

STANDARD SPECIFICATIONS
FOR
EARTHWORK

A GENERAL DESCRIPTION

Earthwork shall consist of performing operations necessary to complete all excavation, preparation of subgrade, ditching, structural excavation, trenching, backfill compacting, sloping, trimming the subgrade, and finish grading; all as shown on the plans or contained in the specifications. The Contractor shall furnish all labor, material, tools and equipment necessary for earthwork operations and perform all incidental work thereto as required.

Earthwork shall include all clearing and grubbing, removal and disposal of paving, removal of water, excavation of all classes of earth and rock regardless of character and subsurface conditions and disposal of all excess excavation.

A-1 SCOPE OF WORK

The Work includes furnishing all services, labor, materials, and equipment and perform all operations in connection with all earthwork necessary for the construction of the improvements as indicated on the plans and in the specifications. Excavation shall include the removal of water and all material of whatever nature and shall include clearing of sites for construction.

A-2 EARTHWORK IN STATE AND COUNTY RIGHTS-OF WAY

Earthwork within the rights-of-way of the State of California, Department of Transportation and the County Road Department shall be performed in accordance with requirements and provisions of the permits issued by those agencies for the construction within their respective rights-of-way. Such requirements and provisions, where applicable, shall take precedence and supersede the provisions of the specifications contained herein.

A-3 SAFETY PRECAUTIONS

All excavations shall be performed, protected and supported as required for safety and in the manner set forth in the operating rules, orders and regulations prescribed by the Division of Industrial Safety of the State of California. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrian and vehicular traffic of such excavations.

A-4 BRACING EXCAVATIONS

All excavations shall be properly supported in the manner prescribed by the rules, orders and regulations of the Division of Industrial Safety of the State of California. Excavations shall be so braced, sheeted and supported that they will be safe and the ground alongside the excavation will not slide or settle, and all existing improvements of any kind, either on public or private

property, will be fully protected from damage. If any damage does result to such improvements, the Contractor, at this own expense, shall make the necessary repairs or reconstruction required as directed by the Engineer.

Excavations shall be so braced or sheeted so as to provide conditions under which workmen may work safely and efficiently at all time. The sheeting, shoring and bracing shall be so arranged as to not place any stress on portions of the completed work until the general construction thereof has proceeded far enough to provide ample strength. Any damage to structures occurring through settlements, water or earth pressures, slides, caves or other causes due to failure or lack of sheeting or bracing or improper bracing or through negligence or fault of the Owner or his Contractor in any other manner, shall be repaired by the Owner at his own expense before acceptance by the District.

Where timber sheeting extends below the invert of the pipe, it shall be cut off at the top of the pipe and the upper portion removed without harming the support conditions. This requirement will not be necessary where steel sheeting is used for shoring below the invert of the pipe.

Care shall be exercised in the drawing or removing of sheeting, shoring, bracing and timbering to prevent the caving or collapsing of the excavation faces which are being supported. All expenses of sheeting and shoring as herein specified shall be included in the various contact prices and no additional allowance will be made therefor.

A-5 OPEN EXCAVATIONS AND STOCKPILING

The Contractor shall control open excavations and stockpiling in a manner to prevent water running into excavations. Obstruction of surface drainage shall be avoided and means shall be provided whereby storm and wastewater can flow uninterruptedly in existing or established flowage courses, other surface drains or temporary drains. Material for backfill or for protection of excavation in public roads from surface drainage shall be neatly placed and kept shaped so as to cause the least possible interference with public travel. Free access must be provided to all fire hydrants, water valves, meters, private drives, roads or existing access routes. Adequate barricades and lighting shall be provided by Owner to protect all persons from said open excavations.

A-6 SELECTED MATERIAL FOR PIPE BEDDING AND PIPE ZONE

Selected material for pipe bedding and pipe zone backfill shall be selected native material free from clods, sticks, vegetation, chunks of asphalt paving, or other deleterious materials and shall be free of rocks or stones which are larger than 3/4 inch in greatest dimension.

A-7 SAND

If sand is to be used for pipe bedding or pipe zone, it shall be free from foreign materials such as rocks, sticks, vegetation, etc., and shall meet the following gradation:

<u>Sieve Size</u>	<u>Percentage Passing (By Weight)</u>
3/8 inch	100
No. 4	75 - 100
No. 30	12 - 50
No. 100	5 - 20
No. 200	0 - 10

A-8 AGGREGATE FOR PIPE BEDDING FOUNDATION

If aggregate is required for pipe bedding foundation, it shall be No. 67 crushed aggregate as defined by ASTM D 448 and shall be free from foreign and organic matter.

A-9 OBSTRUCTIONS

The Contractor's attention is directed to the possible existence of pipe and other underground improvements which may or may not be shown on the plans. The Owner and his Contractor shall preserve and protect any such improvements whether shown on the plans or not. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute the work, they shall be removed, maintained in operation, and permanently replaced by Contractor at his expense.

A-10 COMPACTION TESTS

Compaction tests will be made by the testing laboratory designated by the District or by the County. The number of tests and their location and depth shall be determined by the District's Representative. Relative Compaction specified herein and on the approved plans shall be the percentage of the maximum dry density as determined by ASTM D1557 (5 layer only). Compaction tests shall be taken in accordance with D-1556 or as approved by the District.

Backfill of excavations within the rights-of-way of County streets and State highways shall be performed in accordance with the requirements and to the satisfaction of the agencies having jurisdiction.

The Owner or his Contractor shall make all necessary excavations for compaction tests as directed by the Inspector and/or Engineer.

A-11 CORRECTION OF FAULTY GRADES

Where excavation is inadvertently carried below subgrade and/or foundation elevations due to the Contractor's actions, suitable provision shall be made at the expense of the Contractor for adjustment of the subgrade. It shall be the responsibility of the Contractor to restore the subgrade

or foundation to the condition existing prior to the over-excavation and by means acceptable to the Engineer.

A-12 CLEARING AND GRUBBING

The Owner or his Contractor shall perform all required clearing and grubbing and the proper disposal of all trees, brush, roots and other perishable and objectionable material.

The ground surface of all areas where material is to be excavated or where embankments, stockpiles, fills or structures are to be placed, shall be cleared of all vegetation and rubbish, and all brush, roots and tree roots shall be grubbed and removed from such areas. All cleared and grubbed areas shall be maintained free from vegetable growth.

Organic material from clearing and grubbing operations will not be incorporated in pipe backfill.

A-13 BLASTING AND EXPLOSIVES

Written permission from the District shall be obtained prior to any blasting or use of explosives. Explosives, if used, shall be of such quantity and power and shall be used in such locations so as to minimize opening of seams and disturbing of the material outside the prescribed limits of excavation. As excavation approaches its final limits, the depths of holes for blasting and the quantity of explosives used for each hole shall be reduced so that the underlying or adjacent material will not be disturbed, or shattered as little as possible.

Extreme care shall be exercised when blasting in the vicinity of existing structures, utilities or construction facilities of others.

All blasting shall be performed in conformance with the provisions of the Construction Safety Orders of the California Department of Industrial Safety, California Administrative Code, Article 5, Title 8.

A-14 DEWATERING

The Contractor shall provide and maintain at all times during construction ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Said methods may include well points, sump pumps, suitable rock or gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the Engineer.

Dewatering for structures and pipelines shall commence when groundwater is first encountered and shall be continuous until such times as water can be allowed to rise in accordance with the provisions of this section. No concrete footings or floors shall be laid in water nor shall water be

allowed to rise over them until the concrete or mortar has set at least eight hours. Water shall not be allowed to rise unequally against walls for a period of 28 days.

The water from the work shall be disposed of in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed of in such a manner as not to be a menace to the public health.

B PIPELINE AND TRENCH EARTHWORK

B-1 GENERAL

Work in connection with pipeline and trench earthwork shall include but not be limited to any or all of the following described operations: clearing; excavation of all classes and of whatever substance encountered; backfilling; fine grading; preparation of right-of-way; subgrade for pipe and structures; and paving and performing any other similar, incidental, or appurtenant earthwork operation which may be necessary to properly complete the work indicated.

B-2 EXCAVATION FOR PIPE TRENCHES

Trenches for pipelines shall be excavated to the lines and grades shown on the drawings, as provided in these specifications.

