## ELEMENT 5 – REVISION RECORD

The City of Hollister SSMP Element 5 – Design and Performance Provisions has undergone the following revisions:

| Revision No. | Revision Date | Description of Revisions | Revision Completed By | Revision Approved By |
|---|---|---|---|---|
| 0 | 2007 | The City created a document entitled the Sewer System Management Plan (SSMP) Development Guide to address the requirements of the 2006 Sanitary Sewer System (SSS) Orders issued by the State Water Resources Control Board (SWRCB). | City of Hollister Utilities Department | Unknown |
| 1 | February 2017 | The SSMP was revised in accordance with the findings and recommendations of the November 2, 2015 SSMP Audit. This revision also served as the five (5) year update. | City of Hollister Utilities Department and Wallace Group | City Council |
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# ELEMENT 5 - DESIGN AND PERFORMANCE PROVISIONS

The standards and specifications for new construction and repair of the existing sanitary sewer system described in this SSMP Element are utilized to ensure a high quality, well designed, and functioning sanitary sewer system.

Design Standards and Testing and Inspection procedures are located in the:

- May 1992 City Design Standards,
- May 1992 City Standard Specifications, and
- July 2013 Standard Plans in Appendix 5A.

## 5.1 Regulatory Requirements

WDR Order No. 2006-0003-DWQ Section D.13(v) states that the SSMP must identify:

(a) Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and

(b) Procedures and standards for inspection and testing the installation of new sewers, pumps, and other appurtenances and for rehabilitation and repair projects.

## 5.2 Design and Construction Standards and Specifications [WDR D.13(v)(a)]

The City uses Construction Design Standards and Standard Specifications for the installation of new and existing sanitary sewer systems. The following Sections of the City Standards and Specifications apply to City sewer collection and conveyance systems. The three sets of Standards are located in Appendix 5A:

May 1992 City Standard Specifications:

- Section 4: Control of Material
- Section 5: Utilities
- Part 2 Construction Materials – Section 100, 200 and 300.

May 1992 City Design Standards

- Section 2: Construction Plans
- Section 5: Sanitary Sewers

July 2013 City of Hollister Engineering Department

- C-1-1: Type 1 Standard Manhole Pipe 6” to 18”
- C-1-2: Standard Manhole for Pipe Cover Less than 36”
- C-1-3: Standard Manhole Sections and Notes
- C-1-4: Standard Manhole Frame and Concrete Collar
- C-2-1: Sewer Lateral and Cleanout
- C-2-2: Sewer Cleanout Frame/Cover & Concrete Collar

- C-3: Sewer Lateral Tapping to Existing VCP Sewer Mains
- C-4: Backflow Prevention Devices

Design standards, specifications, and testing requirements for new and replacement sewer pump stations and other Capital Projects are developed on a case by case basis to meet the requirements of each site and incorporated into each project plan set by a registered Professional Engineer.

## 5.3 Procedures and Standards for Inspection and Testing [WDR D.13(v)(b)]

Procedures and standards for the acceptance testing and inspection of new and repaired sewer main and appurtenances are found in:

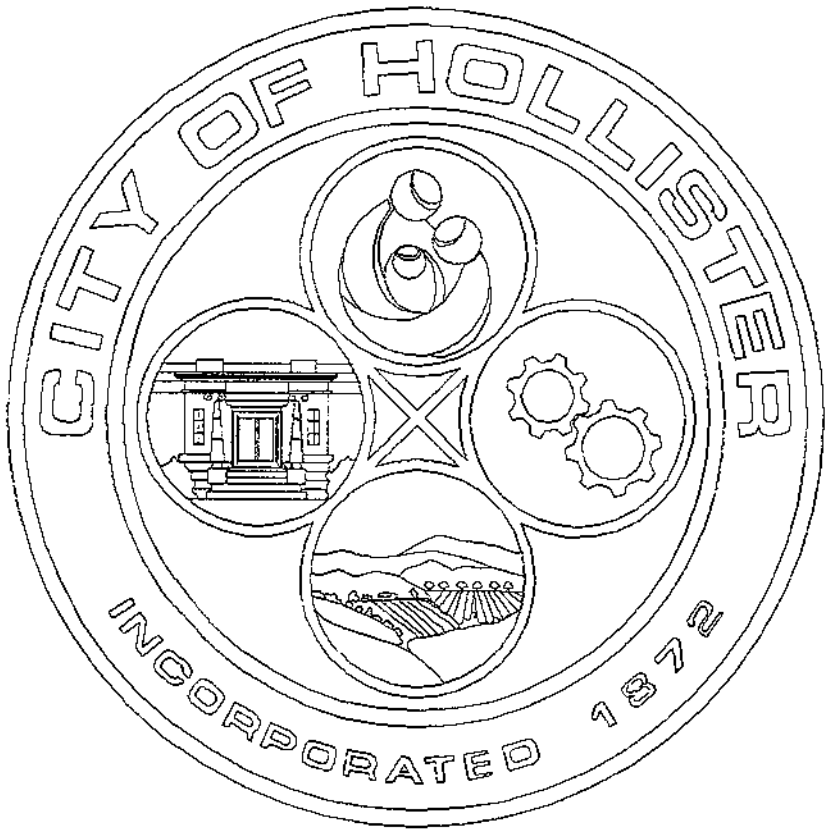
May 1992 City Standard Specifications

- Section 306

# APPENDIX 5A

City of Hollister

- *May 1992 City Standard Specifications*
- *May 1992 City Design Standards*
- *July 2013 Standard Plans*




# STANDARD SPECIFICATIONS

MAY, 1992

# CITY OF HOLLISTER STANDARD SPECIFICATIONS

The City of Hollister Standard Specifications shall be defined as the latest edition and supplement of the Standard Specifications For Public Works Construction ("Green Book" or S.S.P.W.C.) as prepared by the Joint Cooperative Committee of the Southern California chapter of the American Public Works Association, and the Southern California Districts of the Associated General Contractors of California with modifications as set forth herein. The "Green Book" is available for inspection at the City Engineer's Office, 420 Hill Street, Hollister, California, or may be obtained from Building News, Inc., 3055 Overland Avenue, Los Angeles, California 90034, telephone (213) 202-7775.

## PART 1
## GENERAL PROVISIONS

### SECTION 1-TERMS, DEFINITIONS, ABBREVIATIONS AND SYMBOLS

**1-1 TERMS.** Modify to read as follows:

**1-1 TERMS.** Unless otherwise stated, the words directed, required, permitted, ordered, instructed, designated, considered necessary, prescribed, approved, acceptable, satisfactory, or words of like meaning, refer to actions, expressions, and prerogatives of the Engineer.

Unless otherwise stated or specifically enumerated in the Permit or Contract, the words directed, ordered, instructed, or words of like meaning and implying direction of Work shall not apply to Private Contracts, except as required for public safety and convenience.

References to bids, bid items, bidders, or the distribution of costs over same shall not apply to Private Contracts.

**1-2 DEFINITIONS**

**1-2.1 Modifications.** Modify the following definitions to read:

**Contractor**-The individual, partnership, corporation, joint venture, or other legal entity having a Contract with the Agency to perform the Work or cause the Work to be performed. In the case of work being done under permit issued by the Agency, the permittee shall be construed to be the Contractor. The term "prime contractor" shall mean contractor.

**Standard Specifications**-City of Hollister Standard Specifications.

## SECTION 2-SCOPE AND CONTROL OF THE WORK

**2-1 AWARD AND EXECUTION OF CONTRACT.** Modify to read as follows:

**2-1 AWARD AND EXECUTION OF CONTRACT.** Award and execution of Contract will be as provided for in the Specifications, Instruction to Bidders, or Notice Advertising for Bids.

For private Contracts execution of contract shall be as provided for in the Subdivision Map Act and by ordinance.

**2-3 SUBCONTRACTS.** Add Subsection **2-3.01 Applicability.**

**2-3.01 Applicability.** Subsection **2-3.1 General** does not apply to Private Contracts.

**2-4 CONTRACT BONDS.** Add subsection **2-4.01 Applicability.**

**2-4.01 Applicability.** Subsection **2-4 CONTRACT BONDS** does not apply to Private Contracts. Security for Private Contracts shall be as provided for in the Subdivision Map Act and by ordinance.

**2-8 RIGHT-OF-WAY.** Add Subsection **2-8.1 Right-of-Way for Private Contracts.**

**2-8.1 Right-of-Way for Private Contracts.** Rights-of-Way, easements, or rights-of-entry for the Work shall be provided by the Contractor. Unless otherwise provided, The Contractor shall make arrangements, pay for, and assume all responsibility for acquiring, using, and disposing of all rights-of-way, easements or rights-of-entry whether required permanently or temporarily. The Contractor shall indemnify and hold the Agency harmless from all claims for damages caused by such actions.

**2-9 SURVEYING.** Modify Subsection **2-9.5 Line and Grade** to read as follows:

**2-9.5 Line and Grade.** All work shall conform to the lines, elevations, and grades shown on the plans.

Three consecutive points set on the same slope shall be used together so that any variation form a straight grade can be detected. This determination may also be made with laser leveling devices. Any such variation shall be reported to the Engineer. In the absence of such report, the Contractor shall be responsible for any error in the grade of the finished work.

Grades for underground conduits will be set at the surface of the ground. The Contractor shall transfer them to the bottom of the trench.

**2-10 AUTHORITY OF BOARD AND ENGINEER.** Modify to read as follows:

**2-10 AUTHORITY OF BOARD AND ENGINEER.** The Board has the final authority in all matters affecting the Work. Within the scope of the Contract, the Engineer has the authority to enforce compliance with the Plans and Specifications. The Contractor shall promptly comply with instructions from the Engineer or an authorized representative.

On all questions relating to quantities, the acceptability of material, equipment, or work, the execution, progress or sequence of work, and the interpretation of Specifications or drawings, the decision of the Engineer is final and binding, and shall be precedent to any payment under the Contract or disbursement from the set aside account for Private Contracts, unless otherwise ordered by the Board.

**2-11 INSPECTION.** Modify to read as follows:

**2-11 INSPECTION.** The Work is subject to inspection and approval by the Engineer. The contractor shall notify the Engineer 24 hours prior to necessary inspection. Unless otherwise authorized, work shall be done only in the presence of the Engineer or an authorized representative. Any work done without proper inspection will be subject to rejection. The Engineer and any authorized representatives shall at all times have access to the Work during its construction at shops and yards as well as the project site. The Contractor shall provide every reasonable facility for ascertaining that the materials and workmanship are in accordance with these specifications. Inspection of the Work shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.
For Private Contracts inspections may be limited to one per day depending on inspection availability.

## SECTION 3-CHANGES IN WORK

Add Subsection **3-0 APPLICABILITY.**

**3-0 APPLICABILITY.** Only Subsection **3-1 CHANGES REQUESTED BY THE CONTRACTOR** shall apply to Private Contracts.

**3-3 EXTRA WORK.**

**3-3.2 Payment.**

**3-3.2.3 Markup.** Modify to read as follows:

**3-3.2.3 Markup.**

(a) **Work by Contractor.** The following percentage shall be added to the Contractor's costs and shall constitute markup for all overhead and profits:

| | |
|---|---|
| Labor | 15 |
| Materials | 15 |
| Equipment Rental | 15 |
| Other Items and Expenditures | 15 |

(b) **Work by Subcontractor.** When all or any part of extra work is performed by a subcontractor, the markup established in subsection **3-3.2.3**(a) shall be applied to the Subcontractor's actual cost of such work which shall be the entire cost to the Agency.

## SECTION 4-CONTROL OF MATERIAL

### 4-1 MATERIAL AND WORKMANSHIP.

**4-1.1 General.** Add subsection **4-1.1.1 Private Contracts.**

**4-1.1.1 Private Contracts.** All materials, parts, and equipment furnished by the Contractor in the Work shall be new, high grade, and free from defects. Quality of work shall be in accord with the generally accepted standards. Materials and work shall be subject to the Engineer's approval.

Materials and work quality not conforming to the requirements of the Specifications shall be considered defective and will be subject to rejection. Defective work or material, when in place shall be removed from the work at the Contractor's expense and permanently marked. Defective material not yet in place, shall be permanently marked and not allowed to be incorporated into the work.

If the Contractor fails to replace any defective or damaged work or material, approval will not be given for any building permits. If the Contractor fails to replace defective or damaged work or material prior to the expiration of its contract with the City or if the defective or damaged work or material is judged to be a hazard to the public, the Engineer may cause such work or materials to be replaced. The replacement expense shall be deducted from any security held by the City to ensure the completion of the Work.

Used or secondhand materials, parts, and equipment may be used only if permitted by the Specifications.

## SECTION 5-UTILITIES

Add Subsection **5-0 APPLICABILITY.**

**5-0 APPLICABILITY.** Any references to payment shall apply to public contracts only. For Private Contracts, the details and expenses of any relocation or protective measures shall be the responsibility of the Contractor.

**5-1 LOCATION.** Modify to read as follows:

**5-1 LOCATION.** The Permittee, in the case of private contract, and the Agency, in the case of a public, will search known substructure records and furnish the Contractor with copies of documents which describe the location of utility substructures, or will indicate on the plans for the project those substructures, except for service connections, which may affect the Work. Information regarding removal, relocation, abandonment, or installation of new utilities will be furnished to prospective bidders.

Where underground main distribution conduits such as water, gas, sewer electric power, telephone or cable television are shown on the Plans, the Contractor, for the purpose of preparing a Bid shall assume that every property parcel will be served by a service connection for each type of utility.

As provided in Section 4216 of the California Government Code, at least 2 working days prior to commencing any excavation, if the excavation conducted in an area which is known, reasonably should be known, to contain subsurface installations, the Contractor shall contact the regional notification center (Underground Service Alert- (800) 642-2444) and the City of Hollister Service Department (408) 637-8247.

The California Department of Transportation is not required by Section 4216 to become a member of the regional notification center. The Contractor shall contact it for location of its subsurface installations.

The Contractor shall determine the locations and depth of all utilities, including service connections, which have been marked by the respective owners and which may affect or be affected by its operations. If no separate pay item is provided in the contract for this work, full compensation for such work shall be considered as included in the prices bid for other items of work.

Add subsection **5-7 CONTACT PERSONS.**

**5-7 CONTACT PERSONS.** Contact persons for the various utilities involved with or impacted by the Work shall be indicated in the Special Provisions for public contracts. For private contracts

securing contact persons shall be the responsibility of the Contractor.

## SECTION 6-PROSECUTION, PROGRESS AND ACCEPTANCE OF THE WORK

**6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK.** Modify to read as follows:

**6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF WORK.** After notification of award and prior to the start of any work, the Contractor shall submit to the Engineer for approval its proposed construction schedule. the construction schedule shall be in the form of a tabulation, chart, or graph and shall be in sufficient detail to show the chronological relationship of all activities of the project including, but not limited to, estimated starting and completion dates of various activities, submittal of shop drawings to the Engineer for approval, procurement of materials, and scheduling of equipment. The Construction schedule shall recognize the requirements of Subsection 5-5. The construction schedule shall reflect completion of all work under the Contract within the specified time and in accordance with these specifications.

Unless otherwise provided, the Contract time shall commence upon the date of issuance of a notice to proceed. The Work shall start within 10 days thereafter, and be diligently prosecuted to completion within the time provided in the Specifications. For Private Contracts time of completion shall be as indicated in the improvement contract or permit, as specified by ordinance.

If the contractor desires to make a major change in the method of operations after commencing construction, or if the schedule fails to reflect the actual progress, the contractor shall submit to the Engineer a revised construction schedule in advance of beginning revised operations.

The Engineer may waive these requirements for work constructed under permit or Private Contract.

**6-2 PROSECUTION OF WORK.** Modify to read as follows:

**6-2 PROSECUTION OF WORK.** To minimize public inconvenience and possible hazard and to restore streets and other work areas to their original condition and former state of usefulness as soon as practicable, the Contractor shall diligently prosecute the Work to completion. If, as determined by the Engineer, the Contractor fails to prosecute the Work to the extent that the above purposes are not being accomplished, the contractor shall, upon orders from the Engineer, immediately take steps necessary to fully accomplish said purposes. All costs of prosecuting the work as described herein

shall be included in the Contractor's Bid or for Private Contracts shall be borne by the Contractor. Should the contractor fail to take the necessary steps to fully accomplish said purposes, after orders of the Engineer to do so, the Engineer may suspend the Work in whole or in part, until the Contractor takes said steps.

As soon as possible under the provisions of these Standard Specifications, the Contractor shall backfill all excavations and restore to usefulness all improvements existing prior to the start of the Work.

If Work is suspended through no fault of the Agency, all expenses and losses incurred by the Contractor during such suspensions shall be borne by the Contractor. If the Contractor fails to properly provide for public safety, traffic, and protection of the Work during periods of suspension, the Agency may elect to do so, and deduct the cost thereof from monies due the Contractor or in the case of Private Contracts from any securities provided to ensure the completion of the Work. Such actions will not relieve the Contractor from liability.

**6-4 DEFAULT BY CONTRACTOR.** Add subsection **6-4.1 Applicability.**

**6-4.1 Applicability.** Subsection **6-4 DEFAULT BY CONTRACTOR** shall apply only to public contracts.

**6-5 TERMINATION OF CONTRACT.** Add subsection **6-5.1 Applicability.**

**6-5.1 Applicability.** Subsection **6-5 TERMINATION OF CONTRACT.** shall apply only to public contracts.

**6-6 DELAYS AND EXTENSIONS OF TIME.** Add subsection **6-6.01 Applicability.**

**6-6.01 Applicability.** Subsection **6-6 DELAYS AND EXTENSIONS OF TIME.** shall apply only to public contracts.For Private contracts delays and extensions of time shall be as provided in the improvement contract or permit, and as provided for by ordinance.

**6-7 TIME OF COMPLETION.** Add subsection **6-7.01 Applicability.**

**6-7.01 Applicability.** Subsection **6-7 TIME OF COMPLETION.** shall apply only to public contracts. For Private Contracts time of completion shall be as provided for in the improvement contract or permit, and as provided for by ordinance.

**6-9 LIQUIDATED DAMAGES.** Add subsection **6-9.1 Applicability**

**6-9.1 Private Contracts.** For Private Contracts liquidated damages shall be as defined in subsection **6-9 LIQUIDATED**

**DAMAGES.**, but shall be determined as a percentage of the engineering and inspection fees, as determined by ordinance, and assessed on a monthly rather than daily basis.

## SECTION 7-RESPONSIBILITIES OF THE CONTRACTOR

### 7-2 LABOR.

Add subsection **7-2.3 Laws Specifically Applicable to Public Contracts.**
Add subsection **7-2.4 Reports, Records, and Data.**

**7-2.3 Laws Specifically Applicable to Public Contracts.** The laws presented in this section are for the information of the Contractor and while all of these laws are applicable to public contracts, some may be applicable to Private Contracts as well. It is the responsibility of the Contractor to observe and comply with all applicable laws as specified in subsection **7-13.**

**7-2.3.1 Hours of Labor.** The Contractor shall forfeit, as penalty to the City of Hollister twenty five dollars ($25) for each laborer, workman or mechanic employed in execution of the contract by him or by any subcontractor under him upon any of the work hereinbefore mentioned, for each calendar day during which said laborer, workman, or mechanic is required or permitted to labor more than eight (8) hours in any one calendar day and forty (40) hours in any one calendar week in violation of the provisions of the Labor code, and in particular, Section 1810 to 1816 thereof, inclusive.

**7-2.3.2 Prevailing Wage.** Pursuant to Section 1773 of the Labor Code of the State of California, the City has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the general classification, or type of workman required to construct said improvements. A copy of said prevailing rate of per diem wages is on file in the office of the City clerk, to which reference is hereby made for further particulars. Said prevailing rate of per diem wages shall be made available to any interested party upon request, and the successful bidder shall post a copy thereof at the job site.

It shall be incumbent upon the contractor to whom the contract is awarded and upon any subcontractor under him to pay not less than the said specified rates to all laborers, workmen, and mechanics employed by them in the execution of the contract.

The City shall require that any class of laborers or mechanics, including apprentices and trainees, which is not listed in the wage determination and which is to be employed under the contract, shall be classified or reclassified conformably to the wage determination. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics, including apprentices

and trainees, to be used, the question accompanied by the recommendation of the contracting officer shall be referred to the Secretary of Labor for final determination.

**7-2.3.3 Labor Provisions.** Pursuant to the provisions in Sections 1777.5 (Chapter 1411, Statutes of 1968) and 1777.6 of the Labor Code concerning the employment of apprentices of the Contractor or any sub-contractor under him.

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

1. When unemployment in the area of coverage by the joint apprenticeship committee has exceeded and average of 15 percent in the 90 days prior to the request for certificate, or

2. When the number of apprentices in training in the area exceeds the ratio of one to five, or

3. When the trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis statewide or locally, or

4. When the Contractor provides evidence that he employs registered apprentices on all of his contracts on an annual average of no less than one apprentice to eight journeymen.

The contractor is required to make contributions to funds established for the administration of apprenticeship programs, if he employs registered apprentices or journeymen in any apprenticeable trade on such contracts and if other contractors on the public works site are making such contributions.

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

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

**7-2.3.4 EQUAL EMPLOYMENT OPPORTUNITY.**

No person in the United States shall, on the grounds of race, color, national origin, sex, or age be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance Reference Title VI of the Civil Rights Act of 1964 (42 USC 2000d) and Section 112 of Public Law 92.65.

During the performance of this contract, the Contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Contractor will take affirmative action to ensure the applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex age, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or training, recruitment or recruitment advertising;; layoff to termination, rates of pay or other forms of compensation; and selection for training including apprenticeship.

2. The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of the non-discrimination clause.

3. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

4. The Contractor will send to each labor union or representative of the workers with which he has collective bargaining agreements or other contract or understanding, a notice to be provided by the agency contracting officer, advising the labor union or worker's representative of the Contractor's commitment and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

5. The contractor will furnish all information and reports required and will permit access to his books, records, and accounts, by the City for purposes of investigation to ascertain compliance with such rules and regulations, and orders.

6. In the event of the Contractor's non-compliance with non-discrimination clauses of these Standard Specifications or the Special Provisions or with any such rules, regulations or orders, the contract may be canceled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further City contracts.

7. The Contractor will include the provisions of the preceding paragraphs 1 through 7 in every subcontract or purchase order unless exempted by rules, regulations, or orders of the City of Hollister that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontractor or purchase order as the City may direct as a means of enforcing such provisions including sanctions for non-compliance.

8. Exemptions to the above Equal Opportunity Clause:

(a) Contracts and subcontracts no exceeding $10,000 (other than government bills of lading) are exempt.

(b) Except in the case of subcontractors for the performance of construction work at the site of construction, the clause shall not be required to be inserted in subcontracts below the second tier.

(c) Contracts and subcontracts not exceeding $100,000 for standard commercial supplies or raw materials are exempt.

**7-2.3.5 Employment of Local Labor.** The contractor shall give full consideration to all qualified job applicants referred by the local employment service, but it is not required to employ any job applicants referred whom the contractor does no consider qualified to perform the classification of work required.

The Payrolls maintained by the Contractor shall contain the following information: The employee's full name, address, social security number, and an indication of the ethnic background of each worker.

The Contractor shall include the provision of this condition in every subcontract for which is, or reasonably may be, done as onsite work.

**7-2.3.6 Registration of Contractors.** The Contractor shall possess either a Class A license or a combination of licenses as specified in the special provisions at the time the contract is awarded.

**7-2.3.7 Copeland "Anti-Kickback" Provisions.** The provisions of this Section, 29 CFR Part 3, prescribe "Anti-Kickback" regulations under Section 2 of the Act of June 13th, 1964, as amended (40 U.S.C. 276c), popularly known as the Copeland Act.

**7-2.3.8 Other Prohibited Interests.** No official of the City who is authorized in such capacity and in behalf of the City to negotiate, make, accept, or approve, or to take part in

making, accepting, or approving any architecture, engineering inspection, construction or material supply contract, or any subcontract in connection with the construction of the project shall become directly or indirectly interested personally in the any contract or any part thereof. No officer, employee, attorney, architect, engineer or inspector of or for the City who is authorized in such capacity on behalf of the City to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in the contract or any part thereof, any material supply contract, subcontract, insurance contract or any other contract pertaining to the project.

**7-2.4 Reports, Records, and Data.** The City of Hollister, or any of its duly authorized representatives, shall have access to any books, documents, papers, and records of the contractor which are directly pertinent to the Contract for the purpose of making audit, examination excerpts, and transcription. The cost of making these records available shall be considered to be included in the price of the various items of work.

**7-3 LIABILITY INSURANCE.** Modify to read as follows:

**7-3 LIABILITY INSURANCE.** The Contractor shall furnish the Agency a policy or certificate of liability insurance in which the Agency is the named insured or is named as an additional insured with the Contractor. Notwithstanding any inconsistent statement in the policy or any subsequent endorsement attached thereto, the Agency shall be the insured or named as an additional insured covering the Work, whether liability is attributable to the Contractor or the Agency. The policy shall insure the Agency, its officers, employees and agents while acting within the scope of their duties on the Work, against all claims arising out of or in connection with the Work, except as provided for in Subsection 6-10.

The contractor may file insurance acceptable to the Agency covering more than one project. The coverage shall provide the following minimum limits:

| | |
|---|---|
| Bodily Injury Liability ..... | $ 500,000 each person<br>$1,000,000 each occurrence |
| Property Damage ..... | $ 250,000 each occurrence<br>$ 500,000 Aggregate |

A combined single limit policy with aggregate limits in amount $1,000,000 will be considered equal to the required minimum limits. Insurance coverage in the minimum amounts set forth herein shall not be

construed to relieve the Contractor for liability in excess of such coverage nor shall it preclude the Agency from taking such other actions are available under other provisions of the Contract or otherwise in law.

Such insurance shall be issued by a company or companies authorized to transact business in the State of California.

Except as provided for in Subsection **6-10**, the Contractor shall save, keep and hold harmless the Agency, its officers and agents from all damages, costs or expenses in law or equity that may at any time arise or be set up because of damages to property, or of personal injury received by reason of or in the course of performing work, which may be caused by any willful or negligent act or omission by the Contractor, any of the Contractor's employees, or any Subcontractor. The agency will not be liable for any accident, loss or damage to the work prior to its completion and acceptance, except as provided for in Subsection **6-10.**

All liability insurance policies shall bear and endorsement or shall have attached a rider whereby it is provided that, in the event of expiration or proposed cancellation of such policies for any reason whatsoever, the Agency shall be notified by registered mail return receipt requested, giving a sufficient time before the date thereof to comply with any applicable law or stature, but in no event less than 30 days before expiration cancellation is effective.

If the Contractor fails to maintain such insurance, the Agency may take out such insurance and deduct and retain the amount of the premiums.

For private contracts contractual liability insurance for liability assumed by the Contractor under contract with the City of Hollister. Such insurance as is afforded by the policy to Contractor for contractual property damage liability insurance shall include coverage for property damage caused by blasting, collapse, structural, injuries or damage to underground utilities. The policy shall not contain the so-called "x", "c" or "u" exclusions. The minimum limits of liability for this insurance shall be as indicated above.

**7-4 WORKERS' COMPENSATION INSURANCE.** Modify to read as follows:

**7-4 WORKERS' COMPENSATION INSURANCE.** Before execution of the Contract by the Board, the Contractor shall file with the Engineer the following signed certification:

"I am aware of the provisions of Section 3700 of the Labor code which require every employer to insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

The Contractor shall also comply with Section 3800 of the Labor

Code by securing, paying for , and maintaining in full force and effect for the duration of the contract, complete Workers' Compensation Insurance, and shall furnish a Certificate of Insurance or a Certificate of Permission to Self-Insure signed by the Department of Industrial Relations Administration of Self-Insurance to the Engineer before execution of the Contract. The Agency, its officers, or employees, will not be responsible for any claims in law or equity occasioned by failure of the Contractor to comply with this paragraph.

If any injury occurs to any employee of the Contractor for which the employee, or his dependents in the event of his death, is entitled to compensation from the City Agency under provisions of the Workers' Compensation Act, as amended, or for which compensation is claimed from the Agency, the Agency may retain out of sums of money due the contractor or held as security under the Contract an amount sufficient to cover such compensation as fixed by said Act, until such compensation is paid or until it is determined that no compensation is due and if the Agency is compelled to pay such compensation, it will deduct and retain from sums due the Contractor or held as security the amount so paid.

If the contractor fails to maintain such insurance, the Agency may take out such compensation insurance and deduct and retain the amount of the premium.

All compensation insurance policies shall bear an endorsement or shall have attached a rider whereby it is provided that, in the event of expiration or proposed cancellation of such policies for any reason whatsoever, the Agency shall be notified by registered mail not less than 30 day before expiration or cancellation is effective.

**7-5 PERMITS.** Modify subsection to read as follows:

**7-5 PERMITS AND LICENSES.** The Agency will obtain, at no cost to the Contractor, all encroachment and building permits necessary to perform Contract work in streets, highways, railways or other rights-of-way. The Contractor shall obtain and pay for all costs incurred for permits necessitated by its operations such as, but not limited to, those permits required for night work, overload, blasting and demolition. For private contracts, the contractor shall obtain all permits incidental to the Work or made necessary by its operations, and pay all costs incurred by the permit requirements.

The Contractor and all Subcontractors shall obtain a City of Hollister business license. No progress payment or security disbursement, in the case of private contracts, will be made by the Agency to the Contractor if these business licenses are not obtained.

**7-10 PUBLIC CONVENIENCE AND SAFETY.**

**7-10.2 Storage of Equipment and Materials in Public Streets.**

Add subsection **7-10.2.1 Applicability.**

**7-10.2.1 Applicability.** Subsection **7-10.2** shall apply only to improvements within existing Agency rights-of-way.

## SECTION 9-MEASUREMENT AND PAYMENT

Add subsection **9-0.1 APPLICABILITY.**

**9-0.1 APPLICABILITY.** Subsection **9-1 MEASUREMENT OF QUANTITIES FOR UNIT PRICE WORK,** subsection **9-2 LUMP SUM WORK,** and subsections **9-3.3 Delivered Material** and **9-3.4 Mobilization** shall apply to private contracts only for the purpose of making estimates of partial disbursements as reflected in the disbursement schedule supplied prior to commencing the project.

### 9-3 PAYMENT

**9-3.1 General.** Add subsection **9-3.1.1 Private Contracts.**

**9-3.1.1 Private Contracts.** For private contracts quantities listed in the disbursement schedule are for the facilitation of partial disbursements and will be released in proportion to the actual quantities constructed.

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 reasonably expected to be taken, the Agency may, after reasonable attempt to notify the Contractor, cause such precautions to be taken and shall charge the cost thereof against the Contractor, or may not issue building permits to the Contractor until such cost is reimbursed to the Agency. Agency action or inaction shall not be construed as relieving the Contractor or its Surety from liability.

Disbursements from monies held as security by the Agency shall not relieve the Contractor from its obligations under the Contract; nor shall such disbursements be construed to be acceptance of any of the Work. Disbursement shall not be construed as the transfer of ownership of any equipment or materials to the Agency. Responsibility of ownership shall remain with the Contractor who shall be obligated to store, protect, repair, replace, rebuild or otherwise restore any fully or partially completed work or structure; or replace any materials or equipment required to be provided under the Contract which may be damaged, lost, stolen or otherwise degraded in any way prior to acceptance of the Work, except as provided in Subsection **6-10.**

Warranty periods shall not be affected by any disbursement but shall commence upon final acceptance of the improvements.

