

LAMONT PUBLIC UTILITY DISTRICT

Kern County, California
8624 Segrue Road
Lamont, CA 93241
Phone (805) 845-1213

DISTRICT SPECIFICATIONS for Sanitary Sewers and Domestic Water Systems

October 1998

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**LAMONT PUBLIC UTILITY DISTRICT
DISTRICT SPECIFICATIONS
FOR
SANITARY SEWER SYSTEM AND DOMESTIC WATER SYSTEM
GENERAL CONDITIONS**

SECTION 1

DEFINITIONS, TERMS AND ABBREVIATIONS

1-1 DEFINITIONS

Whenever the following terms or abbreviations occur in these specifications, the meaning shall be interpreted as follows:

BOARD OF DIRECTORS OR BOARD - The Board of Directors of the Lamont Public Utility District.

CONTRACT - The agreement executed between the Owner and the District covering the water and sanitary sewer system improvements to be constructed and to become a part of the District's facilities.

CONTRACTOR - The person, firm or corporation constructing the water and sanitary sewer system improvements for the Owner.

DAYS - When used to designate a period of time, shall be in reference to consecutive calendar days.

DISTRICT - Lamont Public Utility District, Kern County, California.

GENERAL MANAGER - The General Manager of Lamont Public Utility District as designated by the Board.

ENGINEER, DISTRICT'S ENGINEER, DISTRICT'S REPRESENTATIVE - Boyle Engineering Corporation, 2601 "F" Street, Bakersfield, California.

FINAL ACCEPTANCE - That formal action by the District accepting the work as fully completed after certification of full completion by the Inspector and/or Engineer and approval of the General Manager.

INSPECTOR - The Inspector employed by the District to perform inspection during construction of the work undertaken by the Owner.

LABORATORY - The laboratory designated by the Engineer and/or District to test materials and work involved in the contract.

LEGAL ADDRESS OF OWNER AND/OR CONTRACTOR - The address given on the Owner's permit is hereby designated as the place which all notices, letters or other communications to the OWNER shall be mailed or delivered.

OWNER - The applicant or Subdivider installing or constructing the sanitary sewer system or water system for integration with the Lamont Public Utility District sanitary sewer system or water system.

PERMIT - Authorization by the District in writing allowing the Owner and/or Contractor to do work within the District on sanitary sewer or water facilities. The Owner or Contractor shall have present the permit at the job site and shall present if demanded by any District agent.

PLANS - The official plans, profiles, typical cross-sections, working drawings, detail drawings and supplemental drawings, or exact reproduction thereof, approved by the District, which show the locations, character, dimensions and details of the work to be done.

PROJECT, THE WORK - The entire public improvement approved by the District to be constructed in whole or in part pursuant to the contract.

SPECIFICATIONS - The directions, provisions and requirements of the District, pertaining to the method and manner of performing the work, and to the qualities and quantities of materials to be furnished under the contract.

STATE SPECIFICATIONS - The Standard Specifications, State of California, Department of Transportation, latest edition.

SUBCONTRACTOR - The person, firm or corporation supplying labor, or labor and materials at the site of the work as a part of the Contractor's obligation with the Owner and/or Contractor and District.

SURETY - The bondsmen or party or parties who may guarantee the fulfillment of work or a portion of the work, by bonds, and whose signatures are attached to the bond.

1-2 TERMS

Whenever in the specifications or upon the plans the words directed, required, permitted, ordered, designated, prescribed or words of like import are used, it shall be understood that the direction, requirements, permission, order, designations, or prescription of the Inspector and/or Engineer is intended. Similarly the terms acceptable, satisfactory, or equal, or words of like import, shall mean acceptable to or satisfactory to the Inspector and/or Engineer, unless otherwise expressly stated. The word "provide" shall be understood to mean furnish and install. It will be the responsibility of the Owner to see that all provisions of these specifications are met either by the Owner himself or by his Contractor.

1-3 ABBREVIATIONS

Wherever the following abbreviations are used, they shall have the meanings indicated:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AI	The Asphalt Institute
AISC	American Institute of Steel Construction
AISI	American Iron & Steel Institute
ANSI	American National Standards Institute (formerly USASI, USAS, ASA)
API	American Petroleum Institute
ASA	American Standards Association (Now ANSI)
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CRSI	Concrete Reinforcing Steel Institute
NBFU	National Board of Fire Underwriters
PCA	Portland Cement Association
State	California Standard Specifications, State of Specifications California Department of Transportation, Division of Highways
SSPC	Steel Structures Painting Council
UBC	Uniform Building Code, Pacific Coast Building Officials Conference of the International Conference of Building Officials
UPC	Uniform Plumbing Code, as adopted by the International Association of Plumbing and Mechanical Officials

SECTION 2

DESIGN CRITERIA AND PLAN CHECKING

2-1 GENERAL

The following, subject to applicable statutes and ordinances of the District, is the procedure for an Owner to obtain approval for construction of water and sewer facilities to be dedicated for operation and maintenance by the Lamont Public Utility District.

2-2 PRELIMINARY INVESTIGATION

It is recommended that the applicant meet with the District at the earliest possible date to determine whether the property to be developed is within the District boundaries. At this time, the availability of existing waterlines and sewer lines can also be reviewed. In some areas, a preliminary feasibility investigation and report may be necessary to establish that the District can serve the proposed development. All costs for such an investigation and report shall be borne solely by the Owner.

For all new developments, the District requires that both water and sewer facilities be constructed whether tie-ins to existing waterlines or sewer lines are readily available. For proposed private water systems, the Owner shall meet with the District to determine the acceptability of such water systems to the District in the future. Sewer systems shall remain "dry" until connection to District sewer system is available.

2-3 PRELIMINARY DESIGN CRITERIA

2-3.1 WATER

Minimum Size - The minimum pipe size for water mains shall be 6 inches in diameter unless specific approval is given by the District for such special conditions as may arise. On dead-end streets, the minimum size main shall be 8 inches to at least the last fire hydrant. All line sizing shall be based on maximum day demand plus fire flow.

Type of Pipe (Distribution Mains) - Asbestos-cement pipe, ductile iron or polyvinyl chloride pipe, Class 150 or Class 200 is to be used for distribution mains.

Standard Location - Domestic water mains shall normally be located in the roadway 5 feet from the curb face.

Water Valve Spacing - As a general rule, there should be two valves where one main ties into another. Where two mains cross, there should be three valves, and there shall be four valves at a major distribution point. On long blocks, intermediate valves should be installed so that only a maximum of 600 feet would have to be shut off at any one time.

When water mains pass through easements outside traveled streets, a valve should be located at each end of the easement. The final determination of valves and location should be per the District.

Pipeline High & Low Points and Ends of Main - Combination air release valves shall be installed at all high points in line as directed by District Engineer. Blowoffs shall be installed at end of main and low points where either the flow velocity or the slope of the line may cause sediment to settle in line.

Pipeline Connections - Each project or development shall have at least two connections to waterlines in different streets to form a looped water system. If connection to different streets is impractical or impossible in the opinion of the District, connections to a waterline in the same street will be permitted. Non-looped systems will be permitted only with the permission of the District.

Cross Connections - Cross connections of any type that permit a backflow condition from any alternate source of water or system other than that of the District's potable water mains are prohibited. A connection constituting a potential or actual backflow hazard is not permissible unless a backflow device or air gap, which is approved by the California State Department of

Health Services and local health agency and complies with Title 17 of the Code of California Regulations is installed. Such an installation shall at all times be subject to inspection and regulation by the District for the purpose of avoiding possibility of backflow.

Backflow preventive devices shall be installed by and at the expense of the water user, landowner or person requesting service as the case may be.

Water System Design - The water system shall be designed based on the following:

<u>System Demand</u>	<u>Description</u>
Residential – Domestic (3.5 persons per dwelling unit) Average Day	250 gpd per capita
Maximum Day	250% of average daily demand
Peak Hour	350% of average daily demand
Commercial	Varies (depending on type)

All line sizing is based on maximum day demand plus fire flow and on Hazen-Williams formula using a coefficient of "C=120".

In general, private water systems are unacceptable to the District. The Owner shall consult with the District prior to designing any private water system to ascertain if such a system is acceptable to the District.

2-3.2 SEWER

Flows Acceptable and Not Acceptable - The District shall accept flows from the following plumbing fixtures, unless unusual circumstances prevent the District from doing so:

Toilets, urinals, bidets, sinks for domestic faucets, showers, bathtubs, connections for dishwashers, drinking fountains, domestic washing machines and garbage disposals.

Flows which shall not be discharged into the sewerage system and are not acceptable to the District are flows other than sewage, which shall include but shall not be limited to any and all liquid or solid waste substance not sewage, from any producing, manufacturing, processing, commercial, or institutional operation of whatever nature. Plumbing fixtures or sources hereafter set forth shall not be discharged into the District's sewer system without specific written permission from District Manager.

All piping from commercial-industrial processing to the sewers.

All floor or stall drains, other than domestic showers.

Swimming pools, ponds, etc., which empty into the sewer system.

Brine from home regenerating water softeners.

Establishments included under the above requirements include, but are not limited to:

Gas stations, car washes, garages, laundromats, etc.

Restaurants, hotels, motels and shopping areas.

The District may require traps, interceptors, or other devices on all outlets which may discharge grease, oil, sand or waste material of any kind of a composition or quality deemed harmful by the District.

Pipeline Criteria - Pipeline design shall be based on peak flows and on Manning's formula using coefficient of "n" = 0.013. Average day flows shall be based upon 100 gallons per person per day and 3.5 people per home for a single family residential development. Peak flows shall be 2.5 times the average day flow.

Design peak flows in pipelines 12 inches in diameter and smaller shall be limited to an approximate liquid depth to pipe diameter ratio of 0.50.

