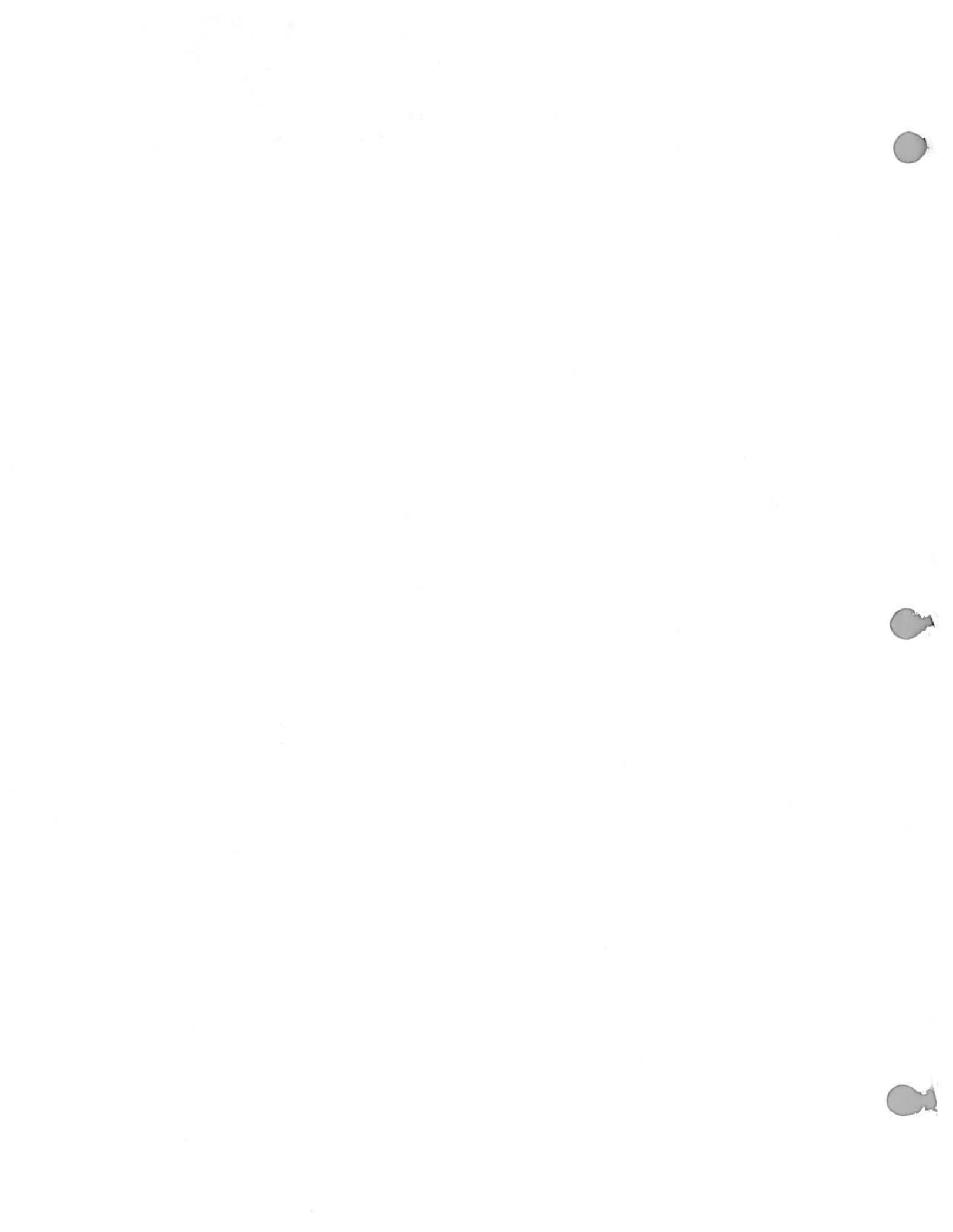


**CITY OF CLOVERDALE
STANDARD CONSTRUCTION SPECIFICATIONS**

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SECTION 1. GENERAL

1-1.01 Referenced Specifications. Public improvements within the City of Cloverdale shall be constructed in accordance with the most recent version of the Standard Specifications of the State of California, Department of Transportation, Division of Highways, which specifications are hereinafter referred to as the State Standard Specifications, and in accordance with the following modifications and revisions, and City of Cloverdale Standard Plans.

Whenever in the State Standard Specifications the terms State of California, Department of Transportation, Director, Division of Highways or Engineer are used, the following terms shall be understood and interpreted to mean and refer to such substituted terms as follows:

For State of California substitute City of Cloverdale

For Department--The Public Works Department of the City of Cloverdale

For Director--The City Engineer of the City of Cloverdale

For Division of Highways--The Public Works Department of the City of Cloverdale

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

In the event of discrepancy between contract documents, the order of precedence from highest to lowest shall be as follows: (1) Contract Change Order, (2) Permits from other agencies, as may be required by law, (3) Special Provisions, (4) Plans, (5) Standard Plans, (6) The modifications and revisions contained herein, and (7) State Standard Specifications.

Specifications pertaining to the administration of City contracts will be contained in the Special Provisions for the contract.

City Standards shall mean City of Cloverdale Standard Plans and Specifications. ATSM shall mean American Society for Testing and Materials latest edition of the specifications. Standard Specifications for Public Works Construction (commonly called the "Green Book"), shall mean the latest edition of the Standard Specifications written and promulgated by the Southern California Chapter, American Public Works Association and the Southern California District, Association General Contractors of California, a Joint Cooperation Committee.

1-1.02 Construction Limitations. The contractor will be expected to conduct his operations in a manner that causes minimum damage to the natural vegetation and landscape. Ingress and egress for all off road work shall be via the existing driveways. Care shall be exercised to avoid hazards that may cause injury to persons, animals or property either during working hours or after work hours, which will include dust control, backfilling trenches immediately following pipe laying and temporary fencing as required.

Prior to working in the City right-of-way, the Contractor shall obtain an encroachment permit from the City. Work by City contract does not require an encroachment permit. A copy of the permit shall be kept on site at all times.

The Contractor will be responsible for obtaining permission from the property owners for any construction outside of the work site or easements as shown on the plans. Equipment will be restricted to the immediate area of construction. Pipe trenches will be backfilled as soon as possible.

Receptacles for construction residue, including oil, cleaning fluids and litter will be covered. Such residues will be disposed of in a proper manner.

Dust control and prohibition of burning of waste construction materials or vegetation will be enforced for all construction activity.

All construction activity, except for emergency situations, will be confined to Monday through Friday, between the hours of 7:00 a.m. and 6:00 p.m., to minimize nuisances to local businesses or residences.

Mufflers and/or baffles will be required on all construction equipment.

Construction activity within the existing right-of-way will be scheduled to minimize traffic inconvenience and safety hazards to motorists, pedestrians and cyclists.

1-1.03 Water for Construction and Dust Control. The Contractor shall be responsible for providing all water necessary for construction and testing.

1-1.04 Protection of Existing Facilities and Property. The Contractor shall notify Underground Service Alert (USA) for marking the locations of existing underground facilities.

The existing underground facilities in the area of work may include telephone, television and electrical cables, gas mains, water mains, sewer pipe and drainage pipe. The various utility companies shall be notified before trenching begins and at such other times as required to protect their facilities. Underground facilities shall be located and exposed ahead of trenching to prevent damage to the facilities, and to determine the depth and character of all facilities that cross or infringe on the trench prism. The Contractor shall immediately notify the City Engineer of any facilities found to differ from those shown on the drawings. If damage should occur to the existing facilities, the utility company and the City shall be notified immediately and repairs acceptable to the utility company shall be made at the Contractor's expense.

