TECHNICAL SPECIFICATIONS

City of Gilroy
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CITY OF GILROY

STATE OF CALIFORNIA

STANDARD SPECIFICATIONS

NOTICE

The City Engineer, on behalf of and as authorized by the City of Gilroy, State of California, requires that all public improvements within the City of Gilroy shall be constructed in accordance with the Standard Details and these Standard Specifications. The Standard Specifications are defined as these Standard Specifications and supplemented by the State of California, Department of Transportation (Caltrans), Standard Plans and Specifications latest version.

In case of conflict, the Standard Details of the City of Gilroy take precedence over the City of Gilroy Standard Specifications, which take precedence over the plans and the Caltrans Standard Specifications.

The Standard Details and Specifications may be modified in special cases on a case-by-case basis by the City Engineer.

Amendments to the Caltrans Standard Specifications may be issued by the State of California and will require adoption by the City Engineer to become a part of the City of Gilroy Standard Specifications.

The City Engineer may also issue clarifications and amendments to these Standard Specifications as required.

Interpretations of the Standard Specifications can be obtained from the City Engineer.

It is the responsibility of all persons to utilize the Standard Specifications containing the latest revision.

Standard Plans and Specifications Purchase

Each set of Standard Specifications may be purchased from the City of Gilroy, Engineering Division. Each and every purchaser of these Standard Specifications shall be responsible for obtaining the revisions from the City of Gilroy, Engineering Division, 7351 Rosanna Street, Gilroy, California 95020.

Interested parties who wish to suggest changes or amendments to these Standard Specifications may contact the City Engineer.

Section 1

DEFINITIONS AND TERMS

1.01 General

Whenever the following terms occur in the Standard Plans and Specifications, the meaning shall be interpreted as follows:

State of California - The City of Gilroy

Department of Transportation - The Engineering Division of the City of Gilroy

Division of Highways - The Engineering Division of the City of Gilroy

Director - The City Engineer of the City of Gilroy

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

Section 16

CLEARING AND GRUBBING

16-1.01 **Description** (The following shall apply in lieu of Sec. 16-1.01 of Caltrans Standard Specifications)

This work shall consist of removing all objectionable material within the limits shown on the plans and as directed by the Engineer. Clearing and grubbing shall be performed in advance of grading operations and in accordance with the requirements of these specifications.

16-1.02 **Preservation of Property**

All existing street designation and traffic control signs and posts within the aforementioned limits of work shall be carefully removed, cleaned of excess earth and delivered to the City Corporation Yard at 613 Old Gilroy Street, except those required for traffic control as determined by the City Engineer.

16-1.03 **Construction**

The area to be cleared and grubbed shall be the area shown on the plans, unless otherwise specified in the Special Provisions.

All stumps, large roots and other objectionable material shall be removed to a depth of 3 feet below finished grade in the area between curbs, and to a depth of 12 inches below finished grade in the area between curb and property line. The resulting spaces shall be backfilled with suitable material placed and compacted in accordance with the applicable provisions of Section 19-6.02 "Compacting" within the latest version of the Caltrans Standards Specifications.

16-1.04 **Removal and Disposal of Materials**

Combustible debris shall be disposed of away from the site of the work. Burning within the limits of the project will not be allowed.

Section 19

EARTHWORK

19-1.01 Description

Unsuitable material may be removed and replaced, or may be stabilized in accordance with the provisions of Section 19-2.02 below, "Unsuitable Material".

19-1.03 Grade Tolerance

Immediately prior to placing subsequent layers of material thereon, the grading plane shall conform to one of the following:

A. When aggregate subbase or aggregate base are to be placed on the grading plane, the grading plane shall not vary more than 0.05' above or 0.1' below the grade established by the Design Engineer.

B. When asphalt concrete base is to be placed on the grading plane, the grading plane shall not vary more than 0.05' above or below the grade established by the Design Engineer.

C. Grading in landscape area shall be plus or minus 0.3'.

19-2.02 Unsuitable Material (The following shall apply in lieu of Section 19-2.02 of Caltrans Standard Specifications)

Material below the natural ground surface in embankment areas, and basement material below the grading plane in excavation areas, that is determined by the Engineer to be unsuitable for the planned use, shall be excavated and disposed of or stabilized as directed by the Project Geotechnical Engineer and approved by the City Engineer.

The removal and disposal of such unsuitable material will be paid for as roadway excavation for the quantities involved.

