

General Specifications

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Community Development Resource Agency -
Engineering and Surveying Division
Department of Public Works and Facilities

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COUNTY OF PLACER

GENERAL SPECIFICATIONS

DIVISION I GENERAL PROVISIONS

SECTION 1: GENERAL

1-1.00 STANDARD SPECIFICATIONS

That edition of the State of California, Department of Transportation Standard Specifications, shall apply, as currently defined by the Director.

All section numbers and titles herein match or are added consecutively to the Standard Specifications.

When the statement, "The Standard Specifications are incorporated herein by this reference," is used, it means the section(s) is adopted from the Standard Specifications without change. When the statement, "The Standard Specifications are incorporated herein by this reference, except as noted," is used, it means that the section(s) is adopted from the Standard Specifications except for changes or exceptions incorporated. When a change to a section(s) of the Standard Specifications has been made, the section(s) has been reprinted in its entirety incorporating the change, and that section(s) of the Standard Specifications not applicable has been eliminated. When the statement, "not adopted" is used, it means that the section(s) from the Standard Specifications has not been adopted.

1-1.01 PAYMENT SECTIONS NOT ADOPTED

All payment and/or compensation sections and terms contained in the Caltrans Standard Specifications are not adopted by Placer County and are not applicable for the purpose of these General Specifications.

The Standard Specifications are incorporated herein by the following references, except as noted:

1-1.07B Glossary

ACCEPTANCE

The formal written acceptance by the Department of an entire contract which has been completed in all respects in accordance with the plans and specifications and any modifications thereof previously approved.

CONTRACT

The documents issued or approved by the Department covering the construction of the work. The contract shall include the project conditions of approval, permits, plans, specifications, and any other approvals given by the Department for the work contemplated and which may be required to complete the work in a substantial and acceptable manner.

CONTRACTOR

The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, who have been authorized or approved by the department to construct work on behalf of a Subdivider, Developer, or Property Owner. Where applicable in the context of these Specifications and as necessary for proper implementation of the contract, the term Contractor shall be interpreted to mean the Subdivider, Developer, or Property Owner of the project.

DEPARTMENT

The Board of Supervisors, the Engineering and Surveying Division of the Community Development Resource Agency, or the Department of Public Works and Facilities of the County of Placer.

DEVELOPER

The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, who have been authorized or approved by the Department to construct improvements.

DIRECTOR

The Director of the Placer County Department of Public Works and Facilities or the Director of the Community Development Resource Agency.

ENGINEER

The Director of the Placer County Department of Public Works and Facilities, the Director of the Engineering and Surveying Division of the Community Development Resource Agency, or an authorized agent appointed by either Director. The duties of the Engineer shall not include any functions that may concern the private contractual relationship between the Subdivider, Developer, or Property Owner and the Contractor, such as questions relating to compensation. Where applicable in the context of these Specifications and as necessary for the proper implementation of the contract, the term Engineer shall be interpreted to mean Private Engineer as defined in this Section.

ENGINEER'S ESTIMATE

The list of estimated quantities and construction costs of work to be performed, as prepared by the Private Engineer.

LABORATORY

The established laboratory(ies) of the Engineering and Surveying Division of the Community Development Resource Agency or the Department of Public Works and Facilities of Placer County, or other laboratories authorized by either Department to test materials and work involved in the contract.

PRIVATE ENGINEER

A registered Civil Engineer who has been employed by a Property Owner, Subdivider, or Developer to prepare the documents, maps and plans required by County Ordinances.

PROPERTY OWNER

The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, shown as the legal owner of the property on the latest equalized assessment roll in the Office of the County Assessor.

STATE

Reference to the State or State of California shall mean the County of Placer unless the reference is to a law or regulation of the State and reference to Sacramento shall mean Placer County offices unless otherwise noted.

SUBDIVIDER

A person, firm, corporation, partnership or association who proposes to divide, divides or causes to be divided real property into a subdivision for himself or for others except that employees and consultants of such persons or entities, acting in such capacity, are not "subdividers."

UTILITY DISTRICT

Any public or private entity which is authorized under a law to provide a utility service to the public.

WORK

All the work specified, indicated, shown or contemplated in the contract to construct the improvement, including all alterations, amendments or extensions thereto, as authorized and approved by the Department.

SECTION 2: BIDDING (not adopted)

SECTION 3: CONTRACT AWARD AND EXECUTION (not adopted)

SECTION 4: SCOPE OF WORK

The Standard Specifications are incorporated herein by the following references, except as noted:

4-1.05 CHANGES AND EXTRA WORK

The Department reserves the right to require alterations, deviations, additions to or deletions from the plans and specifications, as may be deemed by the Engineer to be necessary or advisable for the proper completion or construction of the whole work contemplated.