Design peak flows in pipelines 15 inches in diameter and larger to be limited to an approximate liquid depth to pipe diameter ratio of 0.75.

Minimum pipeline diameter to be 8 inches. Smaller diameter pipe shall be permitted only with prior approval from the District Engineer.

Minimum pipeline grades:

<u>Pipe Size (Inches)</u>	<u>Minimum Grade (%)</u>
8	0.36
10	0.28
12	0.22
15	0.16
18	0.12
21	0.10
24	0.08

Minimum radius of curvature in feet:

<u>Nominal Pipe Size (Inches)</u>	<u>Length of Pipe Joint</u>				
	<u>6'</u>	<u>5'</u>	<u>4'</u>	<u>3'</u>	<u>2'</u>
8-12	175	150	125	85	57
15 - 24	230	190	150	115	76
27 - 39	340	235	230	172	114

Pipeline Location - Whenever possible the pipe is to be located 5 feet off the street centerline in the driving lane on the opposite side of the centerline from the water main. In major or secondary highways pipe shall be located in the center of the driving lane nearest to the center of the street. Pipe will not be located in median strips or parking lanes. However, in all cases the pipeline location shall comply with applicable county and state requirements.

Minimum Depth - Minimum depth from finish street grade to top of sewer main pipe shall be 6 feet unless the District Engineer approves a shallower depth.

Type of Pipe – SDR-35 polyvinyl (PVC) sewer pipe is to be used for the sewer.

Sewer Laterals - Clay sewer laterals shall be used when installed off of clay sewer mains. SDR-35 PVC laterals shall be used when installed off of PVC pipe sewer mains.

Manhole Criteria - Manhole locations are at:

Changes of slope in sewers.

Changes of direction of sewers.

Junction of main sewers.

Junction of main sewer and lateral if lateral is same size as main sewer.

Termination of sewers.

Change of pipe size in sewers.

Other locations specified by the District Engineer.

Maximum spacing shall be 400 feet.

Allowable head losses in manholes:

Straight run through manholes based on 0.00 foot loss.

Right angle turn in manholes based on 0.5 velocity head loss, or 0.10 foot, whichever is greater.

Invert elevation at manhole shall be calculated and shown projected to the centerline of the manhole. Should there be any drop in elevation, the invert elevation "IN" and the direction, N, S, E or W, and invert elevation "OUT" and the direction shall be shown. Should the pipeline be joining a trunk sewer of larger diameter, the smaller pipe shall have its crown elevation equal to or higher than the crown elevation of the trunk sewer.

Selected material for bedding will be required by the District when siltstone, sandstone or rocky conditions are encountered in the pipe zone or as determined by the District.

Sewer line distance shown in profile is the horizontal distance measured from centerline of manhole to centerline of manhole. Surveyor to stake the locations of all wye fittings. All house laterals not normal to street sewer to have the end of lateral at property line staked and tied to a property corner as shown on plans.

In order to prevent accidental use of the new sewer prior to completion and acceptance, the inlet (or outlet) to existing tie-in manholes shall be sealed with an appropriate plug. Installation of these plugs shall be approved by the District. Plugs shall be removed at the time of final inspection.

Horizontal Separation - The District, in accordance with State of California, Department of Health Services regulations requires a 10-foot minimum separation between sewer and water mains.

Vertical Separation - Whenever a sanitary sewer, including house laterals, must cross a pressure water main, the water main shall be at least one foot above the sanitary sewer where they cross.

If the sewer is above the water main, one of the following special construction procedures shall extend a sufficient distance on both sides of the crossing to provide 10 feet of horizontal clearance with the water main. If the sewer is located below the water main and within a vertical distance of 1 foot clearance distance, the special construction shall extend a sufficient distance on both sides of the crossing to provide 4 feet of horizontal clearance with the water main.

1. Vitrified clay pipe within a continuous steel casing which shall have a minimum thickness of 1/4-inch and all voids between sewer pipe and casing pressure grouted with sand-cement grout.
2. Class 150 or heavier cast-iron pipe with hot dip bituminous coating and approved mechanical joints.

2-4 PLAN CHECKING

2-4.1 PREPARATION

All water and sewer plans must be prepared under the direct supervision of a registered civil engineer licensed to practice in the State of California. This requirement must be attested to by the Engineer's signature on the plans. The water and sewer design criteria and plan checking shall be under the direct control and jurisdiction of the District Engineer or other person whom may be designated from time to time.

2-4.2 PRELIMINARY ENGINEERING PLANS/PLAN CHECKING AND INSPECTION DEPOSIT

Upon completion of the improvement plans, the Owner will submit three copies of plans signed by the Owner's engineer to the District for plan checking. The District will review the plans, list out discrepancies, establish the amount of the plan check fees in accordance with District Ordinances and make an estimate of the cost of inspection services for the development. The Owner's engineer will then make any necessary corrections to the plans and return them together with the plan check fees, to the District for approval. The estimated cost of inspection may be paid at any time prior to the start of construction. In the event the cost of inspection is less than estimated, the difference will be refunded to the Owner. If the inspection cost exceeds the amount advanced to the District for that purpose, the Owner shall deposit a sum sufficient to cover such deficiency.

2.4.3 CONTRACT

The contract between the Owner and the District covering the sanitary sewer and water system improvements shall be executed prior to District approval of the water and sewer improvement plans.

2-4.4 EASEMENTS

In case an easement is required for construction and/or maintenance of sewer and water lines, the minimum width shall be 20 feet unless otherwise determined in writing by the District Engineer. However, there may be instances where easements of a greater width are required which will be determined by the District Engineer.

The easement shall be located on one lot and in no case will the District accept an easement split upon two lots Easements shall be granted and accepted prior to District approval of the improvement plans. The form of the grant of easement document and the subordination agreement, if applicable, shall be similar to the forms shown in the appendix. Easements shall be shown on the water and sewer plans. Such easements shall be granted or obtained at no expenses to District.

2-4.5 COPIES OF THE PLANS

Prior to the start of construction, two (2) sets of approved plans shall be furnished to Lamont Public Utility District and one (1) set of same to District Engineer. An electronic set compatible with Autocad Release 13 shall be provided to the District on floppy diskette or compact disk format.

2-4.6 TIME PERIOD - SIGNED PLANS VALID

Approval of plans by the District will be valid for only one year from date of District approval. If construction has not started within one year from date of approval, the approval shall be "null and void." District will then require the plans be rechecked.

2-5 CONNECTION FEES

All water and sewer system connection charges and capacity fees as required by District ordinances are to be paid prior to the beginning of construction at the time approved plans are submitted per Section 2-4.5.

SECTION 3

CONSTRUCTION AND INSPECTION

3-1 GENERAL

The Contractor shall furnish all transportation, materials, equipment, labor and supplies to complete excavation, backfills, street repairing and all other work incidental to the construction of the water mains or sanitary sewer mains and appurtenances.

3-2 GOVERNING SPECIFICATIONS

All facilities to be dedicated to the District shall be constructed in accordance with the District Specifications and the rules and regulations of the District. The rules and regulations, as adopted from time to time, are hereby made a part of these specifications.

3-3 CONNECTION TO EXISTING FACILITIES

No connection shall be made to existing facilities of the District without prior approval and inspection by representatives of the District.

3-4 NOTICE

Notice shall be given to the District at least two working days in advance of commencement of work.

3-5 PERMITS

The Owner shall secure all excavation permits and all licenses, pay all charges and fees, and give all notices as necessary and required for the work. These shall be recorded with the District prior to commencement of work.

3-6 CONSTRUCTION WATER

Water used for construction, testing and dust control shall be arranged for and furnished by the Owner at his expense. The Owner shall comply with all regulations of the District relative to connection to fire hydrants.

3-7 INSPECTION

All work shall be subject to inspection by the District and shall be left open and uncovered until the installation is approved by appropriate District authority.

The Owner or his contractor shall not proceed with any subsequent phase of work until the previous phase has been inspected and approved by the District and other public agencies having jurisdiction.

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

No pipe, fittings, or other materials shall be installed until inspected and approved by the District, or its representative. All installations which are to be backfilled shall be inspected and approved by the District prior to backfilling, and the Owner shall give due notice in advance of backfilling to the District so that proper inspection may be provided.

The inspection of the work shall not relieve the Owner of any of his obligations to complete the work as prescribed by the District Specifications. Defective work shall be made good, and unsuitable materials may be rejected notwithstanding the fact that such defective work and unsuitable materials have been previously overlooked by the District and accepted. The installation and inspection of unsuitable materials shall not be construed as acceptance and modification to these specifications shall only be made by the District in writing.

All construction shall be done in compliance with the standards as established by the Occupational Health and Safety Act (OSHA) and appropriate State of California regulations.

3-8 RECORD DRAWINGS

The Owner shall provide one complete set of record drawings in black water proof drawing ink on polyester film of the size 22 inches by 36 inches to the District upon completion of construction. The Owner shall also provide record drawings in electronic file compatible with Autocad Release 13 on floppy disk or compact disk format. The record drawings shall show all changes in work constituting departures from the original contract drawings.

SECTION 4

CONTROL OF MATERIAL

4-1 QUALITY OF MATERIALS

All equipment, materials and supplies to be incorporated in the work shall be new unless otherwise specified. Unless otherwise specifically provided for in the specifications all workmanship, equipment, material and articles incorporated in the work covered by the contract are to be of the best available grade of their respective kind. Whenever in the specifications any

material, process or article is indicated or specified by grade, patent or proprietary name, or by name of manufacture, such specification shall be deemed to be used for the purpose of facilitating description of the materials, process or articles desired, and shall be deemed to be followed by the words "or equal", and the Owner may offer any material or process which shall be substantially equal or better in every respect to that so indicated or specified; however, that if the material, process or article offered by the Owner is not, in the opinion of the Engineer, substantially equal or better in every respect to that specified, then the Owner must furnish the material, process or article specified or one that in the opinion of the Engineer is the substantial equal or better thereof in every respect.