When unsuitable material is removed and disposed of, the resulting space shall be filled with material suitable for the planned use. Such suitable material shall be placed and compacted in layers as hereinafter specified for constructing embankments. Suitability shall be determined by the Project Geotechnical Engineer and approved by the City Engineer.

A. Unsuitable material may be processed in place, may be excavated and placed on the grade or other locations suitable for further processing, or may be partially excavated and partially processed in place.
B. Processing may consist of drying to provide a stable replacement material as determined by the Geotechnical Engineer and approved by the City Engineer.
C. Stabilized material shall be placed and compacted in layers as hereinafter specified for constructing embankments.
D. Stabilization of unsuitable material shall comply with the following provisions:

Relative compaction of not less than 95 percent shall be obtained for embankment under bridge and retaining wall footings without pile foundations within the limits established by incline planes sloping 1.5:1 out and down from lines one foot outside the bottom edges of the footing.

19-5.04 **Relative Compaction** (90 percent - California Test 216 and 231) (The following shall apply in lieu of Section 19 5.04 of Caltrans Standard Specifications)

Relative compaction of not less than 90 percent shall be obtained in all materials in embankment except as specified here to be 95 percent. Material placed in accordance with the provisions of Section 19 2.02, "Unsuitable Materials," shall be compacted to not less than 90 percent relative compaction.

Section 25

AGGREGATE SUBBASE

25-1.01 Description

Aggregate Subbase shall be Class 4.

25-1.03 Materials

Aggregate Subbase - Class 4 shall have a minimum sand equivalent value of 21, a minimum R-value of 50, and shall conform to the following gradings:

Sieve Size	Percent Passing
3"	100
1-1/2"	90-100
3/4"	50-90
#4	25-55
#200	2-11

The material retained on the #4 screen shall consist of 100% crushed particles.

25-1.03 Grade Tolerance

The subgrade to receive aggregate subbase, immediately prior to spreading, shall not vary more than 0.05-foot above or 0.1-foot below the grade established by the Engineer.

25-1.05 Compacting

The surface of the finished aggregate subbase shall be firm and unyielding. Any visible movement vertically or horizontally of the aggregate subbase under the action of construction equipment or other maximum legal axle loads shall be considered as evidence that the aggregate subbase does not meet this requirement.

Section 26

AGGREGATE BASE

26-1.01 Description

Aggregate base shall be Class 2, and the combined aggregate shall conform to either of the gradings specified in Section 26-1.02A, "Class 2 Aggregate Base" located within the latest version of the Caltrans Standards.

26-1.05 Compacting

The surface of the finished aggregate base shall be firm and unyielding. Any visible movement vertically or horizontally of the aggregate base under the action of construction equipment or other maximum legal axle loads shall be considered as evidence that the aggregate base does not meet this requirement.

Section 39

ASPHALT CONCRETE

39-2.02 Aggregate

The aggregate grading of the various types of Asphalt Concrete shall conform to one of the following as directed by the Engineer:

Surface Course	Type A -- ½" Maximum, Medium or Coarse
Leveling Course	No. 4 Maximum
Asphalt Concrete Base	Type A or B -- 3/4" Maximum, Medium

39-4.01 Grade Tolerance

The subgrade to receive Asphalt Concrete or Asphalt Concrete Base immediately prior to applying prime coat, shall not vary more than 0.05-foot above or below the grade established by the Engineer.

39-5.01 Spreading Equipment

The Asphalt Concrete shall be deposited from the haul vehicle into the hopper of the paving machine.

The practice of depositing the material on the roadbed in a windrow and subsequently using a pick-up machine to deposit the material in the hopper of the asphalt paver will not be allowed.

39-6.01 General Requirements

Asphalt Concrete shall not be placed on any roadbed until all utility construction beneath the roadbed has been completed, sewer and water lines have been tested, and water lines chlorinated. The surface course of Asphalt Concrete shall not be placed until final utility connections have been made, unless otherwise permitted by the Engineer.

Asphalt Concrete shall not be placed after thirty (30) minutes before sunset, as established by weather bureau, except as otherwise authorized by the Engineer.

Asphalt Concrete or Asphalt Concrete Base shall not be placed during rainy weather or on a wet surface. Asphalt Concrete shall not be placed when the atmospheric temperature is below fifty (50) degrees Fahrenheit or conditions indicate it will drop below fifty (50) degrees Fahrenheit or conditions indicate it will drop below fifty (50) degrees Fahrenheit before the material can be satisfactorily compacted. Asphalt Concrete Base shall not be placed when the atmospheric temperature is below forty (40) degrees Fahrenheit or conditions indicate it will drop below forty (40) degrees Fahrenheit before the material can be satisfactorily compacted. Material which cannot be placed in compliance with these requirements shall be rejected.