If, within the time fixed by law, a properly executed notice to stop payment is filed with the Agency, due to the Contractor's failure to pay for labor or materials used in the Work, all money due for such labor or materials will be withheld from disbursement to the Contractor in accordance with applicable laws.

Upon acceptance of the Work, all monies retained by the Agency will be disbursed to the Contractor except such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, amounts to be retained for the warranty, and any additional monies authorized by the Contractor to be further retained.

**9-3.2 Partial and Final Payment.** Modify to read as follows:

**9-3.2 Partial and Final Payment.** The Engineer will, after award of Contract, establish a closure date for the purpose of making monthly progress payment. The Contractor may request in writing that such monthly closure date be changed. The Engineer may approve such request when it is compatible with the Agency's payment procedure.

Each month, the Engineer will make an approximate measurement of the work performed to the closure date and as a basis for making monthly payments, estimate its value based on the Contract Unit Prices or as provided for in subsection **9-2.** No such estimate or payment shall be required to be made, when in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the contract, or when in his judgment the total value of the work done since the last estimate amounts to less than three hundred dollars ($300). When the work has been satisfactorily completed, the Engineer will determine the quantity of work performed and prepare the final estimate.

From each progress estimate, 10 percent will be deducted and retained by the Agency, and the remainder less the amount of all previous payments will be paid to the Contractor. After 50 percent of the Work has been completed and if progress on the Work is satisfactory, the deduction to be made from the remaining progress estimates and from the final estimate may be limited to $500 or 10 percent of the first half of the total Contract amount, whichever is greater.

No progress payment made to the Contractor or its sureties will constitute a waiver of liquidated damages under subsection **6-9.**

As provided for in Sections 10263 and 22300 of the California Public Contract Code, the Contractor may substitute securities for any monies withheld by the Agency to ensure performance under the Contract.

**9-3.2.1 Private Contracts.** The Contractor may request partial disbursements of monies held as security by the Agency on no less than a monthly basis. The Engineer shall, upon request for partial disbursement, estimate the work remaining to complete the Contract. The difference between this amount and the original estimate shall be the estimated amount of work completed. 10 percent of the estimated amount completed will be retained by the Agency to ensure performance under the contract, the remainder of the estimated amount of work completed less all previous disbursements will be disbursed to the Contractor.

No partial disbursement made to the Contractor or its

sureties shall constitute a waiver of the liquidated damages under subsection 6-9.1.

## PART 2
## CONSTRUCTION MATERIALS

ADD **SECTION 100 APPLICABILITY**

### SECTION 100 APPLICABILITY.

**100-1 MEASUREMENT AND PAYMENT.** Unless otherwise noted all references to payment and measurement for payment shall apply only to work contracted for by the agency.

## SECTION 200 ROCK MATERIALS

**200-2 UNTREATED BASE MATERIALS.**
Add **SUBSECTION 200-2.01 Requirements.**

**200-2.01 Requirements.** Unless otherwise specified, untreated base material shall be a minimum of crushed miscellaneous base(see subsection **200-2.1** for order of preference) and shall be of fine gradation.(See subsections **200-2.2.2, 200-2.3.2, and 200-2.4.2)**

**200-2.1 General.** Modify subsection **200-2.1** to read as follows:

**200-2.1 General.** Materials used as untreated base or subbase shall be classified in the order of preference as follows:

Crushed Aggregate Base or Crushed Slag Base
Crushed Miscellaneous Base
Processed Miscellaneous Base
Select Subbase

When base material without further qualification is specified, the Contractor shall supply crushed miscellaneous base. When a particular classification of base material is specified, the Contractor may, following the order of preference listed above, substitute any higher classification of base material for that specified. All processing or blending of materials to meet the grading requirement will be performed at the plant or source. The materials shall compact to a hard, firm, unyielding surface and shall remain stable when saturated with water.

## SECTION 203-BITUMINOUS MATERIALS

### 203-5 EMULSION-AGGREGATE SLURRY

**203-5.3 Composition and Grading.** Add subsection **203-6.5.3.1 Requirements.**

**203-6.5.3.1 Requirements.** Unless otherwise specified all emulsion-aggregate slurry shall be Type II.

### 203-6 ASPHALT CONCRETE

**203-6.2 Materials.**

**203-6.2.1** Modify subsection **203-6.2.1 Asphalt** to read as follows:

**203-6.2.1 Asphalt.** The asphalt binder to be mixed with the aggregate shall be paving asphalt with a viscosity grade of AR-4000, unless otherwise specified and shall conform to subsection 203-1.

**203-6.3 Asphalt Concrete Mixtures.**

**203-6.3.2 Composition and Grading.** Add subsection **203-6.3.2.1 Requirements.**

**203-6.3.2.1 Requirements.** Unless otherwise specified, a Class C1 mixture shall be used when asphalt pavement thickness is less than 3 inches. When asphalt pavement thickness exceeds 3 inches the finish course shall be a Class C2 mixture and all preceding courses shall be a Class B Mixture

## SECTION 207-PIPE

Delete the following subsections in their entirety:

207-1 NONREINFORCED CONCRETE PIPE
207-3 LINED REINFORCED CONCRETE PIPE
207-4 CONCRETE CYLINDER PIPE
207-5 REINFORCED CONCRETE PRESSURE PIPE
207-6 ASBESTOS CEMENT SEWER AND STORM DRAIN PIPE
207-7 ASBESTOS CEMENT PRESSURE PIPE
207-8 VITRIFIED CLAY PIPE
207-10 STEEL PIPE

**207-9 CAST IRON AND DUCTILE IRON PIPE.** Add subsection **207-9.01 Cast iron pipe.**

**207-9.01 Cast iron pipe.** Cast iron pipe of any kind will not be allowed. Cast iron fittings may be allowed.

Add subsection **207-9.2.7 Cathodic Protection Against External Corrosion.**

**207-9.2.7 Cathodic Protection Against External Corrosion.** When required, cathodic protection shall be provided by galvonic magnesium anodes. The magnesium anodes shall meet the following specifications:

1. Composition

   a. Backfill mixture consisting of 75% Hydrated Gypsum, 20% Wyoming Hi-Jel Bentonite, and 5% Sodium Sulfate vibratory packed in cotton bag around anode.

   b. Galvanized steel core weighing not more than 0.10 pounds per lineal foot cast into full length of anode with 10 feet of #12 TW insulated lead wire attached.

   c. Silver soldered, fully insulated connection of anode lead wire to core strap.

   d. Magnesium alloy comprised of:

| Element | Specification |
|---|---|
| Aluminum | 5.0 - 7.0% |
| Manganese | 0.15% Min. |
| Zinc | 2.0 - 4.0% |
| Silicon | 0.30% Max. |
| Copper | 0.10% Max. |
| Nickel | 0.003% Max. |
| Iron | 0.003% Max. |
| Other | 0.30% Max. |

| | |
|---|---|
| Magnesium | Remainder |

2. Size

| Nominal Dia. | Anode Weight |
|---|---|
| 6" - 8" | 9 lbs. |
| 10"-12" | 17 lbs. |
| 14"-24" | 32 lbs. |

Anode installation shall conform to City of Hollister Standard Plans B-15-1 and B-15-2.

**207-15 ABS SOLID WALL PIPE.** Modify subsection **207-15.1 General** to read as follows:

**207-15.1 General.** This subsection applies to ABS solid wall pipe for use as sanitary sewers and house connection sewers which have a nominal diameter of 6 inches or less. Pipe, fittings and joints shall comply with ASTM D 2751 except as modified herein. Minimum wall thickness shall correspond with SDR 23.5 for house connection sewers and SDR 35 for mains. All joints shall be solvent welded.

Joint solvent cement shall be an ABS cement conforming to ASTM D 2235.

**207-17 PVC PLASTIC PIPE.** Modify subsection **207-17 General** to read as follows:

**207-17.1 General.** This subsection applies to the requirements for unplasticized PVC plastic pipe for sanitary sewers, storm drains, and house connection sewers. Pipe, fittings, couplings, and joints shall conform to the requirements listed below except that PVC Schedule 40 shall be used for house connection sewers and as otherwise modified by the Plans or Specifications.

| **Pipe Size(Inches)** | **ASTM** | **Wall Thickness Min.** |
|---|---|---|
| 4-15 | D3033 | SDR 35 |
| 4-15 | D3034 | SDR 35 |
| 4-18 | F949-90 | N/A |
| 18-30 | F679 | "T-1"only |

All pipe, except house connection sewers, shall have integral bell and spigot rubber ring gasket joints. House connection sewer shall be joined in conformance w/ subsection **207-17.3.3 Solvent Cement Joints.** shall be gasket joints.

**207-18(BLANK)** To become **207-18 PVC PIPE FOR POTABLE WATER DISTRIBUTION.**

**207-18 PVC PIPE FOR POTABLE WATER DISTRIBUTION**

**207-18.1 General.** This section applies to PVC pipe for use in pressurized systems for the distribution of potable water. All PVC pipe for potable water distribution shall comply with AWWA Standard C900 and unless otherwise specified be DR 18 (pressure Class 150). Any excerpts from AWWA Standard C900 used in this subsection shall be for reference only and unless otherwise specified the actual AWWA Standard shall apply.

**207-19 POLYETHYLENE SOLID WALL PIPE AND LINER.** Modify to read as follows:

**207-19 HIGH DENSITY POLYETHYLENE (HDPE) PROFILE PIPE AND HIGH DENSITY POLYETHYLENE TUBING.**

**207-19.1 General.** Modify to read as follows:

**207-19.1 General.** High density polyethylene (HDPE) plastic profile pipe for use in 18 inch to 36 inch gravity sanitary sewers and storm drains shall comply with ASTM F 894. All pipe shall have integral bell and spigot rubber ring joints. Pipe with 16 feet of cover or less shall be Class 40. Pipe with cover greater than 16 feet shall be Class 63. Branch connections shall be made with the use of manufactured "tees" or field fabricated tee legs. If field fabricating is done, the HDPE welder shall be certified by the manufacturer prior to any fabrication. With the approval of the Engineer, Fowler "inserta-Tees" may be used.

High density polyethylene CTS tube for the transmission of potable water shall comply with ASTM D 2737 and AWWA Standard C901 and shall meet the following description:
Plastic extrusion compound: Type III, Class C, Category 5 Grade P34 as defined in ASTM D 1248.

High density polyethylene (HDPE) plastic smooth interior corrugated pipe for sanitary sewer shall comply with ASTM F405 or ASTM F667, depending on diameter. Gasketted couplings shall comply with ASTM D-3034 and shall be affixed to the pipe joint at the factory. Fittings shallb e gasketted PVC complying with ASTM D-3034.

Standard pipe dimension ratio (SDR) 9- 200psi pressure rating.

**207-19.4 Marking.** Modify to read as follows:

**207-19.4 Marking.** Pipe and liner shall be marked at 5-foot intervals or less with marking which identify the manufacturer, pipe size, class and profile number, and production code.

At the end of the production shift, during which a production lot has been extruded, the marking code on the pipe shall be changed to indicate that said time intervals have elapsed and that a new production shift has begun.

Fittings shall be marked with the name of the manufacturer or its logo, the size, and the material from which they were molded or fabricated.

## PART 3

## CONSTRUCTION METHODS

## SECTION 300-EARTHWORK

### 300-1 CLEARING AND GRUBBING

**300-1.3 Removal and Disposal of Materials.**

**300-1.3.2 Requirements.**

**(c) Concrete Curb, Walk, Gutter, Cross Gutters, Driveways and Alley Intersections.** Modify to read:

**(c) Concrete Curb, Walk, Gutter, Cross Gutters, Driveways and Alley Intersections.** Concrete shall be removed to neatly sawed edges with saw cuts made to a minimum depth of 1-1/2 inches. Concrete sidewalk or driveway to be removed shall be neatly sawed in straight lines either parallel to the curb or at right angles to the alignment of the sidewalk. Sawcut in sidewalk or driveway shall be at construction joints, expansion joints, or weakened plane joints or at scores. Curb and gutter shall be sawcut to a depth of 1-1/2 inches on a neat line at right angles to the curb face and at construction joints, expansion joints, or weakened plane joints.

## SECTION 301-TREATED SOILS, SUBGRADE PREPARATION AND PLACEMENT OF BASE MATERIALS

Add subsection **301-0 USE OF TREATED SOILS.**

### 301-0 USE OF TREATED SOILS.

**301-0.1 General.** Treated soils will not be allowed except under special circumstances and must be approved in advance by the Engineer.

### 301-1 SUBGRADE PREPARATION.

**301-1.2 Preparation of Subgrade.** Modify to read as follows:

**301-1.2 Preparation of Subgrade.** Unless otherwise specified and, after rough grading has been completed, the bottom six inches of subgrade shall be exposed and then shall be loosened to a depth of at least six inches. The loosened material shall then be worked to a finely divided condition and all rocks larger than 3 inches in diameter shall be removed. The moisture content shall be brought to 2% above optimum or as directed by the geotechnical engineer by the addition of water, by the addition and blending of dry suitable material or by the drying of existing material. The material shall then be compacted by approved

equipment to the specified relative compaction. The top 6 inches of subgrade shall then be placed, worked, moisture, conditioned, and compacted in the same manner as the bottom 6 inches of subgrade. Subgrade beneath sidewalks shall be conditioned to a depth of 6 inches in the same manner as the bottom 6 inches of subgrade as specified above.

Nothing contained herein, shall be construed as a prohibition of the contractor removing, exposing, or processing the subgrade material to greater depths, or the placement of material in less than six (6) inch lifts at the contractors option, or as recommended by the project geotechnical engineer.

**301-1.3 Relative Compaction.** Modify to read as follows:

**301-1.3 Relative Compaction.** Except in areas where P.C.C. sidewalk is to be placed, the top 12 inches of subgrade material shall be compacted to 95% relative compaction, including handicap ramps. In areas where sidewalk is to be placed the top 6 inches of subgrade shall be compacted to 90% relative compaction.

After compaction and trimming, the subgrade shall be firm, hard, and unyielding.

**301-1.6 Adjustment of Manhole Frame and Cover Sets to Grade.** Modify to read as follows:

**301-1.6 Adjustment of Valve Boxes and Manhole Frame and Cover Sets to Grade.** Utility manhole and vault frames and covers within an area to be paved or graded will be set by the owners thereof to finish grade. Water valve boxes and sewer and storm drain manhole frames and covers within the area to be paved or graded shall be set to finish grade by the Contractor. Valve boxes and manholes in AC pavement shall be set to finish grade in accordance with provisions of Subsection 302-5.8. In the case of portland cement concrete pavement, valve boxes and manhole frames shall be set to finish grade before paving. Repaving required as a result of reconstructing or adjusting all valve boxes, manhole and vault frames and covers to grade shall be the responsibility of the Contractor and the cost thereof shall be included in the bid item for pavement.

The Contractor shall remove all debris from the interior of valve boxes and manholes and shall clean all foreign material from the tops of the valve boxes and the manhole frames and covers.

**301-2 UNTREATED BASE.**

**301-2.2 Spreading.** Modify to read as follows:

**301-2.2 Spreading.** Imported aggregate bases shall be delivered to the roadbed as uniform mixtures and each layer shall be spread in one operation. Segregation shall be avoided and the base shall be free from pockets of coarse or fine material.

Aggregate bases shall be deposited on the roadbed at a uniform quantity per linear foot, which quantity will provide the required compacted thickness within the tolerances specified herein without resorting to spotting, picking up or otherwise shifting the aggregate base material. At the time aggregate base is spread, it shall have a moisture content sufficient to obtain the required compaction. Such moisture shall be uniformly distributed throughout the material.

Where the required thickness is 8 inches or less, the base material may be spread and compacted in one layer. Where the required thickness is more than 8 inches the base material shall be spread and compacted in two or more layers of approximately equal thickness, and the maximum compacted thickness of any one layer shall not exceed 8 inches. Each layer shall be spread and compacted in a similar manner.

The use of motor graders will be permitted during depositing, spreading and compacting operations, except when self-propelled spreaders are specified.

When the subgrade for aggregate base consists of cohesionless sand and written permission is granted by the Engineer, a portion of the aggregate base may be dumped in piles upon the subgrade and spread ahead from the dumped material in sufficient quantity to stabilize the subgrade. Segregation of aggregates shall be avoided and the material as spread shall be free from pockets of coarse or fine material.

**301-2.3 Compacting.** Modify to read as follows:

**301-2.3 Compacting.** Rolling shall always be commenced along the edge of the area to be compacted and the roller shall gradually advance toward the center of the area to be compacted.

Rollers shall be operated along lines parallel or concentric with the centerline of the road being constructed, and no material variation therefrom will be permitted. All rollers must be maintained in good mechanical condition.

The relative compaction of each layer of compacted base material shall not be less than 95 percent.

The surface of the finished aggregate base at any point shall not vary more than 0.02 foot above or below the grade established by the Engineer.

Base which does not conform to the above requirements shall be reshaped or reworked, watered and thoroughly recompacted to conform to the specified requirements.

## SECTION 302-ROADWAY SURFACING

### 302-5 ASPHALT CONCRETE PAVEMENT

**302-5.3 Prime Coat.** Modify to read as follows:

**302-5.3 Prime Coat.** When specified, a prime coat consisting of Grade SC-250 liquid asphalt shall be applied at a rate of 0.25 gallon per square yard. Grade SC-70 liquid asphalt may be used when approved by the Engineer.

**302-5.5 Distribution and Spreading.** Modify to read as follows:

**302-5.5 Distribution and Spreading.** The Contractor shall provide and install a header upon the line of termination of asphalt pavement where shown on the Plans or required by the Specifications. Such headers shall remain in place upon completion of the improvements.

Headers shall be 2-inch (nominal size) lumber (Redwood or Pressure Treated Douglas Fir), the vertical dimension of which shall be within 1/2 inch of the thickness of the pavement at the header line. The headers shall have firm bearing on the header subgrade and the top edges shall be set to conform to the grade of the proposed street surface. Side stakes 2 inches by 4 inches (nominal size), 18 inches long, or longer, and spaced not over 4 feet apart, shall be driven on the outside of the headers to a depth of 1 inch below the top edge and then nailed to the header. The joints between the individual boards being used as headers shall be spliced with a 1-inch-thick (nominal size) board of the same height as the header and not less than 24 inches long.

At the time of delivery to the Work site, the temperature on mixture shall not be lower than 260 degrees Fahrenheit or higher than 320 degrees Fahrenheit, the lower limit to be approached in warm weather and higher in cold weather.

Asphalt concrete shall not be placed when the atmospheric temperature is below 40 degrees Fahrenheit or during unsuitable weather.

The asphalt concrete shall be evenly spread upon the subgrade or base to such a depth that, after rolling, it will be of the specified cross section and grade of the course being constructed.

The depositing, distributing, and spreading of the asphalt concrete shall be accomplished in a single, continuous operation by means of a self-propelled mechanical spreading and finishing machine designed specifically for that purpose. The machine shall be equipped with a screed or strike-off assembly capable of being accurately regulated adjusted to distribute a layer of the material to a definite predetermined thickness. When paving is of a size or in a location that use of a self-propelled machine is impractical the Engineer may waive the self-propelled requirement.

Asphalt concrete of the Class indicated in the following table shall be laid in courses not exceeding 6 inches in Thickness.

| Specified Total Thickness of Pavement | | Minimum Number of Courses | Class of Mixture |
|---|---|---|---|
| Greater Than (Inches) | But Not More Than (Inches) | | |
| 0 | 1 | 1 | D1 or D2 |
| 1 | 1-1/2 | 1 | C2 |
| 1-1/2 | 3 | 1 | C2 |
| 3 | --- | 2 | B or C2* |

* For pavements with more than one course the finish course shall be Class C2 and all other courses shall be Class B

Spreading, once commenced, must be continued without interruption. No greater amount of the mixture shall be delivered in any one day than can be properly distributed and rolled during that day.

Successive courses may be laid upon previously laid courses as soon as the previous course has cooled sufficiently to show no appreciable displacement under equipment load.

The asphalt concrete surface of an alley shall be warped up to meet paved driveways which are 6 inches or less above grade. Such warping shall not extend more than 18 inches into the alley and shall be accomplished by thickening the pavement.

**302-5.8 Manholes (and other structures).** Modify to read as follows:

**302-5.8 Manholes (and other structures).** Sewer and storm drain structures and water valve boxes extending 2 inches or more above the finished grade to be paved shall be removed by the Contractor to the finished grade to be paved before paving. Other structures shall be lowered by owners. Structures projecting less than 2 inches above the finished grade to be paved may be paved over and later adjusted to grade.

All structures from which manhole frames and covers have been removed to facilitate paving shall be temporarily covered with a steel plate by the Contractor. When this procedure is impractical, such as for large vaults, special structures, or where portland cement concrete pavement is to constructed, all remodeling or reconstruction shall be completed to finish permanent surface prior to paving operations. The Contractor shall notify utility owners, at least 2 working days in advance, of the need to commence work required prior to paving operations and again for work required after paving operations. If it is found to be impractical for the utility owner to complete the final

remodeling or adjustment of structures within a reasonable time after paving operations, as evaluated by the Engineer, then the Contractor shall be absolved of further responsibility in connection therewith, and the structure shall be adjusted to grade by the utility owner under permit or ordinance procedure established by the Agency for utility cuts in pavement.

After the pavement has been completed, the necessary portions of the subgrade, base and pavement shall be neatly removed, the structure built up, and water valve boxes and the manhole frames set to be backfilled with a 10 inch by 10 inch portland cement concrete (conforming to Subsection 301-6.1) collar to within 1-1/2 inches of the surface by the party responsible for adjustment of the frame and cover. After a minimum 72 hour cure period, the Contractor shall fill the remaining 1-1/2 inches with an asphalt concrete wearing surface mixture to match the pavement surface. This material shall be placed and compacted in a workmanlike manner to conform to the appearance of the surrounding pavement.

## SECTION 303-CONCRETE AND MASONRY CONSTRUCTION

### 303-5 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, ACCESS RAMPS, AND DRIVEWAYS.

**303-5.1 Requirements.**

**303-5.1.1 General.** Modify to read as follows:

**303-5.1.1 General.** Concrete curbs, walks, gutters, cross gutters, alley intersections, access ramps, and driveways shall be constructed of portland cement concrete of the class and other requirements prescribed in Subsection 201-1. Subgrade preparation shall conform to the requirements of Section 301-1.

Unless otherwise specified on the Plans, and except as otherwise prescribed in Subsection 303-5.1.3 under the heading of "Driveway Entrances", the minimum thickness of walks shall be 4 inches. The thickness of gutters, cross gutters, alley intersections, access ramps, and driveway aprons shall be as shown on the Standard Plans or on the Plans.

**303-5.1.3 Driveway Entrances.** Modify to read as follows:

**303-5.1.3 Driveway Entrances.** Driveway entrances shall be provided in new curb at all existing driveways along the line of the work, at locations shown on the plans, and at such other locations as may be designated by the Engineer.

The fully depressed curb opening at driveway entrances shall be 1 inch above gutter flowline at the curb face. The top of the fully depressed portion of the curb shall be finished with a transverse slope of 1/4 inch toward the gutter.

Where walk is to be constructed across driveway, the thickness thereof shall be 6 inches unless otherwise specified or indicated on the Plans.

**303-5.2.2 Slip-forms.** Modify to read as follows:

**303-5.2.2 Slip-forms.** At the option of the Contractor and with the approval of the Engineer, slip-form equipment may be used for the construction of concrete curb and gutter or monolithic curb, gutter, and sidewalk.

Slip-form equipment shall be provided with traveling side and top forms of suitable dimensions, shapes, and strength to support the concrete for a sufficient length of time during placement to produce curb and gutter or monolithic curb, gutter, and sidewalk of the required cross section. The equipment shall spread, consolidate and screed the

freshly placed concrete in such a manner as to provide a dense and homogeneous product.

The slip-form equipment shall have automatic sensor controls which operate from an offset control line. The line and grade of the slip-form equipment shall be automatically controlled.

**303-5.4 JOINTS.**

**303-5.4.2 Expansion Joints.** Modify to read as follows:

**303-5.4.2 Expansion Joints.** Expansion joints shall be constructed in curb, gutter, and walk as shown the Plans, Standard Plans, or as specified herein. Such joints shall filled with premolded joint filler conforming with the requirements prescribed in Subsection 201-3.2.

Three-eighth-inch joints shall be constructed in curb, gutter and sidewalk at the end of all returns except where cross gutter transitions extend beyond the curb return, in which case they shall be placed at the ends of the cross gutter transition, at both sides of all driveways, at both sides of all catch basin aprons, and at 60 foot maximum intervals.

All expansion joint filler strips shall be installed vertically, and shall extend to the full depth and width of the work in which they are installed, and be constructed perpendicular to straight curb or radially to the line of the curb constructed on a curve. Expansion joint filler materials shall completely fill these joints to within 1/4 inch of any surface of the concrete. Excess filler material shall be trimmed off to the specified dimension in a neat and workmanlike manner. During the placing and tamping of the concrete, the filler strips shall be held rigidly and securely in proper position.

**303-5.4.3 Weakened Plane Joints.** Modify to read as follows:

**303-5.4.3 Weakened Plane Joints.**

(a) **General.** Weakened plane joints shall be straight and constructed in accordance with Subsections (b) or (c) below, unless otherwise shown on the Plans.

In walk, Joints shall be transverse to the line of work and at regular intervals not exceeding 10 feet. At curves, the joints shall be radial. At walk returns, the joints shall be as shown on the Standard Plans. Where walk is adjacent to curbing, the joints shall be aligned with the curb joints.

In gutter, including gutter integral with curb, joints shall be at regular intervals not exceeding 10 feet. Where integral curb and gutter is adjacent to concrete pavement, the joints shall be aligned with the pavement joints where practical.

(b) **Control Joint.** After preliminary trowelling, the concrete shall be parted to a depth of 2 inches with a straight edge to create a division in the coarse aggregate. The concrete shall then be refloated to fill the parted joint with mortar. Headers shall be marked to locate the weakened plane for final joint finishing, which shall be accomplished with a jointer tool having a depth of 1/2 inch and a radius of 1/8 inch. The finished joint opening shall not be wider than 1/4 inch.

(c) **Plastic Control Joint.** The joint material shall be a T-shaped plastic strip at least 1-inch deep, having suitable anchorage to prevent vertical movement, and having a removable stiffener with a width of at least 3/4 inch. After preliminary trowelling, the concrete shall be parted to a depth of 2 inches with a straightedge. The plastic strip shall be inserted in the impression so that the upper surface of the removable stiffener is flush with the concrete. After floating the concrete to fill all adjacent voids, the removable stiffener shall be stripped. During final trowelling, the edges shall be finished to a radius of 1/8 inch, using a slit jointer tool.

**303-5.5 Finishing**

**303-5.5.2 Curb.** Modify to read as follows:

**303-5.5.2 Curb.** Following placement, the concrete shall be screeded to the required grade, tamped to consolidate the concrete and to bring a thin layer of mortar to the surface, and floated to a smooth, flat, uniform surface. The concrete shall then be edged at all headers, given a preliminary trowelling and provided with weakened plane joints.The front forms may be stripped as soon as the concrete has set sufficiently.

The face and top of the curb shall then be carefully trowelled to a smooth and even finish; the top being finished to a transverse slope of 1/4 inch toward the gutter, with both edges rounded to a radius of 1/2 inch. The trowelled surface shall be finished with a fine-hair broom applied parallel with the line of the work. The edge of the concrete at all expansion joints shall be rounded to a 1/4 inch radius. The surface of the work shall be finished as prescribed.

Joints shall conform to Subsection 303-5.4.

**303-5.5.3 Walk.** Modify to read as follows:

**303-5.5.3 Walk.** The forms shall be set to place the finished surface in a plane sloping up from the top of curb 2 percent when measured at right angles to the curb.

Following placing, the concrete shall be screeded to the required grade, tamped to consolidate the concrete and to bring a thin layer of mortar to the surface, and floated to a smooth, flat, uniform

surface. The concrete shall then be edged at all headers, given a preliminary trowelling and provided with weakened plane joints.

Walk shall be steel trowel to a smooth and even finish. All formed edges shall be rounded to a radius of 1/8 inch. Preliminary trowelling may be done with a longhandled trowel or"Fresno", but the finish trowelling, shall be done with a hand trowel. After final trowelling, walk on grades of less than 6 percent shall be given a fine hair-broom finish applied transverse to the center line. On grades exceeding 6 percent, walk shall be finished by hand with a wood float. Walk shall be remarked as necessary after final finish, to assure neat uniform edges, joints, and score lines.

Scoring lines, where required, shall have a minimum depth of 1/4 inch and a radius of 1/8 inch. When longitudinal scoring lines are required, they shall be parallel to, or concentric with, the lines of the work. Walk 10 feet or more in width shall have a longitudinal center weakened plane joint. measuring the thickness. In walk returns, scoring and jointing shall be as shown on the Standard Plans or the Plans. When directed by the Engineer, longitudinal and transverse scoring lines shall match the adjacent walk. The Contractor shall have sufficient metal bars, straightedges, and joint tools on the project.

Headers shall remain in place for at least 16 hours after completion of the walk but must be removed before the work is accepted.

**303-5.5.5 Alley Intersections, Access Ramps, and Driveways.** Modify to read as follows:

303-5.5.5 Alley Intersections and Access Ramps. Alley intersections and access ramps shall be constructed as specified for concrete pavement in Subsection 303-6 except final finishing for alley intersections and access ramps shall be done by hand with a wood float.

Add Subsection **303-5.5.6 Driveways.**

303.5.5.6 Driveways. Driveways shall be constructed as specified on the Standard Plans or the Plans for the specified type of driveway and shall be finished as specified for walks in Subsection 303-5.5.3.

**303-6 STAMPED CONCRETE.**

**303-6.1 General.** Modify to read as follows:

**303-6.1 General.** Stamped concrete shall be natural or colored and imprinted with special tools to provide the pattern specified.

The Contractor shall install a sample for each color and pattern included in the Work. The sample shall be a minimum of 10 square feet which shall be inspected and approved by the Engineer. All other areas shall be installed to match the color and texture of the

approved area.

All coloring and curing compounds used in the Work shall be from the same manufacturer.

Stamped concrete will only be allowed with the prior approval of the Engineer.

## SECTION 306-
## UNDERGROUND CONDUIT CONSTRUCTION

### 306-1 OPEN TRENCH OPERATIONS.

#### 306-1.1 Trench Excavations.

**306-1.1.2 Maximum Length of Open Trench.** Modify to read as follows:

**306-1.1.2 Maximum Length of Open Trench.** Except by permission of the Engineer, the maximum length of open trench where prefabricated pipe is used shall be 500 feet or the distance necessary to accommodate the amount of pipe installed in two days, whichever is greater. The distance is the collective length at any location, including open excavation, pipe laying and appurtenant construction and backfill which has not been temporarily resurfaced or In the case of areas greater than eight (8) feet from any vehicular excavation, pipe laying and appurtenant construction and backfill which has not been brought to within 1 foot of finish subgrade elevation.

Except by permission of the Engineer, the maximum length of open trench in any one location where concrete structures are cast in place will be that which is necessary to permit uninterrupted progress. Construction shall be pursued as follows: excavation, setting of reinforcing steel, placing of floor slab, walls, and cover slab or arch. Each shall follow the other without any one operation preceding the next nearest operation by more than 200 feet.