4-2 SAMPLES AND TESTS

All tests of materials furnished by the Owner shall be made in accordance with commonly recognized standards of national organizations and such special methods and tests as are prescribed in the specifications. The Owner shall furnish such samples of materials as are requested by the Inspector without charge. No material shall be used until it has been approved by the Inspector. Samples will be secured and tested whenever necessary to determine the quality of material.

The Owner shall furnish the District in triplicate, certified copies of all required factory and mill test reports. Any materials shipped by the Owner from a factory or mill prior to having satisfactorily passed such testing and inspection by a representative of the District shall not be incorporated in the work, unless the Inspector shall have notified the Owner in writing that such testing and inspection will not be required.

4-3 DEFECTIVE MATERIALS

All materials not conforming to the requirements of the specifications shall be considered as defective and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the site of the work unless otherwise permitted by the Inspector or Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used until approved in writing by the Inspector or Engineer. Upon failure on the part of the Owner to comply with any order of the Inspector or Engineer made under the provisions of this article, the District shall have authority to remove and replace defective material at the expense of the Owner.

4-4 STORAGE OF MATERIALS

All materials for use in the work shall be stored by the Owner in such a manner as to prevent damage from exposure to the elements or from any other cause. The Owner shall be fully responsible for any damage incurred to the materials for the work while being stored, including damage resulting from storing of material in public right-of-way and District acquired easements. The Owner shall also be fully responsible for the preservation of public and private property while storing materials for the work.

SECTION 5

USE OF COMPLETED PORTIONS

When the work or any portion of it is sufficiently complete to be utilized or placed into service, the District shall have the right upon written notification to the Owner to utilize such portions of the work and to place the operable portions into service and to operate same.

Upon said notice and commencement of utilization or operation by the District, the Owner shall be relieved of the duty of maintaining the portions so utilized or placed into operation; provided, however, that nothing in this article shall be construed as relieving the Owner of the full responsibility for completing the work in its entirety, for making good defective work and materials, for protecting the work from damage, and for being responsible for damage and such action shall not relieve the Owner, his sureties, or insurers of the provisions of the section on OWNER'S INSURANCE REQUIREMENTS.

SECTION 6

LEGAL RELATIONS AND RESPONSIBILITIES

6-1 OBSERVING LAWS AND ORDINANCES

The Owner shall keep himself fully informed of all existing laws, ordinances and regulations which in any manner affect those engaged or employed in the work or the materials used in the work or which in any way affect the conduct of the work and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over same.

If any discrepancy or inconsistency is discovered in the plans, specifications or contract for the work in relation to any such law, ordinance, regulation, order or decree, he shall immediately report the same to the General Manager.

The Owner shall at all times observe and comply with and shall cause all his agents, employees, contractors, subcontractors, and their employees, and suppliers to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees and shall hold harmless, indemnify and defend the District, the Engineer and each of their directors, officers, employees and agents against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree by the Owner, his employees, agents, contractors and their employees, or suppliers.

6-2 INVENTIONS, PATENTS AND COPYRIGHTS

The Owner shall pay all royalties and assume all costs arising from the use of any invention, design, process, materials, equipment, product or device which is the subject of patent rights or copyrights.

The Owner shall hold harmless, indemnify and defend the District, the Engineer, and their consultants, and each of their directors, officers, employees and agents from and against all claims, damages, losses, expenses and other costs, including costs of defense and attorney's fees arising out of any infringement of patent rights or copyrights incident to the use in the performance of the work or resulting from the incorporation in the work of any invention, design, process, materials, equipment, product or device and shall defend all such claims in connection with any alleged infringement of such rights.

6-3 PUBLIC CONVENIENCE AND SAFETY

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

Convenient access to driveways, houses and buildings along the line of work shall be maintained and temporary crossings shall be provided and maintained in good condition. Not more than one crossing or intersecting street or road shall be closed at any one time.

The Owner shall provide and maintain such fences, barriers, directional signs, lights and flagmen as are necessary to give adequate warning to the public at all times of any dangerous conditions to be encountered as a result of the construction work and to give directions to the public.

6-4 RESPONSIBILITY FOR LOSS, DAMAGE OR INJURIES

The Owner shall be responsible for all claims, demands, or liability from any cause arising out of or resulting from or in connection with the performance of the work, excepting only those as may be caused by the sole or active negligence or willful misconduct of the District, the Engineer, or their consultants, or their directors, officers, employees and agents. Such responsibility shall extend to claims, demands, or liability for loss, damage or injuries occurring after completion of the work as well as during the progress of the work and shall include claims by the contractor employees, or subcontractors or their employees.

6-5 RESPONSIBILITY FOR THE WORK

Until the acceptance of the work, the Owner shall have the responsible charge and care of the work and of the materials to be used therein (including materials which have been furnished by the District) and shall bear the risk of injury, loss or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the nonexecution of the work.

The Owner shall rebuild, repair, restore and make good all injuries, losses or damages to any portion of the work or the materials occasioned by any cause before its completion and acceptance and shall bear the expense thereof. Where necessary to protect the work or materials from damage, the Owner shall at his expense provide suitable drainage and erect such temporary structures as are necessary to protect the work or materials from damage. The suspension of the

work or the granting of an extension of time from any cause whatever shall not relieve the Owner of his responsibility for the work and materials as herein specified.

6-6 PRESERVATION OF PROPERTY

The Owner shall exercise due care to avoid injury to existing improvements or facilities, utility facilities, adjacent property, and trees and shrubbery that are not to be removed.

All trees, shrubbery and landscaping that are not to be removed, and pole lines, fences, signs, survey markers and monuments, buildings and structures, conduits, pipelines under or above ground, sewer and waterlines, all highway or street facilities, and any other improvements or facilities within or adjacent to the work shall be protected from injury or damage, and the Owner shall provide and install suitable safeguards to protect such objects from injury or damage. If such objects are injured or damaged by reason of the Owner's operation, they shall be replaced or restored at the Owner's expense to a condition as good as when the Owner entered upon the work or as good as required by the plans and specifications if any such objects are a part of the work being performed.

The fact that any such pipe or other underground facility is not shown on the plans shall not relieve the Owner of his responsibility under this article.

In addition to any requirements imposed by law, the Owner shall shore up, brace, underpin and protect as may be necessary, all foundations and other parts of all existing structures adjacent to and adjoining the site of the work which are in any way affected by the excavations or other operations connected with the performance of the work. Whenever any notice is required to be given by the Owner to any adjacent or adjoining landowner or other party before commencement of any work, such notice shall be given by the Owner.

In an emergency affecting the safety of life or property, including adjoining property, the Owner, without special instructions or authorizations, is authorized to act at his discretion to prevent such threatened loss or injury.

6-7 SAFETY

In accordance with generally accepted construction practices, the Owner and Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons and property during performance of the work, and the Owner and Contractor shall fully comply with all state, federal and other laws, rules, regulations and orders relating to safety of the public and workers.

The right of the Engineer and/or Inspector to conduct construction review or observation of the Owner and Contractor's performance will not include review or observation of the adequacy of the Owner and Contractor's safety measures in, on or near the construction site.

6-8 PERSONAL LIABILITY

Neither the Board of Directors, the General Manager, Inspector and the Engineer nor any other officers or agents of the District shall be personally responsible for any liability arising under or by virtue of any agreement or contract between the Owner and the Contractor.

6-9 INDEMNITY

To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the District, the Engineer and their consultants, and each of their directors, officers, agents and employees from and against all claims, damages, losses, expenses and other costs, including costs of defense and attorney's fees, arising out of or resulting from or in connection with the performance of the work, both on and off the jobsite, provided that any of the foregoing (1) is attributable to personal injury, bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself), including the loss of use resulting therefrom and (2) is caused in whole or in part by any act or omission of the Owner, the Contractor, any subcontractor, any supplier, anyone directly or indirectly employed by any of them or anyone for whose acts or omissions any of them may be liable, regardless of whether or not it is caused in part by any act or omission (active, passive or comparative negligence included), of a party indemnified hereunder.

In any and all claims against the indemnified parties by any employee of the Owner, the Contractor, any subcontractor, any supplier, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification for obligation under the first and fourth paragraphs in this article on INDEMNITY shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Owner, the Contractor, or any subcontractor, or any supplier or other person under workers' compensation acts, disability benefit acts or other employee acts.

The obligations of the Owner under the first and fourth paragraphs in this article on INDEMNITY shall not extend to the liability of the Engineer, their consultants and each of their directors, officers, employees and agents, arising out of or resulting from or in connection with the preparation or approval of maps, drawings, opinions, reports, surveys, designs or specifications, providing that the foregoing was the sole and exclusive cause of the loss, damage or injury.

The Owner shall also indemnify and hold harmless the District, the Engineer and their consultants, and each of their directors, officers, employees and agents from and against all losses, expenses, damages (including damages to the work itself), attorney's fees and other costs, including all costs of defense, which any of them may incur with respect to the failure, neglect, or refusal of Owner to faithfully perform the work and all of the Owner's obligations under the contract. Such costs, expenses and damages shall include all cost, including attorney's fees, incurred by the indemnified parties in any lawsuit to which they are a party.

