

## ***PREAMBLE***

The September 2007 edition of the City of Soledad Department of Public Works Design Standards and Standard Specifications was prepared to provide the public with a consistent set of Public Works Standards with which to design and construct many different types of Public Works improvements. The format for submittals and required design parameters are also included. All submittals for public works review and approval must be consistent with these Standards.

Should laws and regulations be enacted after the adoption of these Standards which require modification of these Standards, current law shall govern as determined by the interpretation of the Director of Public Works and/or the City Engineer. Proposals for amenities which meet or exceed the intent of these Standards will be considered by the City. Approval of deviations to these Standards may include review and approval by the City Council and other advisory bodies.

The current edition of the City of Soledad Design Standards and Standard Specifications was reviewed by the City Council of the City of Soledad during the regular City Council meeting of October 17, 2007. Comments received at that meeting, and comments received prior to the regularly scheduled City Council meeting of October 17, 2007 have been incorporated. These revised Designed Standards and Standard Specifications were adopted by the Soledad City Council on October 17, 2007 by Resolution No. 4104.

# **DESIGN STANDARDS & STANDARD SPECIFICATIONS**

## **PART I**

### **STANDARD SPECIFICATIONS**

#### **TABLE OF CONTENTS**

<b>SECTION</b>	<b>TITLE</b>	<b>PAGE</b>
<b>GENERAL PROVISIONS</b>		
1	DEFINITIONS AND TERMS	1
2	PROPOSAL REQUIREMENTS AND CONDITIONS	3
3	AWARD AND EXECUTION OF CONTRACT	4
4	SCOPE OF WORK	4
5	CONTROL OF WORK	4
6	CONTROL OF MATERIALS	4
7	LEGAL RELATIONS AND RESPONSIBILITY	5
8	PROSECUTION AND PROGRESS	7
9	MEASUREMENT AND PAYMENT	8
<b>MISCELLANEOUS</b>		
10	DUST CONTROL	9
11	MOBILIZATION	10
12	CONSTRUCTION AREA TRAFFIC CONTROL DEVICES	10
13 & 14	(Blank)	
15	EXISTING HIGHWAY FACILITIES	10
<b>GRADING</b>		
16	CLEARING AND GRUBBING	11
17	WATERING	11
18	DUST PALLIATIVE	11
19	EARTHWORK	11
20	LANDSCAPE AND IRRIGATION	18
21	(Blank)	
22	FINISHING ROADWAY	25
23	(Blank)	

<b>SECTION</b>	<b>TITLE</b>	<b>PAGE</b>
----------------	--------------	-------------

**SUBBASES AND BASES**

24	LIME TREATMENT	25
25	AGGREGATE SUBBASES	26
26	AGGREGATE BASES	26
27	CEMENT TREATED BASES	27
28	LEAN CONCRETE BASE	27
29 - 35	(Blank)	

**SURFACINGS AND PAVEMENTS**

36	PENETRATION TREATMENT	27
37	BITUMINOUS SEALS	27
38	(Blank)	
39	ASPHALT CONCRETE	28
40	PORTLAND CEMENT CONCRETE PAVEMENT	28
41	PAVEMENT SUBSEALING	28
42	GROOVE AND GRIND PAVEMENT	28
43 - 48	(Blank)	

**STRUCTURES**

49	PILING	28
50	PRESTRESSING CONCRETE	28
51	CONCRETE STRUCTURES	29
52	REINFORCEMENT	29
53	AIR-BLOWN MORTAR	29
54	WATERPROOFING	29
55	STEEL STRUCTURES	29
56	SIGNS	30
57	TIMBER STRUCTURES	30
58	PRESERVATIVE TREATMENT OF LUMBER, TIMBER AND PILING	30
59	PAINTING	30
60	(Blank)	

<b>SECTION</b>	<b>TITLE</b>	<b>PAGE</b>
----------------	--------------	-------------

***DRAINAGE AND SEWER FACILITIES***

61	CULVERT AND DRAINAGE PIPE JOINTS	30
62	ALTERNATIVE PIPE AND PIPE ARCH CULVERTS	30
63	(Blank)	
64	ASBESTOS CEMENT PIPE	30
65	REINFORCED CONCRETE PIPE	30
66	CORRUGATED METAL PIPE	31
67	STRUCTURAL STEEL PLATE PIPE	31
68	SUBSURFACE DRAINS	31
69	OVERSIDE DRAINS	31
70	MISCELLANEOUS FACILITIES	31
71	SEWERS	31
72	SLOPE PROTECTION	36
73	CONCRETE CURBS AND SIDEWALKS	37
74	PUMPING PLANT EQUIPMENT	41
75	MISCELLANEOUS METAL	41
76 – 79	(Blank)	

***RIGHT OF WAY & TRAFFIC CONTROL FACILITIES***

80	FENCES	41
81	MONUMENTS	41
82	MARKERS AND DELINEATORS	42
83	RAILINGS AND BARRIERS	42
84	TRAFFIC STRIPES AND PAVEMENT MARKINGS	42
85	PAVEMENT MARKERS	43
86	SIGNALS AND LIGHTING	43
87	(Blank)	

***MATERIALS***

88	ENGINEERING FABRICS	43
89	LIGHTWEIGHT PORTLAND CEMENT CONCRETE	43
90	PORTLAND CEMENT CONCRETE	43
91	PAINT	43
92	ASPHALTS	43
93	LIQUID ASPHALTS	44
94	ASPHALTIC EMULSIONS	44
95	EPOXY	44
96	SITE DEVELOPMENT, SECURITY AND CLEAN-UP	44

**PART II**

**STANDARD PLANS**

**PART III**

**STANDARD SPECIFICATIONS FOR THE INSTALLATION  
OF WATER FACILITIES**

<b>SECTION</b>	<b>TITLE</b>	<b>PAGE</b>
<b>GENERAL PROVISIONS</b>		
1	GENERAL PROVISIONS	1
2	MATERIALS OF CONSTRUCTION	4
3	EXCAVATION	4
4	BACKFILLING	8
5	INSTALLATION OF C900 PVC PIPE AND DUCTILE IRON PIPE	9
6	INSTALLATION OF APPURTENANCES	10
7	CONNECTION TO EXISTING MAINS	13
8	HYDROSTATIC TEST	14
9	DISINFECTION OF MAINS	26
10	CLEAN-UP OF SITE	27
11	STANDARD MATERIAL SPECIFICATIONS	27

**PART IV**

**WATER STANDARD PLANS**

**PART V**

**DESIGN STANDARDS**

1	IMPROVEMENT POLICY FOR SUBDIVISIONS & UNIMPROVED STREETS	1
2	GENERAL NOTES	12
3	DESIGN STANDARDS FOR LANDSCAPE IRRIGATION & OBSERVATION GUIDE FOR LANDSCAPE PLANTING	29
4	APPLICANT'S CHECKLISTS	60

# ***PART I***

## ***CITY OF SOLEDAD DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS***

***October 2007***

**CITY OF SOLEDAD**  
**DEPARTMENT OF PUBLIC WORKS**  
**STANDARD SPECIFICATIONS**  
*October 2007*

These Standard Specifications shall be used in conjunction with the State of California, Department of Transportation, Standard Specifications, **Latest Edition**, adopted by the City of Soledad, which shall be referred to as State Standard Specifications. In case of conflict between the State Standard Specifications and the City of Soledad Standard Specifications, the City of Soledad Specifications shall apply.

Sections 2, 9 and portions of all other sections pertaining to payment shall be applicable only to work contracted for by the City of Soledad.

**SECTION 1**  
**DEFINITIONS AND TERMS**

Definitions and terms shall be as defined in Section 1 of the State Standard Specifications except as herein modified.

Department of Transportation, Department, Director of Transportation, State of California, State or Division of Highways, when referred to in the State Standard Specifications shall mean the City of Soledad.

**1-1.10 Contractor** - The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, who have either entered into a contract with the City of Soledad as party or parties of the second part or his/her or their representatives, or those who are authorized or given permission to perform work in, under or about City of Soledad streets, alleys or easements.

**1-1.15 Director of Public Works** - Shall mean the person duly and officially appointed by the City to head the Department of Public Works and act in an official capacity to direct all the operations of said Department.

**1-1.18 Engineer** - Shall mean the Engineer duly and officially appointed by the City to supervise and direct the work of construction, acting personally or through agents or assistants duly authorized by him/her, such agents or assistants acting within the scope of the particular duties entrusted to them.

**1-1.19 Engineer's Estimate** - The list of estimated quantities of work to be performed as contained in the "Notice to Bidders" and/or contract "Proposal" form.

**1-1.25 Laboratory** - Shall mean the designated laboratory authorized by the City of Soledad to test the materials and work involved in a contract.

**1-1.255 Legal Holidays** - Those designated as State holidays in the government Code and by the Soledad City Council.

**1-1.37 Special Provisions** - The Special Provisions are specified clauses setting forth conditions or requirements peculiar to the work and supplementary to these Standard Specifications. The State Department of Transportation's publications entitled "Equipment Rental Rates" and "General Prevailing Wage Rates" are to be interpreted to mean the list of rental rates approved by the Public Works Director and on file in the office of the Public Works Director, and the list of prevailing wage rates as adopted by the City of Soledad and on file in the office of the Public Works Director, and shall be considered as a part of the Special Provisions.

**1-1.49 Right-of-Way** - That area delineated on the plans or defined in the Special Provisions which is available to the Contractor.

**1-1.50 Attorney General** - The person or persons, firm, partnership, or combination thereof duly and officially appointed by the City to act as its legal counsel.

**1-1.51 State Highway Engineer** - Shall be the Engineer as defined above.

**1-1.52 City of Soledad, or City** - Shall mean the City of Soledad, Monterey County, California, acting through the City Council or any board, body, official or officials, which or to whom the power belonging to the Council shall by virtue of any act or acts hereafter passed to be held to appertain.

Where the State Standard Specifications refer to "these specifications" or to sections within the State Standard Specifications, the reference shall be interpreted as referring to the City of Soledad Department of Public Works, Standard Specifications, 2005 or to sections therein.

Where the State Standard Specifications refer to "Notice to Contractors" it shall be understood to be "Notice to Bidders".

## **SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS**

Proposal requirements and conditions shall be as specified in Section 2 of the State Standard Specifications, except as herein modified.

**2-1.01 Contents of Proposal Forms** - Prospective bidders will be furnished with proposal forms which will state the official designation for the job and will show the estimate of the various quantities and kinds of work to be performed, or materials to be furnished, as a schedule of items for which bid prices are asked.

**2-1.03 Examination of Plans, Specifications, Contract, and Site of Work** - Records of investigations as may have been made by the City of Soledad pertaining to test borings, contour maps and subsurface conditions may be inspected at the office of the Director of Public Works, City Hall, Soledad, California.

**2-1.05 Proposal Forms** - All proposal forms shall be obtained from the Public Works Department of the City of Soledad, City Hall, Soledad, California.

**2-1.07 Proposal Guaranty** - The proposal guaranty shall be in the form of a certified check or a bidder's bond executed by an admitted surety insurer made payable to the City of Soledad.

**2-1.08 Withdrawal of Proposals** - Any bid may be withdrawn at any time prior to the time fixed in the public notice for the opening of bids only by a written request for the withdrawal of the bid filed with the City Clerk of the City of Soledad.

**2-1.12 Material Guaranty** - Unless otherwise specified in the Special Provisions, all work shall be required to carry a guaranty against defective materials or defective workmanship for a period of one year from the date of acceptance. The signing of the contract shall be considered as the same as the signing of the guaranty. Upon completion of the contract and upon the expiration of thirty-five (35) days after acceptance of the work, the amounts of the Faithful Performance Bond required in Section 3 may, at the Contractor's option, be reduced to an amount equal to ten percent of the total amount of the contract bid price.

If within one year after the date of acceptance any of the work is found to be defective or not in accordance with the contract documents, the Contractor shall correct it promptly after receipt of a written notice from the City to do so unless the City has previously given the Contractor a written acceptance of such condition.

Should the Contractor neglect to carry out the work in accordance with the contract documents, the City may, after seven days written notice to the Contractor and without prejudice to any other remedy he/she may have, make good such deficiencies, and the Contractor shall pay all costs involved including the cost of any necessary engineering expenses.

**SECTION 3  
AWARD AND EXECUTION OF CONTRACT**

Award and execution of contracts shall be as specified in Section 3 of the State Standard Specifications, except as herein modified.

**3-1.01 Contract Bonds** - In lieu of Section 3-1.01 of the State Standard Specifications the Contractor shall furnish two (2) good and sufficient bonds, each of the said bonds to be executed in a sum equal to at least one-half the contract price. One of the said bonds shall guarantee the faithful performance of the said contract by the Contractor, and the other said bond shall be furnished as required by the Government Code.

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

**SECTION 4  
SCOPE OF WORK**

Scope of work shall be as specified in Section 4 of the State Standard Specifications.

**SECTION 5  
CONTROL OF WORK**

Control of work shall be as specified in Section 5 of the State Standard Specifications, except as herein modified.

**5-1.08 Inspection** - Projects financed in whole or in part with federal funds, state funds, or county funds, or private funds, which will become part of the City's infrastructure, shall be subject to inspection at all times by the agencies involved.

**SECTION 6  
CONTROL OF MATERIALS**

Control of materials shall be as specified in Section 6 of the State Standard Specifications.

**6-3.02 Statistical Testing** - Statistical testing shall not be considered a part of these specifications. In all cases not otherwise modified, where reference is made to statistical testing, the acceptable value for a single test is as specified for the acceptable value for the moving average.

## **SECTION 7 LEGAL RELATIONS AND RESPONSIBILITY**

Legal relations and responsibility shall be as specified in Section 7 of the State Standard Specifications, except as herein modified.

**7-1.01C Contractor's Licensing Laws** - The successful bidder and all the subcontractors listed by the successful bidder shall obtain from the City of Soledad, prior to starting work, a business license for taxing purposes.

**7-1.08 Public Convenience** - All items listed under this section and the payment therefore shall be considered as included in the prices for the various contract items of work and no additional compensation will be allowed therefore. If the Special Provisions call for the erection, within or adjacent to the limits of the contract, of warning and directional signs or information signs furnished by the City, and no bid item is included for such erection and return of said signs to the storage location, then the work shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

**7-1.09 Public Safety** - All items listed under this section and the payment therefore shall be considered as included in the prices for the various contract items of work and no additional compensation will be allowed therefore. If the Special Provisions call for the erection, within or adjacent to the limits of the contract, of warning and directional signs or information signs furnished by the City, and no bid item is included for such erection and return of said signs to the storage location, then the work shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

Whenever immediate action is required to prevent impending injury, death, or property damage, and precautions which are the Contractor's responsibility have not been taken and are not expected to be taken, the City may, after reasonable attempts to notify the Contractor, cause such precautions to be taken and shall charge the cost thereof against the Contractor, or may deduct such cost from any amount due or becoming due from the City. City action or inaction under such circumstances shall not be construed as relieving the Contractor or his/her surety from liability.

**7-1 .092A Street Closures** - The Contractor shall comply with all applicable State, County and City requirements for closure of streets. No street closure shall be allowed without an approved plan showing barricading, signing and necessary detour signing in accordance with the latest edition of the "Manual of Warning Signs, Lights and Devices for Use in Performance of Work Upon Highways" as published by the California Department of Transportation.

At least 48 hours in advance of closing or of reopening any City street, alley or other public thoroughfare, the Contractor shall notify the City Public Works Department.

The Contractor shall also be responsible for compliance with additional public safety requirements which may arise during construction. He/She shall furnish, install, and maintain, and upon completion of the work, promptly remove all signs and warning devices. All costs shall be absorbed in the Contractor's bid.

**7-1.098 Flagging Costs** - The cost of furnishing all flagmen and guards under the provisions in Section 7-1.08, "Public Convenience", and 7-1.09, "Public Safety", will be borne by the Contractor.

**7-1.12 Responsibility for Damage** - Section 7-1.12 of the State Standard Specifications shall apply, except that retention of money due the Contractor under and by virtue of the contract will be made by the City of Soledad pending disposition of suits or claims for damages brought against the City.

The Contractor shall indemnify and save harmless the City of Soledad and all officers and employees thereof connected with the work, including but not limited to the Public Works Director, from all claims, suits or actions of every name, kind and description, brought for, or on account of, injuries to or death of any person or damage to property resulting from the construction of the work or by or in consequence of any negligence guarding the work; use of improper materials in construction of the work; or by or on account of any act or omission by the Contractor or his/her agents during the progress of the work or at any time before its completion and final acceptance.

The duty of the Contractor to indemnify and save harmless, as set forth herein, shall include the duty to deed, as set forth in Section 2778 of the Civil Code, provided, however, that nothing herein shall be construed to require the Contractor to indemnify the City against any responsibility or liability in contravention of Section 2782 of the Civil Code, including any loss from a design defect which is the sole negligence of the City.

The Contractor shall, at his/her own expense, procure and at all times during the prosecution of the work and until final completion thereof, maintain in full force and effect Workmen's Compensation Insurance, public liability insurance, and property damage insurance conforming with Section 7-1.12 of the State Standard Specifications with the following provisions:

- (1) A policy covering the full liability of the Contractor to any and all persons, or their dependents, who are employed by him/her, directly or indirectly, in or upon the work, in accordance with the provisions of the Labor Code of the State of California relating to Workmen's Compensation Insurance.
- (2) A policy of public liability and property damage insurance having limits of not less than the limits specified in the State Standard Specifications.

The policies mentioned in this section shall be issued by an insurance carrier satisfactory to the City and shall be delivered to the City at the time of the delivery of such contract. In lieu of actual delivery of such policies, a certificate issued by the insurance carrier showing such policies to be in force for the period covered by the contract will be accepted. Such policies or certificate shall be on the form included in the contract documents or approved by the City Attorney. Should any policy be cancelled before the final completion of the work herein contemplated and the Contractor should fail to immediately procure other insurance as herein required, then the City may procure such insurance and deduct the cost thereof from the amount due the Contractor. The policies shall include as additional insured the City of Soledad, its officers, agents and employees.

## **SECTION 8 PROSECUTION AND PROGRESS**

Prosecution and progress shall be as specified in Section 8 of the State Standard Specifications, except as herein modified.

**8-1.01 Subcontracting** - Enclosed with his/her bid that the Contractor shall file with the Public Works Director at his office, City Hall, Soledad, California, shall be a written statement showing the work to be subcontracted giving the names of the subcontractors, a contact person, and the description of each portion of the work to be so subcontracted.

**8-1.02 Time of Completion** - Shall be as specified in Section 8-1.06 of the State Standard Specifications, except as herein modified.

Working days will be counted beginning on the day specified on the notice to proceed with the work.

**8-1.08 Termination of Control** - If at any time the City Council shall find that 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 as specified in and by the terms of the contract, notice thereof in writing shall be served upon him/her, and should he/she neglect or refuse to provide means for satisfactory compliance with the contract as directed by the Engineer within the time specified in such notice, the City Council shall have a grounds for termination of the Contractor's control over the work and for taking over the work by the City. Upon receiving notice of such suspension, the Contractor shall discontinue said work or such parts of it as the City Council 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 the work or such designated part thereof, and may use any or all of the Contractor's plant, tools, equipment, materials or other property on the work, none of which shall be removed by the Contractor so long as they may be required for the work, and the Engineer may contract or otherwise provide the superintendents, workmen, materials, appliances and equipment necessary for the completion of and may complete the work, or such designated part thereof. The whole of

the expense so incurred for the completion of the work or part thereof, together with all damages, liquidated or otherwise, sustained or to be sustained by the City, shall be deducted from the fund or appropriation set aside for the purpose of the contract and shall be charged to the Contractor as if paid to him/her. In case the amount of such expenses and damages shall exceed the sum which would have been payable under the contract if completed entirely by the Contractor, the amount of such excess shall be paid to the City by the Contractor and both he/she and his/her sureties shall be liable to the City therefore, and in case the amount of such expense and damages shall be less than the sum which would have been payable under the contract if collected entirely by the Contractor, she/he shall be entitled to the amount of the difference subject to all the terms of the contract.

The Contractor shall continue to prosecute to completion all the work from which he/she has not, as above provided, been ordered to desist and he/she shall cooperate with and in nowise hinder or interfere with the forces employed by the City or contract otherwise to do any designated part of the work as above specified.

Upon completion of all the work included under the contract, the Contractor shall be entitled to the return of all his/her materials which have not been used in the work, of his/her plant, tools, and equipment, provided however that he/she shall have no claim on account of usual and ordinary depreciation, loss, wear and tear.

In the determination of the question whether there has been any such noncompliance with the contract as to warrant the suspension or annulment thereof, the decision of the City Council shall be binding on all parties to the contract.

## **SECTION 9 MEASUREMENT AND PAYMENT**

**9-1.01 Measurement of Quantities** - Shall be as specified in Section 9 of the State Standard Specifications except as herein modified. In lieu of the portion of Section 9-1.01 of the State Standard Specifications which provides that roadway material, except imported borrow and imported topsoil, shall have the weight of the wear deducted from the weight of the material delivered to the work, the complete weight of the material shall be the measurement upon which payment will be based, provided, however, that the moisture content does not exceed the optimum moisture for compaction of the material.

**9-1.03A (1b) Labor Surcharge** - Unless otherwise specified in the Special Provisions the labor surcharge shall be the rate as specified in Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates", which is in effect on the date upon which the work is accomplished.

**9-1.07B Final Payment and Claims** - In lieu of the portions of Section 9-1.07 of the State Standard Specifications, which provide thirty (30) days for the Contractor to submit

written approval to the Engineer of the proposed final estimate or thirty (30) days to file a claim, ten (10) days time shall be permitted in these specifications.

On the Contractor's approval or if he/she files no claim within said period of ten (10) days, the Engineers will issue a final estimate in writing in accordance with the proposed final estimates submitted to the Contractor and within thirty-five (35) days thereafter, the City will pay the entire sum so found to be due.

Such final estimate and payment thereon shall be conclusive and binding against both parties to the contract and all questions relating to the amount or work done and any compensation payable therefore.

If the Contractor within said period of ten (10) days files claims, the Engineer will issue a semifinal estimate in accordance with the proposed final estimates submitted to the Contractor and within thirty-five (35) days thereafter, the City will pay the sum so found to be due. Such semifinal estimate and payment thereon shall be conclusive and binding against both parties to the contract as they relate to the amount of work done and the compensation payable therefore except items affected by the claims filed within the time and the manner required hereunder.

**9-1.08 Adjustment of Overhead Costs** - The State Standard Specifications shall not apply to this Section 9-1.08.

## **SECTION 10 DUST CONTROL**

Dust control shall be as specified in Section 10 of the State Standard Specifications, except as herein modified.

**10-1.03 Cleanup** - Throughout all phases of construction including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and free from rubbish and debris. The Contractor shall also abate dust nuisance by cleaning, sweeping, and sprinkling with water, or other means as necessary. The use of water resulting in mud on public streets will not be permitted as a substitute for sweeping or other methods. Non-potable water shall be used when available and approved by local health officer.

Failure of the Contractor to comply with the Engineer's clean up orders may result in an order to suspend the work until the condition is corrected. No additional compensation will be allowed as a result of such suspension.

**10-1.04 Payment** - In lieu of Section 10-1.04 of the State Standard Specifications, full compensation for all expense involved in conforming to the above requirements for applying either water or dust palliative shall be considered as included in the unit prices paid for the other items of work and no additional compensation will be allowed therefore.

## **SECTION 11 MOBILIZATION**

Mobilization shall be as specified in Section 11 of the State Standard Specifications.

## **SECTION 12 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES**

Construction Area Traffic Control Devices shall be as specified in Section 12 of the State Standard Specifications.

## **SECTION 15 EXISTING HIGHWAY FACILITIES**

Existing highway facilities shall be as specified in Section 15 of the State Standard Specifications, except as herein modified.

**15-2.02A Obliterating Roads and Detours** - Unless otherwise specified in the Special Provisions, obliterating shall consist of removal of all asphalt, concrete or Portland Cement Concrete pavement and rooting, plowing, pulverizing or scarifying to a minimum depth of 0.5 feet or to the bottom of the base material, whichever is less. The loosened material shall be shaped to provide a presentable and well drained area.

**15-2.05 A Frames, Covers, Grates and Manholes** - Structures located in the pavement area may be constructed to final grade prior to completion of the pavement or surfacing.

Manholes that are to be lowered to a degree that the frame will be supported with existing structure on more than 50 percent of its base width at any point, may be lowered without removal of the cone as required in Section 15-2.05A of the State Standard Specifications.

**15-2.06 Measurement** - In lieu of the portion of Section 15-2.06 of the State Standard Specifications referring to the quantities of structure excavation, all excavation and backfill required to remove, dispose of, salvage and reconstruct highway facilities will be considered incidental to performing the work and no separate payment will be made therefore.

**15-2.07 Payment** - When the contract does not include separate items for removing any of the existing highway facilities encountered within the project limits, then payment for removing such facilities shall be included in the contract prices paid for the various contract items of work.

**15-3.02 Removing Concrete - Removal Methods** - In addition to the specifications in Section 15-2.02 of the State Standard Specifications, existing concrete shall be cut to a true line where new concrete is to join existing concrete using a concrete saw cutting to a

minimum depth of 1 1/2 inches or to a depth as shown on the plans or as specified in the Special Provisions.

**15-3.04 Removing Concrete - Payment** - In addition to the provisions of Section 15-3.04 of the State Standard Specifications, items or work for removing concrete will be paid for at the price per square foot or in the case of curbs or gutters per lineal foot or by any other method specified on the plans or in the Special Provisions in the proposal.

## **SECTION 16 CLEARING AND GRUBBING**

Clearing and grubbing shall be as specified in Section 16 of the State Standard Specifications.

## **SECTION 17 WATERING**

Watering shall be as specified in Section 17 of the State Standard Specifications, except as herein modified.

**17-1.04 Payment** - In lieu of Section 17-1.04 of the State Standard Specifications, full compensation for developing the water supply for all water required for the work and for furnishing and applying all water will be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefore.

## **SECTION 18 DUST PALLIATIVE**

Dust palliative shall be as specified in Section 18 of the State Standard Specifications, except as herein modified.

**18-1.05 Payment** - No additional compensation will be allowed for furnishing or applying water used with the dust palliative. Binder for dust palliative shall be paid for as extra work as provided in Section 4-1.03D when the application of dust palliative is ordered by the Engineer.

## **SECTION 19 EARTHWORK**

Earthwork shall be as specified in Section 19 of the State Standard Specifications, except as herein modified.

**19-1.03 Grade Tolerance** - In lieu of the applicable provisions of Section 19-1.03 of the State Standard Specifications, the grading plane shall not vary more than 0.01 feet above or below the grade established by the Engineer.

**19-2.01A Preparation of Subgrade** - Scarifying and cultivating will be required for dry soils which are impervious to the penetration of water, for soils which may contain excessive amounts of moisture which may result in unstable foundations, for soils which are non-uniform in character which may result in non-uniform compactions and may result in differential settlements of finished surfaces, or when pavement is to be placed directly on the roadbed material as determined by the project Geotechnical Engineer or directed by the Director of Public Works.

After rough grading has been completed, when scarifying and cultivating are required, the roadbed shall be loosened to a depth of at least 6 inches. The loosened material shall then be worked to a finely divided condition and all rocks larger than 3 inches in diameter removed. The moisture content shall be brought to optimum by the addition of water, by the addition and blending of dry suitable material or by the drying or existing material. The material shall then be compacted by approved equipment to the specified relative compaction.

**19-2.04 Slides and Slip-outs** - In lieu of the applicable provisions of Section 19-2.04 of the State Standard Specifications, the cost of pioneering work necessary to make slide or slip-out areas accessible to normal excavation equipment will be paid at the contract prices for roadway excavation and will not be paid for as extra work.

**19-2.06 Surplus Material** - Unless otherwise shown on the plans or specified in the Special Provisions, surplus excavated material shall become the property of the Contractor and shall be disposed of off the site of the work in a manner approved by the Engineer.

**19-2.09 Payment** - Overhaul and applying water will be included in the price paid per cubic yard for roadway excavation and no additional compensation will be allowed therefore.

**19-3.01 Description** - The State Standard Specifications shall not apply to culverts and pipes, rods and deadmen (anchors).

**19-3.06 Structure Backfill** - Shall be changed to read as follows:

Backfilling operations shall conform to the following requirements:

Except when used at certain locations hereinafter described, material for use as structure backfill shall have a sand equivalent value of not less than 30. The percentage composition by weight as determined by laboratory sieves shall conform to the following grading:

<b>Sieve Sizes</b>	<b>Percentage Passing</b>
3"	100
No. 4	35 - 100

Structure backfill shall not be placed until the structure footings or other portions of the structure or facility have been inspected by the Project Engineer, Geotechnical Engineer, or by the Director of Public Works and approved for backfilling. No backfill material shall be deposited against the back of concrete abutments, concrete retaining walls, or the outside walls of cast-in-place concrete structures until the concrete has developed a strength of not less than 2,500 pounds per square inch of compressive as determined by test cylinders cured under conditions similar to those prevailing at the site and tested in accordance with Test Method No. Calif. 521.

Backfill material shall be placed in horizontal, uniform layers not exceeding 0.67 feet in thickness, before compaction, and shall be brought up uniformly on all sides of the structure of facility. Each layer of backfill shall be compacted to a relative compaction of not less than 90 percent.

Compaction equipment or methods that produce horizontal or vertical earth pressures which may cause excessive displacement or may damage structures shall not be used.

At the option of the Contractor, backfill material conforming to the requirements hereinafter specified may be used at the following locations:

- (1) Footings outside of slope lines and not beneath any roadbed.
- (2) Footings for slope protection, slope paving and aprons.
- (3) All headwalls, end walls, and culvert wingwalls.
- (4) Retaining walls, except for portions under any roadbed.
- (5) Inlets in median areas or in traffic interchange loops.

The backfill material at the above locations may consist of material from excavation, free from stones or lumps exceeding 3 inches in greatest dimension, vegetable matter, or other unsatisfactory material and shall be compacted to a relative compaction of not less than 90 percent. When the material from excavation is unsuitable for use as backfill it shall be disposed of as directed by the Engineer, and suitable material approved by the Engineer shall be furnished by the Contractor at his/her expense for the backfill.

Compaction of structure backfill by jetting will be permitted when, as determined by the Project Geotechnical Engineer or Engineer, the backfill material is of such character that it will be self-draining when compacted and that foundation material will not soften or be otherwise damaged by the applied water and no damage from hydrostatic pressure will result to the structure. When jetting is permitted, material for use as structure backfill shall be placed and compacted in layers not exceeding 4 feet in thickness. The work shall be performed without damage to the structure and embankment methods shall be supplemented with the use of vibratory or other compaction equipment when necessary to obtain the required compaction. Water used for jetting shall be furnished and applied by the Contractor at his/her expense.

### **19-3.061 Trenching In Improved Areas**

**19-3.061A Description** - Trenching in improved areas shall be considered to be in any previously or proposed paved area, either Portland cement concrete or asphalt concrete on public property or right-of-way, subject to vehicular, or pedestrian traffic.

**19-3.061 "B" Trench Excavation** - Except when this requirement is specifically waived by the Engineer, the trench, at the end of the day, shall not be excavated for more than 100 feet in advance of the pipe laying, or left unfilled for more than 100 feet where the pipe has been laid. At no time shall the trench be open further than 300 feet in advance of the pipe laying or 200 feet to the rear thereof, without specific approval of the Public Works Director. This restriction does not apply to cast-in-place pipe. All open trenches at end of day which is in excess of 5' will be fenced off, barricaded and/or secured with caution tape.

Trenches shall be dug in such a manner so as to assure the bottom of the trench shall be true to line and grade, and be free of rocks, organic material and any other deleterious substance. The trench walls shall be cut in such a manner as to provide the proper clearance, in accordance with Standard Plan 13, and shall be cut, shored, or protected in accordance with the most recent issue of the State of California Construction Safety Orders.

When excavating for pipes, conduits, ducts, or lines of any kind, and solid rock or other unyielding material is encountered, additional material shall be removed below the normal trench bottom to a minimum depth of six inches, or as directed by the Project Geotechnical Engineer or Engineer. The resulting sub trench shall be backfilled with pipe bedding material and shall be compacted, by mechanical means, to a relative compaction of 95 percent in improved areas and 90 percent in unimproved areas and shall be true to the designed line and grade for the normal trench bottom.

When excavating for pipes, conduits, ducts, or lines of any kind and a firm foundation is not encountered due to soft, spongy or other unsuitable material, additional material shall be removed below the normal trench bottom to a minimum depth of one foot, or as directed by the Project Geotechnical Engineer. The resulting sub trench shall be backfilled with 1-1/2 to 2-1/2 inch rock, the size of which is to be selected by the Project Geotechnical Engineer and approved by the Public Works Director and shall be true to the designed line and grade.

Any additional bedding material ordered over the amount required by the plans or specifications will be paid for as provided in the Special Provisions, or in accordance with Section 4-1 .03D. If the necessity for such additional bedding material has been caused by an act or failure to act on the part of the Contractor, or is required for the control of ground water, the Contractor shall bear the expense of the additional excavation and bedding material.

**19-3.061C Trench Backfill** - After the pipe, conduit, duct or line hereinafter called pipe, except for cast-in-place concrete pipe, has been properly laid, bedded, and approved, material meeting the following specifications for initial backfill shall be deposited by hand to the spring line of the pipe, and in such a manner as to prevent disturbing the pipe or

altering its line or grade. Said initial backfill material shall be thoroughly compacted by mechanical means or jetting to obtain a density of 95 percent relative compaction. This backfill material shall be placed in horizontal uniform layers and shall be brought up uniformly on all sides of the pipe.

Initial backfill material shall then be placed in uniform layers on all sides of the pipe to a level at least one foot above the top of the pipe. Said initial backfill material shall be compacted by mechanical means or jetting to a relative compaction of 95 percent.

The trench, from a depth of one foot over the top of the pipe to the bottom of the structural section of the pavement, as shown on Standard Plan 13, shall be backfilled with material conforming to the following specifications for intermediate backfill. Initial backfill material may be used in lieu of intermediate backfill.

Intermediate backfill shall be placed in such a manner as to prevent disturbing the pipe or altering its line or grade and shall be thoroughly compacted to a relative compaction of 95 percent.

When heavy machine tamping of backfill material is employed, uniform layer thickness of backfill material shall be as stipulated by the manufacturer of such equipment to produce the relative compaction specified.