Failure by the Contractor to comply with the limitations specified herein may result in an order to halt the work until such time as compliance has been achieved.

#### 306-1.2 Installation of Pipe.

**306-1.2.1 Bedding.** Modify to read as follows:

**306-1.2.1 Bedding.** Bedding shall be defined as that material supporting, surrounding and extending to one foot above the top of the pipe. Where it becomes necessary to remove boulders or other interfering objects at subgrade for bedding, any void below such subgrade shall be filled with the bedding material designated on the Plans or Standard Plans. Where concrete is specified to cover the pipe, the top of the concrete shall be considered as the top of the bedding.

If soft, spongy, unstable, or other similar material is

encountered upon which the bedding material or pipe is to be placed, this unsuitable material shall be removed to a depth ordered by the Engineer and replaced with bedding material suitably densified. Additional bedding so ordered, over the amount required by the Plans or Specifications, will be paid for as provided in the Bid. 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 groundwater, the Contractor shall bear the expense of the additional excavation and bedding.

Bedding material shall first be placed so that the pipe is supported for the full length of the barrel with full bearing on the bottom segment of the pipe equal to a minimum of two-fifths times the outside diameter of the barrel. There shall be at least 4 inches of bedding below the pipe. Then the remainder of the bedding shall be placed. Bedding may be water densified by jetting with the permission of the Engineer prior to backfilling. When jetting is used it shall be the Contractor's responsibility to determine extent of and be liable for any possible saturation of adjacent native soil. The size and length of jet pipe, quantities of water, and jetting locations shall be sufficient to thoroughly saturate the bedding materials around the pipe and densify it to 90% relative compaction. Unless the sheeting or shoring is to be cut off and left in place, densification of bedding for bedding for pipe shall be accomplished after the sheeting or shoring has been removed from the bedding zone.

Except as otherwise specified on the Plans or Specifications, bedding material shall be sand, crushed aggregate base material, crushed miscellaneous base material of fine gradation or native free-draining granular material meeting the specifications of the previously mentioned bedding material and shall be used in accordance with the type of pipe material used as specified in the Standard Plans.

Concrete used for bedding shall be one of the classes of concrete specified in Subsection 201-1 for the indicated time periods before backfill.

In cases where native free-draining granular material is suitable for use as bedding, the trench may be excavated to a point above the invert grade and the trench bottom hand shaped so that the bottom segment of the pipe is firmly supported on undisturbed material. In all cases, whether native or imported bedding is used, the pipe shall be supported along its full length.

**306-1.2.2 Pipe Laying.** Modify to read as follows:

**306-1.2.2 Pipe Laying.** Pipe will be inspected in the field before and after laying. If any cause for rejection is discovered in a pipe after it has been laid, it shall be subject to rejection. Any corrective work shall be approved by the Engineer and shall be at no cost to the Agency.

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 or conduit before connection is made. Any adjustments in line or grade which may be necessary to accomplish the intent of the Plans will be made, and the Contractor will be paid for any additional work resulting from such change in line or grade in the manner provided in Subsection 3-2.

Pipe shall be laid up-grade with the socket or collar ends of the pipe up-grade unless otherwise authorized by the Engineer.

Corrugated metal pipes shall be laid with external laps of the circumferential seams toward the inlet end. Corrugated pipes shall be shipped and handled in such a manner as to prevent damage to protective coatings.

Pipe shall be laid to Plan line and grade, with uniform bearing under the full length of the barrel of the pipe. Suitable excavation shall be made to receive the socket or collar, which shall not bear upon the subgrade or bedding. Any pipe which is not in true alignment or shows any undue settlement after laying shall be taken up and relaid at the Contractor's expense.

Pipe sections shall be laid and jointed in such a manner that the offset of the inside of the pipe at any joint will be held to a minimum at the invert. The maximum offset at the invert of pipe shall be 1 percent of the inside diameter of the pipe or 3/8-inch, whichever is smaller.

In joining socket and spigot pipe, the spigot of each pipe shall be so seated in the socket of the adjacent pipe as to give a minimum of 3/8-inch annular space all around the pipe in the socket. Unavailable offsets shall be distributed around the circumference of the pipe in such manner that the minimum offset occurs at the invert.

After the joints have been made, the pipe shall not be disturbed in any manner.

When pipe is laid in a sheeted trench, all sheeting against which concrete cradle is to be placed shall be faced with at least one thickness of building paper and the sheeting shall be withdrawn without displacing or damaging the cradle, except as otherwise provided in Subsection 306-1.1.6.

At the close of work each day, or whenever the work ceases for any reason, the end of the pipe shall be securely closed unless otherwise permitted by the Engineer.

**306-1.2.3 Field Jointing of Clay Pipe.** Delete this

Subsection in its entirety.

**306-1.2.4 Field Jointing of Reinforced Concrete Pipe. (c) Collar Joints.** Delete this Subsection in its entirety.

**306-1.2.6 Field Jointing of Nonreinforced Concrete Pipe.** Delete this Subsection in its entirety.

**306-1.2.6 Field Jointing of Cast Iron Pipe.** Modify to read as follows:

**306-1.2.6 Field Jointing of Ductile Iron Pipe.**

**306-1.2.8 Field Jointing of Asbestos Cement Pipe.** Delete this Subsection in its entirety.

**306-1.2.10 Field Jointing of Gasket-type ABS and PVC Pipe.** Modify to read:

**306-1.2.10** <u>**Field Jointing of Gasket-type PVC Pipe.**</u> Jointing of pipe shall be in the accordance with the approved manufacturer's printed instructions which shall be furnished to the Engineer. Gaskets shall be in accordance with Subsection 208-2.3.

The spigot end shall be inserted to the proper depth of the socket as indicated by the home mark.

**306-1.2.11 Field Jointing of Injection Sealed PVC Pipe.** Delete this Subsection in its entirety.

**306-1.2.12 Field Inspection for Plastic Pipe and Fittings.** Modify to read as follows:

**306-1.2.12 Field Inspection for Plastic Pipe and Fittings.** Installed pipe shall be tested to ensure that vertical deflections for plastic pipe do not exceed the maximum allowable deflection. Maximum allowable deflections shall be governed by the mandrel requirements stated herein and shall nominally be:

1) <u>5 percent of the maximum average ID for ABS or PVC Composite Pipe.</u>

2) For all plastic pipe other than ABS or PVC Composite Pipe, the percentage listed of the maximum average ID.

| Nominal Pipe Size | Percentage |
|---|---|
| Up to and including 12-inch | 5.0 |
| Over 12-inch to and including 30-inch | 4.0 |
| Over 30-inch | 3.0 |

The maximum average ID shall be equal to the average OD per applicable ASTM Standard minus two minimum wall thicknesses per applicable ASTM Standards. Manufacturing and other tolerances shall not be considered for determining maximum allowable deflections.

Deflection tests shall be performed after a majority of the baserock is in and compacted to 90% relative compaction or in areas which do not receive surface improvements after the trench is backfilled and compacted to final grade. The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.

For all pipes less than 24-inch ID, a mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. Prior to use, the mandrel shall be certified by the Engineer or by another entity approved by the Engineer. Use of an uncertified mandrel or a mandrel altered or modified after certification will invalidate the test. if the mandrel fails to pass, the pipe will be deemed to be overdeflected.

Unless otherwise permitted by the Engineer in conformance with Subsection 3-1, any overdeflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled, but shall be removed from the Work site. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any over-deflection, shall be uncovered, removed from the work site and replaced with new pipe.

The mandrel shall:

1) Be a rigid, nonadjustable, odd-numbering-leg (9 legs minimum) mandrel having an effective length not less than its nominal diameter.

2) Have a minimum diameter at any point along the full length as follows:

(SEE TABLE)
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3) Be fabricated of steel, be fitted with pulling rings at each end, be stamped or engraved on some segment other than a runner indicating the pipe material specification, nominal size, and mandrel OD (e.g., PVC, D 3034-8"-7.524"; ABS Composite D 2680-10"-9.584); and be furnished in a suitable carrying case, labeled with the same data as stamped or engraved on the mandrel.

For pipe IDs nominally 24-inch and larger, deflections shall be determined by a method submitted to and approved by the Engineer. If a mandrel is selected, the minimum diameter, length and other requirements shall conform to the dimensions and requirements as stated above.

All costs incurred by the Contractor attributable to mandrel and deflection testing, including any delays, shall be borne by the Contractor at no cost to the Agency.

**306-1.2.13 Installation of Plastic Pipe and Fittings.** Modify to read as follows:

**306-1.2.13 Installation of Plastic Pipe and Fittings.** Plastic pipe and fittings, including but not limited to:

| Pipe | Subsection |
|---|---|
| ABS Solid Wall Pipe | 207-15 |
| ABS or PVC Composite Pipe | 207-16 |
| PVC Solid Wall Pipe | 207-17 |
| PE Corrugated and Profile Wall Pipe | 207-18 |

shall, except as required by this subsection or the Plans or Specifications, be bedded in conformance with Subsection 306-1.2.1.

The bedding zone shall extend down to not less than 4 inches below the pipe or bell, whichever is lower in elevation. The bedding zone shall extend to not less that 12 inches above the pipe or bell, whichever is higher in elevation. The bedding zone shall extend on each side of the pipe barrel as follows:

| Nominal Pipe Size Inches | Side Clearance (in.) Max. | Min. |
|---|---|---|
| Up to and including 15-inch | 6 | 12 |
| Over | 8 | 18 |

For ABS or PVC Composite pipe, ABS or PVC SDR 23.5 or Schedule 40 pipe, and fittings, the bedding zone shall conform to the above requirements, and the bedding materials shall conform to Subsection 304-1.2.1.

For all other plastic pipe and fittings of other grade or material, the bedding material shall be composed of crushed rock conforming to Subsection 200-1.2 and the following:

| Nominal Pipe Size Inches | Maximum Rock Gradation |
|---|---|
| Up to and including 15 | 1/2-inch |
| Over 15 inch | 3/4-inch |

Bedding materials shall be placed and densified to requirements shown on the plans, if so indicated.

Connections of plastic pipe and fittings to a manhole shall be watertight. the use of manhole water stops per manufacturer's

requirements shall be approved by the Engineer prior to the installation of any pipe or fitting. All junction connecting any pipe or fitting to a plastic pipe shall utilize a "wye" fitting. "Tee" connections will not be permitted on any plastic pipe. Plastic pipe may be used on curves only if approved deflection fittings or couplings are used, or by bending solid wall pipe without any application of heat and subject to the following limitations:

| Nominal Pipe Diameter Inches | Minimum Centerline Radius (Feet) |
|---|---|
| 6 | 210 |
| 8 | 280 |
| 10 | 350 |
| 12 | 420 |
| 15 | 525 |
| Greater than 15 | See Project Plans |

Following the placement and densification of backfill and prior to the placing of permanent pavement, all pipe shall be cleaned and measured for obstructions (deflections, joint offsets, and lateral pipe intrusions). For pipelines less than 24 inches, a rigid, odd numbers leg (9 legs minimum) mandrel, with a circular cross section having a diameter of at least 95 percent of the specified nominal ID, shall be pulled through the pipe by hand. The minimum length of the circular portion of the mandrel shall be equal to the ID of the pipe.

For ID's 24 to 36 inches, deflections shall be checked by means which do not require an inspector to enter the pipeline. For diameters greater than 36 inches, deflections may be checked by a method which allows an inspector to enter the pipeline.

**306-1.3 Backfill and Densification.**

**306-1.3.1 General.** Modify to read as follows:

**306-1.3.1 General.** Backfill shall be considered as starting 1 foot above the pipe or conduit, or at the top of concrete bedding over the pipe or conduit. All material below this point shall be considered as bedding.

Backfill, or fill, as the case may be, for cast-in-place structures such as, but not limited to, manholes, transition structures, junction structures, vaults, valve boxes, and reinforced concrete box conduits shall start at the subgrade for the structure.

Unless otherwise specified, all backfill, except that within State Highways, shall be placed as specified in Subsection 306-1.3.2 or 306-1.3.3, and compaction requirements shall be in accordance with Subsection 306-1.3.4.

Except where the pipe must remain exposed for force main leakage tests and subject to the provisions herein, the Contractor shall proceed as soon as possible with backfilling operations. Care shall be exercised so that the conduit will not be damaged or displaced. If the pipe is supported by concrete bedding placed between the trench wall and the pipe, the remainder of any bedding material shall be placed to 1 foot over the top of the conduit. The backfill above the concrete bedding shall not be placed nor sheeting pulled until at least the minimum time after the placement provided by the optional classes of concrete designated in Subsection 201-1 for such concrete bedding.

Unless otherwise specified, the periods of time set forth in the following table after which the Contractor may place fill or backfill against or over the top of any cast-in-lace structures are predicated on the use of concrete to which no admixture has been added for the purpose of obtaining a high early strength:

| | Location | |
|---|---|---|
| Operation | Against Sides of Structures (Days) | Over Top of Structures (Days) |
| Placement of Loose Backfill | 5 | 21 |
| Densification of Backfill | 7 | 28 |

The Engineer may permit the use of admixtures or the use of additional cement in various parts of the structure in accordance with Subsection 201-1.2.4.

Sand backfill will be required for all trenches to within 1 foot of areas which are to receive surface improvements and to within 1 foot of finish grade in areas which are not to receive surface improvements either now or in the future with the following exception:

Trenches which are greater than 5 feet in width may be backfilled with native material provided self-propelled compaction equipment is used to densify the backfill material. Rocks greater than 6 inches in diameter will not be allowed within one foot above the pipe. Material within 1 foot above the pipe shall be as specified in Subsection 306-1.2.1. Rocks greater than 3 inches in diameter will not be allowed within 1 foot below finished subgrade.

Where rocks are included in the backfill, they shall be mixed with suitable excavated materials so as to eliminate voids.

Subject to the provisions specified herein, the material obtained from project excavations may be used as backfill provided that all organic material, rubbish, debris, and other objectionable concrete and bituminous type pavement obtained from the project excavations will be permitted in the backfill subject to the same limitations as rocks.

Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, the voids remaining after the removal of the boulders shall be backfilled with suitable material and densified as

approved by the Engineer.

The removal of all boulders or other interfering objects and the backfilling of voids left by such removals shall be at the expense of the Contractor and no direct payment for the cost of such work will be made. The cost of such work shall be included in the prices bid for the various items of work.

Voids left by the removal of sheeting, piles and similar sheeting supports shall be immediately backfilled with clean sand which shall be jetted into place to ensure dense and complete filling of the voids.

After the placing of backfill has been started, the Contractor shall proceed as soon as practicable with densification.

**306-1.3.2 Mechanically Compacted Backfill Materials.** Modify to read as follows:

**306-1.3.2 Compaction of Native Backfill Materials.** Native material will only be considered for trenches with widths in excess of 5 feet. Backfill shall be mechanically compacted by means of tamping rollers, sheepsfoot rollers, pneumatic tire roller, vibrating rollers, or other mechanical tampers. All such equipment shall be of a size and type approved by the Engineer. Impact-type pavement breakers (stompers) will not be permitted over plastic pipe.

Permission to use specific compaction equipment shall not be constructed as guaranteeing or implying that the use of such equipment will not result in damage to adjacent ground, existing improvements, or improvements installed under the contract. The Contractor shall make its own determination in this regard.

Material for mechanically compacted backfill shall be placed in lifts which, prior to compaction, shall not exceed the thickness specified below for the various types of equipment:

1) Impact, free-fall, or "stomping" equipment -- maximum lift thickness of 8" inches.

2) Vibratory equipment, including vibratory plates, vibratory smooth-wheel rollers, and vibratory pneumatic-tired rollers -- maximum lift thickness of 8" inches.

3) Rolling equipment, including sheepsfoot (both vibratory and nonvibratory), grid, smooth-wheel (nonvibratory), pneumatic-tired (nonvibratory, and segmented wheels -- maximum lift thickness of 1 foot.

4) Hand-directed mechanical tampers -- maximum lift thickness of 4 inches.

Native compacted backfill shall be placed in horizontal layers of thickness (not exceeding those specified above) compatible to the material being placed and the type of equipment being used. Each

layer shall be evenly spread, moistened (or dried, if necessary), and then tamped or rolled until the specified relative compaction has been attained.

**306-1.3.3 Water Densified Backfill.** Modify to read as follows:

**306-1.3.3 Compaction of Sand Backfill.** All trenches shall be backfilled with a granular, free draining material with a sand equivalent of greater than 30, unless the trench meets the requirements set forth in Subsection 306-1.3.1. Sand backfill shall be compacted using a combination of water densification and mechanical compaction as necessary to meet relative compaction requirements.

As used in these specifications, flooding shall mean the inundation of backfill with water, puddled with poles or bars to ensure saturation of the backfill material for its full depth. Jetting shall be accomplished by the use of a jet pipe to which a hose is attached, carrying a continuous supply of water under pressure.

Unless flooding is specified or other wise authorized by the Engineer, all backfill to be densified by water shall be jetted.

The backfill shall be jetted in accordance with the following requirements:

1) The jet pipe shall consist of a minimum 1-1/2 inch diameter pipe to which a minimum 2 inch diameter hose is attached at the upper end. The jet shall be of sufficient length to project to within 2 feet of the bottom of the lift being densified.

2) The Contractor shall jet to within 2 feet of the bottom of the lift and apply water in a manner, quantity and at a rate sufficient to thoroughly saturate the thickness of the lift being densified. The jet pie shall not be moved until the backfill has collapsed and the water has been forced to the surface.

3) The lift of backfill shall not exceed that which can be readily densified by jetting and mechanically compacting with hand-directed tampers, but in no case shall the undensified lift exceed 4 feet.

4) The backfill shall be allowed to thoroughly drain until the surface of the backfill is in a firm and unyielding condition prior to commencement of any subsequent improvements. The Engineer may require the Contractor, at the Contractor's expense, to provide a sump and pump to remove any accumulated water.

5) The Contractor shall make its own determination that jetting will not result in damage and any resulting damage shall be repaired at the Contractor's expense. The Engineer shall have the right to not allow jetting, if in his opinion jetting will be detrimental to the progress of the project.

**306-1.3.4 Compaction Requirements.** Modify to read as

follows:

**306-1.3.4 Compaction Requirements.** Except as specified otherwise, trench backfill shall be densified to the following minimum relative compaction:

1) 90 percent Relative Compaction:

a) From top of bedding to within 1 foot of finish subgrade in areas to receive future improvements, planned or anticipated

b) From top of bedding to finish grade in areas which are not to receive future improvements.

c) Within engineered embankments.

d) Where lateral support is required for existing or proposed structures.

2) 95 percent Relative Compaction where required by Subsection 301-1.1.3.

**306-1.4 Testing Pipelines.**

**306-1.4.1 General.** Modify to read as follows:

**306-1.4.1 General.** All leakage tests shall be completed and approved prior to placing of permanent resurfacing. Testing will not be allowed until a majority of the baserock has been placed in areas to receive surface improvements or until backfill has been completed in areas not to receive surface improvements.

When leakage exceeds the amount allowed by the specifications, the Contractor at its expense shall locate the leaks and make the necessary repairs or replacements in accordance with the Specifications to reduce the leakage to the specified limits. Any individually detectable leaks shall be repaired, regardless of the results of the texts. Leakage tests shall be made on completed pipelines as follows:

1) Storm Drains - Not required unless called for on the Plans and Specifications.

2) Gravity Sanitary Sewers - Air pressure test.

3) Pressure Sewers (force mains) - Water pressure test at 200 percent of maximum normal operating pressure.

4) Water Pipelines - Water pressure test at 150 psi.

**306-1.4.2 Water Exfiltration Test.** To be used only when specifically called for in the Plans or Specifications.

**306-1.4.3 Water Infiltration Test.** To be used only when specifically called for in the Plans or Specifications.

**306-1.4.5 Water Pressure Test.** Modify to read as follows:

**306-1.4.5 Water Pressure Test.** Preparatory to testing, the section of the pipeline to be tested shall be filled with water and placed under a slight pressure for at least 48 hours. The pipeline shall then be brought up to the test pressure specified and maintained on the section under test for a period of not less than 2 hours.

Accurate means shall be provided for measuring the quantity of water required to maintain full pressure on the line for the test period, which volume shall not exceed:

$$L = CND\ (P)^{1/2}/1850$$

Where:

L = Maximum allowable leakage in gallons per hour for section of pipeline tested.
N = Number of joints in length tested.
D = Diameter of pipe in inches.
P = Test pressure in psi.

C = 0.25 for ductile iron pipe and gasketted or solvent welded plastic pipe.

**306-1.4.6 Leakage Test for Corrugated Metal Pipelines.** Delete this Subsection in its entirety.

**306-1.5 Trench Resurfacing.**

**306-1.5.1 Temporary Resurfacing.** Modify to read as follows:

**306-1.5.1 Temporary Resurfacing.** Unless permanent pavement is placed immediately, temporary bituminous resurfacing thick shall be placed and maintained at locations determined by the Engineer wherever excavation is made through pavement, sidewalk, or driveways. In sidewalk areas the temporary bituminous resurfacing shall be at least 1 inch thick; in all other areas it shall be at least 2 inches thick. At major intersections and other critical resurfacing shall be placed as soon as the condition of the backfill is suitable to receive it and shall remain in place until the condition of the backfill is suitable for permanent resurfacing.

The bituminous mixture used for temporary trench resurfacing shall conform to Class D2 asphalt concrete mixture in Subsection 203-6.3.2; and bitumen conforming to grade S C - 800 liquid asphalt in the Slow Curing Product table, Subsection 203-2.4.

The mixture may be furnished from stockpiles or directly from the plant and may be laid cold, at the option of the Contractor. Prior to placing temporary resurfacing, the Contractor shall level and compact the backfill on which the surfacing is to be placed. The grade of the backfill on which the resurfacing is to be

placed shall be such as to provide the full thickness of temporary resurfacing specified. The temporary resurfacing shall be placed, rolled, maintained, and removed and disposed of by the Contractor.

On improvements being constructed under contract with the Agency, payment for temporary resurfacing shall be included in the price per lineal foot of pipe.

**306-1.5.2 Pavement Resurfacing.** Modify to read as follows:

**306-1.5.2 Pavement Resurfacing.** Unless otherwise shown on the Plans or in the Specifications, all surface improvements damaged or removed as a result of the Contractor's operations shall be reconstructed by the Contractor to the same dimensions, except pavement thickness, and with the same materials used in the original work. Trench resurfacing shall be equal to the existing pavement thickness or 2-1/2 inches minimum whichever is greater.

Subgrade for trench resurfacing shall conform to Section 301 and pavement reconstruction shall comply with the applicable provisions of Section 302.

Permanent Trench Resurfacing shall be paid for at the contract unit price per lineal foot.

**306-1.6 Basis of Payment for Open Trench Installations.** Modify to read as follows:

**306-1.6 Basis of Payment for Open Trench Installations.** Pipe and conduit shall be measured along the longitudinal axis between the ends as laid and shall include the actual pipe in place and shall not include the inside dimensions of structures. House connection sewers shall be paid for at the contract unit price for each. Catch basin connections shall be measured from the inside face of the catch basin to the inside face of conduit or structure to which connection is being made. Chimney pipe shall be measured vertically from the upper end of the chimney to the invert of the sewer.

The price per lineal foot for pipe and conduit in place shall be considered full compensation for all wyes, tees, bends, monolithic catch basin connections, and specials shown on the Plans; removal of interfering portions of existing sewers, abandoned conduit and structures; the excavations of the trench; the control of ground and surface waters; the preparation of subgrade; placing and joining pipe; backfilling the trench; temporary resurfacing; and all other work (excluding permanent resurfacing) necessary to install the pipe or conduit, complete in place.

Payment for structures such as manholes, junction structures, lamp holes, and catch basins shall be made at the price bid for each structure and shall be full payment for each structure complete in place, including excavation, backfill, constructing inverts, furnishing and installing castings, temporary resurfacing and all other work, excluding permanent restoration of the street surface, necessary

to complete the Work.

**306-4 CAST-IN-PLACE NONREINFORCED CONCRETE PIPE (CIPCP).**

**306-4.7 Test Requirements.**

**306-4.7.2 Thickness.** Modify to read as follows:

**306-4.7.2 Thickness.** The Engineer will determine the wall thickness of the pipe as follows:

1) The thickness at the invert and crown of the pipe will be measured by probing at approximately 25-foot intervals during placement of the concrete. The probe shall be forced through the concrete to make firm contact with the form at the crown and shall be held in a position normal to the surface when the measurement is taken. The probe shall be 3/8 inch round bar, at least 2 inches longer than the wall thickness to be measured, rounded on one end with a tee handle on the other. The invert shall be inspected by removing a small portion and measuring the thickness.

2) Thickness at the invert and springline will be measured through holes drilled by the Contractor. The holes shall be at least 3/4 inch in diameter and shall be drilled after the removal of the forms and within 72 hours of concrete placement.
Three holes may drilled every 50 feet at the invert and both springlines and shall be located as determined by the Engineer. The Engineer may require additional holes on curves to determine the extent of thin sections.

After measurement, the Contractor shall fill all holes using Class C mortar per Subsection **201-5.** All costs of probing, drilling, removing, and repairing shall be borne by Contractor.

**306-4.7.3 Concrete Cores.** Modify to read as follows:

**306-4.7.3 Concrete Cores.** Cores, where required shall be obtained from pipe and tested in accordance with ASTM C 42. The cores shall have a length-to-diameter ratio of not less than one. The diameter of cores shall be at least three times the maximum size of the aggregate used in the concrete, except where the wall thickness is such that the length-to-diameter ratio will be less than one, in which case the core diameter may be reduced to two and one-half times the maximum aggregate size used.

There may be at least four cores taken for each 200 linear feet, or fraction thereof, of pipe. Cores shall be taken at the following points at stations selected by the Engineer: one through the crown, one through the invert and two in the lower half of the pipe 45° from the vertical. The Engineer may require additional cores at any location. The Contractor shall patch all core holes in such a manner that the patch will be permanent, will not leak, and will have a smooth finish flush with the interior surface of the conduit. All costs of coring, testing, and patching core holes shall be borne by the

Contractor.

**306-4.7.4 Load Bearing.** Modify to read as follows:

**306-7.4.4 Load Bearing.** Load bearing tests may be required for every 1000 linear feet of pipe having the same size and wall thickness, with a minimum of one per size and two per project. The test locations will be specified by the Engineer. The test shall be performed in the presence of the Engineer, and the Contractor shall be responsible for all costs and risks involved. Failure of the test section will be cause for rejection of the conduit represented by the test.

The method and apparatus requirements for load bearing tests are as follows:

1) The test shall be performed with only the trench form providing bottom support. If the pipe has been constructed so that more than 210 is in contact with the natural soil, the trench walls shall be re-excavated to provide 210 of trench form without altering the existing bedded condition of the trench form.

2) The test length shall be at least 4 feet and not more than 5 feet. At the option of the Contractor, the test section may be isolated from the completed pipe.

3) The test load shall be applied by use of a "sand box," consisting of a frame and bearing plate, in such a manner that sand carefully placed in the sand box forms a bearing symmetrically about the centerline and over the entire length of the test section. The width of the bedding shall be 0.7 times the specified ID of the pipe. The minimum thickness of the sand shall be 0.25 times the specified ID.

4) The frame and bearing plate shall be sufficiently rigid so that they will distribute the load uniformly and will not deform under the loaded condition. The interior surfaces of the frame shall be smooth. The lower surface of the bearing plate shall be a true plane. Cloth or plastic film shall be attached to the inside of the frame along the lower edges to prevent the loss of sand through the gap between the pipe and the frame. This type of apparatus is described in ACI Specification 346.

5) The frame shall be properly located on the pipe test section and filled with sand. The sand shall be clean and graded so that it will pass a No. 4 sieve. The sand shall be struck off level and covered with the bearing plate. During the test, the bearing plate shall not contact the frame.

6) The load shall be applied symmetrically on the bearing plate until the total required has been attained. The pipe shall remain loaded until the interior of the pipe has been inspected by the Engineer and results have been observed and recorded.

7) The applied load, in pounds, shall equal the test load multiplied by the length of the test section, in feet. The test load shall be calculated as follows:

Test Load=

$[(127.5\ H+1.5LL+5.56T)OD+34.0(ID)^2]K$

Where:

ID= Specified inside diameter of the pipe in feet.
T = Specified wall thickness of the pipe in inches.
OD= ID+2T/12=Outside diameter of pipe in feet.
K = 1.0 when pipe is cut circumferentially (isolated at edges of test section.)
K = (1.0+2*OD/L) when pipe is not cut.
L = Test section length in feet.
H = Depth of cover on pipe in feet.
LL= Live load on pipe in pounds per square foot.

| Depth of Cover (Feet) | Live Load(LL) (Lb./Ft.$^2$) |
|---|---|
| 3 | 489 |
| 4 | 314 |
| 5 | 234 |
| 6 | 182 |
| 7 | 145 |
| 8 | 119 |
| 9 | 120 |
| 10 | 90 |
| Over 10 | N/A |

8) The total test load shall be supported by the test section without the development of any additional cracking.

9) After the satisfactory completion of the test,the Contractor shall repair the pipe, resulting from isolating the test section, in a manner satisfactory to the Engineer.

In lieu of using a "sand box" as described above, the Contractor may conduct a wheel load test on a 4-foot section of pipe when approved in writing by the Engineer. The load applied shall be determined by the equations in item 7 above applied to a section of pipe. The total test load shall be supported by the test section without the development of any additional cracking.

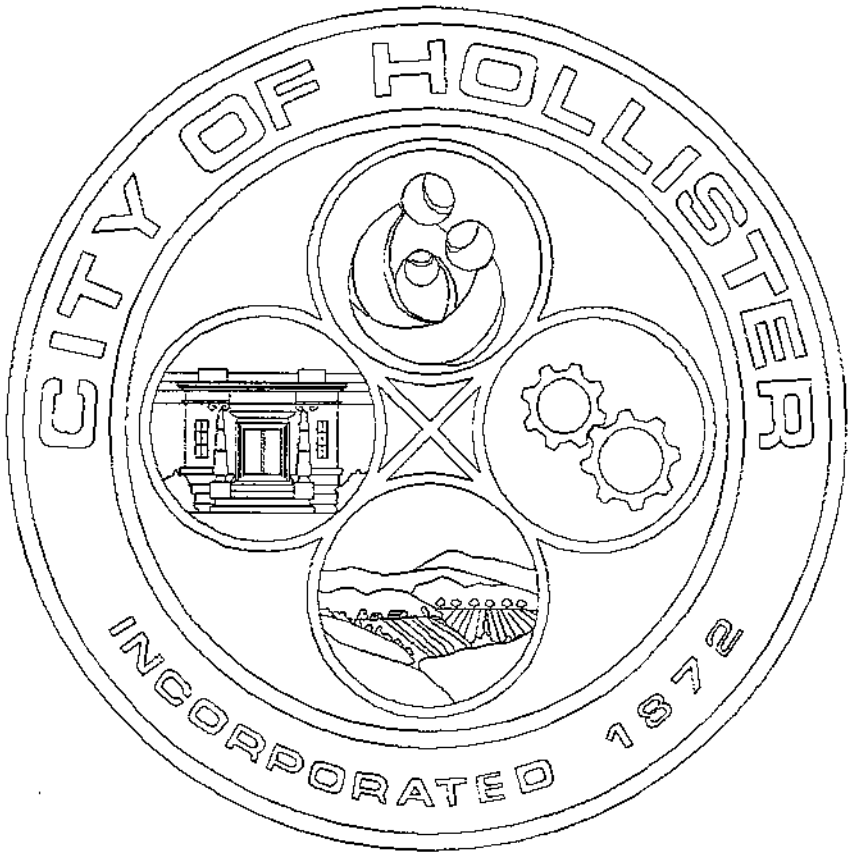
**306-7 CURB DRAINS:** Modify to read as follows:

**306-7 CURB DRAINS.** Drains shall be constructed beneath the sidewalk to connect building drains to curb outlets and to serve low areas on adjacent property as shown on the plans or as directed by the Engineer.