B-3 TRENCH WIDTH

The overall trench width shall not be more than 16 inches nor less than 12 inches wider than the largest outside diameter of the pipe to be laid therein, measured at a point 12 inches above the top of the pipe. Excavating and retrenching shall be true to line so that a clear space of not more than 8 inches or less than 6 inches in width is provided on each side of the largest outside diameter of the pipe in place. For the purpose of this article, the largest outside diameter shall be the outside diameter of the bell, on bell and spigot pipe, and outside diameter of coupling for sleeve coupling pipe.

Where the trench width, measured at a point 6 inches above the top of the bell or sleeve of the pipe is wider than the maximum set forth above, the trench area around the pipe shall be reworked to restore a trench condition and provide load factor acceptable to the Engineer. The reworking may result in one or more of the following operations, subject to the approval of the Engineer: (1) Shaping the bottom of the trench to fit the pipe; (2) Placing sand around the pipe and to a point 6 inches above the top of the pipe; (3) Lowering the grade of the pipe until the trench condition can be met; (4) Installing a concrete cradle for the pipe; and (5) Providing concrete encasement for the pipe to a point 3 inches above the top of the pipe.

B-4 LIMIT OF EXCAVATION

Except by special permission of the Engineer, the maximum length of open trench shall not exceed 600 feet in the aggregate at any one location including excavation, construction, pipe

laying and backfilling. In addition, at locations where access may be somewhat limited, requiring rerouting of traffic unnecessarily, the Engineer may reduce the maximum length of open trench permitted.

B-7 PIPE BEDDING

The pipe shall be carefully bedded during initial pipe zone backfill operations by hand placing, slicing with a shovel and tamping or "walking in" the material under the lower sector of the pipe to produce firm support for the full length of the barrel with full bearing on said bottom segment of the pipe equal to a minimum of five-tenths of the outside diameter of the barrel.

B-8 PROCEDURE AT PIPE ZONE

Subsequent backfill in the pipe zone shall consist of placing material as required in these specifications simultaneously on each side of the pipe for the full width of the trench and compacting said material to a relative compaction of 90% within the limits of the pipe zone. The pipe zone begins at the bottom of the pipe barrel and extends to a horizontal plane 12 inches above the top of the outside diameter of the pipe.

The pipe shall be carefully bedded by hand, placing and compacting selected backfill material or clean imported sand as provided herein from the pipe foundation and/or subgrade to the springline of the pipe prior to backfilling above the pipe within the "pipe zone." Clean imported sand shall be used for the pipe bedding when excavated materials are not suitable for pipe bedding or required by the detail plans.

The pipe bedding, using either selected material or clean imported sand, shall be compacted by approved methods to a relative compaction of 85%. The pipe bedding backfill shall be brought to optimum moisture content and shall be placed in layers not exceeding 6 inches in thickness and each layer shall be solidly tamped with the proper tools so as not to injure, damage or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe. Use of water flooding or jetting techniques to assist in achieving compaction may be approved by the Engineer in the event the foundation and bedding materials are sufficiently granular and sandy in nature that the required compaction will be obtained.

Where pipe is not very deep and the pipe zone extends into the street zone, that portion of the pipe zone within the street zone shall be compacted as set forth in Section B-11 of these specifications.

B-9 PROCEDURE ABOVE PIPE ZONE

The remaining portion of the trench to within 2-1/2 feet of the finished roadway surface or ground surface, as the case may be, shall be backfilled, compacted and/or consolidated by approved methods to obtain a relative compaction of 90%. Backfilling may be done with native trench side material except that no oil cake, bituminous pavement, concrete, rock or other lumpy material shall be used in the backfill, unless these materials are scattered and do not exceed 3 inches in any dimension. Material of perishable, spongy, or otherwise improper nature shall not be used in backfilling and no material greater than 3 inches in any dimension shall be placed within 1 foot of any pipe, manhole or structure.

B-5 TRENCH BOTTOM FOR PIPE

The trench bottom shall be graded to provide a smooth, firm foundation at every point throughout the length of the pipe.

The trench shall be excavated to the established grade line of the outside bottom of the pipe. The bottom of the trench shall then be scarified to a minimum depth of 3 inches below the bottom of the pipe and uniformly graded to produce a firm but yielding subgrade which will provide uniform support of the pipe along the full length of each section. The bedding material so prepared throughout a minimum depth of 3 inches shall meet the requirements of Section A-6 of these specifications.

If it becomes necessary to excavate below the established grade line in order to remove boulders or other interfering objects the voids shall be filled with material meeting Section A-6 requirements densified in the manner specified for bedding materials.

Where excavation is in rock, hardpan, shale, or other similar hard and unyielding materials, the trench shall be excavated to a depth at least 6 inches below the established grade line of the outside bottom of the pipe and filled with material as specified in Section A-6 to grade line. The subgrade shall then be completed as previously stated. The material so placed shall be compacted to 90% relative compaction.

When excavation is in soft, unstable or excessively wet material which is unsuitable as a foundation for the pipe, such material shall be removed as directed by the Engineer and replaced with aggregate (Section A-8) to a depth approximately 3 inches below the grade line. The subgrade shall then be completed to the underside of the pipe using trench side native material if suitable, or imported sand if so directed by the Engineer.

At each joint in the pipe, the bottom of the trench shall be recessed in such a manner as to relieve the bell of the pipe or the pipe coupling of all load and to ensure continuous bearing along the pipe barrel upon the bedding material.

B-6 TRENCH BACKFILL

All trenches shall be backfilled when pipe, fittings and appurtenances have been installed. Whenever a relative compaction requirement value is specified herein, it shall be a percentage of the maximum density as determined hereafter. Optimum moisture content and maximum density shall be determined in accordance with ASTM D 1557 and density of soil in place shall be determined using the sand method per ASTM D1556.

All wood and waste material shall be removed from excavation preparatory to backfilling. Backfill material shall be approved in all cases by the Engineer and shall be free of trash, wood, large rock, or other objectionable debris. Backfilling shall include the refilling and compaction of the fill in trenches of excavations up to the subgrade of the street or to the existing ground surface.

B-10 COMPACTION IN OPEN FIELDS

In open fields, where paving or structures will not be above the excavated area, backfill and compaction as specified in Section B-9 herein before shall extend to the top of the trench, leaving the top slightly mounded.

B-11 PROCEDURE AT STREET ZONE

The top 2-1/2 feet of the trench within roadbed areas shall be compacted in horizontal layers not exceeding 8 inches in thickness, using approved hand, pneumatic or mechanical type tampers to obtain a relative compaction of 95% with a moisture content within 2% of optimum or as required by County. Flooding and jetting will not be permitted within roadbed areas. Compaction requirements in the street zone may be modified by the backfill requirements of other government agencies in areas where these agencies have jurisdiction.

The roadbed area as used herein shall be considered as extending two feet beyond the curbs, gutters or paved shoulders.

From existing street grade to 2-1/2 feet below street grade, the material for backfill may contain stones ranging in size up to 2 inches in diameter, but not exceeding 20% of the volume, where said coarse materials are well distributed throughout the finer material and the specified compaction can be obtained.

B-12 EXCESS EXCAVATED MATERIAL

All surplus material not required for backfill shall be disposed of by the Contractor outside the limits of the public rights-of-way and/or easements.

No excavated material shall be deposited on private property, unless written permission is secured by the Contractor. Before the District will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material, absolving the District from any liability connected therewith.

B-13 IMPORTED PIPE BACKFILL MATERIAL

Whenever the excavated material is not suitable for backfill, as determined by the Engineer, the Contractor shall arrange for and furnish suitable imported material at the expense of the Contractor or Owner.

C STRUCTURES EARTHWORK

C-1 GENERAL

Structure excavation shall include the removal of all material of whatever nature necessary for the construction of structures and foundations in accordance the plans and specifications.

The sides of excavations for structures where all vertical surfaces are formed shall be sufficient to leave at least 2 feet in the clear as measured from the extreme outside of formwork or structure, as the case may be. Where excavation is inadvertently carried below designated elevations, suitable provision shall be made for adjustment of construction, as directed by the Engineer, to meet requirements incurred by the deeper excavation beneath structures, and overdepth excavation in such locations shall be rectified by backfilling with sand, graded gravel, or concrete as directed by the Engineer. All overdepth excavations for footings shall be backfilled with Class C concrete, as defined in the Technical Specifications for Concrete Construction.

C-2 SUBBASE FOR STRUCTURES

Where indicated on the plans, a crushed rock subbase shall extend from firm ground undisturbed by the Contractor's operations to the structure base slab for all concrete structures. Any remaining disturbed or loose material shall be removed before the crushed rock subbase is placed. The subbase shall be compacted to the specified relative compaction, 90% minimum or as approved by the District Engineer, by means of a vibratory roller.