4-1.06 DIFFERING SITE CONDITIONS (not adopted)

4-1.07 VALUE ENGINEERING (not adopted)

SECTION 5: CONTROL OF WORK

The Standard Specifications are incorporated herein by the following references, except as noted:

5-1.02 CONTRACT COMPONENTS

If a discrepancy is found or confusion arises, submit an RFI.

5-1.03 ENGINEER'S AUTHORITY

The Engineer shall decide all questions which may arise as to the quality or acceptability of materials furnished and work performed and all questions which may arise as to the interpretation of the plans and specifications. The Engineer's decision shall be final, and the Engineer shall have authority to enforce and make effective those decisions and orders which the Contractor fails to carry out promptly.

5-1.03A Special Inspection and Certification of Work

The Engineer may request special inspection and certification of portions of work, including but not limited to item such as steel structures and reinforced concrete. Special Inspection shall be performed by registered professional engineers or technicians holding appropriate certifications for the type of work being inspected. Certifications shall be provided by registered professional engineers, shall address the compliance of the work with the approved design or applicable standards, and shall be stamped by the professional engineer providing the certification.

5-1.04 COORDINATION AND INTERPRETATION OF PLANS, STANDARD SPECIFICATIONS, AND SPECIAL PROVISIONS

These County General Specifications, Standard Specifications, Land Development Manual Plates, Standard Plans of the State of California, project plans, Special Provisions, and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary, and to describe and provide for a complete work.

Contract documents shall govern in the following order:

1. Project Conditions of Approval
2. Special Provisions (if approved by Department)
3. Project Plans/Permits
4. County General Specifications
5. Standard Specifications
6. Land Development Manual Plates
7. Standard Plans of the State of California

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Contract Documents, the Contractor, Subdivider, Developer, or Project Owner shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the contract.

5-1.04A Order of Work

When required by the plans, permits or conditions, the Contractor shall follow the sequence of operations as set forth therein.

5-1.04B Superintendence

The Subdivider, Developer, or Project Owner shall designate in writing before starting work, an authorized representative who shall have the authority to represent and act for the Contractor. The authorized representative shall be present at the site of the work at all times while work is actually in progress. When work is not in progress and during periods when work is suspended, arrangements acceptable to the Engineer shall be made for any emergency work that may be required. Whenever the Contractor or the authorized representative is not present on any particular part of the work where it may be desired to give direction, orders will be given by the Engineer, which shall be received and obeyed by the superintendent or foreman who may have charge of the particular work in reference to which the orders are given. Any order given by the Engineer, not otherwise required by the specifications to be in

writing will on request of the Contractor, be given or confirmed by the Engineer in writing.

5-1.07 LINES AND GRADES

5-1.07A Staking

The following lines and grades will normally be furnished by the Private Engineer for the construction:

5-1.07A(1) Clearing Stakes

One set of stakes at 50 foot intervals, or as required.

5-1.07A(2) Slope Stakes

One set of offset stakes at 50 foot intervals, or as required. (Plate 200)

5-1.07A(3) Subgrade, Subbase and Base Stakes

One set of bank plugs shall be placed by the Private Engineer at 50-foot intervals, or as required by the Engineer. The Contractor may place blue tops from the bank plugs for subgrade, subbase and base grade as directed by the Engineer. (Plates 201, 202)

The Contractor shall furnish two persons to assist the Engineer in checking grade.

5-1.07A(4) Utility Stakes

Grade stakes shall be used for utility line control, unless not required by the Engineer. Separate staking shall be provided at street intersections. Vertical curves on all sewer lines shall be staked 25 feet on-center.

5-1.07B Responsibility

Contractor is responsible for all line, location and elevation stakes for pipes, drainage structures, curb and gutter, and other miscellaneous facilities.

Contractor shall maintain at all times adequate location stakes or alternative pavement markings to allow County inspector to identify stationing of work.

When errors in staking are found by the Contractor, he shall notify the Engineer. The Private Engineer shall immediately correct the erroneous stakes.

5-1.13 SUBCONTRACTING (not adopted)

5-1.39B Damage Caused by an Act of God (not adopted)

5-1.43 POTENTIAL CLAIMS AND DISPUTE RESOLUTION (not adopted)

SECTION 6: CONTROL OF MATERIALS

6-1 GENERAL

The Standard Specifications are incorporated herein by the following references, except as noted:

6-1.04 DEFECTIVE MATERIALS

All materials which the Engineer has determined do not conform to the requirements of the plans and specifications will be rejected whether in place or not. They shall be removed immediately from the site of work, unless otherwise permitted by the Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used in the work, unless approval in writing has been given by the Engineer. Materials in place, and samples of the material tested by an independent laboratory and determined not to comply with the specifications shall constitute a means of rejection of those materials.