The drain shall be a 3-inch diameter pipe for a 6-inch curb face, and a 4-inch diameter pipe for an 8-inch curb face or greater. The invert of the drain shall be located 1/2 inch above the gutter flow line. The drain pipe shall have a minimum 2-inch clearance from top of curb and be laid on a straight grade with a minimum slope of 1/8 inch per foot and terminate 1 inch back of the curb face. There shall 6x6x10# welded wire mesh over the pipe(s). The clearance required for the welded wire mesh shall be one inch from the surface of the concrete and 1 inch

from the top of pipe. The welded wire mesh shall extend 6 inches on either side of the pipe and shall be incorporated in both the curb and the sidewalk. For multiple pipes a #4 rebar shall be placed in the curb parallel with the curb and shall extend 6" on each side of the pipes.

Curb drains may be constructed using pipe materials specified in Section 207 or other pipe materials approved by the Engineer. The pipe shall be suitably joined in accordance with the manufacturer's standard jointing system.




# DESIGN STANDARDS

MAY, 1992

SECTION 1

# GENERAL

## 1.01 PURPOSE

The purpose of these Design Standards is to provide certain minimum standards for the design of public works improvements within the City of Hollister or any facilities owned or to be owned, maintained, and/or operated by the City of Hollister or Hollister Redevelopment Agency. Any items which are not included in these Standards shall be designed in accordance with the State Traffic Manual, The City of Hollister Standard Specifications and Plans, City of Hollister Subdivision Ordinance and/or Zoning Ordinance as defined below, or as directed by the City Engineer.

## 1.02 DEFINITIONS

In these Standards, the intent and meaning of the terms that are used shall be as defined:

A. CALTRANS DESIGN MANUAL - Shall mean the State of California Department of Transportation Highway Design Manual, latest edition, unless otherwise stated.

B. CALTRANS SPECIFICATIONS - Shall mean the Standard Specifications of the State of California Department of Transportation, latest edition, unless otherwise stated.

C. CALTRANS STANDARD PLANS - Shall mean the Standard Plans of the State of California Department of Transportation, latest edition.

D. CITY - Shall mean the City of Hollister, a municipal corporation.

E. CITY ENGINEER - Shall mean the City Engineer of the City of Hollister, California.

F. CITY STANDARD PLANS AND SPECIFICATIONS - Shall mean the Standard Plans and Specifications of the City of Hollister.

G. DESIGN ENGINEER - Any person or persons, firm, partnership, or

corporation legally authorized to practice Civil Engineering in the State of California who prepares or submits improvement plans and specifications to the Engineering Department of the City of Hollister for approval.

H. DESIGN - Shall mean street alignment, grade, geometric section, structural section; sanitary sewer alignment, grade, size; water system alignment, size, valving, fire hydrant location; storm drain alignment, grade, size and miscellaneous improvements as required by the City Engineer.

I. DEVELOPER - Shall mean any person, firm, corporation, partnership or association engaged in the development /improvement of property in part or in whole by the placing of any improvements thereon, whether the property was previously developed in whole, in part, or at all.

J. EASEMENT - Shall mean an easement dedicated to the City, to the Public or to Public Utilities which shall be continuing and irrevocable unless formally abandoned.

K. GEOTECHNICAL REPORT - Shall mean a report prepared by any person or persons, firm, partnership, or corporation legally licensed to prepare "Geotechnical Reports" in the State of California.

L. GREENBOOK - Shall mean the Standard Specifications for Public Works Construction as published by APWA, latest edition.

M. IMPROVEMENTS - Refers to street work, sidewalks, curbs, gutters, driveways, water mains, sanitary sewers, storm drains, public utilities, landscaping, fences, and miscellaneous improvements to be installed by the developer on land to be used for public right-of-way.

N. MANUAL ON TRAFFIC CONTROL - Shall mean the "Manual of Traffic Control for Use in Construction and Maintenance Zones, of the State of California, Department of Transportation", latest edition, unless otherwise stated.

O. STATE MATERIALS MANUAL - Shall mean the Materials Manual of Testing and Control Procedures of the State of California, Public

Transportation Laboratory Manual of Tests, Department of Transportation, latest edition, unless otherwise stated.

P. SUBDIVISION ORDINANCE - Shall mean Ordinance 446 and amendments thereto of the City Code as adopted by the City Council of the City of Hollister.

Q. ZONING ORDINANCE - Shall mean Hollister Zoning Ordinance as adopted by the City Council of the City of Hollister, dated September 3, 1985, and as amended.

## 1.03 REVISIONS AND AMENDMENT PROCEDURE

The City of Hollister Design Standards, Standard Specifications, and Standard Plans are intended to be a comprehensive document that can be responsive to innovations in both materials and procedures in the design and construction of public works improvements. To this end, the following procedure for revising and amending this document is provided.

1) Requests for amendments shall be submitted in writing to the office of the city Engineer. This request shall include justification and any data necessary for proper review.

2) Periodically, the City Engineer will compile and review requests submitted, and other amendments initiated by the City. A draft of all suitable amendments will then be prepared and circulated to interested parties for comment. The City Engineer will receive and consider such comments prior to rendering a determination on proposed amendments.

3) This procedure shall not limit the City Engineer's authority to implement policies, or interrupt the existing Design Standards, Standard Specifications, and Standard Plans on behalf of the City. Similarly, the City Engineer may temporarily implement an amendment when the interest of the City necessitates such action, or as a means of gathering additional information during a review and comment period.

4) All amendments approved by the City Engineer will be included as a supplement to the document. On a yearly basis, these amendments shall be compiled and incorporated, as revisions, into the document. The revised document shall be presented to the City Council annually for approval and ratification.

## SECTION 2

## CONSTRUCTION PLANS

### 2.01 GENERAL

Complete plans and specifications for all proposed improvements including any necessary dedications and easements shall be submitted to the Engineering Department for approval and must receive the required approval prior to the beginning of construction of any such improvements. This shall apply where it is the intent that maintenance responsibility for any portion of such improvement will be transferred to the City of Hollister or an Owners Association. Such plans shall be prepared under the direction of a Registered Civil Engineer in accordance with the provisions of "Civil Engineer's Act" Chapter 7 - Division 3 of the Business and professions code, relating to the practice of Civil Engineering.

Any changes or deviations from the City of Hollister Standard Plans and Specifications or from these Design Standards shall be called out in the submittals. Written prior approval from the City Engineer shall be obtained by the designer. If a set of improvement plans have been signed by the City Engineer and changes by the designer to the City of Hollister Standard Plans and Specifications and these Design Standards have not been called out and approved in writing, the developer will be responsible for meeting the requirements of the City of Hollister Standard Plans, Specifications, and Design Standards at no cost to the City of Hollister.

A. Right-of-Way Policy

The right-of-way policy requires that all public utilities including, public sewers, water facilities and storm drainage be in easements or public street rights-of-ways which are granted or dedicated for such use. In the case of public right-of-way for streets, further dedication is not necessary.

Easements for City owned or maintained utilities shall meet both of the following width criteria:

1. Minimum width of any easement shall be 15 feet for one utility, and a minimum width of 5 feet shall be added for each additional utility line; or easements shall have a minimum width in feet equal to the required trench width according to

the standard plan for trench backfill plus 2 additional feet of width for every foot of depth of the pipe as measured from the bottom of the pipe to finished grade, which ever yields the greater width.

2. All sewer pipes shall comply with all separation requirements as setforth within these standards and as required by our Standard Plans, as well as applicable State and/or San Benito County Health Department Regulations.

## 2.02 PREPARATION

Construction plans and specifications shall be prepared in accordance with the following requirements:

A. Dimensions - Construction plans shall be clearly and legibly drawn in ink on mylar film (minimum 3 mil. thickness) 24 by 36 inches with a 1-1/2 inch clear margin on the left edge and 1 inch margins on all other edges.

B. Scale - Horizontal scale shall be 1" = 40'; vertical scale shall be 1" = 4'. Other scales may be approved in writing by the City Engineer in advance of plan preparation.

C. Form

1. Title Sheet

a. Name and/or number of Project. Subdivision Submittals shall have the name and the tract number of project.

b. Vicinity Map with North Arrow.

c. Index of Sheets.

d. City Engineer's Signature Block on each sheet and the approval statement on the cover sheet.

e. Plan view showing the entire street right-of-way layout (Scale: 1" = 100'), lot numbers, street lights, fire hydrants, sheet index, and other miscellaneous improvements to be installed.

f. Complete Legend.

g. Typical Street Section for each varying width street.

h. Title Block - located along lower edge or right edge of paper.

i. Permanent City horizontal and vertical control monuments used for survey control and all temporary bench marks used to establish the surface conditions.

j. General and special notes relating to construction methods and Items. See Appendix A for a list of typical notes used in subdivision construction.

k. Geotechnical engineer's, owners/developers, and design engineer's names, addresses and telephone numbers.

l. Date Completed.

m. Design Engineer signature, registration number and expiration date, on all sheets.

2. Street Plan and Profile

a. Plan views of each street to be improved shall be shown on separate sheets indicating existing improvements and contours/elevations within 150' of the project boundary, proposed improvements and future improvements if known. Any and all existing utilities shall be accurately located (potholed if necessary) prior to submittal. The drawings shall depict the full right-of-way width along the full frontage of the site, where improvements are proposed and shall include sidewalk, curb, gutter, driveways, sewer mains, water mains, water service and sewer lateral locations, storm drains, manholes, valves, fire hydrants, fencing, street signing and pavement markings, barricades, monuments, survey stationing, face of curb data for all curves and other data as required by the City Engineer. The work to be done on the above items shall be clearly and fully specified on the plans. The survey stationing shall increase from left to right with the north

arrow pointing either towards the top or left edge of the sheet. All stationing shall be a continuation of existing improvement plans where possible and full use of existing datum and stationing information will be utilized.

b. Profile view of each street shall be shown immediately below its plan view. The profile shall include existing grade lines, sewer mains, storm drains, water mains, public utility mains, all utility crossings, and top of curb. Discrete elevations shall be shown of top of curb, ER's, at grade break points, manhole and catch basin inverts and rims, and water main crossings with other utilities. Each profile line shall be identified.

c. Subdivision Improvement Plans shall in addition to the above information contain discrete elevations at each lot line shown in the plan view.

3. Site Development Plan

a. Site development plans shall include utility structures, building pad, adjacent land drainage, driveway size and locations, existing contours, existing trees, existing water and sewer services, septic tanks and leach fields, wells, ditches, and other landmarks important in the construction of the improvements. In addition, adjacent land grades shall be shown for a minimum of twenty-five (25) feet from the project boundary.

b. Subdivision improvements shall contain the above information as well as individual lot drainage patterns, in addition, discrete elevations depicting proposed lot grading shall be shown to the project boundary or beyond(as necessary): including any unusual features such a retaining walls, slopes, and existing fences.

4. Landscape Development Plans

Sufficient information for defining the scope of work for each individual project must be developed and submitted in a format compatible with the improvement plans. Sheet size and material, drawing scale, clarity, and utility information must be coordinated with the Improvement Plans.

The design must be coordinated with the City of Hollister Streetscape Improvement Standards and the City Landscape Architect.

Where only a portion of a Block is to be developed and the project boundary ends in the interior of a Block, a conceptual plan shall be developed for the entire Block and the limits of the project's facilities determined. Specific requirements for defining the scope of work include but are not limited to the following:

1. Delineation of the Soundwall

   The soundwall requires specific dimensioning including reference dimensions for panel lengths and articulation, including depths of indentations and height changes; pier locations, including depths, sizes, and location. Where a table is being used to identify the size of footings required, the layout shall contain references sufficient to identify the necessary depths at each pier location. Special sections such as short panels or retaining walls, partial panels, and 3 foot high walls at intersection returns shall be clearly identified and dimensioned.

   Wall thicknesses shall be identified in general and where differences occur. Note: Walls shall be of a 3.5" minimum thickness, when measured at the narrowest point. Terminations at project boundaries or phase lines shall be designed to end on a full panel, whether it is an indentation panel or a panel parallel to the street centerline.

2. Calculations

   Calculations (as well as any manufacturers detail sheet) are required for the soundwalls and shall address ordinary as well as special conditions. Calculations (and detail sheets shall have a wet signature and shall be coordinated with the soils investigation findings for foundation requirements.

   Because some of the information required above can and often does come from shop drawings of the specific soundwall manufacturers or installer, the Design Engineer will need to

coordinate with them to arrive at these final layout construction solutions and then transfer the information to the Improvement Plans for City review.

3. Street Light and Fire Hydrant Layout

a. Improvement plans shall include the existing and proposed location of fire hydrants and street lights for the site and shall depict all existing and future locations within 300 feet of the site boundary. The City Engineer shall determine final locations.

b. Subdivision improvements shall follow the submittal procedure described in section 2.03. After receipt of the reproducible mylar (as requested in section 2.03) the City Engineer will determine final locations of the street lights and fire hydrants and will transmit to the Design Engineer 2 copies of the approved layout for their use. The improvement plans shall reflect this layout and include, service points, pull boxes, wattage of luminaries, and pole numbers.

## 2.03 SUBMISSION

### A. Submissions for Engineering Department Review

Initial submittals for Engineering Department review shall contain a cover letter requesting review of the project. The letter shall be accompanied by a copy of the Planning Commission Approval Notice or other document which requires the review by the Engineering Department.

Three (3) sets of construction plans shall be submitted for checking to insure compliance with these Design Standards and the City of Hollister Ordinances, along with any plan checking fees. Submitted plans shall be accompanied by specification, test data, materials list and engineers cost estimate, drainage calculations, sewer calculations, geotechnical reports, pavement (structural section) calculations, easement and right-of-way descriptions, and other materials as itemized by applicable approval notices and as requested by the City Engineer. Conforms to existing City of Hollister improvements shall be shown

by monument system and by elevation reference: as well as special call out section on the plan which show what has been granted exception from City Standard Specifications and Plans, and Design Standards.

B. Initial Submittals for Subdivision Developments

The Engineering Department of the City of Hollister shall issue a checklist (see Appendix B for typical form) with the required items for the Initial Submittal indicated and shall issue a checklist for each required re-submittal. This initial checklist shall constitute notice to proceed with a Final Map and/or Improvement Plan submittal.

The checklist/cover letter shall include a preliminary estimate of minimum time for processing and review of the initial submittal for plan checking. This time will depend on the current workload, the size of the project, and is subject to change.

Three (3) sets of construction plans shall be submitted along with four (4) copies of the subdivision final map to the City Engineer for checking to insure compliance with these Standards and City of Hollister Ordinances, along with the plan checking fees. Submitted plans shall be accompanied by specifications, test data, materials list and engineers cost estimate, drainage calculations, sewer calculations, geotechnical reports, lot closures, easement and right of way descriptions and other materials as requested by the City Engineer. Conforms to existing City of Hollister improvements shall be shown by monument system and by elevation reference, as well as a special call out section on the plans which show what has been granted exception from City Standard Specifications and Plans, and these Design Standards.

A current title report (three months or less) shall be submitted with the final map. The title report shall include a legal description of the entire property being divided.

Closure calculations shall be provided at the time of initial map check submittal. All calculated points within the map shall be based upon one common set of coordinates. All information on the map shall be directly verifiable by information shown on the closure calculation printout. The points of beginning shall be clearly defined and all lot acreages shall be shown and verifiable from

information shown on the closure calculation printout. Documentation including all pertinent deeds, records and references shall be included.

Earthwork calculations shall be provided at the time of initial submittal. Calculations shall be accompanied by an area map showing contours and section location or quadrant layout. Calculations shall include a listing of areas tabulated with results on the right hand margins.

A reproducible mylar map (lot sheet(s) only) or other scaled (40, 50, or 60 feet to the inch) lot schematic/street plan, illustrating all existing street lights and fire hydrants within 300 feet of the subdivision boundary, shall accompany the submittal.

Geotechnical reports shall be submitted in 8.5" x 11" bound folders. The report shall have a letter from the soils engineer accompanying it, with a current (within six months) date to substantiate its validity. The analysis must at a minimum include a map of the subject area showing proposed and existing streets, contours and location and type of soils samples obtained. The results of all field data and laboratory tests shall be included.

Design for the proposed street sections shall be part of the submittal. Street structural section design shall include recommendations for: natural subgrade, subbase, base and pavement compaction and thickness to achieve design strength.

Six blueline copies of the tract layout, (for street name review) shall be included.

C. Subsequent Submittals for all Improvements

Should there be required alterations or revisions to the plans submitted, one copy shall be returned by the city with the requested clarifications indicated thereon and/or in an itemized checklist along with a Subsequent Submittal Checklist. At such time as the design engineer has made the necessary revisions, the plans shall again be submitted in accordance with the subsequent submittal checklist for further plan checking. Plan checking shall continue until the Designer has met all of the conditions as set forth by the Planning Commission and all other concerns of the City with regards to the project. Having met

conditions and concerns of the City a Final Submittal Checklist shall be issued to the Developer, listing all the items required for final approval signatures.

Additionally the City requests a 5-1/4" floppy disk(s) with improvements and map information, be submitted prior to approval. (See Appendix C for the labeling requested on computer disk(s).) Plans shall not be considered approved until the City Engineer has signed in the approval blocks on all the plans. There shall be no changes permitted to an approved set of plans unless such changes, corrections or additions are resubmitted to the City Engineer for approval as previously described for all submittals. Excepted from approval are any features of the plans that are contrary to, in conflict with, or do not conform to any California State Law, City of Hollister Ordinance or Resolution: even though such errors, omissions or conflicts may have been overlooked by the Engineering Department. After formal approval of the plans by the City Engineer, four (4) blueline copies plus one (1) mylar sepia copy (minimum 3 mil with matte side up) shall be filed with the City Engineers Office. One (1) set of mylar sepia copies of As-Built drawings shall be filed with the City Engineers Office after completion of the project and before the city energizes the street lights or accepts the project for maintenance. The warranty period will not begin until the approved as-built drawings are on file with the City.

Prior to installation all equipment and materials are to be inspected by the City. The City Engineer reserves the right to have the developer submit manufacturer's specifications on any or all equipment and material to be used on the project.

SECTION 3

STREET DESIGN

3.01 GENERAL

For Purposes of geometric and structural design, streets shall be classified according to the listing supplied in Appendix D. Any deviation from the following standard shall require the approval of the City Engineer. This classification chart is a guide and approved plans lines and accepted traffic studies may hereafter alter the necessary criteria.

| Class | Right of Way Max./Min. | Width Between Curbs (feet) | Traffic Index* | Maximum Grade Rate | Minimum** Centerlane Radius for Horizontal Curve (ft) (%) | Min. Ac | Min. Base | Design * Speed | Minimum Distance Between Intersect. |
|---|---|---|---|---|---|---|---|---|---|
| Highways | 120<br>80 | 100<br>64-72 | 8.5-11<br>8.5-11 | (1)<br>(1) | (1)<br>(1) | (1)<br>(1) | (1)<br>(1) | 55 | (1)<br>(1) |
| Major Thorough-fare | 84 | 64-72 | 7.5-8.0 | 10 | 800 | 5" | 12" | 55 | (1) |
| Major Collectors | 84 | 64 | 7.5 | 13 | 600 | 4" | 12" | 45 | 500' |
| Industrial | 60 | 52-49 | 6.5 | 12 | 250 | 4" | 12" | 35 | (1) |
| Collectors | 60 | 40 | 5.5 | 12 | 250 | 3" | 8" | 45 | 250' |
| Residential | 56 | 40 | 5.0 | 12 | 250 | 2.5" | 8" | 35 | 250' |
| Cul-de-sac | 60/50 | 40 | 4.5 | 12 | 250 | 2.5" | 8" | 35 | 250' |

*May be changed at the discretion of the City Engineer if traffic warrants a different value.

**Actual design of horizontal curves shall be based on the design speed of the street and approved by the City Engineer.

Street sections shall be determined by calculated gravel equivalents, and based on "R" values obtained from material gathered from the level of the proposed subgrade using the State of California Division of Highways design method.

(1) Design to be evaluated on an individual basis. Design parameters to be approved in writing by City Engineer and/or other agencies having mutual or exclusive jurisdiction, prior to submittal for review.

## 3.01 GENERAL

If subgrade has an "R" value of 10 or less alternate structural sections designs such as full depth asphalt or sections using geotextile fabric shall be prepared and submitted with the more traditional flexible pavement design of asphalt over aggregate base. The underground utilities shall be designed with sufficient cover to allow use of the alternate sections. Where new streets meet existing, new construction will be to the project boundaries and then continued beyond as needed for conforms which meet all standards for new streets, including cross slope and vertical curve criteria. Conforms shall have sufficient detail to identify the scope of work and the intention of the finished product. Conforms with existing half streets shall describe the existing street as fully as the new street with elevations at edge of pavement, top of curbs, and centerlines. Cross-sections shall be provided showing the relationship of the existing streets to proposed streets.

## 3.02 GEOMETRICS

A. Street centerlines shall intersect at right angles with a variance of plus or minus 5 degrees. For special circumstances the City Engineer may approve a variance of up to 15 degrees. This approval must be secured in writing in advance of plan submittal.

B. Curb line radii shall be tabulated on the construction plans. Numbering shall not repeat from sheet to sheet. Curbs shall be 20 foot radii at all intersections, except intersections with highways, major thoroughfares, and major collectors which shall be a minimum of 30 feet.

C. Gutter flow line grades shall have a minimum slope of .004 feet per foot unless otherwise permitted in writing by the City Engineer.

D. Cross slope on all streets shall be 2% unless a deviation has been previously approved by the City Engineer.

E. The minimum centerline vertical curve length allowable at the intersection of two grades of a roadway profile shall be 100 feet. Actual design of the vertical curve shall be based on the design speed of the street and stopping sight distance as determined by the City Engineer. However, in general, vertical curves may be omitted where the algebraic difference in grades does not exceed 1.0 percent..

F. The minimum stopping and passing sight distance over any segment of the roadway on residential, collector or thoroughfare streets shall conform to the Caltrans Design Manual.

## 3.03 APPURTENANCES

### A. GENERAL

#### 1. Miscellaneous Improvements

Roadway improvements are to be completed across the full frontage of each phase of a development or as determined necessary by the City Engineer.

#### 2. Subdivision Improvements

Roadway improvements are to be completed across the full frontage of each and every lot within a subdivision or subdivision phase and beyond, as directed by the Tentative Map Conditions of Approval, and as determined by the City Engineer.

### B. Driveways

1. No driveway shall be permitted within 5 feet of a fire hydrant or street light or within 10 feet of a curb return.

2. The maximum width of a commercial driveway shall be 42 feet, and for a residential driveway 30 feet. The above widths include curb height transitions at each side of the driveway.

3. Spacing

   a. Miscellaneous Improvements

      The distances between driveways serving the same site shall be maintained at a minimum of 250' for highways, 250' for major thoroughfares, and 250' for major collectors. In all cases speed, stopping distances, passing lanes, and visibility shall be considered and allowed for in determining spacing between driveways. Existing and proposed driveways shall be shown on the plans. Where cross jurisdictions occur, coordination between Agencies shall be requested in writing. Approvals or copies of approvals, from agencies other than the City of Hollister shall be forwarded to the Engineering Department.

b. Subdivision Improvements

The minimum distance between driveways serving the same parcel shall not be less than 18 feet as measured at the face of curb, excluding curb height transitions.(see curbside parking)

4. All driveways shall conform to the City of Hollister Standard Specifications and Plans.

C. Curbside Parking

1. Miscellaneous Improvements

Where allowed, curbside parking shall be maximized by prudent location of driveways, utilities, and structures.

2. Subdivision Improvements

Not more than 40 percent of the frontage of any parcel shall be devoted to driveways. Lots fronting on a cul-de-sac bulbs are exempt from this requirement. Driveways in cul-de-sacs and on streets serving corner lots shall be shown in full on the plans.

D. Valley Gutters

Valley gutters will be allowed within the public right-of-way or public easement only by prior approval of the City Engineer.

E. Sidewalks, Curbs and Gutters

1. Sidewalks shall be a minimum of 5.5 feet wide as measured from face of curb. Wider and/or separated sidewalks may be required by the City Engineer.

Where sidewalks do not extend to the full width of the right-of-way the remaining open land shall be graded at 2% positive slope from the face of curb to the property line.

2. Sidewalk, curb and gutter shall be of the design as shown on the Standard Details or as required by the City Engineer.

3. Handicap ramps shall be designed/provided at all necessary pedestrian crossings and street intersections.

F. Survey Monuments

1. Miscellaneous Improvements

Where required by the City Engineer monuments shall be shown on the construction plans at locations consistent with the monument system of the City of Hollister.

2. Subdivision Improvements

All survey monuments which are shown on the Final Map as new, or replacements, shall be depicted on the construction plans in the same locations as they are located on the Final Map and as follows:

a. On roadway centerline at intersections.

b. At beginning and end of each horizontal curve on the centerline or points of intersection when necessary.

c. In a number and location sufficient to retrace the survey and at all locations as required by the City Engineer.

d. Lot line extensions shall be clearly and permanently marked in the concrete at the top of curb.

3. All monuments set shall be as shown on the Standard Plans and shall clearly show the registration number of the licensed Civil Engineer or Land Surveyor who prepared the final or parcel map.

G. Signing, Stripping, and Barricades

1. General

All signing, stripping, and barricade construction shall be proposed by the developer, reviewed by the City of Hollister, with final approval granted by the City Engineer. Plans shall provide for installation of signing, striping, and barricades, per the City of Hollister Standard Plans and Specifications.

2. Signing and Signalization shall be installed as follows:

   a. Highways:

      As directed by the City Engineer and Other Agencies having jurisdiction.

   b. Major Thoroughfares:

      As directed by the City Engineer and the San Benito County Public Works Department.

   c. Major Collectors:

      As called for in the latest Traffic Circulation Element of the Master Plan and as directed by the City Engineer and San Benito County Public Works Department.

   d. Collectors, Industrial Use, Interior Streets, Cul-de-sac, and Alleys:

      Stop bars and Stop legends with street name signs as described in the City of Hollister Standard Plans.

3. Barricades shall be provided in the right-of-way whenever full width improvements are not provided, at street terminus', cul-de-sacs' which are adjacent to a property line (within 20'), and along the line of any improvements which encroach into the Public right-of-way.

H. Easements

All public utilities which go through private property shall be provided with the minimum easements as set forth in Section 2.

Where roadway construction is required offsite and outside of the dedicated public right-of-way; additional right-of-entry and construction easements shall be provided.

Where street easements for the construction of roadways are required, the Developer shall acquire additional 20' construction easements on either or both sides of the Street easement or R.O.W. Easements shall be permanent when

lying in future right-of-ways or temporary if outside, as the situation requires. Legal deeds and descriptions for the easements shall be submitted for City approval along with the initial submittal.

Where streets abut adjacent County Roads and State Highways, the Developer shall acquire encroachment permits from the appropriate Agencies to do the proposed work. The Developer shall submit the approval notices attached to the plan reviewed or copies of the same in conjunction with a subsequent submittal.

SECTION 4

# STORM DRAINAGE

## 4.01 GENERAL

These Design Standards are intended to insure that watercourses and surface water laws are complied with and that runoff from storms up to the 100-year return frequency are conveyed through storm facilities and disposed of in a manner which protects public and private improvements from flood hazards.

All storm drainage facilities shall include provisions for future upstream development and no development shall discharge at a rate which exceeds or causes flows to exceed the capacity of any portion of the existing downstream system.

Calculations for storm drainage design within a development as well as calculations for runoff generated by upstream areas within the contributing watershed shall be submitted to the City Engineer for approval.

All proposed improvements shall be designed such that, for the design storm, there is no surcharging in any conduit unless written approval is granted by the City Engineer. In those special cases where surcharging is permitted, provide a minimum of 1.25' feet of freeboard as measured down from the gutter flowline, for the applicable storm frequency. When in multi-jurisdictional areas, with requirements under the Federal Emergency Management Agency (FEMA) and/or the Department of Water Resources (DWR) Division of Safety of Dams, and/or other Flood Control Districts and Agencies administrating flood water control policies; the requirement which is most stringent shall hold.

Containment of flood waters within the public right-of-way is required at all times. Flood waters shall be confined to streets or other approved right-of-ways by grading, or alternative means acceptable to the City Engineer. In no instance shall an improvement be designed such that flood waters reach a depth of 0.70 feet, as measured from the gutter flowline. A 100 year storm shall be contained in the right-of-way. The design of all bridges, box culverts, levees, detention basins, spillways, and other applicable structures shall comply with the latest FEMA and DWR Division of Safety of Dams regulations.

At intersections of pipes, the downstream pipe shall have a crown elevation which is equal to the crowns of all upstream connecting pipes. Pipe diameters shall not decrease in the downstream direction.

A. Drainage Pond Policy:

1. Ponds in commercial and residential areas shall be allowed only on an interim basis, in areas planned for permanent City storm drainage systems, with system improvement planned by the City Capital Improvement Budget or based upon an enforceable agreement with a developer to construct the improvements within two (2) years.

2. Ponds are meant to be interim, as called for in (1) above and not a substitute for permanent City storm drainage systems. All ponds shall flow to permanent City storm drainage systems or acceptable outlet as approved by the Planning Commission.

3. Ponds may be allowed on a case by case basis as approved by the Planning Commission. All requests for ponds shall be accompanied by engineering and design criteria that demonstrate adequacy and feasibility of the proposed facility. Percolation ponds shall not be authorized unless it can be determined, based upon engineering and design criteria, that the pond will not be detrimental to the public health, safety and welfare of the project area and the City; and not be detrimental because of maintenance and design criteria.

4. All ponds shall be fenced and landscaped, as approved by the Planning Commission, to maximize public safety and to minimize visual blight.

5. All ponds shall be maintained by the property owner(s). Prior to pond approval, a mechanism for said maintenance, shall be identified (in place). As part of the pond approval, the applicant/property owner shall enter into an agreement to remove the pond within a specific period of time upon availability of the permanent City drainage system. Bonding for the maintenance and removal of the pond, including any hold harmless agreements, shall also be a condition of pond approval.

6. Ponds without an outlet, either by outfall or percolation, shall be prohibited in all areas of the City. Ponds shall comply with the hydraulic requirements as stated in this section and as modified in Section 4.03, D.

7. All ponds having overland outflow shall not exceed the pre-development rates or the capacity of the natural channels that the flow will be conveyed in: whichever is less.

B. Subdivision Lot Grading

For the purposes of providing positive drainage on and from the subdivision lots to the streets minimum slopes shall be held for these areas:

1. Right-of-ways shall have a constant 2% slope to the street. The 2% grading shall extend from the back of sidewalk to the property line.

2. Subdivision Lots shall have a minimum of 1% slope from the furthest rear lot corner to the front lot corner with a maximum slope of 10% in any portion of the front yard setback. Rear yard setbacks shall have a minimum of 15 feet of depth which has a maximum slope of 15:1.