The locations of the existing facilities are typically compiled from the best information available during design. However, the locations of the underground facilities shown on the drawing are approximate only and should not be taken as final or all inclusive. The Contractor is cautioned that the drawings may be incomplete and the Contractor shall repair all damage done to existing facilities at his own expense.

Existing facilities shall not be intentionally disturbed and shall be supported and protected against injury and maintained in good operating condition at the expense of the Contractor for the entire duration of the contract.

Any proposed disruption of the existing facilities shall be approved by and coordinated with the Engineer.

1-1.05 Traffic Control. The site of the work shall be enclosed by suitable barricades, signs and

lights to warn and protect traffic effectively and shall be in accordance with those procedures as set by the State of California Department of Transportation manual of warning signs, lights and devices. The Contractor shall submit for review and approval traffic control plans prior to beginning construction. The Contractor shall have a copy of the approved traffic control plans on site at all times.

Excavation shall be backfilled before leaving the work for the night. All trenching in the travel-way shall be plated with non-skid plates or paved (temporary or permanent) before leaving the work for the night. Flasher barricades or illuminated cones shall be placed adjacent to the trench plates if required by the Engineer.

All detours and traffic control shall be between 8:00 a.m. and 5:00 p.m.; unobstructed two-way traffic shall be maintained daily between 5:00 p.m. and 8:00 a.m. Any work within Caltrans right-of-way will require a separate encroachment permit from Caltrans.

Adequate traffic control, flag persons, signing and barricades shall be provided by the Contractor at all times as approved by the Engineer.

If at any time, work continues for more than one working day, advance warning signs affixed to 4" x 4" wooden posts anchored to the ground shall be used. At no time shall construction signs be attached in any way to power or light poles.

The Contractor shall be responsible for keeping the police, fire department and the local schools informed of obstructions to either private or public roads caused by reason of his operations. The Contractor shall make provisions for the safe passage of pedestrians around the area of work at all times.

1-1.06 Plan for Protection from Caving. In accordance with the latest requirements of the California Occupational Safety and Health Act (Cal-OSHA) and all such similar legislation, the Contractor shall submit to the Engineer for reference in advance of excavation a Cal-OSHA approved detailed plan showing the design, shoring, bracing, sloping or other provision to be made for work or protection from the hazard of caving ground during the excavation of such trench or trenches located in the public right-of-way. If such plan varies from the shoring system standards, the plan shall be prepared by a Registered Civil or Structural Engineer.

The plan shall be kept on the job site at all times. The Contractor shall have a competent person, conversant with the plan on site at all times.

Nothing in this section shall be deemed to allow the use of shoring, sloping or protective system less effective than that required by the Cal-OSHA.

Nothing in this section shall be constructed to impose tort liability on the City or Engineer.

1-1.08 Shop Drawings. When shop drawings or other drawings are required by the Plans and Specifications, or requested by the Engineer, they shall be prepared in accordance with current Engineering practice and at the Contractor's expense. Drawings shall be of a size and scale to clearly

show necessary details and shall be transmitted by letter to the Engineer for approval or correction within at least fifteen (15) days of the Contract award.

Materials shall not be furnished or fabricated, nor any work done for which drawings are required before approval of the drawings.

When first submitted by the Contractor, each drawing shall be a good quality transparency accompanied by two prints. If approved without change or correction, three approved copies on paper will be furnished to the Contractor. If extensive additions or corrections are required, the Engineer will return one marked up copy together with a transparency to the Contractor for correction and resubmission. Approved transparencies will be retained by the Engineer. Approval of drawings by the Engineer shall not relieve the Contractor of the responsibility for errors or omissions in the drawings or from deviation from the contract documents, unless such deviations were those specifically called to the attention of the Engineer, and in the letter of transmittal submitted with the drawings. The Contractor shall be responsible for the correctness of the drawings for shop fits and fuel connections and for the results obtained by use of such drawings.

Drawings required for conventional stock pumps, motors and all other manufactured equipment may be brochures or catalogue sheets submitted in quadruplicate and shall show all necessary dimensions required for the proper location and installation of tie down bolts, brackets, plumbing and other appurtenant detail.

When required by the Special Provisions, assembly drawings, parts lists, nomenclature lists or diagrams shall be furnished.

1-1.09 Clean Up. Attention is directed to Section 4-1.02 of the State Standard Specifications.

Before final inspection of the work, the Contractor shall clean the construction site and all ground occupied by him in connection with the work, of all rubbish, excess materials, false work, temporary structures and equipment. All parts of the work shall be left in a neat and presentable condition.

Nothing herein shall require the Contractor to remove warning, regulatory, and guide signs prior to formal acceptance by the Engineer.

SECTION 6. CONTROL OF MATERIALS

6-1.01 General. California Test 231 (Nuclear Gage Determination of In-Place Density) is amended as follows:

In-place density and relative compaction may be determined on the basis of individual test sites in lieu of the area concept, at the discretion of the Engineer.

6-1.02 Relative Compaction (field density). ASTM D 2922-81 amended as follows:

- a. Gage calibration will be based on the six California Transportation Laboratory Master Standard Density Blocks (CTLMSDB), located in Sacramento, California. These blocks are the Standard Reference blocks for the California Department of Transportation.
- b. Percent Relative compaction shall be calculated using lab curves for each individual test location unless otherwise permitted by the Engineer. If permitted by the Engineer, composite samples may be taken for certain manufactured or otherwise uniform materials according to California test method 231 - Part II "METHODS OF APPLYING THE AREA CONCEPT AND DETERMINING PERCENT RELATIVE COMPACTION".

The use of sand cone methods (such as ASTM 1556 or CT 216) for determining field densities will not be allowed as a substitute.

6-1.03 Statistical Testing. Statistical means will not be used for determination of specification compliance. Whenever both individual test results and moving average requirements are specified in these specifications, the moving average requirements shall apply to the individual test results.

SECTION 16. CLEARING AND GRUBBING

16-1.01 Description. The following shall apply in lieu of Section 16-1.01 of the State 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, except those required for traffic control as determined by the 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 three feet below finished grade in the area between the 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 of the State Standard Specifications.

16-1.04 Removal and Disposal of Materials. Burning within the limits of the project will not be allowed. Combustible debris shall be disposed of away from the site of the work.

16-1.05 Tree Preservation. The Contractor shall comply with all requirements of the tree preservation plan if one is included as part of the Improvement Plans.

All trees to be removed shall be marked in the field. A representative of the City must field review the trees to be removed prior to removal.

SECTION 19. EARTHWORK

19-1.01 General. Earthwork shall conform to the provisions of Section 19 of the State Standard Specifications.

19-1.02 Protection of Vegetation. When it is necessary to excavate adjacent to existing trees, shrubs or hedges, the Contractor shall use all possible care to avoid injury to the trees, shrubs or hedges and their roots. Roots or limbs two (2) inches or larger in diameter shall not be cut without the express approval of the Engineer. All roots two (2) inches in diameter and larger left in place shall be wrapped with burlap to prevent scarring and excessive drying. When it is necessary to cut limbs and branches of trees to provide clearance for equipment used in construction, the Contractor shall make pruning cuts just beyond the branch bark ridge. All cuts through ½-inch or larger roots and limbs shall be hand-trimmed and cleanly cut before being repaired.