Jetting of intermediate backfill will be allowed unless otherwise specified in the Special Provisions or shown on the plans. Horizontal layers shall not exceed four (4) feet in depth.

Jetting shall be accomplished only by inserting the water pipe, equipped with an approved jetting head, to the lowest portion of the fill to be compacted, and continuously running water until the water rises to the surface. Insertion of jet pipes shall be at four (4) feet maximum intervals.

Trenches too narrow for mechanical compaction shall be completely jetted for compaction.

**19-3.061C(1) Backfill Material** - Backfill material shall be clean and free from decomposed materials, vegetable matter and other deleterious substances. Bedding material, initial backfill, and intermediate backfill shall consist of material which conforms to the following grading requirements:

**BACKFILL GRADING REQUIREMENTS**  
**Percentage Passing**

Sieve Sizes	Bedding Material (other than water pipe)	Initial Backfill (all pipes and bedding material for water pipe)	Intermediate Backfill
3"	-----	-----	100
2-1/2"	-----	-----	90-100
1-1/2"	-----	-----	-----
1"	100	-----	-----
3/4"	65-90	100	-----
1/2"	30-45	90-100	-----
3/8"	5-25	-----	-----
#4	0-10	35-100	35-100
#200	-----	0-10	0-10

Initial and Intermediate backfill material shall have a sand equivalent of not less than 30 as determined by test method Calif. 217.

**19-3.061C(2) Slurry Cement Backfill** - Slurry cement backfill shall be as specified in Section 19-3.062 of the State Standard Specifications and as herein modified.

Slurry cement backfill may be used in lieu of the requirements of Sections 19-3.061C and 19-3061G(1) of these specifications upon approval of the Engineer.

Aggregate shall be commercial quality concrete sand.

**19-3.061 "D" Trench Resurfacing** - Unless permanent pavement is placed immediately, temporary bituminous surfacing two inches thick shall be placed and maintained at locations determined by the Engineer wherever excavation is made through pavement, sidewalk or driveways.

**19-3.062 Trenches in Unimproved Areas (Areas Outside of Pavement Areas)**

**19-3.062A Description** - Trenches in unimproved areas shall be considered any trench in an area not considered an improved area under Section 19-3.061 A, or any area as defined in Section 19-3.063 Subdivisions and Unimproved Streets.

**19-3.062B Trench Excavation** - In all areas for farming purposes or when designed on the plans or in the Special Provisions, the top soil shall be removed to a depth of two (2) feet, for the entire width of the excavated area and stockpiled for subsequent replacement. The removed top soil shall be protected and preserved from mixture with other soils and deleterious substances until it is replaced to its former location. All other conditions shall be as specified in Section 19-3.061 B.

**19-3.062C Trench Backfill** - After the pipe, conduit, duct or line hereinafter called pipe, except for cast-in-place concrete pipe, has been properly laid and approved, material meeting the specification for bedding material, as shown in Section 19-3.061C(1), shall be deposited by hand as shown on Standard Plan No.13. Initial backfill material shall be thoroughly compacted by mechanical means or jetting to obtain a density of 95 percent relative compaction. Initial backfill material shall then be placed in uniform layers on all sides of the pipe to a level at least one (1) foot above the top of the pipe. Said initial backfill material shall be compacted by mechanical means or jetting to a relative compaction of 95 percent.

The trench, from one (1) foot over the top of the pipe to an even plane two (2) feet below final finished grade, may be backfilled with native material from excavation, free from stones or lumps exceeding three (3) inches in greatest diameter, vegetable matter or other unsatisfactory material, and shall be compacted to a relative compaction of 85 percent or to a density equal to that of surrounding soils, whichever is lesser.

Compaction of trench backfill by jetting will be permitted to a point of 24 inches below finished grade except when, as determined by the Project Geotechnical Engineer or Engineer, the backfill material is of such character that it will not be self-draining when compacted. No ponding will be permitted.

Top soil shall be wheel rolled for compaction.

When jetting is permitted, material for use as trench backfill shall be placed and compacted in layers not exceeding four (4) feet in thickness. The work shall be performed without damage to the pipe and embankment and in such manner that water will not be impounded. Jetting methods shall be supplemented by the use of other compaction equipment when necessary to obtain the required compaction. Water used for jetting shall be furnished and applied at the Contractor's expense.

Jetting shall be accomplished only by inserting the water pipe, equipped with an approved jetting head, to the lowest portion of the fill to be compacted, and continuously running water until the water rises to the surface. Insertion of jet pipes shall be at four (4) feet maximum intervals.

When heavy machine tamping of backfill material is employed, layer thickness of backfill material may be modified to depths stipulated by the manufacturer of such equipment to produce the relative compaction specified. Such equipment shall be equipped with impact regulator valves which will permit the rams to strike more gentle blows against the first course of material and as otherwise required.

### **19-3.063 Subdivisions and Unimproved Streets**

**19-3.063A Description** - Trenching in subdivisions and unimproved streets shall be considered any area which when accepted by the City will become part of the public property or right-of-way.

**19-3.063B Trench Excavation** - Shall be as specified in Section 19-3061B of these specifications.

**19-3.063C Trench Backfill** - Shall be as specified in Section 19-3.062C of these specifications except as herein modified.

The trench from one foot (1') over the top of the pipe to the bottom of the structural section may be filled with native material from the excavation, free from stones or lumps exceeding three inches (3") in diameter, vegetable matter or other unsatisfactory material, and shall be compacted to a relative compaction of 95 percent.

**19-3.065 Pervious Backfill Material** - Shall be in accordance with the State Standard Specifications.

**19-3.08 Payment** - Payment for structure excavation and backfill and trench excavation and backfill are considered to be included in the payment for the structure and/or pipe and no additional compensation will be allowed therefore.

A proposal item may be included for removal of unsuitable material and imported select material to be paid for on a cubic yardage basis. Such payment shall include the necessary excavation and select material in place and the City shall have the right to increase or decrease the proposal quantity by more than 25 percent with no adjustment of the contract unit price.

## **SECTION 20 LANDSCAPE AND IRRIGATION**

Landscaping, functional planting and irrigation shall be as specified herein in lieu of the State Standard Specifications, and as specified in Part V, sections 3 and 4 of these Standards.

**20-1 General** - This section shall govern the preparation, planting and irrigation system construction for landscaping areas required by the plans or Special Provisions. Exceptions to the requirements of this section may be made by the City for the use of California Native plants in landscaping. Any exceptions shall be reviewed and approved by the City. Prior to preparation of landscape improvement plans, the plan preparer shall arrange a pre-design conference with the City to discuss design concepts, unacceptable plant species and preferred plant species.

Existing utilities and improvements not designated for removal shall be protected in place. Removals shall be performed in accordance with applicable provisions of Section 8 of the State Standard Specifications.

Unless otherwise provided, walls, curbs, planter boxes, walks, irrigation systems and similar improvements required by the plans or Special Provisions shall be constructed following rough grading and before landscaping.

## **20-2 Landscape and Irrigation Materials**

### **20-2.1 Landscape Materials**

**20-2.11 Topsoil** - Topsoil shall be designated as Class A (imported), Class B (selected) or Class C (unclassified) as specified herein. The Project Landscape Architect shall determine the suitability of topsoil prior to use. Topsoil shall be transported from the source to its final position unless stockpiling is specified.

- (a) Class A Topsoil Class A topsoil shall be from a source outside the limits of the project selected by the Contractor and in compliance with the requirements specified herein. The Engineer may make such inspections and perform such tests as deemed necessary to determine that the material meets the requirements.

At least fifteen (15) days before scheduled use, the proposed source of topsoil must be submitted to the Engineer for approval. The Contractor shall submit a written request for approval which shall be accompanied by a written report of a testing agency registered by the State for agricultural soil evaluation which states that the proposed source complies with these specifications. Class A topsoil shall have the same relative composition and structure, a friable sandy loam character, and be free of roots, clods and stones larger than 1" in greatest dimension, pockets of coarse sand, noxious weeds, sticks, brush and other litter. It shall not be infested with nematodes or other undesirable insects and plant disease organisms. Class A topsoil shall meet the following additional requirements:

- (1) Gradation Limits Sand, 50-80%, clay, 20% maximum, and silt, 30% maximum. The sand, clay and silt gradation limits shall be as defined in ASTM DA22.
- (2) Permeability Rate Not less than 0.05" per hour nor more than 2" per hour when tested in accordance with ASTM D-2434 or other approved methods.
- (3) Agricultural Suitability The topsoil shall be suitable to sustain growth of the plants specified.

- (b) Class B Topsoil Class B topsoil is defined as material which is obtained from sources and in the quantities designated on the plans or in the Special Provisions and which requires transport to the designated landscape areas. Such designated sources of the Class B topsoil may be within or outside the project limits. The cost of stripping the surface of vegetation and debris at the designated locations and processing of the material to a finely divided state, before it is spread, shall be included in the price bid for hauling and placing.
- (c) Class C Topsoil Class C topsoil is defined as soil found in place in the designated landscape area, including soil compacted in place as part of the earthwork specified for the project.

### **20-2.1.2 Soil Fertilizing and Conditioning Materials**

- (a) General Fertilizing materials shall comply with the applicable requirements of the State Agricultural Code. All fertilizing materials shall be packaged, first grade commercial quality products identified as to source, type of material, weight and manufacturer's guaranteed analysis. Fertilizing material shall not contain toxic ingredients or fillers in quantities harmful to human life, animals or plants. The Contractor shall furnish a Certificate of Compliance stating that the material meets the specifications.
- (b) Manure shall be the product of yard fed cattle, free of weed seed, straw or other inert material, and aged at least 3 months. The manure shall have been processed by grinding and screening and shall be of a consistency that will readily spread with a mechanical spreader. Manure may be supplied in bulk if the source is approved in advance by the Engineer.
- (c) Commercial Fertilizer Commercial fertilizer shall be a palletized or granular product having a chemical analysis as specified on the plans or in the Special Provisions. Commercial fertilizer shall be free flowing material delivered in unopened sacks. Material which becomes caked or otherwise damaged shall not be used.
- (d) Organic Soil Amendment Organic soil amendment shall be selected from Type 1, 2 or 3 products as described herein.

Type 1 organic soil amendment shall be a ground or processed wood product derived from redwood, fir or cedar sawdust, or from the bark of fir or pine, treated with a non-toxic agent to absorb water quickly, and shall comply with the following requirements:

<b>Graduation: Sieve Size</b>	<b>Percent Passing</b>
1/4"	95% minimum
#8	80% minimum
#35	30% minimum

**Nitrogen Content (% Dry Weight)**

Redwood	0.4 – 0.6%
Fir	0.56 – 0.84%
Cedar	0.56 – 0.84%
Fir Bark	0.8 – 1.2%
Pine Bark	0.8 – 1.2%

**Salinity**

Maximum saturation extract conductivity: 2.5 milliohms/centimeter at 25°C.

**Wet Ability**

When one teaspoon of tap water is applied to 4 cubic inches of the air-dry product, the material shall become completely damp in a period of not exceeding 2 minutes. Any wetting agent added shall be guaranteed non-phyto-toxic at the rate used.

Type 2 organic soil amendment shall be relatively dry friable organic compost derived from sewage sludge processed for agricultural use. It shall contain at least 1% nitrogen by dry weight and comply substantially with the gradation for Type 1 soil amendment.

Type 3 organic soil amendment shall be relatively dry organic compost consisting of mushroom bed by products containing at least 1% nitrogen by dry weight and substantially comply with the gradation for Type 1 soil amendment.

- (e) Mulch shall be designated by Type in accordance with the requirements herein. Mulch shall be packaged in bales or bags unless the Engineer approves a bulk source in advance of delivery to the site of the work. Depth of mulch shall be a minimum of three inches (3").

Type 1 mulch (ground wood product), shall comply with the requirements for Type 1 organic soil amendment.

Type 2 mulch (sewage sludge product), shall comply with the requirements for Type 2 organic soil amendment.

Type 3 mulch (mushroom compost), shall comply with the requirements for Type 3 organic soil amendment.

Type 4 mulch (peat), shall be brown compressed sphagnum or hypnum.

Type 5 mulch (fir bark chips), shall be fir bark chips in the gradation specified.

Type 6 mulch (straw), shall be either threshed new straw or stable bedding material derived from rice, oats or barley. Straw in an advanced state of decomposition will not be acceptable.

**20-2.1.3 Seed** - Seed shall be fresh, clean, new crop seed, mechanically premixed to specified proportions.

Seed shall be delivered to the site in original unopened containers bearing the dealer's guaranteed analysis and germination percentage, and a certificate or stamp of release by a County Agriculture Commissioner. Any seed tagged "warning, hold for inspection" shall be inspected and released by the Agriculture Commissioner of the county within which the seeds are to be planted.

**20-2.1.4 Not Used**

**20-2.1.5 Headers, Stakes and Ties**

- (a) General - Lumber for landscape work shall be construction heart rough redwood in the size specified. Galvanized steel pipe shall be as specified in Section 20-2.2.1(a). Nails, lag screws and miscellaneous hardware shall be galvanized commercial quality material. Miscellaneous fabricated metal items shall be made from steel conforming to ASTM A-36 and shall include a galvanized coating.
- (b) Headers and Stakes - Headers shall be 2X4 inch except that two 1X4 inch boards shall be supplied for laminations on turns and curves. Header stock shall be supplied in lengths of at least 10 feet. Stakes for headers shall be pointed 2X4 inch, at least 18 inches long. Joint splicing lumber shall be 1X4 inch, 2 feet long.
- (c) Tree Stakes - The type of tree stake shall be as designated in the Special Provisions. The length of the tree support stakes shall be 8 feet.

Guy wire shall be No.12 AWG zinc-coated iron. Plastic ribbon tie material shall be one inch (1") wide with a minimum tensile strength of 500 pounds.

Deadman stakes shall be either 2X4 inch redwood or 3/4 inch diameter steel pipe 3 feet long.

## **20-2.2 Irrigation System Materials**

**20-2.2.1 Pipe and Fittings** – The type of pipe materials and fittings shall be as designated on the plans, in the Special Provisions on Part V, Section 3 of these Standards.

## **20-2.3 Electrical Materials**

**20-2.3.1 General** - The Contractor shall furnish and install all electrical equipment and materials required for a complete electrical system.

All equipment and materials shall comply with the requirements of the governing code and the servicing utility and shall be approved and identified by Underwriters Laboratories, Inc. (U L).

## **20-3 Not Used**

**20-4 Plant Establishment Work** - Plant establishment work shall consist of caring for the highway planting as specified in this Section 20-3 and in the Special Provisions.

The Engineer will notify the Contractor in writing of the start of the following plant establishment periods and will furnish statements regarding days credited to the plant establishment work after said notification:

1. Type 1 plant establishment period shall be the number of working days specified in the Special Provisions and shall begin after all work has been completed, except the application of commercial fertilizer.
2. Type 2 plant establishment period shall be the time between completion of all planting work (except the application of commercial fertilizer) and acceptance of the contract, provided however, that the contract will not be accepted unless the plant establishment work has been satisfactorily performed for at least the number of working days specified for plant establishment in the Special Provisions.

If relief from maintenance and responsibility is granted for a completed portion of the work, as provided in Section 7-1.15, "Relief from Maintenance and Responsibility", Type 2 plant establishment period for said completed portion shall be the time between completion of all planting work (except the application of commercial fertilizer) and the granting of relief from maintenance and responsibility, provided however, that said relief will not be granted unless the plant establishment work in the completed portion of the work has been satisfactorily performed for at least the number of working days specified for plant establishment in the Special Provisions.

The time required for plant establishment work shall be considered as included in the total time limit specified for the contract.

The Contractor will be required to adequately water plants, replace unsuitable plants and/or trees, do weed, rodent and other pest control and other work, as determined necessary by the Engineer, every calendar day before acceptance of the contract.

Working days upon which no work will be required, as determined by the Engineer, will be credited as one (1) of the plant establishment working days, regardless of whether or not the Contractor performs plant establishment work.

Working days when the Contractor fails to adequately perform plant establishment work including, but not limited to, watering plants, replacing unsuitable plants and/or trees, do weed, rodent and other pest control determined to be necessary by the Engineer, will not be credited as plant establishment working days.

Commercial fertilizer shall be applied to trees, shrubs, vines and ground cover areas as specified in the Special Provisions.

Plants shall be kept watered as provided in Section 20-3.4.9(d), "Watering"; basins and basin walls shall be kept well formed, and weeds shall be kept removed from within the basins, including the basin walls, and from within header boards.

Vines next to fences shall be kept tied to the fences as provided in Section 20-3.4.7, "Ground Cover and Vine Planting".

Weeds which appear in asphalt concrete or rock sealed areas shall be killed before they exceed 2 inches in height by spraying with a chemical weed killer which will not stain the surfacing. All spraying shall be done in accordance with the latest state or governmental requirements.

All planted areas shall be kept free of debris and shall be weeded and cultivated at intervals not to exceed 10 days or as specified in the Special Provisions. The first mowing of lawn areas shall be performed when the grass is 2-1/2 inches high and shall be repeated as often as is necessary to maintain the lawn at a height of 2 inches. In no case shall the lawn be cut lower than 1-1/2 inches in height.

Any required pruning of plants will be designated by the Engineer at the start of the plant establishment period and the Contractor shall perform the pruning as part of the plant establishment work.

Where chemical weed control is permitted by the Special Provisions or the Engineer, weeds shall be killed before they exceed 2 inches in height.

Where weeds are to be mowed as specified in the Special Provisions, they shall be mowed as close to the ground as possible before they exceed 6 inches in height.

Where weeds are to be pulled by hand as specified in the Special Provisions they shall be pulled before they exceed 4 inches in height.

Weed control, as specified in this Section 20-4.08, shall be performed as often as required to maintain the project in a neat and uniform condition at all times.

At the time of acceptance of the project all planted areas shall be in a weed free or neatly mowed condition.

Surplus earth, papers, trash and debris which accumulate in the planted areas shall be removed and disposed of in accordance with the provisions in Section 7-1.13, "Disposal of Material outside the Highway Right-of-way", and the planted areas shall be so cared for as to present a neat and clean condition at all times.

During the plant establishment period, trees, shrubs and ground cover plants shall be pruned or headed back by the Contractor at his/her expense, when and as directed by the Engineer.

In order to carry out the plant establishment work, the Contractor shall furnish sufficient men and adequate equipment to perform the work during the plant establishment period.

**20-5 Guarantee** - The entire irrigation control system shall be guaranteed against defects in materials and workmanship for a period of one (1) year from the of acceptance of the work. The Contractor shall furnish a faithful performance bond in the amount specified in the contract documents to cover the guarantee.

**20-6 Measurement and Payment** - Measurement for payment purposes shall be in accordance with Section 9-1. The lump sum or unit prices set forth in the contract documents shall include full compensation for furnishing all labor, materials, tools and equipment, and performing all work necessary to complete and maintain the landscape and irrigation work described or specified in the contract documents.

## **SECTION 22 FINISHING ROADWAY**

Finishing roadway shall be as specified in Section 22 of the State Standard Specifications.

## **SECTION 24 LIME TREATMENT**

Lime treatment shall be as specified in Section 24 of the State Standard Specifications.

## **SECTION 25 AGGREGATE SUBBASES**

Aggregate sub-bases shall be as specified in Section 25 of the State Standard Specifications except as herein modified and shall be Class 2 aggregate sub-base.

**25-1.06 Measurement** - Quantities of aggregate sub-base are computed from the square foot areas on which sub-base material is to be placed as shown on the Contract Drawings for each in place thickness specified. The quantity as set forth in the proposal shall be considered as final unless the Engineer modifies the typical sections or limits of work as shown on the Contract Drawings.

**25-1.07 Payment** - Aggregate sub-base will be paid for as specified in the State Standard Specifications except that the cost of furnishing and applying water will be considered as included in other items and no additional compensation will be allowed therefore, and shall be paid for by the square foot for each in place section thickness designated.

## **SECTION 26 AGGREGATE BASES**

Aggregate bases shall conform to Section 26 of the State Standard Specifications, except as herein modified.

**26-1.01 Description** - Aggregate base is designated herein as Class 2.

**26-1.02 Materials** - Class 2 aggregate base shall be as specified in Section 26-1 .02B of the State Standard Specifications

The aggregate shall consist of any one or a mixture of the following materials:

1. Broken stone or crushed gravel.
2. Natural material having essentially the same qualities of angularity or surface irregularity and roughness as broken stone.
3. Natural rough surface gravel.

**26-1.04 Spreading** - The provisions of the State Standard Specifications shall be modified as follows:

Water shall be introduced into the aggregate base prior to spreading in sufficient quantity to prevent segregation and non uniform thickness of spread.

The use of bottom dump trucks is not precluded if the desired final results can be satisfactorily obtained. New and approved spreading equipment which will produce

the desired results may be used. If methods can be developed whereby material can be successfully spread working from wind rows, this is satisfactory.

Aggregate base shall be spread as specified in the State Standard Specifications, except that it may be spread with the use of a motor grader or other equipment that will provide the uniform layer conforming to the planned section both transversely and longitudinally within the thickness tolerance specified hereafter without causing segregation of the material. Segregation of the material shall be cause for removal of the material and replacement at the Contractor's expense.

**26-1.07 Payment** - Payment for furnishing and applying water after weighing shall be considered to be included in the price paid for other items and no additional compensation will be allowed therefore.

### **SECTION 27 CEMENT TREATED BASES**

Cement Treated Bases shall be as specified in Section 27 of the State Standard Specifications.

### **SECTION 28 LEAN CONCRETE BASE**

Lean Concrete Base shall be as specified in Section 28 of the State Standard Specifications.

### **SECTION 36 PENETRATION TREATMENT**

Penetration treatment shall be as specified in Section 36 of the State Standard Specifications, except as herein modified.

**36-1.07 Payment** - Cost for sand cover used to cover excess asphalt for public convenience or because of failure to penetrate the surface will be considered as included in other items of work and no additional compensation will be allowed therefore.

### **SECTION 37 BITUMINOUS SEALS**

Bituminous seal shall be specified in Section 37 of the State Standard Specifications, except as herein modified.

**36-1.08 Payment** - The cost of traffic control and flagmen and the cost of salvaging the stockpiling excess screenings will be considered as included in the price paid for other items and no additional compensation will be allowed therefore.

### **SECTION 39 ASPHALT CONCRETE**

Asphalt concrete shall be as specified in Section 39 of the State Standard Specifications except as herein modified.

**39-6.01 Compacting** - Compacting shall be in accordance with the State Standard Specifications except that payment for any and all water used shall be considered as part of the other items of work and no additional compensation will be made.

### **SECTION 40 PORTLAND CEMENT CONCRETE PAVEMENT**

Portland cement concrete pavement shall be as specified in Section 40 of the State Standard Specifications.

### **SECTION 41 PAVEMENT SUBSEALING**

Pavement sub-sealing shall be as specified in Section 41 of the State Standard Specifications.

### **SECTION 42 GROOVE AND GRIND PAVEMENT**

Groove and grind pavement shall be as specified in Section 42 of the State Standard Specifications.

### **SECTION 49 PILING**

Piling shall be as specified in Section 49 of the State Standard Specifications.

### **SECTION 50 PRESTRESSING CONCRETE**

Pre-stressed concrete members shall be as specified in Section 50 of the State Standard Specifications.

## **SECTION 51 CONCRETE STRUCTURES**

Concrete structures shall be as specified in Section 51 of the State Standard Specifications, except as herein modified:

**Minor Structures** - In lieu of the provisions of Section 51-1.02, 51-1.05, 51-1.22, and 51-1.23 of the State Standard Specifications, such pipe headwalls, drop inlets, catch basins and such other miscellaneous concrete structures that are identified on the plans or in the Special Provisions as minor structures and are listed in the proposal as separate items will be paid for at the contract price for each structure so listed, which price shall include full compensation for all excavation, backfill, reinforcing steel, stops, metal frames, covers, grates, unused pipe stubs, and pipe connections into the structures as provided for in the Special Provisions or as shown on the plans. Minor structures, at the option of the Contractor, may be furnished and installed as pre-cast units provided the structures in place are equal in all respects to cast-in-place construction as specified herein.

**51-1.12C Pre-Molded Expansion Joint Fillers** - Unless otherwise provided in the Special Provisions, pre-molded joint fillers shall have a minimum content of thirty-five percent and a maximum of fifty percent air-blown asphalt by weight. The thickness shall be 3/8 inch. The basic material shall be cane fiber.

## **SECTION 52 REINFORCEMENT**

Reinforcement shall be as specified in Section 52 of the State Standard Specifications.

## **SECTION 53 AIR-BLOWN MORTAR**

Air-blown mortar shall be as specified in Section 53 of the State Standard Specifications.

## **SECTION 54 WATERPROOFING**

Waterproofing shall be as specified in Section 54 of the State Standard Specifications.

## **SECTION 55 STEEL STRUCTURES**

Steel structures shall be as specified in Section 55 of the State Standard Specifications.

**SECTION 56  
SIGNS**

Signs shall be as specified in Section 56 of the State Standard Specifications.

**SECTION 57  
TIMBER STRUCTURES**

Timber structures shall be as specified in Section 57 of the State Standard Specifications.

**SECTION 58  
PRESERVATIVE TREATMENT OF LUMBER, TIMBER AND PILING**

Preservative treatment of lumber, timber, and piling shall be as specified in Section 58 of the State Standard Specifications.

**SECTION 59  
PAINTING**

Painting shall be as specified in Section 59 of the State Standard Specifications.

**SECTION 61  
CULVERT AND DRAINAGE PIPE JOINTS**

Culvert and drainage pipe joints shall be as specified in Section 61 of the State Standard Specifications.

**SECTION 62  
ALTERNATIVE PIPE AND PIPE ARCH CULVERTS**

Alternative pipe and pipe arch culverts shall be as specified in Section 62 of the State Standard Specifications.

**SECTION 64  
ASBESTOS CEMENT PIPE**

Asbestos cement pipe is prohibited.

**SECTION 65  
REINFORCED CONCRETE PIPE**

Reinforced concrete pipe shall be as specified in Section 65 of the State Standard Specifications, except as herein modified.

**65-1.10 Payment** - In lieu of the portions of this section pertaining to structure excavation and structure backfill, those items will be considered as included in the price paid for other items, as well as pavement cutting and replacement, and no additional compensation will be allowed therefore.

**SECTION 66  
CORRUGATED METAL PIPE**

Corrugated metal pipe shall be as specified in Section 66 of the State Standard Specifications.

**SECTION 67  
STRUCTURAL STEEL PLATE PIPE**

Structural metal plate pipe shall be as specified in Section 67 of the State Standard Specifications.

**SECTION 68  
SUBSURFACE DRAINS**

Subsurface drains shall be as specified in Section 68 of the State Standard Specifications.

**SECTION 69  
OVERSIDE DRAINS**

Over-side drains shall be as specified in Section 69 of the State Standard Specifications.

**SECTION 70  
MISCELLANEOUS FACILITIES**

Miscellaneous facilities shall be as specified in Section 70 of the State Standard Specifications.

**SECTION 71  
SEWERS**

Sewers shall be as specified in Section 71 of the State Standard Specifications except as herein modified.

**71-1.01 Description** - This work shall consist of constructing sewers, manholes and appurtenances as shown on the plans and in accordance with these specifications, the Special Provisions, and as directed by the Engineer, including all necessary street cutting

excavation, laying of pipe, backfilling and repaving, to provide a complete sewer of the size and type and to the line and grade shown on the plans.

The type of sewer pipe and manhole will be designated in the contract item.

**71-1.02A Reinforced Concrete Sewer Pipe** - Reinforced Concrete Sewer Pipe shall conform to the specifications of the American Society for Testing Materials for Reinforced Concrete low-head internal pressure sewer pipe (ASTM C362 - 57T), hereinafter referred to as ASTM C362-57T. It shall be manufactured by the spin-cast method. The pipe shall have a continuous plastic lining and gasketed joints, as approved by the Engineer.

**71-1.02B Non-Reinforced Concrete Sewer Pipe** - Non-reinforced concrete pipe is prohibited.

**71-1.02C Clay Sewer Pipe** - Clay sewer pipe is prohibited. Exception: in order to make repairs on existing clay pipe.

**71-1.02D Asbestos Cement Sewer Pipe** - Asbestos Cement Sewer Pipe is prohibited.

**71-1.02E Bituminous Lined Corrugated Metal Pipe** - Bituminous Lined Corrugated Metal Pipe is prohibited.

**71-1.02F Cast Iron Pipe and Fittings** - Cast Iron Pipe and Fittings are prohibited.

**71-1.02G Miscellaneous Iron and Steel** - Miscellaneous iron and steel shall conform to the provisions of Section 75.

All steel items shall be galvanized. All cast iron items shall be painted or dipped in commercial quality, asphalt paint furnished by the Contractor. Galvanizing shall be performed after fabrication.

Frames and covers shall be match-marked in pairs before delivery to the work site and the covers shall fit into their frames without rocking. The faces and seats of manhole covers shall be machined.

**71-1.02H Polyvinyl Chloride Pipe & Fittings** - Polyvinyl Chloride sewer pipe shall conform to the following requirements:

1. Sanitary Sewer Mains, Laterals, and Fittings: ASTM D3034 for diameters from 4" to 12". For pipes greater than 12" in diameter, pipe shall conform to Section 71-1 .02A. Alternate pipe materials for pipes larger than 12" shall be approved by the Public Works Director. Rubber gaskets shall conform to ASTM F4777 and be factory installed.

Pipe shall have a Standard Dimension Ratio (SDR) of 35 minimum and minimum pipe stiffness of 46 psi.

**71-1.04 Existing Manholes** - Shall be adjusted to grade, remodeled or abandoned as shown on the plans, in accordance with the provisions of Section 15.

**71-1.05 Pipe Laying** - Pipe shall be protected during handling against impact shocks and free fall.

When the new facilities interfere with the existing flow of sewage, the Contractor shall provide satisfactory bypass facilities at his/her expense.

The pipe shall be laid without break upgrade from structure to structure, with bell end upgrade for bell and spigot pipe, unless otherwise permitted by Engineer.

Suitable excavation shall be made to receive the bell of the pipe and the joint shall not bear upon the bedding material. All adjustments to line and grade shall be made by scraping away or filling in with rock under the barrel of the pipe, and not by wedging or blocking.

Unless otherwise indicated on the drawings or permitted by the Engineer, excavation for sewers shall be by open cut.

All joints shall be cleaned and lubricated immediately prior to installation. All joints shall be mechanical joints, using pre-molded gaskets, attached to the pipes at the factory, except where other type joints are specifically approved by the Engineer or required in the Special Provisions. All joints shall be watertight against leakage and infiltration under all conditions of expansion, contraction and settlement.

Whenever the work ceases for any reason, the end of the pipe shall be securely closed with a tight fitting plug or cover.

Whenever existing pipes are to be cut and abandoned, the open ends of said pipes shall be securely closed by a tight fitting plug or wall of Class A concrete not less than 0.5 foot thick, or by a tight brick wall 0.67 foot thick with cement mortar joints.

When connections are to be made to any existing pipe, conduit, or other appurtenances, the actual elevation or position of which cannot be determined without excavation, the Contractor shall excavate for, and expose, the existing improvement before laying any pipe or conduit. The Engineer shall be given the opportunity to inspect the existing pipe before connection is made.

Where ground water occurs, the bottom of the trench shall be kept entirely free of water during the pipe laying, filling of the joints, and as long thereafter as directed by the Engineer. The Contractor shall furnish, install and operate all necessary machinery, appliances and equipment to keep excavations reasonably free from water during

construction, and shall dispose of the water so as not to cause injury to public or private property, or to cause a nuisance or menace to the public. He shall at all times have on hand sufficient pumping equipment and machinery, in good working condition, for all ordinary emergencies, and shall have available at all times competent mechanics for the operations of all pumping equipment. During placement of concrete, and until concrete has set, the excavation shall be kept free of water.

**71-1.06 Pipe Reinforcement and Cradles** - Shall be as specified in Section 71-1.06 of the State Standard Specifications.

**71-1.07 Sewer Structures** - New manholes shall conform with Section 71-1.07 of the State Standard Specifications, except that steps shall not be installed in manholes, and pipe may be laid through the manhole and be used as the channel.

**71-1.07A Flushing Inlets** - Flushing inlets shall be constructed of the same material as the rest of the sewer, in the manner shown on the Standard Plans and on the plans. The frame shall be securely set in concrete supports with top flush with the established finished grade. Flushing inlets shall only be used to replace existing flushing inlets. Manholes shall be used in all new construction.

**71-1.08 Testing of Sewers** - Unless specifically waived by the Engineer, before the tests are performed, the pipe installation shall be cleaned in the following manner:

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

**AIR TEST:** The Contractor shall furnish all materials, equipment and labor for making an air pressure test. Air test equipment shall be approved by the Engineer unless otherwise provided on the plans or in the Special Provisions.

At his/her option the Contractor may conduct an initial air test of the sewer lines prior to backfilling the trenches and such tests will be considered to be for the Contractor's convenience only and shall not be construed to be an acceptance test. The initial tests need not be performed in the presence of the Engineer. The acceptance test shall be conducted under the supervision of the Engineer at the time designated by him/her in the following manner:

Immediately following the pipe cleaning described, the pipe installation shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease from 3.5 to 2.5 pounds per square inch as determined by the table shown on Standard Plan #29.

If the time lapse is less than that shown in the table on Standard Plan #29, the Contractor shall determine at his/her own expense the source or sources of the leakage, and s/he shall repair or replace all defective materials or workmanship. The completed pipe installation shall meet the requirements of this test.

**TELEVISION INSPECTION:** The Contractor shall hire an independent firm and furnish a closed circuit television camera inspection of the sewer mains. The firm selected shall submit to the City proof of past satisfactory performance in the conduct of closed circuit television camera inspections. The television camera check of the sewer mains shall be made after air tests have been performed and prior to placing of street asphalt paving. If more than an hour has elapsed since the main was flushed, no television camera operations shall take place until water has been re-introduced into the most upstream manhole and allowed to flow into the most downstream manhole of the sewer main to be tested. Any broken pipe, separation of joints, or any pipe exceeding the permitted tolerances for line and grade shall be replaced as a result of camera inspection shall be re-tested for leakage and deflection. The Engineer shall be present during all television inspection operations. One complete set of video in DVD format with voice comment made during the television inspection shall be supplied to the City at the completion of the inspection including written report of defects, lateral locations, etc. The Contractor shall be responsible for all costs associated with furnishing television inspection and making final repairs to the sewer mains.