6-2.03 DEPARTMENT-FURNISHED MATERIALS (not adopted)

6-2.04 LOCAL MATERIALS (not adopted)

6-2.05 BUY AMERICA (not adopted)

6-3 QUALITY

The Standard Specifications are incorporated herein by the following references, except as noted:

6-3.05 QUALITY ASSURANCE

Various acceptance tests may be performed by the Engineer as outlined in the following sections. Testing of any areas shall be at random locations as selected by the Engineer.

All testing shall be conducted by the Engineer or his representative. Any tests performed by others will not be acknowledged or recognized for acceptance of materials or work performed, unless authorized by the Engineer.

SECTION 7: LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

The Standard Specifications are incorporated herein by the following references, except as noted:

7-1.02B U.S. Fair Labor Standards Act (not adopted)

7-1.02C Emissions Reduction (not adopted)

7-1.02I Government Code (not adopted)

7-1.02K(1) General (not adopted)

7-1.02K(2) Wages (not adopted)

7-1.03K(3) Certified Payroll Records (not adopted)

7-1.02K(4) Apprentices (not adopted)

7-1.02K(5) Working Hours (not adopted)

7-1.02K(5)A Holidays and Hours of Work

No work can take place on days recognized as Placer County Holidays. The list of these days is available from the County and is set annually as required by Placer County Code, Chapter 2, Section 2.12.010.

No work can take place outside of working hours as established by a project's conditions of approval, encroachment permit, or based on restrictions that may be created by noise as defined in the Placer County Noise Ordinance.

7-1.02L Public Contract Code (not adopted)

7-1.11 FEDERAL LAWS FOR FEDERAL-AID CONTRACTS (not adopted)

7-1.12 PRESERVATION OF PROPERTY AND FACILITIES

Attention is directed to Section 7-1.05, "Indemnification," and to Section 5-1.36D, "Non Highway Facilities." Due care shall be exercised to avoid injury to existing highway improvements or facilities, utility facilities, adjacent property, and roadside trees, shrubs, and other plants that are not to be removed.

Roadside trees, shrubs, and other plants that are not to be removed, and pole lines, fences, signs, markers and monuments, buildings and structures, conduits, pipe lines under or above ground, sewer and water lines, all highway facilities, and any other improvements or facilities within or adjacent to the highway shall be protected from injury or damage, and if ordered by

the Engineer, the Contractor shall provide and install suitable safeguards, approved by the Engineer, to protect such objects from injury or damage. If such objects are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored at the Contractor's expense. The facilities shall be replaced or restored to a condition as good as when the Contractor entered upon the work, or as good as required by the specifications accompanying the contract, if any such objects are part of the work being performed under the contract. The Engineer may make or cause to be made such temporary repairs as are necessary to restore to service any damaged highway facility. The cost of such repairs shall be borne by the Contractor and may be deducted from any monies due or to become due to the Contractor under the contract.

The location of existing utilities such as gas mains, water and sewer mains, drainage lines, underground electric and telephone installations where indicated on the plans are in accordance with such information as may be available to the County. However, the exact positions of such facilities must be ascertained by the Contractor by means of potholing. Likewise it shall be the duty of the Contractor to ascertain if additional facilities other than those shown on the plans may exist. The information concerning utilities as shown on the plans is offered for such use as the Contractor may wish to make of it but the County does not guarantee its correctness or completeness.

The limits of work shall be flagged in the field by the Private Engineer. The contractor shall confine all construction activities to these limits. Upon completion of the work, denuded areas within the limits shall be cleaned up and seeded or planted as specified in Section 13.11 or as required by the approved project plans.

7-1.12A Survey Monument Protection

When monuments exist that control the location of subdivisions, tracts, boundaries, roads, streets, or highways, or provide horizontal or vertical survey control, the monuments shall be located and referenced by or under the direction of a licensed land surveyor or licensed civil engineer legally authorized to practice land surveying prior to the time when any streets, highways, other rights-of-way, or easements are improved, constructed, reconstructed, maintained, resurfaced, or relocated and a corner record or record of survey shall be filed with the County Surveyor.

If these monuments, known prior to construction or discovered during construction are damaged, altered or destroyed during the course of constructing the improvements, they shall be replaced or repaired by a licensed land surveyor or licensed civil engineer legally authorized to practice

land surveying and a corner record or record of survey shall be filed with the County Surveyor. In areas where the monument is to be placed in pavement, or where required by law or accepted survey practice, the monument shall be reset in the surface of the new construction and a suitable monument box placed thereon.

The actual requirements of this section shall be as described herein or as required by current law with the greater of the two taking precedence.

7-1.125A Protection of the Public and Private Property

Unusual conditions may arise on the work which will require that immediate and unusual provisions be made to protect the public from danger or loss or damage to life or property, due directly or indirectly to the prosecution of the work, and it is part of the service required of the Contractor to make such provisions and to furnish such protection.