The compacted thickness of Asphalt Concrete layers shall be as directed by the Engineer. The normal minimum and maximum compacted lift thickness for Asphalt Concrete surfacing are 0.17' and 0.25' respectively. The normal minimum and maximum compacted lift thickness for Asphalt Concrete Base are 0.25' and 0.33' respectively.

Section 71

SEWERS

71-1.01 Materials

Sewer pipe shall be vitrified clay pipe or ductile iron pipe.

71-1.02 Clay Sewer Pipe

Vitrified clay pipe and fittings shall be extra strength, plain end pipe conforming to ASTM C-700. Joints shall conform to the material and performance requirements of ASTM C4235 "Compression joints for Vitrified Clay Pipe and Fittings." All material shall be installed in strict conformance with the manufacturers recommendations.

71-1.03 Ductile Iron Pipe

Ductile iron pipe shall be polyurethane lined, new pipe conforming to ANSI. A 21.51-1976 or most recent issue, if any, as sponsored by the American Water Works Association for thickness Class 50 Ductile Iron Pipe. The pipe shall be furnished with either bell and spigot ends, "Tyton Joints", or mechanical joints except where specifically specified on the plans.

All ductile iron pipe buried underground shall be encased in polyethylene film in the tube form. Polyethylene material and installation procedure for the encasement shall conform to ANSI/AWWA C105/A21.5-82 or most recent issue, if any. Installation Method "A" as described in aforementioned specification shall apply.

Couplings for connection to the sewer main shall be of a type approved by the City Engineer. All material shall be installed in strict conformance with the manufacturers recommendations.

71-1.04 Polyvinyl Chloride Pipe & Fittings

Only 8" diameter and smaller Polyvinyl Chloride pipe will be allowed. Larger diameter pipe shall be Vitrified Clay or Ductile Iron.

Polyvinyl Chloride gravity sewer pipe shall be SDR 26 and shall be made of compounds conforming to material requirements of ASTM D-3034 & F679 in accordance with ASTM D-1784. PVC Sewer Pipe shall meet all the dimensional, chemical and physical requirements as outlined in ASTM D-3034 or F-679.

The pipe shall be made with an integral bell to utilize the gasket for sealing which meets specifications defined in ASTM F-477.

Each male end shall be beveled to facilitate joining and reference marked to insure proper insertion depth. Lubricant is to be used in the joining process. All material shall be installed in strict conformance with the manufacturer's recommendations.

71-1.05 Excavation and Backfill

Excavation and backfill shall be as shown on the City of Gilroy Standard Details.

All stumps and large roots encountered during trenching operations shall be removed to the satisfaction of the Engineer.

The trench shall be opened no more than 200 feet ahead of the pipe laying operations to reveal obstructions. Trench crossings shall be provided to accommodate public travel and to provide convenient access to adjacent properties. Flow shall be maintained in any sanitary sewers, storm drains, water lines, or water courses encountered in trenching.

All cutting, handling and disposal of asbestos cement pipe shall be done in accordance with the Contractor's State Licensing Law and all applicable laws and regulations.

A permit to do the above described work must be obtained from the State of California, Division of Industrial Safety. Proof of such permit shall be submitted to the Engineer prior to starting the trench work.

71-1.06 Existing Manholes

Existing manholes and cleanouts located within the street right of way shall be adjusted to conform to finished pavement grades in accordance with the details shown on the plans.

Prior to the removal of an existing manhole frame, a platform shall be constructed in the manhole above the top of the sewer to prevent any dirt or debris from falling into the sewer. The platform shall remain in place until all work on the manhole has been completed and the asphalt concrete has been placed around the manhole. Prior to the removal of the platform from the manhole, all dirt and debris shall be removed.

Lowering of the manhole ring and cover shall be accomplished by the removal of existing concrete grade rings below the manhole ring or by removing the upper section of manhole barrel and substituting therefore a shorter section of barrel.

At the Contractor's option, in lieu of removing and replacing barrel sections as above provided, the top of the existing upper barrel section may be trimmed and the taper section replaced on such trimmed surface provided, however, that such trimming shall not crack or otherwise damage the remaining portion of barrel section.

In the event that the portion of barrel section to remain is cracked or damaged or otherwise made unsuitable for use by such trimming, the entire section shall be removed and replaced with a new section of barrel. Trimming of taper sections will not be permitted.