**71-1.09 Trench Resurfacing** - Trenches shall be resurfaced as shown on Standard Plan 13. The Contractor shall proceed immediately to resurface with temporary pavement any part of any excavation subject to heavy traffic upon notice from the Engineer without waiting for completion of the full length of the sewer.

**71-1.10 Measurement** - Sewer work performed under Section 71, "Sewers", will be designated by size, type, quality or whatever information is necessary for identifying sewer work. The length of sewer pipe to be paid for will be the slope length designated by the Engineer. Pipe placed in excess of the length designated will not be paid for. Measurement will be to the center of the manhole, or inner edge of other structures to which the sewer is connected.

Pipe bends, tees, wyes and other branches will be measured and paid for by the linear foot for the sizes of pipes involved. Bends will be measured along the center line to the point of intersection.

Quantities of drop manholes, offset manholes, other manholes and flushing inlets will be determined as units from actual count. New frames and covers shall be considered as included in the price paid for manholes and flushing inlets.

The quantity of concrete for pipe reinforcement to be paid for shall be the actual volume placed, except that the maximum width used for computing pay quantities shall be considered as two feet greater than the outside diameter of the pipe.

Trench resurfacing shall be considered as included in other items, and no additional compensation will be paid therefore.

Reinforcement will be considered as included in the price paid for other items and no additional compensation will be allowed therefore.

Excavation and backfill shall be considered as included in the price paid for other items of work, and no additional compensation will be allowed therefore.

**71-1.11 Payment** - Items of work, measured as specified above, will be paid for at the contract price per linear foot for the different sizes and types of sewer pipe; the contract unit price for manholes and flushing inlets; the contract price per cubic yard for Class III concrete (pipe reinforcement); all other items of work such as reinforcing steel, excavation and backfill, trench paving, frames and covers, and equipment and materials used for testing, including the water used for cleaning, will be considered as included in the price paid for other items.

Full compensation for all tunneling and jacking of pipe, capping open end of pipe, joining of pipe to other pipe or structure, utility support and protective work operations required to construct the sewer system shall be considered as included in the prices paid for the various contract items of sewer work and no separate payment will be made therefore.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved for constructing sewers, complete in place, as shown on the plans, and specified in these specifications and the Special Provisions, and as directed by the Engineer.

## **SECTION 72 SLOPE PROTECTION**

Slope protection shall be as specified in Section 72 of the State Standard Specifications.

## **SECTION 73 CONCRETE CURBS AND SIDEWALKS**

**73-1.01 Description** - This work shall consist of constructing curbs, gutters, sidewalks, island paving, and driveways of the form and dimensions shown on the plans, on the City of Soledad Standard Plans, or as specified in these specifications and the Special Provisions. They shall be constructed of Class III concrete conforming to the provisions in Section 90 with a maximum slump of four inches as determined by the slump cone method except for curbs & curbs/gutters which shall be Class II concrete, reinforcement conforming to the provisions of Section 52, "Reinforcement".

**73-1.02 Subgrade Preparation** - The subgrade shall be constructed true to grade and cross section, as shown on the plans or directed by the Project Geotechnical Engineer and approved by the Public Works Director. It shall be watered and thoroughly compacted by mechanical means before placing the concrete. All soft and spongy material shall be removed to a depth of not less than 0.5 foot below subgrade elevation for curbs, island paving and driveways and 0.25 foot below for sidewalks, and the resulting space filled with earth, sand or gravel of a quality that when moistened and compacted will form a stable foundation. The subgrade for commercial driveways shall be compacted to a relative compaction of not less than 95 percent.

Base material as called for in the City of Soledad Standard Plans shall be installed, compacted, wetted and tested for grade and cross section by means of a template supported on the side forms. The base material and forms shall be wet immediately in advance of placing concrete.

**73-1.03 Existing Curbs, Gutters, Driveways and Sidewalks** - Where the plans provide for the reconstruction of a portion of an existing curb, gutter, driveway or sidewalk, the existing section shall be cut to a minimum depth of 1 1/2 inches with an abrasive type saw at the location shown on the plans or designated by the Engineer. The entire section to be reconstructed shall be removed. The new curb, gutter, driveway or sidewalk shall join the old work at this line. No sawing is necessary along an existing construction joint where an area designated for removal abuts such a joint. Epoxy dowels into existing sidewalk, curb or gutter prior to placement of concrete.

**73-1.04 Forms** - Forms shall be true and shall have a smooth straight upper edge. Timber forms shall be surfaced on the side placed next to the concrete and shall have a true surfaced upper edge and shall not be less than 1 1/2 inches thick after being surfaced, except on curves.

All forms shall be thoroughly cleaned and coated with form oil to prevent the concrete from adhering to them.

Nominal dimension back forms may be used for Type "B" and Type "C" and roll type curb. All face of gutter forms shall be full dimension.

Forms shall be carefully set to alignment and grade and shall conform to the required dimensions. Forms shall be held rigidly in place by iron or wooden stakes placed at intervals not to exceed four feet. Clamps, spreaders, and braces shall be used where required to insure rigidity in the forms. In addition to adding rigidity to the forms and preventing the concrete from leaking under the forms, earth shall be bladed or pushed against the outside back edge of the form. Benders or thin plank forms may be used on curves, grade changes, or for curb returns. Back forms for curb returns may be made of 1/2 inch thick benders cleated together for the full depth of the curb.

The form on the front of curbs shall not be removed while the concrete is sufficiently plastic to slump. Side forms for sidewalks, island paving and curbs, except for the face, shall not be removed in less than 12 hours after the finishing has been completed.

**73-1.05 Curb Construction** - In constructing curbs, entrances shall be provided for driveways as shown on the plans or designated by the Engineer.

Concrete curbs to be constructed over an existing pavement shall be anchored to the pavement by means of steel dowels firmly grouted with 1:1 Portland cement and sand grout in holes drilled in the pavement except as provided in Section 73-1.06 "Extruded Curb Construction". Dowels shall conform to the provisions for bar reinforcing steel in Section 52 and shall be spaced and shall be of the sizes shown on the plans, or on the City of Soledad Standard Plans. Approved anchor bolts may be used in lieu of dowels at the option of the Contractor.

Expansion joints 3/8 inch wide shall be constructed in curbs at 20 foot intervals except for extruded curbs which shall be at 60 foot intervals and at the ends of curb returns, except that expansion joints shall not be constructed within 20 feet of an island nose. Expansion joints shall be filled with pre-molded joint filler conforming to the provisions of Section 51. Expansion joint filler shall be shaped to the cross section of the curb. Joints shall be constructed at right angles to the curb line. Weakened plane joints shall be constructed at 20 foot intervals.

Concrete shall be placed and compacted in forms without segregation.

Immediately after removing the front curb forms, the face of the curb shall be troweled smooth to a depth of not less than 0.17 feet below the flow line or to the flow line of integral curb and gutter, and then finished with a steel trowel. The top shall be finished and the front and back edges rounded as shown on the plans and on the City of Soledad Standard Plans. Concrete placed next to expansion joints shall be finished with an edger tool.

After the face of the curb has been troweled smooth, it shall be given a final fine brush finish with brush strokes parallel to the line of the curb.

The top and face of the finished curb shall be true and straight, and the top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. When a straight edge 10 feet long is laid on top of face of the curb or on the surface of gutters, the surface shall not vary more than 0.02 foot from the edge of the straight edge, except at a grade change or curves. The top of finished curb shall not vary more than 0.02 foot above or below the grade established by the Engineer.

Exposed surfaces of curbs shall be cured by the pigmented curing compound method as provided in Section 90-7.07, except that the curbs may be sprinkled with water as soon after finishing as possible without pitting the surface and shall, in that case, be kept moist in this manner for a period of seven days between the hours of sunrise and sunset.

When required by the Engineer, curbs and gutters shall be water tested for flow line characteristics.

The Contractor shall clean at his/her expense all discolored concrete. The concrete may be cleaned by abrasive blast cleaning.

Repairs shall be made by removing and replacing the entire unit between scoring lines or joints.

**73-1.06 Extruded Curb Construction** - Shall be as specified in Section 73-1.06 of the State Standard Specifications, except that cleaning of the existing pavement shall be understood to include the removal of any existing striping.

**73-1.06A Drainage Outlets Through Curb** - The Contractor will be required to provide suitable outlets through new curb for all existing building drains along the line of the work. He shall place similar outlets opposite any low area on adjacent property, the drainage of which will be affected by the new work. Where sidewalk will be higher than adjacent property, the Contractor shall provide curb drainage per Standard Plan 15.

**73-1.06B Sidewalk Gutter Depression, Island Paving, and Driveway Construction** - Fresh concrete shall be struck off and compacted until a layer of mortar has been brought to the surface. The surface shall be finished to grade and cross section with a float, troweled smooth and finished with a broom. Brooming shall be transverse to the line of traffic and if water is necessary it shall be applied to the surface immediately in advance of brooming.

The surface of sidewalks shall be marked into rectangles of not more than 16 square feet in area for sidewalks four feet in width, or more than 15 square feet for sidewalks five feet in width, unless otherwise directed by the Engineer. A scoring tool shall be used which will leave the edges rounded.

On straight work, the scoring lines shall be perpendicular to the line of the work; at curves, the scoring lines shall be radial to the curb; when longitudinal scoring lines are required,

they shall be parallel to, or concentric with the line of the work. When sidewalk is constructed adjacent to the curbs, the score marks will also correspond with the weakened plane joints in the curb.

Expansion joints 3/8 inch wide shall be constructed at all returns and opposite expansion joints in adjacent curb. Where curb is not adjacent, expansion joints shall be constructed at intervals of 20 feet. Expansion joints shall be filled with pre-molded joint filler conforming to the provisions of Section 51 of these specifications. Expansion joint filler shall be shaped to fit the concrete that is being placed, with the edge placed 1/8 inch below the top of the finished concrete surface. Concrete placed next to an expansion joint shall be finished with an edger tool.

The surface shall not vary more than 0.02 feet from a 10 foot straightedge, except at grade changes, and the finished surface shall be free from blemishes.

Concrete sidewalks, island paving, driveways, and gutters shall be cured as provided in Section 90 of these specifications. If the pigmented curing compound method is used the manual operation of an unshielded spray nozzle will be permitted.

**73-1.07 Measurement** - Quantities of curbs, sidewalks, gutter depressions, island paving, gutters, and driveways will be measured by the linear foot or square foot as indicated in the proposal.

All base material, reinforcing steel, expansion joint material, shall be considered as included in the unit price paid for other items, except as noted below.

**73-1.08 Payment** - Quantities of curbs, gutters, sidewalks, gutter depressions, island paving, and driveways will be paid for at the contract price per linear foot or square foot as indicated in the proposal, which prices shall include full compensation for any necessary excavation and backfill and for furnishing and applying water, curb dowels, reinforcing steel, base material and expansion material, and no separate payment will be made therefore, unless specified otherwise in the Special Provisions or shown on the plans.

Payment for curb, or curb and gutter, constructed as part of a catch basin, as shown on the Standard Plans, shall be included in the contract price of the catch basin and no other compensation shall be made.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing curbs, gutters, sidewalks, island paving and driveways, complete in place, as shown on the plans, and as specified in these specifications and Special Provisions and as directed by the Engineer. Payment for depressed curbs at driveways or pedestrian access ramps shall be at the contract unit price for type of curbs specified and no additional compensation will be allowed therefore.

**SECTION 74  
PUMPING PLANT EQUIPMENT**

Pumping plant equipment shall be as specified in Section 74 of the State Standard Specifications.

**SECTION 75  
MISCELLANEOUS METAL**

Miscellaneous metal shall be as specified in Section 75 of the State Standard Specifications.

**SECTION 80  
FENCES**

Fences shall be as specified in Section 80 of the State Standard Specifications.

**SECTION 81  
MONUMENTS**

Monuments shall be as specified in the State Standard Specifications, except as herein modified.

**81-1.01 Description** - This work shall consist of furnishing and installing Portland cement concrete survey monuments at the locations shown on the plans or as directed by the Engineer, and as specified in the specifications and the Special Provisions.

**81-1.02 Materials** - The concrete portion of the monuments shall be constructed in accordance with the provisions in Sections 51 and 90.

Concrete shall be Class II or III using 3/4 inch maximum size aggregate.

Bronze plates punched with the precise monument location point (minimum depth 3/32") and the registration number of the licensed surveyor or registered civil engineer setting the point shall be as shown on the Standard Plans.

The upper portion of the survey monuments shall consist of a cast steel valve box top, constructed and marked as shown on the Standard Plans.

**81-1.03 Construction** - The concrete portion of the monuments shall be cast-in-place using the adjacent earth for exterior forms. The holes forming such monuments shall be neat and true according to the Standard Plans.

The bronze marker shall be placed in survey monuments before the concrete block has acquired its initial set, and shall be firmly bedded in the concrete. When the plate is inserted,

the reference point shall fall within a 1" diameter circle in the center of the plate, and the plate shall fall within a 3" diameter circle in the center of the concrete block.

**81-1.04 Installation** - Survey monuments shall be installed as shown on the Standard Plans. The top of the steel valve box cap shall be flush with the finished pavement grade.

**81-1.06 Measurement** - The quantity of monuments furnished and installed will be paid for as units determined from actual count.

**81-1.06 Payment** - The unit price paid for survey monuments shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing the monuments completely in place, including necessary excavation and backfill as shown on the plans and specified in these specifications and the Special Provisions and as directed and located by the Engineer.

## **SECTION 82 MARKERS AND DELINEATORS**

Markers shall be as specified in Section 82 of the State Standard Specifications.

## **SECTION 83 RAILINGS AND BARRIERS**

Guard railings and barriers shall be as specified in Section 83 of the State Standard Specifications.

## **SECTION 84 TRAFFIC STRIPES AND PAVEMENT MARKINGS**

Traffic stripes and pavement marking shall be as specified in Section 84 of the State Standard Specifications and Standard Plans 39 and 40, except as modified herein.

**84-3.02 Painted Traffic Stripes and Pavement Markings Materials** - Paint and glass beads shall be as specified in the Special Provisions and shall be furnished by the Contractor.

**84-3.07 Payment** - The contract unit prices for painted traffic stripes and pavement markings shall also include full compensation for furnishing paint and glass beads.

**SECTION 85  
PAVEMENT MARKERS**

Pavement markers shall be as specified in Section 85 of the State Standard Specifications and Standard Plan No. 39.

**SECTION 86  
SIGNALS AND LIGHTING**

Signals and lighting shall be as specified in Section 86 of the State Standard Specifications, except as modified by these Specifications and Standard Plans. Maintain proper separation between PG&E facilities and “wet” utility lines as described in latest UO Standard S5453.

**SECTION 88  
ENGINEERING FABRICS**

Engineering fabrics shall be as specified in Section 88 of the State Standard Specifications.

**SECTION 89  
LIGHTWEIGHT PORTLAND CEMENT CONCRETE**

Lightweight Portland cement concrete shall be as specified in Section 89 of the State Standard Specifications.

**SECTION 90  
PORTLAND CEMENT CONCRETE**

Portland cement concrete shall be as specified in the most recent State Standard Specifications which contain Section 90, except that Portland cement may be either Type II or Type III. Type IP (MS) modified or Type II modified, refer to State Standard Specs., 7-1999, section 90-2, materials. Class 2 concrete mix shall have a minimum strength of 3,750 psi at 28 days. Class 3 concrete mix shall have a minimum strength of 3,000 psi at 28 days.

**SECTION 91  
PAINT**

Paint shall be as specified in Section 91 of the State Standard Specifications.

**SECTION 92  
ASPHALTS**

Asphalts shall be as specified in Section 92 of the State Standard Specifications.

**SECTION 93  
LIQUID ASPHALTS**

Liquid asphalts shall be as specified in Section 93 of the State Standard Specifications.

**SECTION 94  
ASPHALTIC EMULSIONS**

Asphalt emulsions shall be as specified in Section 94 of the State Standard Specifications.

**SECTION 95  
EPOXY**

Epoxy shall be as specified in Section 95 of the State Standard Specifications.

**SECTION 96  
SITE DEVELOPMENT, SECURITY AND CLEAN-UP**

Contractor shall make arrangements with employees and or subcontractors to pick up and dispose of all rubbish and debris generated from the day's activities. Site clean up shall be completed on a daily bases. Large common areas i.e. sidewalks, street, curb and gutter shall be scheduled at least bi-weekly to be swept or as necessary.

Any person making or causing an excavation to be made to a depth of 12 inches or more shall provided barricades, caution tape or other approved controls that will protect personnel and equipment from the area being excavated.

All construction areas shall be posted.

Construction fencing shall occur at property lines of parcel that are adjacent occupied parcels, across streets to separate construction areas from public areas, in right-of-way and along sidewalks where necessary to protect public from construction activities.

Fences shall be of chain link or better and substantially anchored to prevent removal. Opening in such fences shall be by gate, access though such opening shall be limited to construction traffic or personnel only, all opening shall be protected by gates that are normally kept closed.

It shall be the sole responsibility the property owner/developer/contractor to ensure that all construction activities conform to the requirements set forth in the Public Works Design as adopted by the Soledad City Council. Failure to comply with this section will result in the suspension of all public works inspections, the suspension of all other on-site work activities and no additional compensation will be allowed as a result of such suspension.

Public improvements will not be accepted by the City of Soledad until 100% of the public improvements and homes/structures are complete. Subdivisions may be accepted in phases at the sole discretion of the City of Soledad Public Works Department.

# **PART II**

## **STANDARD PLANS**

<b>NO.</b>	<b>TITLE</b>	<b>NO.</b>	<b>TITLE</b>
1.	Curbs and Gutters	27.	Requirements Prior to Public Works Acceptance Inspection
1A.	Paving Requirements Adjacent to New Curb & Gutter	28.	Blank
1B.	Cross Gutters	29.	Time Requirements for Air Test of Sanitary Sewer
2.	Sidewalks	30.	Sewer Saddle Connection
3.	Street Structural Sections	31.	Flushing Inlet Frame and Cover
4.	Access Ramps	32.	Flushing Inlet
5.	Residential Driveway Approach	33.	Sewer Lateral
5A.	2/3 Car Garage Driveway Approach	34.	Percolation Pond Detail
5B.	Commercial Driveway Approach	35.	Storm Water Drainage Pond Designs
6.	Driveway Approach for Roll-Type Curb	36.	Concrete Washout Basin
7.	Alley Approach and Section	37.	Street Name Signs
8.	Tree Well	38.	Traffic Signs (Stop-Yield)
9.	Driveway Location Standards	39.	Raised Pavement Markers, Striping and Pavement Markings
10.	City Monument	40.	Not used
11.	Trench Safety Requirements	41.	Parking Standards
12.	Blank	42.	Chain Link Fence
13.	Trench Backfill and Surface Restoration	43.	Masonry Non-Access Wall
14.	Misc. Storm Drain Details	44.	Wooden Barricade
15.	Curb Drain	45.	Wooden Perimeter/Property Line Fence
16.	Type "A" Catch Basin (36")	46.	Street Tree Planting
17.	Type "B" Catch Basin (24")	47.	Slope Grading
18.	Type "C" Catch Basin (36")	48.	Utility Service Pedestal
19.	Type "D" Side Opening Catch Basin	49.	P.C.C. Lighting Foundation
20.	Type "E" Top Opening Catch Basin	50.	Lighting Poles
21.	Type "F" R.C.P Catch Basin	51.	Utility Locations (Typical)
21A.	Storm Drain Markers	52.	Typical Lot Grading
22.	Manhole Frame and Cover	53.	Mail Box Cluster
23.	Manhole Frame and Cover Adjustment	54.	Site Security, Clean-up & Erosion Control
24.	Manholes – Type "A" and "B"	55.	Public Works Inspection Checklist
25.	Manhole – Type "C"		
26.	Cast-In-Place Concrete Pipe		

***PART III***

***STANDARD SPECIFICATIONS FOR THE  
INSTALLATION OF WATER FACILITIES***

## **SECTION 1 GENERAL PROVISIONS**

**1.1** These specifications have been prepared for the design and installation, complete in place, of water transmission and distribution facilities by applicants to the City of Soledad for water service.

**1.2 Definitions.** The word "City", as used herein, shall mean the City of Soledad. The words "applicant" and/or "contractor" means the person, firm, company or corporation with whom the agreement is made by the City, or his/her authorized agent. The word "engineer" means the City Engineer of Soledad acting personally or through his/her authorized representatives. "Shall" is mandatory; "may" is permissive. "Provide" shall mean to provide complete in place, that is "furnish and install."

**1.3 Drawings.** The Standard Drawings as approved by the Engineer show the design and installation of mains and appurtenances. Prints of these drawings are attached and form a part of these specifications.

Additional detailed drawings showing the size, type, and location of mains to be installed, and other pertinent details, shall be prepared by the Applicant or his/her consultant. These drawings shall show the location of mains and details of construction as nearly as it is possible to determine in advance of the construction. If, during the progress of the work, changes in design, material, or location are deemed necessary by the City for proper construction of the work, the City reserves the right to make such changes. The increase or decrease in cost of materials and construction caused by such changes will be borne by the Applicant.

The size, type, length, and general location of mains and facilities to be installed shall be reviewed by the Public Works Director of the City of Soledad after these detailed drawings have been prepared by the Applicant. No bids for the work shall be accepted, and no work shall commence until the Engineer's approval has been granted and endorsed in writing on the plans filed with the City.

Sufficient copies of the approved drawings shall be furnished to the Engineer to enable him/her to adequately inspect the work and prepare as-built drawings thereof.

**1.4 Permits and Rights-of-Way.** The Applicant shall obtain all necessary permits for doing work within the limits of public property. Where the facilities location is not in public property, a right-of-way satisfactory to the City shall be obtained at the Applicant's expense, by the City or the applicants, at the option of the City, and the title shall be vested in the City.

Construction within County roadways and State highways shall be subject to the County of Monterey and State of California Encroachment permit terms and conditions. The project proponent will be responsible for obtaining said permits. The City retains the right to review all permits for conformance with City Standards.

**1.5 Licenses.** The Applicant or his/her agent designing the work shall have California registration as a Civil Engineer. The Applicant or his/her agent performing the work shall possess such State or local contractor's licenses as are required by law, and shall furnish satisfactory proof to the Engineer, upon request, that such licenses are in effect during the entire period of construction. All contractors and subcontractors shall have a valid City of Soledad business license and a valid contractor's license for the work to be performed.

The Contractor performing the work shall be experienced in water facility construction. No work shall commence until the Engineer has approved the Contractor and all subcontractors.

**1.6 Inspection.** All work done under this agreement will be subject to rigid inspection. All costs for inspection shall be paid by the Applicant. The Engineer shall have access to all parts of the work at all times. Work or material that does not conform to the specifications may be rejected at any stage of the work. The Contractor shall remove and rebuild, at his/her own expense, any part of the work that has been improperly executed. The Contractor shall notify the Engineer not less than forty-eight (48) hours prior to commencement of work on the water system, and whenever work done under these specifications is to be done on Saturday, Sunday, or on holidays, the Applicant shall pay all costs to City of such extra inspection.

**1.7 Lines, Grades and Measurement.** All lines, grades and measurements shall be established by the Contractor, subject to inspection, review and approval of the Engineer. A minimum of ten (10) feet of horizontal distance shall be maintained between sewer and water facilities. Where the minimum distance cannot be maintained, special designs shall be prepared by the Design Engineer and approved by the Public Works Director.

**1.8 Authority of Engineer.** On all questions concerning the acceptability of materials or machinery, the classification of material, the execution of the work and conflicting interests of contractors performing related work, the decisions of the Engineer shall be final and binding on both parties.

**1.9 Bonds** The Contractor shall file with the City's Clerk a bond covering the faithful performance of the requirements of these specifications. The amount of the bond shall equal the estimated cost for labor and materials (consistent with the Design Standards and Specifications) of the water facilities guaranteeing the completion and installation of the facilities to City standards.

The Contractor shall file with the City's Clerk a Guarantee bond in the amount of ten percent (10%) of the estimated labor and material cost of water facilities. Said bond shall

protect the City from all costs required for the repair of the work by the Contractor for a period of two years from the date of the acceptance of the water facilities.

## **SECTION 2 MATERIALS OF CONSTRUCTION**

**2.1** All materials used for installation of water service facilities shall be furnished by the Applicant. The materials shall be of the type, size and class indicated on the drawings, and shall conform in all respects to City of Soledad Public Works Department Standard Material Specifications (see Section 11) and American Water Works Association Standards (latest edition).

## **SECTION 3 EXCAVATION**

**3.1 General.** The Contractor shall perform all excavation necessary or required for the construction of a pipeline and appurtenances covered by the project drawings and specifications. The excavation shall include the removal and disposal of all materials, of whatever nature encountered, including water and subsurface obstructions. No water main shall be installed in the same trench with other utilities unless written approval of the Engineer is first obtained.

**3.2 Trench Excavation.** Excavation of the pipelines shall follow lines parallel to and equidistant from the location of the pipe centerline. The allowable width of trench measured at the top of the pipe shall be the outside diameter of the pipe (exclusive of bells and collars), plus 12 to 24 inches, and such width shall be inclusive of all trench timbers or sheeting and shoring.

**3.3 Trench Spoils.** Trench spoils may be stockpiled within the right-of-way but must clear the highway pavement edge by at least 10 feet and must be marked with flashers and barricades. Trench spoils shall be removed before the job is complete and shall not interfere with traffic, drainage or irrigation. Spoils in developed streets with sidewalks or other restricted rights-of-way shall be immediately removed.

**3.4 Excavation to Grade and Below Grade.** Excavation shall be made to depths and widths required to accommodate construction of the pipeline and structures. The grades in general will be such as to provide a minimum depth of cover to finish grade of forty-two (42) inches over the top of the pipe, unless shown on the drawings, and unless conditions develop in the field which require additional depth. A minimum of twelve (12) inches of vertical clearance shall be maintained between other utility line crossings. Also, the trench shall be excavated to at least six (6) inches below pipe grade to provide for bedding material. Upon approval of the Engineer, tunneling for short distances under existing facilities, sidewalks, and pavement will be allowed.

- A. Control of Water.** Contractor shall furnish and operate all necessary equipment to keep excavation reasonably free from water during construction, and shall dispose of the water to prevent a nuisance or a menace to the public. The Contractor shall at all times have on hand sufficient pumps and operators for all ordinary emergencies. The dewatering systems shall not be shut down during work stoppages without permission of the Engineer. The control of ground water shall be such that softening of the bottom of the excavation shall be prevented.

Where water enters the trench and makes the trench bottom unsuitable, the Contractors shall deepen the trench by one foot and then place permeable materials and vibrate it with a mechanical tamper. This permeable material shall be Class 1, Type B and shall be graded to the bottom of the pipe. Conform to Sections 10-2.02 "Unsuitable Material" and 68.1.025 "Permeable Material" of the State Standards, including the definition of unsuitable material. "Roadway Excavation", however, shall mean trench excavation.

- B. Removal of Obstructions and Unsuitable Material.** Unless otherwise indicated, the Contractor shall remove all brush, trees, logs, stumps, roots, decayed vegetable matter, fences, and all structures where the proper construction and completion of work require their removal. The Contractor shall also remove all rock, stones, broken concrete, debris, and obstructions of any kind encountered in the work. All excess excavated material shall be removed from the work site and legally disposed of by the Contractor.

Where material encountered at the bottom of the trench is found to be unsatisfactory, in the opinion of the Engineer, for properly supporting the pipe, the Contractor shall make further excavation to sound material and backfill in accordance with Section 3.4A "Control of Water" of these Special Provisions and shall conform to the referenced State Standard Sections and the provided definitions.

**3.5 Bell Holes.** Bell holes shall be excavated in the bottom of the trench at pipe joint locations of such size that the process of making joints and inspection can be carried on satisfactorily and so that the pipe barrel will bear evenly on the trench bedding.

**3.6 Blasting.** No blasting will be permitted without the approval of the Engineer. When blasting is permitted, it shall be done only by skilled operators and under the direction of a competent foreman.

Blasting will be permitted only when proper precautions are taken for the protection of persons, the work, and existing structures. Any damage done to persons, private property, the work, or existing structures shall be the responsibility of the Contractor. Storage, handling, and the use of explosives shall be in accordance with the Construction Safety Orders of the Division of Industrial Safety, State of California.

Blasting shall be done with explosives of such power and in such quantities and positions as not to make the excavation unduly large, to shatter the rock upon or against which embankments or concrete will be placed, to shatter the faces of cuts which are to remain open, or to injure masonry or the structures already built. Whenever in the opinion of the Engineer further blasting is liable to injure such rock or masonry, the Contractors shall cease blasting and continue to excavate the rock by other approved methods.

Excessive blasting or "overshooting" will not be permitted, and any material outside the authorized cross-section which may be shattered or loosened by blasting shall be removed and replaced with concrete or earth, as specified by the Engineer, at the Contractor's expense. The Engineer shall have authority to require the Contractor to discontinue any method of blasting which leads to overshooting or is dangerous to the public or destructive to property or to natural features.

Permits for blasting shall be obtained and paid for by the Contractor.

**3.7 Bracing and Shoring.** Excavations shall be adequately shored and braced so that the earth will not slide or settle, and so that all existing improvements of any kind will be fully protected from damage. Any damage resulting from lack of, or inadequate shoring and bracing shall be the responsibility of the Contractor. The Contractor shall effect all necessary repairs or reconstruction at the Contractor's own expense, as directed by the Engineer, and shall bear all other expenses resulting from such damage. All shoring and bracing shall conform to the latest State of California Occupational Safety and Health Standards (CAL./OSHA).

**3.8 Excavation in Areas with Portland Cement Concrete.** Where excavation is located within the sidewalk area and the sidewalk is four feet or less in width, the entire sidewalk shall be removed and replaced. Where excavation is located within a sidewalk area and the sidewalk is more than four feet in width, it shall, in general, be removed and replaced to the nearest existing longitudinal groove or score located outside the limits of the appropriate minimum excavation. In all sidewalk areas, the Contractor shall use a concrete saw to cut the sidewalk, and it shall be neatly removed to such cut. In any case, whether the alignment of the new excavation parallels or crosses the sidewalk, the limits of sidewalk removal and replacement will be designated by the Engineer.

**3.9 Protection of Other Utilities.** If during the progress of the work the Contractor encounters existing sewers, water mains, gas lines, power cables or telephone cables which require laying the new main at a new grade, or require other minor alterations, such relaying or alterations will be made at no expense to the City. The approximate location of all recorded underground utilities shall be shown on the drawings. Excavation and other work under or adjacent to sewers, water and gas services, conduits, and other structures, or appurtenances thereto, shall be prosecuted in such manner as not to interfere with their safe operation or use, and proper precautions shall be taken to prevent damage to them. Should any such structure or property be damaged during operations of the Contractor, he/she shall

immediately notify the property owners or authorities and arrange for immediate repairs of the same at his/her own expense.

The location of underground utilities or other obstruction shall be determined by the applicant or applicant's contractor sufficiently in advance of excavation so that the pipe alignment can be confirmed or rerouted without delay. The Contractor is responsible for calling Underground Service Alert 72 hours minimum prior to excavation.

**3.10 Safety.** All safety orders, rules and recommendations of the Division of Industrial Safety or the Department of Industrial Relations of the State of California applicable to the work to be done under this contract shall be obeyed and enforced by the Applicant. The Applicant shall comply with all applicable City regulations.

**3.11 Protection of Property.** The Contractor shall restore or cause to be restored all damaged property, including sidewalks; curbing; pipes; conduit; gas, water and other services; sewers; monuments; stakes; trees; shrubs and other planting, and other public or private property to a condition as good as it was when he/she entered upon the work. The Contractor shall provide and maintain such fences, barricades, "Street Closed" signs, warning lights and watchmen, as may be required to provide safety against accidents to the public. In no case shall the spacing between the warning lights be more than fifty (50) feet along the length of the trench where it is adjacent to or within the boundaries of a thoroughfare. No material or other obstruction shall be placed with fifteen (15) feet of fire hydrants. Convenient access to driveways, houses, buildings, and water main valves and gas main valves along the line of work must be maintained at all times. Temporary approaches to, and crossing of intersecting streets shall be provided and kept in good condition.

**3.12 Disposal of Excavated Materials.** The materials excavated from the trench shall be so placed as to offer minimum obstruction to traffic. Gutters shall be kept clear, or other provisions shall be made for handling street or road drainage. Excess material and material that is not approved by the Engineer for use as backfill, shall be disposed of elsewhere by the Contractor entirely at his/her own expense and on his/her own responsibility.

**3.13 Bridge Over Trench.** Foot bridges of approved construction, not less than four feet in width, and provided with hand rails and uprights of dressed lumber, shall be installed over the trench at all crosswalks, intersections, and at such other points where, in the opinion of the Engineer, traffic conditions make it advisable.

Substantially constructed bridges, adequate for handling all vehicular traffic, shall be installed over the trench or toward excavation in each street or road intersection, so as to provide a traffic lane extending over not less than one-half the width of the street or road, wherever such excavation obstructs in excess of one-half the width of the street or road crossing. Adequate bridges shall be provided to make possible the safe use of all garage driveways and other driveways or roadways used to move vehicles from the public street on to private property.

## **SECTION 4 BACKFILLING**

**4.1 General.** Backfill of all excavation necessary for the installation of pipelines shall be as contained in this section except where located in State Highways or County roads where their requirements shall prevail.

Before backfilling, the trench shall be cleared of all debris such as wood blocks, grade stakes, paper, rope and rags. Caution shall be taken to ensure that material used for backfill is free from such debris.

**4.2 Initial Backfill.** After the pipe has been properly laid and inspected, the sand backfill shall be placed around the pipe as shown on the plans and to 24 inches above the pipe. The backfill material shall be placed and compacted according to the Section 19-3 "Structure Excavation and Backfill" of the State Standards. Do not use native material for initial backfill. Initial backfill shall be compacted to 95% relative compaction.

**4.3 Compaction Tests.** Compaction tests will be made by an approved soil testing firm and shall be paid for by the developer of the water system improvement; however, any required retests due to prior test failures shall be at the expense of the Contractor. Contractor shall allow time for compaction tests during all filling operations. The tests will be California Test Method 216-F of the State of California, Department of Transportation. The Engineer may allow ASTM test method at his/her sole discretion.

**4.4 Backfill Material From Twenty-four inches (24") Above Top of Pipe to Subgrade.** Backfill in this area shall conform to the State Standard Specifications, Section 19-3, "Structure Excavation and Backfill" of the State Standards. Compaction shall be to 95% relative compaction and in conformance with City Standard Plan W-12.