6-10 WARRANTY OF TITLE

No materials, supplies, or equipment for the work under this contract shall be purchased subject to any chattel mortgage or under a conditional sales contract or other agreement by which an interest therein or any part thereof is retained by the seller or supplier. The Owner warrants clear and good title to all materials, supplies and equipment installed and incorporated in the work and agrees upon completion of all work to deliver the premises together with all improvements and appurtenances constructed or placed thereon by him to the District free from any claims, liens, encumbrances or charges and further agrees that neither he nor any person, firm or corporation furnishing any material or labor for any work covered in a contract shall have any right to a lien upon the premises or any improvement or appurtenances thereon, provided that this shall not preclude the Owner from installing metering devices or other equipment of utility companies or of municipalities, the title of which is commonly retained by the utility company or the municipality. Nothing contained in this article, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Owner for their protection, or any right under any law permitting such persons to look to funds due the Owner in the hands of the District. The provisions of this article shall be inserted in all subcontracts and material contracts, and notices of its provision shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

6-11 TERMINATION FOR BREACH

If the Owner refuses or fails to prosecute the work or any separable part thereof with such diligence as will insure its completion within the time specified in the permit, or any extension thereof, or fails to complete such work within such time, or if the Owner should be adjudged bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he or any of his subcontractors should violate any of the provisions of the permit, the District may serve written notice upon the Owner and his surety of its intention to terminate the contract, and unless within ten (10) days after the service of such notice such violations shall cease and satisfactory arrangements for the corrections thereof be made, the permit shall, upon the expiration of said ten (10) days, cease and terminate.

In the event of any such termination, the District shall immediately serve written notice thereof upon the surety, and the surety shall have the right to take over and perform the work, providing, however, that if the surety within fifteen (15) days after the serving upon it of its intention to take over and perform the work, or does not commence performance thereof within thirty (30) days from the date of serving said notice, the District may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable for the account and at the expense of the Owner, and his surety shall be liable to the District for any excess cost or other damage occasioned the District hereby, and in such event the District may, without liability for so doing, take possession of and utilize in completing the work such materials, appliances, plants and other property belonging to the Owner that may be on the site of the work and be necessary therefor.

The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the District and shall not be construed as requiring any action whatsoever on the part of District.

6-12 NOTICE AND SERVICE THEREOF

Any notice required shall be in writing, be dated and signed by the party giving such notice or his duly authorized representative, and be served as follows:

If to the District, by personal delivery or by deposit in the United States mail.

If to the Owner, by personal delivery to the Owner or to his authorized representative at site of the project or by deposit in the United States mail.

If to the surety or any other person, by personal delivery to said surety or other person or by deposit in the United States Mail.

All mailed notices shall be in sealed envelopes, shall be sent by certified mail with postage prepaid and shall be addressed to the addresses in the contract documents or such substitute addresses which a party designates in writing and serves as set forth herein.

6-13 GUARANTEES

Upon acceptance of the sewer or water system, the Owner shall be responsible for all repairs for any portion of said system which requires repair within one year from the date of acceptance whether repairs are completed during said period so long as Owner is notified of the necessity of said repairs during the period. Owner shall repair and replace any and all such work that may prove defective in workmanship without expense whatsoever to the District, ordinary wear and tear and unusual abuse or neglect excepted. In the event of failure to comply with the aforementioned conditions, the District is hereby authorized to proceed to have the defects repaired and made good at the expense of the Owner, who hereby agrees to pay the cost and charges therefor immediately upon demand. This article does not in any way limit the guarantee on any items for which a longer guarantee is specified or on any items for which a manufacturer or supplier gives a guarantee for a longer period. The Contractor and Owner agree to act as a co-guarantor with such manufacturer or supplier and shall furnish the District all appropriate guarantee or warranty certificates upon completion of the project. No guarantee period, whether provided for in this article or elsewhere, shall in any way limit the liability of Owner or his sureties or insurers under the indemnity or insurance provisions of these General Conditions.

SECTION 7

INSURANCE REQUIREMENTS

7-1 GENERAL

Worker's compensation insurance and liability insurance shall be maintained in effect for the full guarantee period. Environmental loss coverage shall also be maintained. Construction shall not commence or continue until or unless there is in full force and effect all required insurance. The Owner shall not permit any Contractor or subcontractor to perform work on this project unless the worker's compensation, performance and payment bond and liability insurance requirements have been complied with.

Insurers must be authorized to do business and have an agent for service of process in California and have at least an "A" policyholder's rating and a financial rating of at least Class VIII in accordance with the most current A.M. Best Company rating.

Lamont Public Utility District, the District's Engineer, and their consultants, and each of their directors, officers, agents, and employees shall be named as additional insureds on each of the above described policies, save and except the workers' compensation insurance coverage. An additional insured endorsement shall be obtained and provided to Lamont Public Utility District within ten (10) days of the placement of such policy, with a provision that Lamont Public Utility District will be advised by any insurers of any cancellation or notice of intent to cancel any such policy.

As evidence of specified insurance coverage, the Owner shall provide certificates of insurance and endorsements to the District in accordance and in the form set forth in the appendix hereto. No alteration or substitution of said form in these District Specifications will be allowed.

The requirement for the Owner to maintain environmental loss coverage may be negotiated with the District.

7-2 WORKER'S COMPENSATION INSURANCE

The Owner shall provide a certificate(s) of insurance certifying that his Contractor has obtained for the period of the contract full worker's compensation insurance coverage for all persons whom he employs or may employ in carrying out the work under the contract. This insurance shall be in strict accordance with the requirements of the most current and applicable state worker's compensation insurance laws.

7-3 LIABILITY INSURANCE

The Owner shall provide a certificate(s) of insurance showing that he has liability insurance coverage as stated in the Contract.

Included in such insurance shall be contractual coverage sufficiently broad to insure the matters set forth in the article entitled "INDEMNITY" are covered, except those matters set forth in the fourth paragraph thereof.

Included in such insurance shall be a "Cross Liability" or "Severability of Interest" clause.

The liability insurance coverage shall include each of the following types of insurance:

A. General Liability

- (1) Comprehensive Form
- (2) Premises-Operations
- (3) Explosion and Collapse Hazard
- (4) Underground Hazard
- (5) Products/Completed Operations Hazard
- (6) Contractual Insurance
- (7) Broad Form Property Damage Including Completed Operations
- (8) Independent Contractors
- (9) Personal Injury

B. Automobile Liability

- (1) Comprehensive Form Including Loading and Unloading
- (2) Owned
- (3) Hired
- (4) Non-Owned

In accordance with Section 7-1, the liability insurance shall include as additional insureds: the District, the Engineer and their consultants, and each of their directors, officers, agents and employees. The insurance afforded to these additional insureds shall be primary insurance. If the additional insureds have other insurance that might be applicable to any loss, the amount of the insurance provided under this article on LIABILITY INSURANCE shall not be reduced or prorated by the existence of such other insurance.

7-3.1 AMOUNT OF LIABILITY INSURANCE

General liability insurance shall provide bodily injury coverage of not less than \$3,000,000 for each occurrence and not less than \$3,000,000 aggregate. Property damage coverage shall be for not less than \$3,000,000 each occurrence and not less than \$3,000,000 aggregate. Personal injury coverage shall be for not less than \$1,000,000 aggregate.

As an alternative to the above general liability insurance limits, bodily injury, personal injury, and property damage coverage shall be in a combined single limit of not less than \$4,000,000 each occurrence and \$4,000,000 aggregate.

Automobile liability insurance shall provide bodily injury coverage for not less than \$3,000,000 for each person and not less than \$3,000,000 for each accident, per each occurrence. Property damage coverage shall be for not less than \$3,000,000 for each occurrence.

As an alternative to the above automobile liability insurance limits, bodily injury and property damage coverage shall be in a combined single limit of not less than \$4,000,000 for each occurrence and \$4,000,000 aggregate.

Excess liability insurance shall provide bodily injury and property damage combined coverage for not less than \$3,000,000 each occurrence and \$3,000,000 aggregate.

SECTION 8

CONSTRUCTION SECURITY

8-1 GENERAL

All bonds, when required by the District and/or by ordinance, shall be secured from a surety company or companies satisfactory to the Lamont Public Utility District and whose name is on file with the County Clerk of Kern County as an approved and financially sound surety company, authorized to transact business in this state.

The bonds shall meet all of the requirements and contain all of the conditions required by law and shall be on forms supplied by the District. The performance and payment bond shall continue in full force and effect for the guarantee period.

The Owner shall submit copies of proposals received from Contractor(s) for the construction of the improvements or other evidence satisfactory to the District, to establish the Project construction costs for purposes of bonding.

DEPARTMENT OF HEALTH SERVICES

714/744 P STREET
SACRAMENTO, CA 95814CRITERIA FOR THE SEPARATION
OF WATER MAINS AND SANITARY SEWERSA. PUBLIC HEALTH CONSIDERATIONS

Waterborne disease outbreaks attributed to the entry of sewage-contaminated groundwater into the distribution systems of public water supplies continue to be a problem in the United States. A community with its buried water mains in close proximity to sanitary sewers is vulnerable to waterborne disease outbreaks.

Sanitary sewers frequently leak and saturate the surrounding soil with sewage. This is caused primarily by structural failure of the sewer line, improperly constructed joints, and subsidence or upheaval of the soil encasing the conduit. A serious public health hazard exists when the water mains are depressurized and no pressure or negative pressures occur. The hazard is further compounded when, in the course of installing or repairing a water main, existing sewer lines are broken. Sewage spills into the excavation and, hence, enters into the water main itself. Additionally, if a water main fails in close proximity to a sewer line, the resultant failure may disturb the bedding of the sewer line and cause it to fail. In the event of an earthquake or man-made disaster, simultaneous failure of both conduits often occurs.

The water supplier is responsible for the quality of the water delivered to consumers and must take all practical steps to minimize the hazard of sewage contamination to the public water supply. Protection of the quality of the water in the public water system is best achieved by the barrier provided by the physical separation of the water mains and sewer lines.