19-1.03 Subgrade Preparation. Subgrade shall be smooth and uniform, and true to the required grade cross-section, and shall be within the tolerance specified in these Specifications or as shown on the plans. The Contractor shall repair at his expense any damage to a prepared subgrade caused by his operations or by use of public traffic. No material shall be placed upon the prepared subgrade until the subgrade is in the condition meeting the requirements specified.

Subgrade that does not conform to the above requirements shall be reshaped to conform to the specified tolerances and recompact, all at the Contractor's expense.

19-1.04 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 bases 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 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 Engineer.

19-1.05 Unsuitable Material. The following shall apply in lieu of Section 19-02 of the State 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 or approved by the Engineer.

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.

Stabilization of unsuitable material shall comply with the following provisions:

- 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 or mixing with hydrated lime or granular quicklime.
- C. Stabilized material shall be placed and compacted in layers as hereinafter specified for constructing embankments.

19-1.06 Trench Excavation. The Contractor shall perform all excavations of every description and all substances encountered to the depth indicated on the drawings. During excavation, that material suitable for backfilling shall be deposited in an orderly manner a sufficient distance from the banks for the trench to avoid overloading and to prevent slides or cave-ins. All excavated material not required or suitable for backfill shall be removed and disposed of outside the streets right-of-way. The Contractor shall first obtain a written permit from the property owner on whose property the disposal is to be made and he shall file with the City Engineer said permit, together with a written release from the property owner absolving the City from any and all responsibility in connection with the disposal of material on said property. Material shall not be disposed of within any floodway in the City of Cloverdale or County of Sonoma, or within the normal channel of any river, creek, stream, ditch, canal, swale or other watercourse and within portions of same as required to efficiently carry the flood flow as determined by the Engineer.

Trenches shall be the necessary width for proper laying of the pipe, and the banks shall be as nearly vertical as practicable. The bottoms of the trenches shall be accurately graded to provide uniform bearing and support for each section of pipe on the prepared pipe bedding at every point along its entire length. Trenches shall be excavated to the depth indicated on the drawings and care shall be taken not to excavate beyond the depth indicated or required.

The Contractor shall at all times furnish, install and maintain sufficient bracing and shoring in trenches to ensure the safety of workmen and to protect and facilitate the work. All such bracing and shoring shall be removed from the trench as backfilling proceeds.

The Contractor shall furnish, install and operate such pumps or other devices as may be necessary for removing water from the trenches during construction.

19-1.07 Structure Backfill. Specifications for pipe bedding, trench backfill and surfacing shall be as shown on Std. 300, "Standard Trench Detail," of the City of Cloverdale Standard Plans.

Except for structure backfill placed at specific locations described and enumerated in Sec.

19-3.06 of the State Standard Specifications, structure backfill material specifications and compaction requirements shall be as follows:

Structure backfill shall have a Sand Equivalent of not less than 30 and shall conform to the following grading:

<u>Sieve Sizes</u>	<u>Percentage Passing</u>
3"	100
No. 4	40-100

Structure backfill shall be compacted to not less than 90 percent relative compaction, except that when placed under any roadbed, relative compaction shall not be less than 95 percent within three feet of finished grade, as determined by California Tests 216 and 231.

19-1.08 Relative Compaction. 95 percent--California tests 216 and 231. The following shall apply in lieu of Sec. 19-5.03 of the State Standard Specifications.

Relative compaction of not less than 95 percent shall be obtained for a minimum depth of 0.5-foot below the grading plane for the full width of the planned structural section, whether in excavation or embankment.

Any area of the subgrade determined by the Engineer to be unstable, as evidenced by excessive deflection under the movement of equipment, shall be brought to satisfactory stability by additional rolling, reworking, removal and replacement of unsuitable material, or stabilization with lime, as directed by the Engineer.

Lime-treated materials shall be compacted to not less than 95 percent relative compaction in accordance with the provisions of Section 24, except when lime is used to stabilize unsuitable material as specified in Sec. 19-2.02 of the State Standard Specifications.

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.

19-1.09 Relative Compaction. 90 percent--California Tests 216 and 231. The following shall apply in lieu of Sec. 19-5.04 of the State Standard Specifications.

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

19-1.10 Excess Material. Excess trench material shall be removed promptly and disposed of elsewhere by the Contractor at his own expense. The Contractor shall not dump material on any private property without the permission of the owner thereof.

19-1.11 Samples for Approval. Representative samples of all material to be imported shall be sufficiently in advance of installation operations for testing and approval of the Engineer. All costs associated with testing shall be paid by the Contractor. Imported material shall not be installed until it has been so approved.

Tests will be made in accordance with the following standards:

1. Grading--ASTM C114 and C136
2. Plasticity Index--ASTM D424
3. Sand Equivalent Value--Test Method No. Calif. 217 (CALTRANS)

SECTION 24. LIME TREATMENT

24-1.01 Description. The following shall apply in lieu of Sec. 24-1.01 of the State Standard Specifications.

This work consists of stabilizing basement soil, mixing in place material, lime and water, and spreading and compacting the mixture to the lines, grades and dimensions shown on the plans and as specified in these Specifications and the Special Provisions.

Where designated by the Engineer, basement soil below the planned lime-treated subgrade shall be stabilized in the following manner:

The material shall be excavated to the lines and grades specified by the Engineer and spread in a uniform layer over another portion of the grade.

Dry lime in the amount specified by the Engineer shall be spread and mixed into the material as provided in Sec. 24-1.04, "Mixing" of the State Standards. The material shall then be used to backfill the original excavation in 6" compacted layers. Each layer below a plane 12" below the grading plane shall be compacted to not less than 90 percent relative compaction. Each successive 6" layer up to the bottom of the planned lime-treated subgrade shall be compacted to not less than 92 percent relative compaction.

24-1.02 Materials. When permitted by the Engineer in writing, and when accompanied by an adequate safety program to be proposed by the Contractor, granular quicklime conforming to the specifications of ATSM Designation C51 may be used in lieu of commercial hydrated lime. Hydrated lime shall be used only when permitted by the Engineer in writing.

When sampled by the Engineer at the point of delivery, the sample of quicklime shall contain not less than 90 percent calcium oxide (CaO), as determined by ATSM: C25-67.

When granular quicklime is used, initial mixing shall continue until the quicklime is uniformly distributed throughout the material. Water shall be added as required to provide sufficient moisture for hydration. The mixture shall be cured for not less than 16 hours prior to final mixing.

The Contractor shall provide a grade checker to ensure mixing to the full depth as specified. Water shall be added during the final mixing operations until the water content of the mixture is approximately two percent above the test optimum moisture content.

24-1.03 Spreading and Compacting. Lime-treated material shall be compacted to not less than 95 percent, as determined by Test Method No. California 216 and 231. The sample of lime-treated soil used for determining the maximum wet density shall be obtained from the test site at the time of testing.

24-1.04 Curing. The curing seal requirement may be waived at the discretion of the Engineer when it can be shown that placement of a subsequent layer of aggregate base or asphalt concrete can proceed within 24 hours after the completion of final rolling.

SECTION 25. AGGREGATE SUBBASES

25-1.01 Description. Aggregate Subbase shall be Class 4.

25-1.02 Materials. Aggregate Subbase--Class 4 shall have a minimum sand equivalent of 21, a minimum R value of 50 and shall conform to the following gradings:

<u>Sieve Size</u>	<u>Percent Passing</u>
	100
3"	90-100
1½"	50-90
¾"	25-55
#4	2-11
#200	

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

Representative samples of all material to be imported shall be supplied sufficiently in advance of installation operations for testing and approval of the Engineer. All costs associated with testing shall be paid by the Contractor. Tests for sieve analysis, R-value, sand equivalent and relative compaction shall be per Caltrans Standards.