3. Subdivision Corner Lots - Shall have the same as #1 and #2 above with the addition that if a side yard is designated a 20% slope will be allowed from the property line to building setback.

4. Where building pads are higher than rear lot corners the slope from said 'pad' to the rear property line shall not exceed the slope of the rear to front property line.

5. Where soundwalls and landscaping, in conformance with our Streetscape Standards, is required the allowable slopes are; 16% maximum from back of sidewalk to the furthest section of wall.

   Where the soundwall is in a rear yard and the building pad is at a higher elevation than the toe of wall the maximum rear yard slope shall be 5:1 (horz. to vert.) for any portion of the rear yard. Where the toe of the soundwall is higher than the building pad the typical rear yard grading requirements shall apply.

C. Easements

All public utilities which go through private property shall be provided with the minimum easements as set forth in Section 2.

Publicly maintained drainage conduits and channels will not be allowed on private property unless they lie within a dedicated public easement. Where minor improvement of a drainage channel falls on adjacent property (such as daylighting a ditch profile) written permission from the adjacent property owner(s) for such construction shall be required. A copy of the document which

grants said approval shall be submitted to the City Engineer for approval in conjunction with a Subsequent Submittal.

D. Water and Storm Sewer Separation

In order to minimize the hazards to public health which may occur due to accidental contamination of water supply facilities by tainted storm waters, the location and construction of water supply facilities and storm sewer facilities in close proximity to one another must be regulated. If the regulations in this standard are insufficient to provide reasonable protection to the public health due to unusual circumstances the City Engineer shall prescribed a more effective separation or protection of the lines.

The provisions of this standard shall govern the separation of public water supply facilities and storm drain facilities located in areas including, but not limited to, public roads, rights of way, and utility easements.

1. The required horizontal separation between water lines and storm drainage lines shall generally be not less than 10 feet wherever possible or as superseded by Standard Plan B-13.

4.02 PREPARATION

Submittals for review are to be accompanied by all calculations and area maps necessary to describe the design.

Please submit drainage calculations for storm conduits on a copy of the attached form (see page 31) along with a drainage area map clearly indicating all drainage areas, pipes, channels, manholes, catch basins, outfalls and any other pertinent information. These calculations are to be based upon the ultimate watershed development and shall include:

A. Topographic map showing the relationship between the proposed development/improvements and the remainder of the watershed, including acreages of all sub-areas.

B. Map of the proposed development indicating:

1. All applicable existing and proposed improvements.

2. Runoff coefficients for all areas where runoff was calculated.

3. Time of concentration and intensity of rainfall at each hydraulic structure.

4. The magnitude and direction (indicated by arrows) of flow in each pipe and flow to each structure contributed by its tributary area. All flow rates shall be in cubic feet per second (cfs).

5. Elevation of pipe inverts at structures and the top of structure elevation, at each structure.

6. Slopes of all storm water conveyance structures and conduits.

C. Tabulation sheet which includes all of the above information and summarizes the design in a clear, concise manner. Use the form shown on Page 31.

D. Construction drawings shall include:

1. Water surface elevations to be called out on profile view at each structure when surcharging has been allowed.

2. Pipe lengths, slopes and size.

3. Material shall be called out for each segment where a change in material occurs.

4. All applicable existing and proposed improvements.

5. Elevation of pipe inverts at structures and the top of structures elevation at each structure.

## 4.03 DESIGN

A. 1. Design Storm

The following table shall be used to determine the required design storm for drainage calculations.

| Design Area or Item | Design Method | Design Return | Comments |
|---|---|---|---|
| under 50 Acres | Rational Method | 10 Yr. | Refer to these specs and details |
| Between 50 Acres 10 Sq.Mi. | Rational Method | 15 Yr. | Refer to these specs and details |
| Greater 10 Sq.Mi. | Unit Hydrograph or Rational Method | 100 Yr. 24 Hr. | Provide support data for choice of hydrograph |
| Detention Basin and All channel Imprs. | Unit Hydrograph or Rational Method | 100 Yr. 24 Hr. | Peak discharge from a detention basin shall not exceed 90% of the undeveloped peak flow from the 24 hr., 100 yr. event. |

B. Storm Runoff

1. Rational Method of Estimating Runoff

Q = CIA where:
Q = peak runoff in cubic feet per second
C = runoff coefficient expressing the fraction of rainfall which appears as surface flow
I = rainfall intensity in inches per hour
A = the drainage area in acres tributary to the design, point or point of concentration

2. Runoff Coefficients, C

| Density | Coefficient of Runoff (C) |
|---|---|
| Undeveloped Areas, Parks | 0.20 |
| Suburban Residential | 0.30 |
| Single Fam. Residential | 0.40 |
| Detached Multi-Unit Res. | 0.50 |
| Condominiums, Apartments, Mobile Home Parks | 0.60 |
| Light to Medium Industrial, Commercial | 0.70 |
| Heavy Industrial | 0.80 |

3. Time of Concentration, $t_c$ = Inlet time, plus conduit time

a. Inlet Time

1) Undeveloped Watersheds

10 minutes $\leq$ Initial $t_c = 60(11.9L^3/H)^{0.385}$

Where t = Time of concentration in minutes

L = Overland flow length in miles

H = Elevation difference between point of initial concentration and top of watershed in feet.

2) Urbanized Watersheds

INITIAL $t_c$ = 10 minutes ("roof to gutter" time) plus the length of time required for the water to flow from the upper most part of the drainage basin to the initial point of concentration, ("gutter time".)

b. Conduit Time

Conduit time is the length of time required water to flow from one point of concentration, or inlet, to the next. The chosen average velocity or weighted incremental velocities must accurately reflect the hydraulic conditions, within the storm water system.

4. Rainfall Intensity, I

Based on:

a. for 10 year storm frequency:

$I_{10} = 5.78 (t_c^{-1/2})$

b. for 15 year storm frequency:

$I_{15} = 6.18 (t_c^{-1/2})$

c. for 100 year storm frequency:

$I_{100} = 8.13 (t_c^{-1/2})$

d. for other storm frequencies:

| Frequency (year) | Ratio x $I_{100}$ | Frequency (year) | Ratio x $I_{100}$ | Frequency (year) | Ratio x $I_{100}$ |
|---|---|---|---|---|---|
| 2 | 0.48 | 15 | 0.76 | 100 | 1.00 |
| 3 | 0.54 | 20 | 0.80 | 120 | 1.02 |
| 4 | 0.58 | 25 | 0.83 | 150 | 1.05 |
| 5 | 0.62 | 30 | 0.85 | 200 | 1.08 |
| 6 | 0.64 | 40 | 0.88 | 250 | 1.11 |
| 8 | 0.68 | 50 | 0.91 | 300 | 1.14 |
| 10 | 0.71 | 60 | 0.94 | 400 | 1.17 |
| 12 | 0.73 | 80 | 0.97 | 500 | 1.20 |

C. Hydraulic Capacity:

All storm water conveyance structures, unless otherwise stated herein or directed by the City Engineer, shall be designed to function without surcharging for purposes of determining hydraulic capacity. Capacity shall be determined under the following criteria.

1. Friction Losses:

The Manning equation should be used to calculate hydraulic profiles. The Manning equation is

$$Q = \frac{1.49\ a r^{2/3} S^{1/2}}{n}$$ where:

Q = the flow rate, or discharge, in cubic feet per second (cfs).

n = the roughness coefficient of the particular channel or conduit.

S = the slope, in feet per foot.

A = the cross sectional area of the channel or conduit in square feet.

R = the hydraulic radius in feet.

The losses due to friction may be determined by:

$$H_f = S \times L$$

where L is the length of conduit or channel.

2. Roughness Coefficient, n:

| Type of Surface | Manning's "n" Value |
|---|---|
| Polyvinyl Chloride pipe | 0.011 |
| High Density Polyethylene pipe | 0.011 |
| RCP 15" - 24" diameter | 0.015 |
| RCP 24" diameter and larger | 0.013 |
| CMP | 0.023 |
| Earth Channels, Smooth Geometric | 0.030 |
| Concrete Lined Channels | |
| Smooth Troweled | 0.015 |

| | |
|---|---|
| Others | Refer to the"Handbook of Hydraulics" :King & Brater |

3. Transition Losses:

At points of change in the hydraulic parameters of flow rate or section, the hydraulic grade line (HGL) should be calculated considering velocity heads and losses due to bends, entrances, exists, turbulence, etc. as well as friction losses. The transition losses should be calculated using energy losses expressed in terms of Kinetic energy.

$$h_L = KV^2/2_g$$

K varies for different conditions including bends, elbows, joints, etc. Tables A & B on page 32 and Figure C on page 33 give values for determining K due to sudden expansions, sudden contractions and bend in pipes.

D. Detention Pond Hydraulics

1. General

a. Ponds shall be excavated below natural ground with no levees. Ponds with a defined outlet and designed for a 72 hour maximum retention period are exempt.

b. Side slopes shall not be less than 2-foot horizontal to one-foot vertical. If retaining walls are constructed, the design shall be approved by the City Engineer.

c. Entire area shall be enclosed with a 6-foot high chain link fence with redwood slats and topped with three strands of barb wire. The fence shall be located in conformance with setback requirements and shall provide a six-foot wide access path around the pond perimeter and between the fence and top of slope. A 16-foot access gate and road down to the bottom of the pond shall be provided.

d. The pond shall be provided with a silting or stilling basin to remove silts and other debris from the water entering the pond. The basin design shall be approved by the City Engineer.

REFERENCES: _____ DRAINAGE STUDY OF _____

_____

ROOF TO GUTTER TIME _____ _____ BY _____ CHK'D BY _____

DATE _____ DATE _____

SHEET NO. ____ OF ____

AREA OF TRACT _____

NO. OF LOTS _____

| PT. OF CONC. | AREA DESIGNATION | INCREMENT | | | ACCUMULATED | | TIME OF CONC. | RAINFALL INTENSITY (In./Hr.) | | R or X RATIO | RUNOFF | | DESIGN | | | | | | MINIMUM CURB DATA | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Δ A | C | Δ AC | Σ A | Σ AC | | | | | Q=CIAX | | Q (cfs) | CONDUIT SIZE | SL = SLOPE | L = LENGTH | VEL. | TIME IN SECT | H = SL * L | ELEV. HGL | ELEV. EGL | M.T.C. (HGL*) | DESIGN TC |
| | | ACRES | | | ACRES | ACRES | MIN. | I | I | | Q | Q | | | | | (fps) | | | | | | |
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TABLE A

Values of K for Determining Loss of Head Due to Sudden Enlargement in Pipes, from the Formula $H = K (V_1^2/2g)$

$d_2/d_1$ – ratio of larger pipe to smaller pipe  $V_1$ – velocity in smaller pipe

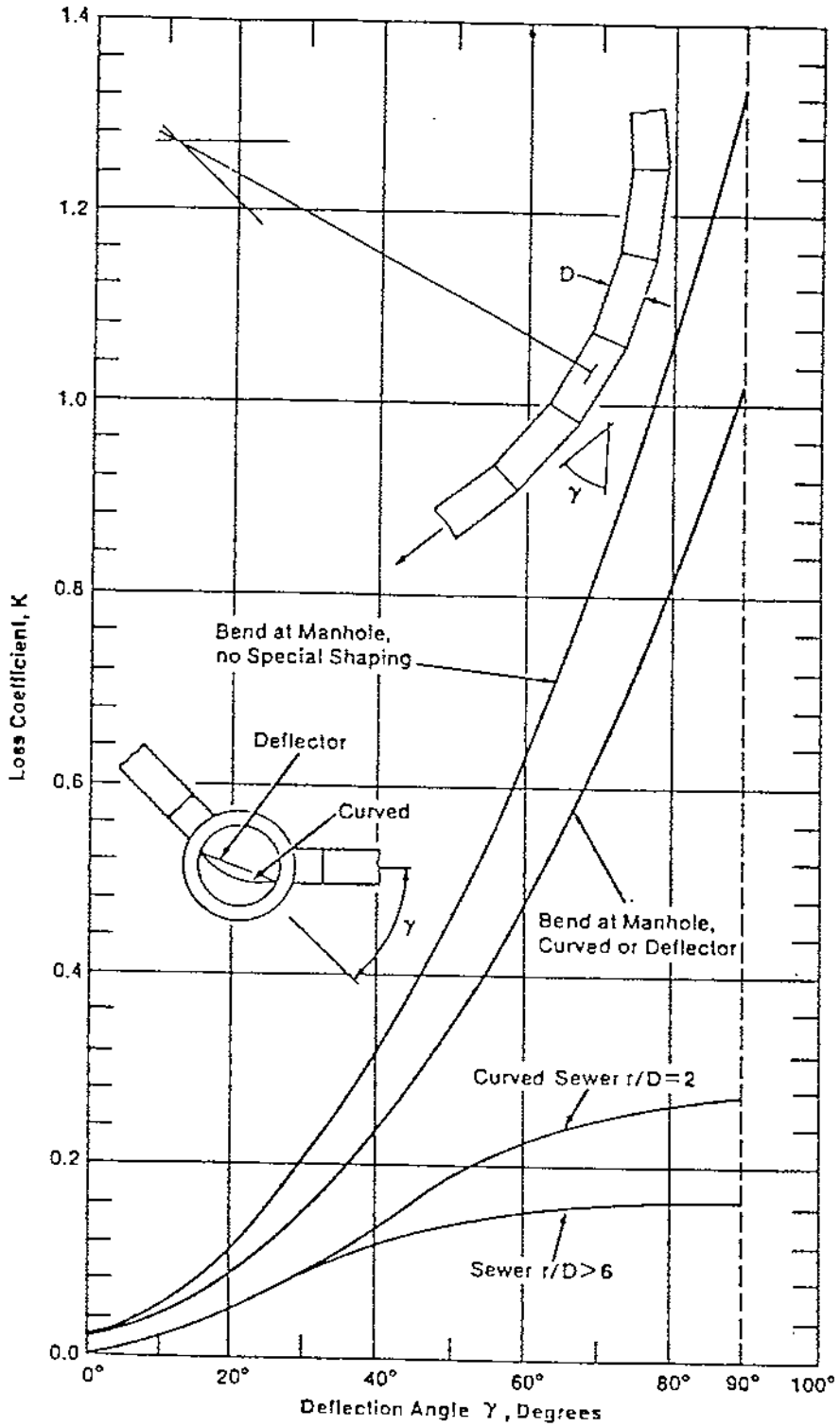
| $d_1$ / $d_2$ | Velocity, $V_1$, in feet per second | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 15 | 20 | 30 | 40 |
| 1.2 | .11 | .10 | .10 | .10 | .10 | .10 | .10 | .09 | .09 | .09 | .09 | .09 | .08 |
| 1.4 | .26 | .26 | .25 | .24 | .24 | .24 | .24 | .23 | .23 | .22 | .22 | .21 | .20 |
| 1.6 | .40 | .39 | .38 | .37 | .37 | .36 | .36 | .35 | .35 | .34 | .33 | .32 | .32 |
| 1.8 | .51 | .49 | .48 | .47 | .47 | .46 | .46 | .45 | .44 | .43 | .42 | .41 | .40 |
| 2.0 | .60 | .58 | .56 | .55 | .55 | .54 | .53 | .52 | .52 | .51 | .50 | .48 | .47 |
| 2.5 | .74 | .72 | .70 | .69 | .68 | .67 | .66 | .65 | .64 | .63 | .62 | .60 | .58 |
| 3.0 | .83 | .80 | .78 | .77 | .76 | .75 | .74 | .73 | .72 | .70 | .69 | .67 | .65 |
| 4.0 | .92 | .89 | .87 | .85 | .84 | .83 | .82 | .80 | .79 | .78 | .76 | .74 | .72 |
| 5.0 | .96 | .93 | .91 | .89 | .88 | .87 | .86 | .84 | .83 | .82 | .80 | .77 | .75 |
| 10.0 | 1.00 | .99 | .96 | .95 | .93 | .92 | .91 | .89 | .88 | .86 | .84 | .82 | .80 |
| | 1.00 | 1.00 | .98 | .96 | .95 | .94 | .93 | .91 | .90 | .88 | .86 | .83 | .81 |

TABLE B

Values of K for Determining Loss of Head Due to Sudden Enlargement in Pipes, from the Formula $H = K (V_1^2/2g)$

$d_2/d_1$ – ratio of larger to smaller diameter  $V_2$ – velocity in smaller pipe

| $d_1$ / $d_2$ | Velocity, $V_2$, in feet per second | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 15 | 20 | 30 | 40 |
| 1.1 | .03 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .05 | .05 | .06 |
| 1.2 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .08 | .08 | .08 | .09 | .10 | .11 |
| 1.4 | .17 | .17 | .17 | .17 | .17 | .17 | .17 | .18 | .18 | .18 | .18 | .19 | .20 |
| 1.6 | .26 | .25 | .26 | .26 | .26 | .26 | .26 | .26 | .26 | .25 | .25 | .25 | .24 |
| 1.8 | .34 | .34 | .34 | .34 | .34 | .34 | .33 | .33 | .32 | .32 | .31 | .29 | .27 |
| 2.0 | .38 | .38 | .37 | .37 | .37 | .37 | .36 | .36 | .35 | .34 | .33 | .31 | .29 |
| 2.2 | .40 | .40 | .40 | .39 | .39 | .39 | .39 | .38 | .37 | .37 | .36 | .33 | .30 |
| 2.5 | .42 | .42 | .42 | .41 | .41 | .41 | .40 | .40 | .39 | .38 | .37 | .34 | .31 |
| 3.0 | .44 | .44 | .44 | .43 | .43 | .43 | .42 | .42 | .41 | .40 | .39 | .36 | .33 |
| 4.0 | .47 | .46 | .46 | .46 | .45 | .45 | .45 | .44 | .43 | .42 | .41 | .37 | .34 |
| 5.0 | .48 | .48 | .47 | .47 | .47 | .46 | .46 | .45 | .45 | .44 | .42 | .38 | .35 |
| 10.0 | .49 | .48 | .48 | .48 | .48 | .47 | .47 | .46 | .46 | .45 | .43 | .40 | .36 |
| | .49 | .49 | .48 | .48 | .48 | .47 | .47 | .47 | .46 | .45 | .44 | .41 | .38 |




FROM: MODERN SEWER DESIGN, AMERICAN IRON & STEEL INSTITUTE

2. Hydrologic and Hydraulic design factors shall be as follows:

a. The design storm frequency shall be 100 year and the rainfall intensity shall be as expressed in A. above.

b. Runoff coefficients shall be as in B.,2. above.

c. Infiltration rate or percolation rate shall be determined from percolation tests of the soils at the proposed pond site. The tests shall be performed by licensed, qualified, soils engineers and a report with test data, conclusions and a recommended infiltration rate shall be submitted, with the pond calculations, to the City Engineer, for approval. A factor of safety may be required by the City Engineer, if in his opinion the recommended infiltration rate is not substantially documented and or has not taken into consideration the log term effects of silts and other debris.

d. The area to be used in runoff calculations shall include all areas proposed for improvement and all existing improved and unimproved areas draining into the pond.

e. The pond shall be maintained by the City or by the Developer, under agreement with the City, depending on the circumstances.

f. Pond storage required, PS, shall be derived from the following formula:

$$PS = \frac{1000 \quad (\Sigma\ AC)^2}{Ä\ p}$$

where:

| | | |
|---|---|---|
| PS | = | Pond Storage required in acre-feet |
| Σ AC | = | The sum of the products of the runoff areas and their respective runoff coefficients, in acres |
| Ä | = | The infiltration area or percolation area in square feet |
| p | = | The infiltration rate or percolation in inches per hour |

One and one-quarter foot of freeboard shall be provided and shall not be included in the storage volume of the pond.

g. Overland outflow shall be measured at maximum head and in accordance with Pond Policy 4.01 A(7).

E. Pipe Materials:

The minimum allowable inside diameter of any storm drain pipe shall be 18 inches for trunk lines and 15 inches for inlet laterals. The pipe materials which may be used for storm drainage improvements within the City, City rights-of-way, and easements, shall be Reinforced Concrete pipe, Cast in Place pipe, High Density Polyethylene pipe, and Polyvinyl Chloride pipe (SDR 35.0) as specified by the City of Hollister Standard Plans and Specifications.

F. Velocities

Minimum velocities allowed in any trunk line shall be 2 feet per second when flowing full. Inlet laterals shall maintain 2 feet per second for their ultimate flow.

G. Cover Requirements:

All storm drain pipe shall be designed to allow a minimum of 2 feet of cover as measured from top of pipe to subgrade. If, for sound engineering reasons, 2 feet of cover cannot be obtained, the pipe shall either be encased in concrete or provided with a concrete cover as approved by the City Engineer.

No storm drain pipe which lies totally or in part within the structural section of a street will be allowed.

1. RCP - The following chart lists the minimum allowable classes of reinforced concrete pipe. For use in this chart, cover is defined as the distance from the top of pipe to the subgrade.

| Cover in Feet | Minimum Class, RCP | |
|---|---|---|
| Less than 2.5 | CL V | (3000 D) |
| 2.5 - 7.9 | CL III | (1500 D) |
| 8.0 - 11.9 | CL IV | (2000 D) |
| 12.0 - 17.0 | CL V | (3000 D) |

2. CIPCP - Cast-in-Place concrete pipe shall have a minimum cover in conformance with the following:

Cast-in-place concrete pipe shall not be used if the subgrade surface is less than 24 inches above the top of pipe or a distance less than 1/2 of the outside pipe diameter, whichever is greater.

In each case the Design Engineer shall provide calculations substantiating the wall thickness and required cover for the specific design/construction conditions.

3. Polyvinyl Chloride Pipe (SDR 35.0) shall conform to the materials allowed by the Standard Specifications and Plans, but shall not be used if finished subgrade surface is less than 24" above the top of the proposed pipe.

   In each case where depth from finished subgrade to top of pipe is less than twice the diameter of the proposed pipe, whichever is greater, and where the total depth is more than 10 feet, the Design Engineer shall provide calculations substantiating the pipe class and cover to subgrade, as proposed, is adequately maintains less than 5% deflection under expected loading.

4. High Density Polyethylene Pipe shall be a profile-wall type material, and shall conform to materials as specified in the Standard Specifications and Details, but shall not be used if finished subgrade surface is less than 36" or one diameter, whichever is greater, above the top of the proposed pipe.

   In each case where depth from finished subgrade to top of pipe is less than twice the diameter of the proposed pipe or deeper than 15 feet the Design Engineer shall provide calculations substantiating the pipe class and cover to subgrade adequately maintains less than 5% deflection under expected loading.

H. Horizontal Alignment:

Storm drainage lines shall be parallel with the centerline of the street. Pipe curvature shall not exceed 80 percent of the manufacturer's recommendations. Pipe shall not be placed under sidewalks, curbs, or gutter pans.

I. Open Channels:

For the purposes of these specifications, a ditch shall be classified as an open channel when its capacity exceeds 2.5 cfs. Drainage may not be conveyed through a development in open channels. Open channels shall be designed in accordance with the following:

1. Velocity range shall be between 2.5 and 6.0 feet per second in unlined open channels and between 3.0 and 12.0 feet per second in lined open channels.

2. Channel linings shall be approved by the City Engineer prior to submittal. In all cases any lining work shall comply with the construction methods as specified in the Standard Specifications.

3. All open channels shall be designed to carry the 100-year frequency flood. The hydraulic grade line shall be calculated and plotted on all channel profiles. All computations, including a narrative of the design shall be clearly documented and submitted to the City Engineer for approval.

4. Freeboard shall be a minimum of 1.0 feet in channels with or without levees, respectively, for the 100 year event.

5. Side slopes shall be 2 feet horizontal minimum to 1-foot vertical, the minimum bottom width of the channel shall be 4 feet.

6. The profile of the existing channel shall be shown on the construction plans. Any cross sections will also show the relative existing cross section.

7. A minimum of one access road along one side of the channel shall be provided. A minimum width of 15 feet of travel way shall be provided.

8. Plans shall reflect design in graphical representation.

J. Bench Drains and Diversion Ditches:

A ditch shall be considered a bench drain or diversion ditch as long as its design capacity does not exceed 2.5 cfs. Any ditch which has a capacity greater than 2.5 cfs shall be considered an open channel and designed in accordance with Section I.

Bench drains and diversion ditches shall be concrete lined and designed in accordance with the following:

1. Velocity range shall be between 3.0 and 20.0 feet per second, but shall not exceed 10 feet per second at any change in horizontal direction.

2. At changes in alignment and at inlets, adequate measures such as banking, circular curves or energy dissipaters shall be used to confine water within the channel.

3. At locations where, in the opinion of the City Engineer, the overflow of a bench drain or diversion ditch could cause flooding, erosion or other damage, the channel section shall be designed to carry the 100 year runoff.

4. Plans shall reflect design in graphical representation.

K. Drainage Structures:

Any and all designs which vary from the City Standard Plans and Specifications by any dimension or any feature, or is not covered by the Standard Plans shall be detailed in full on the plans.

1. Manholes and Junction Boxes - Shall conform to the City of Hollister Standard Plans and Specifications. They shall be located at changes in grade or conduit size, at junction points, on curved pipe at the EC or BC of the curve, and at 300 foot intervals along the curve. Generally not more than 520 feet apart otherwise.

2. Catch basins - Shall conform to the City of Hollister Standard Plans and Specifications. Catch basins should be placed at all intersections which have low drainage points and positioned 7' minimum to centerline from E.R. to centerline of the box to collect the flow prior to pedestrian crosswalks and they should be placed at intervals that will not allow curb and gutter capacity to be exceeded, such that water encroaches into the travel way of streets. Generally catch basins should coincide with manholes and should be spaced not more than 520 feet apart unless otherwise approved by the City Engineer. Where a catch basin has incoming laterals from other catch basins, a plan and section detail shall be provided on the plans.

   Care should be taken not to conflict with driveways and P.G.&E. facilities.

3. Box Culverts - Shall be required when specified by the City Engineer and designed on an individual basis.

4. Headwalls, Wingwalls, Endwalls, Etc. - Shall be considered on an individual basis.

5. Drainage Pump Stations - Are not permitted.

6. Temporary Inlets and Outlets - Shall conform to good engineering practice and shall be specifically designed and detailed on the plans.

7. Gutters - Storm water runoff in gutters shall be conveyed in underground structures when any one of the following criteria is met:

   a. Gutter runoff exceeds 1.0 cubic feet per second.

   b. Length of gutter exceeds 520 feet.

c. Water depth in gutter reaches 0.3 feet in depth or spread extends 8 feet into roadway from gutter flowline, for a 10 year storm frequency.

L. Miscellaneous Items:

1. Fencing - All open channels shall be enclosed by a chain link fence complying with the City Standard Details and Specifications. The fence shall be located 6 inches inside the required easement lines.

2. Service Road - One service road shall be provided within the boundary of all open channels. They shall be a minimum of 15 feet wide, each graded for vehicular traffic and clear of trees, shrubbery, and other obstructions for its full width. Thirteen feet of the road's width shall be paved or graveled (surface type to be determined by the City Engineer for each case) with a minimum unpaved shoulder width of 1 foot on each side of the roadway.

SECTION 5

# SANITARY SEWERS

## 5.01 GENERAL

These Design Standards are intended to insure that all sewer systems contributing to the City of Hollister Wastewater Treatment Facilities are operating at equal levels of efficiency. These criteria shall hold for sewer systems served but not owned, maintained and operated by the City of Hollister as said criteria may affect the efficiency of the City's system. The City Engineer retains the right to require additional upgrading and oversizing on all plans in accordance with the requirements of municipal growth.

### A. Oversizing Policy

In the event oversizing and upgrading of a system or a portion of a system is required and where it has been previously agreed that the oversizing and upgrading is for the general benefit of areas beyond the boundary of the development: it is the general policy of the City that the Developer may request reimbursement for the oversizing work. The reimbursement shall be in accordance with an agreement negotiated between Developer and the City Engineer and approved by the City Council, prior to the work being done.

1. All negotiated agreements shall be based in part on a minimum of three (3) competitive, itemized, bids.

### B. Line Size and Service Policy

1. The line size and service policy requires that the minimum size of any new public sewer shall be 8 inches in diameter.

2. In residential areas where it can be shown that a line cannot be extended and is less than 300 feet from terminus to nearest manhole; the size may be reduced to 6 inches in diameter.

### C. Sewer and Water Separation Policy

In order to minimize the hazards to public health which may occur due to accidental contamination of water supply facilities by sewage, the location and construction of water supply facilities and sewerage facilities in close proximity to one another must be regulated. If the regulations in this standard are insufficient to provide reasonable protection to the public health due to unusual circumstances the City Engineer shall prescribe a more effective separation and/or protection of the lines.

The provisions of this standard in conjunction with California Waterworks Standard, Title 22 of the California Administrative Code shall govern the separation of water supply facilities and sewerage facilities located in areas including, but not limited to, public roads, rights of way, and utility easements.

1. The required separation between water lines and sewer lines, except as hereinafter provided, shall be as depicted in City of Hollister Standards Plan B-13.

2. In addition required separation between other water supply facilities and sewerage facilities shall meet or exceed the following minimum horizontal separations:

Water well and sewer line.....50 feet
Water line and septic tank.....10 feet
Water line and seepage pit or
cesspool.....10 feet

5.02 Preparation

Sanitary sewer system design within a developing area must include provisions for size and capacity to adequately convey all domestic and industrial waste that can be reasonably anticipated under conditions of full ultimate development. Engineering calculations to support the sewer system design shall be submitted to the City Engineer for approval. The calculations shall include:

1. Map indicating service area within the sewer system including any future contributing development with projected land use, zoning, and physical features contributing to the sewer design.

2. Sanitary sewer waste volumes existing and proposed within the service area of the system.

3. Size and slope of each pipe between appurtenant structures.

4. Invert/RIM elevations of each pipe and appurtenant structure.

5.03 Design

A. Flow

1. Equation

The design sanitary sewer flow shall be computed using the following formula:

Q = (Q(avg)) (DU) * PF

where:

| | | |
|---|---|---|
| Q | = | DESIGN FLOW IN GALLONS PER DAY |
| Q(avg) | = | waste water coefficients |
| DU | = | estimated number of units(either dwelling or acres) |
| PF | = | peaking factor of 2.5 unless otherwise specified by the Engineering Department |

The DESIGN FLOW is computed using two basic assumptions:

a. Full upstream development

b. Maximum density - estimated number of units for undeveloped land shall be based on Land Use Classifications contained in the Hollister General Plan.
Low Density Residential - 7.5 units per gross acre.
Medium Density Residential - 11.25 units per gross acre (use multiple family coefficient).
High Density Residential - 32.5 units per gross acre (use multiple family coefficient).
Central Residential/Commercial -
Commercial Office Neighborhood - 6 units per gross acre (use single family coefficient).

2. Wastewater coefficients

Coefficients for service types are listed in Table below:

Wastewater Generation Coefficients (1)

| Land Use | Unit | .Q Average Coefficients Q(avg) |
|---|---|---|
| Single Family | gpd/DU | 290 Average Daily Flow |
| Multiple Family | gpd/DU | 160 Average Daily Flow |
| Commercial/Office | gpd/ac | 920 Average Daily Flow |

| | | |
|---|---|---|
| Light Industrial | gpd/ac | 1800 Average Daily Flow |
| Heavy Industrial | gpd/ac | 12000 Average Daily Flow |
| Public Bldgs, etc. | gpd/ac | 1500 Average Daily Flow |

Infiltration is considered to be negligible unless directed otherwise by the Engineering Department.