This document sets forth the construction criteria for the installation of water mains and sewer lines to prevent contamination of the public water supplies from nearby sanitary sewers.

B. BASIC SEPARATION STANDARDS

The "California Waterworks Standards" sets forth the minimum separation requirements for water mains and sewer lines. These standards, contained in Section 64630, Title 22, California Administrative Code, specify:

- (c) (1) Parallel Construction: The horizontal distance between pressure water mains and sewer lines shall be at least 10 feet.
- (2) Perpendicular Construction (Crossing): Pressure water mains shall be at least one foot above sanitary sewer lines where these lines must cross.

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- (d) Separation distances specified in (c) shall be measured from the nearest edges of the facilities.
- (e) (2) Common Trench: Water mains and sewer lines must not be installed in the same trench.

When water mains and sanitary sewers are not adequately separated, the potential for contamination of the water supply increases. Therefore, when adequate physical separation cannot be attained an increase in the factor of safety should be provided by increasing the structural integrity of both the pipe materials and joints.

C. EXCEPTIONS TO BASIC SEPARATION STANDARDS

Local conditions, such as available space, limited slope, existing structures, etc., may create a situation where there is no alternative but to install water mains or sewer lines at a distance less than that required by the Basic Separation Standards. In such cases, alternative construction criteria as specified in Section E should be followed, subject to the special provisions in Section D.

Water mains and sewers of 24 inches diameter or greater may create special hazards because of the large volumes of flow. Therefore, installations of water mains and sewer lines 24 inches diameter or larger should be reviewed and approved by the health agency prior to construction.

D. SPECIAL PROVISIONS

1. The Basic Separation Standards are applicable under normal conditions for sewage collection lines and water distribution mains. More stringent requirements may be necessary if conditions, such as, high groundwater exist.
2. Sewer lines shall not be installed within 25 feet horizontally of a low head (5 psi or less pressure) water main.
3. New water mains and sewers shall be pressure tested where the conduits are located ten feet apart or less.
4. In the installation of water mains or sewer lines, measures should be taken to prevent or minimize disturbances of the existing line. Disturbance of the supporting base of this line could eventually result in failure of this existing pipeline.
5. Special consideration shall be given to the selection of pipe materials if corrosive conditions are likely to exist. These conditions may be due to soil type and/or the nature of the fluid conveyed in the conduit, such as a septic sewage which produces corrosive hydrogen sulfide.

6. Sewer Force Mains

- a. Sewer force mains shall not be installed within ten feet (horizontally) of a water main.
- b. When a sewer force main must cross a water line, the crossing should be as close as practical to the perpendicular. The sewer force main should be at least one foot below the water line.
- c. When a new sewer force main crosses under an existing water main, all portions of the sewer force main within ten feet (horizontally) of the water main shall be enclosed in a continuous sleeve.
- d. When a new water main crosses over an existing sewer force main, the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psi or equivalent pressure rating. (Ductile Iron Class 50)

E. ALTERNATE CRITERIA FOR CONSTRUCTION

The construction criteria for sewer lines or water mains where the Basic Separation Standards cannot be attained are shown in Figures 1 and 2. There are two situations encountered:

Case 1 -- New sewer line -- new or existing water main.

Case 2 -- New water main -- existing sewer line.

For Case 1, the alternate construction criteria apply to the sewer line.

For Case 2, the alternate construction criteria may apply to either or both the water main and sewer line.

The construction criteria should apply to the house laterals that cross above a pressure water main but not to those house laterals that cross below a pressure water main.

Case 1: New Sewer Being Installed (Figures 1 and 2)

Zone Special Construction Required for Sewer

- A Sewer lines parallel to water mains shall not be permitted in this zone without approval from the responsible health agency and water supplier.
- B A sewer line placed parallel to a water line shall be constructed of:
1. Extra strength vitrified clay pipe with compression joints.
 2. Class 4000, Type II, asbestos-cement pipe with rubber gasket joints.
 3. Plastic sewer pipe with rubber ring joints (per ASTM D3034) or equivalent.
 4. Cast or ductile iron pipe with compression joints.
 5. Reinforced concrete pressure pipe with compression joints (per AWWA C302-74).
- C A sewer line crossing a water main shall be constructed of:
1. Ductile iron pipe with hot dip bituminous coating and mechanical joints.
 2. A continuous section of Class 200 (DR 14 per AWWA C900) plastic pipe or equivalent, centered over the pipe being crossed.
 3. A continuous section of reinforced concrete pressure pipe (per AWWA C302-74) centered over the pipe being crossed.
 4. Any sewer pipe within a continuous sleeve.
- D A sewer line crossing a water main shall be constructed of:
1. A continuous section of ductile iron pipe with hot dip bituminous coating.
 2. A continuous section of Class 200 (DR 14 per AWWA C900) plastic pipe or equivalent, centered on the pipe being crossed.
 3. A continuous section of reinforced concrete pressure pipe (per AWWA C302-74) centered on the pipe being crossed.
 4. Any sewer pipe within a continuous sleeve.
 5. Any sewer pipe separated by a ten-foot by ten-foot, four-inch thick reinforced concrete slab.

Case 2: New Water Mains Being Installed (Figures 1 and 2)

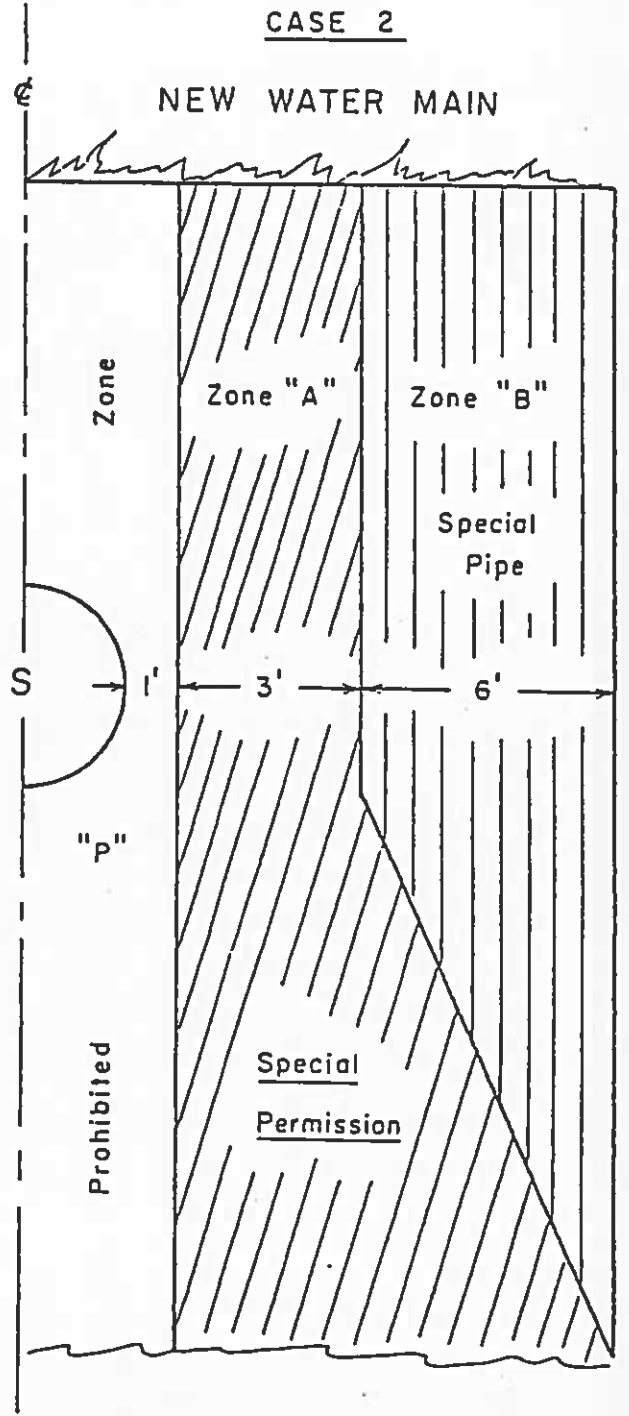
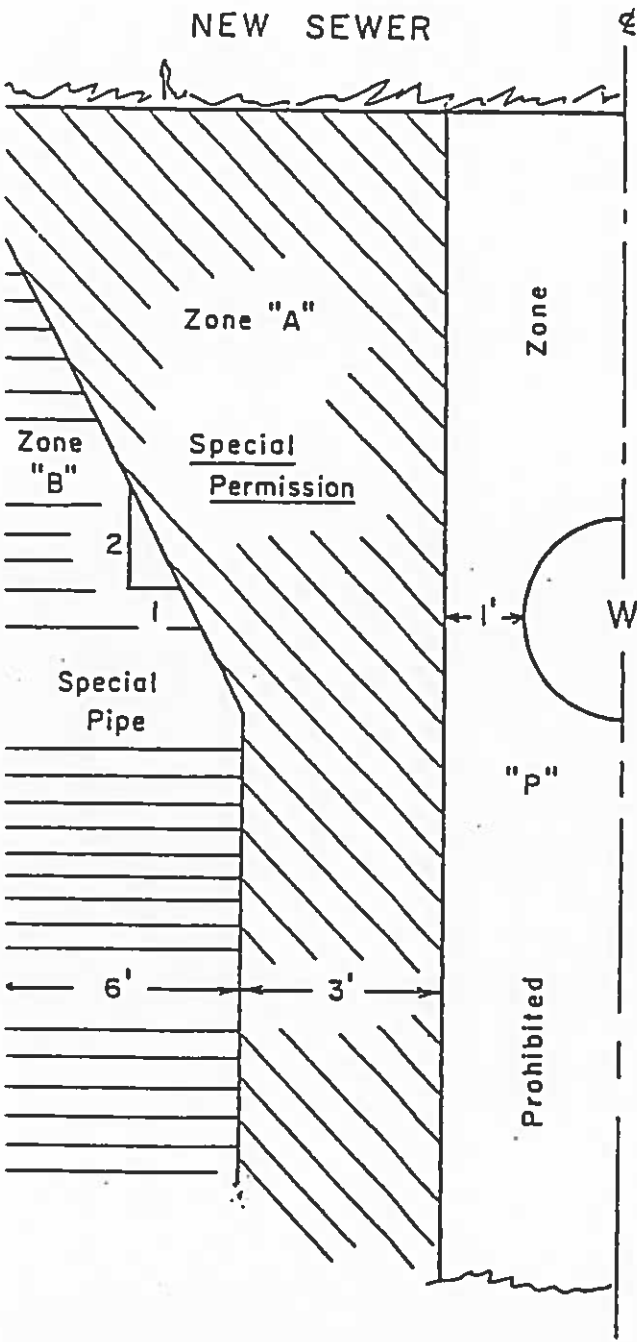
Zone