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.

25-1.04 Compacting. The surface of 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 BASES

26-1.01 Description. Aggregate Base shall be Class 2, and the combined aggregate shall conform to either of the gradings specified in Sec. 26-1.02B of the State Standard Specifications, "Class 2 Aggregate Base."

26-1.02 Class 2 Aggregate Base. Quality Requirements: The minimum sand equivalent value shall be not less than 30 for any individual test. The resistance (R-value) shall not be less than 78 for any individual test. The durability index shall not be less than 35 for any individual test unless specifically approved by the City Engineer.

26-1.03 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.

26-1.04 Shoulder Backing. This work shall consist of constructing shoulder backing adjacent to the edge of the new surfacing in accordance with the details shown on the plans and these special provisions.

The material for shoulder backing shall consist of material of which at least 60% by weight shall be crushed particles as determined by California Test 205 and shall conform to the following grading:

<u>Sieve Sizes</u>	<u>Percentage Passing</u>
1"	100
¾	87-100
#4	30-74
#200	7-23

Shoulder backing shall meet all quality requirements as mentioned in Section 26-1.02 of these Specifications.

The areas where shoulder backing is to be constructed shall be cleared of all weeds, grass and debris. Removed weeds and grass shall be disposed of outside the highway right-of-way in accordance with the provisions in Section 7-1.13 of the State Standard Specifications.

Shoulder backing material shall be watered and rolled to form a smooth, firmly compacted surface. Watering shall conform to the provisions in Section 17, "Watering," of the State Standard Specifications.

Shoulder backing material shall not be deposited on the new surfacing prior to placing it in final position, nor shall it be bladed onto the new surfacing during mixing, watering and blading operations.

Shoulder backing construction shall be completed along the edges of any portion of new surfacing within five days after completion of that portion of the new surfacing. Until such time as the Contractor is able to complete shoulder backing along any portion of new surfacing, he shall furnish and place portable delineators and C31 "Low Shoulder" signs off of and adjacent to the new surfacing. A portable delineator and a C31 sign shall be placed at the beginning of the drop-off in the direction of travel on the adjacent lane, and at the following maximum intervals along the drop-off:

C31 signs--2,000 feet
Portable Delineators:
 on tangents--500 feet
 on curves--200 feet

The portable delineators and C31 signs shall be maintained in place at each location until shoulder backing operations are completed at that location. Portable delineators and signs shall conform to the requirements in Section 12, "Construction Area Traffic Control Devices," of the State Standard Specifications, except that the base material for the signs shall not be plywood and the signs may be set on temporary portable supports or in barricades.

SECTION 39. ASPHALT CONCRETE

39-1.01 Description. A minimum of two weeks prior to the placement of any asphalt concrete, the Contractor shall notify the Engineer of which asphalt plant will be used to supply the mix. For any job, asphalt concrete shall be supplied from a single plant.

39-1.02 Asphalts. Asphalt binder to be mixed with aggregate for asphalt concrete surface, leveling, or open graded courses shall be AR-4000 grade paving asphalt.

Asphalt binder to be mixed with aggregate for asphalt concrete base shall be AR-8000 grade paving asphalt.

39-1.03 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-- $\frac{1}{2}$ " Maximum, Medium or Coarse, or $\frac{3}{4}$ " Maximum, Coarse
Leveling Course	Type A-- $\frac{3}{4}$ " Maximum, Coarse
Asphalt Concrete Base	Type A or B-- $\frac{3}{4}$ " Maximum, Medium
Open Graded	$\frac{3}{8}$ " Maximum

39-1.04 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.

39-1.05 Tack Coat. Tack coat shall be diluted SS1 or CSS1, or undiluted RS-1 or CRS-1 type asphalt emulsion.

39-1.06 Haul Vehicles. Prior to loading asphalt concrete, the bed of the haul vehicle shall be clean and free from all soil, sand, gravel and other deleterious substances.

All haul vehicles shall be equipped with tarps that are in working order. Tarps shall be used on haul vehicles unless prior approval is obtained from the City Engineer.

When spraying diesel or other parting agents in the bed of the haul vehicle, the minimum amount necessary to moisten the surface shall be used. In no instance will the parting agent be allowed to accumulate in the bed of the vehicle.

39-1.07 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.

39-1.08 Compacting Equipment. Compaction rollers shall be either two-axle steel-tired rollers, pneumatic-tired rollers or approved double-drum vibratory rollers. Steel-tired static compaction

rollers shall weigh not less than 12 tons.

Double-drum vibratory rollers shall be operated at a maximum speed of 135-feet per minute (approximately 1.5 mph). Double-drum vibratory rollers shall have a minimum frequency of 2400 VPM and the amplitude shall be field-adjustable.

All pneumatic-tired rollers shall be equipped with an approved windskirt unless otherwise permitted by the Engineer. Pneumatic-tired rollers used for compaction of asphalt concrete base shall be so equipped that the air pressure in all tires may be regulated uniformly by the operator while the roller is in motion.

Finish rollers shall be two-axle steel-tired tandem rollers weighing not less than eight tons.

39-1.09 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 Engineer.

Asphalt concrete shall not be placed less than thirty (30) minutes before sunset, as established by weather bureau, except as otherwise authorized 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 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 that 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.

39-1.10 Compacting. The temperature of the asphalt concrete shall be specified by the Engineer. Unless lower temperatures are specified by the Engineer, all mixtures shall be spread and the first coverage of initial or breakdown compaction shall be performed when the temperature of the mixture is not less than 200°F at mid-depth. Additional rolling equipment shall be required or the rate of spread shall be reduced to permit compliance with this requirement.

- A. Asphalt concrete surface course and leveling courses.
 - I. Equipment required

If production in any one hour exceeds the limits set forth below, the Contractor shall cease his paving operation until additional rolling equipment has arrived on the project.

- a. 125 tons per hour or more.
The Contractor will be required to furnish a minimum of two approved double-drum vibratory rollers and one eight-ton tandem finish roller for each roller.

A pneumatic roller may be substituted for one of the vibratory rollers if approved by the Engineer.

- b. 50-125 tons per hour.
The required minimum rolling equipment specified above may be reduced to one approved double-drum vibratory roller and one eight-ton tandem roller for each asphalt paver, with a separate operator for each roller when the compacted thickness is not less than 0.17'.
- c. 50 tons per hour or less, at any location.
The required minimum rolling equipment specified above may be reduced to one approved double-drum vibratory roller, weighing not less than 12 tons, for each paving machine.

2. Compaction requirements.

Compaction rolling shall consist of a minimum of four complete vibratory coverages with an approved double-drum vibratory roller.

Finish rolling shall consist of one or more coverages with an eight-ton tandem roller immediately following completion of compaction rolling.

B. Asphalt Concrete Base.

1. Equipment required.

The Contractor shall be required to furnish one approved double-drum vibratory roller and a minimum of one pneumatic-tired roller, with a separate operator for each roller.

An approved double-drum vibratory roller may be substituted for the pneumatic-tired roller specified above.

2. Compaction requirements.

Compaction rolling shall consist of the following: a minimum of two complete vibratory coverages with an approved double-drum vibratory roller and two complete coverages with a pneumatic-tired roller. The order of rolling shall be specified by the Engineer.

Final rolling shall consist of one coverage with the vibrating units turned off.

Approval of vibratory rollers: The Engineer may approve initial use of a double-drum vibratory roller not previously approved on the basis of tests by other agencies or other information provided by the Contractor.