C-3 SUBBASE MATERIALS

Mineral aggregate shall conform to the following gradation requirements:

<u>Sieve Size</u>	<u>Percentage Passing Sieves</u>
3/4 inch	90—100
No. 4	40 – 60
No. 30	13 – 23
No. 200	0 - 2

C-4 BACKFILLING

After compaction of foundation footings and walls of the structure and of construction below the elevation of the final grade and prior to backfilling, all forms shall be removed, and the excavation shall be cleared of debris. Backfilling shall not be commenced until the structure and excavation involved shall have been inspected and approved by the Engineer. Material for backfilling shall consist of selected excavation material, imported sand, gravel or other material approved by the District and shall be free of trash, lumber or other debris. No material of a perishable or spongy nature and no stone or piece of rock greater than 4-inches in the greatest dimension shall be used in backfilling.

Compaction shall be obtained by means of mechanical tamping. Backfill of excavated material shall be placed in horizontal layers not exceeding 9 inches in thickness and shall have a moisture content within 2% of optimum, such that the required degree of compaction may be obtained. Each layer shall be compacted by hand, machine tampered, or other suitable equipment to the specified relative compaction, 90% minimum or as approved by the District.

Where backfill or fill is against only one side of a concrete structure, no fill shall be placed until the concrete in place has obtained an acceptable seven-day strength based upon a concrete cylinder test, unless otherwise directed by the District.

Particular care shall be exercised when backfilling at the various structures to obtain adequate compaction beneath pipes connected thereto and to avoid injury or displacement of such pipes or projections of the structures.

STANDARD SPECIFICATIONS
FOR
GATE VALVES

A GENERAL

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

B MATERIALS AND WORKMANSHIP

B-1 GATE VALVES

Gate valves, unless otherwise indicated, shall be the same size as the main in which they are installed. All gate valves shall be nonrising stem, counterclockwise opening. Valves shall have the same type ends as the pipe or fitting on which they are installed. Exposed valves are to have handwheel operators and buried valves are to have 2-inch-square-cast-iron operating nuts and valve boxes. Valves shall be marked with raised lettering cast on the body indicating manufacture and working pressure.

Three-Inch and Smaller Gate Valves

The body and all interior working parts shall be constructed of ASTM B62 (85-5-5-5) Bronze. Stem bronze shall not contain more the 2% aluminum nor more than 7% zinc and shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 30,000 psi, and a minimum of 10% elongation in 2 inches. Handwheels shall be brass. Valves shall be Crane 438, Jones 372, or approved equal.

Four-Inch Through Twelve Inch Gate Valves

Valves shall conform to all sections of the latest revision of AWWA 500 and the following:

Gate valves shall be iron bodied, solid bronze internal working parts, parallel faced, double-disc bottom welding valves, and "O" ring seals. Valves shall be designed for 200 psi minimum working pressure. Bronze for all internal working parts, including stems, shall not contain more than 2% aluminum nor more than 7% zinc. Bronze shall be ASTM B 62 (85-5-5-5) bronze, except that stem bronze shall have a minimum tensile strength of 60,000 psi a minimum yield strength of 30,000 psi, and a minimum of 10% elongation in 2 inches. All body bolts shall be standard hexagonal head machine bolts. Valves shall be Mueller Series A2380, or approved equal.

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 Keystone 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.

Exterior Coating

For buried service, valve bodies and cast-iron portions of the operator housings and extensions shall be coated at the place of manufacture. Surfaces shall be sandblasted in accordance with SSPC-SP 6 (commercial blast cleaning). One coat of heavy-duty coal-tar (Koppers Bitumastic or approved equal) shall be applied to a minimum dry-film thickness of 15 mils. The paint manufacturer's application recommendations shall be followed.

B-2 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-3 NUTS AND BOLTS

Nuts and bolts used for bolting flanged-end 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.

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

B-4 GASKETS

Gaskets for flanged-end gate 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" valve machined to AC pipe OD dimensions are not acceptable for use with DIP and PVCP.

STANDARD SPECIFICATIONS
FOR
HOUSE SEWER CONNECTIONS

A GENERAL

House connections shall be constructed of the type and size and at the locations shown on the plans and as covered by the permit and in conformance with these specifications. The term "house connection" is used in these specifications, the plans, permits and Standard Drawings to designate the sewer line extending from the house soil line 2 feet outside the building to and including its connection with the sewer lateral at the property line including all necessary fittings as shown on the detail drawings.

House connections shall be installed as specified by the most recent revision of the Uniform Plumbing Code adopted by the County of Kern.

B MATERIALS AND WORKMANSHIP

B-1 EARTHWORK

Earthwork for house connections shall conform to the provisions of the Standard Specifications for Earthwork.

B-2 QUALITY OF PIPE AND FITTINGS

House connections shall be constructed of the following material subject to the approval of the General Manager for the specific situation:

Vitrified Clay Pipe, Asphalt-Coated (interior and exterior) Cast Iron Pie, Schedule 40 or 80 ABS Plastic Sewer Pipe, or SDR 35 polyvinyl chloride plastic sewer pipe.

B-3 SIZE OF PIPE

House connections shall be not less than 4 inches internal diameter. If the number of persons to be served is more than ten (10), a pipe size not less than 6 inches in diameter shall be installed.

B-4 DEPTH OF PIPE

House connections shall not be laid less than 12 inches below ground surface in open areas, nor less than 18 inches under driveways, porches and steps, whether covered or uncovered, breezeways, roofed porte-cocheres, carports, covered walks, covered driveways and similar structures or appurtenances.

C CONSTRUCTION

C-1 LAYING PIPE

All pipe shall be laid upgrade on an unyielding foundation true to line and grade and with a uniform bearing under the full length of the barrel of the pipe. Bell and spigot pipe shall be laid with sockets upgrade. Suitable excavations shall be made to receive the bells or collars of the pipe. All adjustments to bring the pipe to line and grade shall be made by scraping away or filling in under the body of the pipe and not be wedging or clocking. The grade of all sewers covered by this specification shall not be less than 1/4 inch to the foot towards the outlet except where otherwise permitted in writing by the General Manager. A standard chimney pipe as shown in the detail drawings shall be constructed where the grade of the standard house connection without a chimney pipe would exceed 100%. Where any portion of the sewer line other than cast iron soil pipe is located within 10 feet of any tree or hedge, the joints of the pipe shall be entirely encased in 4 inches of concrete. All concrete encasement called for in this specification shall be Class C.

C-2 ALIGNMENT

The house connections shall leave the building in a straight and direct line to the house lateral or shall be run in such a manner that the house drain shall discharge into the house sewer at an angle of 45 degrees. Changes in direction shall be made by using 1/16 bend fittings unless "unusual circumstances" dictate the use of 1/8 bends or "tees." Any change from one size of pipe to another shall be made by the use of a reducer. Use of 1/8 bend fittings in order to save ditch digging time will not be considered "unusual circumstances":

House sewers shall be located at the center of the lot.

C-3 CLEANOUTS

The first section of the house connection laying upgrade from the house lateral shall be a cleanout as shown on the detail drawings. Cleanouts shall be placed in every house connection at the junctions with soil pipe at the building and at intervals of 50 feet (maximum) in straight runs. The cleanout shall be the same diameter as the house connection line.

Every change in alignment or grade in excess of 22-1/2 degrees in a house connection shall be served by a cleanout. The extension of house connection cleanouts is required.

Cleanouts shall be installed at locations required by the District, and shall be constructed according to the detail drawings.

C-4 JOINTS AND CONNECTIONS

Joints in vitrified clay pipe shall conform to the provisions of the Standard Specifications for Vitrified Clay Pipe Sewer and Fittings.

Caulked joints shall be used for cast iron pipe. The bell and spigot joint shall be firmly packed with oakum or hemp or other approved material and filled with molten pig lead of a standard

width to a depth of not less than 1 inch and not to extend more than 1/8 inch below the rim of the hub. No paint or varnish or other coatings shall be permitted on the joining material until after the joint has been tested and approved.

D TESTING

All piping of house connections shall be tested in the presence of the Inspector and/or Engineer before the line is backfilled and before the final Certificate of Inspection is issued. All openings in the pipe shall be tightly closed except at the highest point and the piping filled with water. The entire length shall be tested with not less than a 4 foot head of water. All dead ends shall be relieved of air during the process of filling. Under this test condition, the water pressure shall remain constant without showing any addition of water or showing any leaks. The Owner shall at his own expense furnish all materials for making the tests required under the direction of the Inspector and/or Engineer.