- A No water mains parallel to sewers shall be constructed without approval from the health agency.
- B If the sewer paralleling the water main does not meet the Case 1, Zone B; requirements, the water main shall be constructed of:
1. Ductile iron pipe with hot dip bituminous coating.
 2. Dipped and wrapped one-fourth-inch-thick welded steel pipe.
 3. Class 200, Type II, asbestos-cement pressure pipe.
 4. Class 200 pressure rated plastic water pipe (DR 14 per AWWA C900) or equivalent.
 5. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300-74 or C301-79 or C303-70).
- C If the sewer crossing the water main does not meet the Case 1, Zone C, requirements, the water main shall have no joints in Zone C and be constructed of:
1. Ductile iron pipe with hot dip bituminous coating.
 2. Dipped and wrapped one-fourth-inch-thick welded steel pipe.
 3. Class 200 pressure rated plastic water pipe (DR 14 per AWWA C900) or equivalent.
 4. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300-74 or C301-79 or C303-70).
- D If the sewer crossing the water main does not meet the requirements for Zone D, Case 1, the water main shall have no joints within four feet from either side of the sewer and shall be constructed of:
1. Ductile iron pipe with hot dip bituminous coating.
 2. Dipped and wrapped one-fourth-inch-thick welded steel pipe.
 3. Class 200 pressure rated plastic water pipe (DR 14 per AWWA C900) or equivalent.
 4. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300-74 or C301-79 or C303-70).

NOTES AND DEFINITIONS:

1. HEALTH AGENCY -- The Department of Health Services. For those water systems supplying fewer than 200 service connections, the local health officer shall act for the Department of Health Services.
2. WATER SUPPLIER -- "Person operating a public water system" or "supplier of water" means any person who owns or operates a public water system.
3. LOW HEAD WATER MAIN -- Any water main which has a pressure of five psi or less at any time at any point in the main.
4. Dimensions are from outside of water main to outside of sewer line or manhole.
5. COMPRESSION JOINT -- A push-on joint that seals by means of the compression of a rubber ring or gasket between the pipe and a bell or coupling.
6. MECHANICAL JOINTS -- Bolted joints.
7. RATED WORKING WATER PRESSURE OR PRESSURE CLASS -- A pipe classification system based upon internal working pressure of the fluid in the pipe, type of pipe material, and the thickness of the pipe wall.
8. FUSED JOINT -- The jointing of sections of pipe using thermal or chemical bonding processes.
9. SLEEVE -- A protective tube of steel with a wall thickness of not less than one-fourth inch into which a pipe is inserted.
10. GROUND WATER -- Subsurface water found in the saturation zone.
11. HOUSE LATERAL -- A sewer connecting the building drain and the main sewer line.

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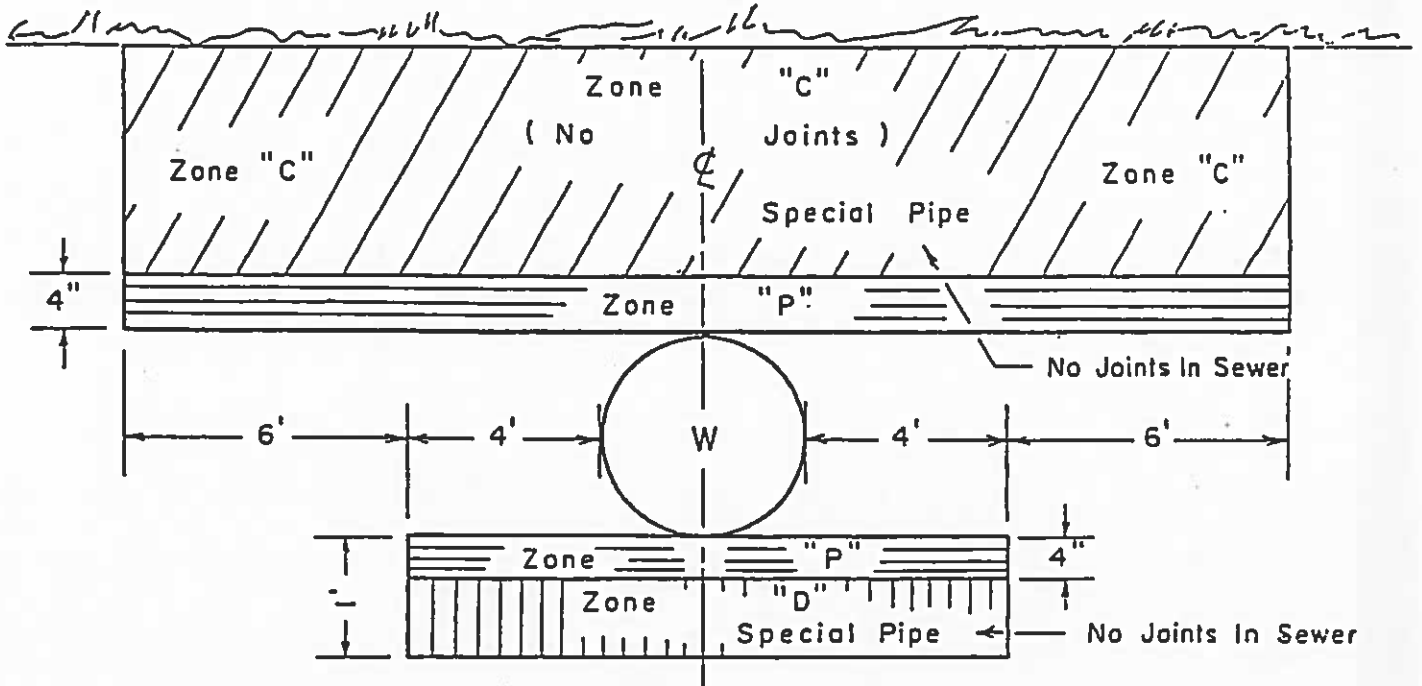


Note: Zones identical on either side of center lines.
 Zone "P" is a prohibited zone, Section 64630 (e) (2) California Administrative Code, Title 22

Figure 1 - PARALLEL CONSTRUCTION

CASE 1

NEW SEWER



Note: "P" is a prohibited construction zone

CASE 2

NEW WATER MAIN

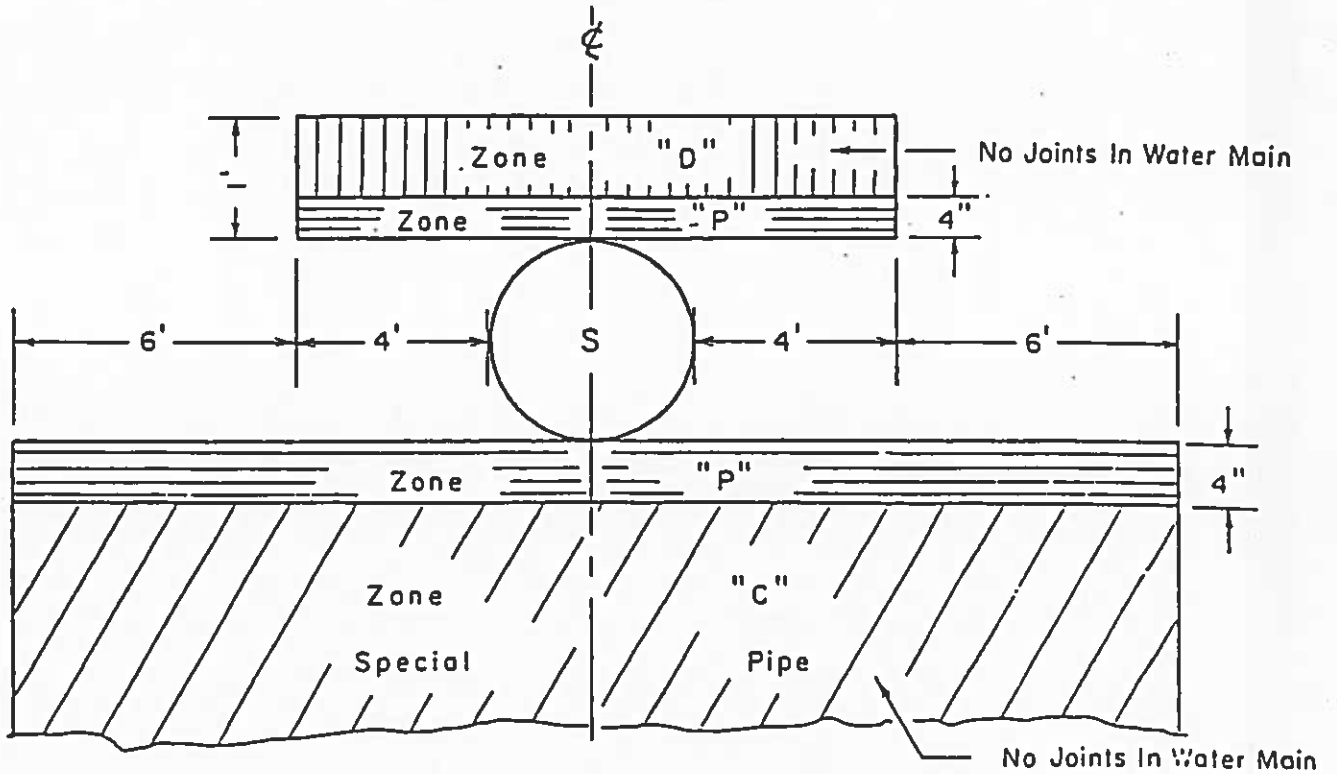


Figure 2 - CROSSINGS

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**STANDARD SPECIFICATIONS
OR
ASBESTOS-CEMENT PIPE AND FITTINGS**

A GENERAL REQUIREMENTS

This specification designates the requirements for the manufacture and installation of asbestos-cement (A.C.) pipe as manufactured by Johns-Manville, Certain-teed Products Corporation or equal.