Approval for subsequent use of the roller shall be based on cores taken from test sections designated by the Engineer and compacted with different numbers of coverages.

Test sections shall be compacted under the following conditions:

1. Asphalt concrete temperature at mid-depth shall be between 270 and 280 degrees Fahrenheit at the beginning of rolling. Rolling shall not continue after the mix temperature has dropped to 200 degrees Fahrenheit. The compacted thickness shall be between 2" and 3.5".
2. The Contractor or manufacturer's representative shall specify the operating conditions of frequency and amplitude.

The basis for approval shall be the attainment of 97% relative compaction and satisfactory surface condition following final rolling. The number of coverages required shall be the minimum number required to obtain 97% relative compaction.

The mix will be sampled during paving of the test sections, and the test maximum density will be the average density of specimens compacted in accordance with California Test 304. The in-place density for each test section shall be the average of three core densities. Relative density will be the ratio of in-place density to test maximum density.

39-1.11 Pavement Reinforcing Fabric. Those areas to receive the reinforcing fabric will be marked in the field by the Engineer and shall consist of the following materials and shall be applied in accordance with those procedures outlined below:

The fabric and placement of fabric shall conform to the provisions of Section 88 of the State Standard Specifications and these Special Provisions.

Prior to placing the fabric, the existing pavement to receive the fabric shall be cleaned of all materials such as, but not limited to, leaves, sand, dirt, gravel, water and vegetation.

Placement of the fabric shall be made only under the following conditions:

1. The ambient air temperature is above 50 degrees Fahrenheit and rising.
2. The pavement is dry and the pavement temperature is above 40 degrees Fahrenheit and rising.

The surface area to receive the fabric shall be sprayed with steam-refined paving asphalt type AR-

4000 at the rate of 0.22 - 0.28 gallons per square yard. The Contractor's attention is directed to Section 92-1.04, "Applying", of the State of California Standard Specifications. The exact rate of application will be determined by the Engineer. The asphalt shall be sprayed with a suitably metered truck and the truck must have been recently calibrated by test method California No. 399A. The temperature of the asphalt binder must be spread between 290 degrees F. and 365 degrees F.

The width of asphalt application will be the fabric width plus 4 inches. Paving asphalt shall be applied no farther in advance of the fabric than the distance the Contractor can maintain free of traffic. The paving operation shall closely follow fabric placement and no more fabric than can be covered up with the hot mix that working day shall be placed.

The fabric shall overlap 2-6 inches at all joints. No joints shall be lapped with more than two layers of fabric. Transverse joints shall be shingled in the direction of the paving to prevent edge pickup by the paver.

The fabric shall be placed on the asphaltic binder with a minimum of wrinkles and broomed or squeegeed to remove any bubbles prior to the binder cooling. The equipment for placing the fabric shall be mechanized and capable of handling full rolls of material and shall be capable of laying the fabric without forming excessive wrinkles and/or folds. As directed by the Engineer, if folds or wrinkles ½ inch in height or greater exist, the fabric shall be slit and allowed to lay flat. Brooming will maximize fabric contact with the pavement surface. The equipment used to place the fabric is subject to approval by the Engineer.

At all utility covers which could be covered with fabric, the fabric shall be neatly cut around the cover to allow for raising the cover to finished grade.

SECTION 51. STORM DRAIN STRUCTURES

51-1.01 Curb Inlets. Curb inlets to be installed shall be in conformance with the City of Cloverdale Standard Plans and the details shown on the plans and as directed by the City Engineer.

51-1.02 Storm Drain Manholes. Storm drain manholes shall consist of a precast unit, and or a cast-in-place unit in conformance with Section 51 of the State Standard Specifications, or a combination thereof.

Manholes shall be fitted with either an eccentric cone or a flat "reducer" slab. Manholes shall be adjusted to match the finished grade with no less than two precast grade rings fitted with a cast iron frame and cover not less than 24" in diameter.

The inside diameter of the manhole shall be of such size that it accommodates the outside diameter of the largest adjoining pipe, however, in no case shall the inside diameter of any manhole be less than 48 inches. All pipe ends shall be rounded and all joints grouted. No pipe ends shall extend into the barrel of the manhole.

When the flowline of the manhole is over seven (7) feet below the top of the cover the inside of the manhole will be no less than 60 inches in any direction.

Turning of the paving machine or other vehicles should be gradual and shall be kept to a minimum to avoid damage to the membrane. Should equipment tires stick to the fabric during pavement operations, small quantities of asphaltic concrete shall be broadcast ahead to prevent sticking.

SECTION 63. CAST-IN-PLACE CONCRETE PIPE

63-1.01 Description. Cast-in-place concrete pipe shall conform to Section 63 of the State Standard Specifications

63-1.02 Materials. Consistency of the concrete shall be determined in accordance with ASTM C-143. Maximum slump shall be 2 inches.

63-1.03 Structures. Where shown on the plans, inlet and outlet structures shall be constructed or installed in connection with cast-in-place concrete pipe. Where such structures are constructed or installed, the ends of pipes shall be placed flush or cut off flush with the structure face, unless otherwise directed by the Engineer.

A starter section shall be used at the beginning of each run of cast-in-place concrete pipe, and a closing section shall be used where a run cannot be completed because of lack of clearance ahead in the trench. Starter sections shall be six feet in length and of the same inside diameter as the cast-in-place concrete pipe. Manhole bases may be formed by opening and troweling the cast-in-place concrete pipe on continuous runs.

Storm drain manholes shall be standard four or five foot diameter precast manholes as detailed in the Standard Plans. Storm drain manhole barrels and taper sections shall be precast concrete sections using Type II Portland Cement complying with ASTM C-150.

Catch basins shall be constructed as shown in the Standard Plans. Concrete for cast-in-place catch basins shall be Class B. Bar reinforcing steel shall conform to and be placed in accordance with the provisions of Section 52 of the State Standard Specifications.

Connections to existing storm drain structures shall be made with care to avoid unnecessary damage to any existing curb and gutter or sidewalk. Any damaged section of curb and gutter or sidewalk shall be removed and replaced in accordance with City Standards and as approved by the Engineer. Pipe connections to the existing structures shall be sealed with cement mortar.

63-1.04 Curing and Protection Concrete and Backfill. The following shall apply in lieu of Section 63-1.06 and Section 63-1.07 of the State Standard Specifications.

Backfill shall be placed in accordance with Standard 300, "Standard Trench Detail" of the City of Cloverdale Standard Plans, except that the pipe bedding specifications shall not apply.

Curing and protecting concrete shall comply with the following requirements:

When Type E trench backfill is designated, the cast-in-place concrete pipe shall be cured by placing backfill material to an approximate depth of one foot over the top of the pipe.

When either Type A, B, C or D backfill is designated the concrete shall be cured by placing trench backfill complying with the specifications contained in Standard 300 to an approximate depth of 0.5-

foot following application of either a waterproof membrane or a pigmented curing compound as provided in Section 90-7, "Curing Concrete" of the State Standard Specifications.

Hand spraying of the curing compound will be permitted. During the period following the placement of the concrete, the ends of the pipeline shall be covered with suitable material to maintain a humid condition within the pipe for a minimum of seven days.

Initial backfill placement shall be made immediately after the concrete has hardened sufficiently to prevent injury to the pipe during backfill operations. When Type E backfill is designated, only soft, damp and loose material shall be used for the initial placement of backfill.

The concrete pipe shall be protected as provided in Section 90-8, "Protecting Concrete" of the State Standard Specifications.

After the pipeline has been completed, but not prior to seven days following the placement of the concrete, the Contractor shall backfill the pipe trench in accordance with the requirements of Std. Dwg. 300.