B. Pipe Capacity

1. Manning's Formula [$Q = A\ (1.49/n)\ R^{2/3}\ S^{1/2}$] shall be used to determine pipe capacity. The "n" value shall be .011 for PVC, ABS, HDPE, composite or solid wall pipes.

2. a. For pipe 10" or less in diameter, design the pipe so Design flow will be carried when pipe is flowing at one-half depth.

   b. For trunk sewers 12 inches and larger design pipe so Design flow will be carried when pipe is flowing at 2/3 depth.

3. Table of Minimum Slopes:

   Minimum and Maximum Slopes for Gravity Sewers to provide velocity within acceptable range

| Pipe Inside Diameter (in.) | Minimum Slope (%) | Maximum Slope (%) |
|---|---|---|
| 8 | 0.35 | 8 |
| 10 | 0.25 | 6 |
| 12 | 0.20 | 4 |
| 15 | 0.15 | 3 |
| 18 | 0.12 | 2.6 |
| 21 | 0.10 | 2.0 |
| 24 | 0.08 | 1.8 |
| 27 | 0.08 | 1.5 |
| 30 | 0.08 | 1.3 |
| 33 | 0.08 | 1.2 |
| 36 | 0.08 | 1.0 |
| 39 to 60 | 0.08 | 0.9 |

C. Velocity

Sewer velocity shall be equal to or greater than 2 feet per second for all sewers when flowing at design capacity. Where design velocities for main sewers exceed 10 feet per second, polyethylene lined ductile iron pipe conforming to the requirements of ANSI/AWWA C151/A2.51 and liner shall conform to SDR 32.5: class of pipe shall be as required for design loads. All ductile iron pipe shall be wrapped with a 8-mil polyethylene blanket. High Density Polyethylene pipe for direct burial as specified in the City of Hollister Details and Specifications can also be used in sewers where high velocities occur.

D. Pipe Cover and Clearances

1. Minimum pipe cover and clearances, as stated below, shall be maintained in the design of sanitary sewers. If certain conditions exist which make it impractical to meet the minimum cover and clearance requirements, the conditions and locations shall be specifically noted above the sewer profile and on the plan view. Each location not meeting the minimum cover and clearance requirements will require special approval. Any planned condition being specially approved with less than minimum cover will require special pipe, bedding and/or backfill as directed by the City Engineer. Special construction sequences or methods to insure quality of the product shall be called out on the plans.

   Sewers shall be installed at a depth which will provide suitable service to the properties connected and will allow subsequent installation of water lines in accordance with the Water/Sewer separation, as detailed in the City of Hollister Details and Specifications, and with a minimum of special construction of the water lines other than joint spacing.

   Compliance will usually be assured if: The main sewer is located at a depth of 5' to the top of pipe below the finished grade of the existing or proposed roadway and the house laterals are located 4' to top of pipe below the ground surface at the property line.

   Other utilities shall not, under any circumstances, be installed directly over and parallel to any sanitary sewer line installation.

2. Main and trunk sewers shall have a minimum depth of 4 feet as measured from the top of the pipe to the finish grade or a minimum of 24" from subgrade to top of pipe whichever yields the greater total depth from top of curb.

3. Laterals shall have a minimum depth of 3.5 feet from the top of the pipe to the top of curb at the face of curb or a minimum of 24" from subgrade to top of pipe whichever yields the greater total depth from top of curb.

4. Pipe shall be designed with the "no joint zones"and vertical clearances from water lines and vertical clearances from all other improvements and utilities, as shown in the City of Hollister Standard Plans (B-13), unless otherwise approved by the City Engineer.

E. Allowable Pipe Materials

Composite Truss pipe, HDPE Ribbed profile wall pipe, PVC corrugated profile wall pipe, HDPE smooth interior corrugated pipe, or PVC Sewer Pipe-SDR 35 can be used in City installations. For related material requirements see the City of Hollister Plans and Specifications.

F. Horizontal and Vertical Curves

1. Sanitary sewer mains shall be on a straight line between manholes. Whenever it is essential that a curved alignment be used, a minimum radius of 200 feet shall be required. but shall be greater whenever possible. The radius and delta of all curves shall be indicated on the plans adjacent to the curve.

2. Whenever a curved alignment is to be used #10 insulated tracer wire is to be placed within the trench at springline of the main.

3. The deflection in the joint between any two successive pipe sections shall not exceed eighty (80) percent of the maximum deflection as recommended in writing by the pipe manufacturer. Minimum 4 foot pipe lengths may be used to install short radius curves providing the requirements specified herein are met.

4. There shall not be more than 45 degrees combined horizontal and vertical deflection between structures.

G. Lateral Sewers

Laterals are those portions of the sewer system from the sewer main to the property line and is the portion of the sewer maintained by the property owner. The usual location of the line of responsibility is the sewer main. In all cases, City maintained sewer main will lie in a street right-of-way or easement. In all new subdivision work, the house lateral line from the sewer to the property line shall be installed at the time the sewer main is constructed. Whenever a sanitary sewer is installed which will serve existing houses or other buildings, a lateral line shall be constructed for each existing individual

house or building. Whenever it is known or can be reasonably assumed that a future building sewer connection will be required, the lines shall be shown on the plans and installed to the property line as part of the sewer main construction, prior to paving. The improvement plans shall adequately reference each lateral location. Each individual on-site building shall be serviced by a separate lateral to the sewer main.

1. All laterals, from property line or edge of easement to the point of connection with the main line or a manhole shall have an alignment that provides an angle of intersection with the downstream section of the main sewer of no less than 90°.

2. The maximum deflection at any one point in a lateral, not including fittings at saddle or wye connection to main sewer or at angle points having clean outs, shall be 22-1/2° (1/16 bend) and any two consecutive deflections (bends) shall not be less than 4 feet apart.

3. Building drains (i.e. floor drains, etc.) shall not be connected to the sanitary sewer system, exceptions shall be approved prior to submittal by the City Engineer and the Building Director.

4. Laterals connecting houses having a finished floor elevation 12 inches or less above the highest elevation of the nearest upstream structure shall require installation of a backflow prevention device next to the clean out at the house.

5. All side sewers (laterals) 8" and larger shall be connected to the main by or at a manhole.

6. The minimum lateral size for commercial and industrial developments as well as multifamily-residential developments shall be 6". The final size shall be based on the criteria in this section.

7. The minimum lateral size is 4 inches with the lateral's intended use to serve single family residences. Joint use of laterals will not be permitted except in multi-family residential uses.

H. Appurtenances

1. Manholes - Manholes shall be located at all abrupt changes in alignment or grade and at all junctions. Normal maximum spacing for manholes shall be 300 feet. Where the location of two manholes is determined by intersecting lines, the distances between intervening manholes shall be approximately equal. Sewers on curved alignment with a radius of less than 400 feet shall have manholes

spaced at a maximum of 300 feet on the BC or EC of the curve to adjusted to fit the individual case.

The spacing of manholes on trunk sewer lines 10 inches and larger in diameter shall be proposed for each individual case and shall be approved by the Hollister City Engineer.

Whenever, at manholes, a change in the size of pipe, or an angle of 45° or more in alignment occurs, the flow line of the incoming pipe shall be a minimum of 0.10 feet above the flow line of the outgoing pipe, or an amount necessary to match pipe springline. The Design Engineer shall show all inverts of proposed manholes, and include elevations of pipe inverts entering manholes when difference than outlet pipe invert.

Drop manholes will only be permitted when circumstances make them necessary and shall have prior approval from the City Engineer.

Manholes shall be used at the termination of all sewer mains including cul-de-sacs. A maximum of three (3) laterals shall be connected to this manhole for services to adjacent properties within the cul-de-sac.

Manholes shall not be placed any closer than 6' to a face of curb. If manholes are placed closer than 4' to a P.G.&E. trench it shall be depicted in the profile and a dimension provided to clarify the clearance expected.

2. Depending on spacing, manholes or cleanouts shall be installed at the upstream end of mains which are proposed to be extended in the future and stubbed out as approved by the City Engineer.

I. Unusual Design

Special design of unusual features or structures require individual study and approval by the City Engineer.

J. Force Mains

Material to be used for force mains(if permitted) shall be PVC pipe, AWWA C-900, and shall be stenciled "sewer". Alternative pipe materials shall be submitted with performance data, and design calculations which include an approved safety factor.

K. Pump Stations/Lift Stations

Pumping of sanitary sewer flows will not be permitted unless there is not other feasible alternative in the opinion of the City Engineer and only after approval of a preliminary study by the City Engineer and only where a station serves a significant area, and gravity service is totally prohibitive.

SECTION 6

# WATER SYSTEM

## 6.01 GENERAL

### A. General

The City of Hollister and the Sunnyslope County Water District currently supply water within the developed area of the City. While the City Hollister system uses a 2,000,000 gallon storage tank atop of Park Hill, elevated to 390.4 feet above sea level, with a reservoir elevation set at 425.0. The Sunnyslope County Water District uses an operational portion of a City built 2,000,000 gallon storage tank, which lies east of Fairview and south of Hillcrest Road in line with the extension of Sunnyslope Road, at an elevation of 515.0 feet and the reservoir level set at 550.0 above sea level. Both Districts use a gravity network from the reservoirs to pressurize their distribution systems. The systems are interconnected and can supply each other with an emergency supply. Both maintain supplies through a system of local wells.

Sunnyslope County Water District supplies the easterly portion of Hollister; from Memorial Drive, which runs north to south, to Fairview Road and some other areas outside of the City of Hollister boundary, so their district standards should be included in the plans when improvements are built in this area. Maps of the specific boundary are available for viewing at the City Engineers Office.

Water systems designed within a City limits and the Residential Development Service Area shall conform to the City of Hollister Standard Plans and Specifications. All improvements including extensions, replacements, and repairs shall conform to the requirements of the National Board of Fire Underwriters, American Water Works Association Standards, Hollister Administrative Regulations, the Code of the City of Hollister, and these Design Standards.

### B. Service and Oversizing Policy

A single service connection shall not serve more than one premise except in multi-family dwellings. Separate premises under a single ownership, control or management shall be supplied water through separate service connections.

More than one property shall not be connected to a single service for the purpose of avoiding water connection charges.

Reference is also made to Title 17, Chapter VIII, Sections 7583 - 7605 inclusive of the California Administrative Code, regulating the construction of cross connections

between drinking water systems and other sources of water. All construction shall be in strict compliance with said regulations and City of Hollister Codes.

The City Engineer retains the right to require additional upgrading and sizing on all plans in accordance with the most recent studies of demand.

1. Oversizing Policy

In the event oversizing and upgrading of a system or a portion of a system is required and where it has been previously agreed that the oversizing and upgrading is for the general benefit of areas beyond the boundary of the development: it is the general policy of the City that the Developer may request reimbursement for the oversizing work. The reimbursement shall be in accordance with an agreement negotiated between Developer and the City Engineer and approved by the City Council, prior to the work being done.

a. All negotiated agreements shall be based in part on a minimum of three (3) competitive, itemized, bids.

If approval by other agencies such as the Bureau of Reclamation or Sunnyslope County Water District or San Benito County Water District or any other agency within whose jurisdiction facilities are to be constructed is required, a letter of approval attached to a relevant set of plans will be forwarded to this office as verification of approval by the outside agency.

C. Easements

All Sunnyslope County Water District and City owned water system facilities shall be installed only in public streets, easements or rights-of-way, in accordance with the requirements as stated in Section 2 of these Design Standards.

## 6.02 PREPARATION

A. Calculations

Submittals for review are to be accompanied by all necessary calculations and system maps necessary to describe the proposed design.

The calculations should include data showing compliance with Sections 64566 and 64568 of Title 22 of the California Administrative Code.

The maximum allowable design static pressure in the system is 125 p.s.i.

Calculations shall reflect minimum residual pressures as follows:

1. Domestic user maximum demand - 25 p.s.i.
2. User average day demand plus design fire flows - 20 p.s.i.

B. Corrosive Soil Determination

A field corrosion potential survey shall be performed for any project which is situated northeasterly of the line defined by the right-of-way of the Southern Pacific Railroad Mainline, the right-of-way of Prospect Avenue and the right-of-way of Airline Highway.

1. The survey shall determine the following conditions:

   a. Soil Resistivity

   b. Oxidation-Reduction Potential

   c. pH

   d. Sulfides

   e. Moisture

2. This information shallb e used to determine field corrosion potential utilizing the D.I.P.R.A. - C.I.P.R.A. Soil Corrosivity Point Classification System as shown in Table I, Page 52.

   The corrosion susceptibility increases with increasing values of this scale. For values of 10 or more the following specifications must be incorporated into the design.

   a. Ductile Iron Pipe, if specified, must be installed with loose polyethylene bagging in accordance with **Subsection 207-9.2.6 Polyethylene Encasement for external Corrosion Protection** of the City of Hollister Standard Specifications.

   b. Copper services shallb e prohibited.

   c. Ductile Iron or Cast Iron valves or fittings, as well as hydrant buries must be cathodically protected by a galvonic magnesium anode in accordance with Subsection **207-9.2.7 Cathodic Protection Against External Corrosion** of the City of Hollister Standard Specifications

**TABLE I**
**Soil Test Evaluation**

| Factors | Range | Points* |
|---|---|---|
| Resistivity (ohms-cm) | <700 | 10 |
| | 700-1000 | 8 |
| | 1000-1200 | 5 |
| | 1200-1500 | 2 |
| | 1500-2000 | 1 |
| | >2000 | 0 |
| pH | 0-2 | 5 |
| | 2-4 | 3 |
| | 4-6.5 | 0 |
| | 6.5-7.5 | 0** |
| | 7.5-8.5 | 0 |
| | >8.5 | 3 |
| Oxidation-Reduction Potential | >100mV | 0 |
| | 50-100mV | 3.5 |
| | 0- 50mV | 4 |
| | Negative(-) | 5 |
| Sulfides | + | 3.5 |
| | Trace | 2 |
| | Negative | 0 |
| Moisture | Poor drainage, continuously wet | 2 |
| | Fair drainage, generally moist | 1 |
| | Good drainage, generally dry | 0 |

* A total of ten points indicates that the soil is corrosive to cast iron pipe.
** If sulfides are present and low or negative oxidation-reduction potential results are obtained, three points shall be given for this range.

C. Plans

The plans shall show the water system in plan and profile, whether existing or proposed. Fittings, valves, and hydrants shall be located by centerline stationing when specific location and clearances are of a critical nature. For the purposes of this standard objects within a proximity of 4 feet for fittings, 3 feet for valves, and 5 feet for hydrants shall be deemed of a critical nature.

1. Construction drawings shall include:

   a. Water pipe crown elevations and outside diameters are to be called out on the plan/profile to clarify clearances expected and allowed, at critical locations as defined above.

   b. Pipe lengths and size, cover and changes in cover.

   c. Material shall be called for each segment where a change in material occurs.

   d. All applicable existing and proposed improvements.

   e. Call out special fittings used for changing direction or depth.

6.03 DESIGN

A. Layout of Mains

The distribution system, generally shall be looped to form a "Grid System" of water circulation so as to allow pressure equalization. All water pipelines designed for the transmission or distribution of domestic water supply shall be constructed and installed within the right-of-way of public streets or roads, unless such construction or installation is determined to be impractical by the City Engineer.

Water lines and services are generally not allowed to cross under sanitary mains or laterals.

The location of the water main in any street shall be 10 or more feet from the nearest sewer main. The location shall conform to the separation requirements of the City Standard Plans while maintaining minimum cover as required by these standards. Insulated #10 tracer wire shall be placed at springline of the pipe and called out on the plans.

The Design Engineer shall show existing and new lines and clearly identify by station on the plan and profile the limits of each. The Design Engineer shall show, on the

profile of improvement plans, elevations of the top of pipe at all changes in grade in all areas where conflicts with other utilities might arise. A scaled detail shall be drawn of such conflicts with sufficient dimensions, elevations, and information shown that the City Engineer can make a determination as to the adequacy of the solution shown.

All future extensions and proposed stubs shall be shown out to the 100' limit beyond the project boundary to better anticipate future conflicts. Plugs at the project limits shall be clearly identified.

Location of existing utilities shall be verified by potholing or other means as part of the design process and said information shall be shown on the plans.

B. Sizes

In general, the minimum size water main shall be 8 inches in diameter. The installation of 6 inch mains may be permitted in cul-de-sacs where there are no fire hydrants served by the 6-inch main. All dead end mains shall be provided with a City standard blow-off or other acceptable means of flushing such as a fire hydrant.

In all cases, water mains shall be sufficient size to meet fire flow requirements as outlined by the requirements of the Hollister Fire Department and stated in section F of this Standard.

C. Pipe Materials

Allowable materials are PVC AWWA approved, C-900 class 150 or lined ductile iron pipe -AWWA approved, Class 50. Services lines over 1 inch and up to and including 2 inches shall be Type K soft copper tubing. 1" service lines to residential lots are to be polyethylene tubing. See Section 207, 212 of the City of Hollister Standard Plans and Details for related material requirements.

D. Cover Requirements

Water mains and services shall be designed at a depth which will provide between 36-54 inches of cover from the top of the pipe to finished pavement surface.

The amount of cover which remains after excavation for compaction processing will determine the depth necessary to protect the pipe since structural sections vary in depth and will require different amounts of soil removal, the construction process should be considered when establishing design depth.

Other clearance requirements as established by these Standards and the City of Hollister Standard Plans shall not be reduced by this cover requirement.

If variance from the above specified cover limits can not be avoided, approval shall be obtained from the City Engineer, in writing and prior to submittal.

E. Valves

The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in shutting down a transmission main, or necessitate the removal from service of a length of pipe greater than 250 feet in high density districts or greater than 600 feet in other districts; additionally, in no case shall more than two fire hydrants be removed from service. The valves should be so located that any section of main can be shut down without going to more than three locations to close valves. All valves shall be gate valves with fully encapsulated wedge, resilient seat, and integral bronze nut and stem. All tees shall have a minimum of two (2) valves and all crosses shall have a minimum of three (3) valves. Blow-offs at ends shall be installed on pipe extended short of the lip of gutter. A valve shall be installed on each side of services to all hospitals, schools and major industrial sites as directed by the City Engineer. All valves shall conform with the City of Hollister Standard Specifications and Details.

Air release valves shall be installed at critical high points in water lines of more that 8" in diameter.

F. Fire Hydrants

Fire hydrants shall be placed where directed by the Engineering Department and approved by the Hollister Fire Department. Fire hydrants on streets without fronting residential lots shall have a maximum spacing of 600 feet. The minimum size water main serving a fire hydrant shall be 8 inches and no more than three hydrants will be allowed on any 8 inch line between intersecting lines. Connections will not be allowed to be made to fire hydrant laterals.

Fire hydrants shall be installed as specified in the City Standard Detail. Hydrants shall be shown and placed, 18" from back of walk to centerline of bury, behind the sidewalks. Hydrants shall always be located at common lot lines and at street intersections unless specifically directed otherwise by the City Engineer.

Hydrants which are affected by new construction as well as rehabilitation work shall be reviewed and compared to current service standards, including but not limited to location, general condition, and, size and number of nozzles. Where adjustment to existing fire hydrants is needed the full hydrant and bury shall be replaced with an acceptable current model.

All design fire flows and residential pressures shall meet criteria established by Hollister Fire Department.

1. General Fire Flow Requirements

The water distribution system supplying fire protection facilities shall be designed to provide fire flows through standard fire hydrants as provided for herein. The Fire Chief shall interpret the following categories in considering any proposed development and reserves the right to increase or decrease the fire flow requirements as stated herein. Required fire flow rates are to be determined with a minimum of 20 psi residual pressure within all portions of the water distribution system.

1. Single Family Residential - Occupancy Group R-3:
A fire flow rate of 800 GPM or more shall be supplied from each fire hydrant with a minimum combined flow rate of at least 1500 GPM from any two fire hydrants.

2. Multiple Family Residential, Motels & Schools - Occupancy Groups R-1, E-1, E-2, and E-3:
A fire flow of 800 GPM or more shall be supplied from each fire hydrant with a combined flow rate of at least 2500 GPM from any combination of not more than three (3) hydrants.

3. General Commercial and Light Industrial - All B Group Occupancies of Type I, or Type II - fire resistive construction:
All fire hydrants shall be Class A or better. This requires that a flow rate of 1000 GPM or better shall be supplied by each fire hydrant, and that a combined flow rate of at least 3200 GPM shall be provided from any combination of no more than three (3) hydrants.

4. Heavy Commercial and Industrial - All other B Group Occupancies:
All fire hydrants shall be Class A or better, with at least one of every three hydrants being a designated Class AA (1500 GPM or better) hydrant. The combined flow rate of any two (2) hydrants plus a designated Class AA hydrant shall be at least 3500 GPM.

G. Services

Service lines from the water main to the property line shall normally be installed at the time the main is constructed to avoid future cutting of the street.

In all new subdivisions, the residential service lines shall be located in pairs on the common lot line of the lots to be served. Service lines and meter box locations shall be shown for every lot with care taken to coordinate locations with P.G.&E. and other

utility requirements. The service line to existing buildings shall be located so as to make the most direct connection to the existing structure.

Minimum service line size to single family residences shall be 1 inch. Service lines for required landscaping shall be sized by the Landscape Designer and included in the improvement plans and its location coordinated with the engineering design as well as Public Utilities considerations.

Private fire services shall have a minimum size of 6" from the main to the detector check valve (as required by state codes) but no section shall be smaller than required by its service criteria as determined by the system designer.

H. Anchors

Concrete anchors or thrust blocks shall be provided at all bends, behind tees, fire hydrants, crosses which are valved in such a manner that they can be used as tees, and at valves, as shown in the City Standard Details and called for in the Standard Specifications.

I. Fittings

Standard approved fittings shall be used at all bends of 11-1/4 degrees and greater. Deflections shall not exceed 80 percent of manufacturer's recommended values.

J. Backflow Prevention Devices

Backflow prevention devices shall be provided at all crossconnections including but not limited to connections with irrigation systems, fire services, and commercial applications requiring protection. Double Detector Check Valve assemblies shall be installed in the P.U.E.(public utility easement) per City of Hollister Standard Details. Reduced Pressure Principle assemblies shall be installed a minimum of 2 feet from the back of walks, in the P.U.E, and according to the Standard Plans.

Backflow prevention devices shall conform with current California Department of Health Services Standards and State of California. Acceptable devices are listed periodically by the University of Souther California. This list is available for review at the Office of the City Engineer.

SECTION 7

# STREET LIGHTING AND UTILITY COORDINATION

## 7.01 GENERAL

These Design Standards shall cover the design of street lights and utility coordination with other improvements required by this Design Manual. The construction of street lights shall conform to the City of Hollister Standard Plans and Specifications.

The Developer shall make arrangements for, P.G.&E., Pacific Bell, and Falcon Cable, referred to hereafter as Joint Utilities, for installation of facilities in part or in full. All work shall be done in accordance with Joint Utility requirements and the City of Hollister Specifications and Details.

The Developer shall pay all costs related to providing Joint Utility service. This shall include but not be limited to contractual obligations with Joint Utilities, system design by P.G.&E., Joint Utility undergrounding, and the P.G.&E. connection charges for energizing street lights.

Upon written notification by the City of Hollister, identifying the street light by number, location, and wattage, P.G.&E. will energize the street lights. Such notification shall be deemed warranted when all proposed improvements are accepted by the City.

## 7.02 PREPARATION

The Design Engineer shall submit a base map for the entire project to establish an overall street light layout showing all existing street lights and fire hydrants within 300 feet of all property boundaries upon which improvements are proposed. Additionally, existing joint utility surface structures and, underground structures and services are to be shown within 100 feet of any property boundary.

The Design Engineer shall coordinate service locations with Joint Utilities and resolve any conflicts without altering the City approved layout. Variations from the approved layout shall be approved by the City Engineer in writing.

### A. Miscellaneous Improvements

The Design Engineer shall show the proposed street lighting system and Joint Utility structures, both surface and subsurface, on the project improvement plans.

The plans shall include the following items:

1. Location of electroliers.

2. Location of switch boxes, transformer, vaults, and other structures located within the rights-of way.

3. The street light numbers shall be specified as affixed to the pole per P.G.&E. standards.

4. Specify the mounting height and arm length.

5. High pressure sodium luminaires shall be specified for all street lights. Each luminaire shall have its own solar switch and each electrolier its own regulator ballast.

6. The Joint Utility construction plans can be incorporated by reference into the project improvement plans upon written approval of the City Engineer.

7.03 Design

The City Engineering Department will design street light and fire hydrant layouts on the reproducible sepia/mylar supplied by the Design Engineer; as part of the initial submittal review. The City Engineers Office will then transmit two (2) copies of the layout to the Design Engineer and three (3) copies of the layout to P.G.&E. P.G.&E. will subsequently return return one (1) copy with assigned pole numbers. This additional information will then be furnished to the Design Engineer for inclusion on the improvement plans.

Electroliers shall be specified as being installed per the City of Hollister Standard Plans and in compliance with P.G.&E. requirements.

# APPENDIX A

The following notes are attached here for the convenience of the designer. These notes represent some of the most common recurring questions and answers about the City's construction requirements. These notes are not be to used for facsimile transfer to the construction plans but should be edited, and custom tailored for each individual and unique project. The Designer is responsible for the appropriate transfer and applicability of any and all information in these general notes.

1. ALL CONSTRUCTION MUST BE TO THE CITY OF HOLLISTER STANDARDS AND ACCEPTED BY THE PUBLIC WORKS INSPECTOR. STANDARD PLANS ARE AVAILABLE AT THE OFFICE OF THE PUBLIC WORKS INSPECTOR.

2. CONTRACTOR SHALL MEET WITH CITY OF HOLLISTER AT LEAST 48 HOURS PRIOR TO START OF CONSTRUCTION, 24 HOURS NOTICE REQUIRED ON ALL INSPECTIONS.

3. CONTRACTOR IS RESPONSIBLE TO MAKE ALL ARRANGEMENTS FOR SITE INSPECTIONS AND INSURE THAT ALL CURRENT STANDARDS FOR THE CITY OF HOLLISTER ARE FOLLOWED PRIOR TO THE BEGINNING ANY PHASE OF CONSTRUCTION WORK.

4. CONSTRUCTION SHALL BE LIMITED TO BETWEEN THE HOURS OF 7:00 A.M. AND 6:00 P.M., MONDAY THRU FRIDAY AND INSPECTION REQUESTS SHALL BE LIMITED TO NORMAL CITY BUSINESS HOURS: 8:00 A.M. TO 5:00 P.M., MONDAY THRU FRIDAY. ARRANGEMENTS FOR ANY OVERTIME INSPECTION SERVICES AND PAYMENT OF FEES FOR SAME SHOULD BE MADE 48 HOURS IN ADVANCE AND ARE SUBJECT TO INSPECTION AVAILABILITY AND APPROVAL BY THE CITY ENGINEER

5. THE OWNER IS RESPONSIBLE FOR ARRANGEMENTS TO PAY FOR ALL MATERIAL TESTING REQUIRED BY THE PUBLIC WORKS INSPECTOR. IT IS THE CONTRACTORS RESPONSIBILITY TO SEE TO IT THAT ALL TESTING REQUIRED BY THE PUBLIC WORKS INSPECTOR IS PERFORMED.

6. DUST CONTROL DURING THE GRADING PROCESS IS THE RESPONSIBILITY OF THE CONTRACTOR. IT IS ALSO THE CONTRACTORS RESPONSIBILITY TO MAINTAIN CLEANLINESS OF THE EXISTING IMPROVED STREETS IN THE CONSTRUCTION AREA.

7. WATER FOR DUST CONTROL AND USE FOR COMPACTION MAY BE PURCHASED FROM THE APPROPRIATE AGENCY PRIOR TO START OF ANY WORK, AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR FOR ANY FEES OR DEPOSITS.

8. CONSTRUCTION EQUIPMENT SHALL UTILIZE _____ FOR ACCESS.

9. IT IS THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE DESIGN ENGINEER OF ANY ANTICIPATED SOILS IMBALANCE SO GRADES CAN BE ADJUSTED. ADJUSTMENTS REQUIRE THE APPROVAL OF THE CITY ENGINEER.

10. CONTRACTOR IS TO MAKE PROVISIONS FOR TRENCH SPOILS.

11. PADS SHALL BE GRADED TO WITHIN +/- 0.1 FOOT OF THE GIVEN ELEVATION.

12. SAWCUT ALL TRENCHES IN EXISTING PAVEMENT.

13. CONTRACTOR IS RESPONSIBLE FOR COMPACTION OF ALL UTILITY TRENCHES INCLUDING P.G.&E. AND FOR THE SPOILS GENERATED BY THESE SAME UTILITY TRENCHES.

14. ALL ENDS, BENDS, AND TEES ON WATER LINES MUST HAVE ADEQUATE THRUST BLOCKS CALCULATED FROM CITY OF HOLLISTER STANDARDS.

15. CITY/SCWD WILL OPERATE ALL EXISTING WATER VALVES. CONTRACTOR SHALL MAKE ARRANGEMENTS IN ADVANCE WITH THE PUBLIC WORKS/SCWD INSPECTOR.

16. SEWER SERVICES FOR RESIDENTIAL LOTS TO BE MINIMUM 4" PIPE AND MUST BE MARKED WITH AN "S" ON CURB FACE.

17. CURB INLETS ARE TO BE CITY OF HOLLISTER STANDARD TYPE "A" UNLESS OTHERWISE INDICATED.

18. CONTRACTOR SHALL FURNISH CERTIFICATES OF COMPLIANCE TO THE CITY FOR CRUSHED MISCELLANEOUS BASE MATERIAL AND FOR THE SPECIFIED CLASS OF P.C.C. PRIOR TO PAVING ROADWAYS.

19. DRIVEWAY LOCATIONS WILL BE DETERMINED BY OWNER PRIOR TO CONSTRUCTION OF CURB AND GUTTER, UNLESS OTHERWISE SHOWN ON THE PLANS. MINIMUM WIDTH SHALL BE 16' AS MEASURED AT THE BOTTOM OF THE DEPRESSION.

20. IN AREAS WHICH ARE TO RECEIVE A.C., P.C.C. OR AGGREGATE BASE, THE CONTRACTOR SHALL MAINTAIN SUBGRADE AT THE AS GRADED WATER CONTENT. IF THE SUBGRADE IS ALLOWED TO DRY, THE WATER CONTENT OF SOIL SHOULD BE RAISED TO THE RECOMMENDED VALUE SPECIFIED FOR THE PROJECT.

RE:

Gentlemen:

Your map was conditionally approved on , 199 by the City of Hollister Planning Commission. Processing of the improvement plans will now be done through the office of the City Engineer. We have attached a copy of our subdivision processing checklist to aid you in preparing your submittals.

It should be noted that initial submittals will not be accepted or processed unless all indicated items of the submittal checklist are received.

Our processing time for an initial submittal is expected to be four to six weeks, and will depend a great deal upon the accuracy and completeness of the submittal and the current work load.

If you should have any questions during your submittal processing, please call our office at 408-637-1640.