Whenever, in the opinion of the Department, an emergency exists, against which the Contractor has not taken sufficient precaution for the safety of the public or the protection of utilities or of adjacent structures or property which may be injured by process of construction on account of such neglect; and whenever, in the opinion of the Department, immediate action shall be considered necessary in order to protect public or private property interest, or prevent likely loss of human life or damage on account of the operations under the contract, then, and in that event the Department may provide suitable protection to said interests by causing such work to be done and material to be furnished as, in the opinion of the Department may seem reasonable and necessary.

The cost and expense of said labor and material, together with the cost and expense of such repairs as may be deemed necessary, shall be borne by the Contractor. Failure of the Department, however, to take such precautionary measures, shall not relieve the Contractor of his full responsibility for public safety.

7-1.17 ACCEPTANCE OF PROJECT

When the Engineer has made the final inspection as provided in Section 5-1.46 "Final Inspection and Contract Acceptance," the developer shall furnish the Engineer with letters of acceptance from all agencies having utilities or facilities within the project area, Project Final Acceptance form signed by the appropriate County Departments, record drawings in a format determined by the Engineer, a copy of a sewer "Bill of Sale" if required, and a copy of the recorded "Notice of Completion," if required. If at this time the Engineer determines that the contract has been complete in all respects in accordance

with the plans and specifications, the Engineer will recommend that the Department formally accept the project.

SECTION 8: PROSECUTION AND PROGRESS (not adopted)

SECTION 9: PAYMENT (not adopted)

SECTION 10: GENERAL (Reserved)

DIVISION II GENERAL CONSTRUCTION

SECTION 11: QUALITY CONTROL AND ASSURANCE

The Standard Specifications are incorporated herein by this reference.

SECTION 12: TEMPORARY TRAFFIC CONTROL

The Standard Specifications are incorporated herein by this reference.

SECTION 13: WATER POLLUTION CONTROL (not adopted)

Add:

13.11

EROSION AND SEDIMENT CONTROL GUIDELINES

The "Erosion & Sediment Control Guidelines for Developing Areas of the Sierra Foothills and Mountains" (prepared by the High Sierra RC&D Council, October, 1991) are incorporated herein by this reference. In addition, water quality treatment Best Management Practices (BMPs) may be applied according to the guidance of the California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbooks for Construction, for New Development / Redevelopment, and for Industrial and Commercial (or other similar source as approved by the Engineer). In the Lake Tahoe Basin, authoritative site-specific erosion control manuals may be used in lieu of the High Sierra RC&D Manual when allowed by the Engineer.

SECTION 14: ENVIRONMENTAL STEWARDSHIP

This section is not adopted with the exception of 14-9.03 Dust Control which is incorporated herein by this reference except this work is not considered change order work.

SECTION 15: EXISTING FACILITIES

The Standard Specifications are incorporated herein by this reference.

DIVISION III GRADING

SECTION 16: CLEARING AND GRUBBING

The Standard Specifications are incorporated herein by this reference.

SECTION 17: WATERING

The Standard Specifications are incorporated herein by this reference.

SECTION 18: DUST PALLIATIVE

The Standard Specifications are incorporated herein by this reference.

SECTION 19: EARTHWORK

19-1 GENERAL

The Standard Specifications are incorporated herein by the following references, except as noted:

- 19-1.01A Summary**
Earthwork shall consist of all excavation, including roadways, unless separately designated.
- 19-1.03C Grade Tolerance**
Immediately prior to placing subsequent layers thereon, the grading plane of the sub-grade at any point shall not vary more than 0.00 foot above or 0.10 foot below the grade established by the Private Engineer. Immediately prior to placing subsequent layers thereon, the grading plane of the aggregate base grade at any point shall not vary more than 0.00 foot above or 0.05 foot below the grade established by the Private Engineer.

19-2 ROADWAY EXCAVATION

The Standard Specifications are incorporated herein by the following references, except as noted:

- 19-2.02A Regulatory Approvals**
Excavation or utilization of hazardous materials and/or asbestos containing materials shall not be permitted without a work plan and site safety plan approved by the appropriate regulatory agency.

19-3 STRUCTURE EXCAVATION & BACKFILL

The Standard Specifications are incorporated herein by the following reference, except as noted:

19-4 TRENCH EXCAVATION AND RESTORATION

19-4.01 TRENCH EXCAVATION

Unless boring is required, trench excavation shall be in accordance with Plates 431, 432, 433, and 434 of these General Specifications. When the trench is in an existing paved area of a County-maintained road, the pavement shall be sawed or scored and broken, or ground, ahead of the trenching operations. The proper tools and equipment shall be used in marking and breaking so that the pavement will be cut accurately on neat lines, generally parallel and perpendicular to wheel path.