E PRESERVATION OF PROPERTY

Any and all damages to private property which occurs as a result of the Contractor's or Owner's operation in connection with the installation of the house connection shall be repaired and/or restored to the original condition. Prior to final acceptance by the District, a signed release by the Owner is to be witnessed and filed with the Inspector that all damages incurred have been restored to the original condition or repaired to his satisfaction.

**STANDARD SPECIFICATIONS
FOR
HOUSE SEWER LATERALS**

A GENERAL

These specifications designate the requirements for furnishing and installations of house sewer laterals.

Sewer laterals shall be constructed of the type and size and at the locations shown on the plans and/or permit and in conformance with these specifications. The term "sewer lateral" is used in these specifications and on the plans to designate a branch sewer laid from a sanitary sewer main to a point on a street or public right-of-way or easement boundary from which sewer service to an individual building unit can be obtained through proper sewer extension by the property owner and shall be constructed according to the form, dimensions and details shown on the detail drawings.

B MATERIALS AND WORKMANSHIP

B-1 EARTHWORK

Earthwork for house laterals shall conform to the provisions of the Standard Specifications for Earthwork.

B-2 QUALITY OF PIPE AND FITTINGS

All sewer laterals and fittings shall be constructed of PVC and shall conform in all respects to the provisions of the Standard Specifications for Polyvinyl Chloride Sewer Pipe.

B-3 SIZE OF PIPE

Sewer laterals shall be not less than 4 inches internal diameter. If the number of persons to be served is more than ten (10), a pipe size not less than 6 inches in diameter shall be installed.

B-4 DEPTH OF PIPE

House laterals shall be placed at such depth to give a minimum of 48 inches of cover to the top of the bell at the property line or to edge of the easement. A minimum of 12 inches of clearance shall be maintained at all times between the house lateral and any domestic water pipe.

B-5 CONSTRUCTION

Sewer laterals and sanitary "wye" branch fittings shall be of the diameter and of the form shown on the plans.

Branch fittings for house laterals shall be installed as may be designated on the plans or as covered by the Permit. Each branch fitting shall have its barrel diameter equal to the diameter of the sanitary sewer main and the spur (or branch) diameter as indicated on the plans. The spur pipe of branch fittings shall be inclined at an angle of 45 degrees from a horizontal line and shall be supported with compacted clean sand, crushed rock or other material approved by the Inspector and/or Engineer in accordance with the details shown on the plans. All "tee" branch fittings that are to be left unconnected shall be plugged with a disc stopper equal in diameter to the outside of the pipe barrel and affixed securely in place with approved jointing compound.

Sewer laterals shall be jointed to branch fittings at the sanitary sewer main as set forth above by eighth bends. All sewer laterals shall be plugged with a stopper in the socket at the last joint of said house laterals which shall be securely jointed and shall lie approximately at the public right-of-way boundary and/or property installation of house laterals shall conform to the applicable provisions of Standard Specifications for Polyvinyl Chloride Sewer Pipe and in accordance with details shown on the plans or as shown on the detail drawings.

C SPECIAL REQUIREMENTS

C-1 LOCATION OF SEWER LATERALS

The location of each sewer lateral shall be marked at its upper end by chiseling a letter "S" 1 1/2 inches high on the top of the curb. If the terminal point of the house lateral is more than 8 feet beyond the curb line or curb improvements do not exist, the Contractor or Owner shall furnish and install a wood stake at the end of the house lateral in conformance with the detail drawings. Sewer laterals shall be located at the center of the lot to be serviced.

C-3 FITTING AT END OF SEWER LATERALS

"Wye" branch fittings shall be installed at the end of Sewer laterals and unconnected ends shall be plugged with stoppers as provided herein.

C-4 PRESERVATION OF PROPERTY

Any and all damage to improvements, whether in private property or public right-of-way, which occurs as a result of the Owner or his Contractor's operations in connection with the installation of house laterals shall be repaired and/or restored to the original condition to the satisfaction of the Inspector and/or Engineer. Improvements shall include but not be limited to curbs, gutters, paving, driveways, lawns, shrubs, fences, retaining walls and any or all improvements. This provision shall apply whether such obstructions are shown on the plans or not.

C-5 TESTING

All piping of sewer laterals shall be tested in accordance with the Standard Specifications for Polyvinyl Chloride Sewer Pipe and in the presence of the Inspector and/or Engineer before the line is backfilled and before the final Certificate of Inspection is issued.

If the house lateral has been previously tested subsequent to the last backfill operation such as an installation and compaction of a crossing waterline, the lateral shall be retested.

All openings in the pipe shall be tightly closed except at the highest point and the piping filled with water; but all parts of its length shall be tested with not less than a 4-foot head of water. All dead ends shall be relieved of air during the process of filling. Under this test condition, the water pressure shall remain constant without showing any addition of water or showing any leaks. The Owner shall furnish all materials for making the tests required at the own expense under the direction of the Inspector and/or Engineer. Test period shall be 10 minutes.

STANDARD SPECIFICATIONS
FOR
INSPECTION OF WORK

A GENERAL

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

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.

The Contractor shall submit a schedule to the District outlining his proposed construction operation. Whenever the Contractor varies the period during which work is carried on each day, he shall give due notice to the District so that proper inspection may be provided. Any work done in the absence of the District Inspector will be subject to rejection.

No valves, 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 Contractor shall give due notice to the District in advance of backfilling so that proper inspection may be provided.

The inspection of the work shall not relieve the Owner and/or Contractor 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 District shall have the authority to suspend the work wholly or in part for such time as it may deem necessary due to the failure on the part of the Owner to carry out orders given, or to perform any provisions of the plans or specifications. The Contractor shall immediately comply with the written order of the District to suspend the work wholly or in part. The work shall be resumed when methods or defective work are corrected as ordered or approved in writing by the District.

In addition to the requirements of the District ordinance under which these specifications are adopted, the Owner shall bear all costs of construction inspection. The Owner shall also bear the cost of traffic regulations lawfully exacted by the Federal Government, the State of California, County or City during the time of performing work affecting the property of said Government, State, County or City.

**STANDARD SPECIFICATIONS
FOR
PERMITS, LICENSES AND NOTIFICATIONS**

A GENERAL

The Owner and his Contractor shall comply with the lawful orders, regulations and ordinances of the State of California and the County of Kern applying to construction operations affecting property or improvements under the respective jurisdiction of said authorities.

B LICENSES AND PERMITS

The Owner and his Contractor shall at his own expense apply for and procure all licenses and permits as required by the regulations or ordinances of said State and County. Copies of said licenses and permits shall be delivered to the General Manager prior to issuance of District permit.

Special attention is directed to the narrow roadways in some streets where work is to be performed. Work in such streets shall be arranged so that vehicular traffic of residents to and from their homes will not be interrupted at any time for more than 8 hours. The Owner shall give advance notice to such residents of the time he expects any street or portion thereof to be closed to traffic.

The District shall be notified in advance when connections are to be made to water consumers. Whenever practical, such connections shall be made during a period of low water usage, but in any event, only after proper authorization from the District.

STANDARD SPECIFICATIONS
FOR
PLASTIC FILM WRAP OF VALVES, FLANGES
AND OTHER FITTINGS

A GENERAL

This specification designates the requirements for the manufacture, and installation for polyethylene plastic film wrap around all valves, flanges and other fittings when buried underground.

B MATERIALS

The polyethylene film shall be of virgin polyethylene and shall meet the requirements of ASTM D 1248 for Type I, Class A, Grade E-1, and shall have a flow rate not exceeding 0.4/min. per ASTM D 1238.

The polyethylene film shall be 10 mils in thickness. The length shall be sufficient to firmly attach the film to the pipe on either side of the valve, flange or fitting. The following minimum flat sheet widths shall be used for the specified valve sizes:

Nominal Valve or Flange Size (Inches)	Minimum Flat Sheet Width (Inches)
4	24
6	24
8	24
10	30
12	36
16	48
18	48
20	48

At the Owner's option, he may purchase tubular material and rip one side to fold out to the required width.

Tape for securing the polyethylene wrap shall be 2-inch-wide adhesive tape, such as Polyken 900 (polyethylene), Scotchwrap 5 (polyvinyl), or approved equal. The tape shall be such that the adhesive will bond securely to both metal surfaces and polyethylene film.