A-1 ADDITIONAL REQUIREMENTS

Materials and workmanship in the manufacture and installation of A.C. water mains shall conform to the applicable requirements of the following specifications or the latest revision thereof, which are hereby included and made a part of this specification:

American Water Works Association Specification C400
American Society for Testing and Materials Specification C296
American National Standards Institute Specification A21.10

B PIPE

B-1 CLASSIFICATION

A.C. pipe shall be manufactured for use in water service and shall be designated as Class 150 or Class 200.

B-2 SHORT LENGTHS

Short lengths ordered for use in making rigid connections to fittings or structures shall not exceed 3 feet 3 inches.

B-3 LENGTH TOLERANCES

Allowable tolerances on the dimensions given above for standard, random and short lengths are ± 1 inch for standard lengths, ± 6 inches for random lengths and $\pm 3/8$ inch for short lengths.

B-4 PIPE ENDS

The outside surface of ends of the pipe shall be tapered to facilitate joining the pipe sections without damaging or misplacing the rubber-ring gasket.

B-5 A.C. COUPLINGS

One coupling consisting of an A.C. sleeve and two rubber rings shall be furnished with each standard, random or short length of pipe. The coupling shall be suitable for the particular size, class and manufacture of pipe with which it is to be used.

Coupling sleeves shall be A.C. composed of the same materials as specified for A.C. pipe in the preceding paragraph.

Rubber-ring gasket retaining grooves shall be machined into the inner surface of the sleeve so that when the joint is assembled, the gasket shall be compressed to form a watertight seal.

Coupling rubber rings shall consist of a molded and vulcanized rubber compound and shall be Ring-Tite, Fluid-Tite, or equal. Prior to shipment, each coupling rubber ring shall be stretched and subjected to a visual inspection by the manufacturer while in a stretched condition. Defective rings shall be rejected.

B-6 CHEMICAL REQUIREMENTS

The uncombined calcium hydroxide content of the pipe and coupling sleeves shall not be more than 1% when tested in accordance with ASTM C 500.

B-7 HYDROSTATIC STRENGTH AND PROOF TEST

The requirements as set forth in AWWA C400 shall be strictly adhered to.

Each length of pipe and coupling shall be tested in accordance with the above designated specification and the testing shall be done in recognized independent test laboratories in the United States of America.

B-8 FLEXURE AND CRUSHING STRENGTH

All pipe and couplings shall meet the requirements of AWWA C400 and shall be tested as therein specified.

B-9 INSPECTION

All material tested under this specification shall be inspected and tested in a normal air-dry condition by the manufacturer prior to shipment for conformance to the requirements stated in previous section. The District shall at all times have the right to inspect the work and materials in the course of manufacturer and to make or witness such tests as required in these specifications or as he may deem advisable. The manufacturer shall furnish the District's Representative reasonable facilities for so doing and for obtaining such information as he may desire regarding the manner and progress of the work and the character and quality of the material used. In lieu of the preceding, the manufacturer shall, upon request, submit a certificate certifying that the

materials meet the requirements of this specification. All testing will be done in recognized independent testing laboratories in the United States of America.

C MARKING

C-1 PIPE

Each standard length and each random length of pipe shall be marked with the manufacturer's name, trade name (if any), nominal size, class hydrostatic test pressure, a "T" to signify it was tested and the date of manufacture.

C-2 COUPLING SLEEVES

Each coupling sleeve shall be marked by the manufacturer with the nominal size and class of pipe with which it shall be used and a "T" signifying it has been hydrostatically tested.

C-3 COUPLING RUBBER RINGS

Each coupling rubber ring shall be marked by the manufacturer with the nominal size and class of pipe with which it shall be used and the date of manufacturer.

C-4 SHIPMENT AND DELIVERY

After the pipe and couplings have been properly manufactured, tested, and inspected as set forth above, they shall be prepared for standard commercial shipment so as to assure acceptance by common or other carriers. Any damaged pipe or fittings delivered and unloaded at trench side shall be removed by the Contractor from the site of the work.

D INSTALLATION

D-1 EXCAVATION AND BACKFILL

Excavation and backfill shall conform to the provisions of the Standard Specifications for Earthwork.

D-2 INSTALLATION PROCEDURES AND WORKMANSHIP

Installation instructions furnished by the pipe manufacturer shall be closely and carefully followed. The pipe shall be laid true to line and grade at the locations shown on the plans.

A specially prepared nontoxic and water soluble lubricant shall be applied to machined pipe ends just prior to installation of the couplings. Proper location of all rubber rings shall be checked by use of a suitable feeler gage at all points around the circumference of couplings ends.

Fittings shall be supported independently of the pipe. Quarter lengths (MEE and MOA) of pipe shall be used in and out of each fitting and valves and wherever pipe passes through a rigid

structure. Pipe may be cut by means of saws, power-drive abrasive wheels, or pipe cutters that will produce a square cut. No wedge-type roller cutters will be permitted.

Pipe shall be carefully lowered into the trench using suitable means that will prevent disturbing the prepared foundation or getting dirt inside the pipe or couplings. All pipe ends and coupling parts shall be thoroughly cleaned before final assembly of the joint.

D-3 CONCRETE THRUST BLOCKS

Concrete thrust blocks shall be installed at the locations and in accordance with the detail sheets and shall consist of concrete containing not less than six sacks of Portland cement per cubic yard. Thrust blocks shall conform to the applicable provisions of the Standard Specifications for Concrete Construction.

Concrete blocks shall be placed between the undisturbed ground and the fittings to be anchored. Quantity of concrete and the area of bearing of the pipe and undisturbed soil shall be as shown on the plans or directed by the Inspector and/or Engineer. The concrete shall be so placed, unless specifically shown otherwise on the plans, that the pipe joints and fittings will be accessible to repairs.

E FITTINGS

E-1 GENERAL

All elbows, tees, crosses, reducers and special fittings used with asbestos-cement pipelines shall be manufactured of tough gray cast iron.

E-2 CAST-IRON FITTINGS

Cast-iron fittings shall be manufactured of gray cast-iron, free of all imperfections conforming to the requirements of ANSI A21.10, 250 psi pressure rating. All fittings shall be wrapped in plastic film per the Standard Specifications.

Fittings shall be rubber ring, hub end, suitable for direct connection to the mating asbestos-cement pipe except when connecting to a valve. Where valves and fittings are directly connected, the fitting shall be flanged.

Flanged connections shall be 125 lb. meeting the requirements of ANSI B16.1 Gaskets for flanged joints shall be fullface, cut from 1/16 inch thick rubber with cloth insert, bolt holes prepunched as manufactured by Crane Company, or equal.

Nuts and bolts for bolting flanged joints shall be standard hexagonal head machine bolts and nuts conforming to the requirements of ASTM A307, Grade B. All buried flanged-end fittings shall be bolted with cadmium-plated steel nuts and bolts. All bolts shall be lubricated with graphite and oil. Flanged faces shall be wire brushed and cleaned prior to joining each flange.

The Owner shall furnish and install all fittings for making connections and shall furnish and install hoses, piping, pumps and all other materials required to convey water to the test reaches. Upon completion of testing, appurtenances shall be removed and the pipeline restored to its former condition.

F HYDROSTATIC TEST

After completion of the pipeline installation, the line shall be tested under the hydrostatic pressure test of 200 psi for a period of not less than 1 hour for each section of pipe tested. The pressure shall be maintained by restoring the test pressure whenever it falls an amount of 25 psi. At the conclusion of the 1 hour, the test pressure shall be restored and all water used during the tests shall be accurately measured to determine the actual leakage.

The Owner shall provide suitable calibrated tanks for measurement of leakage and shall furnish the necessary bulkheads, piping, calibrated gages, pumps, power, labor and other means, and shall do everything necessary for filling the pipeline and for obtaining and maintaining the required water pressure.

The Owner, at his own expense, shall do all excavating necessary to locate and repair leaks or other defects which may develop under test, including removal of backfill already placed. He shall make all repairs necessary to secure the required watertightness and shall replace excavated material, following which the test shall be repeated until the pipe is found satisfactory.

F-1 ALLOWABLE LEAKAGE RATE

The leakage per inch of internal pipe diameter for a 24-hour period at the pressure specified shall be as follows:

For asbestos-cement pipe and fittings - a rate of 28 gallons per day per inch diameter per mile.

Regardless of the rate of leakage, all detectable leaks shall be stopped.

G DISINFECTION OF WATER LINES

After pressure testing and prior to acceptance of the work, the entire pipeline, including all valves, fittings, hydrants, and other accessories shall be disinfected in accordance with AWWA C601 and as follows:

Chlorine residual shall be determined in accordance with the method specified in Appendix to AWWA 601 with amounts of applied chlorine to produce a dosage of 40-50 ppm and a residual of not less than 5 ppm in all parts of the line after a 24-hour period has elapsed by the Representative. The Contractor shall provide and keep chlorine residual testing and indicating apparatus available on the site during the disinfection period.