All sections of the manhole shall be set in cement mortar or in approved gasket material. Trim excess gasket material and plaster inside joints smoothly. Manhole sections set in cement mortar shall be smoothly plastered inside and out.

After placing the surface course of asphalt concrete, all manholes and cleanouts shall be located and marked with white paint before the close of that work day.

Within two working days of paving, all manholes and cleanouts shall be adjusted to grade and inspected.

Existing grade adjustment rings in the adjustment of manhole frames shall become the property of the Contractor and, if undamaged and thoroughly cleaned of mortar, may be reused in the work. If not so used, they shall be disposed of away from the site of the work at the expense of the Contractor.

71-1.07 Pipe Laying

Pipe laying shall begin at lowest starting point and proceed upstream. Where ground water occurs, pumping shall continue until backfilling has progressed to a sufficient height to prevent flotation of the pipe. Water shall be disposed of in such a manner as to cause no property damage or not be a hazard to public health.

Where construction consists of constructing a new main or extension of an existing main, the downstream end of the new main shall be securely closed with a tight fitting plug until the construction is accepted by the City Engineer.

Connection to existing sanitary sewer main shall utilize a manhole. If a new manhole is required, the Contractor shall pothole the existing sewer main to verify invert grades and locations.

Sewer pipe shall be installed on the alignment and grade as shown on the plans and in accordance with the Standard Specifications, or as directed by the Engineer. Existing sewer laterals shall be removed and replaced at the locations shown on the plans, or as directed by the Engineer.

Sewer pipe shall be laid in straight lines and on uniform rates of grade between points where changes in alignment or grade are shown on the plans. The interior of the pipe shall be free of foreign matter before lowering into the trench.

The pipe manufacturer's written instructions covering the installation of his pipe shall be closely followed unless otherwise directed by the Engineer or these Special Provisions. The trench shall not be backfilled until authorized by the Engineer. Pipe laying shall proceed upgrade with the spigots pointing in direction of flow. The invert of the pipe shall be set at required line and grade as determined from batter boards set not over 25 feet apart.

Electro-optical grade setting devices may be used provided that the device will be operated by a person proficient in its operation.
Any section of pipe found to be defective or which has had grade or joints disturbed shall be re-laid by the Contractor at his expense.

Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and efficient execution of the work. All pipe, fittings and accessories shall be carefully lowered into the trench by means of derrick, ropes, or other suitable equipment in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. The pipe and accessories shall be inspected for visible defects prior to lowering into trench. Any visibly defective or unsound pipe shall be replaced.

The line and grade of existing utilities shall not be altered. Any leakage caused in existing utilities by reason of the Contractor's operations shall be immediately repaired at the Contractor's expense.

Existing storm drains shall be supported or removed and replaced at the Contractor's option. In any case, the Contractor shall be responsible for maintaining the existing line and grade of the storm drains.

Existing water lines shall be supported in place with service maintained during construction. The Contractor shall be responsible for any damage to the water lines during construction and any damage resulting from improper backfilling.

Existing sewer lines shall be supported in place with service maintained during construction. The Contractor may, at his option, remove and replace any sewer laterals which are not in use during construction. The Contractor shall be responsible for damage to sewer lines during construction and any damage resulting from improper backfilling.

71-1.08 Sewer Structures

Manholes shall be standard precast concrete manholes as detailed on the City Standard Details. Precast concrete manhole bases must be from list approved by the City Engineer.

Manhole bases may be poured-in-place concrete on undisturbed earth. The bases shall be poured full thickness against the side of the manhole excavation or to dimensions shown on the Plans. The manhole excavation site shall be dewatered before pouring.

Pre-cast manhole bases, conforming to the City Standard Details in dimensions and the requirements outlined below for materials may be used. Such pre-cast bases shall be placed on a minimum 12-inch thick cushion of drain rock, as specified in the City Standard Details. The drain rock shall extend a minimum of 6 inches beyond the outside edges of the base.

Concrete for manhole bases shall be Class A Portland cement concrete conforming to the applicable requirements of Section 90 of the Standard Specifications. The Portland cement shall be Type V conforming to ASTM Designation: C 150 or low-alkali-Type II cement meeting the requirements for Type V cement.

Where steel reinforcement is required in manhole base construction, such reinforcement shall be furnished and placed as shown on the plans and in accordance with the applicable provisions of Section 52 of the Caltrans Standard Specifications.