When water is encountered, the trench shall be kept dry in a manner approved by the Engineer until the placing of the bedding material, laying and jointing of the pipe, and placing of the shading material has been completed and approved. Ground water pumped from the trench shall be disposed of in such manner as will not cause injury to public or private property or constitute nuisance or menace to the public. The manner employed to dispose of water pumped from an excavation shall be subject to the approval of the Engineer and shall conform to Section 13, "Water Pollution Control."

Whenever the bottom of the trench is soft, yielding, or in the opinion of the Engineer otherwise unsuitable as a foundation for the pipe, the unsuitable material shall be removed to a depth such that when replaced with suitable material as specified in Section 19-3.03E of these General Specifications, it will provide a stable and satisfactory foundation. Compaction of the imported material shall be 90 percent relative compaction or as shown on the plans or detailed in the project specifications.

In new construction, when sewer pipes and manholes are to be placed in new fill material, the fill material (down to original subgrade) under the sewer pipes and manholes shall be compacted to a relative compaction of 95%.

Trenches shall not be left open farther than 300 feet in advance of pipe laying operations or 200 feet to the rear thereof, unless otherwise permitted by the Engineer. When left unattended by the contractor, no more than 100 feet of trench shall be left open. When contractor is working in public rights-of-way or easements, prior to departure from the work site, all unattended open trenches

shall be protected by approved steel plate, or 6' high chain link fence, or as directed by the Engineer.

Attention is directed to Section 7-1.02K(6)(b) "Excavation Safety" of the Standard Specifications. The contractor shall comply with the California Division of Occupational Safety and Health (OSHA) and all other applicable safety regulations.

19-4.02 TRENCH BEDDING AND INITIAL BACKFILL

Bedding and initial backfill shall consist of material placed from the bottom of the trench to 1 foot above the top of pipe or as required by the utility owner. This material shall have a minimum sand equivalent of 25 and shall pass the ¾ inch aggregate grading requirements shown below. All exceptions shall be approved by the Engineer. (See Section 71 for special conditions for sewer pipe.)

Aggregate Grading Requirements
Percentage Passing for ¾" Maximum Aggregate

Sieve Size	Percent Passing (%)
1"	100
¾"	90-100
No. 4	35-60
No. 30	10-30
No. 200	2-5

Compactable concrete may also be approved as pipe bedding material. The compactable concrete shall be prepared and placed as specified in Section 19-3.03F.

When determined by the Engineer that the foundation material is wet or rocky, bedding material shall be placed to a depth of at least 6.0 inches below the pipe or one-fourth the outside diameter of the pipe barrel, whichever is greater. This material shall be washed rock 100% passing the ¾ inch screen, and wrapped in filter fabric as appropriate to prevent migration of fines into rock voids. Approval of the Engineer is required for use within public rights-of-way.

In excessively wet areas a special foundation design may be required by the Engineer.

In fill areas and sag points in the profile, cross trenches and cross drains may be required by the Engineer to relieve trench water accumulation. The trenches shall be daylighted to the fill slope at a minimum slope of 0.5 percent and the lower 1.0 foot backfilled with bedding and initial backfill material. Engineer approval of daylight areas shall be required.

19-4.03 TRENCH INTERMEDIATE BACKFILL

Intermediate backfill shall consist of material placed from 1.0 foot above the pipe to subgrade. All intermediate backfill shall be free of debris and organic matter, and shall be free of any rocks over 3.0 inches in diameter.

Utilities and culverts placed with less than 1.0 foot of intermediate backfill, shall be encased in concrete or provided with a concrete cover, cement slurry or other method approved by the Engineer.

19-4.03A Compactible 3/8" Concrete Mix Design for Intermediate Backfill

Per Cubic Yard:

77% of 3/8" aggregate (crushed rock)

23% of sand

188# of cement (2 sack)

12 gallons of water

Compact in 1-foot lifts using a vibraplate or whacker.

3/8" Aggregate per following specification:

Sieve Size	Percent Passing (%)
3/4"	100
3/8"	0-20
No. 100	2-3

Sand as per Standard Specifications Section 90-1.02C(4)(c).

19-4.04 TRENCH COMPACTION

The required compaction for utility trenches within the roadway shall be a minimum of:

Bedding and Initial Backfill

90% relative compaction, unless otherwise specified by the utility owner.

Intermediate Backfill

95% relative compaction for upper 6-inches of intermediate backfill, 92% relative compaction for remainder, or as shown on the plans or in the project specifications.

The required compaction for utility trenches outside the roadway shall be a minimum of 90 percent from the bottom of the trench to finished grade, or as shown on the plans or in the project specifications.

Compaction shall be obtained by mechanical means in layers not to exceed 8 inches in thickness. Trench jetting will not be allowed within the roadway prism.