C INSTALLATION

The valves shall be wrapped by passing the flat sheet of film under the valve bottom and bringing the ends up around the body to the stem and securing it in place with 2-inch strips of the plastic adhesive tape. The polyethylene shall be secured around the valve stem in such a manner as to leave the stem free to operate. The film shall be brought completely around the flanges and secured to the pipe with plastic adhesive tape on either side of the valve, flange or fitting.

STANDARD SPECIFICATIONS
FOR
POLYVINYL CHLORIDE PIPE & FITTINGS

A GENERAL

Plastic pipe for water distribution systems shall be PVC with elastomeric gasket joints, either gasket bell and spigot type or plain end with gasket coupling type. Nominal diameters: 4 inches through 12 inches. Pipe shall have cast-iron pipe equivalent (CI) outside diameter. Requirements for fittings, pipe embedment, thrust, anchorage and installation shall comply with AWWA C900-75 and the following options and restrictions.

B PIPE CLASSIFICATION

PVC pipe shall be manufactured for use in water service and shall be designated as Class 150 (DR 18) or Class 200 (DR 14).

C SUBMITTALS

1. Provide an affidavit of compliance with AWWA C900 to the District.
2. Copies of the manufacturer-required tests of the following conducted on project pipe:
 - a. Quick-burst strength of pipe and couplings.
 - b. Flattening resistance of pipe.
 - c. Record of additional tests after test sample failure.
3. Manufacturer's literature of gray iron and ductile-iron fittings including dimensions, thickness, weight, coating, lining and a statement of inspection and compliance with the acceptance tests of AWWA C110-77.

D PRODUCT MARKING

Legibly mark pipe at 5-foot intervals and each coupling to identify the nominal diameter, the OD base, cast iron (CI), the material code PVC 1120 for pipe and PVC 1 for couplings; the dimension ratio (DR) number, AWWA C900 and the seal of the testing agency that verified the suitability of the material for potable water services (nsf in the United States).

E DELIVERY AND TEMPORARY STORAGE OF PIPE

Ship, store and place pipe at the installation site supporting the pipe uniformly. Avoid scratching the pipe surface. Do not stack higher than 4 feet nor stack with weight on bells. If stored for prolonged period, cover to protect from sun's rays.

F MATERIAL

F-1 POLYVINYL CHLORIDE PIPE

AWWA C900-75, gasket bell end or plain end with elastomeric gasket coupling, Class 150 as detailed, cast iron equivalent OD. material and hydrostatic design stress designation: PVC 1120.

G 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. Bells shall be sized specifically for OD of Class 150 cast iron equivalent PVC pipe including rubber ring retaining groove. All fittings shall be wrapped in plastic film per the Standard Specifications.

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 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.

H INSTALLATION

H-1 PIPE LAYOUT FOR CURVED ALIGNMENT

Pipe may be bent for curved alignment, but to no tighter curve than the following:

<u>Pipe Diameter</u>	<u>Minimum Curve Radius</u>
4 inch	100 feet
6 inch	150 feet
8 inch	200 feet
10 inch	250 feet
12 inch	300 feet

H-2 RECEIVING AND STRINGING THE PIPE

1. Unload pipe close to point of installation to avoid handling damage. Avoid scratching the pipe surface.
2. Observe traffic signing and the requirements of encroachment permits.

3. Characteristic deformation of PVC pipe under higher pressure multiples stress concentration at minor imperfections leading to early distress of installations subject to surges. Reject pipe that is gouged, scratched forming a clear depression or marred.

H-3 HANDLING OF PIPE

1. To hoist pipe with mechanical equipment use a cloth belt sling or a continuous fiber rope which avoids scratching the pipe. Do not use a chain. Pipes up to 12 inches in diameter may be lowered by rolling on two ropes controlled by snubbing. Pipes up to 6 inches in diameter can be lifted by hand.
2. Unloading shocks, especially to pipes with a factory assembled bell coupling, are a frequent cause of later rupture under pressure.

H-4 PLACEMENT OF PIPE ON PREPARED TRENCH BOTTOM BEDDING

1. Carry excavation to between 4 and 6 inches below the pipe barrel for the placement of embedment material. If foundation is yielding, over-excavate and stabilize.
2. Fill the trench bottom and cover stabilized foundation with embedment material and compact it with several passes of a vibratory or impact-type machine to obtain a relative compaction of 90% at pipe grade. Shovel out a depression to accommodate the pipe coupling and a space to permit removal of the pipe sling.
3. Lower the pipe onto the bedding in the bottom of the trench. If the embedment material has been graded correctly, the pipe will lie within 1/4 inch of the design elevation, will slope in the same direction indicated on the drawings, and will rest upon the bedding along the full length of the pipe except at the bell and at the pipe sling depression. If not, remove the pipe and regrade the embedment material.

H-5 ASSEMBLY OF THE PIPE JOINT

1. The spigot and bell or bell coupling must slide together without displacing the rubber gasket. This requires a dirt-free spigot and bell and is best accomplished by laying the pipe section with the bell coupling facing the direction of laying.
2. Insert the rubber ring into the groove in the bell in the trench just before joining the pipes. First clean the groove. Observe the correct direction of the shaped ring. Feel that the ring is completely seated.
3. Lubricate the spigot over the taper and up to the full insertion mark with the lubricant supplied by the pipe manufacturer. If the lubricated pipe end touches dirt, clean the pipe end and apply lubricant again.
4. Insert the spigot into the bell and force it slowly into position with the aid of:

- a. For Smaller Diameter Pipes: A large bar lever against a wood block across the open pipe end.
 - b. For Larger Diameter Pipes: A friction puller or come along that is arranged so that chains or wire cables do not scratch the pipe.
5. Check that the rubber has stayed in the groove during assembly by passing a feeler gage around the completed joint.

H-6 FITTINGS

Pipe fittings shall be supported independently of the pipe. Quarter lengths of pipe shall be used in and out of each fitting and valves whenever pipe passes through a rigid structure.

H-7 SANITATION OF PIPE INTERIOR

1. During laying operations, do not place tools, clothing or other materials in the pipe.
2. At night and when pipelaying is not in progress, close the open ends of the pipe by a vermin-proof plug secured so as to discourage tampering by children.

H-8 EXCAVATION AND BACKFILL

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

I 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.

J HYDROSTATIC TEST

After completion of the pipeline installation, the line shall be tested under the hydrostatic pressure test of 200 psi specified in the special provisions 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.

J-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 PVC pipe and fittings - a rate of 10 gallons per day per inch diameter per mile.

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

K 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 C 601 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 at the line after a 24-hour period has elapsed or by the Representative. The Contractor shall provide and keep chlorine residual testing and indicating apparatus available on the site during the disinfection period.

L MANUALLY OPERATED VALVES

During chlorination process, all valves and accessories shall be operated. After chlorination, the water shall be flushed 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 the Owner to have a qualified laboratory perform a bacteriological test. Such a test shall meet the Kern County Health Department 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
PRECAST CONCRETE MANHOLES

A GENERAL

These specifications designate the requirements for finishing and installation of concrete manholes.

Precast concrete sewer manholes shall be constructed in accordance with the design, size and details and at the locations shown on the plans. The manholes shall be constructed of precast eccentric or concentric manhole units in accordance with the plans and these specifications. The precast eccentric manhole shall be used, unless otherwise specified on the plans or in the special provisions.

Manhole locations are fixed and cannot be moved to accommodate pipe manufacturing or laying. If necessary, special lengths will have to be provided to meet manhole location requirements.

B MATERIALS AND WORKMANSHIP

B-1 EXCAVATION AND BACKFILL

Excavation and backfill shall be performed in accordance with the Standard Specifications for Earthwork.

B-2 CONCRETE

All concrete used in the construction of manholes shall conform to the Standard Specifications for Concrete Construction.

B-3 PRECAST MANHOLES

Precast manholes shall conform to the size, shape, form and details shown on the plans. Concrete for precast manhole units shall be Class A concrete. The precast cylinder units, the precast concrete taper sections and precast eccentric flat top sections shall meet the strength requirements for ASTM C 478. Precast manholes shall be equal in all respects to those as manufactured by Associated Concrete Products or centrifugally spun manhole units as manufactured by Ameron or approved equal. The minimum allowable steel shall be hoops of No. 4 wire to be cast into each unit at adequate places as a precautionary measure for handling. Each manhole section shall be set in a bed of grout to make a watertight joint and shall be neatly pointed on the inside and outside and shall be set perfectly plumb. Sections of various heights shall be used in order to bring the top of the manhole ring and cover to the required elevation.