The base slab and initial riser section shall be connected with integrally poured concrete to create a watertight joint. Flow channels shall be constructed as shown on the plans. Changes in size or grade shall be made gradually and changes in direction by smooth curves. All finished surfaces shall be smoothly troweled with a steel trowel. All manhole barrels and taper section shall be precast concrete sections using Type V Portland cement complying with ASTM Designation: C 150 or low-alkali Type II cement meeting the requirements for Type V cement.

The 48-inch and 60-inch diameter barrels and taper sections shall be constructed in accordance with the applicable provisions of ASTM Designation: C 478 and shall be inspected by the Engineer to determine that the interior surfaces are smooth and free of pockets or depressions.

Manhole frames and covers shall be in accordance with City Standard Details.

At locations where sewer is to be installed into or out of existing manholes the manhole wall and base shall be chipped or core drilled to accept the new size of pipe and to form a flow channel in the manhole base. The Contractor shall dry pack around the pipe between the pipe and the opening. The Contractor shall also backfill in the area around the pipe with concrete to insure a watertight connection.

Mainline cleanouts shall be installed per City Standard Detail at the locations shown on the Plans.

After placing the surface course of asphalt concrete, all manholes and cleanouts shall be located and marked with white paint before the close of that work day.

Within two working days of paving, all manholes and cleanouts shall be adjusted to grade and inspected.

71-1.09 Testing of Sewers

Testing of all portions of the sewer including manholes will be required.

For either exfiltration or infiltration test, the maximum leakage shall not exceed 250 gallons per inch of pipe diameter per mile per 24 hours as measured over a period of 30 minutes minimum. Should the leakage exceed the maximum allowable rate, the Contractor shall repair, overhaul, or rebuild the defective portion of the sewer line to the satisfaction of the Engineer at no additional cost to the City. After repairs have been completed by the Contractor, the line shall be retested as specified above, all at no cost to the City.

The test shall be performed after the line has been laid and all backfill placed and compacted as specified elsewhere in these specifications. The Contractor, at his option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place and compacted.

In the event that the exfiltration test prescribed above is impractical due to wet trench conditions, these portions of the sewer line where such conditions are encountered will be tested for infiltration. The Engineer shall determine whether the exfiltration or infiltration test will be used.

Even though the test for leakage is within the prescribed limits, the Contractor shall repair any obvious leaks.

Low pressure air testing may be used in lieu of water testing at the option of the Contractor. Water testing may be required by the Engineer. The following procedure shall be used for air testing:

1. Clean pipe to be tested by propelling a snug fitting inflated rubber ball through the pipe with water. Remove any debris.

2. Plug all pipe outlets with suitable test plugs. Brace each plug securely.

3. If the pipe to be tested is submerged in ground water, insert a pipe probe, by boring or jetting, into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.

4. Add air slowly to the portion of the pipe installation under test until the internal pressure is raised to 4.0 p.s.i.g.

5. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any leakage is observed, bleed off air and make necessary repairs.

6. After an internal pressure of 4.0 p.s.i.g. is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.

7. After the two minute period, disconnect the air supply.

8. When pressure decreases to 3.5 p.s.i.g. , start stopwatch Determine the time in seconds that is required for the internal air pressure to reach 2. 5 p.s.i.g. The minimum allowable time in seconds shall be based on the diameters and lengths of pipe under test.

Air test data sheets and nomograph with directions for computing the specification time are available at the office of the City Engineer.

The Contractor shall hire an independent television inspection service to perform a closed-circuit television inspection of all newly constructed sewers. A video tape of the television inspection shall be produced and delivered to the Engineer in color VHS format, together with a typed log of the inspection.

The following conditions shall exist prior to the television inspection:

a. All sewer lines shall be in installed, backfilled and compacted;
b. All structures shall be in place, all channeling complete and all pipeline' s accessible from structures;
c. All other underground facilities, utility piping and conduit within two feet of the sewer main, shall be installed;
d. All compaction required shall be completed;
e. Pipelines to be inspected shall be balled, flushed and mandrel tested;
f. The final air or water test shall have been completed.
g. Immediately before the television inspection, run fresh water into the sewer until it passes through the downstream manhole.

When the above work has been completed, the Contractor shall notify the Engineer 48 hours in advance of the date for television inspection. During this inspection, the Contractor or his authorized representative shall be present to observe the video pictures as provided by the television camera.