If compaction of backfill is to be accomplished with mechanical tampers, the materials shall be placed in uniform horizontal layers, not exceeding one foot in thickness, before compaction.

Compaction backfill by ponding or jetting may be permitted if, as determined by the Engineer, the backfill material is of such character that it will be self-draining when compacted, and the basement material will not soften or be otherwise damaged by the applied water. When ponding and jetting, the jetting bar must not come in contact with the pipe, in order to prevent damage to the pipe. The decision by the Engineer is final.

**4.5 Pavement Repairs.** All pavement repairs shall match the existing pavement section, but in no case shall the pavement section be less than eight-inches (8") of Class 2 aggregate base and three-inches (3") of asphalt concrete.

Class 2 aggregate base and asphalt concrete shall be in accordance with the requirements of the State Standard Specifications.

A temporary one inch (1") *thick* asphalt plant mix surface (cold mix) shall be placed immediately after backfilling has been completed, and removed just prior to placing the permanent surfacing material.

All pavement repairs shall be coated with seal coat at seams, overlapping adjacent AC.

## **SECTION 5 INSTALLATION OF C900 PVC PIPE AND DUCTILE IRON PIPE**

**5.1 Handling of Pipe and Accessories.** All installations shall be in conformance with latest AWWA Standards. Proper implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe prosecution of the work. All pipe, fittings, and valves shall be carefully lowered into the trench, piece by piece, by means of a crane, ropes or other suitable equipment, in such a manner as to prevent damage to water main material, protective coatings, and linings. Under no circumstances shall water main materials be dropped into the trench.

**5.2 Cleaning Pipe and Fittings.** Ductile Iron Pipe - All lumps, blisters, and excess coal tar coating shall be removed from the bell-and-spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire brushed and wiped clean and dry and free from oil and grease before the pipe is laid. PVC Pipe - All bells and spigots shall be wiped clean and dry and free from oil and grease and all possible contaminants.

**5.3 Pipe Joints.** Joints in ductile iron pipe shall be Tyton joints. Joints in PVC shall be integral bell and spigot gasketed joints.

The specified "Tyton" joint must have the spigot of the pipe centrally located in the bell of the fitting or valve. The rubber gasket, with a light coating of "Tyton" joint lubricating compound, shall be inserted into the bell. "Tyton" joints shall be assembled as per manufacturer's instructions.

**5.4 Protection of Buried Fittings.** Buried flange, glands, fittings, bolts and nuts shall be wrapped with visquine film (8 mils minimum thickness) and secured in place, using 3M tape (10 mils minimum thickness) or approved equal.

**5.5 Laying Pipe.** Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. If the pipe-laying crew cannot put the pipe into the trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is to be made to the adjacent pipe. No debris, tools, clothing, or other material shall be placed in the pipe and a visual inspection shall be made of each piece of pipe. All buried pipe (except PVC) and fittings shall be encased with polyethylene wrap in accordance with ANSI/AWWA C105/A21, 5-82. Care shall be taken to prevent soil and foreign material from coming between pipe and wrap.

If crushed drain rock should be required as bedding where a high water table is encountered, then the Contractor shall, prior to laying pipe, lay over the bedding such backfill or fabric material that will protect the poly film, for ductile iron pipe, against rips, punctures or other damage and the outside of PVC pipe from nicks, cuts or other damage. A filter fabric envelope shall be placed around crushed rock. The protective material shall be approved by the Engineer before it is installed.

At times when pipe-laying is not in progress, the open ends of pipe shall be closed by a water-tight plug or other means approved by the Engineer. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

**5.6 Cutting Pipe.** The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or lining. Cut ends and rough edges shall be ground smooth, and for push-on joint connections, the cut end shall be beveled. The flame cutting of ductile iron pipe by means of an oxyacetylene torch will not be allowed. Also, cut end shall be marked with a line to ensure proper insertion depth.

**5.7 Bell Ends to Face Direction of Laying.** Pipe shall be laid with the bell ends facing in the direction of laying, unless directed otherwise by the Engineer. Pipe is to be laid going uphill whenever possible.

**5.8 Permissible Deflection at Joints.** Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstruction or to plumb stems, or where long-radius curves are permitted, the deflection shall not exceed the manufacturer's recommendation.

**5.9 Unsuitable Conditions for Laying Pipe.** No pipe shall be laid in water or when, in the opinion of the Engineer, trench conditions are unsuitable.

## **SECTION 6 INSTALLATION OF APPURTENANCES**

**6.1 Installation of Valves.** The Contractor shall install gate valves at the location shown on the drawings or where directed by the Engineer. The valves shall be properly fitted to the adjacent sections of the main and supported on cast in place concrete blocking as shown on Standard Plan W-7. Mechanical joints or rubber ring joints shall be made in accordance with good practice, and as directed by the Engineer. Flanged joints shall be fitted with gaskets.

**6.2 Installation of Blow-offs.** Where necessary for use in disinfecting the main, the Applicant shall install and remove temporary blow-offs at locations shown on the drawings or designated by the Engineer.

The temporary blow-off assembly shall be furnished by the Contractor.

In general, the minimum size of blow-off to be provided will be as follows:

<b>Diameter of Mains To be Flushed (Inches)</b>	<b>Required Blow-Off Diameter (Inches)</b>
4	2
6	2
8	2
10, 12	4
14, 16, 18, 20	As indicated on drawings for the particular installation

Where indicated on the drawings, the Applicant shall install permanent blow-offs. A permanent blow-off is defined as one which will be left in place upon completion of the work. The Applicant shall perform all required excavation, backfill and repair of pavement necessary for the installation, and shall install all blow-off material as shown on the drawings and standard drawings.

**6.3 Installation of Air and Vacuum Relief Valves.** Air and vacuum relief valves shall be installed on the pipeline where shown on the drawings. The valve with its protecting box shall be located outside the roadway at a location to be designated in the field. Pipe and fittings required for connecting the valve to the main shall be as specified on the drawings.

**6.4 Installation of Fire Hydrants.** The Contractor shall install new fire hydrants at locations shown on the drawings. He/She shall excavate the trench, place the pipe and hydrant, make joints, backfill the trench, and repair the pavement and sidewalk in accordance with the specification of those classes of work and the details shown on the standard plans.

If the hydrant is to be removed, the hydrant and appurtenances up to the hydrant tee in the main shall be removed.

The Contractor is responsible for filling out a HIO form (standard drawing No. W-13) and submitting it to the Engineer as part of the as-built.

All salvaged hydrants and appurtenances shall be delivered to the City at the Municipal Service Center if so directed by the City. All hydrant tees from which piping has been removed shall be plugged and the plug tied back by means of collars and rods.

Where fire hydrants are not protected from traffic by curbs or curb and gutter, the Contractor shall install bollards as directed by the Engineer.

Contractor shall install a blue reflected pavement marker at each fire hydrant location, or as directed by the Engineer. Pavement marker shall be located in the street, one (1) foot off the street centerline on the side closest to the fire hydrant.

**6.5 Installation of Flexible Couplings.** Flexible couplings shall be installed at the locations shown on the drawings. Care shall be taken to see that the pipe is in proper alignment, and that smooth surfaces have been provided so that the couplings can be properly fitted. Couplings will be epoxy coated per AWWA Standards both on the inside and outside and wrapped with polyethylene.

**6.6 Concrete Thrust Blocks.** Plain and reinforced concrete anchors for the pipelines, supports of valves, and other structures shall be constructed wherever shown or required. The anchors shall be constructed so as to obtain a full bearing, opposed to axial and lateral thrusts, against solid undisturbed material.

Ground against which concrete is to be placed shall be moistened previous to placing, so that it will not absorb excessive moisture from the green concrete. Forms required shall be smooth, mortar-tight, and of sufficient strength to maintain shape during the placement of the concrete. Placing methods shall be such that the concrete will be placed in its final position without segregation. All concrete shall be rodded and spaded to insure smooth surfaces along form lines and to eliminate rock pockets. The use of mechanical vibrators will not be required on anchors and valve supports.

Concrete shall not be placed in direct contact with ductile iron pipe or fittings, but shall be insulated therefrom by polyethylene.

Reinforcement bars, if required, shall be cleaned of all loose rust scale, mortar, oil, dirt, or other foreign substances; shall be accurately bent to prescribed dimensions, and shall be placed accurately to the dimensions shown on the drawings. Where bars are spliced, they shall be lapped at least 25 diameters.

**6.7 Exclusion of Water.** Concrete shall not be placed in free water. Pumping from the interior of any foundation enclosure shall be done in such a manner as to preclude the possibility of any portion of the concrete materials being carried away. No pumping will be permitted during the placing of concrete, or for a period of twenty-four (24) hours thereafter, unless it is done from a suitable pump separated from the concrete.

Water shall not be allowed to rise on any concrete until the concrete shall have attained its initial set. Every precaution shall be taken against the floating of the pipe, either in existing lines or in the new lines, due to water entering the trench. In case of such floating, the Contractor shall replace the pipe at his/her own expense, and make good any injury or damage which may have resulted.

The water resulting from cutting operating existing mains shall be removed and the excavation kept dry until all necessary work within the excavation has been completed.

**6.8 Installation of Customer Service Lines.** When indicated on the drawings or called for in the agreement with the Contractor, the Contractor shall install a complete customer service line with meter box and all other appurtenances, including tap or connection to the

main, as shown on the Standard Drawings. The service line may be laid in an open cut or placed through a hole produced by a jacking or drilling tool.

**6.9 Subdivision.** When new subdivisions are to be constructed, the developer shall be required to install all water facilities required to serve the subdivision in accordance with City Standards, Health Department Standards and AWWA Standards. The new water facilities shall include, but not be limited to, upsizing or upgrading existing facilities, providing connections to existing facilities, or other improvements as required to provide adequate water supply for the subdivision.

**6.10 Water Main Extensions to Serve Customers.** When a water main extension, including appurtenances, is required to serve a project, the developer shall be required to install water main and appurtenances along the entire property frontage to allow for future water main extensions.

**6.11 Cross-Connections.** Unprotected cross-connections will not be allowed. Refer to State Department of Health, Drinking Water Division for regulations governing cross-connections and approved devices for preventing backflow depending on degrees of hazard. All residential irrigation systems shall comply with the Uniform Plumbing Code provisions.

## **SECTION 7 CONNECTION TO EXISTING MAINS**

**7.1 Connection to Existing Mains.** The Contractor shall connect the new mains to existing mains at the locations shown on the drawings. The Contractor shall give the City Engineer not less than three (3) days notice before these operations are to be made, so that advance notice of the shutdown may be given to the customers affected. He/She shall also stipulate the expected duration of the shutdown.

In general, shutdowns in residential or industrial areas shall be made at times when there will be the least interference with preparation of meals or production. In all cases, shutdowns shall be made by the Public Works Department. Contact the Public Works Director for scheduled shut downs.

Public Works Personnel will close all valves in making a shutdown, and open all valves in restoring pressure to the existing main and initiating pressure in the new installation. Connections to water mains shall be made by the Contractor only after complete and satisfactory preparation for such work has been made, in order that the shutdown may be as short as possible. All work required to make connections shall be done by the Contractor.

Where existing mains are provided with fittings for the purpose of connecting to the new main, the Contractor shall remove the plugs or bulkheads, clean the ends, prepare them for connection to the new main, and make the new joint.

No live or wet taps will be permitted without approval of the Engineer. When wet taps are permitted, it shall be done by skilled operators under the direction of a competent foreman with Public Works Personnel standing by.

No connections shall be made to the existing main until all new mains and laterals have been installed, disinfected and pressure tested in conformance with these specifications and to the satisfaction of the Director of Public Works. Contractor shall supply and have on site in good working order pumps suitable to handle emergencies such as water main breaks.

## **SECTION 8 HYDROSTATIC TEST**

**8.1 Pressure Test.** Each pipeline or section thereof shall be pressure-tested by the Contractor at 1.25 times the working pressure at the highest point, plus or minus 5 psig, for at least two hours in accordance with AWWA Specifications C600-93 or C900-89. The Contractor shall make all necessary taps, and supply the test pump, pipe connections and test pressure gauge. The City shall witness the pressure-testing of the pipelines.

No section of the pipe shall be tested until at least five (5) days have elapsed since placing of concrete thrust blocks.

**8.2 Expelling Air Before Test.** Before applying the specified test pressure, all air shall be expelled from the pipe. If hydrants or blow-offs are not available at high points, the Contractor shall make the necessary taps at points of highest elevation before the test is made, and insert plugs after the test has been completed. Temporary blow offs and/or taps may be needed for various testing which are not shown on the plans. Contractor is responsible to install and remove them as directed by the Engineer.

**8.3 Examination Under Pressure.** All exposed pipes, fittings, valves, hydrants and joints will be carefully examined during the test. All services shall be visually checked while the main is under test pressure. Any cracked or defective pipes, fittings, valves, services, or hydrants discovered in consequence of this pressure test shall be removed and replaced by the Contractor with sound material, and the test shall be repeated until satisfactory to the Engineer.

**8.4 Leakage Test.** A leakage test shall be conducted after the pressure test has been satisfactorily completed and all base rock has been compacted in accordance with AWWA Specification C600-93 or C900-89. The Contractor shall supply the pump, gauge, pipe, connections, and all other necessary apparatus, and shall conduct the test. The duration of each leakage test shall be two hours, and during the test the main shall be subjected to 150 psig, and maintained to within 5 psig.

Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any section with a valve thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

No pipe installation will be accepted until the leakage is less than the number of gallons per hour as determined by the formula:

$$L = \frac{S \times D \times P \times 0.5}{133,200}$$

For example:

$$L = \frac{500 \text{ ft.} \times 6" \text{ DI main} \times 125 \text{ PSI} \times 0.5}{132,200}$$

$$L = \frac{187,500}{132,200} = 1.4 \text{ gal. per hour}$$

which L equals the allowable leakage in gallons per hour, S equals the length of pipeline tested in feet, D is the nominal diameter of the pipe in inches, and P is the average test pressure during the leakage test in pounds per square inch, gauge.

Where the actual leakage exceeds that allowed, the Contractor shall locate and repair the defect. If the leakage is within the allowance and leaks are observed, the leaks shall be repaired to the satisfaction of the City.

## **CHAPTER 8.32 REGULATION OF WATER SYSTEM CROSS-CONNECTIONS**

### **Sections:**

- 8.32.010 Purpose.
- 8.32.020 Definitions.
- 8.32.030 Cross-Connection Protection Requirements.
- 8.32.040 Backflow Prevention Devices.
- 8.32.050 User Supervisor.
- 8.32.060 Administrative Procedures.
- 8.32.070 Water Service Termination.
- 8.32.080 Qualifications of Testers.
- 8.32.090 Severability.

**8.32.010 Purpose.** The purpose of this ordinance is (1) to protect the public water supply against actual or potential cross-connection by isolating within the premise contamination

that may occur because of some undiscovered or unauthorized cross-connection on the premises; (2) to eliminate existing connections between drinking water systems and other sources of water that are not approved as safe and potable for human consumption; (3) to eliminate cross-connections between drinking water systems and sources of contamination; and (4) to prevent the making of cross-connections in future.

These regulations are adopted pursuant to the State of California Code of Regulations, Title 17 - Public Health entitled "Regulations Relating to Cross Connections".

It is unlawful for any person, firm, or corporation at any time to make or maintain or cause to be made or maintained, temporarily or permanently, for any period of time whatsoever, any cross-connection between plumbing pipes or water fixtures being served with water by the City Water Department and any other source of water supply, or to maintain any sanitary fixture or other appurtenances or fixtures which by reason of their construction may cause or allow backflow of water or other substances into the water supply system of the City and/or the service of water pipes or fixtures of any consumer of the City.

**8.32.020 Definitions.** For purposes of this chapter, the following words and phrases shall have the meanings, respectively, ascribed to them by this section:

"Air-gap separation" means a physical break between a supply pipe and a receiving vessel. The air-gap shall be at least double the diameter of the supply pipe measured vertically above the top rim of the vessel, in no case less than one inch.

"Approved backflow prevention device" means devices which have passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated their competency to perform such tests to the California Department of Health Services.

"Approved water supply" means any water supply which is satisfactory for drinking, culinary and domestic purposes and meets the basic sanitary requirements and is regulated by a State or local health agency.

"Auxiliary supply" means any water supply on or available to the premises other than the approved water supply.

"AWWA Standard" means the latest official standard approved by the American Water Works Association (AWWA).

"Backflow" means a flow condition, caused by a differential in pressure, that causes the flow of water or other liquids, gases, mixtures or substances into the distributing pipes of a potable supply of water from any source or sources other than an approved water supply source. Siphonage is one cause of backflow. Back pressure is the other cause.

"Contamination" means a degradation of the quality of the potable water by any foreign substance which creates a hazard to the public health or which may impair the usefulness or quality of the water.

"Cross-connection" means any unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome and potable. By-pass arrangements, jumper connections, removable sections, swivel or change-over devices, or other devices through which back-flow could occur, shall be considered to be cross-connections.

"Double check valve assembly" means an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the water-tightness of each check valve.

"Health agency" means the California Department of Health Services, or the local health agency with respect to a small water system.

"Local health agency" means the County or City health authority.

"Person" means an individual, company, corporation, association, partnership, municipality, public utility, or other public body or institution.

"Premise" means any and all areas on a customer's property which are served or have the potential to be served by the public water system.

"Public water system" means a system for the provision of piped water to the public for human consumption which has five or more service connection or regularly serves an average of 25 individuals daily at least 60 days out of the year.

"Reclaimed/Recycled water" means a wastewater which as a result of treatment is suitable for uses other than potable use.

"Reduced pressure principal backflow prevention device" means a device incorporating two or more check valves and an automatically operating differential relief valve located between the two checks, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing.

"Service connection" means the point of connection of a user's piping to the water supplier's facilities.

"Water supplier" means the person who owns or operates the approved water supply system.

"Water user" means any person obtaining water from an approved water supply system.

### **8.32.030 Cross-Connection Protection Requirements**

#### **General Provisions**

Unprotected cross-connections with the public water supply are prohibited.

Whenever backflow protection has been found necessary, the City will require the water user to install an approved backflow prevention device by and at his/her expense for continued services or before a new service will be granted.

Wherever backflow protection has been found necessary on water supply line entering a water user's premises, then any and all water supply lines from the City's main entering such premises, buildings, or structures shall be protected by an approved backflow prevention device. The type of device to be installed will be in accordance with the requirements of this ordinance.

#### **Where Protection is Required**

Each service connection from the City water system for supplying water to premises having an auxiliary water supply shall be protected against backflow of water from the premises into the public water system unless the auxiliary water supply is accepted as an additional source by the City, and is approved by the public health agency having jurisdiction.

Each service connection from the City water system for supplying water to any premises on which any substance is handled in such fashion as may allow its entry into the water system shall be protected against backflow of the water from the premises into the public system. This shall include the handling of process waters and waters originating from the City water system which have been subjected to deterioration in sanitary quality.

Backflow prevention devices shall be installed on the service connection to any premises having (a) internal cross-connection that cannot be permanently corrected and controlled to the satisfaction of the State or local health department and the City, or (b) intricate plumbing and piping arrangements or where entry to all portions of the premises is not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not cross-connections exist.

#### **Type of Protection Required**

The type of protection that shall be provided to prevent backflow into the approved water supply shall be commensurate with the degree of hazard that exists on the consumer's premises. The type of protective device that may be required (listing in an increasing level of protection) includes: Double Check Valve Assembly (DC), Reduced pressure Principle Backflow Prevention Device, (RP), and an Air-Gap Separation (AG). The water user may

choose a higher level of protection than required by the City. The minimum types of backflow protection required to protect the approved water supply, at the user's water connection to premises with varying degrees of hazard are given in Table 1 below. Situations which are not covered in Table 1 shall be evaluated on a case by case basis and the appropriate backflow protection shall be determined by the City or health agency.

**TYPE OF BACKFLOW PROTECTION REQUIRED**

**Minimum  
Type of Backflow**

**Prevention  
Degree of Hazard**

***Sewage and Hazardous Substances***

Premises where the public water system is used to supplement the reclaimed water supply.	AG
Premises where there are wastewater pumping and/or treatment plants and there is no interconnection with the potable water system. This does not include a single family residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and the City.	AG
Premises where reclaimed water is used and there is no interconnection with the potable water system. A RP may be provided in lieu of an AG if approved by the health agency and the City.	AG
Premises where hazardous substances are handled in any manner in which the substances may enter a potable water system. This does not include a single family residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and the City.	AG
Premises where there are irrigation systems into which fertilizers, herbicides, or pesticides are, or can be, injected.	RP

***Auxiliary Water Supplies***

Premises where there is an unapproved auxiliary water supply which is interconnected with the public water system. A RP or DC may be provided in lieu of an AG if approved by the health agency and the City.	AG
Premises where there is an unapproved auxiliary water supply and there are no interconnections with the public water system. A DC may be provided in lieu of a RP if approved by the health agency and the City.	RP

***Fire Protection Systems***

Premises where the fire system is directly supplied from the public water system and there is an unapproved auxiliary water supply on or to the premises (not interconnected).	DC
Premises where the fire system is directly supplied from the public water system and interconnected with an unapproved auxiliary water supply. A RP may be provided in lieu of an AG if approved by the health agency and the City.	AG

**Fire Protection Systems, cont'd.**

Premises where the fire system is supplied from the public water system and where either elevated storage tanks or fire pumps which take suction from the private reservoirs or tanks are used.	DC
Premises where entry is restricted so that inspections for cross-connections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connections do not exist.	RP
Premises where there is a repeated history of cross-connections being established or re-established.	RP

Two or more services supplying water from different street mains to the same building, structure, or premises through which an inter-street main flow may occur, shall be at least a standard check valve on each water service to be located adjacent to and on the property side of the respective meters. Such check valve shall not be considered adequate if backflow protection is deemed necessary to protect the City's mains from pollution or contamination. In such cases the installation of approved backflow devices at such service connections shall be required.

**8.32.040 Backflow Prevention Devices.**

**Approved Backflow Prevention Devices**

Only backflow prevention devices which have been approved by the City shall be acceptable for installation by a water user connected to the City's potable water system.

The City will provide, upon request, to any affected customer a list of approved backflow prevention devices.

**Backflow Prevention Device Installation**

Backflow prevention devices shall be installed in a manner prescribed in Section 7603, Title 17 of the California Code of Regulations. Location of the devices should be as close as practical to the user's connection. The City shall have the final authority in determining the required location of a backflow prevention device.

Air-gap separation (AG) - The air-gap separation shall be located on the user's side of and as close to the service connection as is practical. All piping from the service connection to the receiving tank shall be above grade and be entirely visible. No water use shall be provided from any point between the service connection and the air-gap separation. The

water inlet piping shall terminate a distance of at least two (2) pipe diameters of the supply inlet, but in no case less than one inch (1") above the overflow rim of the receiving tank.

Reduced pressure principle backflow prevention device (RP) - The approved reduced pressure principle backflow prevention device shall be installed on the user's side of and as close to the service connection as is practical. The device shall be installed a minimum of twelve inches (12") above grade and not more than thirty-six inches (36") above grade measured from the bottom of the device and with a minimum of twelve inches (12") side clearance. The device shall be installed so that it is readily accessible for maintenance and testing. Water supplied from any point between the service connection and the RP device shall be protected in a manner approved by the City.

Double check valve assembly (DC) - The approved double check valve assembly shall be located as close as practical to the user's connection and shall be installed above grade, if possible, and in a manner where it is readily accessible for testing and maintenance. If a double check valve assembly is put below grade it must be installed in a vault such that there is a minimum of six inches (6") between the bottom of the vault and the bottom of the device, so that the top of the device is no more than a maximum of eight inches (8") below grade, so that there is a minimum of six inches (6") of clearance between the side of the device with the test cocks and the side of the vault, and so there is a minimum of three inches (3") clearance between the other side of the device and the side of the vault. Special consideration must be given to double check valve assemblies of the "Y" type. These devices must be installed on their "side" with the test cocks in a vertical position so that either check valve may be removed for service without removing the device. Vaults which do not have an integrated bottom must be placed on a three inch (3") layer of gravel.

Freeze protection jackets shall be used to protect device from freeze damages.

### ***C. Backflow Prevention Device Testing and Maintenance***

The owners of any premises on which, or on account of which, backflow prevention devices are installed, shall have the devices tested by a person who has demonstrated competency in testing of these devices to the City. Backflow prevention devices must be tested at least annually and immediately after installation, relocation, or repair. The City may require a more frequent testing schedule if it is determined to be necessary. No device shall be placed back in service unless it is functioning as required. A report in a form acceptable to the City shall be filed with the City each time a device is tested, relocated, or repaired. These devices shall be serviced, overhauled, or replaced whenever they are found to be defective and all costs of testing, repair and maintenance shall be borne by the water user.

The City will supply affected water users with a list of persons acceptable to the City to test backflow prevention devices. The City will notify affected customers by mail when annual testing of a device is needed and also supply users with the necessary forms which must be filled out each time a device is tested or repaired.

#### **D. Backflow Prevention Device Removal**

Approval must be obtained from the City before a backflow prevention device is removed, relocated, or replaced.

Removal - The use of a device may be discontinued and the device removed from service upon presentation of sufficient evidence to the City to verify that a hazard no longer exists or is not likely to be created in the future.

Relocation - A device may be relocated following confirmation by the City that the relocation will continue to provide the required protection and satisfy installation requirements. A retest will be required following the relocation of the device.

Repair - A device may be removed for repair, provided the water use is either discontinued until repair is completed and the device is returned to the service, or the service connection is equipped with other backflow protection approved by the City. A retest will be required following the repair of the device.

Replacement - A device may be removed and replaced provided the water use is discontinued until the replacement device is installed. All replacement devices must be approved by the City and must be commensurate with the degree of hazard involved.

**8.32.050 User Supervisor.** At each premise where it is necessary, in the opinion of the City, a user supervisor shall be designated by and at the expense of the water user. This user supervisor shall be responsible for the monitoring of the backflow prevention devices and for avoidance of cross-connections. In the event of contamination or pollution of the drinking water system due to a cross-connection on the premises, the City shall be promptly notified by the user supervisor so that appropriate measures may be taken to overcome the contamination. The water user shall inform the City of the user supervisor's identity on, as a minimum, an annual basis and whenever a change occurs.

#### **8.32.060 Administrative Procedures.**

##### **A. Water System Survey**

The City shall review all requests for new services to determine if backflow protection is needed. Plans and specifications must be submitted to the City upon request for review of possible cross-connection hazards as a condition of service for new service connections. If it is determined that a backflow prevention device is necessary to protect the public water system, the required device must be installed before service will be granted.

The City may require an on-premises inspection to evaluate cross-connection hazards. The City will transmit a written notice requesting an inspection appointment to each affected water user. Any customer who cannot or will not allow an on-premise inspection of their

pipng system shall be required to install the backflow prevention device the City considers necessary.

The City may, at its discretion, require a re-inspection for cross-connection hazards of any premise to which it serves water. The City will transmit a written notice requesting an inspection appointment to each affected water user. Any customer who cannot or will not allow an on-premise inspection of their piping system shall be required to install the backflow prevention device the City considers necessary.

### ***B. Customer Notification - Device Installation***

The City will notify the water user of the survey findings, listing corrective action to be taken if required. A period of sixty (60) days will be given to complete all corrective action required including installation of backflow prevention devices.

A second notice will be sent each water user who does not take the required corrective action prescribed in the first notice within the 60-day period allowed. The second notice will give the water user a two week period to take the required corrective action. If no action is taken within the two week period, the City may terminate water service to the affected water user until the required corrective actions are taken.

### ***C. Customer Notification - Testing and Maintenance***

The City will notify each affected water user when it is time for the backflow prevention device installed on their service connection to be tested. This written notice shall give the water user thirty (30) days to have the device tested and supply the water user with the necessary form to be completed and resubmitted to the City.

A second notice shall be sent to each water user who does not have his/her backflow prevention device tested as prescribed in the first notice with the 30-day period allowed. The second notice will give the water user a two week period to have his/her backflow prevention device tested. If no action is taken within the two week period, the City may terminate water service to the affected water user until the subject device is tested.

### ***8.32.070 Water Service Termination.***

- A.** General. When the City encounters water uses that represent a clear and immediate hazard to the potable water supply that cannot be immediately abated, the City shall institute the procedure for discontinuing the City water service.
- B.** Basis for Termination. Conditions or water uses that create a basis for water service termination shall include, but are not limited to, the following items:

1. Refusal to install a required backflow prevention device;

2. Refusal to test a backflow prevention device;
3. Refusal to repair a faulty backflow prevention device;
4. Refusal to replace a faulty backflow prevention device;
5. Direct or indirect connection between the public water system and a sewer line;
6. Unprotected direct or indirect connection between the public water system and a system or equipment containing contaminants;
7. Unprotected direct or indirect connection between the public water system and an auxiliary water system; and
8. A situation which presents an immediate health hazard to the public water system.

**C. *Water Service Termination Procedures.***

For conditions 1, 2, 3, or 4, of subsection B, the City will terminate service to a customer's premise after two (2) written notices have been sent specifying the corrective action needed and the time period in which it must be done. If no action is taken within the allowed time period, water service may be terminated.

For conditions 4, 5, 6, 7, or 8, of subsection B, the City will take the following steps:

Make reasonable effort to advise the water user of its intention to terminate water service; and

Terminate the water supply and lock the service valve. The water service will remain inactive until correction of violations has been approved by the City.

**8.32.080 *Qualifications of Testers.*** Each person performing tests of backflow prevention devices pursuant to this chapter shall have the following minimum qualifications:

- A.** At least two (2) years experience in plumbing or pipe fitting, or equivalent qualifications.
- B.** Hold valid certifications from the American Water Works Association (AWWA) California-Nevada Section, from a County certification, or equivalent training in the opinion of the Health Department.
- C.** Furnish evidence to show that he/she has available the necessary tools and equipment to properly test such devices.

Each person performing such tests in the City shall be responsible for the competency and accuracy of the tests and the correctness of reports thereon submitted to the City.

**8.32.090 Severability.** If any section, subsection, subdivision, paragraph, sentence, clause, or phrase of this chapter, or any part thereof, is for any reason held to be invalid, such decision shall not affect the validity of the remaining portions of this chapter or any part thereof the City Council hereby declares that it would have passed each section, subsection, subdivision, paragraph, sentence, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, subdivisions, paragraphs, sentences, clauses, or phrases be declared invalid.

## **SECTION 9 DISINFECTION OF MAINS**

**9.1 General.** The Contractor shall disinfect the main in accordance with the applicable portions of AWWA publication C651-92, "Standard for Disinfecting Water Mains".

**9.2 Disinfection Procedure.** Before final acceptance, the pipelines shall be disinfected with a chlorine solution to a residual of fifty (50) parts per million. The chlorine solution shall be allowed to stay in the lines for a period of 24 hours. A City representative will take chlorine residual samples once at initial pipe line chlorination, and again after a 24 hour period to verify that the 50 parts per million requirement has been met. Samples will be taken to a state approved testing laboratory. Costs for chlorine residual tests will be paid for by the Contractor installing the water system. The Contractor shall chlorinate the pipelines by use of Olin dry HTH tablets (calcium Hypochlorite containing 70% available chlorine). The Contractor shall place the number of tablets per joint of pipe as shown in the following table, and shall securely attach tablets to the top of the pipe with Permatex No. 1. In the event the pipelines fail to pass the coliform tests, the Contractor shall submit in writing for the Engineer's approval the method proposed to be used to re-chlorinate the pipeline to 50 parts per million. One acceptable method is liquid injection and may be used in lieu of tablets for initial disinfection.

Pipe diameter;	6"	8"	10"	12"	14"	16"	20"
No. of Tablets:	3	4	5	7	8	12	15

Disposal of chlorinated water shall be per Section 6.2 of AWWA C651 -86.

**9.3 Coliform Tests.** Samples shall be taken from representative points in the system established by the Public Works Director, or parts thereof by a state certified water tester paid for by the Contractor and approved by the Public Works Director, that is being disinfected. The system shall not be accepted until the samples from the portion of the main being tested meet the U.S. Public Health Service Standards for drinking water. Cost of the

samples and testing shall be borne by the Applicant. A representative from the City will observe all field collection and testing.

Contractor shall provide taps and shall install corp. stops in the pipeline for sampling. Temporary ones will be abandoned by Contractor at his/her expense.

## **SECTION 10 CLEAN-UP OF SITE**

**10.1 General.** The Contractor shall keep the construction site in a neat and sanitary condition at all times. He/She shall remove all trash and excess excavated materials from the site as soon as possible. On or before completion of the work, the Contractor shall remove all temporary structures built by him/her and leave all areas in a condition satisfactory to the Engineer.

Street areas shall be swept by power or hand broom at the end of each work day. Frequent street watering and, in some cases, light oiling of the trench, may be required if dust problems occur.

## **SECTION 11 STANDARD MATERIAL SPECIFICATIONS**

**11.1 Ductile Iron Pipe Water Main.** Ductile iron pipe shall be ANSI/AWWA C151/A21.51 conforming to USASI Specifications A21 .51 with a minimum working pressure of 150 psi. Pipes shall have outer bituminous seal coating approximately 1mil thick and cement mortar linings conforming to USASI Specifications A21 .4 and ANSI/AWWA C104/A21.4. The minimum thickness of the linings shall be 1/16 inch. The joint shall be Tyton or equal rubber gasket type conforming to AWWA Specifications C 111-80, except where "Field Lok" gasket is required. Construct the water main according to the manufacturer's recommendations.

**11.1A PVC Pipe Water Main.** 4" to 12" diameter Polyvinyl chloride pipe shall be AWWA C900-81, class 150, DR18 with integral bell and spigot gasketed joints conforming to ASTM D3139 and ASTM F477. 14" and 16" diameter PVC pipe shall conform to the above with a DR of 25. Construct water main per the manufacturer's recommendation.

**11.2 Polyethylene Encasement** All ductile iron pipe, fittings and appurtenances shall be encased in polyethylene wrap (8 mils minimum thickness, tightly wrapped and taped to pipe) and installed and repaired in accordance with ANSI/AWWA C105/Aa2I, 5-82.