The precast concrete manhole rings shall be joined with a minimum thickness of 1/2 inch of portland cement grout. Grout shall conform to the requirements of the Standard Specifications for Concrete Construction.

Manhole Bases: Manhole bases shall be constructed of Class A concrete to the form and dimensions shown on the details on the plans. Said concrete bases shall be formed and poured on undisturbed soil and/or on gravel subbase as called for in the special provisions. That portion of the base above the invert elevation of the sewer pipe shall be formed to provide a smooth channel section as shown on the plans. The forms shall be checked and approved by the District's Representative for accuracy of dimensions and relative smoothness prior to pouring the base. Channels shall vary uniformly in size and shape from inlet to outlet if required. The manhole base shall be poured as one monolithic pour.

B-4 MANHOLES FRAMES AND COVERS

Manholes frame and cover sets of the type, size and quality as indicated in these specifications or on the plans shall be installed at the locations shown.

Castings for frame and cover sets shall conform to the requirements for gray iron castings in ASTM A 48 for Class No. 30 castings. Before leaving the foundry, all castings shall be thoroughly cleaned and subjected to a hammer inspection, after which they shall be dipped twice in a preparation of asphalt or coal tar and oil applied at a temperature of not less than 290 F, nor more than 310 F and in such a manner as to form a firm and tenacious coating. Each cover shall be ground or otherwise finished so that it will fit in its frame without rocking, and frames and covers shall be match-marked in sets before shipping to the site. Covers shall have the word "Sewer" and the initials "LPUD" cast thereon as shown in these specifications or on the plans. Shop drawings of all manhole rings and covers shall be submitted to the Engineer for approval.

Setting Manhole Frames and Covers: The elevations at which manhole frames and covers are to be set shall conform to the requirements set forth on the plans, but in all cases shall be governed by the District's Representative in the field. Where the cover is in existing pavement or in the traveled way of the existing road shoulder, it is to be placed flush with the existing surface. Where the structure is outside the limits of the traveled shoulder but not in the roadside ditch, it should be placed 1/10 foot or more above the existing ground surface. Where the manhole cover falls in the existing roadside ditch or right-of-way, it is to be placed approximately 1-1/2 feet above the existing ground surface or as directed by the Inspector and/or Engineer. Manhole frames shall be set at the required grade and shall be securely attached to the top precast manhole shaft unit with a grout bed and fillet as shown on the plans. After the frames are securely set in the place provided herein, covers shall be installed and all necessary cleaning and scraping of foreign materials from the frames and covers shall be accomplished to ensure a fine satisfactory fit.

B-5 DROP MANHOLES

Drop manholes shall be constructed at the location and in conformance with the details shown on the plans. Materials and construction of drop manholes shall conform in all respects to the

applicable provisions of these specifications for standard precast manholes (including frames and covers), with modifications for the addition of drop inlets as set forth on the plans. The inside diameter of the drop inlet pipe shall be the same diameter as the intercepted sewer, unless otherwise noted on the plans or in these specifications.

B-6 STUBS AT MANHOLES

Vitrified clay pipe stubs shall be furnished and installed at manholes at the locations and in conformance with details shown on the plans and as herein specified. All stubs shall be plugged with a vitrified clay stopper or brick plug as shown on the plans. Unless otherwise noted on the plans, vitrified clay stoppers shall be used to plug stubs up to and including 21 inches and brick plugs shall be used on stubs greater than 21 inches.

B-7 SEWER PIPE AND FITTINGS

All sewer pipe and fittings, including installation at manholes, shall conform to the provisions of the Standard Specifications for the type of sewer pipe used in the Construction.

B-8 RESURFACING

Resurfacing of all excavations for construction of manholes shall conform to the applicable permits.

B-9 WATERTIGHTNESS OF MANHOLES

It is the intent of the plans and these specifications that manholes and appurtenances be watertight and free from infiltration. The adequacy of manholes and appurtenances as to watertightness shall be determined when ordered by the Inspector and/or Engineer by filling the manhole with water. When testing of the manholes is ordered, said test may be made in connection with the leakage test of the sanitary sewer. Any evidence of leakage as a result of testing shall be repaired to the satisfaction of the Inspector and/or Engineer at the sole expense of the Contractor or Owner.

B-10 RAISING OF MANHOLES WITHIN SURFACED STREETS

The Owner shall be responsible for raising manhole frames and covers to finish grade as shown on the detail drawings within 30 days after pavement placement has been completed.

B-11 MANHOLE STEPS

Steps shall be installed in manholes not to exceed 12 inches apart vertically. Steps shall be constructed of 0.5 inch diameter, Grade 60, concrete reinforcing steel per ASTM A-615, covered with copolymer polypropylene plastic, Model PS2-PF, as manufactured by MA Industries, Inc., or equal.

STANDARD SPECIFICATIONS
FOR
RAILROAD CROSSINGS

A GENERAL

These specifications summarize certain minimum requirements by the District where proposed improvements affect railroad property and facilities.

B NOTIFICATION

No work of any character shall be commenced on railroad right-of-way until the Railroad Company and the Owner have entered into an appropriate agreement; and the company has issued a permit to the Owner and has been duly notified by the Owner, in writing (with a copy forwarded to the District) of the date he proposes to begin the work; or until an authorized representative of the railroad is present, unless the railroad company waives such requirement.

C INSPECTION BY RAILROAD COMPANY

All work performed by the Owner within the right-of-way limits of the railroad shall be subject to the inspection and approval of the Chief Engineer of the railroad company or his authorized representative, and any precautions considered necessary by said Chief Engineer to safeguard the property, equipment, employees and passengers of the Railroad Company shall be taken by the Owner without extra compensation.

D COOPERATION WITH RAILROAD COMPANY

The Owner shall, without extra compensation, take such precautions and erect and maintain such telltale or warning devices as the Railroad Company considers necessary to safeguard the operation of its trains. The temporary vertical and horizontal clearances specified by the Chief Engineer of the Railroad Company in approving these shall be maintained at all times. No steel, brick, pipe or any other loose material shall be left on the ground in the immediate vicinity of the railroad track. The Owner shall so plan his work as not to delay railroad company operations in making track changes or placing temporary or permanent operations and/or permanent structures or work incidental thereto.

E SURETY BOND

The above-mentioned agreement shall contain a surety bond in an amount of \$10,000 to be executed by a reliable surety company and will be held to apply to any inspection, flagging, or related costs to the railroad.

F SPECIAL ENDORSEMENT

Each public liability and property damage and motor vehicle public liability and property damage insurance policy as specified in the general conditions shall contain the following endorsement verbatim:

"The Owner hereby releases and agrees to indemnify Railroad from and against all cost, expense, claims and liability for injuries to or deaths of persons (including, but not limited to, passengers and employees of Railroad), and damage to or loss of property (including, but not limited to property owned, leased, occupied or used by, or in the care, custody or control of Railroad or the employees of Railroad) howsoever the same may be caused, resulting from, arising out of, or in any way connected with the prosecution of the work under said contract upon or adjacent to Railroad's property at said location. For purposes of this section, the term "Railroad" shall include any other Railroad company using Railroad's property at said location with Railroad's consent and any affiliate, subsidiary or lessor of Railroad."

Certified copies of the above policies shall be furnished the railroad company.

STANDARD SPECIFICATIONS
FOR
REMOVAL AND RESURFACING OF
STREET PAVEMENT AND SURFACES

A GENERAL

Street pavement and surfaces shall be removed and replaced in all areas of construction excavation in conformance with details shown on the plans and as specified herein. Resurfacing of existing pavement and surfaces damaged or removed in connection with the construction of improvements shall conform for the provisions of permits issued by the state or county agency for the work within the rights-of-way of the respective agency.

B EARTHWORK

All earthwork shall conform to the provisions of the Standard Specifications for Earthwork.

C PAVEMENT REMOVAL

C-1 GENERAL

Street pavement or existing road surfacing shall be removed within the limits of all construction excavations prior to proceeding with excavation operations of any nature. Surplus material shall be removed as provided in the Technical Specifications for Earthwork. Prior to removal of existing surfacing, pavement cuts shall be made as shown on the plans and/or specified herein. All pavement cuts shall be neat and straight along both sides of the trench and parallel to the alignment of the pipe to provide an unfractured and level pavement joint for bonding existing surfacing with pavement replacement. Where large irregular surfaces are removed, such trimming or cutting as hereinafter provided shall be parallel with roadway centerline or at right angles to the same. All cut edges shall provide clean, solid, vertical faces free from all loose material.