The following video tape observations shall be considered defects in the construction of the sewer pipelines and will require corrections prior to acceptance:

a. Off grade - 0.08 foot, or over, deviation from grade;
b. Joint separations
c. Offset joints
d. Chips in pipe ends
e. Cracked or damaged pipe or evidence of the presence of an external object bearing upon the pipe (rocks, roots, etc.);
f. Infiltration;
g. Debris or other foreign objects;
h. Other obvious deficiencies when compared to Approved Plans and Specifications, these Standard Specifications and Standard Details.

The contractor shall be notified in writing of any deficiencies revealed by the television inspection that will require repair, following which the Contractor shall excavate and make the necessary repairs and request a television re-inspection. Television re-inspection shall be at the contractor's expense.

71-1.10 Trench Resurfacing

Trench resurfacing shall be as shown on the Standard Details of the City of Gilroy or as specified on the plans.

Section 73

CONCRETE CURBS AND SIDEWALKS

73-1.01 **Description** (The following shall apply in lieu of Sec. 73-1.01 of Caltrans Standard Specifications)

This work shall consist of construction curbs, sidewalks, gutter depressions, island paving, and driveways of the form and dimensions shown on the plans, and as specified in these specifications and the Special Provisions. The concrete shall conform to Class 2 concrete as described in Sec. 90 of Caltrans Standard Specifications, July 1995.

A handicap ramp shall be constructed in all curb returns in accordance with the City of Gilroy Standard Details.

Reinforcement shall conform to the provisions in Section 52, "Reinforcement" of the most recent version of the Caltrans Standards and specifications.

73-1.02 **Subgrade Preparation**

The subgrade shall be constructed true to grade and cross section, as shown in the plans or directed by the Engineer. It shall be watered and thoroughly compacted, and unsuitable material removed and replaced, to provide a stable grade with above optimum moisture content for a minimum depth of 0.5-foot.

Base material under curb and gutter shall comply with the provisions of Section 26, "Aggregate Bases" of Caltrans Standard Specifications, and shall be a minimum of 6 inches in compacted thickness.

Sidewalk shall be placed on a 4 inch thick layer of clean sand or Class II aggregate base, thoroughly consolidated by watering. Sidewalks constructed across driveways, and driveway ramps constructed between curb and edge of sidewalk, shall be a six inch thick layer of Class 2 Aggregate Base and shall be placed directly on the prepared subgrade.

The completed subgrade shall be tested for grade and cross section by means of a templet supported on the side forms, and shall not project into the planned concrete cross section at any point. The subgrade and forms shall be wet immediately in advance of placing concrete.

73-1.05 **Curb Construction**

Attention is directed to City of Gilroy Standard Details for Weakened Planes, Expansion Joints and Score Marks.

The finished surface of the top of curb shall not vary more than 0.01 foot above or below the staked grade.

73-1.07 **Sidewalk, Gutter Depression, Island Paving, and Driveway Construction**

The surface of sidewalks shall be marked into rectangles as shown on the City of Gilroy Standard Details.

Section 81

MONUMENTS

(The following shall apply in lieu of Section 81 of Caltrans Standard Specifications)

This work shall consist of furnishing and installing cast-in-place survey monuments at the locations shown on the plans and in accordance with the City of Gilroy Standard Details.

The exact location of the monuments will be established by the Design Engineer. Monuments will be checked and the center point stamped by the Design Engineer.

Standard City brass markers shall be furnished by the Contractor. They shall be placed in survey monuments before the concrete block has acquired its initial set and shall be firmly bedded in the concrete. The concrete block shall be so located that when the marker is installed, the reference point will fall within a one inch circle in the center of the marker.

City monuments will be paid for at the contract unit price each, which price shall include full compensation for furnishing all labor, materials, tools and equipment, and doing all the work involved in constructing monuments complete in place.

Section 99

WATER MAIN CONSTRUCTION

99-1.01 Description

All water mains and related appurtenances shall be constructed in accordance with the City of Gilroy Standard Details.

99-1.02 Pipe

The pipe, except where otherwise specified on the plans, shall be Ductile Cast Iron in accordance with the following:

Ductile Iron Pipe shall be cement lined, new pipe conforming to ANSI A 21.51 1976 or most recent issue, if any, as sponsored by the American Water Works Association for thickness Class 50 Ductile Iron Pipe. The pipe shall be furnished with either Bell and spigot end, "Tyton Joints" or Mechanical Joints except where otherwise specified on the plans.

99-1.03 Copper Water Service Tubing

All copper water service tubing shall conform with the latest AWWA Standards as described in ANSI/AWWA C800 of the latest revision, and with ASTM B88, and shall be Type K soft temper tubing.