19-5 COMPACTION

19-5.03 CONSTRUCTION

The Standard Specifications are incorporated herein by the following references, except as noted:

19-5.03B Relative Compaction (95 Percent)

Relative compaction of not less than 95 percent shall be obtained for a minimum depth of 0.50 foot below the grading plane for the width between the outer edges of shoulders, whether in excavation or embankment.

Except for the outer 5.0 feet measured horizontally from the embankment side slopes, the full width of embankment within 150 feet of bridge abutments shall be compacted to a relative compaction of not less than 95 percent. The 150 feet limit of 95 percent compaction will be measured horizontally from the bridge abutment and either parallel or concentric with the roadway centerline. In addition, a relative compaction of not less than 95 percent shall be obtained for embankment under retaining wall footings without pile foundations within the limits established by inclined planes sloping 1:1.5 down and out from lines 1.0 foot outside the bottom edges of the footing.

All materials used shall be compacted to a relative compaction of 95% minimum.

19-5.05 RESTORATION AND RESURFACING

Trench restoration and final resurfacing shall be performed in conjunction with the other operations of the contractor so that no more than 1,000 lineal feet (in aggregate) of trench has not been resurfaced and accepted by the County at any time. This limit may be modified in writing by the Engineer to a lesser or greater amount as a permit condition.

19-6 EMBANKMENT CONSTRUCTION

The Standard Specifications are incorporated herein by this reference.

19-7 BORROW MATERIAL

The Standard Specifications are incorporated herein by this reference.

SECTION 20: LANDSCAPE (not adopted)

SECTION 21: EROSION CONTROL (not adopted)

SECTION 22: FINISHING ROADWAY (not adopted)

SECTION 23: RESERVED

DIVISION IV SUBBASES AND BASES

SECTION 24: STABILIZED SOILS

The Standard Specifications are incorporated herein by this reference, except as noted:

24-2.03F Finish Grading

The finished surface of the lime stabilized material shall be the grading plane and at any point shall not vary more than 0.00-foot above or 0.08-foot below the grade established by the Engineer.

If the compacted material is above the grade tolerances specified in this section, the excess material shall be trimmed, removed, and disposed of. No loose material shall be left on the finished plane. Trimming of excess material shall not be conducted unless finish rolling can be completed within 2 hours after trimming.

Trimmed surfaces shall receive finish rolling consisting of at least one complete coverage with steel drum or pneumatic-tired rollers. Vibratory rollers will not be allowed. Minor indentations may remain in the surface of the finished material after final trimming and rolling. Under no circumstances will it be permissible to add new or trimmed lime stabilized material to fill low areas or to raise the grade of compacted lime stabilized material.

SECTION 25: AGGREGATE SUBBASES

The Standard Specifications are incorporated herein by this reference.

SECTION 26: AGGREGATE BASES

The Standard Specifications are incorporated herein by the following reference, except as noted:

26-1.02A General

Add to item 3 "Natural rough surfaced gravel" in the second paragraph list, "(Natural rough surfaced gravel shall be defined as naturally occurring gravel

or aggregate that has a broken or fractured side on at least two faces.)”

Add to item 5 “Processed reclaimed asphalt concrete, PCC, LCB or CTB,”
“where the gravel or aggregate stones have clearly gone through a mechanical process resulting in crushed gravel displaying at least 2 fractured faces.”

26-1.03D Compacting

Aggregate bases, after compaction, shall be watered in conformance with the provisions in Section 17, "Watering."

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

The surface of the finished aggregate base at any point shall not vary more than 0.00-foot above or 0.05-foot below the grade established by the Engineer.

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

SECTION 27: CEMENT TREATED BASES

The Standard Specifications are incorporated herein by the following reference, except as noted:

27-2.03F Compacting

Compacting equipment shall produce the required compaction within the operation time limit specified in Section 27-2.03G, "Operation Time Requirement."

Compaction shall follow immediately after the spreading operation, and shall consist of at least one complete coverage of the treated material.

When the finished surface after initial compaction is outside the tolerance specified hereinafter, high spots shall be trimmed off to within the specified tolerance. Filling of low areas by drifting or hauling of trimmed material is prohibited. Following trimming, trimmed areas shall receive one complete coverage and have such additional compaction performed that the entire layer of cement treated base conforms to the compaction requirements hereinafter specified. Final compaction shall be accomplished in such a manner that no loose material remains on the surface and tear marks are eliminated.

When cement treated base is spread and compacted in more than one layer, each lower layer shall be compacted to the required degree of compaction before placing the next layer. Only such trimming will be required as is necessary to meet the requirements for layer thickness contained in Section 27-2.03E, "Spreading Treated Mixture."

The relative compaction of cement treated base shall be not less than 95 percent. The compaction shall be determined by California Test 312 or 231 for Class A cement treated base. Each layer of cement treated base may be tested for compaction, or all layers may be tested together, at the option of the Engineer. When all layers are tested together, the Contractor will not be relieved of the responsibility to achieve the required compaction in each layer placed.