H FLOW REGULATION DEVICES

H-1 MANUALLY OPERATED VALVES

During chlorination process, all valves and accessories shall be operated. After chlorination, the water shall be flushed at a rate of 2.5 feet per second from the line at its extremities until the replacement water tests are equal, chemically and bacteriologically, to those of the permanent supply.

Following the flushing of the line, the District may require them to have a qualified laboratory perform a bacteriological test. Such a test shall meet the State Department of Health Services requirements for domestic purposes prior to acceptance of the lines by the District for integration and use in the system.

The sterilization of lines and any laboratory testing shall be entirely at the Owner's expense.

**STANDARD SPECIFICATIONS
FOR
BUTTERFLY VALVES**

A GENERAL

These specifications designate the requirements for the manufacture and installation of butterfly valves.

B MATERIALS AND WORKMANSHIP

B-1 BUTTERFLY VALVES

Butterfly valves shall have the same type end configurations as the pipe or fitting on which they are installed. They shall be tight closing, rubber seated valves conforming to the latest revision of AWWA C504, except as herein modified. Valves shall be designed for tight shutoff with no water leaks when subjected to a maximum differential pressure across the disc of 150 psi for valves sizes 4 inches and larger. Valves shaft shall consist of a one-piece unit extending completely through the valve disc. Valve shafts shall be 18-8 Type 304 stainless steel, except where completely sealed from water in the valve. Valve disc fasteners shall be 18-8 Type 304 stainless steel. Valve discs shall be of alloy cast iron, conforming to ASTM A 436, Type 1, or cast iron conforming to ASTM A48, Class 40. The valve disc shall rotate 90 degrees from fully open to the tightly shut position. Valves shall be Dresser 450 or approved equal.

B-2 VALVE OPERATIONS

Valve operators shall be of the manual type. The operators shall be totally enclosed, self-locking, worm gear, or traveling-nut type with adjustable stops to limit disc travel. The number of complete turns of the operator required to rotate the disc 90 degrees shall be approximately the same as an equivalent sized gate valve. All valve operators shall be fully gasketed, weatherproof and factory packed with grease. Operators shall be of the size required for opening and closing the valve against its design water pressure and they shall have a torque rating not less than that shown in AWWA C 504, Table 1, Class 150-B.

Buried operators shall be worm gear or traveling-nut type and shall be equipped with standard AWWA 2-inch operating nuts. Operators shall be specifically designed and suitable for permanent buried service.

Operators for valves located above ground shall have disc-position indicators and a hand wheel.

B-3 INTERIOR COATING

Interior cast-iron surfaces shall be shop coated at the place of manufacture. Surfaces shall be sandblasted in accordance with SSPC-SP-5 (white metal blast cleaning). Two coats of epoxy resin (Keysite 740 or approved equal) shall be applied to a minimum dry-film thickness of 10

mils. The paint manufacturer's application recommendations, including minimum and maximum drying time between the required two coats, shall be followed. Special care must be taken to remove all contaminants adjacent to the seats in order to obtain a bond.

B-4 EXTERIOR COATING

For buried service, valve bodies and operator housings and extensions shall receive two 15 mil (minimum) thickness exterior coat of heavy-duty coal tar equal to Koppers Bitumastic 50. Application shall be at the place of manufacture. The coating shall be applied after the surface has been sandblasted to "commercial" standard as defined in SSPC-SP-6. The paint manufacturer's application recommendations shall be followed.

Above ground valves shall be coated the same as adjacent piping.

B-5 VALVE BOXES

Valve boxes shall be Brooks 1-RT with cast iron cover or equal. Risers may be asbestos concrete pipe, C-900 PVC or steel. If steel pipe is used, it shall be lined and coated with the best grade of air blown California asphalt pipe dip. Covers and concrete pad shall be 3 inches above natural ground or flush with the paved surface.

B-6 NUTS AND BOLTS

Nuts and bolts used for bolting flanged-end butterfly valves to steel pipe flanges above ground shall be standard hexagonal head machine bolts and nuts conforming to ASTM A 307, Grade B. All buried flanged-end valves shall be bolted with cadmium-plated steel nuts and bolts. All bolt threads shall be lubricated with graphite and oil prior to installation. Flanged faces shall be wire brushed and cleaned prior to joining each flange.

All fittings shall be completely encapsulated with a 10-mil wrap of polyethylene film as set forth in the Technical Specifications for Plastic Film Wrap of Valves, Flanges and Other Fittings.

B-7 GASKETS

Gaskets for flanged-end butterfly valves shall be 1/8-inch neoprene (durometer 60-80).

B-8 VALVE END CONFIGURATIONS

End configurations shall be flanged, mechanical joint, "push-on" machined to iron pipe OD dimensions, or combination thereof. "Hub end" valves machined to AC pipe OD dimensions are not acceptable for use with DIP and PVCP.

STANDARD SPECIFICATIONS
FOR
CLEAN-UP

A GENERAL

During the progress of the work, the premises shall be kept free of any unsightly accumulation of rubbish and debris. Upon completion of the work and before final acceptance by the District, all unused materials, rubbish, concrete forms, surplus excavated material and other materials or equipment shall be removed from the work area.

If during the progress of the work any improvements such as fences, lawns, shrubs or other vegetation, whether on private or public property, are damaged, they shall be restored to a condition equivalent to that which existed at the time he started construction operations. These repairs shall be completed prior to acceptance of the completed facilities by the District.

**TECHNICAL SPECIFICATIONS
FOR
CONCRETE CONSTRUCTION**

A GENERAL

The Owner shall place and construct concrete paving, manholes, manhole bases, pipe cradles, curbs, gutters, sidewalks, manhole frame and cover squares, headwalls, detector pad bases, thrust blocks and other works and appurtenances involving concrete where shown on the plans or as shown on the detail drawings.

B MATERIALS AND WORKMANSHIP

All concrete construction shall conform to the provisions of Section 40 and 90 of the State of California Standard Specifications, except as herein modified. Unless otherwise noted on the Plans or in the Specifications, all concrete shall be Class A.

C CONCRETE

C-1 CLASS A

All other concrete shall be Class A containing not less than six sacks of Portland cement per cubic yard and have a minimum compressive strength of 3,000 psi in 28 days.

C-2 CLASS B

Manhole bases and thrust blocks shall be Class B concrete containing not less than five sacks of Portland cement per cubic yard and have a minimum compressive strength of 2,500 psi in 28 days.

C-3 CLASS C

Pipe cradles and cut-off walls shall be Class C concrete containing not less than four sacks of Portland cement per cubic yard and have a minimum compressive strength of 2,000 psi in 28 days.

D CONCRETE DESIGN AND MATERIALS

The Owner shall submit to the Inspector and/or Engineer for approval the design of the mix proposed for use. Said mix design shall set forth weights of cement, sand, coarse aggregate and water to be used together with a grading analysis of sand and coarse aggregate. The source of supply of all materials entering into the mix shall also be given. The mix design and materials shall be approved by the Inspector and/or Engineer prior to placing any concrete.

E REINFORCING

Where reinforced concrete is required as shown on the plans or specified herein, reinforcing steel conforming to the applicable provisions of the State of California Standard Specifications shall be furnished and installed.

STANDARD SPECIFICATIONS
FOR
CONNECTIONS TO EXISTING WORK
(SEWAGE)

A TEMPORARY HANDLING OF SEWAGE

Certain work in connection with tying into existing sewers and manholes may require the temporary handling of sewage either by temporary bypass lines, pumping, bulkheading at low flows, or other means to be approved by the District. Sewage so diverted shall be handled in a manner so as not to create a public nuisance or health hazard. The Owner shall be responsible for any costs related to making these connections.

B REMODELING EXISTING MANHOLES

Connections to existing manholes and to existing sewers shall be at the locations shown on the plans. Where an existing manhole base has to be reworked, provisions shall be made to keep pieces of concrete and debris out of the sewer. Manhole bases shall be reworked as shown on the drawings. Where new flow-through channels have to be cut, they shall be cut so that the resulting section is smooth and conforms to the intended shape. Deviation from form and grade shall not be greater than 1/4 inch. Where holes are required in existing manhole walls for new or revamped connections, the Owner will be required to use coring-type equipment if, in the opinion of the Inspector and/or Engineer, the Contractor's method of making holes will result in excessive damage to existing manholes. The size of the hole shall have a maximum dimension of 4 inches larger than the outside diameter of the pipe and a minimum dimension of 2 inches larger than the outside diameter of the pipe. The annular space shall be filled with dry-pack mortar.

**STANDARD SPECIFICATIONS
FOR
CONNECTIONS TO EXISTING DOMESTIC WATER SYSTEM**

A CONNECTIONS

Whenever the location of existing mains makes it necessary to use a gradual transition on the alignment of the proposed mains, said gradual transition shall be made in the shortest practical distance with the maximum deflection per joint for curves not to exceed 5 degrees. All tie-ins, taps, saddle and connections to existing District mains shall be made in the presence of an authorized District representative.

B VALVES AND HYDRANTS

Installation of valves and hydrants to existing mains may be made by use of stainless steel tapping sleeves, tapping crosses and tapping valves provided that their locations are as shown in the plans and/or specifications. The tapping sleeves and crosses must be mechanical joint type for Class 150 asbestos cement pipe and must be capable of 150 pounds per square inch working pressure such as Mueller H 611 and H 711 or equal. The tapping valve must have essentially the same construction as the AWWA nonrising stem gate valves as specified in the Standard Specifications for Gate Valves.