C-2 PORTLAND CEMENT CONCRETE SURFACES

Concrete pavement, including cross-gutters, curbs and gutters, sidewalks, driveways and concrete surfaces of whatever nature, shall be saw cut to minimum depth of 1-1/2 inches prior to removal in accordance with details shown on the plans or as specified herein. Said saw cut shall be made at a point approximately 1 foot beyond the edge of the trench and/or excavation. With the written permission of the Property Owner or Governing Agency, pneumatic tools or other approved equipment may be used to cut concrete pavement prior to removal at the limits of the excavation. In such an event, the saw cut, as provided herein, shall be made after backfilling, and the additional concrete pavement shall be removed and disposed of by the Contractor prior to resurfacing.

C-3 ASHALT CONCRETE PAVEMENT

Streets and alleys surfaced with asphalt concrete pavement shall be initially cut by means of pneumatic pavement cutters or other approved equipment at the limits of the trench and/or excavation prior to removal of surfacing. After backfilling the excavation, asphalt concrete pavement shall be saw cut to a minimum depth of 4 inches at a point not less than 9 inches outside the limits of excavation or the previous payment cut (made by pneumatic tools), whichever limits are the greater. The additional surfacing so cut shall be removed and disposed of by the Contractor prior to resurfacing.

C-4 ROAD MIXED SURFACING

Streets and alleys surfaced with road mixed surfacing shall be cut at the limits of the trench and/or excavation prior to removal of existing surfacing. Cuts may be made with pneumatic tools or other approved equipment. The extra trimming width by saw cuts prior to resurfacing will not be required.

D RESURFACING

In all streets or alleys in which the surface is removed, broken or damaged by equipment or in which the ground has caved in or settled due to the installation of the improvements, the surface shall be restored to the original grade and crown section by the Contractor. In the absence of specified designation on the plans, and where the street has been improved with roadway surface, base course, curb, sidewalk or gutter, trenches or damaged sections shall be restored with the type of improvement conforming to that which existed at the time the Contractor entered upon the work. Prior to resurfacing, the existing surfacing shall be removed as provided above. All broken and jagged edges of the trench edge shall be straight. Areas to be cut shall be indicated by the Owner and no permanent pavement shall be placed until these edges have been sawed. If during the initial removal of the existing pavement a method of removal was used which disturbed the adjoining pavement or if during general construction the adjacent pavement was disturbed, then this adjoining pavement must also be removed and replaced. Disturbed or undermined cement treated base shall be removed and replaced with its equivalent aggregate base, and asphalt concrete paving above the cement treated base shall be sawed in a straight line and replaced in kind. Where irregular surfaces are to be surfaced, existing pavement shall be cut parallel to the alignment of the pipe or to the centerline of the street at the Owner's discretion. End cuts shall be perpendicular.

All work shall match the appearance of the existing improvements and finished pavement shall not deviate from existing grade by more than 1/8 inch in 10 feet and shall be free from ruts, depressions, and irregularities. Asphaltic emulsion shall be applied to the vertical faces of all asphaltic concrete pavement against which the pavement replacement materials are to be placed. The completed surface, when ready for acceptance, shall be thoroughly compacted, true to grade and cross section and shall be free from ruts, depressions and irregularities. Where the trench line is approximately parallel with the traveled way, the pavement shall be brought to the final grade with a Barber-Green paving machine or approved equal. The resulting edge of contact between

the new and existing pavement on each side shall parallel the existing trench and be a straight and neat joint line. New pavement shall not lap over existing pavement.

All work shall be in accordance with County requirements.

STANDARD SPECIFICATIONS
FOR
RESILIENT SEAT GATE VALVES

A GENERAL

These specifications designate the requirements for the manufacture and installation of 3-inch through 12-inch resilient seat gate valves.

B MATERIALS AND WORKMANSHIP

B-1 GENERAL

Resilient seat gate valves shall conform to the requirements of AWWA C-509 and the requirements set forth herein.

Resilient seat gate valves, unless otherwise indicated, shall be the same size as the main in which they are installed and shall be flange connected to cast iron fittings. All valves shall be non-rising stem, counterclockwise opening. Valves shall have the same type ends as the pipe or fitting on which they are installed. Valves are to have 2-inch-square cast-iron operating nuts. Valves shall be marked with raised lettering cast on the body indicating manufacture and working pressure. Minimum water working pressure to be 200 psig.

Valves shall be iron bodied, bronze mounted, with modified wedge disc or parallel faced disk with replaceable resilient seats. The bronze stem nut shall be solid bronze conforming to ASTM B-62 (4-6% zinc). The bronze stem shall be cast bronze or forged bronze bar stock containing a maximum of 2% zinc. Valves shall be manufactured by Mueller, Clow or approved equal.

B-2 INTERIOR COATING

The interior of the valve body and wedge shall be coated at the place of manufacture. Surfaces shall be sandblasted in accordance with SSPC-SP-5 (white metal blast cleaning). Interior coating shall consist of a two coats of epoxy resin, Keysite 740 or equal, applied to a minimum dry-film thickness of 10 mils.

B-3 EXTERIOR COATING

For buried service, valve bodies and cast-iron portions of the operator housing and extensions shall be coated at the place of manufacture. Surfaces shall be sandblasted in accordance with SSPC-SP-6 (commercial blast cleaning). One coat of heavy-duty coal-tar (Koppers Bitumastic 50 or approved equal) shall be applied to a minimum dry-film thickness of 15 mils. The paint manufacturer's application recommendations shall be followed.

B-4 VALVE BOXES

The steel pipe shall be lined and coated with the best grade of air-blown California asphalt pipe dip. Valve box shall be Brooks 1-RT with cast iron cover or equal. Covers and concrete pad shall be 3 inches above natural ground or flush with the paved surface.

B-5 NUTS AND BOLTS

All flanged-end fittings shall be bolted with cadmium plated steel machine bolts and nuts conforming to ASTM A-307, Grade B. All bolt threads shall be lubricated with graphite and oil prior to installation. Flange faces shall be wire brushed and cleaned prior to joining each flange.

B-6 GASKETS

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

B-7 PLASTIC FILM WRAP

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

B-8 END CONFIGURATIONS

Valve ends shall be mechanical joint, flange, push-on, machined to iron pipe OD dimensions or other type as required and noted on the approved construction plans. Where flanged end valves are used, the flanges shall conform to the bolt circle and bolt hole dimension for flanges in AWWA C-110. Hub-end valves machined to AC pipe OD are not acceptable for use with DIP and PVCPC.

**STANDARD SPECIFICATIONS
FOR
SEWER CLEANOUTS**

A GENERAL

Sewer cleanouts shall be constructed at the locations on the plans, in accordance with Standard Details for Sewer Cleanout.

B CONSTRUCTION

The polyvinyl chloride pipe sewer cleanouts and chimneys shall be encased with Class A Portland cement concrete to the form and dimensions as shown on the detail drawings. The base of the concrete encasement shall be poured against firm, undisturbed earth.

STANDARD SPECIFICATIONS
FOR
STEEL CASING PIPE

A GENERAL

Steel casing pipe shall be installed at the locations and to the lines and grades indicated on the plans or detail drawings and as herein specified. All work shall conform to the specifications and requirements of the State of California Department of Transportation (Cal Trans), the County of Kern, and/or the Railroad Company involved. It shall be the Owner's responsibility to secure all necessary permits for casing pipe installation. The Owner shall submit one copy of said permit(s) to District prior to start of construction.

B MATERIALS AND WORKMANSHIP

B-1 GENERAL

The equipment, materials and methods used for the construction of the complete installation of the casing pipe and the carrier pipe shall be determined by the Owner to the extent that the final and completed installation receives the approval of the Inspector and/or Engineer and is consistent with the intent of these specifications.

The Owner may present an alternate detailed proposal in lieu of the methods and materials specified herein to jack or bore casing pipe under the locations as shown on the plans. Such proposal shall be subject to the sole approval of the Inspector and/or Engineer and shall be presented sufficiently in advance of the work to allow adequate time for checking and must be in accordance with all the conditions set forth in the necessary permits.

B-2 MATERIALS

Steel casing pipe shall be butt welded Steel pipe, conforming to ASTM A-53, Grade B, electric resistance welded (ERW). All field joints also shall be butt welded full circumference or by other means approved by the Inspector and/or Engineer. Use of a jacking band to reinforce the end of the pipe receiving the jacking thrust will be required. All joints shall be capable of resisting the jacking stresses without failure. Wall thickness of casing pipe shall be a minimum of 3/8 inch and the diameter shall be of the minimum size shown on the plans or as covered by the permit.