The finished surface of cement treated base shall be uniform and shall not deviate at any point more than 0.03-foot from the bottom of an 11.8 feet \pm 0.2-foot straightedge laid in any direction.

The surface of the finished cement treated base at any point shall not vary more than 0.00-foot above or 0.05-foot below the grade established by the Engineer, except that when portland cement concrete pavement is to be placed on cement treated base, the surface of the cement treated base at any point shall not extend above the grade established by the Engineer.

Areas of the finished cement treated base which are lower than 0.05-foot below the grade established by the Engineer shall be removed and replaced with cement treated base which complies with requirements of these specifications, or if permitted by the Engineer, shall be filled as hereinafter specified.

When surfacing material is asphalt concrete, the low areas shall be filled with asphalt concrete conforming to the requirements for the lowest layer of asphalt concrete to be placed as surfacing. This filling shall be done as a separate operation prior to placing the lowest layer of surfacing.

When surfacing material is portland cement concrete, the low areas shall be filled with pavement concrete at the time and in the same operation that the surfacing is placed.

The surface shall be kept moist at all times until the curing seal is applied.

Excess material may be placed as aggregate for shoulder construction subject to the following conditions:

- A. The shoulder subgrade shall be prepared as specified.
- B. Hardened chunks of trimmed material shall be removed or reduced to the maximum size specified for shoulder aggregate prior to spreading additional shoulder aggregate.
- C. The amount of trimmed material incorporated in the shoulder shall not exceed 25 percent of the planned volume of shoulder aggregate per linear meter {linear foot} of shoulder. When trimmings exceed this limit, the excess shall be removed and may be placed in other shoulder areas, in conformance with the 25 percent limit.
- D. The excess material shall be uniformly distributed in the shoulder area prior to spreading additional shoulder aggregate.

The excess material may also be used at other locations in the work provided the excess material complies with applicable specification requirements, or shall be otherwise disposed of as permitted by the Engineer.

SECTION 28: CONCRETE BASES

The Standard Specifications are incorporated herein by this reference.

SECTION 29: TREATED PERMEABLE BASES (not adopted)

SECTION 30 – 36: (RESERVED)

DIVISION V SURFACINGS AND PAVEMENTS

SECTION 37: BITUMINOUS SEALS

The Standard Specifications are incorporated herein by this reference, except as noted:

37-2.02 MATERIALS

Asphalt emulsion shall conform to the provisions in section 94, Table 3, "Asphaltic Emulsions," and shall be of the grade specified in the special provisions.

Liquid asphalt for prime coat, if required, shall be of the grade specified in the special provisions, and shall conform to the provisions in Section 93, "Liquid Asphalts."

Asphalt emulsion shall be anionic or cationic type polymer modified asphaltic emulsion grade PMRS-2h or PMCRS-2h. Bituminous binder shall be determined by use of California test Method 302, Film Stripping, 10% Maximum, for

Compatibility to Anionic or Cationic Emulsions.

Due to field conditions or performance of the finished product, modifications to the asphaltic emulsion may be necessary. Modifications will be as requested by the Engineer and will be within the ranges specified in these Provisions.

Cationic type asphaltic emulsion grade PMCRS-2h shall conform to the following requirements when tested in accordance with the specified test methods:

Test on Emulsions:		
TEST	TEST METHOD	REQUIREMENT
Viscosity SSF, @ 122°F, sec.	AASHTO T 59	100-300
Settlement, 5 days, %	AASHTO T 59	5 Maximum
Storage Stability, 1 day, %	AASHTO T 59	1 Maximum
Sieve Test, %	AASHTO T 59	0.30 Maximum
Demulsibility, 35 ml 0.8% Sodium dioctyl sulfosuccinate, %	AASHTO T 59	60-95
Particle Charge	AASHTO T 59	3 Maximum

Test on Residue from Evaporation Using California Test Method 331:		
TEST	TEST METHOD	REQUIREMENT
Ring & Ball Softening Point, °F	AASHTO T 53	120°
Residue, %	AASHTO T 59	65 Minimum
Penetration, @ 77°F, with 100 grams for 5 seconds	AASHTO T 59	45-65 dmm
Solubility in Trichloroethylene, %	ASTM D 2042	97.5 Minimum
Ductility, 77°F, 5 cm/min., cm RTFP Aged Residue	AASHTO T 51	60 Minimum
Torsional Recovery, %	Cal. Test 332	18 Minimum

Anionic type asphaltic emulsion grade PMRS-2h shall conform to the following requirements when tested in accordance with the specified test methods:

