelines, a schedule for ongoing maintenance shall be prepared and shown on the planting plan.
- D. Minimum Plant Establishment period shall be 90 days.
- E. Maintenance shall include, but not be limited to the following:
  - 1. Control all harmful diseases and pests. All chemical applications must be per state licensed advisors and applications.
  - 2. Pruning shall be done to keep plants within special limitations, removal of deadwood, cross-branching, etc., per International Society of Arboriculture (ISA) standards. Plants shall never be sheared unless specified on the approved plan. Trees are to be allowed to grow to the designed size to provide maximum shading of paved areas.
  - 3. Water shall be applied for optimum plant growth with minimal runoff or overspray. Adjust controllers per current California Irrigation Management Information System (CIMIS) data. Information can be obtained at [www.cimis.ca.gov](http://www.cimis.ca.gov) .
  - 4. Always replace heads with the same kind of head, or head with a matching precipitation rate.
  - 5. Backflow device shall be tested and certified annually.
  - 6. Inspect tree supports frequently, and remove as soon as the plants will stand without support and will be able to resist wind damage. Never allow support materials to girdle the trunk or branches.
  - 7. Landscape irrigation shall be scheduled during the night or early morning hours.
  - 8. A regular maintenance schedule shall include checking, adjusting, and repairing the irrigation equipment; aerating and de-thatching turf areas; replenishing mulch; fertilizing; pruning; weeding; and removing litter in all landscaped areas.