**11.3 Cast Iron Pipe Fittings.** Cast iron pipe fittings shall be a mechanical joint end conforming that to USASI Specifications A21.4 and ANSI/AWWA C111/A21.11 or C110/A21.10. Fitting shall be Class 250. The Contractor shall install the fittings at the locations shown on the plans. Fittings shall have the same coatings and linings as ductile iron pipe Section 11.1 Tees and crosses shall be flange x flange with flange by mechanical

joint valves bolted to tees, etc. Fittings shall be tested in accordance with ASTM A536, except that the casting grade shall be 70.50-05.

Buried flange, glands, fittings, bolts and nuts shall be wrapped with visquine (8 mils minimum thickness) and secured in place, using 3M tape (10 mils minimum thickness) or approved equal.

**11.4 Valve Boxes.** Valve boxes shall be a G-5 box as manufactured by Christy Concrete Products or equal. Each valve box shall have a cast iron cover marked "WATER".

The casing shall be 8-inch diameter SAE pipe. Casings are to be notched and placed 6-inches below operating nut.

**11.5 Butterfly Valves.** Butterfly valves are not allowed.

**11.6 Gate Valves.** Gate valves shall comply with AWWA Designation C509. Gate valves shall be AVK American Gate Resilient seated or approved equal. They shall have mechanical joints with a non-rising stem with "O" ring seal, thrust bearings, and a two-inch square operating nut. They shall be epoxy coated inside and out and have flanged or mechanical joint ends.

**11.7 Blow Offs.** Blow off valves shall be in conformance with Standard Plan W-16.

**11.8 Air and Vacuum Relief Valves.** Air and vacuum relief valves shall be APCO Model 200A or approved equal.

**11.9 Pressure Regulating and Relief Valves.** Pressure regulating and relief valves shall be Cla-Valve.

**11.10 All Valves.** All valves shall open LEFT, have non-rising stems and be set plumb.

**11.11 Tapping Sleeves.** All tapping sleeves shall be Clow or Mueller cast iron mechanical joint or equal and shall accept a U.S. Pipe Instroseal Resilient seat tapping valve. Tapping Sleeves shall be installed in conformance with Standard Plan W-19.

**11.12 Service Line.** All 3/4", 1", 1 1/2" and 2" service pipes shall be Type K (soft) copper in accordance with AWWA Standard C800-84, latest revision.

Service line shall be connected by flared fitting except for 1 1/2" and 2" connections which can be connected with Mueller 110 compression-type fittings or any flare fitting.

**11.13 Brass Service Fittings.** Corporation stops shall be Mueller H-15000 series or approved equal, angle meter stops shall be Mueller H-14000 series or approved equal, couplings and connections shall be Mueller 110 compression-type fittings or any flare fitting or approved equal. All corporation stops will be supplied with wing locks.

**11.14 Service Clamps.** Service clamps shall be Mueller double strap bronze with CC thread or equal.

**11.15 Fire Hydrants.** Fire hydrants shall be furnished with burys with mechanical joint megalug restraining gland and Tyton joint pipe with field loc gaskets. All hydrants shall be painted with two (2) coats of Tru-Test, Tru-Serv IBM # 802-108 neon grass color (X0-N color formula AX10Y24, C4, D10 AND KX4Y24) and the black painted area Rustoleum™ flat black as approved by the Public Works Director. All hydrants shall have National Standard hose threads on outlets and be Clow-Rich No. 860 with one 4-1/2" and two 2-1/2" outlets. A Clow Model 40 break-off spool with check valve, witness hole, and hollow break off bolts shall be provided with each fire hydrant. Refer to Standard Plan No. W -8.

**11.16 Meter Boxes.** Meter boxes shall be as manufactured by Christy Concrete Products, Inc., or equal, and shall be furnished according to the following schedule:

Christy B-16 with remote meter reading sensor for single service replacement (3/4" or 1").

Christy B-36 with remote meter reading sensor for combo domestic/fire services ( 1-1/2").

Traffic-rated meter box lids with reading lids will be required in all areas subject to traffic or as directed by Engineer.

**11.17 Flexible Couplings.** Flexible couplings shall be Dresser, Romac, Rockwell or equal.

**11.18 Galvanized Pipe and Fittings.** Galvanized pipe and fittings are not allowed.

**11.19 Portland Cement.** Portland cement shall be either "Type IP (MS) Modified" or "Type II Modified". Refer to State Standard Specifications, 7-1999, Section 90-2, Materials.

**11.20 Concrete.** All concrete shall be Portland cement concrete and shall be composed of Portland cement, fine and coarse aggregates, and water, proportioned and mixed as required to produce a smooth, workable mixture. It shall have minimum ultimate compressive strength of 3,000 pounds per square inch at twenty-eight (28) days, as determined by testing 5" x 12" cylinder samples of the concrete, in accordance with the requirements of the latest revision of ASTM Specifications C39-61, Standard Method of Testing for Compressive Strength of Molded Concrete Cylinders. The maximum size of aggregate shall be that which passes a 1" mesh screen. It is anticipated that not less than five (5) sacks of cement per cubic yard must be used in order to obtain the above strength.

**11.21 Reinforcement Bars.** Reinforcement bars shall conform to the requirements of the latest revision of ASTM Specification A15, Standard Method of testing for Concrete Reinforcement, Intermediate Grade. All bars shall be deformed. Deformations shall conform to the requirements of the latest revision of ASTM Specification A305,

Specifications for Minimum Requirements for the Deformation of Deformed Steel Bars for Concrete Reinforcement.

***PART IV***  
***WATER STANDARD PLANS***

<b>NO.</b>	<b>TITLE</b>
W-1	1" to 2" Service Connection and Meter Box Installation
W-1A	Combination Domestic and Fire Service Detail
W-1B	Domestic Service Detail
W-2	2" and Larger Service Connection and Meter Box Installation
W-3	Backflow Protection
W-4	Valve Box Installation
W-5	Blocking Detail for 4" through 12" Fittings
W-6	Standard Thrust Blocking
W-7	Valve Anchor for Line Valve
W-8	Fire Hydrant Construction
W-9	Typical Valve and Plug Locations
W-10	Typical Water Main Crossing at Sewer or Storm Drain Mains
W-11	Detector Check Valve 4" through 10"
W-12	Typical Trench Section
W-13	Fire Hydrant Installation Order Form
W-14	Water Service Application
W-15	Driveway and Hydrant Location at Corners
W-16	Blow-off Installation Detail
W-17	Air Release Valve Detail
W-18	Water Main Jumper Connection for Disinfection and Testing of New Water Mains
W-19	Wet Tap Construction
W-20	Sprinkler Connection Detail
W-21	Water Sampling Station
W-22	Water Disinfecting Requirements
W-23	Standard Multiple Branch Service Installation (3/4" – 2")
W-24	Typical Separation Requirements

# ***PART V***

## ***DESIGN STANDARDS***

**SECTION 1**

**IMPROVEMENT POLICY FOR**

**SUBDIVISIONS & UNIMPROVED**

**STREETS**

**October 2007**

## **1. IMPROVEMENT POLICY FOR SUBDIVISIONS & UNIMPROVED STREETS**

### **A. GENERAL**

It is the City's policy to require all developers and subdividers to construct the public improvements within and adjacent to their property to City Standards. Unless specified otherwise, such improvements shall have appearance characteristics compatible with those of the neighborhood in which they are installed.

All public improvements shall be designed and constructed according to these Design Standards and the Standard Plans and Specifications adopted by the City Council of the City of Soledad, unless specific modifications to such standards are approved by the Public Works Director.

### **B. ROADWAY PAVING**

Design procedures for rigid and flexible roadway pavements shall be in accordance with Section 7 of the Caltrans Highway Design Manual, City Standard Plan No. 3 and these following requirements.

Basement soil "R" value tests will be required for roadway pavement designs by qualified laboratories in accordance with testing procedures of Caltrans. Soil samples for R-Value tests shall be of sufficient number and at appropriate intervals to reflect R-Values representative of the entire development. Pavement structural section designs shall be governed by the lowest of obtained R-Values, with a minimum section of 3 inches of Asphalt Concrete over 8 inches of Class 2 Aggregate Base. Off right-of-way parking areas shall be paved in accordance with R-Value tests with a minimum of 2 inches of asphalt concrete over 6 inches of Class 2 Aggregate Base.

### **C. CURBS**

Unless permitted otherwise, concrete vertical curbs with integral gutters shall be constructed throughout the City. In blocks where streets have already been improved with roll-type curbs, replacement roll-type curbs may be approved at the discretion of the City and only with City approval.

### **D. SIDEWALKS**

Concrete sidewalks shall be constructed in all residential, industrial and commercial developments, unless designated otherwise by separate agreement.

Sidewalk standards shall be as determined by the City of Soledad including location, width and face of curb to right-of-way dimension.

Any standards adopted should permit variations where special design conditions exist. For example, it might be desirable to permit the planting of street trees in certain commercial areas. Where special design conditions exist the Public Works Director may allow a deviation from these standards.

In areas where a new sidewalk installation meets an existing sidewalk of different width, the curb line of the new sidewalk shall be tapered as needed to effect a smooth transition at the meeting point.

Whenever a driveway providing street access to a property is abandoned due to the construction or alteration of improvements on the property which block such access, or due to a change in the use of the property, the curb, driveway approach and sidewalk shall be removed and replaced with new sidewalk and curb consistent with the sidewalk and curb in front of other properties in the same block or neighborhood.

No sidewalk shall be installed over water or other utility lines, except for lateral lines leading directly to residences, without permission, in writing, of the Public Works Director.

It is the policy of the City that all pedestrian walkways shall have sidewalk installed by the property owner. Whenever a building permit for construction in new residential or commercial areas is granted it shall be subject to the condition that concrete sidewalks be installed in an approved area along all street frontage of the property according to specifications established by the Public Works Director.

Handicapped access ramps shall be constructed within sidewalk areas at curb returns and other locations per City requirements.

Sidewalk construction shall conform to ADA requirements.

## **E. DRIVEWAYS**

Driveways shall be constructed only at locations where access from private property is required. The design of driveways shall be as detailed on Standard Plan No.5 and shall not be constructed closer than 20' from the end of curb return at intersections. No more than 50% of a lot frontage shall consist of driveway as measured from the inside of the driveway flares.

Commercial type driveways with heavy duty curbs shall be constructed for all commercial, industrial applications, and multiple residential developments of three or more units.

Driveway construction shall conform to ADA requirements.

## **F. STREET LIGHTING**

A street lighting system shall be required of new developments, with service design and connections coordinated with the Utility Company. Street lighting designs including fixture wattage, pole locations and spacing, street light numbers, and conduit shall be subject to review and approval of the Public Works Director.

Electroliers and appurtenances shall be in accordance with City Standard Plans unless otherwise approved by the City Engineer. The poles and mast arms shall be City-owned upon completion of the development, and the luminaries shall be owned and maintained by PG&E. Street lights shall be installed by PG&E at the locations approved by the Public Works Director if they are to be mounted on existing wood electrical or joint poles.

## **G. MONUMENTS**

Standard street monuments shall be constructed on the centerlines of streets at the following locations:

1. All intersections of street centerlines.
2. All beginnings and ends of curves.

All street monuments shall be punched with license number before acceptance by City.

Lot corners and subdivision corners shall be as specified in the Subdivision Ordinance.

Section 8771 of the Land Surveyors Act requires that all existing monumentation shall be referred and reestablished when disturbed by new construction.

## **H. STREET SIGNS**

Street name signs shall be constructed at each intersection. Roadways of 4 or more travel lanes shall be furnished with a minimum of 2 street name signs. Traffic signs together with appropriate pavement markings, striping and/or raised pavement markers shall be installed as directed by the Public Works Director.

## **I. STORM DRAIN**

Storm drains shall be designed and constructed to serve the development including any areas which will ultimately drain through the development with the cost of over-sizing to be shared per current City policy (which is on a case by case basis). All intersections requiring drainage improvements shall be served with underground

pipes and appropriate drainage facilities. "T" intersections with low traffic volumes may use cross-gutters on the leg of the "T". Siphons are not acceptable, except as a temporary measure.

**J. SEWERS**

Sanitary sewer mains and laterals shall be constructed to serve each lot. Laterals shall lead directly to the sewer main in the street. Except on a temporary basis during construction, sewer laterals shall not pass through lots other than the one served. Joint use of laterals is not permitted.

Sanitary sewer mains/trunk lines shall be designed to accommodate the development including affected portions of sewage service areas as applicable. Sewer main over-sizing costs to be shared per current City policy (which is on a case by case basis).

**K. FIRE PROTECTION**

The development shall include fire protection systems including all necessary fire hydrants, valves, mains, and appurtenances, together with fire access lanes and equipment turn-arounds as applicable. Materials, equipment, and installation shall conform to the requirements of the City, State and Federal agencies.

**L. RIGHTS-OF-WAY AND EASEMENTS**

As a condition for development, street rights-of-way and/or easements for publicly owned and maintained facilities shall be conveyed to the City in accordance with current policy. All plats and deed descriptions necessary for recordation of such conveyances shall be prepared/submitted by the developer in accordance with current City policies and procedures before acceptance.

**M. PARKING AND TRAFFIC CIRCULATION**

Access roadways, on-site parking and interior vehicular circulation designs shall be in accordance with current City policies.

Entrances/driveways to developments shall be located and designed with appropriate signing, striping and marking, divider strips, signalizations and other traffic control devices as necessary to minimize conflicts with or disruptions to through traffic.

Parking layouts, stall and aisle dimensions shall be in accordance with the Soledad Municipal Code. For high-turnover rate parking, recommended stall dimensions are minimum 9 feet in width and 19 feet in length as measured along the angle of parking.

All parking areas shall be graded and paved to drain and delineated by painted lines and/or raised markers. Individual stalls adjacent to buildings, pedestrian walks or other similar structures shall be separated by raised curbs, sidewalks, planters or other type barriers. Where parking spaces abut pedestrian or landscape planters, the walkways and planters shall be of adequate width to provide for 3 foot vehicle overhang where such improvements are used for wheel stops, allowing for minimum 4 foot clearance for pedestrian traffic as applicable. Planted areas adjacent to paved parking or roadway areas shall be separated by vertical type curbs (epoxy Type A, Type B, or Type C).

Provisions for handicapped parking stalls, with ramps as applicable, shall be included in parking designs, in accordance with latest State Standards.

On-site vehicular roadways shall include provisions for emergency vehicle corridors and turn-arounds in accordance to Fire Department regulations. Such corridors shall be adequately marked and/or signed to prohibit unauthorized parking.

## **2. STORM DRAIN DESIGN**

### **A. GENERAL**

The determination of storm runoff shall be as outlined herein.

### **B. HYDROLOGY - SURFACE RUNOFF**

The "Rational Method" shall be used for the determination of storm runoff in the City of Soledad for areas 100 acres or less and "Soil Conservation Service Method" for developments over 100 acres.

The "Rational Method" approach is represented by the formula:

$$Q=CIA$$

- Q - Storm runoff in cubic feet per second.
- C - Coefficient of runoff, representing the ratio of runoff to rainfall.
- I - Average rainfall intensity expressed in inches per hour for a duration equal to the time of concentration.
- A - Size of the tributary drainage area in acres.

The time of concentration is considered as the time required for water to flow overland to reach established surface drainage channels such as street gutters, and

channel flow time required for water to flow through established drainage channels to the point of inlet. A minimum inlet time of fifteen minutes is used. Subsequent time of concentration in the drainage system is determined by the time of flow in the conduit.

Modified rainfall intensity curves for the City of Soledad shown herein shall be used for runoff computations.

**IDF Curve for Various Return Periods**  
Soledad IDF Station

Duration	Design Storm			
	2 year in/hr	10 year in/hr	25 year in/hr	100 year in/hr
5 min.	1.51	2.48	2.98	3.69
10 min.	1.01	1.66	2.00	2.47
15 min.	0.80	1.31	1.58	1.96
30 min.	0.54	0.88	1.06	1.31
60 min.	0.36	0.59	0.71	0.88
2 hours	0.24	0.40	0.48	0.59
4 hours	0.16	0.27	0.32	0.40
8 hours	0.11	0.18	0.21	0.27
16 hours	0.73	0.12	0.14	0.18
24 hours	0.06	0.09	0.11	0.14

10 Year Design Storm Rainfall Intensity Equation

$$I = 6.28 / (T_c)^{0.58}$$

I = Rainfall Intensity in Inches/Hour    T<sub>c</sub> = Time of Concentration in Minutes

A 25-year average return intensity is to be used for design of conduits and inlets in commercial and industrial areas and main trunk lines and a 10-year average return for residential areas. Depth of water in streets shall not exceed curb heights for these intensities. Retention facilities shall be included as part of the overall design and shall mitigate any runoff due to development for a 100 year storm return period. All retention pond calculations shall be submitted to the Monterey County Water Resources Agency and a written letter of approval shall be obtained from the Agency. Minimum runoff coefficients shall be as follows:

**RUNOFF COEFFICIENT BY LAND USE CATEGORY**

<b>RESIDENTIAL</b>	<b>C</b>
Rural (0.4 DU/acre)	0.20 to 0.35
Low Density (4 DU/acre)	0.50 to 0.60
Medium Density (12 DU/acre)	0.60 to 0.70
High Density (22 DU/acre)	0.70 to 0.80

<b>NON-RESIDENTIAL</b>	<b>C</b>
Commercial	0.70 to 0.80
Industrial	0.70 to 0.90
Public Facilities - School Site	0.35 to 0.50
Freeways	0.75 to 0.90

<b>OPEN SPACE</b>	<b>C</b>
Irrigated Park	0.20 to 0.30
Agricultural Lands	0.15 to 0.25

**C. HYDRAULIC CONSIDERATIONS**

Drainage inlet type and spacing shall be governed by the capacity of the drainage channel/gutter as well as the capacity of the inlet itself. Generally, channel flow lengths between inlets should be less than 1,000 feet, and an inlet shall be provided at the downstream end of each block, with a flow line grade of not less than 0.50 percent.

In designing a structure, the inlet capacity of the pipe draining the inlet structure shall be considered. Depth of drainage inlets shall not exceed 6 feet unless prior authorization has been granted by the Public Works Director.

Gradients of the pipes shall be sufficient to provide a velocity not less than 2.0 feet per second nor more than 8 feet per second when flowing full. A minimum pipe size of 15" diameter is required for all mains and laterals.

Manning's formula for gravity flow in pipes should be used in computing the capacity. The roughness coefficients (n) shall be as follows:

## **MANNING’S FRICTION FACTORS**

<b>Type of Facility</b>	<b>Friction Factor</b>
<b>Concrete Pipe</b>	
Reinforced (RCP)	0.012 to 0.014
Cast In Place (CIP)	0.012 to 0.014
<b>Corrugated Metal Pipe</b>	
Annular	0.020 to 0.024
<b>Concrete-Lined Channels</b>	
Smooth-troweled	0.014 to 0.016
Rough	0.016 to 0.18
<b>Earth Channels</b>	
Smooth Geometric	0.025 to 0.040
Irregular or Natural	0.040 to 0.055

Where grades permit, 0.1 feet drop in manholes should be included where there is no appreciable change in direction and 0.2 feet drop where turns occur.

Special considerations shall be given to the design criteria for major trunk lines and outfalls, pumping stations and areas historically subject to flooding. Design criteria for flood prone lands shall be in accordance with these specifications and the standards of the Monterey County Water Resources Agency and Federal Emergency Management Agency. Storm water retention basins/areas are required and are subject to review and approval from the Monterey County Water Resources Agency. For the protection of properties under flooding conditions, flood relief structures, channels or other drainage facilities shall be constructed to accommodate flood water depths exceeding 8 inches above gutter flow lines, or those which will impact property adjacent to the street right-of-way.

Manholes or structures providing access to the pipe should be constructed at all changes in pipe size, change in grade and angle points. Manhole spacing should not exceed 500 feet.

Manholes are required at lateral pipe junctions with new and existing mains, unless the main pipeline is three times or more greater in diameter than the joining pipe.

Pipelines may be laid on curves by using beveled pipe sections and/or by deflections of straight pipe in accordance with pipe manufacturer's recommendations.

Storm Drain runoff from any development shall not raise the 100-year flood elevation.

### **3. SANITARY SEWER DESIGN**

#### **A. DESIGN**

Sanitary sewers shall be designed to discharge the expected peak flow when pipe is running full. Grades shall be sufficient to provide a velocity of at least 2.00 feet per second when running full, and 1.75 feet per second, at average rate of flow.

Maximum velocity shall be limited to 8 feet per second. Friction factor (n) shall be taken as 0.011 for PVC pipe. Manning's Formula Nomograph or other method of solution which relates pipe diameter, slope, discharge, and velocity, may be used. Unless approved by the Public Works Director, no sewer mains less than 8 inch diameter shall be used.

Design and sizing of sewer mains and major laterals shall be based upon the anticipated sewage discharge in accordance with the following criteria. On the basis of an average flow of 100 gallons per capita per day, the average flow rates (cfs/acre) shall be based upon allowable land use densities (units per acre) and average occupancy figures (persons per unit), per the following data:

<b>Service Population</b>	<b>Ratio of Peak to Average Flow</b>
1,000	2.5
3,000	2.1
10,000	1.8
35,000	1.6
100,000	1.5

Infiltration and storm water inflow shall be at 500 gallons per acre per day for new sewer mains.

Sewers shall be designed parallel and offset from street centerline as practicable. Spacing of manholes shall not exceed 400 feet on lines under 12" diameter. All grades for sewer pipe shall be given in feet/foot to 4 decimal places and preferably shall be divisible by four. In manholes where outlet pipe has a greater diameter than the inlets, the crowns or the 0.8 diameter lines should be matched. Where grades permit, 0.20 feet drop should be allowed at 90 degrees alignment change in manholes, to insure sufficient fall. Drop manholes shall be constructed where the inlet/outlet differential is 2 feet or greater.

## **B. DEPTH OF SEWERS**

Sewer mains and laterals shall be deep enough to insure adequate drainage of lowest sanitary fitting connected thereto and to accommodate any future building extensions in the area. Sewer lateral connections to mains in Public Street right-of-way shall be a minimum 5 foot depth to top of pipe at property line.

## **C. CONNECTIONS TO SEWERS**

All lateral connections to sewer mains shall be made by means of wye branches saddles or manholes, with connections in accordance with Standard Plans 24, 30, and 33 in the upper half of the sewer main. Lateral connections shall be ABS or PVC pipe not less than 4" diameter and shall be laid to a minimum grade of 1 % between sewer main and property line. A lateral cleanout shall be installed at property line. Additional wye branches shall be installed in the sewer mains for future anticipated services.

No roof drains or storm water inlets shall be connected to sanitary sewers, nor shall sanitary sewers be connected to storm drains.

Upon completion of sewer main installations of 8 inch and larger diameter within public easements and right-of-way, all sections of pipe shall be checked with video equipment and air tested in accordance with current requirements of the Public Works Department. Contractor or Developer shall provide City with two(2) sets of video records in DVD format that can be played by personal computers.

Swimming pools and backwash must be discharged to the sanitary sewer system.

## ***SECTION 2***

### ***REQUIRED IMPROVEMENT PLAN***

#### ***GENERAL NOTES***

**NOTE:** THESE GENERAL NOTES ARE REQUIRED TO BE INCLUDED IN ALL STREET IMPROVEMENT PLANS. APPLICABLE NOTES FROM THE FOLLOWING SHALL BE INCLUDED IN OTHER IMPROVEMENT PLANS.

## **GENERAL NOTES**

1. ALL WORK AND MATERIALS SHALL BE IN CONFORMANCE WITH THE FOLLOWING:
  - STANDARD SPECIFICATIONS AND STANDARD DETAILS, LATEST EDITION, OF THE CITY OF SOLEDAD.
  - CALTRANS STANDARD SPECIFICATIONS AND STANDARD PLANS, LATEST EDITION.
  - AWWA STANDARDS.
  - ALL OTHER APPLICABLE LOCAL, STATE AND FEDERAL STANDARDS. IN CASE OF CONFLICTS BETWEEN THE ABOVE STANDARDS, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.
2. CONTRACTOR SHALL SECURE AND COMPLY WITH CITY PERMIT REQUIREMENTS. CONTRACTOR SHALL NOTIFY THE CITY 48 HOURS PRIOR TO THE INTENTION TO COMMENCE WORK. (PUBLIC WORKS DEPARTMENT PHONE 831-678-3963 ext.5173).
3. CONTRACTOR SHALL SUPPLY ALL EQUIPMENT, LABOR AND MATERIALS NECESSARY TO PERFORM THE WORK SHOWN IN THE PLANS AND SPECIFICATIONS. CONTRACTOR SHALL USE ADEQUATE NUMBERS OF SKILLED WORKERS WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHOD NEEDED FOR PROPER PERFORMANCE OF THE WORK.
4. CONTRACTOR SHALL COORDINATE ALL WORK AND WORK OF OTHER CONTRACTORS, INCLUDING SUB-CONTRACTORS WORK, SO AS TO ELIMINATE CONFLICTS AND WORK TOWARDS THE GENERAL GOOD AND COMPLETION OF THE ENTIRE PROJECT.
5. THE UTILITY COMPANIES ARE MEMBERS OF THE UNDERGROUND SERVICE ALERT ONE CALL PROGRAM. THE CONTRACTOR OR ANY SUB-CONTRACTOR FOR THIS CONTRACT SHALL NOTIFY MEMBERS OF THE U.S.A. 48 HOURS IN ADVANCE OF PERFORMING EXCAVATION

WORK BY CALLING THE TOLL FREE NUMBER 800-227-2600.  
EXCAVATION IS DEFINED AS BEING 18 OR MORE INCHES IN DEPTH  
BELOW THE EXISTING GROUND.

6. THE CONTRACTOR SHALL REMOVE ALL OBSTRUCTIONS, BOTH ABOVE GROUND AND UNDERGROUND, EXCEPT AS NOTED IN ITEM 5 ABOVE, AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS AND SHALL COORDINATE RELOCATION OF EXISTING UTILITIES WITH THE APPLICABLE UTILITY COMPANY WHERE RELOCATIONS ARE REQUIRED.
7. CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ANY CURRENTLY APPLICABLE SAFETY LAW OF ANY JURISDICTIONAL BODY. FOR INFORMATION REGARDING THIS PROVISION, THE CONTRACTOR IS DIRECTED TO CONTACT THE STATE OF CALIFORNIA, DIVISION OF OCCUPATIONAL SAFETY AND HEALTH, SALINAS, CA. PHONE 831-443-3050. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL BARRICADES, SAFETY DEVICES, AND CONTROL OF TRAFFIC WITHIN THE CONSTRUCTION AREA. FOR ALL TRENCH EXCAVATION FIVE (5) FEET OR MORE IN DEPTH, THE CONTRACTOR SHALL OBTAIN A PERMIT FROM THE DIVISION OF OCCUPATIONAL SAFETY AND HEALTH, 1164 MONROE STREET, SUITE 1, SALINAS, CA. 93906-3564, PRIOR TO BEGINNING ANY EXCAVATION. A COPY OF THIS PERMIT SHALL BE AVAILABLE AT THE CONSTRUCTION SITE AT ALL TIMES. THE CONTRACTOR SHALL MAINTAIN A LIST OF PERSONNEL CERTIFIED TO BE RESPONSIBLE FOR TRENCH SAFETY.
8. CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL, AND THE CITY AND THE CITY'S AGENTS HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL OR THE CITY.
9. THE CONSTRUCTION CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL. ALL WARNING AND TRAFFIC CONTROL SIGNS,

AND LOCATIONS FOR THE SIGNS SHALL BE IN ACCORDANCE WITH CALTRANS REQUIREMENTS. A TRAFFIC CONTROL PLAN SHALL BE SUBMITTED BY THE CONTRACTOR, TO THE CITY A MINIMUM OF TWO WEEKS PRIOR TO PROCEEDING WITH THE WORK.

10. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS ON THE JOB, AND SHALL NOTIFY CITY ENGINEER OF ANY VARIATION FROM THE DIMENSIONS AND CONDITIONS SHOWN. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING SHOP DRAWINGS AND ALL MATERIAL SUBMITTALS TO THE CITY BEFORE PROCEEDING WITH FABRICATION OR ORDERING MATERIALS.
11. ANY DISCREPANCIES OR OMISSIONS FOUND IN THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE CITY ENGINEER AND THE DESIGN ENGINEER IMMEDIATELY. THE DESIGN ENGINEER WILL CLARIFY DISCREPANCIES OR OMISSIONS, IN WRITING, WITHIN A REASONABLE TIME.
12. BEFORE ORDERING STREET NAME SIGNS, THE CONTRACTOR SHALL CONTACT THE CITY FOR VERIFICATION OF STREET NAMES AND MANUFACTURER OF CITY STANDARD SIGNS. (PUBLIC WORKS DEPARTMENT PHONE 831-223-5170) AND PROVIDE SHOP DRAWINGS AND MATERIALS SUBMITTALS FOR REVIEW AND APPROVAL BY THE CITY ENGINEER.
13. THE PUBLIC WORKS DIRECTOR WILL MAKE DECISIONS, IN WRITING, ON ALL CLAIMS OF ANY PARTY ARISING FROM INTERPRETATIONS OR EXECUTION OF THE STANDARD SPECIFICATIONS. SUCH DECISIONS BY THE PUBLIC WORKS DIRECTOR SHALL BE FINAL.
14. CONTRACTOR SHALL POSSESS A VALID CLASS A - GENERAL ENGINEERING CONTRACTOR LICENSE, OR APPLICABLE CLASS C - SPECIALTY CONTRACTOR LICENSES, AT THE TIME THAT THE CONTRACT IS AWARDED.
15. CONTRACTOR SHALL PROVIDE LABORATORY REPORTS FROM AN ENGINEERING TESTING LABORATORY CERTIFYING THAT THE VARIOUS MATERIALS COMPLY WITH THE SPECIFICATIONS AT LEAST 10 DAYS PRIOR TO STARTING WORK ON THAT PARTICULAR ITEM OF WORK.
16. CONTRACTOR SHALL HAVE CITY OF SOLEDAD STDS. AND SPECS. AND A SET OF SIGNED PLANS ON SITE AT ALL TIMES, (INCLUDING

SUBCONTRACTORS).

## **UNDERGROUND NOTES (GENERAL)**

1. CONTRACTOR SHALL EXPOSE AND VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES, INCLUDING STORM DRAINS, SANITARY SEWERS AND WATER LINES, BEFORE ORDERING MATERIALS AND/OR CONSTRUCTING NEW FACILITIES.
2. ALL MANHOLES AND VALVE BOXES TO BE SET FLUSH WITH FINISHED GRADE, UNLESS OTHERWISE NOTED.
3. ALL TRENCHES AND EXCAVATIONS SHALL BE CONSTRUCTED IN STRICT COMPLIANCE WITH THE APPLICABLE SECTIONS OF CALIFORNIA AND FEDERAL O.S.H.A. REQUIREMENTS AND OTHER APPLICABLE SAFETY ORDINANCES, CONTRACTOR SHALL BEAR FULL RESPONSIBILITY FOR TRENCH SHORING DESIGN AND INSTALLATION. SEE GENERAL NOTES, NOTE 7.
4. PIPE MATERIALS AND INSTALLATION PROCEDURE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS AND THE MANUFACTURER'S RECOMMENDATIONS.
5. SHOULD ANY WATER SYSTEM MAINS OR SERVICES BE DAMAGED BY THE CONTRACTOR, THE WATER SYSTEM SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE CITY AND/OR AS DIRECTED BY THE CITY. THE CITY SHALL BE PROMPTLY NOTIFIED AND REPAIRS SHALL BE MADE AS DIRECTED BY THE CITY AT THE CONTRACTOR'S EXPENSE.
6. TRENCHES MAY BE BACKFILLED WITH NATIVE MATERIAL OR APPROVED IMPORTED GRANULAR MATERIAL WITH THE SOIL COMPACTED IN THIN LIFTS IN THE INTERMEDIATE BACKFILL ZONE PER THE GRADING SPECIFICATIONS IN THE GEOTECHNICAL REPORT. TRENCHES IN EXISTING STREETS SHALL BE BACKFILLED WITH CLEAN, IMPORTED SAND MATERIAL (MINIMUM S.E. = 30) FOR BOTH INITIAL AND INTERMEDIATE BACKFILL ZONES. A SAMPLE ANALYSIS BY THE GEOTECHNICAL ENGINEER SHALL BE SUBMITTED FOUR (4) DAYS BEFORE INTENDED USE, FOR APPROVAL BY THE CITY ENGINEER. BACKFILL WITHIN THE TRENCHES SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 95% BASED UPON THE ASTM TEST DESIGNATIONS D1557, D1556 AND D2992 (LATEST EDITIONS).

7. JETTING OF THE TRENCH BACKFILL MAY BE ALLOWED PER THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT AND AT THE DISCRETION OF THE CITY ENGINEER.
8. ALL AIR AND WATER PRESSURE TESTING OF PIPE SHALL BE WITNESSED BY THE CITY INSPECTOR. CLOSED CIRCUIT SEWER INSPECTION SHALL BE PERFORMED, REVIEWED AND ACCEPTED BY THE CITY ENGINEER PRIOR TO PLACING OF ANY ASPHALY CONCRETE.
9. PVC WATER SYSTEM MAINS SHALL HAVE LOCATING WIRE AND MAGNETIC TAPE PER THE STANDARD DETAILS.
10. APPROVAL OF THE CITY ENGINEER OR HIS AUTHORIZED REPRESENTATIVE, IS REQUIRED ON COMPLETED WORK PRIOR TO: (A) PLACING OF ANY CONCRETE, (B) PLACING OF AGGREGATE BASE, (C) PLACING OF ASPHALTIC CONCRETE, (D) BACK FILLING TRENCHES FOR PIPE. WORK DONE WITHOUT SUCH APPROVAL SHALL BE AT THE CONTRACTOR'S RISK. SUCH APPROVAL SHALL NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF PERFORMING THE WORK IN AN ACCEPTABLE MANNER. CITY MAY REQUIRE THE CONTRACTOR UNCOVER ALL SUCH WORK INSTALLED WITHOUT SUCH APPROVAL.