99-1.-04 Fittings

All fittings shall be new gray iron or ductile iron fittings conforming to ANSI/AWWA C110/C153 of latest revision and shall have the proper type of ends to match the type of pipe used.

Gray iron or ductile iron fittings shall be cement mortar lined in accordance with AWWA C104 of latest revision and shall have a petroleum asphaltic coating conforming to AWWA C110. Ductile iron fittings shall have a minimum pressure rating of 250 P.S.I. and shall be of the thickness class as shown on the plans.

99-1.05 Gate Valves

Gate valves shall conform to AWWA Standard C509 of latest revision and shall be the resilient seat type with non-rising stem opening counter-clockwise with O-ring stem seal and suitable ends for connections to type of pipe or fitting used. The working pressure rating of gate valves shall meet or exceed the pressure rating of the pipe specified on the plans. External bolts and nuts shall be 304 stainless or poly wrapped per standard. Valves shall be as shown on the City of Gilroy Standard Details.

99-1.06 Butterfly Valves

Butterfly valves shall conform to AWWA Standard C504 of latest revision and shall be of the rubber seat type. Valve discs shall rotate 90 degrees from the full open position to the tight shut position. The valve seat shall provide a tight shutoff at a pressure differential of 150 psi upstream and 0 psi downstream in either direction. The valve operator shall be the traveling nut type. Valve shall open with a counter-clockwise rotation of the operating nut.

99-1.07 Valve Boxes

Each gate valve shall be covered by a precast 8" valve box set flush with street surface with cast iron ring and cover marked "WATER". The valve boxes are to be Christy G 5, or approved equal.

99-1.08 Fire Hydrant and Lateral Assembly

At the location(s) shown on the plans, the Contractor shall provide and install a fire hydrant and lateral assembly per City of Gilroy Standard Details.

No bends will be allowed in fire hydrant laterals without approval of the City Utilities Engineering Department.

99-1.09 Asbestos Cement Pipe

The installation of asbestos cement pipe is prohibited.

All cutting, handling and disposal of asbestos cement pipe shall be done in compliance with the Contractor's State Licensing Law and all applicable laws and regulations.

99-1.10 Excavation and Backfill

Excavation and backfill of the pipeline shall be as shown on the City of Gilroy Standard Details.

Excess material from excavation shall become the property of the Contractor and shall be disposed of to the satisfaction of the Engineer.

Prior to disposal of any materials or operation of any equipment on sites provided by the Contractor for disposal of excess trench excavation owned by him, the Contractor shall submit to the Engineer written authorization for such disposal of materials and entry permission signed by the owners of the disposal site and the required permits.

99-1.11 Laying and Handling Pipe Materials

Proper implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for safe, convenient, and workmanlike prosecution of the work. All pipe fittings and valves shall be carefully lowered into the trench in such a manner as to prevent damage to pipe coatings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Before lowering and while suspended, the pipe shall be inspected for defects and the cast iron pipe rung with a light hammer to detect cracks. Any defective, damaged, or unsound pipe shall be rejected and sound material furnished. Cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and workmanlike manner without damage to pipe. Al pipe stockpiled on the job shall be stored with the ends covered to prevent the entrance of foreign matter.

Long radius curves in either the vertical or horizontal plane, must be approved in writing by the City Engineer.

Each length of pipe shall be free of any visible evidence of contamination, dirt, and foreign material before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying. At times when pipe laying is not in progress, the open ends of

any pipe which have been laid shall be closed by approved means to prevent the entrance of small animals or foreign material. Trench water shall not be permitted to enter the pipe.

99-1.12 Laying of Ductile Iron Pipe

The flame cutting of pipe by means of oxyacetylene torch shall not be allowed.

Ductile iron pipe shall be as specified in and installed per AWWA C600 or latest revision and in accordance with the manufacturer's recommendations and the thickness class specified on the plans.

99-1.13 Thrust Backing

All tees, bends, and plugs shall be provided with thrust backing and/or harness as shown on the plans or in accordance with the City of Gilroy Standard Details.

99-1.14 Hydrostatic Test

The test shall be performed after the line has been laid and all backfill placed and compacted as specified elsewhere in these specifications. The Contractor, at his option, may test the line at any time during construction. However, the final test for acceptance shall be made only after all backfill is in place. Each valved section of pipe, or combined sections, as approved by the Engineer, shall be subjected to a hydrostatic pressure of not less than 150 psi, at any point on the main. The duration of each pressure test shall be 120 minutes. Valves on existing mains in service required to be operated in connection with this job shall be operated only by personnel of the City forces. Each section of pipe shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. The pump, pipe connection, and all necessary apparatus including new gauge and measuring devices shall be furnished by the Contractor. The Contractor shall make the taps into the pipe and shall furnish all necessary assistance for conducting the tests. Before applying the test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made, if necessary, at the points of the highest elevation, and afterwards, tightly plugged.