Sincerely,

CITY OF HOLLISTER

City Engineer

cc:

CITY OF HOLLISTER - SUBDIVISION PROCESSING CHECKLIST

SUBDIVISION:

DATE TENTATIVE MAP APPROVED:
DATE TENTATIVE MAP EXPIRES:
DATE INITIAL SUBMITTAL RECEIVED:
DATE FINAL SUBMITTAL RECEIVED:
SUBDIVISION AGREEMENT DATE:

## 1. INITIAL SUBMITTAL

Before a map is accepted by the City for an initial submittal check it must be a part of a package that must include all of the following items:

| Received | Needed | | |
|---|---|---|---|
| _____(5) | ____ | 1. | Four copies of the Subdivision Map signed by the engineer or surveyor. (5-1/4" floppy disk(s) requested at final submittal). |
| _____ | ____ | 2. | A current title report. |
| _____ | ____ | 3. | A full set of boundary and lot calculations. |
| _____ | ____ | 4. | Complete documentation (all pertinent deeds and record maps). |
| _____ | ____ | 5. | A reproducible mylar map (lot sheet only) or other scaled (40, 50, or 60) lot schematic/street plan, illustrating all street lights and fire hydrants within 300 feet. |
| _____(5) | ____ | 6. | Three sets of signed blueline construction plans including the Rough Grading Plan, Street Improvement Plan, Storm Drain, Sewer, and Water Improvement Plan, Traffic Signing and Striping Plan, and Landscape Improvement Plan. (5-1/4" floppy disk(s) requested at final submittal). |
| _____ | ____ | 7. | Earthwork Calculations (Section or Quadrants). |
| _____ | ____ | 8. | Pavement Design Calculations. |
| _____ | ____ | 9. | Two copies of a geotechnical report. |

| | | | |
|---|---|---|---|
| _____ | ____ | 10. | Two copies of any geological investigation, which includes the area encompassed by this subdivision. |
| _____ | ____ | 11. | Two sets of hydrology calculations and hydrology map. |
| _____ | ____ | 12. | To sets of hydraulic calculations. |
| _____ | ____ | 13. | Two copies of an Engineer's cost estimate for all construction encompassed on the plans. |
| _____ | ____ | 14. | Map checking fee for the Subdivision Map in the amount of $ Receipt No. |
| _____(1) | ____ | 15. | Non-refundable deposit of 50% of the engineering and inspection fee for construction plan checking, $ , Receipt No. |
| _____ | ____ | 16. | Six copies of tract layout, for street name review. Minimum size of 11" x 17". |

II - SUBSEQUENT SUBMITTAL

The second and all subsequent submittals should include the following items:

| Received | Needed | | |
|---|---|---|---|
| _____ | ____ | 1. | Two copies of the revised Subdivision Map. |
| _____ | ____ | 2. | All waiver letters required by Section 66436 of the Subdivision Map Act. |
| _____ | ____ | 3. | Two copies of the revised improvement plans. |
| _____ | ____ | 4. | Two sets of revised hydrology and hydraulic calculations. |
| _____ | ____ | 5. | Two sets of retaining wall design and calcs. |
| _____ | ____ | 6. | Written notarized permission from any property owner where grading or drainage is proposed on adjacent property not owned by the applicant. |
| _____ | ____ | 7. | Approval from Sunnyslope County Water District |
| _____ | ____ | 8. | Previous Map and Improvement plan checkprints. |
| _____ | ____ | 9. | Previous hydrology and hydraulic calculation checksets. |

## III - FINAL SUBMITTAL

The following items must be in the City Engineer's Office at least two weeks prior to the City Council meeting at which action is expected.

| Received | Needed | | |
|---|---|---|---|
| _____ | ____ | 1. | Original tracing Subdivision Map and a reproducible mylar copy of Lot Sheets for address assignment. |
| ____(5) | __ | 2. | If available provide information in Autocad .DWG format on a 5-1/4" floppy disk(s) and other items as listed on note #1. |
| _____ | ____ | 3. | Original tracing of all improvement plan and grading plan, along with one (1) mylar copy and three (3) blueline prints. |
| _____ | ____ | 4. | Three (3) copies of the Improvement Contract. |
| _____(2) | ____ | 5. | Set-a-side letter or other approved form of improvement security in the amount of $_____. |
| _____ | ____ | 6. | Monumentation Bond or letter of waiver from Subdividers Engineer/Surveyor. |
| _____(3) | __ | 7. | Tax Clearance certificate. |
| _____ | ____ | 8. | Recording fee in the amount of $_____. Check to be made payable to San Benito County Recorder. ($6.00-one sheet, $9.00-two sheets, etc.) |
| _____ | ____ | 9. | Map reproduction fee in the amount of $_____. Check made payable to San Benito Engineering. ($30.00-one sheet, $40.00-two sheets, etc.) |
| _____ | __ | 10. | Preliminary Subdivision Guarantee (Final Subdivision Guarantee required by County Recorder at time of recordation.) |
| _____ | ____ | 11. | Certificate of Insurance to the values called out in the Subdivision Agreement. |

_____ ____ 12. Memorandum of Understanding, RE: On-site construction within an incomplete subdivision.

_____ ____ 13. Park "In-Lieu" Fund fee in the amount of $_____, Receipt No. _____.

_____(4) ____ 14. Engineering and inspection fee in the amount of $_____, Receipt No. _____.

_____ ____ 15. Hillcrest-Memorial Storm Drainage Area Fund Fee in the amount of $_____, Receipt No. _____.

_____ ____ 16. Reimbursable Fee for _____in the amount of $_____, Receipt No. _____.

(1) Based on the initial, unapproved, engineer's cost estimate for improvements (to be credited toward the engineering and inspection fee that is based on the final approved engineer's estimate for improvements).

(2) In lieu of Item 5, for the final submittal, a Performance Bond for 100% of the security amount and a Materials and Labor Bond for 100% of the security amount, may be submitted for approval. (Based on final approved engineer's cost estimate for improvements).

(3) Tax clearance and estimate letters to be obtained from the San Benito County Tax Collector. Tax security for taxes not yet payable shall be in the form of Certificate of Deposit at a Bank of Savings and Loan, cash deposit with the County Clerk-Recorder or a Letter of Credit.

(4) Based on the final approved engineer's cost estimate for improvements.

(5) Information in accordance with the attached Hollister Layering Specification (dated 9/20/91) on a 5-1/4" floppy disk(s) including boundaries, lots and easements of the finished Parcel/Subdivision Map as approved by the City Engineer and of the subdivision improvements including but not limited to, right-of-way improvements, storm drain improvements, sanitary sewer improvements, water improvements, property lines; all labeled, per the layering specification. Information shall be in Autocad's .DWG (drawing format). Label disk(s) with file name. Any information in excess of those layers on the layering specification should be placed on other layers and <u>not</u> mixed with layers in the layering specification.

Revised 5/91

APPENDIX C

IN ADDITION TO THE LISTING PRESENTED BELOW THE 5-1/4" FLOPPY DISK(S) SHALL INCLUDE CONTENTS OF THE FINISHED SUBDIVISION MAP AS APPROVED BY THE CITY ENGINEER AND A COMPOSITE DRAWING OF THE SUBDIVISION IMPROVEMENTS, INCLUDING AT A MINIMUM, RIGHT-OF-WAY IMPROVEMENTS, STORM DRAIN IMPROVEMENTS, SANITARY SEWER IMPROVEMENTS, WATER IMPROVEMENTS, PROPERTY LINES; ALL LABELED, PER THE CITY DESIGN STANDARD REQUIREMENTS. INFORMATION SHALL BE COPIED IN AUTOCAD'S .DWG (DRAWING) FORMAT AND STORED ON THE DISK(S). LABEL THE DISK(S) WITH PERTINENT DATA FOR ACCESS, I.E. SOFTWARE USED, FILE NAMES, ETC.

HOLLISTER LAYERING SPECIFICATION

| NEW LAYER | DESCRIPTION | COLOR | LINE TYPE |
|---|---|---|---|
| GRID | GRID TICKS | YELLOW | CONTINUOUS |
| GRIDTX | CA GRID COORDINATES | 9 | CONTINUOUS |
| BORDER | TITLE BLOCK | BLUE | CONTINUOUS |
| BORDERTX | TITLE BLOCK TEXT | BLUE | CONTINUOUS |
| NOTE | BASE ROAD LEGEND | MAGENTA | CONTINUOUS |
| CTYLMTBY | CITY LIMIT BOUNDARY | MAGENTA | DIVIDE |
| ROW | CURBS/STREETS/ROW | GREEN | CONTINUOUS |
| STTX | STREET TEXT | WHITE | CONTINUOUS |
| CENTER | STREET CENTERLINES | WHITE | CENTER |
| FEATURES | ALLEY | WHITE | CONTINUOUS |
| PRCLBNDY | PROPERTY LINES | RED | CONTINUOUS |
| ADTX | ADDRESS TEXT | WHITE | CONTINUOUS |
| RAILROAD | RAILROAD | WHITE | CONTINUOUS |
| RRTX | RAILROAD TEXT | WHITE | CONTINUOUS |
| HIGHWAY | HIGHWAY | YELLOW | DASHED |
| HWYTX | HIGHWAY TEXT | YELLOW | CONTINUOUS |
| SCHOOL | SCHOOL | WHITE | CONTINUOUS |
| SCHOOLTX | SCHOOL TEXT | WHITE | CONTINUOUS |
| ZONEPLAN | ZONE PLAN | CYAN | CONTINUOUS |
| ZONETX | ZONE TEXT | CYAN | CONTINUOUS |

# HOLLISTER LAYERING SPECIFICATION

| NEW LAYER | DESCRIPTION | COLOR | LINE TYPE |
|---|---|---|---|
| GENPLAN | GENERAL PLAN | GREY | CONTINUOUS |
| GENTX | GENERAL PLAN TEXT | GREY | CONTINUOUS |
| PARK | PARK | CYAN | CONTINUOUS |
| PARKTX | PARK TEXT | CYAN | CONTINUOUS |
| WATER | WATER COURSES | BLUE | CONTINUOUS |
| WTRTX | WATER TEXT | BLUE | CONTINUOUS |
| SD6 | 6" STORM PIPE | WHITE | STORM |
| SD6TX | 6" STORM PIPE TEXT | WHITE | CONTINUOUS |
| SD8 | 8" STORM PIPE | YELLOW | STORM |
| SD8TX | 8" STORM PIPE TEXT | YELLOW | CONTINUOUS |
| SD10 | 10" STORM PIPE | CYAN | STORM |
| SD10TX | 10" STORM PIPE TEXT | CYAN | CONTINUOUS |
| SD12 | 12" STORM PIPE | BLUE | STORM |
| SD12TX | 12" STORM PIPE TEXT | BLUE | CONTINUOUS |
| SD15 | 15" STORM PIPE | MAGENTA | STORM |
| SD15TX | 15" STORM PIPE TEXT | MAGENTA | CONTINUOUS |
| SD18 | 18" STORM PIPE | GREY | STORM |
| SD18TX | 18" STORM PIPE TEXT | GREY | CONTINUOUS |
| SD21 | 21" STORM PIPE | YELLOW | STORM |
| SD21TX | 21" STORM PIPE TEXT | YELLOW | CONTINUOUS |
| SD24 | 24" STORM PIPE | CYAN | STORM |
| SD24TX | 24" STORM PIPE TEXT | CYAN | CONTINUOUS |
| SD27 | 27" STORM PIPE | BLUE | STORM |
| SD27TX | 27" STORM PIPE TEXT | BLUE | CONTINUOUS |
| SD30 | 30" STORM PIPE | MAGENTA | STORM |
| SD30TX | 30" STORM PIPE TEXT | MAGENTA | CONTINUOUS |
| SD33 | 33" STORM PIPE | GREY | STORM |
| SD33TX | 33" STORM PIPE TEXT | GREY | CONTINUOUS |
| SD36 | 36" STORM PIPE | RED | STORM |
| SD36TX | 36" STORM PIPE TEXT | RED | CONTINUOUS |
| SD42 | 42" STORM PIPE | YELLOW | STORM |
| SD42TX | 42" STORM PIPE TEXT | YELLOW | CONTINUOUS |
| SD48 | 48" STORM PIPE | CYAN | STORM |
| SD48TX | 48" STORM PIPE TEXT | CYAN | CONTINUOUS |
| SD54 | 54" STORM PIPE | BLUE | STORM |

HOLLISTER LAYERING SPECIFICATION

| NEW LAYER | DESCRIPTION | COLOR | LINE TYPE |
|---|---|---|---|
| SD54TX | 54" STORM PIPE TEXT | BLUE | CONTINUOUS |
| SD60 | 60" STORM PIPE | MAGENTA | STORM |
| SD60TX | 60" STORM PIPE TEXT | MAGENTA | CONTINUOUS |
| SD66 | 66" STORM PIPE | GREY | STORM |
| SD66TX | 66" STORM PIPE TEXT | GREY | CONTINUOUS |
| SD72 | 72" STORM PIPE | RED | STORM |
| SD72TX | 72" STORM PIPE TEXT | RED | CONTINUOUS |
| SD84 | 84" STORM PIPE | YELLOW | STORM |
| SD84TX | 84" STORM PIPE TEXT | YELLOW | CONTINUOUS |
| SDMISC | STORM MISCELLANEOUS | MAGENTA | STORM |
| SD500TX | STORM 500 PLOT TEXT | WHITE | CONTINUOUS |

# HOLLISTER LAYERING SPECIFICATION

| NEW LAYER | DESCRIPTION | COLOR | LINE TYPE |
|---|---|---|---|
| SS4 | 4" SEWER PIPE | RED | SANITARY |
| SS4TX | 4" SEWER PIPE TEXT | RED | CONTINUOUS |
| SS6 | 6" SEWER PIPE | CYAN | SANITARY |
| SS6TX | 6" SEWER PIPE TEXT | CYAN | CONTINUOUS |
| SS8 | 8" SEWER PIPE | BLUE | SANITARY |
| SS8TX | 8" SEWER PIPE TEXT | BLUE | CONTINUOUS |
| SS10 | 10" SEWER PIPE | MAGENTA | SANITARY |
| SS10TX | 10" SEWER PIPE TEXT | MAGENTA | CONTINUOUS |
| SS12 | 12" SEWER PIPE | YELLOW | SANITARY |
| SS12TX | 12" SEWER PIPE TEXT | YELLOW | CONTINUOUS |
| SS14 | 14" SEWER PIPE | RED | SANITARY |
| SS14TX | 14" SEWER PIPE TEXT | RED | CONTINUOUS |
| SS15 | 15" SEWER PIPE | GREY | SANITARY |
| SS15TX | 15" SEWER PIPE TEXT | GREY | CONTINUOUS |
| SS18 | 18" SEWER PIPE | RED | SANITARY |
| SS18TX | 18" SEWER PIPE TEXT | RED | CONTINIUOUS |
| SS21 | 21" SEWER PIPE | BLUE | SANITARY |
| SS21TX | 21" SEWER PIPE TEXT | BLUE | CONTINUOUS |
| SS24 | 24" SEWER PIPE | MAGENTA | SANITARY |
| SS24TX | 24" SEWER PIPE TEXT | MAGENTA | CONTINUOU'S |
| SS27 | 27" SEWER PIPE | YELLOW | SANITARY |
| SS27TX | 27" SEWER PIPE TEXT | YELLOW | CONTINUOUS |
| SS30 | 30" SEWER PIPE | CYAN | SANITARY |
| SS30TX | 30" SEWER PIPE TEXT | CYAN | CONTINUOUS |
| SS33 | 33" SEWER PIPE | BLUE | SANITARY |
| SS33TX | 33" SEWER PIPE TEXT | BLUE | CONTINUOUS |
| SS36 | 36" SEWER PIPE | GREY | SANITARY |
| SS36TX | 36" SEWER PIPE TEXT | GREY | CONTINUOUS |
| SSMISC | SEWER MISCELLANEOUS | RED | SANITARY |
| SS500TX | SEWER 500 PLOT TEXT | WHITE | CONTINUOUS |

# HOLLISTER LAYERING SPECIFICATION

| NEW LAYER | DESCRIPTION | COLOR | LINE TYPE |
|---|---|---|---|
| WD1 | 1" WATER PIPE | RED | WATER |
| WD1TX | 1" WATER PIPE TEXT | RED | CONTINUOUS |
| WD2 | 2" WATER PIPE | RED | WATER |
| WD2TX | 2" WATER PIPE TEXT | RED | CONTINUOUS |
| WD3 | 3" WATER PIPE | BLUE | WATER |
| WD3TX | 3" WATER PIPE TEXT | BLUE | CONTINUOUS |
| WD4 | 4" WATER PIPE | MAGENTA | WATER |
| WD4TX | 4" WATER PIPE TEXT | MAGENTA | CONTINUOUS |
| WD6 | 6" WATER PIPE | CYAN | WATER |
| WD6TX | 6" WATER PIPE TEXT | CYAN | CONTINUOUS |
| WD8 | 8" WATER PIPE | GREY | WATER |
| WD8TX | 8" WATER PIPE TEXT | GREY | CONTINUOUS |
| WD10 | 10" WATER PIPE | WHITE | WATER |
| WD10TX | 10" WATER PIPE TEXT | WHITE | CONTINUOUS |
| WD12 | 12" WATER PIPE | YELLOW | WATER |
| WD12TX | 12" WATER PIPE TEXT | YELLOW | CONTINUOUS |
| WD16 | 16" WATER PIPE | RED | WATER |
| WD16TX | 16" WATER PIPE TEXT | RED | CONTINUOUS |
| WDMISC | WATER MISCELLANEOUS | WHITE | WATER |
| WD500TX | WATER 500 PLOT TEXT | WHITE | CONTINUOUS |
| WELL | WELL | BLUE | CONTINUOUS |

APPENDIX D

| ITEM | NAME | ULTIMATE LANES | T.I. | R.O.W./$F_c$-$F_c$ |
|---|---|---|---|---|
| HIGHWAYS | | | | |
| 1. | AIRLINE HIGHWAY | 4 | 11 | 120′ |
| 2. | HIGHWAY 25 BYPASS | 4 | 10.5 | 120′ |
| 3. | *MC CRAY STREET | 4 | 8.5-9.5++ | 84′/64′ OFFSET FROM CENTERLINE (E) |
| 4. | PROSPECT AVENUE | 4 | 8.5-9.5++ | 84′/64′ OFFSET (54-30) CENTERLINE (E) |
| 5. | SAN BENITO STREET (EXTENSION) | 4 | 8.5-9.5++ | 80′ |
| 6. | WESTSIDE BLVD. (CIENEGA TO AIRLINE) | 4 | 8.5-9.5++ | 84′/64′ |
| 7. | 156 HIGHWAY | 4 | 116′ | |

++ DESIGN FOR 9.5 - CONSTRUCT FOR 8.5
* PORTIONS MAY NOT ALWAYS FIT HIGHWAY DESCRIPTIONS.

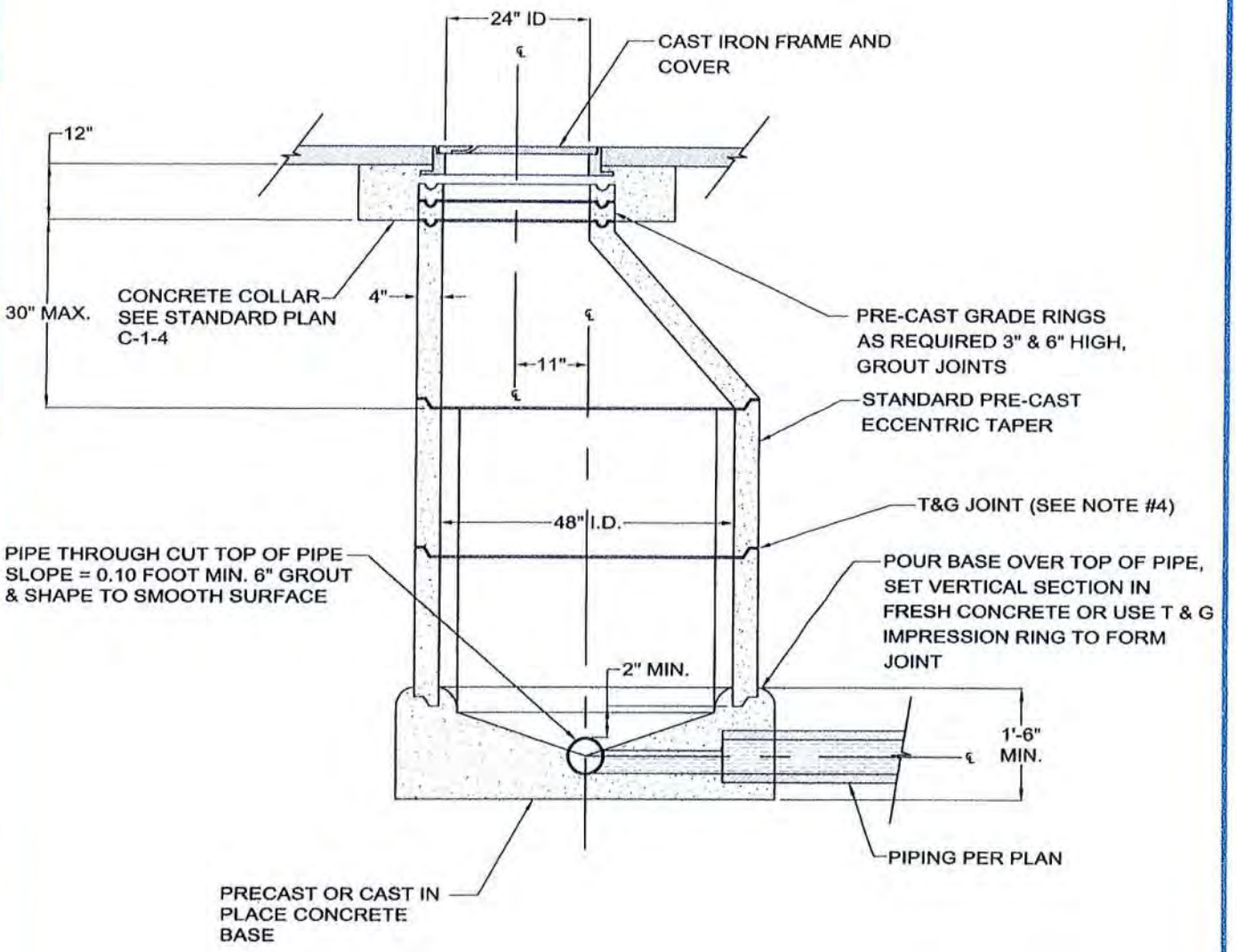
| | | | | |
|---|---|---|---|---|
| MAJOR THOROUGHFARES | | | | |
| 1. | FAIRVIEW ROAD | 4 | 8.0 | 84′/64′ |
| 2. | FALLON ROAD | 4 | 8.0 | 84′/64′ |
| 3. | FLYNN ROAD | 4 | 8.0 | 84′/64′ |
| 4. | SOUTHSIDE ROAD | 4 | 8.0 | 84′/64′ |
| 5. | WESTSIDE BLVD. (NASH RD. TO BUENA VISTA) | 4 | 7.5 * | 84′/64′ |

MAJOR COLLECTORS:

| | | | | |
|---|---|---|---|---|
| 1. | BUENA VISTA ROAD | 4 | 7.5 | 84'/64' |
| 2. | CRESTVIEW DRIVE | 4 | 7.5 | 84'/64' |
| 3. | HILLCREST ROAD | 4 | 7.5 | 80'/64' |
| 4. | MEMORIAL DRIVE | 4 | 7.5 | 84'/64' |
| 5. | MERIDIAN AVENUE | 4 | 7.5 | 84'/64' |
| 6. | SANTA ANA ROAD | 4 | 7.5 | 84'/64' |
| 7. | SUNNYSLOPE RD/ TRES PINOS RD | 4 | 7.5 | 84'/64' |
| 8. | SUNSET BOULEVARD | 4 | 7.5 | 84'/64' |
| 9. | NASH ROAD | 2 | 7.5 | 60'/40' |

COLLECTORS:

| | | | | |
|---|---|---|---|---|
| 1. | CIENEGA ROAD | | 6.0 | 60'/40' |
| 2. | LINE STREET | | 6.0 | 60'/40' |
| 3. | CLEARVIEW DRIVE | | 5.5 | 60'/40' |
| 4. | EASTVIEW DRIVE | | 6.0 | 60'/40' |
| 5. | CENTRAL AVENUE | | 6.0 | 60'/40' |
| 6. | CERRA VISTA DRIVE | | 6.0 | 60'/40' |
| 7. | BEVERLY DRIVE | | 6.0 | 60'/40' |
| 8. | CHAPPELL ROAD | | 6.0 | 60'/40' |
| 9. | MAPLE STREET | | 6.0 | 60'/40' |




## TYPICAL SECTION A-A

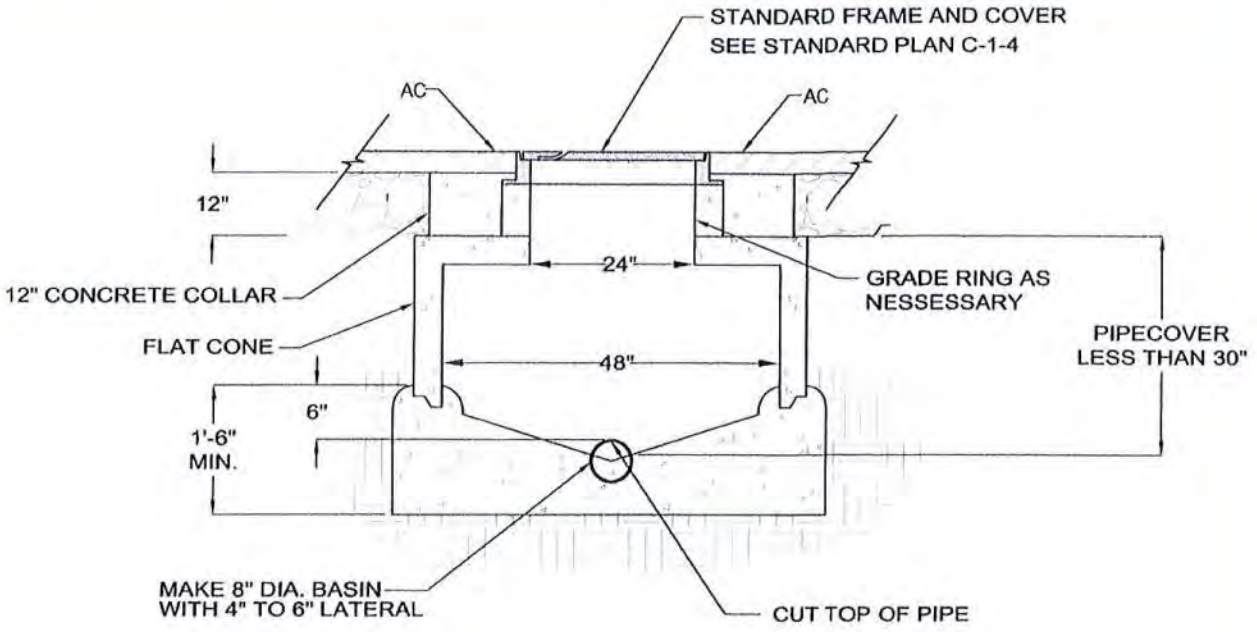
NOTES:

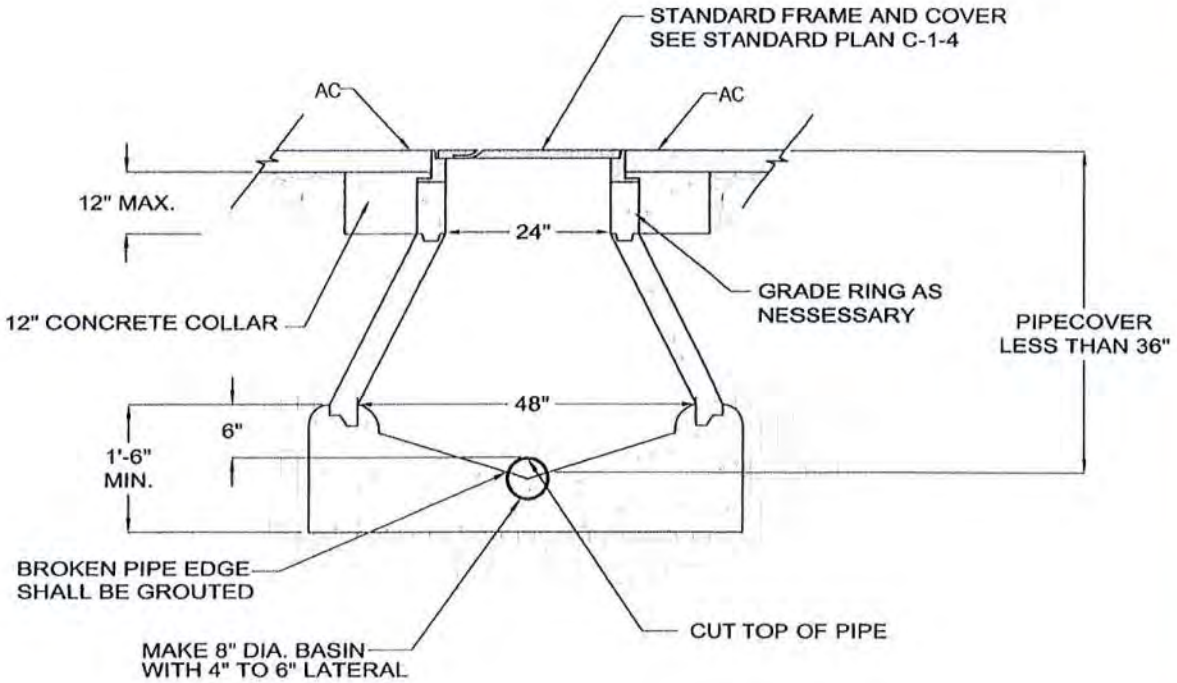
1. SHALLOW FLAT TOP COVER MAYBE USED WITH AGENCY ENGINEER APPROVAL.
2. DROP MANHOLE DETAIL SEE STANDARD PLAN C-1-3.
3. CONCENTRIC CONE MAY BE WITH AGENCY ENGINEER APPROVAL.
4. AN IMPRESSION RING SHALL BE USED PRIOR TO INSTALLING THE FIRST RISER SECTION. PRECUT UNITS SHALL BE ASSEMBLED USING PERFORMED JOINT SEALING COMPOUND OR CLASS "B"MORTAR AND SHALL FINISH ALL JOINTS.