## **STORM DRAIN**

1. DRAINAGE PIPE SHALL BE AS SHOWN ON THE PLANS.
2. STORM DRAIN MANHOLES SHALL BE CONSTRUCTED TO THE CITY STANDARD SPECIFICATIONS AND STANDARD DETAILS.
3. DROP INLETS (AND/OR CATCH BASINS) SHALL BE CONSTRUCTED TO THE CITY STANDARD SPECIFICATION AND STANDARD DETAILS.
4. STORM DRAIN PIPE SHALL BE AS FOLLOWS:
  - 1 REINFORCED CONCRETE PIPE (RCP) SHALL BE CLASS III OR HIGHER CLASS DEPENDING ON DEPTH OF COVER AND SHALL MEET CALTRANS STANDARD SPECIFICATIONS, SECTION 65-1.06 REQUIREMENTS FOR RUBBER GASKETED JOINTS UNDER ALL PAVEMENT AREAS.
  - 2 POLYETHYLENE PIPE SHALL MEET AASHTO M252/M294 REQUIREMENTS AND ASTM F405/F667 SPECIFICATIONS IF THE

CITY ALLOWS THE USE AT CITY'S WHOLE DISCRETION,  
USUALLY IN LANDSCAPED OR NON-PAVEMENT AREAS.

NOTE: HIGH DENSITY POLYETHYLENE PIPE IS FOR SPECIAL  
PURPOSES AND MAY APPROVED BY THE CITY PUBLIC WORKS  
DIRECTOR FOR USE ON A CASE BY CASE BASIS.

## **SANITARY SEWER**

1. SANITARY SEWER MANHOLES SHALL BE CONSTRUCTED TO THE CITY STANDARD SPECIFICATIONS AND STANDARD DETAILS.
2. SANITARY SEWER PIPE SHALL BE POLYVINYL CHLORIDE (PVC) PLASTIC GRAVITY SEWER PIPE WITH INTEGRAL WALL BELL AND SPIGOT JOINTS FOR THE CONVEYANCE OF DOMESTIC SEWAGE. ALL SOLID WALL PIPE, FITTINGS AND COUPLINGS IN 4" THROUGH 15" INCH DIAMETERS SHALL CONFORM TO ASTM D3033 AND ASTM D3034, SDR 35 MINIMUM. PIPE, FITTINGS AND COUPLINGS SHALL BE MARKED PER ASTM REQUIREMENTS. RUBBER GASKETS SHALL BE FACTORY INSTALLED AND CONFORM TO ASTM F477.
3. PIPE SHALL BE INSTALLED IN COMPLIANCE WITH THE STANDARD SPECIFICATIONS AND THE MANUFACTURERS RECOMMENDED TRENCH CONSTRUCTION PRACTICE FOR SEMI-RIGID PVC SEWER PIPE AND AS DIRECTED BY THE CITY.
4. ALL SEWER SERVICES SHALL BE 4" MINIMUM DIAMETER PVC SEWER PIPE, SDR 35 AND SHALL BE INSTALLED AT OR NEAR THE PREFERRED CENTER OF LOT LOCATION AND EXTEND 5' INTO LOTS, CAPPED AND MARKED FOR FUTURE EXTENSION PER CITY STANDARDS.
5. SEWER SERVICE LATERALS SHALL BE CONSTRUCTED TO THE CITY STANDARD SPECIFICATIONS AND STANDARD DETAILS. ALL NEWER PIPE SERVICE CONNECTIONS SHALL BE INSTALLED WITH WYE FITTINGS. NEW SERVICES ON EXISTING SEWER PIPES SHALL BE CONNECTED WITH WYE SADDLES WITH STAINLESS STEEL BANDS. EXISTING SERVICES SHALL BE CONNECTED WITH APPROPRIATE ADAPTERS AND FITTINGS FOR CONNECTING VARIOUS PIPES, MATERIALS AND SIZES.
6. ALL SEWER SERVICES SHALL BE MARKED WITH AN "S" ON TOP OF CURB.

7. SANITARY SEWER MANHOLES SHALL BE USED AT THE UPSTREAM ENDS OF ALL SANITARY SEWER MAINS.

## **WATER SYSTEM**

1. ALL WORK SHALL BE IN CONFORMANCE WITH THE FOLLOWING:
  - APPLICABLE SECTIONS OF THE AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARDS, LATEST EDITION.
  - CITY STANDARD SPECIFICATIONS, FOR THE INSTALLATION OF WATER FACILITIES.
  - DEPARTMENT OF HEALTH SERVICES, WATER MAIN AND APPURTENANCES STANDARD (ARTICLE 5, CHAPTER 16, TITLE 22, CALIFORNIA CODE OF REGULATIONS - CCR).
2. MATERIALS - ALL PIPE, VALVES, FITTINGS, CONNECTIONS AND APPURTENANCES THERETO SHALL CONFORM TO THE PROVISIONS OF THESE SPECIFICATIONS OR AS SPECIFICALLY SET FORTH IN THE CITY STANDARDS. THE DEPARTMENT OF PUBLIC WORKS MAINTAINS A LISTING OF APPROVED FIRE HYDRANTS, METERS AND WATER SERVICE MATERIAL AND FITTINGS WHICH ESTABLISH A STANDARD OF MATERIAL QUALITY FOR THE CITY WATER SYSTEM. MATERIAL USED SHALL BE LIMITED TO THOSE ON THIS LISTING. ALTERNATE MATERIAL ITEMS MAY BE ADDED TO THIS LIST UPON REVIEW AND/OR TEST BY THE DEPARTMENT OF PUBLIC WORKS.

ALL TEES, VALVES, REDUCERS, ETC. SHALL BE FLANGE BY FLANGE (FLxFL) CONNECTED. FITTING TO WATER MAIN CONNECTION MAY BE FLANGE X MECHANICAL JOINT (FLxMJ). ALL PIPES AND FITTINGS (EXCEPT VALVES) SHALL HAVE A MINIMUM WORKING PRESSURE OF ONE HUNDRED AND FIFTY (150) POUNDS PER SQUARE INCH (PSI) AND CONFORM TO THE FOLLOWING REQUIREMENTS.

CITY OF SOLEDAD WATER SYSTEM MAINS SHALL BE PVC C900 PER ASTM D1784. DUCTILE IRON PIPE MAY BE REQUIRED BY THE CITY ON A CASE-BY-CASE BASIS FOR SPECIAL INSTALLATION CONDITIONS SUCH AS SHALLOW COVER.

PVC PIPE - PVC WATER SYSTEM PIPE SHALL CONFORM TO ASTM D1784 C900 CLASS 150 DR18 FOR 4" TO 12" DIAMETER PIPE. ASTM D1784 C905 CLASS 165 DR25 FOR 14" THROUGH 20" PIPE. HIGHER CLASS PIPE MAY BE REQUIRED BY THE CITY ON A CASE-BY-CASE BASIS. ALL JOINTS SHALL BE INTEGRAL BELL AND SPIGOT

GASKETED JOINTS PER ASTM F477 AND ASTM D3139. CELL CLASS SHALL BE 12454B.

PVC FITTINGS - PVC FITTINGS SHALL CONFORM TO THE CLASS OF THE PVC MAIN AND AWWA STANDARDS. INSTALLATION OF COMPLETE ASSEMBLY SHALL BE IN CONFORMANCE WITH AWWA M23 AND UNIBEL B3 SPECIFICATIONS FOR PVC PRESSURE PIPE. DUCTILE IRON FITTING CONFORMING TO CITY STANDARDS MAY BE USED PROVIDED THEY ARE CEMENT MORTAR LINED AND WRAPPED WITH 8 MIL. MINIMUM PLASTIC WRAPPING.

TRACER WIRES - TRACER WIRES SHALL BE PROVIDED FOR ALL PVC WATER MAINS PER CITY STANDARDS.

DUCTILE IRON PIPE - DUCTILE IRON PIPE FOR WATER AND OTHER LIQUIDS SHALL BE FURNISHED IN THE SIZES, CLASSES, GRADES OR NOMINAL THICKNESS, AND JOINT TYPES DESIGNATED ON THE PLANS OR IN THE SUPPLEMENTAL CONDITIONS.

DUCTILE IRON PIPE SHALL COMPLY WITH ANSI/AWWA C151/A21.51 FOR A MINIMUM WORKING PRESSURE OF 150 PSI UNLESS OTHERWISE SPECIFIED. DUCTILE IRON PIPE SHALL CONFORM TO AND BE TESTED IN ACCORDANCE WITH ASTM E8 AND E23. CASTING GRADE FOR PIPE SHALL BE 60-42-10. LAYING LENGTH SHALL BE THE MANUFACTURER'S STANDARD LENGTH, NORMALLY 18 FEET. SHORTER LENGTHS MAY BE USED WHEN REQUIRED FOR CLOSURES AND PROPER LOCATION OR SPECIAL SECTIONS.

THE INTERIOR SURFACE OF ALL DUCTILE IRON PIPE SHALL BE CEMENT MORTAR LINED AND SEAL COATED IN CONFORMANCE WITH ANSI/AWWA C104/A21.4 AND THE EXTERIOR SURFACE SHALL HAVE AN ASPHALTIC COATING, APPROXIMATELY 1 MIL. THICK.

FITTINGS SHALL BE PUSH-ON, MECHANICAL, OR FLANGED-TYPE DUCTILE IRON OR CAST IRON AND SHALL CONFORM TO ANSI/AWWA C111/A21.11 OR ANSI/AWWA C110/A21.10 DESIGNATED FOR A WORKING PRESSURE OF 250 PSI. DUCTILE IRON CASTINGS SHALL CONFORM TO AND BE TESTED IN ACCORDANCE WITH ASTM A536, EXCEPT THE CASTING GRADE SHALL BE 70-50-05. COATING AND LINING REQUIREMENTS SHALL BE PER AWWA C104/A21.4.

JOINTS SHALL BE MECHANICAL OR FLANGED TYPE AND SHALL CONFORM TO ANSI/AWWA C111/A21.11 AND ANSI/AWWA C110/B16.1 AND A 21.10 WITH RUBBER GASKETS UNLESS OTHERWISE SPECIFIED.

3. CAST IRON FITTINGS - CAST IRON FITTINGS SHALL BE USED ON ALL DUCTILE IRON AND POLYVINYL CHLORIDE PIPELINES AND SHALL CONFORM TO ANSI/AWWA C110/A21.10 IN MATERIAL, BODY THICKNESS, AND RADII OF CURVATURE. THE FITTINGS SHALL BE COATED WITH A CEMENT MORTAR LINING AT LEAST 1/16" THICK IN ACCORDANCE WITH ANSI/AWWA C104/A21.4.

CAST IRON FITTINGS SHALL BE CLASS D FITTINGS CONFORMING TO ASTM DESIGNATION 126 AND SHALL BE ONE HUNDRED AND TWENTY FIVE (125) PSI STANDARD. ALL VALVES AND FITTINGS SHALL BE FLANGED.

4. VALVES - THIS SPECIFICATION INCLUDES GATE VALVES AND OPERATORS INTENDED FOR BURIED SERVICE IN A DOMESTIC WATER SYSTEM.

VALVES SHALL BE IRON BODY, WITH BRONZE STEM NUTS, GLANDS AND BUSHINGS, RESILIENT-SEATED GATE VALVE WITH RESILIENT SEAT BONDED OR MECHANICALLY ATTACHED TO THE GATE, NON-RISING STEM (NRS), OPEN TO THE LEFT (COUNTER-CLOCKWISE), WORKING WATER PRESSURE OF 200 PSI, CONFORMING TO THE REQUIREMENTS OF ANSI/AWWA C509. THE VALVE SHALL HAVE A TWO (2) INCH SQUARE OPERATING UNIT. UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE PLANS, VALVES SHALL BE FURNISHED WITH ENDS FLANGED OR MECHANICAL JOINT, USING AN ELASTOMERIC-GASKET SEAL, AND SHALL CONFORM IN DIMENSIONS AND STYLE TO THE PIPE AND/OR FITTING REQUIREMENTS. THEY SHALL BE EPOXY COATED INSIDE AND OUT. VALVES SHALL BE AS MANUFACTURED BY AVK AMERICAN GATE, MUELLER OR EQUAL.

VALVES FOR USE WITH FLANGED PIPE SHALL BE CAST WITH CLASS 125 FLANGES, DIMENSIONS AND DRILLING SHALL CONFORM TO ASA B16.1. FLANGE BOLT HOLES SHALL BE SPOT FACED IF FLANGE FILLETS INTERFERE WITH BOLT HEADS AND NUTS.

INLET FLANGE AND TAPPING GATE VALVE FLANGES SHALL BE CLASS 125 FLANGES. TAPPING SLEEVES SHALL BE ROMAC SST, ROCKWELL 600 SERIES, OR AN APPROVED EQUAL.

ALL STEM SEALS, SHALL BE O-RINGS ONLY.

WRENCH NUTS SHALL BE MADE OF TOP GRADE CAST IRON, FITTING THE TOP OF THE VALVE STEM AND SECURED BY NUT OR KEY.

VALVES REQUIRING OPERATING WRENCHES EXCEEDING SIX (6) FEET IN LENGTH SHALL HAVE EXTENSION AND GUIDES INSTALLED IN VALVE BOXES.

5. VALVE BOXES - VALVE BOXES FOR TRAFFIC SERVICE SHALL BE A G-5 BOX AS MANUFACTURED BY CHRISTY CONCRETE PRODUCTS OR EQUAL AND BE OF A PRECAST CONCRETE, AND SHALL HAVE A CAST IRON FACE AND A CAST IRON TRAFFIC LID. VALVE BOXES OUT OF TRAFFIC AREAS SHALL BE OF PRECAST CONCRETE, WITH A CONCRETE LID. COVERS SHALL BE MARKED "WATER" AND SHALL HAVE A LOOSE FIT IN THE BOX. VALVE BOX RISERS SHALL BE OF PRECAST CONCRETE OR PVC AND SHALL FIT INSIDE OF VALVE BOX WITHOUT SLIPPING.
6. THRUST BLOCKS - THRUST BLOCKS SHALL CONFORM TO THE STANDARDS DRAWINGS. CONCRETE FOR THRUST BLOCKS SHALL BE CLASS III WITH ONE AND ONE-HALF (1-1/2) INCH MAX. SIZE AGGREGATE IN ACCORDANCE WITH SECTION 90 OF THE STANDARD SPECIFICATIONS.
7. FIRE HYDRANTS ASSEMBLIES - FIRE HYDRANTS SHALL BE WET BARREL, MEETING THE REQUIREMENTS OF ANSI/AWWA C503. WET BARREL HYDRANTS SHALL BE FURNISHED WITH A CLOW MODEL 40 BREAK-OFF SPOOL WITH CHECK VALVE AND WITNESS HOLE OR EQUAL.

THE FOOTPIECE SHALL HAVE AN INLET SIZE FOR CONNECTING TO PIPE OF NOT LESS THAN SIX (6) INCHES AND SHALL BE SUITABLE FOR PUSH-ON, MECHANICAL JOINT, OR FLANGED END PIPE.

THE BURY LENGTH SHALL BE THREE (3) FEET FROM THE FLANGED "BREAKABLE" SECTION TO THE CENTERLINE OF THE CONNECTING PIPE, UNLESS OTHERWISE SHOWN ON THE PLANS, OR REQUIRED BY THE TOPOGRAPHY AND APPROVED BY THE ENGINEER.

FIRE HYDRANT SHALL BE CLOW 860 WITH TWO 2-1/2" AND ONE 4-1/2" OUTLET.

EVEN THOUGH NOT INDICATED ON THE PLANS, EVERY FIRE HYDRANT INSTALLATION SHALL HAVE A SIX (6) INCH GATE VALVE INSTALLED ON THE LATERAL TEE AT THE MAIN.

8. INSTALLATION - FOR INSTALLATION DETAILS, SEE THE STANDARD DRAWINGS. IN NO CASE SHALL A FIRE HYDRANT BE INSTALLED WITHIN THREE (3) FEET OF A BUILDING OR ANY OTHER STRUCTURE

THAT WOULD LIMIT ACCESS. FIRE HYDRANTS SHALL STAND PLUMB WITH THE PUMPER OUTLET FACING THE STREET AND AT LEAST EIGHTEEN (18) INCHES ABOVE THE SIDEWALK OR FINISHED GROUND SURFACE, WHICHEVER IS HIGHER.

INSTALL 2-WAY BLUE REFLECTIVE STREET MARKER IN STREET DIRECTLY ACROSS FROM FIRE HYDRANT AND 12" OFF CENTERLINE TOWARD THE FIRE HYDRANT.

9. SERVICE LINES - SERVICE LINES UP TO AND INCLUDING METER CONNECTION SHALL BE AS DETAILED IN THE STANDARD DRAWINGS, AS APPLICABLE FOR THE SERVICE INTENDED AND WITH THE AWWA STANDARD C800, EXCEPT AS HEREINAFTER MODIFIED OR AS MODIFIED BY THE PLANS AND SPECIAL CONDITIONS.
10. MATERIALS - ALL WATER SERVICE LINES SHALL BE 1 INCH IN DIAMETER FOR DOMESTIC SERVICE WITHOUT SPRINKLERS AND 1-1/2 INCHES FOR DOMESTIC SERVICE WITH SPRINKLERS UNLESS OTHERWISE SPECIFIED. WATER SERVICE PIPE MATERIAL UP TO AND INCLUDING 2 INCHES SHALL BE COPPER WATER TUBING, "TYPE K", SOFT TEMPERED, MEETING ASTM B88 AND ANSI/AWWA C800. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. SERVICES TWO (2) INCHES AND LARGER SHALL BE CONSIDERED AS A SPECIAL CONDITION AND WILL REQUIRE THE PRIOR APPROVAL OF THE CITY ENGINEER.

ALL SERVICES SHALL BE EQUIPPED WITH A CORPORATION STOP AT THE MAIN. ON SERVICES UP TO AND INCLUDING 2 INCH DIAMETER, A CURB STOP SHALL BE INSTALLED AT THE PROPERTY LINE OR EASEMENT LINE; ON LARGER SERVICES A GATE VALVE SHALL BE INSTALLED. SIZE OF THE CORPORATION STOP AND CURB STOP OR GATE VALVE SHALL BE THE SAME AS THE SERVICE LINE. A VALVE BOX AT THE PROPERTY LINE OR EASEMENT LINE IS REQUIRED FOR ALL SERVICES. VALVE BOXES IN UNIMPROVED AREAS SHALL BE SET 6 INCHES ABOVE GRADE. SERVICE SADDLE REQUIREMENTS ARE INDICATED ON THE STANDARD DRAWINGS. ONLY NEOPRENE OR RUBBER GASKETS SHALL BE USED BETWEEN THE SADDLE AND THE PIPE. THREADS FOR UNDERGROUND SERVICE LINE AND FITTINGS SHALL CONFORM TO ANSI/AWWA C800.

11. ALL WATER SERVICES SHALL BE MARKED WITH A "W" ON TOP OF CURB.

12. WATER METERS - WATER METERS ARE SUPPLIED AND INSTALLED BY THE CITY. ONE WATER METER SHALL BE REQUIRED FOR EACH RESIDENTIAL UNIT, APARTMENT, CONDO, TOWNHOME, GRANNY UNIT, AND RENTAL UNIT WHETHER COMMERCIAL OR RESIDENTIAL.

COLD-WATER METER MAIN CASE CONNECTIONS FOR 1-1/2" AND 2 INCH SIZES SHALL BE PROVIDED ON BOTH ENDS WITH OVAL TYPE FLANGE; 3 INCH SIZE AND LARGER SHALL BE PROVIDED ON BOTH ENDS WITH ROUND TYPE FLANGE; BOTH OVAL AND ROUND FLANGE DIMENSIONED AS SHOWN IN TABLE 3, ANSI/AWWA C701.

13. METER BOX - METER BOX SHALL BE OF PRECAST REINFORCED CONCRETE DESIGNED FOR THE APPROPRIATE SIZE OF METER AND CURB STOP. METER BOX LID OUTSIDE OF TRAFFIC AREA SHALL HAVE A REINFORCED CONCRETE LID AND METER BOX FOR TRAFFIC SERVICE SHALL HAVE A STEEL CHECKER PLATE TRAFFIC COVER WITH ROUND-SELF CLOSING READING LID. COVERS SHALL BE MARKED "WATER".
14. INSTALLATION - A METER BOX SHALL BE INSTALLED AT EACH METER LOCATION IN SUCH A MANNER TO PREVENT UNDUE STRESS FROM NORMAL OR TRAFFIC LOAD ON THE METER, CURB STOP, FITTINGS AND PIPING.

METER BOX, WITH THE APPROPRIATE LID, SHALL BE SET FLUSH WITH THE FINISH GRADE, PAVEMENT OR CONCRETE.

## **GRADING AND PAVING NOTES**

1. CONTRACTOR SHALL NOTIFY THE CITY 48 HOURS BEFORE STARTING GRADING WORK.
2. ALL EARTHWORK SHALL BE CONSTRUCTED PER THE GRADING SPECIFICATIONS IN THE GEOTECHNICAL REPORT. ALL SOIL SHALL BE COMPACTED TO A MINIMUM OF 90% RELATIVE COMPACTION, AS REQUIRED BY THE ASTM TEST DESIGNATIONS D1557, D1556, AND D2992 (LATEST EDITIONS), EXCEPT THE PAVEMENT SUB-GRADE. THE UPPER LAYER OF SUBGRADE SHALL BE COMPACTED TO 95% RELATIVE COMPACTION, THE EXACT DEPTH SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND/OR AS SHOWN ON THESE PLANS.
3. BACKFILL FOR UNDERGROUND UTILITIES PLACED ON THE SITE SHALL CONSIST OF CLEAN, IMPORTED SAND MATERIAL (MINIMUM S.E.=30) TO A MINIMUM OF 12 INCHES OVER THE CONDUIT, UNLESS

SHOWN OTHERWISE ON THE PLAN. BACKFILL FOR UNDERGROUND UTILITIES PLACED IN EXISTING STREETS SHALL CONSIST OF CLEAN, IMPORTED SAND MATERIAL (MINIMUM S.E.=30) FOR THE FULL TRENCH DEPTH TO THE PAVEMENT SUBGRADE, UNLESS SHOWN OTHERWISE ON THE PLAN. A SAMPLE SHALL BE SUBMITTED FOUR (4) DAYS BEFORE INTENDED USE, FOR REVIEW BY THE ENGINEER. BACKFILL WITHIN THE UTILITY TRENCHES SHALL BE COMPACTED TO A MINIMUM RELATIVE COMPACTION OF 95% (OR 90% DEPENDING UPON THE LOCATION AND APPROVED BY THE CITY) AND BASED UPON THE ASTM TEST DESIGNATIONS D1557, D1556 AND D2992 (LATEST EDITIONS).

4. AT ALL TIMES DURING CONSTRUCTION AND UNTIL FINAL COMPLETION, THE CONTRACTOR, WHEN HE OR HIS SUBCONTRACTORS ARE OPERATING EQUIPMENT ON THE SITE, SHALL PREVENT THE FORMATION OF AN AIRBORNE DUST NUISANCE BY WATERING AND/OR TREATING THE SITE OF THE WORK IN SUCH MANNER THAT WILL CONFINE DUST PARTICLES TO THE IMMEDIATE SURFACE OF THE WORK. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE DONE BY THE DUST FROM HIS OR HER SUBCONTRACTOR'S ACTIVITIES IN PERFORMING THE WORK UNDER THIS CONTRACT.
5. ALL AGGREGATE SUBBASE AND AGGREGATE BASE MATERIAL, AND THE HANDLING AND PLACEMENT THEREOF, SHALL BE IN CONFORMANCE WITH CALTRANS STANDARD SPECIFICATIONS. AGGREGATE SUBBASE SHALL BE CLASS 2. COMPACT TO A MINIMUM OF 95% RELATIVE COMPACTION.
6. A PRIME COAT OF LIQUID ASPHALT, GRADE SC-70, CONFORMING TO CALTRANS STANDARD SPECIFICATIONS, SHALL BE APPLIED AT THE RATE OF 0.25+ GALLONS PER SQUARE YARD TO THE SURFACE OF AGGREGATE BASE PRIOR TO PLACEMENT OF ASPHALT CONCRETE, UNLESS WAIVED BY THE CITY.
7. ASPHALT CONCRETE (AC) SHALL CONSIST OF A MIXTURE OF SAND, MINERAL, AGGREGATE, AND LIQUID ASPHALT, DESIGNATED AS CALTRANS STANDARD SPECIFICATIONS, TYPE "A", 3/4" MAXIMUM, MEDIUM GRADING. MIXED IN SUCH PROPORTIONS THAT THE PERCENTAGE BY WEIGHT WILL BE WITHIN:

<b>SIEVE SIZES</b>	<b>(PERCENTAGE PASSING)</b>
3/4 "	100
1/2 "	95-100
3/8 "	80-95

No. 4	59-66
No. 8	43-49
No. 30	22-27
No. 200	3-8

PLUS PAVING ASPHALT, VISCOSITY GRADE PG64-10 AT 5 TO 6-1/2% OF THE COMBINED DRY AGGREGATES.

ACTUAL MIX DESIGN SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL AT LEAST 10 WORKING DAYS PRIOR TO STARTING ANY PAVING WORK.

8. PAINT BINDER OR ASPHALT EMULSION, GRADE CRS-1, CONFORMING TO CALTRANS STANDARD SPECIFICATIONS, SHALL BE APPLIED TO EXISTING ASPHALT CONCRETE SURFACES AND VERTICAL CONCRETE SURFACES TO RECEIVE ASPHALT CONCRETE.
9. FOG SEAL, GRADE CSS-1H, CONFORMING TO CALTRANS STANDARD SPECIFICATION, SHALL BE APPLIED AT THE RATE OF 0.10+ GALLONS PER SQUARE YARD TO THE SURFACE OF ALL NEW ASPHALT CONCRETE PAVEMENT.
10. MATERIALS AND INSTALLATION OF PORTLAND CEMENT CONCRETE CURB, GUTTER AND SIDEWALK SHALL CONFORM TO THE APPLICABLE SECTIONS OF THE CALTRANS STANDARD SPECIFICATIONS AND THE CITY STANDARD SPECIFICATIONS AND DETAILS.
11. EXISTING A.C. SURFACE SHALL BE SAW CUT TO A NEAT STRAIGHT LINE PARALLEL WITH THE STREET CENTERLINE AND THE EXPOSED EDGE SHALL BE TACKED WITH EMULSION PRIOR TO PAVING. WHEN TRENCHING THROUGH CURB, GUTTER AND SIDEWALK, A SAW CUT WILL BE USED. WHERE EXISTING PAVEMENT IS TRENCHED, REPLACE WITH 3" A.C. AND 8" A.B. MINIMUM OR MATCH THE EXISTING SECTION, WHICHEVER IS GREATER. THE EXPOSED BASE MATERIAL SHALL BE GRADED, RECOMPACTED AND RESEALED PRIOR TO REPAVING. SEAL COAT <E> A.C. AND NEWLY PLACED A.C. AT EDGES.
12. ALL VALVE BOXES AND MANHOLES TO BE SET FLUSH WITH FINISHED GRADE, UNLESS OTHERWISE NOTED.
13. PRIOR TO PERFORMING THE FINAL GRADING AND SUB-GRADE COMPACTION FOR THE PAVED AREAS, THE CONTRACTOR SHALL REVIEW THE PROPOSED GRADES WITH THE CITY ENGINEER AND COMPLY WITH HIS REQUESTS FOR ANY MINOR GRADE CHANGES.



TRENCHES FOR PIPE. WORK DONE WITHOUT SUCH APPROVAL SHALL BE AT CONTRACTOR'S RISK. SUCH REVIEW SHALL NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF PERFORMING THE WORK IN AN ACCEPTABLE MANNER.

22. IN THE EVENT THAT HUMAN REMAINS AND/OR CULTURAL MATERIALS ARE FOUND, ALL PROJECT RELATED CONSTRUCTION SHOULD CEASE WITHIN A 100' RADIUS. THE CONTRACTOR SHALL, PURSUANT TO SEC. 7050.0 OF THE HEALTH AND SAFETY CODE, AND SECTION 5097.97 OF THE PUBLIC RESOURCES STATE CODE, NOTIFY THE MONTEREY COUNTY CORONER IMMEDIATELY.

## **SECTION 3**

# **DESIGN STANDARDS FOR LANDSCAPE IRRIGATION AND OBSERVATION GUIDE FOR LANDSCAPE PLANTING**

***DESIGN STANDARDS  
FOR LANDSCAPE IRRIGATION***

## **DESIGN STANDARDS FOR LANDSCAPE IRRIGATION**

### **PART 1 - GENERAL**

#### **A. PLANNING AN IRRIGATION SYSTEM**

1. Planning the Irrigation System is a totally separate process from design. The planning phase is the information gathering phase.
2. Questions concerning available site utilities (water and power), landscape planting, hardscape, grading, site usage, soil characteristics, product type preferences, irrigation time constraints, budget, phasing, level of commitment to system management etc., must be investigated and correctly answered in the planning phase.

#### **B. PLAN SUBMITTAL**

1. Plans and specifications for all irrigation systems shall be submitted to the appropriate governing agency for approval prior to installation.

#### **C. AUTOMATED SYSTEMS**

1. All landscape irrigation projects shall be irrigated by a fully automated irrigation system.

### **PART 2 - PLAN REQUIREMENTS**

#### **A. GRAPHICS**

1. The graphic presentation of the design shall include clear and concise drawings in Autocad 2006 version or other medium as directed by the City.
2. Where plan reduction is anticipated, symbol sizing and lettering shall be appropriate to permit legibility.

#### **B. POINT OF CONNECTION (POC)**

Information for each POC shall include the following:

1. Exact location of each POC together with tie in fittings where known.
2. Type, size and length of meter service piping.
3. Meter type and size.
4. Static water pressure.
5. System design pressure.
6. Maximum flow requirement.

### **C. Installation Details**

Provide installation details as required for all major components of the system, which typically might include the following:

1. Point of connection (POC).
2. Pump stations.
3. Backflow prevention assemblies.
4. Gate and specialty valves.
5. Remote control valves (RCV).
6. Automatic controllers.
7. Pop-up sprinkler heads and swing joints.
8. Shrub spray sprinkler heads and swing joints.
9. Bubblers.
10. Emitter control assembly showing RCV, strainer, and pressure regulating valve.
11. Emitter and emitter tubing installation.
12. Thrust blocks.
13. Drain valves.
14. Quick coupling valves.
15. Trenching details.
16. Electrical wire splicing.
17. Moisture sensing devices.

## **PART 3 – DESIGN REQUIREMENTS**

### **A. PRESSURE**

1. Systems shall be designed to the lowest static pressure available in any 12- month period.
2. Pressure reducing valves or pressure regulating remote control valves shall be required when available static pressure exceeds the “System Design Pressure” by more than 15 psi. (System Design Pressure = all losses + sprinkler operating pressure).
3. The designer shall specify, in legend, the design operating pressure for each model of sprinkler head used.
4. Pressure at any point within a section should not vary by more than 20% from the designed outlet operating pressure, unless pressure-compensating outlets are used.

**B. PRESSURE LOSS CALCULATIONS**

- 1. Provide a chart showing pressure losses for the “worst case” zone. This may be the largest zone, and/or the farthest zone from the POC, and /or the highest zone.

**PRESSURE LOSS CALCULATIONS**

PROJECT \_\_\_\_\_

SHEET NO. \_\_\_\_\_

POC NO. \_\_\_\_\_

RCV NO. \_\_\_\_\_

FLOW \_\_\_\_\_ GPM

MINIMUM ANNUAL STATIC PRESSURE \_\_\_\_\_

MAXIMUM STATIC PRESSURE \_\_\_\_\_

A- LOSSES \_\_\_\_\_

1. MAIN TO METER \_\_\_\_\_

2. METER \_\_\_\_\_

3. METER TO POC \_\_\_\_\_

4. BACKFLOW PREVENTION UNIT \_\_\_\_\_

5. MAIN LINE \_\_\_\_\_

6. REMOTE CONTROL VALVE \_\_\_\_\_

7. SPECIALTY VALVES \_\_\_\_\_

8. ACCESSORIES \_\_\_\_\_

9. LATERAL LINE PIPE \_\_\_\_\_

10. ELEVATION \_\_\_\_\_

11. FITTINGS & MISCELLANEOUS \_\_\_\_\_

B- REQUIRED SPRINKLER OPERATING PRESSURE \_\_\_\_\_

C- REQUIRED SYSTEM OPERATING PRESSURE \_\_\_\_\_

D- DIFFERENCE \_\_\_\_\_

NOTE: \_\_\_\_\_

**C.    **EVAPO-TRANSPIRATION DEFICIT & PRECIPITATION RATE****

1.    Systems must have the capacity to apply water in an amount that will satisfy the weekly evapo-transpiration deficit.
2.    Turf area sprinklers must complete each day’s watering within a time frame that will not interfere with the facility activities.
3.    Germination and plant establishment periods are exempt from the above provision.
4.    Controllers must be capable of multiple start times per day, as required.
5.    Calculate the precipitation rate, this section, using the following formula:

TRIANGULAR SPACING

SQUARE SPACING

$$\frac{96.3 \text{ X GPM}}{S \text{ X L}}$$

$$\frac{96.3 \text{ X GPM}}{S \text{ X S}}$$

WHEREIN:

- 96.3 = CONSTANT
- GPM = OF FULL CIRCLE SPRINKLER IN PATTERN
- S = SPACING BETWEEN SPRINKLERS
- L = SPACING BETWEEN ROWS  
(S X .866)

6.    Calculate the application rate, this section, for the highest use month, in inches/week.
7.    Total the accumulated watering time for each POC, per day, maximum condition.

**D.    **SECTIONING****

1.    Provide separate sections where practical, for areas such as:
  - a.    Turf
  - b.    Shrubs
  - c.    Ground Cover
  - d.    North & East sun exposures
  - e.    South & West sun exposures
  - f.    Sloping areas of 3:1 or greater – usually with top and toe of slope with separate valves, if slope is more than 25’ vertical height.

- g. Special situations such as building overhands, on structure planting, areas of deep shade, raised planters and pots, supplemental tree watering, etc.
2. No section shall be designed with sprinkler heads having precipitation rates, which vary by more than 20%, where practical.
3. No single section shall be designed with sprinkler heads having required operating pressures, which vary by more than 20%.

**E. PVC PIPE, FITTINGS AND FLOW VELOCITY**

1. PVC Pipe shall be cell classification 12454 B, unless otherwise approved.
2. The working pressure rating of mainline pipe should be at least twice the anticipated working pressure of the system.
3. The minimum working pressure rating of lateral line pipe (intermittent pressure) should be 200 psi.
4. Solvent weld fittings shall be schedule 40 PVC, or schedule 80 PVC, as shown on the detail drawings.
5. Gasketed fittings shall be class 200 psi rated PVC, epoxy coated steel, or cast iron.
6. Polyethylene pipe and fittings shall be as called for on the drawings.
7. PVC nipples shall be only schedule 80.
8. Flow velocity in a pipeline operating at full system capacity should not exceed 5 ft./sec., unless special consideration is given to the control of surge or water hammer thru the use of specialty valves.