In all cases, the Contractor shall be responsible for correcting any damage to cast-in-place concrete pipe caused by premature or excessive loading prior to the end of a seven day curing period.

SECTION 64. PLASTIC STORM DRAIN

64-1.01 Description. Plastic storm drain pipe (ADS N-12) shall conform to the provisions of Section 64, "Plastic Pipe" of the State Standard Specifications. Plastic pipe shall be Type S corrugated polyethylene pipe with a smooth inner lining and corrugated outer wall. Minimum cover from top of pipe to finished grade shall be 24".

64-1.02 Placing. Excavation and backfill shall be as shown on Std. Dwg. 412, "HDPE Trench Detail" of the City of Cloverdale Standard Plans.

No pipe shall be laid which is damaged or which, in the opinion of the Engineer, is unsuitable for use.

SECTION 65. REINFORCED CONCRETE PIPE

65-1.01 Description. Reinforced concrete pipe shall be either Class III, Class IV, or Class V, as shown on the plans and shall conform to the provisions of ASTM C-76.

65-1.02 Earthwork. Excavation and backfill shall be as shown on Std. Dwg. 300, "Standard Trench Detail" of the City of Cloverdale Standard Plans.

65-1.03 Structures. Storm drain manholes shall be standard four or five foot diameter precast manholes as detailed in the Standard Plans. Storm drain manholes barrels and taper sections shall be precast concrete sections using Type II Portland Cement complying with ASTM C-150.

Catch basins shall be constructed as shown in the Standard Plans. Concrete for cast-in-place catch basins shall be Class B. Bar reinforcing steel shall conform to and be placed in accordance with the provisions of Section 52 of the State Standard Specifications.

Connections to existing storm drain structures shall be made with care to avoid unnecessary damage to any existing curb and gutter or sidewalk. Any damaged section to be removed and replaced in accordance with City Standards and as approved by the Engineer. Pipe connections to the existing structures shall be sealed with cement mortar.

65-1.04 Laying Culvert Pipe. No pipe shall be laid which is cracked, checked, spalled, or damaged and which in the opinion of the Engineer is unsuitable for use.

SECTION 66. CORRUGATED METAL PIPE

66-1.01 Description. Corrugated metal pipe shall conform to the provisions of Section 66-3, "Corrugated Steel Pipe" of the State Standard Specifications. Corrugated metal pipe shall not be used in the street right-of-way.

66-1.02 Placing. Excavation and backfill shall be as shown on Standard 300, "Standard Trench Detail" of the City of Cloverdale Standard Plans.

No pipe shall be laid which is damaged or which, in the opinion of the Engineer is unsuitable for use.

SECTION 67. STORM SEWER ACCEPTANCE

67-1.01 Video Inspection. 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 City in color VHS format, together with a typed log of their inspection.

The following conditions shall exist prior to the television inspection:

- a. All storm sewer lines shall be installed, backfilled and compacted;
- b. All structures shall be in place, all channeling complete and all pipelines accessible from structures;
- c. All other underground facilities, utility piping and conduit within two feet of the storm sewer main, shall be installed;
- d. All compaction required shall be completed;
- e. Immediately before the television inspection, run fresh water into the storm sewer until it passes through the downstream manhole.
- f. No more than 1" deep water will be present at all times during video inspection.

When the above work has been completed, the Contractor shall notify the City 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. Cameras shall be pointed upstream and all video inspections shall run upstream.

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

- a. Off grade - 0.08 foot, or over, deviation from grade
- b. Joint separations - over 3/4";
- c. Offset joints;
- d. Chips in pipe ends - none more than 1/4" deep;
- e. Cracked or damaged pipe or evidence of the presence of an external object bearing upon the pipe (rocks, root, etc.);
- f. Infiltration;
- g. Debris or other foreign objects;
- h. Other obvious deficiencies when compared to Approved Plans and Specifications, these Standards and Standard Drawings.

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.

SECTION 71. SEWERS

71-1.01 Materials. Sewer pipe shall be polyvinyl chloride pipe or ductile iron pipe.

71-1.01A Polyvinyl Chloride (PVC) Pipe. PVC solid wall sewer pipe and fittings for gravity sewers shall be made for all new, rigid, unplasticized polyvinyl chloride in accordance with ASTM Standard Specifications D3034 and F-679 and shall have a wall thickness of at least SDR 35. Joints shall consist of an integral thickened bell-and-rubber ring and shall conform to ASTM D3212. Gaskets shall conform to ASTM E477. Joints shall be assembled using only manufacturers recommended lubricant.

All pipe shall have a home mark to indicate full penetration of the spigot when the joint is made.

All PVC pipe entering or leaving a concrete structure shall have a standard manhole gasket, as supplied by the pipe manufacturer, firmly clamped around the pipe exterior and cast into the structure base or near the structure wall center as a water stop.

After pipe installation and placement and compaction of backfill, but prior to placement of pavement, all pipe shall be cleaned and then mandrelled to measure for obstructions. Obstructions shall included, but not be limited to deflections, joint offsets and lateral pipe intrusions. A rigid mandrel, with an effective circular cross section having a diameter of at least 95% of the specified base inside diameter shall be pulled through the pipe by hand. The minimum length of the circular portion of the mandrel shall be equal to the nominal diameter of the pipe. All obstructions encountered by the mandrel shall be corrected by the Contractor.

Obstructions due to deflection shall be corrected by replacement of the over-deflected pipe, not by re-rounding in place.

If a section of pipe fails to meet the mandrel test and is reinstalled and fails the second time, said section(s) of pipe shall be replaced with an approved rigid pipe material.

The manufacturer shall furnish to the City a 5% deflection mandrel and proving ring as shown on the District Standards for the City's retention and use.

The average inside diameter for PVC Solid Wall Sewer Pipe shall be the "Average Outside Diameter" (see ASTM D3034 and F679) minus 2.12 times the "Minimum Wall Thickness" (see ASTM D3034 and F619).

The Contractor shall retest the solid wall pipe using a mandrel with an effective circular cross section having a diameter of at least 95% of the specified average inside diameter eleven (11) months after recordation of Notice of Completion of a City contract or after the acceptance by the City Council of a subdivision. Any pipe which fails to pass the mandrel test shall be replaced at the expense of the Contractor. The City reserves the right to determine the longitudinal limits of any pipe that is required to be replaced. Pipe replacement shall be guaranteed by the project maintenance bond.

Lateral wyes added after pipe installation shall be solvent welded saddles, not mechanically connected wyes.

71-1.01 Ductile Iron Pipe (DIP). 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 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.

71-1.02 Excavation and Backfill. Excavation and backfill shall be as shown on Std. Dwg. 300, "Standard Trench Detail" of the City of Cloverdale Standard Drawing.

All stumps and large roots encountered during trenching operations shall be removed to the satisfaction of the City. The trench shall be opened sufficiently ahead of the pipe laying operations to reveal obstructions. Trench crossings shall be provided as necessary 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.

71-1.03 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.

71-1.04 Pipe Laying. 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 or the environment.

Where projects consist of construction or new mains or extensions of existing mains, contractors must make provisions to keep flow from entering the sewer collection system. This shall include the installation of a positive sealing plug on the outlet of the new mains closest manhole to the existing main. Additionally, if any new laterals enter the new main between the existing main and the closest manhole on the new main, each lateral shall be individually plugged with a positive sealing plug. The Contractor shall be held responsible to periodically check that all plugs are holding tight. The Contractor shall ensure that the water contained in the new main is not contaminated with human or hazardous waste, prior to removal of any plugs. The Contractor shall make provisions to dewater the new mains without disposal into the sewer collection system and without cause of property damage or hazard to the public health or environment. Failure to comply may result in penalties.