TITLE:

# TYPE 1 STANDARD MANHOLE PIPE 6" TO 18"

| | | | |
|---|---|---|---|
| DRAWN BY: LOUIE C. GUEVARA | SCALE: NONE | APPROVED: | STANDARD PLAN |
| REVIEWED BY: DAVID RUBCIC | REVISED: APRIL, 2013 | 7-16-13 | C-1-1 |
| CITY OF HOLLISTER ENGINEERING DEPARTMENT | | CITY ENGINEER: RUDI GOLNIK LIC. NO. 39570 EXP. DATE: 12-31-2013 — DATE | SHEET 1 OF 4 |



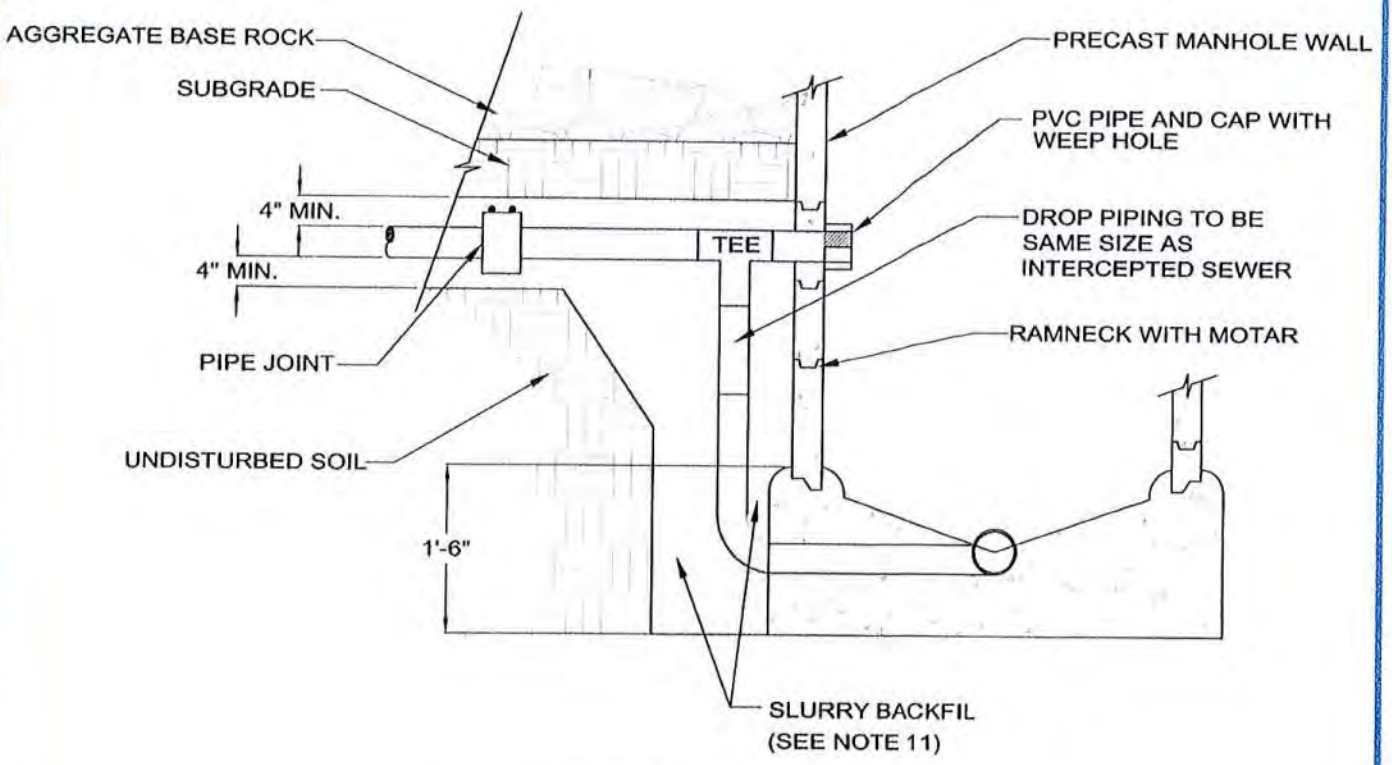

NOTES:

1. PROVIDE STRUCTURAL CALCULATION FOR USING FLAT TOP MANHOLE.

TITLE:

# STANDARD MANHOLE FOR PIPE COVER LESS THAN 36" COVER

| | | | |
|---|---|---|---|
| DRAWN BY: LOUIE C. GUEVARA | SCALE: NONE | APPROVED: | STANDARD PLAN |
| REVIEWED BY: DAVID RUBCIC | REVISED: APRIL, 2013 | 7-16-13 | C-1-2 |
| CITY OF HOLLISTER ENGINEERING DEPARTMENT | | CITY ENGINEER: RUDI GOLNIK LIC. NO. 39570 EXP. DATE: 12-31-2013 DATE | SHEET 2 OF 4 |




# DROP MANHOLE 6'

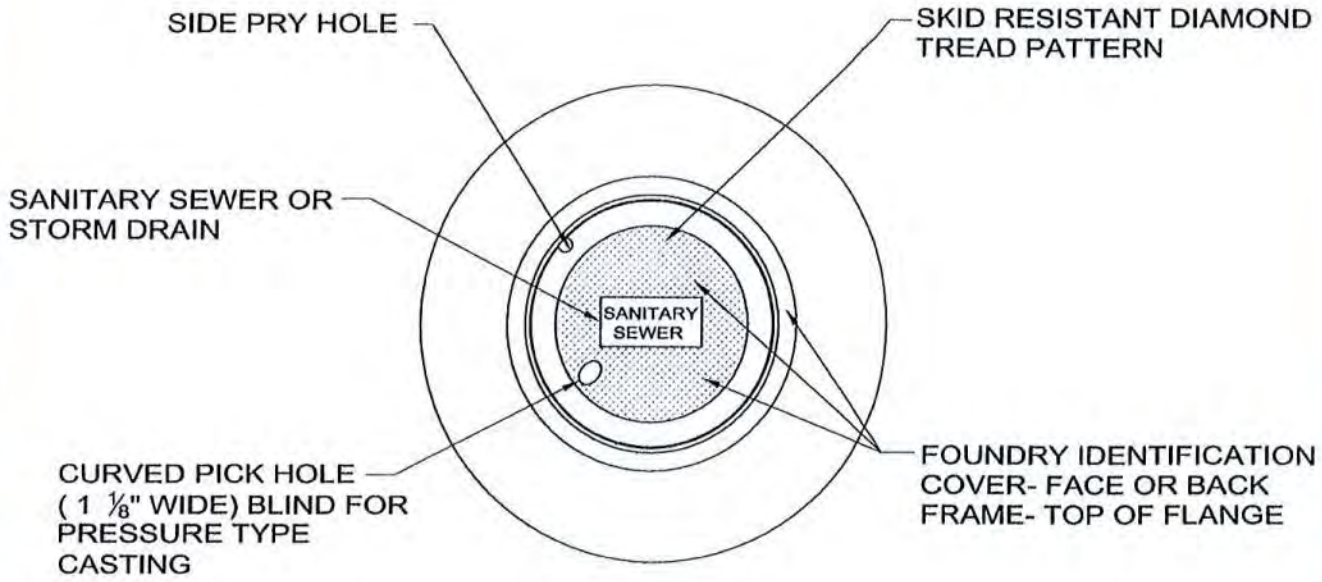
NOTES:

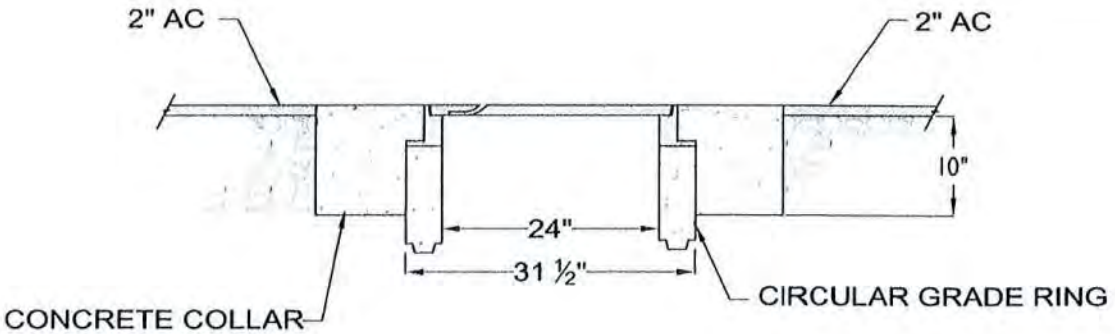
1. SANITARY SEWER MANHOLE PRE-CAST UNITS SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH ASTM C 478.
2. SANITARY SEWER MANHOLE RISER SECTIONS AND CONES MAY BE REINFORCED. REINFORCED SECTIONS AND CONES SHALL BE IN ACCORDANCE WITH ASTM C 478 AND SHALL NAVE A MINIMUM WALL THICKNESS OF 4". UNREINFORCED RISER SECTIONS AND CONES SHALL HAVE A MINIMUM WALL THICKNESS OF 6".
3. JOINTS SHALL BE TONGUE AND GROVE AND SHALL CONFORM WITH ASTM C 478 SECTION 14.
4. AN IMPRESSION RING SHALL BE USED PRIOR TO INSTALLING THE FIRST RISER SECTION. PRECUTS UNITS SHALL BE ASSEMBLED USING PERFORMED JOINT SEALING COMPOUND OR CLASS "B" MORTAR AND SHALL FINISH ALL JOINTS.
5. INSTALL MANHOLE WATER STOP GASKET AND CLAMP ASSEMBLY ON ALL SANITARY SEWER PIPES.
6. INSTALL RAMNECK OR EQUAL ON ALL MANHOLES PRE CAST JOINTS ALL RAMNECK JOINTS SHALL BE SMOOTHLY FINISHED WITH MORTAR.
7. REINFORCED CIRCULAR GRADE RINGS SHALL NOT BE INSTALLED MORE THAN 12 INCHES HIGH FROM TOP OF CONE TO BOTTOM OF CAST IRON FRAME.
8. LADDER STEPS SHALL NOT BE PLACED IN MANHOLE.
9. CONCRETE MANHOLE BASE AND COLLAR SHALL BE CLASS 520-C-2500.
10. FOR CHANNELIZATION OF INTERCEPTING LINES, PROVIDE SMOOTH TRANSITIONS (APPROX. 1'-8" INSIDE RADIUS) TOWARDS DOWNSTREAM FLOW OF MAIN.
11. SAND BACKFILL OR SLURRY BACKFILL CLASS 100-E-100 AROUND THE MANHOLE.

TITLE:

# STANDARD MANHOLE SECTIONS AND NOTES

| | | | |
|---|---|---|---|
| DRAWN BY: LOUIE C. GUEVARA | SCALE: NONE | APPROVED: | STANDARD PLAN |
| REVIEWED BY: DAVID RUBCIC | REVISED: APRIL, 2013 | 7-16-13 | C-1-3 |
| CITY OF HOLLISTER ENGINEERING DEPARTMENT | | CITY ENGINEER: RUDI GOLNIK LIC. NO. 39570 EXP. DATE: 12-31-2013 DATE | SHEET 3 OF 4 |

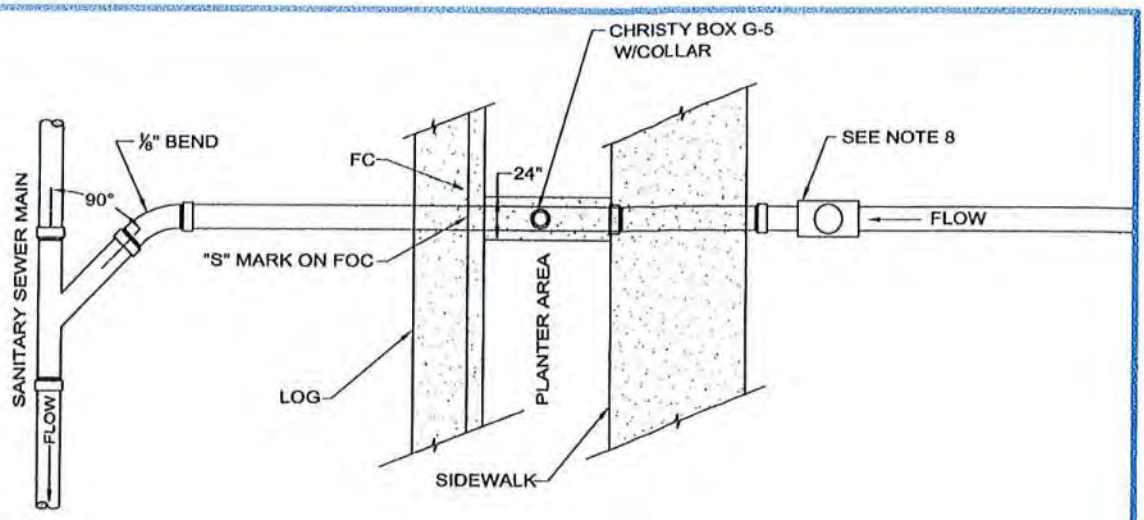


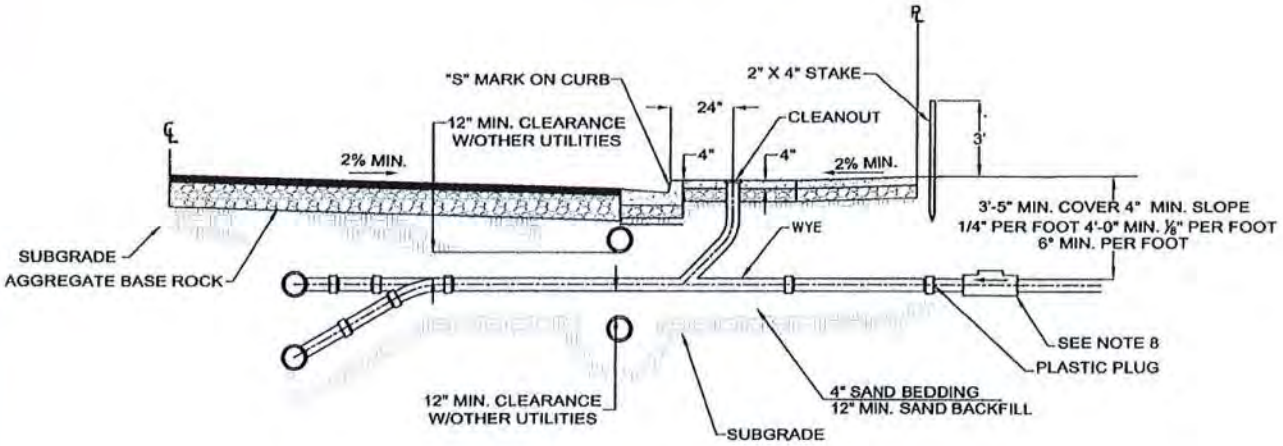

NOTES:
1. MANHOLE FRAME AND COVER SHALL BE PHOENIX IRON WORKS P-1090 OR EQUAL.
2. CASTING SHALL RECEIVE AN ASPHALTIC COATING AFTER FABRICATION.
3. CAST IRON SHALL CONFORM TO ASTM A 48 CLASS 35B.

TITLE:
# STANDARD MANHOLE FRAME AND CONCRETE COLLAR

| | | | |
|---|---|---|---|
| DRAWN BY: LOUIE C. GUEVARA | SCALE: NONE | APPROVED: | STANDARD PLAN C-1-4 |
| REVIEWED BY: DAVID RUBCIC | REVISED: APRIL, 2013 | 7-16-13 | |
| CITY OF HOLLISTER ENGINEERING DEPARTMENT | | CITY ENGINEER: RUDI GOLNIK LIC. NO. 39570 EXP. DATE: 12-31-2013 DATE | SHEET 4 OF 4 |




## PLAN




## ELEVATION

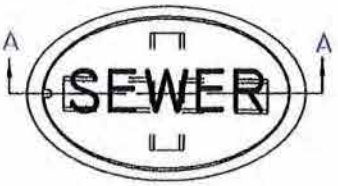
NOTES:

1. SEWER LATERALS SHALL BE ABS (SCH. 40) OR PVC (SDR 26) ASTM D3035 PIPE.
2. STAMP OR CHISEL AN "S" ON THE FACE OF CURB AT LATERAL LOCATION.
3. A PRESSURE TREATED DOUGLAS FIR STAKE SHALL BE INSTALLED AT EACH LATERAL TERMINUS. ALL STAKES SHALL BE PAINTED WHITE.
4. ALL SAND BACKFILL SHALL BE COMPACTED TO 90% RELATIVE COMPACTION
5. ALL SEWER LATERALS SHALL PASS A LOW PRESSURE AIR AND MANDREL TESTING PREFORMED AFTER COMPACTION & MAJORITY OF BASE ROCK INSTALLED.
6. ALL SANITARY SEWER MAINS SHALL BE VIDEOED BY AN INDEPENDENT CONTRACTOR APPROVED BY CITY ENGINEER.
7. BEDDING & TRENCH BACKFILLING REQUIREMENTS PER STANDARD PLAN E-3-1.
8. BACKFLOW PREVENTION DEVICE IS REQUIRED ON SEWER LATERALS WITH FULL CAPACITY SEWER MAINS AND SEWER LATERAL. BELOW THE DOWNS STREAM INVERT ELEVATION OF SEWER MAINS BACKFLOW PREVENTION DEVICE TO BE INSTALLED ON PRIVATE PROPERTY ONLY.

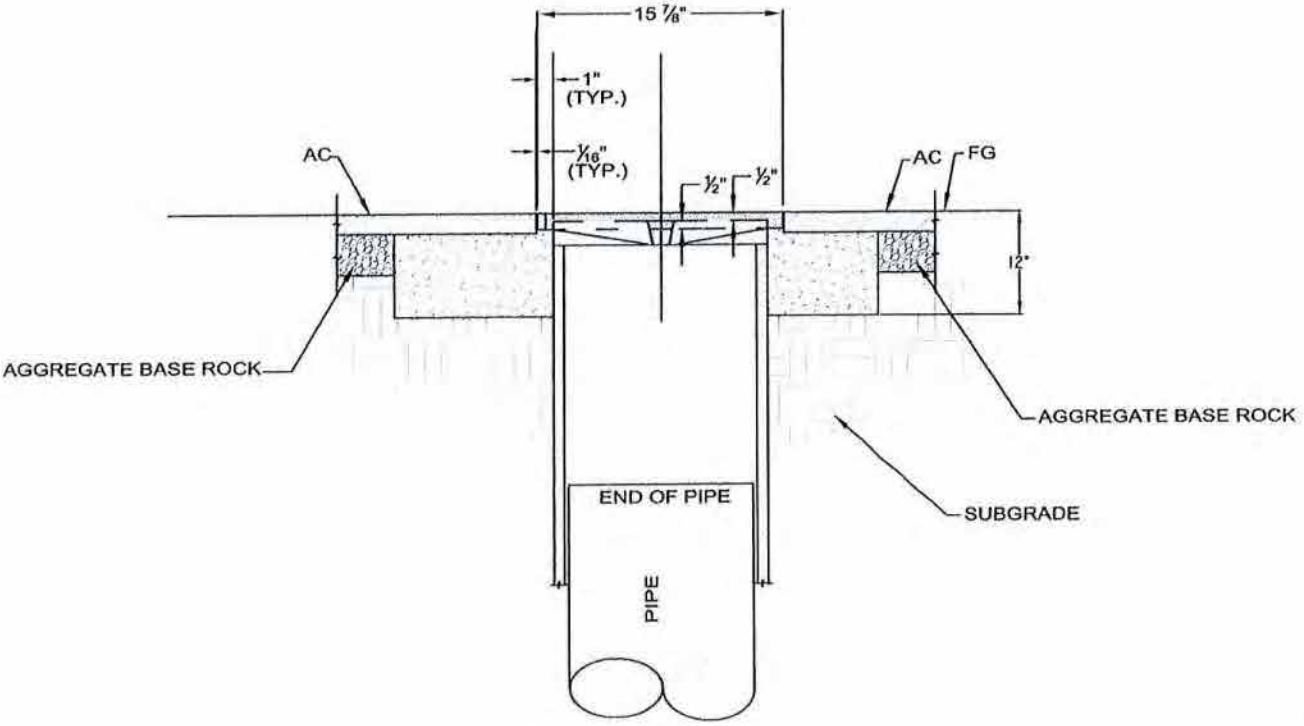
TITLE:

# SEWER LATERAL & CLEANOUT

| | | | |
|---|---|---|---|
| DRAWN BY: LOUIE C. GUEVARA | SCALE: NONE | APPROVED: | STANDARD PLAN |
| REVIEWED BY: DAVID RUBCIC | REVISED: APRIL, 2013 | | C-2-1 |
| CITY OF HOLLISTER ENGINEERING DEPARTMENT | | CITY ENGINEER: RUDI GOLNIK LIC. NO. 39570 EXP. DATE: 12-31-2013 — DATE 7-16-13 | SHEET 1 OF 1 |




## COVER AND FRAME



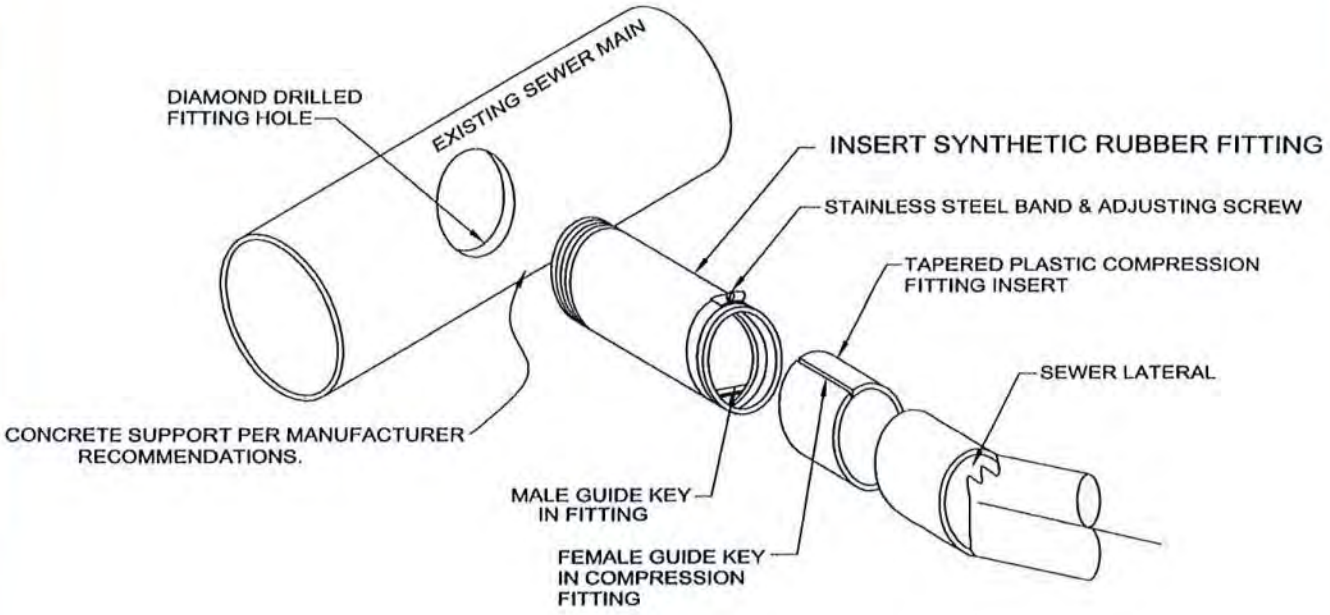

# SECTION A-A

RISER FRAME COVER & COLLAR

TITLE:

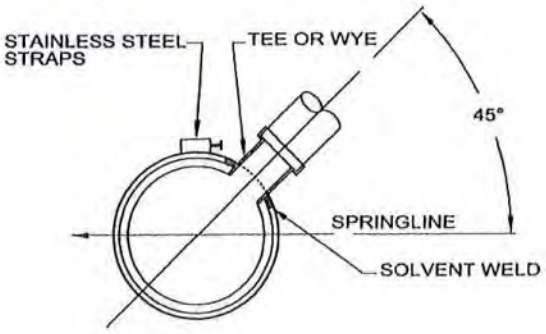
## SEWER CLEANOUT FRAME/COVER & CONCRETE COLLAR

| | | | |
|---|---|---|---|
| DRAWN BY: LOUIE C. GUEVARA | SCALE: NONE | APPROVED: | STANDARD PLAN |
| REVIEWED BY: DAVID RUBCIC | REVISED: APRIL, 2013 | 7-16-13 | C-2-2 |
| CITY OF HOLLISTER ENGINEERING DEPARTMENT | | CITY ENGINEER: RUDI GOLNIK LIC. NO. 39570 EXP. DATE: 12-31-2013 DATE | SHEET 2 OF 2 |



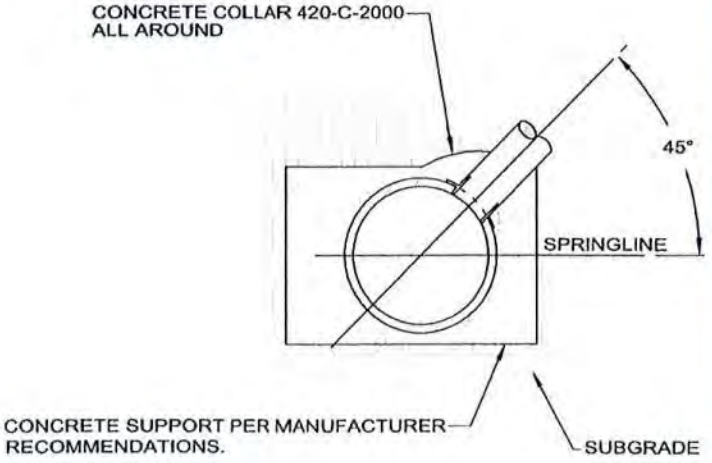

## SYNTHETIC RUBBER WEDGED INSERT TEE TAP TITE (VCP)

(MIN. DIFFERENTIAL OF TWO SIZES REQUIRED)




## TEE OR WYE (PVC OR ABS)

(SOLVENT WELDED FITTINGS)

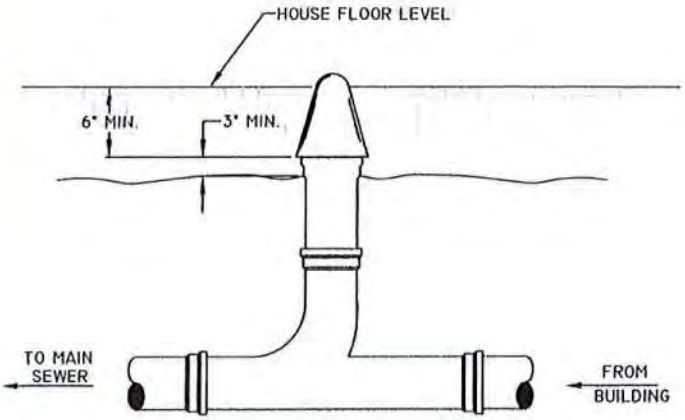


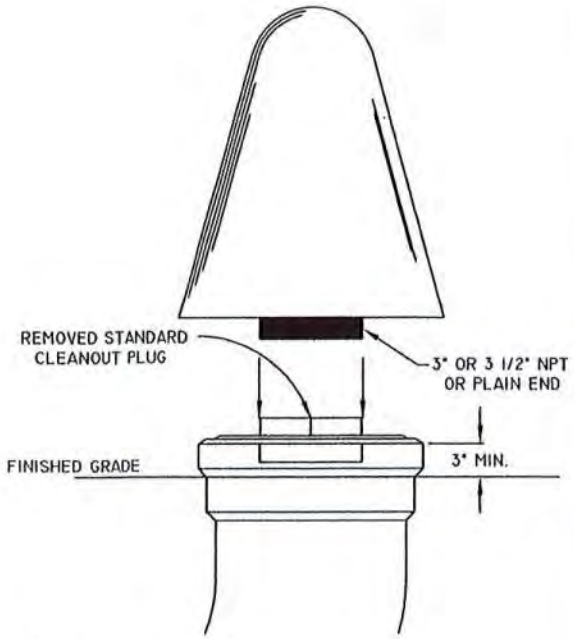

## SEWER MAIN TAP

TITLE:

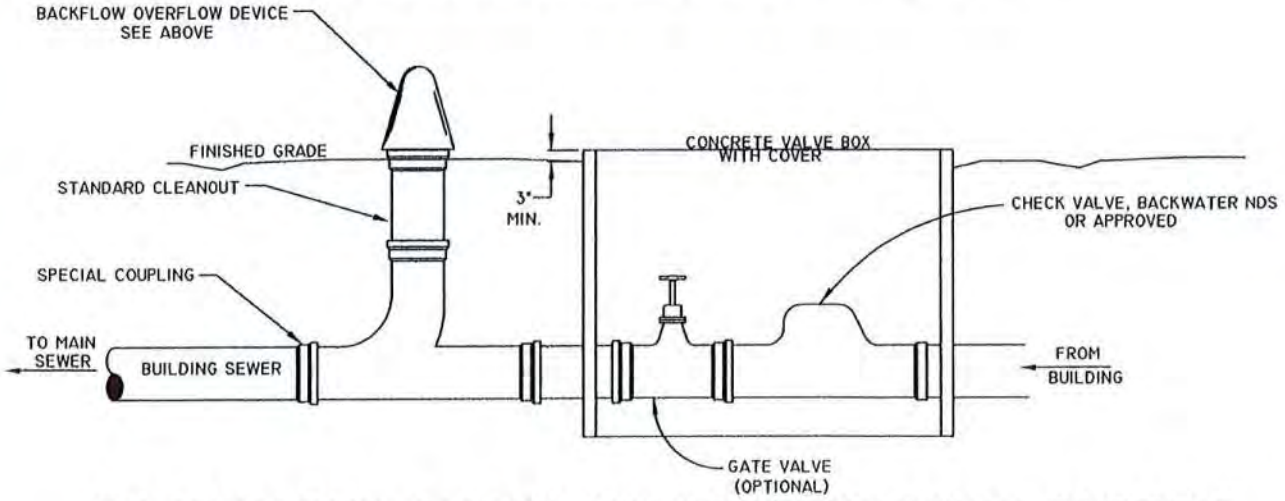
# SEWER LATERAL TAPPING TO EXISTING VCP SEWER MAINS

| | | | |
|---|---|---|---|
| DRAWN BY: LOUIE C. GUEVARA | SCALE: NONE | APPROVED: | STANDARD PLAN |
| REVIEWED BY: DAVID RUBCIC | REVISED: APRIL, 2013 | 7-16-13 | C-3 |
| CITY OF HOLLISTER ENGINEERING DEPARTMENT | | CITY ENGINEER: RUDI GOLNIK LIC. NO. 39570 EXP. DATE: 12-31-2013 — DATE | SHEET 1 OF 1 |




# BACKWATER OVERFLOW DEVICE




# BACKWATER CHECK VALVE & SHUTOFF SYSTEM

NOTES:

1. AN OVERFLOW SYSTEM IS REQUIRED AND SHALL BE INSTALLED WHERE THE FINISH FLOOR ELEVATION OF THE BUILDING TO BE CONNECTED IS LESS THAN (1) ONE FOOT ABOVE THE RIM OF THE NEAREST UPSTREAM MANHOLE.
2. THE INSTALLATION OF THE BACKWATER OVERFLOW DEVICE SHALL BE MADE AFTER THE FINAL GRADING AROUND THE BUILDING IS COMPLETE. THE BACKWATER OVERFLOW DEVICE SHALL BE AS DETAILED, OR AN APPROVED EQUAL.
3. CONSIDERATION MUST BE GIVEN TO THE DAMAGE POTENTIAL TO ADJACENT PROPERTY BY SEWAGE RELEASED THROUGH THE BACKWATER OVERFLOW DEVICE.

TITLE:

## BACKFLOW PREVENTATIVE DEVICES

| | | | |
|---|---|---|---|
| DRAWN BY: LOUIE C. GUEVARA | SCALE: NONE | APPROVED: 7-16-13 | STANDARD PLAN C-4 |
| REVIEWED BY: DAVID RUBCIC | REVISED: APRIL, 2013 | CITY ENGINEER: RUDI GOLNIK LIC. NO. 39570 EXP. DATE: 12-31-2013 DATE | SHEET 1 OF 1 |
| CITY OF HOLLISTER ENGINEERING DEPARTMENT | | | |