**F. MISCELLANEOUS VALVES**

1. Where necessary, the designer shall incorporate the following specialty valves: pressure reducing valves; pressure relief valves; air relief valves; vacuum relief valves; isolation valves; quick coupler valves; drain valves; flush valves; strainers and filters.

**G. BACKFLOW PREVENTION ASSEMBLIES**

1. All irrigation systems shall be isolated from potable water supplies by use of an approved backflow prevention assembly.

2. Install all backflow preventers in compliance with local requirements.
3. Atmospheric vacuum breaker (AVB):
  - a. The AVB shall not be installed where there can be back pressure, but may be installed where the only backflow will be siphoned.
  - b. The AVB shall not be installed where toxic fluids or fertilizer may backflow.
  - c. The AVB shall be installed only on the non-pressure side of RCV'S, and there shall be no shut off valves down stream of the AVB.
  - d. There shall be no openings or accessories between the POC and the AVB without cross-connection protection for that device; i.e., drinking fountains or faucets with integral vacuum breakers.
  - e. The AVB shall be installed 12" above the highest component in that section, with air vents level.
4. Pressure vacuum breaker (PVB):
  - a. The PVB shall not be installed where there can be backpressure, but may be installed where the only backflow will be siphoned.
  - b. The PVB shall not be installed where toxic fluids or fertilizer may backflow.
  - c. The PBV shall be installed on the pressure side of RCV'S, and there shall be no opening or accessory between the POC and the PVB without cross-connection protection for that device; i.e., drinking fountains or faucets having integral vacuum breakers.
  - d. There may be openings or accessories on the downstream side of the PVB.
  - e. The PVB shall be installed 12" above the highest component in the entire system.
5. Reduced pressure backflow prevention assemblies (RPBP):
  - a. The RPBP shall be installed where there will be either back pressure or siphoned, and shall be installed on the pressure side of RCV'S.

- b. There shall be no openings or accessories between the POC and the RPBP without cross-connection protection for that device; i.e., drinking fountains or faucets with integral vacuum breakers.
  - c. There may be openings or accessories on the downstream side of the RPBP.
  - d. The RPBP may be installed where other components of the system are at a higher elevation or where there may be greater downstream pressure than in the potable system.
  - e. The RPBP must be installed where toxic fluid or fertilizers may backflow into the potable water system.
  - f. The RPBP shall be installed a minimum of 12” above the surrounding grade to provide both access for testing and drainage of discharge.
6. Install backflow preventers so as to provide a minimum clearance of 12” on all sides for access for servicing.
  7. Locate backflow preventers within shrub beds and adjacent to walls where practical and permitted.
  8. Locate backflow preventers a minimum of 6’ away from vehicular traffic.
  9. All risers and fittings used in the installation of backflow preventers shall be metallic, unless otherwise approved.

**H. REMOTE CONTROL VALVES (RCV)**

1. Valves shall be sized to provide for a minimum flow condition – if so required by the manufacturer. The size of these valves is usually irrespective of upstream and downstream pipe sizes. The use of a pressure regulator equipped remote control valve should be considered where the required pressure downstream of the RCV is 15 psi less than the available pressure on the upstream side of the RCV.

**I. SPRINKLER HEAD LOCATION**

1. All sprinkler heads should be spaced at 60% of diameter or less, and must take into account any anticipated stream or spray break-up that will reduce the distance of throw.
2. Trim perimeters of irrigated areas with sprinklers having an arc pattern and radius that will avoid overthrow onto adjacent areas.

**J. DEPTH OF PIPE BURY**

1. The minimum depth of soil cover shall conform to local codes, and/or as shown or listed in the drawings, details or specifications. Generally accepted practice follows:

<b>PRESSURE LINES</b>		<b>NON-PRESSURE LINES</b>	
<b>IN LANDSCAPING</b>	<b>UNDER VEHICULAR PAVING</b>	<b>IN LANDSCAPING</b>	<b>UNDER VEHICULAR PAVING</b>
RESIDENTIAL 12"	18"	8"	12"
COMMERCIAL 18"	24"	12"	18"

2. All pipe and wire under vehicular paving shall be installed in PVC sleeves, as practical, and where live loads are anticipated.
3. Pipe sleeves shall be marked with an above ground marking system for future location.

**K. VANDALISM**

1. Designers shall determine the historical and potential level of vandalism for the site and design the system as required to limit damage, using items such as backflow prevention device enclosures, controller enclosures, vandal resistant screws, lockable valve boxes, etc.

**L. HAZARDS**

1. Rotor sprinklers used in play areas shall have suitable protective covers (lids).
2. Shrub heads adjacent to bicycle, pedestrian and parking areas shall be the pop-up type as a substitute for fixed shrub risers.
3. Valve boxes shall not be located in playfields unless special consideration is made for safety.

**M. CODES**

1. Designs shall comply with all applicable codes.

**N. SPECIFICATIONS**

1. Project specifications may be statements shown on the plan or in a bound volume, comprehensive and concise.

2. Specifications shall prescribe material and the installation thereof.
3. “Standard” or “Boiler Plate” specifications must be adapted to the specific site and project.

## **INSTALLATION STANDARDS**

### **PART 1 – GENERAL**

#### **A. INSTALLATIONS ACCORDING TO APPROVED PLAN**

1. Installation of irrigation systems for commercial and institutional sites shall be performed in accordance with plans and specifications previously approved by the City.

#### **B. THE LANDSCAPE PLANS**

1. Landscape design professionals should keep in mind the many principles of xeriscape when preparing planting and irrigation plans. This will lead to increased system efficiency, greater water savings and easier system management. Features of the landscape planting plan that can contribute to greatly increased system efficiency and lowered maintenance, and shall be included are:
  - a. Grouping plants by their general water requirements;
  - b. Sizing and shaping of turf areas to meet City's equipment operating parameters;
  - c. Type of planting on steep slopes being consistent with post-construction BMP's;
  - d. Grouping plants based upon site conditions.
  - e. Installing weed control fabric for non-grass/non-turf areas.
  - f. Applying pre-emergent herbicides.
  - g. Minimizing uses eliminating altogether decomposed granite pathways or landscaped areas.
  - h. Providing dedicated drip heads.

### **PART 2 – INSTALLATION REQUIREMENTS**

#### **A. POINT OF CONNECTION (POC)**

1. Piping from the point of connection to the backflow prevention shall be as approved by local code.

#### **B. BACKFLOW PREVENTION ASSEMBLIES**

1. Install with union on discharge side for servicing, or with flanges, as required.

#### **C. REMOTE CONTROL VALVES (RCV)**

1. RCV's shall be installed in a manufactured plastic or concrete irrigation control valve box with optional locking lid.

2. Clearance between the highest part of the valve and the bottom of the valve box lid shall be 2" minimum and 4" maximum. (Lid must not rest on any part of valve and valves must not be buried too deep for convenient access.)
3. Clearance between the top of the piping and the bottom of the valve box and/or the valve box knock outs, shall be a minimum of 2". (The box must not rest on the piping.)
4. Clearance between the valve and the sides of the valve box shall be a minimum of 3".
5. Valve boxes shall not be installed within 12" of paving or structures.
6. Valve boxes shall be set with all surfaces of the lid within 1/2" of level with the compacted and settled finish grade.

**D. SPECIALTY VALVES**

1. All field located specialty valves shall be installed within a valve access box of adequate size to permit easy access for servicing and adjustment.

**E. SPRINKLER HEADS**

1. No sprinkler head shall be installed directly to rigid pipe. A method for achieving flexibility between the sprinkler head and the pipe is required using flexible nipples, swing joint assemblies, or multiple threaded ells.
2. Sprinkler heads must be set within 1/2" of level with the compacted and settled finish grade.
3. Part circle sprinklers must be set a minimum of 2" and a maximum 4" from all paved areas.
4. Pop-Up turf sprinklers shall have a spring retraction and a minimum 2" rise in the operating position.

**F. CONTROLLERS AND ELECTRIC POWER WIRE**

1. Secure the controllers and all exposed conduit so as to reduce damage from anticipated vandalism.
2. Install 110 volt wire to local code requirements.
3. Grounding of irrigation controllers shall be as per manufacturer's recommendations and as per local code.

## **G. LOW VOLTAGE CONTROL WIRE**

1. Install all 24 volt wire not occurring within the mainline trench at 18" depth.
2. Control wire shall be a minimum of 14 gage, direct burial, AWG, UF, UL, 300V wire, if not installed within a protective jacket.
3. Common wire shall be white. Control wires shall be other than white. Use a different color control wire for each controller.
4. Wire splices shall be made with epoxy filled, heat shrink, or other U.L. approved waterproof splice kits.
5. Splice wire in valve boxes or pull boxes only.
6. Bundle wire together in common "cable" by taping at maximum 15' intervals. Lay in trench beside main line, or as shown on detail drawings.
7. Provide slack in wire at each valve to permit valve cover, solenoid and wire splices to be lifted 18" for service.
8. Provide expansion loop at all 90 degree angles, and every 100' of straight wire run.

## **H. FLUSHING**

1. Do not install valves, sprinklers or emitters until the entire piping system serving them has been flushed under pressure adequate to expel all foreign material.

## **I. PRESSURE TESTS**

1. The contractor shall partially backfill, leaving all fittings exposed before testing.
2. Cap all valve openings and test the mainline pipe at full line working pressure and visually check all fittings.

## **J. BACKFILLING**

1. All pipe shall have a bedding of 2" under and 4" over of select, rock free backfill.
2. Any settling of more than 1" which may occur during the guarantee period shall be brought to finish grade by the contractor at his expense.

**K. FIELD OBSERVATIONS**

1. Any test or stages of construction for which observations are to be made will be specified by the designer.
2. The contractor shall notify the owner's representative three working days prior to the time the components are ready for observation.
3. The contractor shall have available to the owner's representative, an individual competent to demonstrate the system and to record the results of observations.

**L. RECORD DRAWINGS**

1. The contractor shall maintain a clean set of drawings for the exclusive purpose of recording changes from the originally approved design.
2. The changes shall be kept current and available at the site for review by the owner's representative.
3. The contractor shall arrange for the transfer of these changes to a full size set of reproducible media which shall be provided to the client upon completion and final acceptance of the system by the owner.
4. The contractor shall provide 2 project manuals which shall include reduced (11"x17") size record drawings, specifications, operating instructions, parts list, materials submittals and 2 sets of laminated irrigation zone schematics and 1 extra set to be included in the irrigation control cabinet.

**M. CODES**

1. All work shall comply with all applicable codes.

**N. GUARANTEE**

1. The contractor shall guarantee the system to perform satisfactorily for a minimum of one year from date of acceptance by the owner.
2. During the guarantee period, the contractor shall correct all problems which develop in the system due to faulty materials or workmanship.

# ***OBSERVATION GUIDE FOR LANDSCAPE PLANTING***

## **OBSERVATION GUIDE FOR LANDSCAPE PLANTING**

Adapted from a pamphlet published by the  
American Association of State Highway Officials

Due to the fact that plant materials are grown under varying conditions, allowances must be made for reasonable variations in growth and appearance. With this in mind, the following guidelines give outline standards for plant material in regards to straightness of trunk, branching habit, proportion, size of material and general acceptable conditions.

### **PART 1 – OBSERVATION OF PLANT STOCK**

#### **A. OBSERVATIONS AT THE NURSERY OR OTHER SOURCE OF SUPPLY SHOULD INCLUDE THE FOLLOWING CHECKS**

Check the general condition of the plant in the block from which the stock is to be taken from:

**1. Uniformity of leaf coloration:** Plants which exhibit yellowing or other discoloration could indicate poor drainage, fertilizer deficiency, insect damage, or disease, and may not meet specifications.

**2. Bud development:** Plants during dormant periods of the growth cycle should have buds that are firm, moist, and uniformly spaced. A slight cut into the bark may be made to determine that the cambium or growing layer just beneath the bark is moist and green.

**3. Uniformity of growth:** The plants in any given block should exhibit uniform growth. Plants with less growth and which are less vigorous than the majority of the plants in the block may not be acceptable.

**4. Spacing of plants in the row:** Vigorously growing, well-rounded, fully developed plants will transplant well. Quality nursery stock should be grown with sufficient spacing to permit good development of the individual plant. Plants spaced too closely in the row will be tall and spindly with little, if any, side branching. Shade trees grown too closely may be extremely high headed.

**5. Soil:** Plants to be balled must be grown from soil, which will hold a firm ball. Broken or loose balls are a cause for rejection because of possible damage to the hair roots, a very important part of the plant's feeding system.

**6. Presence of weeds:** An overgrown, weed-infested nursery block indicates lack of care and the plants growing in it may be in a poor state of vigor because of the weed competition.

Check individual plants for freedom of defects such as:

- 1. Decay:** On trees, look for spots of decayed tissue on the trunk and branches.
- 2. Sunscald or sunburn:** The destruction of tissue caused by the sun's rays striking a plant on the south or southwest side. This may result in the death of cambium tissue and bark, exposing the plant to secondary insect and/or disease infestation.
- 3. Abrasions of the bark:** Abrasions severe enough to damage the cambium tissue may be sufficient for rejection.
- 4. Girdling roots:** Such roots are close to the surface, tend to encircle the trunk, and may eventually kill the tree.
- 5. Improper pruning:** Stubs resulting from improper pruning, which have died back, are an excellent point of entry for disease organisms. All cuts should be flush with the trunk or supporting branch. When a cut is made to encourage branching, it should be made back to a bud.
- 6. Frost cracks:** Long vertical splits in the bark and/or wood may occur on the south and southwest sides of young and thin-barked trees. Such cracks may become invaded by canker or decay-producing fungi and bacteria.
- 7. Signs of injury:** Dead leaves, dry buds; die-back of twigs and branches; blackened sapwood and sunken, discolored patches of bark (sunscald) on the trunk or limbs.

Check individual plants for freedom from plant diseases and pests such as:

- 1. Diseases:** These will appear in a variety of forms such as abnormal growth of leaves, twigs, fruits, discoloration of leaves and bark, unusual discharges of sap through the bark, etc. Any plant showing evidence of diseases should be rejected.
- 2. Insects:** Look for insect eggs, evidence of damage from insect feeding on leaves, twigs, buds, or other plant parts. Examine the trunks of trees for borer holes, which appear as tunnels drilled into the bark and inward into the wood of the trunk. Trees with evidence of borers or other insect damages should be rejected.

Check individual plants for proper habit of growth as follows:

- 1- If a particular habit, i.e., single stem, multiple stem, etc., has been specified, be sure to obtain plants that conform to this requirement.

2- Shade and flowering trees should have top growth symmetrically balanced. Shade trees should have a single leader. The branching should be well developed and characteristic of the species.

3- Evergreen trees should be full foliated plants with uniform density. Sheared plants, such as pines sheared for Christmas trees, should be avoided unless specified.

4- Shrubs should be well branched in a manner characteristic of the species.

Check all container grown plants to determine that they meet the requirements outlined in 1 through 4, above. In addition, a random sampling of plants should be removed from their containers to determine that the root system is healthy. Plants which are found to be pot bound and plants which have insufficiently developed root systems to hold the soil together when removed from the container should be rejected. Healthy roots should be able to hold the soil mass together yet not be crowded around the outside perimeter of the container.

Planting stock, which is based on the above criteria, may be tagged with seals placed on all plants or representative samples at the nursery. This will assist in future inspection of these plants when delivered on the job site. Seals placed on planting stock for later identification do not imply acceptance on the construction site.

## **B. OBSERVATION AT THE CONSTRUCTION SITE**

Observation of stock at the construction site is to insure that the plants are from an approved source and are in a healthy and undamaged condition, and conform to sizes, quantities, and standards called for in the specifications.

This observation should consider the condition of the plant and the use of proper handling procedures from the time of digging or handling at the nursery to delivery at the construction site.

Observation at the construction site should include the following checks:

Each shipment of plants should be free of disease and insect pests, and meet all applicable State and Federal certification requirements. All necessary quarantine or State nursery inspection certificates should accompany each shipment.

All trees and a representative sample of shrubs should be legibly tagged with the correct botanical name, common name, and size to agree with the specifications and plant list. Bare-root plants should be shipped in bundles with each bundle properly tagged.

Planting stock which has not been inspected at the source should be inspected as appropriate, in accordance with items 1 through 6, as outlined under “A—Observation at the Nursery.” This should be done as the materials are being unloaded, or immediately thereafter, so that plants which are unacceptable can be set aside for removal from the project site.

Where root formation is irregular, measurement of the spread of bare-root plants should be the average, considering all sides of the plant, rather than the maximum root spread. The observer may allow moderate deviations from exact measurements in the case of plants, which normally have irregular root systems.

Large root stubs on nursery grown balled or bare-root stock should be considered evidence of lack of proper care and root pruning, and sufficient grounds for rejection of such plants. Root stubs frequently characterize “collected” stock and precautions should be taken to insure that root systems are adequate.

Damage to plant material caused by improper operation of mechanical diggers may be sufficient cause for rejection at the construction site. Plants dug with equipment leaving a cone-shaped ball should be carefully checked to make sure that an excessive portion of the feeder-roots have not been cut away.

Bare-rooted plants should have adequate live, damp, fibrous roots, free of rot and mold. Earth balls should be unbroken and have specified size.

Precautions should be taken to prevent the drying of root systems in all shipments of plants to insure arrival in good condition. All plants must exhibit normal growth.

Plants damaged in transit, or not conforming to the specifications, should be rejected. All rejected plants should be removed from the site immediately, and should be marked to preclude the possibility of their future use on the job.

Following completion of inspection, all plants accepted should be carefully stored as required until planted.

### **C. STORAGE OF PLANTS**

Plants not planted on the day of arrival at the site should be placed “in storage” and handled as follows:

Outside storage should be shaded and protected from the wind where feasible.

Bare-root plants should be heeled-in.

Plants stored on the project should be protected from drying out at all times by covering the balls with moist sawdust, wood chips, shredded bark, peat moss, or other similar approved mulching material. Plants, including those in containers, should be kept in a moist condition until planted by using a fine mist spray instead of a heavy stream which may cause severe damage.

## **PART 2 – OBSERVATION DURING PLANTING**

### **PURPOSE**

The purpose of Part 2 is to serve as a guide for an observer who may not have the experience to determine that planting operations at the construction site are being properly completed in conformance with contract plans and specifications and good horticultural practices.

Planting stock on hand and ready for planting at the construction site should have been observed either at the nursery or upon delivery, in accordance with items 1 through 6, “Observation at the Nursery” in Part 1. This will insure that the plants delivered meet the requirements of the contract planting plans and specifications.

### **A. PRELIMINARY PREPARATION**

The observer and contractor should jointly review and become familiar with all plan sheets, quantities, details, specifications, and other provisions of the contract. At this time, questions or interpretations can be answered or problems resolved through discussion with the landscape architect, horticulturist, or other authorized persons.

Sources of materials other than plants required for planting operation. Some of the materials that may require approval prior to use are topsoil, peat materials, (peat, mosses, humus, and related products), manure, fertilizer, lime, mulch, stakes, and deadmen wire and hose, wrapping material, turnbuckles, and water.

The observer should check and approve the stakeout of all planting areas and planting pit locations prior to excavation. Minor relocation of planting areas and pits can be done at this time to avoid utility lines, rock outcrops, drainage ditches, or impervious or wet soil conditions. If minor relocations of plantings are not possible, the observer should contact the landscape architect or horticulturist to adjust the design requirements.

### **B. SITE PREPARATION**

Prior to installing planting stock at the construction site, the following preparation should be completed according to the requirement of the contract plans and specifications.

1. Excavation of planting pits, pockets, or beds to the required size and depth and spaced as shown on plans.
2. Preparation and stockpiling of backfill mixture as called for by contract specifications.

3. Installation of weed-block fabric in all planted areas not to receive grass.

### **C. INTERIM CARE OF PLANTING STOCK**

Care must be taken to avoid damaging plants being moved from the storage area to the planting site. B&B plants should be protected against drying and handled carefully to avoid cracking or breaking the earth ball. Plants should be protected against freezing or drying by a covering of burlap, tarpaulin, or mulching material during transportation from the heeling-in bed to the planting site. Should damage occur, or be found at this time, the plants should be rejected and removed from the site.

At the time of planting, the observer should be alert for any damaged balls, leaders, major branches, or roots. Pruning should be permitted to remove minor damaged branches, which will not affect the characteristic shape of the plant. All rejected plants should be replaced during the current planting season.

In order to insure against reuse of discarded plants, seals should be removed and the trunk or stems above the root crowns should be marked with a small spot of paint or dye. Since discarded plants are the property of the contractor, they should not be marked or mistreated in such a way as to make them unfit for other uses.

### **D. PLANTING OPERATION**

Unless in conflict with the contract specifications, the following checklist of horticultural practices may be used by the observer.

1. Plantings should be performed only during the specified planting season.
2. The observer should check for proper positioning of the plants and the spread of the bare root system in the planting pit. After B&B plants are set, burlap and any twine should be loosened, laid back and cut away, if bulky, without damaging the ball. Non-biodegradable materials should not be used in lieu of burlap.
3. Check for correct depth of the plant crown.
4. Place approved backfill material around plant roots or plant balls, being careful not to damage the ball or the fine root system of bare-rooted plants. Backfill, which is frozen or too wet, should not be used.
5. Eliminate air pockets in the backfill by filling, tamping, and watering as required by the specifications. It is generally advisable to water the plants thoroughly before the backfilling of the pit is completed. Container plants should be moist at the time of planting.

6. When the above operations have been completed, unless otherwise specified, a berm of soil should be placed around the perimeter of the pit to form a basin or saucer to facilitate watering and retention of moisture.

7. Plants should be mulched to the specified depth with approved mulch material. The use of mulches about plants prevents rapid temperature fluctuation reduces moisture loss and aids in weed control.

## **E. STAKING, AND PRUNING**

All plants should be staked, and pruned as specified.

Stakes should be driven solidly into the ground and guying installed to prevent movement of the plant until the root system is firmly established in the new planting location.

Plants should be pruned at planting time to restore a balance between the root and top growth. Tops should be pruned to compensate for the partial loss of roots when the plant was removed from the nursery, and in a manner that will retain the characteristic shape of the plant.

Generally, all deciduous trees should be pruned by removing one-third to one-half their former branch structure. Broken or damaged branches plus competing leaders should be removed.

All broken, torn, or damaged roots should be pruned, leaving a clean-cut surface to help prevent rot and disease.

Deciduous shrubs should be pruned to approximately one-half their former branch structure. Coniferous evergreens normally should not be pruned except for broken branches, unless otherwise specified or directed.

Trees may be pruned before planting to save time and trouble. At this time, hand clippers can be used to cut closer than can be done with pole pruners – usually used for trees in an upright position. Pruning may be done under observer's supervision prior to planting.

The planting operation is completed by watering all plants as specified.

## **PART 3 - OBSERVATION DURING THE PLANT ESTABLISHMENT PERIOD**

### **PURPOSE**

Although planting stock has been properly selected, delivered to the planting site in a vigorous, thrifty condition, and planted in accordance with good horticultural practices, survival and normal growth depend to a large degree upon appropriate care during the establishment period.

The purpose of Part 3 is to serve as a guide for an observer in determining if the plant establishment specifications are being properly carried out. If differences of opinion concerning the need for a particular procedure occur, and the answers are not readily found in this guide, the observer should seek the counsel of a horticulturist or landscape architect.

Ideally, the establishment period should encompass the time required by the planting to become acclimated to the growing conditions at the planting site. The project specifications should clearly indicate the length of the establishment period, which may vary depending on the type of plant materials utilized.

A well-rounded program of horticultural practices during the establishment period may include watering, fertilizing, pruning, insect, disease, and weed control, and replacement of unsatisfactory plants in accordance with the specifications.

### **A. OBSERVATION CHECK LIST**

The following observation checklist includes critical items which should be observed periodically during the establishment period.

1. Plants must be kept in proper position as appropriate for the species. Plants may require repositioning as a result of settlement, wind action, vandalism, etc. Care should be exercised in straightening to minimize disturbance to the root mass and should include replacing topsoil s required.
2. Stakes should be firmly imbedded, re-driving may be necessary.
3. Guy wires should be snug. Adjustments may be necessary to keep the tree straight and to prevent swaying.
4. Vehicular, fire, or damage due to vandalism should be noted and corrective action taken.
5. Note damage caused by animals (i.e., deer, rodents) and seek advice on control measures.

Report infestations of insects and disease to the horticulturist or other appropriate professional for corrective action.

6. Observe for broken branches or sucker growth and remove by pruning.
7. Where discoloration of foliage occurs, especially in evergreen material, advice on corrective measures should be sought.
8. Dead and severely damaged plants should be removed immediately and replaced.
9. Observe for settlement of topsoil and replace to required grade, repositioning the plant if necessary.
10. Check overall depth of mulch and add or replace as required.
11. Observe berms and saucers (constructed for the purpose of retaining water) to insure that they are functioning properly. Repair and rebuild as necessary.
12. See that pits and bed areas are weeded as specified.
13. If planting projects require the use of fertilizers, specifications should be followed.
14. Pruning should be performed at the appropriate time by qualified personnel, utilizing the best horticultural practices and tools.

### ***B. OBSERVATION AT THE END OF THE PLANT ESTABLISHMENT PERIOD***

The inspection should include a plan-in-hand review of each planting area or bed to determine that the arrangement, number, and species of plants called for on the planting plans are present.

Since this observation is of major importance to the ultimate success of the project, the landscape architect and horticulturist, as well as the observer and contractor, should be members of the observation team.

All plants rejected during the observation should be removed and replaced by new plants which meet all of the requirements of Phases I and II of this guide, the project plan, and specifications.

The final acceptance of the project shall not have been completed until all plant replacements have been satisfactorily made.

### ***C. RECORD DOCUMENTS***

The landscape contractor shall supply the City with complete record documents, including, but not limited to, record landscape planting and irrigation plans and details, specifications, operations manual, parts list and 2 sets of irrigation zone and schematic for each landscape controller (laminated).

**SECTION 4**

**APPLICANT'S CHECKLISTS**

**CITY OF SOLEDAD  
CITY ENGINEER'S OFFICE**

**TENTATIVE MAP REQUIREMENTS**

**NOTE:** The purpose for the preparation and consideration of a Tentative Map is to review in detail a proposed development, identify and determine direction of all problems, identify any further official action on matters of zoning, acquisition of access, or rights of way, and clearly define steps to be taken by the subdivider, developer, the engineer, and others before final acceptance of the development. It is not intended to include detailed design of streets, utilities, or buildings.

The subdivider may, at his option, submit 2 copies of a preliminary tentative map of any proposed subdivision to the Public Works Director, and 1 copy to the Planning Director, prior to the formal filing of a tentative map. A preliminary map may be schematic and less detailed than the tentative map, but major issues and problems should be addressed. If submittal to the Planning Commission for review and comment is desired, contact the Planning Director for fees and scheduling. Ten copies of the Tentative Map shall be submitted to the Planning Director.

The following items shall be shown on all tentative maps submitted for processing:

**A - Statements**

1. Name and Address of Subdivider. \_\_\_\_
2. Name and Address of Owner(s). \_\_\_\_
3. Name and Address of Civil Engineer. \_\_\_\_
4. Location of Property:
  - Assessors Parcel Number(s) and/or \_\_\_\_
  - Street Number \_\_\_\_
  - City and County (in Title Block) \_\_\_\_
5. Present Zoning. \_\_\_\_
6. Proposed Zoning. \_\_\_\_
7. Existing or Previous Use of Property. \_\_\_\_
8. Proposed Use of Property. \_\_\_\_

9. Size of Property:
- Total Area \_\_\_
  - Street and R/W (and other) Area \_\_\_
  - Open Space Area \_\_\_
  - Net Area \_\_\_
10. Density of Property:
- Total Number of Lots \_\_\_
  - Average Lot Size \_\_\_
  - Minimum Lot Size \_\_\_
  - Net Density per Acre \_\_\_
11. Proposed Utility Suppliers for:
- Electricity \_\_\_
  - Gas \_\_\_
  - CATV \_\_\_
  - Water \_\_\_
  - Sanitary Sewer \_\_\_
  - Storm Drainage \_\_\_

**B - Data/Information**

**Vicinity Map**

At a scale not smaller than one inch equals one mile indicating the location of the development with relation to surrounding area and well known landmarks such as, major streets, major buildings, landmarks, etc. \_\_\_

**Scale, Date, North Arrow**

Minimum scale shall be one inch equals 100 feet. \_\_\_

Identification of adjoining subdivisions, streets, walkways, buildings, structures, terrain features, and other items affected by the development of the subdivision; land use on adjacent un-subdivided areas, right-of-way and pavement width on streets providing access to the development, existing utilities, hydrants, and drainage structures on or adjacent to the property. This information shall be shown within 150 feet of the subdivision. \_\_\_

Existing elevations of the land to be subdivided shall be shown by contours, using not less than one foot intervals for terrain under one percent gradient, two foot contours between one percent and five percent gradients, and five foot intervals on land over five percent slope. Source of the data shall be described on the face of the map. Tree coverage (show individual trees with a >6 caliper trunk 4' above existing ground), water courses, ponds,

and areas subject to present or potential inundation or storm water overflow before of after development shall be delineated. \_\_\_\_

Brief legal description of land defined with boundary. Boundary of the subdivision, and proposed increments or phases of development, if any. Offsite work shall be included with appropriate phase. \_\_\_\_

All proposed streets (and alleys, if any) shall show:

- Proposed name. \_\_\_\_
- Location, right-of-way width, approximate centerline radii of curves, approximate grades, and spot elevations at intersections and key points. \_\_\_\_
- Proposed street cross section. \_\_\_\_
- The tentative map shall accurately show the right-of-way lines of each street, radii of cul-de-sacs and curb returns, the widths being offered for dedication, the widths of existing dedications, the widths and locations of all adjacent streets and public property or easements contiguous to the subdivision, any centerlines previously established by the City, and the degree of conformity or non-conformity of any proposed subdivision street which is a continuation or extension of an existing street. \_\_\_\_

Walks and walkways except for street sidewalks. \_\_\_\_

Proposed land uses. \_\_\_\_

Recreation areas, open space, scenic or open space easements. \_\_\_\_

Rights-of-way and easements including width and purpose. \_\_\_\_

Lot and block numbers. \_\_\_\_

Typical lot dimensions (unless critical or minimum); approximate lot areas in subdivision where critical or where there is material variation. Setback lines will be shown where nonstandard and shown on typical lot where standard. \_\_\_\_

Proposed grading including locations of all cuts and fills over one foot in depth, and typical sections at the subdivision boundaries and interior lot lines. Also show any proposed retaining walls. \_\_\_\_

Non-access strips or other controls. \_\_\_\_

Proposed traffic control signs. \_\_\_\_

Traffic Analysis and calculations. \_\_\_\_

Proposed sanitary sewer, water, and storm drainage systems, including offsite routes. Show source of water supply and sewer disposal. These shall be schematic rather than detailed design. Pump stations, manholes, drop inlet (catch basins), headwalls, and other structures shall be schematically located. Connections to existing facilities shall show elevations and slopes to verify compatibility with proposed facilities. \_\_\_\_

If construction of multi-family, commercial, or industrial buildings is part of the basic proposal, and if (as in a planned unit development) other than standard setbacks and building spacing of these and any other structures is a part of the proposal, such deviations from standards shall be explicitly shown. \_\_\_\_

On a planned unit development, or other project where the above maps and documents will not adequately describe the developer's intentions, a "Development Proposal" report describing unusual features or problems shall be submitted. \_\_\_\_

Tract number and tract name. \_\_\_\_

Items to be avoided in tentative map layout:

- Pipelines, utilities along property line/side yards of residential lots. \_\_\_\_
- Low points at ends of cul-de-sacs or streets. \_\_\_\_
- Non-aligned intersections, or intersections within 150' of another intersecting street on the opposite side. \_\_\_\_

Items to conform with:

- City Standards. \_\_\_\_
- ADA Standards. \_\_\_\_
- City Waste Water Master Plan. \_\_\_\_
- City Storm Drain Master Plan. \_\_\_\_
- City Water System Master Plan. \_\_\_\_
- City Urban Water Management Plan. \_\_\_\_
- City Recycled Water Ordinance. \_\_\_\_
- City Park Master Plan. \_\_\_\_
- City Traffic Fee Ordinance. \_\_\_\_
- City General Plan. \_\_\_\_
- City Storm water Management Plan and Ordinance. \_\_\_\_
- Project Environmental Document Mitigation Measures. \_\_\_\_
- Storm Water BMP's. \_\_\_\_
- LAFCO Requirements. \_\_\_\_
- Plan for services requirements. \_\_\_\_
- MCWRA Requirements. \_\_\_\_
- RWQCB requirements (reclaimed water use). \_\_\_\_

**CITY OF SOLEDAD  
CITY ENGINEER'S OFFICE  
APPLICANT'S CHECKLIST FOR PARCEL AND FINAL MAPS**

**SUBMITTAL REQUIREMENTS**

Please submit the following items at the time of submittal:

1. Five sets (two sets of signed and sealed originals by the engineer/surveyor are required for final approval). \_\_\_\_
2. Two copies of the complete electronic calculations (lot, block and boundary closures). \_\_\_\_
3. Two copies of the current recorded deed for the property involved and a preliminary title report issued within the past two months including copies of all recorded documents referenced. \_\_\_\_
4. Two copies of adjoiner deeds when senior conveyances are involved. \_\_\_\_
5. Two Copies of unrecorded documents or maps when they are used in the preparation of the map. \_\_\_\_
6. Two Parcel/Final map checklist, completed and signed by the engineer/surveyor. \_\_\_\_
7. Map checking fee deposit, set up direct billing account with City. City Account# \_\_\_\_
8. Two copies of approved tentative map and conditions of approval, and geotechnical report. \_\_\_\_
9. CA coordinates referenced on all street monuments. \_\_\_\_

Engineer/Surveyor: \_\_\_\_\_

Applicant: \_\_\_\_\_

Project Name: \_\_\_\_\_

File No.: \_\_\_\_\_ Tentative Map Expiration Date: \_\_\_\_\_

The map accompanying this check list has been checked by me or under my direction for completeness and consistency with the items in the above check list, and is submitted for your examination and filing.