B-3 INSTALLATION

B-3.1 GENERAL

Steel casing pipe of the minimum size and thickness shown on the Plans shall be installed in place by jacking and/or boring methods without the use of water or air, at the locations and to the lines and grades shown on the Plans.

B-3.2 SEWER PIPELINE

The sewer pipelines, which are gravity flow, are designed at grades which will not permit variance from the lines and grades as shown. It shall be the Owner's responsibility for choosing a size of casing at/or above the minimum specified in order that the jacking may be done with a sufficient degree of accuracy to permit installation of the carried pipe to the grades shown on the plans. Should voids or loss of ground occur during jacking operations, said voids shall be filled with grout consisting of a lean mixture of cement and sand. The carrier pipe shall be supported on wood skids in such a manner as to relieve the pipe bells from all load and bearing. After the sewer carrier pipe has been installed, the space between the pipe and the casing pipe shall be hydraulically backfilled with sand to provide a firm bedding. The end of all casing pipe shall be sealed with an end seal constructed of 1/8-inch thick neoprene fastened with stainless steel clamps.

B-3.3 WATER PIPELINE

The water carrier pipeline shall be installed in the casing per the detail drawings, and shall not require filling of the annular space between the inside of the casing and the outside of the carrier pipe.

B-4 EARTHWORK AND RESURFACING

Earthwork and resurfacing shall conform respectively to the provisions of the Standard Specifications for Earthwork and Removal and Resurfacing of Street Pavement and Surfaces.

STANDARD SPECIFICATIONS
FOR
USE OF COMPLETED FACILITIES

A GENERAL

The District shall have the right upon ten days written notice to the Owner and his surety to take possession of and use any completed or partially completed portion of the work notwithstanding that the time for completing the entire work may not have expired, but such taking possession and use and assumption of maintenance of any portion of the work shall not be deemed an acceptance of any work. It is the intent of this section to provide for the District placing into operation portions of the facilities as the work progresses. It shall be mandatory upon the Owner to test and make ready for operation each section of the sewers between manholes or watermains between intersections within 14 consecutive calendar days following the completion of the pipe laying for any such section.

When the Owner has completed any section of the sewers or watermains in all respects except for trench resurfacing, the General Manager may so notify the Owner and his surety in writing as provided herein. After such notice has been given, the District shall have the right to place such section of the facility into service and to operate same. The Owner will be relieved of the duty of maintaining and protecting said portion of the work except for said resurfacing. When resurfacing is not required pursuant to the plans and specifications for completed portions of the work, the Owner shall be relieved of the responsibility and duty of maintaining and protecting portions of the roadway only with written notice from the Inspector and/or Engineer.

However, nothing in this section shall be construed as relieving the Owner of the full responsibility for making good defective work or materials as specified in the General Provisions.

**STANDARD SPECIFICATIONS
FOR
WATER SERVICES**

A WATER SERVICES

Water services shall be installed at the location shown on the plans using the type of materials, fittings, valves and appurtenances as shown on the detail drawings at the back of these Specifications. The water services shall be terminated at a lock-wing angle meter stop at the location as shown on the plans.

B WATER METERS

Water meters shall be installed at the location shown on the plans.

C METER BOXES

Concrete meter boxes shall be purchased and installed by the Owner for each meter connection as shown on the plans. Meter boxes shall be Brooks No. 1-RT or equal with cast iron traffic lids or approved equal.

CONTENTS

FORMS

FORM DESCRIPTION

CONTRACT

PERFORMANCE BOND

PAYMENT BOND

GUARANTEE BOND

CONTRACTOR'S CERTIFICATE REGARDING WORKER'S COMPENSATION

CERTIFICATE OF INSURANCE (WORKER'S COMPENSATION)

INSURANCE ENDORSEMENT (WORKER'S COMPENSATION)

CERTIFICATE OF INSURANCE (LIABILITY)

INSURANCE ENDORSEMENT (LIABILITY)

GRANT OF UTILITY EASEMENT

CERTIFICATE OF ACCEPTANCE OF PUBLIC UTILITY EASEMENT

GRANT DEED AND DEDICATION

ACCEPTANCE

CONTRACT

SEWER AND/OR WATER SYSTEM IMPROVEMENTS

This contract, dated _____, 19____, is made by and between the LAMONT PUBLIC UTILITY DISTRICT, hereinafter called "District", and _____, hereinafter called "Owner". This contract contains all the terms of the agreement between the District and the Owner concerning domestic water and/or sanitary sewer system improvements to be furnished and constructed for by the Owner, and dedicated to and accepted by the District for inclusion into the District's domestic water and/or sanitary sewer system.

ARTICLE I. SANITARY SEWER AND DOMESTIC WATER SYSTEM IMPROVEMENTS TO BE CONSTRUCTED

The improvements to be constructed as part of the sewer system shall consist of sewer pipelines, manholes, cleanouts, and other appurtenances. The improvements to be constructed as part of the water system shall consist of water pipelines, valves, fittings, service connections, fire hydrants and other appurtenances. These improvements shall serve the subdivision or parcel of land described in the Attached Exhibit "A".

ARTICLE II. OWNER'S ENGINEER

Owner hereby names as his engineer to prepare the construction documents for the proposed improvements:

Firm's Name

Engineer to Contact

Certificate No.

Street Address

City, State and Zip Code

(____)_____
Phone Number

ARTICLE III. DISTRICT IMPROVEMENT STANDARDS

The District Specifications for Sanitary Sewers and Domestic Water Systems, hereinafter called District Specifications, is hereby made a part of this Contract by reference as though set forth in full in this Contract.

ARTICLE IV. FEES

1. PLAN CHECK AND INSPECTION FEE

As described in Section 2-4.2 of the General Conditions of the District Specifications, the Owner shall, when provided with the amount of the plan checking fees calculated in accordance with District ordinances, pay that amount to the District prior to the final approval of the plans. Prior to the start of construction the Owner shall deposit with the District the estimated cost of inspection as calculated by the District. In the event the cost of inspection does not require all of such deposit, then the balance thereof will be returned to the Owner. If the inspection costs exceed the amount deposited, the Owner shall deposit an additional sum sufficient to cover the deficiency.

2. WATER SERVICE AND SEWER CONNECTION CHARGES

Pursuant to the District ordinances, a Water System Connection charge in the amount of \$_____, a Sewer System Connection charge in the amount of \$_____, a Water Capacity fee in the amount of \$_____, and a Sewer Capacity fee in the amount of \$_____ is to be paid to the District by the Owner at the time plans are approved.

ARTICLE V. INSURANCE REQUIREMENTS

As required by Section 7 of the General Conditions of the District Specifications, the Owner shall provide to the District proof of his Contractor's Worker's Compensation Insurance and Liability Insurance on the forms provided by the District. No alteration or substitution of said forms will be allowed.

No work shall be permitted until the required insurance forms have been filed with and approved by the District.

ARTICLE VI. CONSTRUCTION SECURITY

As required by Section 8 of the General Conditions of the District Specifications, the Owner shall provide to the District proof of Performance Bond and Payment Bond on the forms provided by the District. No alteration or substitution of said forms will be allowed. No work shall be permitted until the bond forms have been filed with and accepted by the District.

ARTICLE VII. ACCEPTANCE OF THE WORK BY THE DISTRICT

After the construction of the improvements described in Article I have been completed to the satisfaction of the District and any sums due have been paid by the Owner to the District, the District will issue a notice of acceptance of the domestic water system and sanitary sewer system improvements.

ARTICLE VIII. TERMINATION OF CONTRACT

Owner may terminate this agreement upon giving written notice to the District. In which event, the District will prepare a statement summarizing the costs to the District and deposits made by the Owner. If cost(s) exceeds the deposit(s), Owner shall pay the sum due to the District within 30 calendar days. If deposit(s) exceeds the cost(s), District will reimburse the Owner the sum due Owner within 30 calendar days.

ARTICLE IX. GIVING NOTICE

Any notice to be given hereunder by either party to the other party shall be by personal delivery in writing or by registered or certified mail, postage prepaid, return receipt requested. Either party may change its address by written notice in accordance with this paragraph.

The addresses of the parties to this agreement as of the date of this agreement are:

DISTRICT

OWNER

LAMONT PUBLIC UTILITY DISTRICT
8624 Segrue Road
Lamont, CA 93241

President
Board of Directors

Date

District Secretary

Date

Approved as to form
District Counsel