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.

If the new sewer main is connecting to an existing main at a location other than an existing manhole, 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.

Electro-optical grade setting devices must be used and shall 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 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.

71-1.05 Sewer Laterals and Services. Sewer lateral inverts shall be set above the mid point of the sewer main.

71-1.05A Grades and Alignment. Service sewers shall be run in practical alignment at a uniform slope of not less than 1/4 inch per foot toward the main sewer; provided that where it is impractical due to the depth of the main sewer or to the structural features or the arrangement of any building or structure, to obtain a slope of 1/4 inch per foot, any such piping may have a slope of not less than 1/8 inch per foot when approved by an Engineer.

71-1.05B Pipe Cover and Clearance. Lateral sewers - shall be installed at sufficient depth to serve the parcel involved, but in no case less than three (3) feet clear cover at the property line.

Building sewers - shall have a clear cover of eighteen (18) inches minimum from finished grade. Where clear cover is less than eighteen (18) inches, cast iron pipe shall be used. Where building sewers are located in or cross driveways, ductile iron pipe shall be used.

71-1.06 Sewer Structures. Manholes shall be standard precast concrete manholes as detailed on Std. Dwg. 301. Mains larger than 18" in diameter or deeper than eight feet require 60" diameter manholes.

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.

Precast manhole bases, conforming to City Standard 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 Std. Dwg. 301. 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. 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.

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 City to determine that the interior surfaces are smooth and free of pockets or depressions. The inside face of all barrels, tapers and rings shall be aligned with and flush to adjacent sections.

Manhole frames and covers shall be in accordance with the City Std. Dwg. 303.

At locations where sewer is to be installed into or out of existing manholes, the manhole wall and base shall be chipped 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 chipped out opening. The Contractor shall also backfill the area around the pipe with concrete to insure a watertight connection.

Mainline cleanouts shall be installed per Std. Dwg. 307 at the locations shown on the Plans.

All joints in manholes shall be sealed by means of a preformed, self-bonding, self-sealing plastic gasket, such as "Ram-Nek", manufactured by the K.T. Snyder Company, Houston, Texas, or approved equal. Joint seals shall be installed in full compliance with the manufacturer's current

recommendations. All manholes shall be water tight prior to grouting.

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 48 hours of paving, all manholes and cleanouts shall be adjusted to grade and inspected.

71-1.07 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 50 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 City 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 City. 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, Inspector may require that gauge pressures be increased to compensate for groundwater hydrostatic pressure.
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 stop watch. 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. The Contractor will be allowed to manually bleed air as required to drop the internal pressure to 3.5 p.s.i.g. to start 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 City in color VHS format, together with a typed log of their 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 pipelines 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.
- h. No more than 1" deep water will be present at all times during video inspection.

When the above work has been completed, the Contractor shall notify the City 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. Cameras shall be pointed upstream and all video inspections shall run upstream.

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 - over 3/4";
- c. Offset joints;
- d. Chips in pipe ends - none more than 1/4" deep;
- e. Cracked or damaged pipe or evidence of the presence of an external object bearing upon the pipe (rocks, root, etc.);

- f. Infiltration;
- g. Debris or other foreign objects;
- h. Other obvious deficiencies when compared to Approved Plans and Specifications, these Standards and Standard Drawings.

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.

71-1.08 Trench Resurfacing. Trench resurfacing shall be as shown on STD DWG 115, "Standard Trench Detail".

SECTION 73. CONCRETE CURB, GUTTER AND SIDEWALK

73-1.01 Description. Concrete curb, gutter and sidewalks shall conform to Section 73 of the State Standard Specifications. The following shall apply in lieu of Section 73-1.01.

This work shall consist of constructing 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 attain a minimum compressive strength of 3000 psi at 28 days, and shall contain not less than six sacks of cement per cubic yard. Maximum slump of the concrete shall be 4 inches, as determined in accordance with ASTM C-143.

All miscellaneous concrete shall meet the above criteria unless directed otherwise by the City Engineer.

A pedestrian ramp shall be constructed in all curb returns in accordance with Std. Dwg. 208, "Pedestrian Ramp Type A, B or C", of the City of Cloverdale Standard Plans.

Reinforcement shall conform to the provisions in Section 52, "Reinforcement" of the State Standard 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 and sidewalk shall comply with the provisions of Section 26, "Aggregate Bases" of these Standard Specifications and shall be a minimum of 4 inches in compacted thickness.

Sidewalks constructed across driveways, and driveway ramps constructed between curb and edge of sidewalk, shall be six inches thick.

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.

73-1.03 Curb Construction. Attention is directed to Std. Dwg. 205, "Curb, Gutter and Sidewalk", of the Standard Plans.

Weakened plane joints shall be constructed at 15-foot intervals, except that when Portland Cement concrete pavement is adjacent thereto, the joints shall coincide with the weakened plane joints in the adjacent pavement. The joints shall be constructed to a minimum depth of 1½ inches by scoring with a tool which will leave the corners rounded with a ¼ inch radius and insure a free movement of the concrete at the joint.

Expansion joint filler strips shall have the top edge placed and securely held $\frac{1}{4}$ inch below the surface. Expansion joints shall be edged with an edging tool having a radius of $\frac{1}{4}$ inch.

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

73-1.04 Sidewalk, Gutter Depression, Island Paving and Driveway Construction. The surface of sidewalks shall be marked into rectangles per Standard 205, "Curb, Gutter and Sidewalk".

Weakened plane joints shall be constructed to a minimum depth of one inch with a tool which will leave the corners rounded with a $\frac{1}{4}$ inch radius and insure a free movement of concrete at the joint.

Expansion joint filler strips shall have the top edge placed and securely held $\frac{1}{4}$ inch below the surface. Expansion joints shall be edged with an edging tool having a radius of $\frac{1}{4}$ inch. Scoring lines shall be made with jointer tools having a radius of $\frac{1}{4}$ inch.

SECTION 81. MONUMENTS

81-1.01 General. The following shall apply in lieu of Section 81 of the State 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 Std. Dwg. 219, "Standard Permanent Monument" of the City of Cloverdale Standard Plans.

The exact location of the monuments will be established by the City Engineer for City contracts and by the subdivider's Engineer for subdivisions, and upon completion, the monuments will be checked and the center point stamped by the City Engineer of the subdivider's Engineer/Surveyor.

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.

SECTION 99. WATER MAIN CONSTRUCTION

99-1.01 Description. All water mains and related appurtenances shall be constructed in accordance with the City of Cloverdale Water System Design Standards.

99-1.02 Pipe. The pipe, except where otherwise specified on the plans, can either be Ductile Iron or Polyvinyl Chloride (PVC), all in accordance with the following:

- A. 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.

All Ductile Iron Pipe buried underground shall be encased in Polyethylene film in tube form. Polyethylene material and installation procedure for the encasement shall conform to A.N.S.I. A21.5 1972 or most recent issue, if any. Installation Method "A" as described in aforementioned specification shall apply.

- B. Polyvinyl Chloride (PVC) Pipe 4-inch through 12-inch shall be minimum class 150, or as shown on the plans and conforming to the requirements of AWWA C900 "Standard for Polyvinyl Chloride Pressure Pipe, 4-inch through 12-inch for Water" and shall be furnished with either bell ends or couplings designed to effect an elastomeric pressure seal. PVC pipe greater than 12-inch shall be Class 235 (DR18) unplasticized polyvinyl conforming to AWWA C905 and ASTM D2241.