\_\_\_\_\_  
(Signature) LS or RCE No

\_\_\_\_\_  
(Date)

**CITY OF SOLEDAD  
CITY ENGINEER'S OFFICE  
CHECKLIST FOR PARCEL AND FINAL MAPS**

**GENERAL INSTRUCTIONS:**

It is requested that surveyors/engineers use this form as a checklist for the preparation of parcel maps and tract maps to be submitted to the City Engineer and furnish a completed and signed copy of the form at the time of submitting the initial check prints. (See sheet 1 for complete submittal requirements). The purposes of this form are first, to inform all parties, in advance, of the City's requirements, and secondly, to expedite the City's review. The ultimate goal is the initial receipt of maps that are acceptable for signing and filing without changes.

**LEGEND**

(66445) State Subdivision Map Act  
 (8764) State Land Surveyors' Act  
 OK Good or Acceptable  
 NA Not Applicable

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>OK</b>	<b>NA</b>	<b>COMMENTS</b>
1	Agrees with approved Tentative Map.	<input type="checkbox"/>	<input type="checkbox"/>	
2	This Map complies with the Conditions of Approval:	<input type="checkbox"/>	<input type="checkbox"/>	
	A. Survey.	<input type="checkbox"/>	<input type="checkbox"/>	
	B. Easement Dedications.	<input type="checkbox"/>	<input type="checkbox"/>	
	1. Roads.	<input type="checkbox"/>	<input type="checkbox"/>	
	2. Storm Drainage.	<input type="checkbox"/>	<input type="checkbox"/>	
	3. Sewer.	<input type="checkbox"/>	<input type="checkbox"/>	
	4. Ingress & Egress.	<input type="checkbox"/>	<input type="checkbox"/>	
	5. Public Utilities.	<input type="checkbox"/>	<input type="checkbox"/>	
	6. Slope Easement.	<input type="checkbox"/>	<input type="checkbox"/>	
	7. Other.	<input type="checkbox"/>	<input type="checkbox"/>	
3	All monuments have been set per City requirements or by specified date.	<input type="checkbox"/>	<input type="checkbox"/>	
4	Title Report current within 6 months and map represents fee title described.	<input type="checkbox"/>	<input type="checkbox"/>	

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>OK</b>	<b>NA</b>	<b>COMMENTS</b>
5	Discrepancies with recorded data shown and source of record data noted (Map Bk & Pg; Deed Bk & Pg) (8762, 8764)	<input type="checkbox"/>	<input type="checkbox"/>	
6	Non-measured Record lines parenthesized and source of record data identified with Map Bk & Pg or Deed Bk & Pg	<input type="checkbox"/>	<input type="checkbox"/>	
7	Show and tie to Map all easements of record, include dedication Bk & Pg	<input type="checkbox"/>	<input type="checkbox"/>	
8	Show approved legal access with record Bk & Pg	<input type="checkbox"/>	<input type="checkbox"/>	
9	Distinctive border line around exterior boundary of the land within the subdivision (66445, 66434e)	<input type="checkbox"/>	<input type="checkbox"/>	
10	Parcel designation (66445) letter or number	<input type="checkbox"/>	<input type="checkbox"/>	
11	Owner's Statement (66436)	<input type="checkbox"/>	<input type="checkbox"/>	
12	All easements shown on the map for dedication have appropriate wording in the owner's statement, purpose indicated on map, and tied to map	<input type="checkbox"/>	<input type="checkbox"/>	
13	All monuments found, replaced or removed by construction are described as to kind, size, tag numbers, reference to origin, and tied by survey to this map (8764a, 8772)	<input type="checkbox"/>	<input type="checkbox"/>	
14	Monument new R/W at BC, EC and property line	<input type="checkbox"/>	<input type="checkbox"/>	
15	Minimum 2" inside dia. I.P. required at all Section, Quarter Section and Rancho corners	<input type="checkbox"/>	<input type="checkbox"/>	
16	Extension of streets into a new subdivision, requires adequate survey tie	<input type="checkbox"/>	<input type="checkbox"/>	
17	Monument boxes required in new City streets are shown on map and improvement plans	<input type="checkbox"/>	<input type="checkbox"/>	
18	Show by survey the relationship to adjacent lands, streets, or senior conveyances (8764d)	<input type="checkbox"/>	<input type="checkbox"/>	
19	Bk & Pg of adjoining record maps	<input type="checkbox"/>	<input type="checkbox"/>	
20	Basis of Bearing, Two found monuments on map of record, recorded deed (8764b)	<input type="checkbox"/>	<input type="checkbox"/>	

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>OK</b>	<b>NA</b>	<b>COMMENTS</b>
21	Legend: Found monument-solid symbol set monument-open symbol and tag number noted; distinctive borderline symbol; ( ) all recorded data identified by Map Bk & Pg or Deed Bk & Pg	<input type="checkbox"/>	<input type="checkbox"/>	
22	Mathematical closures (8766a)	<input type="checkbox"/>	<input type="checkbox"/>	
23	Bearings & distances of all lines shown	<input type="checkbox"/>	<input type="checkbox"/>	
24	Curve data (delta, radius, length) (8764b)	<input type="checkbox"/>	<input type="checkbox"/>	
25	Radial bearings of Non-tangent curves (8764b,g)	<input type="checkbox"/>	<input type="checkbox"/>	
26	Areas - net and gross	<input type="checkbox"/>	<input type="checkbox"/>	
27	Sum of the increment parts equals total distance or delta angle (8764b)	<input type="checkbox"/>	<input type="checkbox"/>	
28	Map tie to next street intersection (8764g)	<input type="checkbox"/>	<input type="checkbox"/>	
29	Details are required for clarity (8764g, 8763)	<input type="checkbox"/>	<input type="checkbox"/>	
30	Title block: "Parcel Map", or "Tract Map No. _"; name and legal designation of property in which the survey is located; city, county, state, date of survey; firm name; scale; sheet number	<input type="checkbox"/>	<input type="checkbox"/>	
31	Minimum road centerline radius	<input type="checkbox"/>	<input type="checkbox"/>	
32	Sectionalized land - show method of subdivision	<input type="checkbox"/>	<input type="checkbox"/>	
33	Calif Coordinates, show control scheme from which they were determined (8771.5)	<input type="checkbox"/>	<input type="checkbox"/>	
34	Surveyor/Engineer's Statement signed, sealed, exp. date (66441, 66449, 66445i)	<input type="checkbox"/>	<input type="checkbox"/>	
35	City Engineer's Statement (66442, 664500)	<input type="checkbox"/>	<input type="checkbox"/>	
36	Recorder's Statement (66449)	<input type="checkbox"/>	<input type="checkbox"/>	
37	City Clerk's Statement (66440)	<input type="checkbox"/>	<input type="checkbox"/>	
38	All statements signed and acknowledged in black opaque ink and Notary seal legible	<input type="checkbox"/>	<input type="checkbox"/>	
39	Map size (18"x26"), permanent record material, 1" blank margin (66434, 66445)	<input type="checkbox"/>	<input type="checkbox"/>	
40	Map suitable for microfilming - minimum lettering 3/32"	<input type="checkbox"/>	<input type="checkbox"/>	

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>OK</b>	<b>NA</b>	<b>COMMENTS</b>
41	Scale & North Arrow	<input type="checkbox"/>	<input type="checkbox"/>	
42	New street names approved by the Planning Dept. and filed with the City Clerk	<input type="checkbox"/>	<input type="checkbox"/>	
43	Street names complete, spelling correct, R/W width, centerline data	<input type="checkbox"/>	<input type="checkbox"/>	
44	Adjoining property owner's names and/or subdivisions shown	<input type="checkbox"/>	<input type="checkbox"/>	
45	Privately maintained road easements shown by dashed line; public maintained roads by solid lines	<input type="checkbox"/>	<input type="checkbox"/>	
46	City limit lines shown	<input type="checkbox"/>	<input type="checkbox"/>	
47	Official Plan Lines, future R/W width lines, landscape setback lines shown	<input type="checkbox"/>	<input type="checkbox"/>	
48	Show and tie lines of possession (i.e., fences) and encroachments of buildings (8764d,g)	<input type="checkbox"/>	<input type="checkbox"/>	
49	Location map and streets numbered, if more than one sheet (66445)	<input type="checkbox"/>	<input type="checkbox"/>	
50	Each lot/parcel must be shown complete on one sheet. If more than one sheet is required, the first sheet after the cover sheet shall contain a small scale, un-dimensioned map of the parcels	<input type="checkbox"/>	<input type="checkbox"/>	
51	Planning Commission's Statement (66443)	<input type="checkbox"/>	<input type="checkbox"/>	
52	Easements and monuments correspond with the improvement plans	<input type="checkbox"/>	<input type="checkbox"/>	
53	Set monuments or specify time to set in Surveyor's Certificate and designate monuments on map (66441, 66445)	<input type="checkbox"/>	<input type="checkbox"/>	
54	Subdivision guarantee - provide at final submittal	<input type="checkbox"/>	<input type="checkbox"/>	



2. North arrow and scale on each sheet. North up and/or left preferred.
3. Titles and numbers on all sheets and match index.
4. Conformance to Tentative Map and Conditions of Approval, especially street and R/W widths, grading, drainage, sewerage, water lines, number and size of lots, etc.

## **II. TITLE SHEET**

1. Name of Subdivision or Project and Location (City of Soledad, County of Monterey, State of California).
2. Subdivision Number.
3. Vicinity Map with north arrow (north arrow up and/or left).
4. Sheet Index.
5. City Engineer's Signature Block.
6. Consulting Engineer's Signature Block.
7. City Required General Notes (may be on Sheet 2).
8. Reference Bench Mark, Location and Elevation, and Local Bench Mark Location and Elevation N.G.V.D.

## **III. COMPOSITE MAP**

1. Map showing all streets, sewers, storm drains, water lines, fire hydrants, street lights, utilities, structures, street names, lot numbers, driveways, street stationing, north arrow, scale, easements, street tree types and locations, cluster mailbox locations, all mains with sizes and materials, street widths, sidewalks, etc. and show improvement plan sheet layout.

## **IV. NOTES & DETAILS**

1. Drafting symbol legend including references to applicable standard plan numbers.
2. Street sections shown.
3. Structural sections shown and agree with City Standards and calculations (TL, R-values, etc.).

4. Street Cross-slope shown - note relative difference of centerline and top of curb (TC) elevations.
5. List of Abbreviations.
6. Required Improvement Plan General Notes.
7. Any proposed deviations from or modifications of City Standards.
8. References to the City Standard Plans and Specifications and City Standard Plans and Specifications for the Installation of Water Facilities where applicable.
9. Any items not addressed by the City Standard Plans and Specifications.
10. Where an option exists in the City Standard Plans and Specifications, delineate option chosen.
11. Reference to the project Geotechnical Investigation.
12. Reference to the SWPPP & NOI for the project including where they can be obtained.
13. All water system, sewer system, storm drain system and surface improvement components including fittings and appurtenances referenced by manufacturer and model number.
14. Details of any proposed deviations from or modifications to the City Standard Plans and Specifications.
15. Details of any proposed structures or other items not included in the City Standard Plans and Specifications.

#### ***V. DEMOLITION AND ABANDONMENT PLAN (If required.)***

1. Show limits of demolition.
2. Show existing buildings.
3. Existing septic tanks and leach fields shown.
4. Existing wells and irrigation facilities shown.

#### ***VI. GRADING PLANS***

1. Existing elevations or contours shown.

2. Proposed pad grades, pad limits, and correct relationship to TC grades proposed finished floor elevations.
3. TC elevations at property line extensions.
4. TC elevations at grade breaks, curb returns (CR) shown, and at  $\frac{1}{4}$  points on all curves.
5. TC elevations at storm drain inlets shown.
6. Storm drain lines and structures shown.
7. Street profile grades at centerlines shown (0.5% minimum).
8. Lot numbers shown.
9. Retaining walls and sound walls shown.
10. Plan view of typical lot drainage. Minimum slope of lots 1% (plus protective slopes from finish floor per UBC). Residential lots shall have usable rear yard with a depth of 15' minimum at a maximum slope of 5%.
11. Section of typical interior and exterior lots to show property line/slope relationships.
12. Show grading required for off-site drainage.
13. Grading shown between back-of-curb (BOC) or sidewalk (SW) and original ground at R/W line.
14. Grading conforms to adjacent properties shown correctly and no adverse effects on adjoining properties or on future development.
15. Check no drainage across lot lines and lots to drain to streets.
16. Maximum slopes 2:1 or per Soils Report.
17. All pads above high water when storm drains plug. (Surface flows for 100-year design storm.)
18. Elevations at all lot corners (with elevations shown at toe and top of slopes).
19. Reference to project Geotechnical Investigation.
20. Compaction requirements for site grading.

21. Swale and bank gradients.
22. Foundation section.
23. North Arrow and Scale.
24. Grades at change in grade, swale high points, swale slopes and ground/bank slopes.

## **VII. STREETS**

### **A. Plan Views**

1. Wheelchair ramps shown per Standard Plans.
2. Radius of curvature, central angle, and length shown on all street curves.
3. Curb curve data given - central angle, length, and radius.
4. Scale 1"=20'.
5. Cul-de-sac radius.
6. Property corner cutoffs used when wheelchair ramps installed, otherwise concentric with curb.
7. R/W and street width dimensions shown.
8. Centerline stationing at 100', BC & EC of curves shown, and  $\frac{1}{4}$  points.
9. Lot/parcel lines and numbers/letters shown.
10. Cul-de-sac cross slopes from high point in pavement to gutter lip minimum 2% and maximum 5%. Minimum curb & gutter grade around intersection corner rounded to 0.5%.
11. Cross gutters to be avoided if possible. Minimum width 8 feet, show flow lines at center of gutter.
12. Stationing on all drainage structures shown.
13. TC elevations shown at all drain structures.
14. Drainage easements shown and dimensioned.

15. Location of underground pipes and utilities shown.
16. Location of fire hydrants (FH) shown. Maximum spacing 500' measured along street centerline.
17. Street monuments shown.
18. Pedestrian paths shown (if any). Basic grades shown. Comply with ADA requirements.
19. Street names shown.
20. Stations and elevations of street intersections shown.
21. All notes and symbols standard and conforming to legend.
22. All existing utility poles, manholes, valves, signs, mail boxes, trees, etc. shown. Indicate those to be removed, relocated or adjusted to grade.
23. Continuations and cross streets properly referenced (for example: See Sheet # \_\_\_\_\_).
24. Project limits and City Limits shown.
25. Standard street knuckles used.
26. Street signs, traffic signs and barricades shown in proper locations.
27. Driveway locations and widths shown. Minimum 3' vertical curb between driveways with 1.5' to property lines.

**B. Profiles**

1. Vertical curves designed for proper speeds per the latest Caltrans Highway Design Manual. This also applies to horizontal curves and stopping distance.
2. Minimum vertical curve lengths observed (50' minimum).
3. Vertical scale 1" = 2' or 4'.
4. Vertical curves used for grade breaks greater than 2.0%
5. In cul-de-sacs, show profiles at centerline from radius point to TC at end of cul-de-sac.

6. Minimum curb & gutter grade of 0.5% observed.
7. 2% maximum grade observed across intersections. Maximum grade break is 0.5%.
8. All underground pipes (storm drain, sewer, water) and utilities shown.
9. Existing ground at centerline shown.
10. Finished grade profile for TC shown. Show elevations at  $\frac{1}{4}$  points. Plot profile of all curb returns plus 50' on both streets when difference in street profiles exceeds 1% or as required by City Engineer. Vertical curve required when difference exceeds 2%.
11. Centerline profiles of intersecting streets shown to their point of intersection.
12. Off-site profile to catch point shown where street is constructed to subdivision boundary.
13. Centerline stations and elevations shown at all BVC, EVC, PIVC,  $\frac{1}{4}$  points, grade breaks, low points, high points, curb returns (CR) and 100' stations.
14. All slopes in profile shown.
15. Show all utility crossings with clearances indicated.
16. Manhole and drop inlet invert and flow line elevations shown.
17. Elevation at high and low points of water main shown.

### **VIII. SANITARY SEWERS**

1. System in agreement with previous approvals and City master plan.
2. Design conforms to City Standards with a Mannings  $n=0.013$ .
3. Size of pipe shown on plan (8" minimum).
4. Adequate cover shown. Sewer service lateral to have 5' minimum cover and 6' maximum cover at R/W line.
5. Clearance with other mains per DPH requirements typical for all mains.
6. Pipe size, slope, length between structures, and type of pipe shown.

7. Connection to existing facilities - Show connection details. Manhole installed when tying to existing pipeline.
8. Extension possible - Pipeline to subdivision boundary.
9. Sewer pipeline to be located per City Standards.
10. Curves allowed within 80% of recommendations of pipe manufacturer. Show curve data or offsets if concentric with centerline.
11. On all curves where short pipe lengths are used indicate clearly on plans.
12. Stationing on all manholes shown.
13. Top of manhole and invert elevations shown.
14. Sizes of existing pipelines shown.
15. Pipe types allowed:
  - PVC, ASTM D3034, SDR 35
  - ABS, ASTM D2751, SDR 35
16. 500' maximum distance MH to MH.
17. Minimum 2 fps velocity with the pipe flowing full.
18. Pipe change of direction in MH - 0.2' drop between inlet and outlet where direction change exceeds 20 degrees.
19. Off-street manholes - Bolted MH covers required.
20. In unimproved areas, MH extended 1' above ground.
21. Check sanitary calculations.
22. Service laterals shown in plan at center of lot with centerline stationing. Minimum 10' separation per DOHS requirements for water mains.
23. Special approval areas shall be noted in profile (less than minimum cover and clearances).

### **Easements**

1. Off-tract sanitary sewer improvements (plan and profile) and accompanying easements shown. Off-tract offers of dedication for sanitary sewer easements submitted for review.
2. Off-tract work to be done but no easement requirements. Right of entry submitted for review.
3. Easement widths indicated (20' unobstructed width minimum 1 pipe or access. 25' unobstructed width min. 2 pipes, typical for all pipe installations.)
4. Easements across lots not permitted unless approved during tentative map, SPP, PUD, CUP review.

## **IX. DRAINAGE**

### **Hydrology-Hydraulics**

1. Calculations per City Standards and based upon 10-year design storm with minimum velocity of 2 fps when flowing full. System in agreement with previous approvals and City master plan.
2. Calculations shall include: HGL, FL, EGL, Q, A, S, V, freeboard at structures, structure losses, tail water assumptions.
3. Adequacy of in-tract and off-tract drainage system verified.
4. All starting water surface elevations adequately verified.
5. Drainage map showing street system, existing and proposed drainage system, slope arrows, tributary sub-areas in acres, peak flow in all pipes (1" = 100' preferred, all calculation nodes referenced).
6. All pipe in tributary areas nodes labeled to correspond to pipe designations in calculations.
7. Percolation pond design and calculations per City Standards and retaining design storm with controlled outlet for 100-year design storm and maximum design percolation rate of 2"/hour.

### **Easements**

1. Off-tract drainage improvements (plan and profile) and accompanying easements shown. Off-tract offers of dedication for drainage easements submitted for review.

2. Off-tract work to be done but no easement requirements. Right of entry submitted for review.
3. Easement widths indicated (20' unobstructed width minimum 1 pipe or access, 25' unobstructed width 2 pipes typical all installations pipe.)
4. Easements across lots not permitted.

### **Structures**

1. Maximum diameter pipes through drainage structures per City Standards.
2. 1.00' minimum HGL to TC.
3. Special structural calculations provided.
4. Drain inlets connected to manholes. Drain inlets not used as manhole system, slope arrows.
5. Maximum 600' distance MH to MH.

### **Pipe**

1. Closed conduit minimum slope to maintain 2 fps observed min. 8 fps max. Size, slope, length between structures, type and class or thickness of pipe shown in profiles. Minimum 15" pipe diameter.
2. RCP (HDPE, PVC, upon prior City Approval) for outside traffic areas only.
3. Pipe location to be approved by City Public Works Director. On all curves where non-standard pipe lengths are to be used, indicate clearly on the plans.
4. Adequate cover shown. 3' minimum cover over pipe to finished grade observed (provided manufacturer specs do not require more cover) unless special design and calculations submitted.
5. Outlet protection required.
6. Curve radii allowed to within 80% of pipe manufacture's recommendations.
7. All curve data at centerline of pipe shown unless concentric with street centerline then offsets allowed.
8. Elevations, slopes, and distances all mathematically correct.

9. Match hydraulic/hydrology calculations.

### **Channels**

1. Maximum velocity in earth channel verified by soils report, or not to exceed 6 fps.
2. Channel side slopes as specified by soils report.
3. Channel design per City or MCWRA standards.
4. Adequate erosion control and 1' minimum freeboard, design storm frequency to be determined by City.

## **X. WATER LINES**

1. System in agreement with previous approvals and City master plan.
2. Design conforms to City Standards (or water purveyor).
3. Size of pipe shown on plan (8" minimum except cul-de-sacs without hydrants where 6" is allowed).
4. Valves shown.
5. Fire hydrants (FH) maximum spacing - 500' residential and 300' other. Hose lay lengths 250' residential and 150' other. Cul-de-sacs within 200' of radius point.
6. Fire hydrants (FH) - Brand and model number per local requirements. Standard location at lot lines and CR's.
7. TC elevations at hydrant locations.
8. Adequate cover shown - 3' minimum to finished grade.
9. Proper separation from sewer lines per DOHS requirements.
10. Water main to be located per City Standards.
11. Mains kept in streets - easements not allowed.
12. Crossings with sewer lines or laterals per DOHS requirements.
13. Pipe size, class and length shown in profile.

14. Length shown as distance between crosses or tees.
15. Top of pipe elevations shown at grade breaks.
16. Sizes of all existing pipelines shown.
17. Curves allowed within 80% of recommendations of pipe manufacturer. Show curve data or offsets if concentric with centerline.
18. Combination air valves and blow-offs-behind sidewalks.
19. Air and vacuum valves at high points and elevated cul-de-sacs if difference in elevation greater than 1/2 pipe diameter.
20. Connection detail to existing facilities. May require valve for testing and isolation.
21. Future extension - Install temporary blow off with valve at point of future extension.
22. Mains extend to tract boundaries and along frontage.
23. House services shown in plan.

### ***Easements***

1. Off-tract water line improvements (plan and profile) and accompanying easements shown. Off-tract offers of dedication for water line easements submitted for review.
2. Off-tract work to be done but no easement requirements. Right of entry submitted for review.
3. Easement widths indicated (20' width minimum 1 pipe or access. 25' width 2 pipes.)
4. Easements across lots not permitted.

## **XI. STREET LIGHTING**

1. Shown on 1" = 100' scale plan.
2. Cul-de-sacs - 100 watt in bulb of cul-de-sac 100' deep or deeper.

3. Residential streets - spaced on both sides of street at 200' maximum. 100 watts on 30'-0" poles with 12' arms. Closer spacing is required at curves and intersections.
4. Collector streets - spaced at 200' maximum. 200 watts on 30'-0" poles with 12' arms. Closer spacing is required at curves and intersections.
5. Arterial streets - spaced at 150' maximum. 200 watts on 30'-0" poles with 12' arms. Closer spacing is required at curves and intersections.
6. Wattage and pole heights indicated on plans.

## **XII. OTHER**

1. Erosion Control Plan.
2. Street Landscaping Plan. Include irrigation and planting plans, irrigation and planting specifications including calculations.

**CITY OF SOLEDAD  
CITY ENGINEER'S OFFICE**

**MINIMUM REQUIREMENTS FOR SITE DRAINAGE PLAN**

1. Delineate drainage area on USGS quad map. \_\_\_
2. Elevations of existing ground (one foot contours and/or spot elevations at one or two inch grid) indicating slope of site including 100 feet beyond the property boundaries. \_\_\_
3. Existing and proposed creeks, swales, roadside ditches and culverts, curb & gutter, and storm drain systems, including location, size, direction of fall, and termination point which this parcel will effect. \_\_\_
4. Existing and proposed flood control facilities, including centerline of flow and top of bank. \_\_\_
5. Direct drainage system on site to the nearest positive drainage system and show on plan. \_\_\_
6. Proposed drainage easements for present and future surface drainage systems. \_\_\_
7. Existing and proposed building structures and facilities including septic tank drain fields and agricultural facilities. \_\_\_
8. If property is generally flat (less than 1% slope) elevate building pad or finish first floor grades to provide positive fall away from building (per the UBC). Pad elevations or finish first floor elevations must be shown. All residential lots shall have a 15' minimum depth usable rear yard with a maximum 5% slope. \_\_\_
9. If proposed open channel, maintenance road must be included. If proposed road side ditch, check culverts for effect on existing facilities within 1000 feet of site. \_\_\_
10. Determine maximum runoff, using Rational Method for 100 acres or less, and Soil Conservation Service Method for greater than 100 acres. \_\_\_
11. Closed conduit system, submit calculations on standard form (attached), or print out from computer program calculations. \_\_\_
12. Open channel system, submit:
  - The proposed section and maximum volume of flow in the proposed section. \_\_\_
  - The velocity and depth of flow for each section of different slope. (Show relationship between slope, velocity, critical depth, and depth of flow on profile). \_\_\_

- The estimated maximum permissible velocity for the types of soil encountered, and/or show erosion protection provisions. \_\_\_
  - Backwater computations when downstream water surface elevations affect drainage structure capacities. \_\_\_
13. All calculations to be in accordance with and to the satisfaction and approval of the Monterey County Water Resources Agency (MCWRA).
  14. All improvements in accordance with City storm water management ordinance, BMP's (construction and post-construction). \_\_\_
  15. Provide SWPPP and NOI for projects with area of disturbance 0.5 acres and over. \_\_\_

**HYDRAULIC DESIGN CRITERIA:**

**Flow Computations:**

1. Manning's Formula shall be used to compute capacities of all open and closed conduits. \_\_\_
2. Appropriate "n" values shall be used. \_\_\_

**Pipe Criteria:**

1. Minimum pipe diameter allowable on any storm drain shall be 15 inches. \_\_\_
2. Culverts shall be approved by the City for size, grade, alignment, and type. \_\_\_
3. Minimum velocity in closed conduits shall be 2 fps when flowing 0.8 full 8 fps max. \_\_\_
4. The profile for closed conduits shall include upstream and downstream profile for a distance of 500 feet. \_\_\_

**Open Channels Criteria:**

1. Minimum velocity shall be 2 fps. \_\_\_
2. Maximum velocity shall be as specified by the MCWRA. \_\_\_
3. Freeboard requirements shall be as specified by the MCWRA. \_\_\_

**Design Computation:**

1. Watershed map (USGS topo map for offsite watersheds; separate plan for onsite water sheds.\_\_\_\_
2. Drainage area in acres.\_\_\_\_
3. Velocity in each pipe or channel reach.\_\_\_\_
4. Invert elevations of each pipe or channel reach.\_\_\_\_
5. Top of structure elevation or top of channel lining elevation.\_\_\_\_
6. Hydraulic grade line elevation.\_\_\_\_
7. Hydraulic gradient.\_\_\_\_
8. Pipe size, class length, and gradient. Items 6 & 7 are not required when design is bases on hydraulic grade line inside conduit.\_\_\_\_
9. Channel dimensions and water surface profile computations. \_\_\_\_

**Hydraulic Grade Line:**

1. HGL shall be a minimum of 0.50 feet below the elevation of inlet grates and manhole covers.\_\_\_\_
2. HGL shall be shown on the profile when the HGL is above the top of pipe.\_\_\_\_
3. For open channel systems, the HGL shall be shown for the 100-year design runoff.\_\_\_\_
4. Design Engineer must sign and seal drainage plan.\_\_\_\_
5. A reproducible drainage plan shall be kept by the City.\_\_\_\_

## Pre-construction Meeting

Date: \_\_\_\_\_ Project Name: \_\_\_\_\_  
 MTCO Project No: \_\_\_\_\_ General Contractor: \_\_\_\_\_  
 Developer: \_\_\_\_\_  
 Developer Account No. \_\_\_\_\_ Deposit Status \_\_\_\_\_

1. Introductions and exchange business cards. \_\_\_\_\_
2. Sign-in sheet complete including emergency contacts and phone numbers (use standard form). Complete? Yes \_\_\_ No \_\_\_
3. All contractors and sub-contractors to have a current City of Soledad Business License. Copy Received? Yes \_\_\_ No \_\_\_
4. Contractors are required to have a signed set of approved plans and a copy of the City of Soledad Design Standards and Standard Specifications on site at all times. Contractor has copy present? Yes \_\_\_ No \_\_\_
5. Submittals of materials to be used on project, including water disinfection plan and traffic control plan for prior approval: C=Complete; I= Incomplete; N/A= Not Applicable. Must include hard copy and PDF version

**Grading:** Geotech of Record \_\_\_ SWPPP & NOI (BMPs) \_\_\_ Contractor Contact \_\_\_  
 \$5k Clean-up Dep. \_\_\_ Haul Routes \_\_\_ Staging Area \_\_\_  
 Construction Signage \_\_\_ Ingress/Egress \_\_\_ Notices \_\_\_

Other: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Sanitary Sewer:

Trench Safety ___	Emergency Contact ___	ThoroSeal or Equal ___
SS Main Pipe ___	SS Main Fittings ___	
SS Lateral Fittings ___	SS Cleanout/Flushing inlet ___	
Eccentric SSMH, Ramnek ___	Backfill material ___	
Concrete Mix Designs (#5 rebar for base)/ or pre-cast base ___	Ball & Flush ___	
#4x30" rebar (end of lateral @ 11' from FOC) ___	AC(trench rest.) ___	
Sand (SE=30min.) ___	Haul Routes ___	
Pressure Test ___	SS Lateral pipe ___	
AB(trench rest.) ___	SS Cleanout Box ___	
"S" curb stamp ___	SSMH Frame & Cover ___	
	Compaction ___	
	Geotech of Record ___	
	Sanitary Sewer video ___	

Other: \_\_\_\_\_  
 \_\_\_\_\_

**Storm Drain:**

SD Main Pipe ____	SD Main Fittings ____	SD Outfall ____
SD Catch Basins ____	SW Curb Drains ____	AB(Trench Rest.) ____
AC(Trench Rest.) ____	SWPPP/BMPs ____	Geotech of Record ____
Eccentric SDMH, Ramnek ____		SDMH Frame & Cover ____
Class II Concrete Mix Design (for base & collar): ____		
Crushed rock bedding w/sand, jetted ____		Sand (SE=30 min.) ____
Backfill Material ____	Compaction ____	
Other:		

---



---

**Water:**

Water Main Pipe ____	WM Fittings ____	WM Valves ____
FH Assembly ____	FH ____	BOV Assembly ____
ARV Assembly ____	Sampling Sta. Assembly ____	Service Lateral ____
Corporation Stop ____	Curb Stop ____	B-16 Meter Box (& lid) ____
Misc. Svc. Fittings ____	Tracer Wire ____	Gate Valve ____
G-5 Valve Box ____	RPD Check Valve ____	Valve Vault ____
WM Jumper Ass. ____	Sand (SE 30 Min.) ____	Backfill Material ____
Thrust Blocks ____	Slurry ____	Compaction ____
AB(Trench Rest.) ____	AC(Trench Rest.) ____	Concrete Mix Design ____
Geotech of Record ____	“W” Curb Stamp ____	Red Curb Stain ____
Notices ____		
Other:		

---



---

**Surface Improvements:**

ASB ____	AB ____	Concrete Mix Designs ____
Electroliers ____	Service Boxes ____	Elec. Numbering ____
Service Pedestals ____	USPS Mailboxes ____	Fencing ____
AC Mix ____	Prime and Tack Coats ____	Contractor’s Stamp ____
Striping ____	Signage ____	FH Blue Reflectors ____
Monuments ____	Truncated Domes (with manufacturer’s Cert. of 70% rule) ____	Tree Wells ____
Flare and Ramp PCC Stain ____		Daily Site Clean-up ____
Soundwalls ____	Barricades ____	
Landscaping ____	Concrete Washout Basin ____	

Other:

---



---

6. Schedule of Work Submitted? Yes \_\_\_\_ No \_\_\_\_ (This will be required to be updated weekly on a consistent basis. Additional Inspection Charges Will Occur Without Proper Scheduling.)
7. Testing requirements per plans and specifications. Yes \_\_\_\_ No \_\_\_\_?
8. Requests for inspections require 48 hours prior notice to inspector. Yes \_\_\_\_ No \_\_\_\_?

9. Hours allowed by the City for work are between 7:00 AM and 7:00 PM, Monday through Friday. Extra charges for special inspections, 48 hours notice minimum. Notified? Yes \_\_\_ No \_\_\_
10. All Contractors: Must contact Soledad Public Works Department, (831)223-5173 for ***all accidents, emergencies and breakages (i.e. pipes, valve shut off, etc.)***. Notified? Yes \_\_\_ No \_\_\_
11. All Contractors: Obtain a water flow meter from the City prior to any use of water on site. This may be acquired at City Hall, 248 Main Street. Notified? Yes \_\_\_ No \_\_\_
12. All Contractors: **DO NOT OPERATE CITY WATER VALVES**, unless directed by the City. Notified? Yes \_\_\_ No \_\_\_
13. All Contractors: Use designated truck haul routes **ONLY!** Notified? Yes \_\_\_ No \_\_\_
14. All Contractors: Direct the concrete truck drivers to use the on site designated wash out area **ONLY!** Notified? Yes \_\_\_ No \_\_\_
15. All Contractors: Note the trenching depth safety requirements, width, bedding and backfill requirements and install per specs. Notified? Yes \_\_\_ No \_\_\_
16. Questions regarding: General Notes, Underground, Paving & Grading, Water, Sewer, Plans, Standards and Specifications, Special Provisions, Encroachment, Coordination, Payment, Schedule, Changes, etc. Yes \_\_\_ No \_\_\_?
17. Additional discussion or questions?

---



---



---

18. Contractors shall schedule a meeting with various City Departments 2 to 4 weeks before the tentative date of acceptance or occupancy to produce punch lists.
19. Project Close-out: Final Walkthrough for City Acceptance, Record Drawings, Electronic Files in Auto-CAD of the record drawing improvement plans (i.e. all changes included) and final map, Operators Manuals and Diagrams, Monument Certifications, Warranties, Bonds, GASB Report, DVD of Storm drain and Sewer Video, Test results of all backflow prevention devices, Final reports from project Civil Engineer and Soil Engineer, Payment of money due to the City, Provide dedication or original signed Grant Deed if applicable, Return all Fire Hydrant Water Meters to City.