Suitable means shall be provided by the City for determining the quantity of water leakage under the test pressure. No pipe installation will be accepted until or unless this leakage is less than 40 U.S. gallons per 24 hours, per mile of pipe, per inch nominal diameter of pipe. Should any test of combined sections of pipe laid disclose leakage per mile of pipe greater than that Water specified, or if individual sections show leakage greater than the specified limit, the Contractor shall, at his own expense, locate the cause and repair the defect until the leakage is within the specified allowance.

Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section of it, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. The Engineer shall designate the time at which the test shall be made.

The Contractor shall repair any obvious leaks even though the hydrostatic test results are within the prescribed limits above.

99-1.15 Chlorination of Pipeline

Chlorine may be applied by any of the standard methods, subject to the approval of the Engineer. The point of application of the chlorination agent shall be at the beginning of the pipe

extension, or any valved section of it, and through a corporation stop inserted in the newly laid pipe.

Water from the existing distribution system shall be controlled to flow very slowly in the newly laid pipe during the application of chlorine. Valves on existing mains in service shall be operated only by personnel of the City forces. The rate of chlorine feed shall be in such proportion to the rate of water entering the pipe that the chlorine is applied to the water entering the newly laid pipe at a minimum of least 100 ppm. Precautions shall be taken to prevent back pressure causing a reversal of flow into pipe treated.

Treated water shall be retained in the pipe for a period of twenty-four hours. After the chlorine treated water has been retained for the required time, the chlorine residual at the pipe extremities and at representative points shall be at least five (5) parts per million. In the process of chlorinating, all valves and other appurtenances on the newly laid main shall be operated. Discharge of chlorinated water shall be in accordance with local and state laws.

Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe line. The water throughout its length shall, upon test, both chemically and bacteriologically be proved equal to the water quality served the public from the existing water supply system. The necessary samples will be taken and tests made by the Contractor. Should the initial treatment, in the opinion of the Engineer, prove ineffective, the chlorination procedure shall be repeated until confirmed tests show that the water sampled from the newly laid pipe conforms to the above requirements.

There shall be a 24-hour waiting period after blowing off the main prior to taking bacteria samples. The initial bacteria tests shall be of the 72-hour duration type. If the initial bacteria test fails, two consecutive passing bacteria tests must be obtained prior to making the tie-in. The first of these two subsequent tests shall be of the 24-hour duration type, and the second shall be of the 72-hour duration type. Bacteria tests are valid for only 30 days. If there is more than a 30-day lapse between a passing bacteria test and the applicable tie-in, the bacteria test must be repeated prior to water main tie-in.

99-1.16 **Water Main Tie-Ins**

The Contractor shall notify the City Inspector 48 hours prior to individual mainline shutdowns required to facilitate his tie-in operations. Tie-ins will not be scheduled until a written passing bacteria test has been received by City of Gilroy. A City Inspector must be present during all tie-in operations. No tie-ins shall be performed without prior authorization of the City.

Interruption of service to commercial customers shall, as much as practical, be coordinated with the customer's needs. The Contractor will contact the customers, consider the customer's interests and inform the City accordingly.

After hours work or weekend work is to be avoided whenever possible and any overtime costs shall be borne by the Contractor requesting such after hours work. Normal working hours are: 7:00 A.M. to 3:30 P.M.

Contractors or parties requiring work of any king by the City forces shall request such services a minimum of 48 hours in advance of the time such services are desired. Work requests, which will involve Utility forces for more than 8 hours or an extensive number of City supplied parts, shall be requested a minimum of 7 calendar days in advance.

If it is necessary to terminate service to any customer, the Contractor shall make the request for such work an additional 72 hours (three additional working days for a total of five working days

advance notice) in advance of the time such services are desired to allow the customers affected to have a minimum of 72 hour notice.

During the work, the Contractor shall exercise all necessary precautions to prevent the entrance of trench water or any other foreign material into the water main and shall conduct all operations in accordance with the most stringent sanitation practices. The interior of all appurtenances being installed shall be thoroughly swabbed with a strong HTH solution prior to installation.