Each and every length of pipe and coupling shall be marked with the manufacturer's name, lot number and the date the pipe was tested. The pipe shall be tested in accordance with the most recent American Water Works Standard Specifications and amendments thereto for the pipe furnished. The testing shall be performed in a State licensed materials testing laboratory where the testing standards meet or exceed State of California testing standards.

Accompanying or preceding each load of pipe delivered, a certificate shall be furnished to the City certifying that the pipe which is (to be) delivered has been tested and meets the requirements of the American Water Works Association Standard Specifications. The certificate shall identify the pipe by manufacturer's name, lot number and date tested by a State certified materials testing laboratory.

A number 10 insulated copper wire shall be laid on top of and along the entire length of all non-metallic service laterals and mains and shall be extended to the surface at all valve, blow-off and meter box locations sufficiently for locator equipment to be attached.

99-1.03 Service Tubing. All water service tubing shall be copper conforming to the latest AWWA standards as described in ANSI/AWWA C800 or the latest revision and with ASTM B88. One inch (1") tubing shall be Type "K" soft temper and 1½" and 2" tubing shall be Type "K" hard temper tubing.

Polyethylene tubing may only be used if specifically authorized by the City Engineer in writing. Polyethylene tubing shall be SDR 9 conforming to ASTM D-2737 with a water pressure rating of 200 psi.

99-1.04 Fittings. All fittings shall be new gray iron or ductile iron fittings conforming to ANSI/AWWA C110/C153 or latest revision and shall have the proper type of ends to match the type of pipe used. Gray iron fittings shall be coated inside and outside with a petroleum asphaltic coating conforming to AWWA C110 and shall meet or exceed the pressure rating of the pipe to be installed.

Ductile iron fittings shall be cement mortar lined in accordance with AWWA C104 or 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 otherwise meet or exceed the pressure rating of the pipe to be installed and shall have a minimum Class 53 thickness rating.

99-1.05 Gate Valves. Gate valves shall conform to AWWA Standard C509 or 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.

99-1.06 Butterfly Valves. Butterfly valves shall conform to AWWA Standard C504 or latest revision and shall be of the rubber seat type. Valve discs shall rotate 90 degrees for 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 G5, VG8, 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 Std. Dwg. 502.

No bends will be allowed in fire hydrant laterals without approval of the City Engineer.

Fire hydrants shall conform to the list of approved fire hydrants shown on the Engineer's Approved List.

Residential fire hydrants will have one 2 ½ inch outlet and one 4 ½ inch outlet.

Commercial fire hydrants will have two 2 ½ inch outlets and one 4 ½ inch outlet.

All hydrants shall be painted in accordance with the specifications shown on Std. Dwg. 502.

All hydrants shall be installed plumb.

Before a fire hydrant may be placed in service, a high velocity flushing of the hydrant lateral shall be witnessed and approved by City personnel.

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 water pipe shall be as shown on Std. Dwg. 300.

Excess Material from excavation shall become the property of the Contractor and shall be disposed of to the satisfaction of the City 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 City 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 City 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. All pipe stockpiled on the job shall be stored with the ends covered to prevent the entrance of foreign matter.

Whenever it is necessary, either in the vertical or horizontal plane, to avoid obstructions, or when long radius curves are permitted, the amount of deflection shall not exceed the maximum recommended by the pipe manufacturer or that required for satisfactory jointing.

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 PVC Pipe. Individual pieces of pipe, valves and fittings shall be joined by placing the rubber rings on the machined ends of the pipe and pulling the couplings, valves or fittings in accordance with the manufacturer's recommendations. The rings shall be checked to be sure they are in the proper position after the coupling is in place. Care shall be taken to insure proper seating of the rings, and adapters shall be utilized for connections as required by the manufacturer.

Fittings for PVC pipe shall be either the mechanical joint type or the push-on type.

PVC pipe shall be as specified in and installed per AWWA C900 or latest revision and in accordance with the manufacturer's recommendations.

99-1.13 Laying of Ductile Iron Pipe (DIP). 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.

99-1.14 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 Std. Dwg. 520.

99-1.15 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 City Engineer, shall be subjected to a hydrostatic pressure of not less than 200 psi for 15 minutes, then 150 psi for 30 minutes for a total duration of 45 minutes. Valves on existing mains in services required to be operated in connection with this job shall be operated only by City personnel. 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, all necessary apparatus, gauges 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 afterward tightly plugged.

Suitable means shall be provided by the Contractor so that the City can determine the quantity of water leakage under the test pressure. No pipe installation will be accepted until all leakage is stopped. The Contractor shall, at his own expense, locate the cause and repair any leakage.

99-1.16 Chlorination of Pipeline. Chlorine may be applied by any of the standard methods indicated in AWWA C651, subject to the approval of the City. 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 City personnel. The rate of chlorine feed shall be in such proportion to the rate of water entering the pipe that the chlorine dose applied to the water entering the newly laid pipe shall be at least 100 p.p.m. Precautions shall be taken to prevent back pressure causing a reversal of flow into treated pipe.

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.

Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe line. The water throughout its length shall, upon test, be proven both chemically and bacteriologically equal to the water quality serving the public from the existing water supply system.

Should the initial treatment, in the opinion of the City prove ineffective, the chlorination procedure shall be repeated until confirmed tests show that the water sampled from the newly laid pipe conforms to the aforementioned requirements.

Care shall be taken, and if necessary provisions shall be made by the Contractor to insure no highly chlorinated water from treated pipelines enters any natural surface waters either directly or by way of any storm drainage systems.

There shall be a 24-hour waiting period after blowing off the main prior to taking bacteria samples. The initial bacteria test shall be of the 28-hour duration type, in accordance with the State Department of Health Services requirements. 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. Contractor shall be responsible for reimbursing the City for all costs associated with performing sample gathering and testing.

99-1.17 Water Main Tie Ins. Water main tie-ins are not permitted on Fridays or days preceding a holiday except as authorized by the City Engineer.

The Contractor shall notify the Engineer 24 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 the Engineer. All shutdowns and valve turning operations shall be performed by City personnel only. A City inspector must be present during all tie-in operations. No tie-ins shall be performed without prior authorization of the Engineer.

Pipe and fittings furnished for tie-ins shall be no smaller than the existing water main to which each tie-in is made.

Contractors or parties who fail to keep field appointments may be billed for scheduled City personnel

waiting or standby time which was used and the contractor shall bear the costs incurred by the City for renotification of its customer.

Interruption of service to commercial customers shall, as much as practical, be coordinated with the customer's needs. The Contractor will contact the customer, 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: 8:00 a.m. to 5:00 p.m. Monday through Friday.

Contractors or parties requiring work of any kind by the City shall request such services a minimum of 24 hours in advance of the time such services are desired. Work requests, which will involve City personnel for more than 8 hours and/or extensive number of City supplied parts, including installation of new meters, 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 hours 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.

99-1.18 Water System Component Reporting. The Contractor shall submit the material type, manufacturer and model number of all water system components to the City prior to final testing.

99-1.19 Construction Water. Construction water shall be obtained from the City only at the point(s) designated by the City.

Hydrant meters shall only be connected to hydrants which have been accepted by the City.

A refundable deposit for each meter will be required.

Contractors are prohibited from operating gate valves or fire hydrants on the City system.

Acquisition of water through appropriation at unmetered fire hydrants or other facilities is a violation of City Ordinance and the State law. Use of construction water from sources other than the City Water System must be approved by the City.