Test on Emulsions:		
TEST	TEST METHOD	REQUIREMENT
Viscosity SSF, @ 122°F, sec.	AASHTO T 59	100-250
Settlement, 5 days, %	AASHTO T 59	5 Maximum
Storage Stability, 1 day, %	AASHTO T 59	1 Maximum
Sieve Test, %	AASHTO T 59	0.30 Maximum
Demulsibility, 35 ml 0.02 N CaCl ₂ , %	AASHTO T 59	60-95
Oil distillate by volume of emulsion, %	AASHTO T 59	3 Maximum

Test on Residue from Evaporation Using California Test Method 331:		
TEST	TEST METHOD	REQUIREMENT
Ring & Ball Softening Point, °F	AASHTO T 53	120°
Residue, %	AASHTO T 59	65 Minimum
Penetration, @ 77°F, with 100 grams for 5 seconds	AASHTO T 59	45-65 dmm
Solubility in Trichloroethylene, %	ASTM D 2042	97.5 Minimum
Ductility, 77°F, 5 cm/min., cm RTFP Aged Residue	AASHTO T 51	60 Minimum
Torsional Recovery, %	Cal. Test 332	18 Minimum

The Contractor shall submit samples from all suppliers furnishing the following materials:

- 1) One quart of the asphaltic emulsion.
- 2) 50 pounds of the medium fine screening.

The above sample (No. 1) shall be submitted to the Engineer in a one quart plastic container, and both samples (No. 1 and 2) shall be submitted in a minimum of 10 days prior to the beginning of the seal coat work.

Additionally, half-gallon samples of the asphaltic emulsion delivered to the project will be taken from the spray bar of the distributor truck at mid-load.

The size of screenings for the various types of seal coats shall conform to the following:

Seal Coat Types	Size of Screenings
Medium fine	5/16" x No.8
Medium	3/8" x No.6

Screenings shall conform to the following requirements prior to depositing on the roadbed.

Screenings shall consist of broken stone, crushed gravel or both. At least 90 percent by mass of the screenings shall consist of crushed particles as determined by California Test 205.

Screenings shall be clean and free from dirt and other deleterious substances.

The percentage composition by mass of screenings shall conform to one of the following gradings:

Percentage Passing (%)		
Sieve Size	Medium 3/8 x No. 6	Medium Fine 5/16 x No. 8
1/2"	100	-
3/8"	90-100	100
No. 4	5-30	30-60
No. 8	0-10	0-15
No. 16	0-5	0-5
No. 30	-	0-3
No. 200	0-2	0-2

Screenings shall contain no more than 10% by weight of quartz rock.

Screenings shall contain no more than 25% by weight of Lime Stone.

Screenings shall also conform to the following quality requirements:

	California Test	Requirements
Cleanness value Minimum	227	85
Los Angeles Rattler Loss at 500 Rev. (Maximum)	211	25%

If the results of the aggregate grading for screenings does not meet the gradation specified, the seal coat represented by the test shall be removed.

Samples for the aggregate grading and Cleanness Value tests will be taken from the conveyor belt of the spreader prior to application.

37-2.03F Applying Emulsion

Asphaltic emulsion shall be applied in accordance with the provisions in Section 94, "Asphaltic Emulsions," and the provisions specified in this Section 37-2.03F.

The application rate of fog seal coat (asphaltic emulsion and added water) shall be such that the original emulsion will be spread at a rate of 0.05- to 0.10-gallon per square yard. The exact rate of application will be determined by the Engineer.

The application rates of asphaltic emulsion for the other types of seal coats shall be within the following ranges in gallons per square yard. The exact rates will be determined by the Engineer.

Seal Coat Type	Ranges (Gal/Sq. Yd)
Medium	0.26 to 0.42
Medium / Fine	0.25 to 0.35

Asphaltic emulsion at the time of application shall be between 130° F and 180° F.

Asphaltic emulsion shall not be applied when weather conditions are unsuitable. Seal coats requiring screenings shall not be applied until sufficient screenings are on hand to immediately cover the asphaltic emulsion, or when the atmospheric temperature is below 65° F or above 110° F, or when the pavement temperature is below 80° F. Fog seal coat shall not be applied when the atmospheric temperature is below 40° F.

The Engineer will notify the Contractor, no later than 4:00 p.m., if it is anticipated that the next working day will not be suitable for the application of seal coat. This notice may be given on the day preceding the date the Contractor intends to begin work, any working day after the Contractor has begun work, and any day previously named by the Engineer as a day unsuitable for applying seal coat. When the Engineer has declared a day to be unsuitable by reason of expected low temperature or unsuitable weather conditions, the Contractor shall not apply any new seal coat. If maintenance of previously applied seal coat can be performed, the Contractor shall continue to perform the maintenance.

If the Contractor has not been notified by the Engineer of an anticipated unsuitable day and at the beginning of the work day the weather is unsuitable for the application of seal coats, but maintenance of previously applied seal coat can be performed, the Contractor shall not apply any seal coat. Binder and screenings brought to the project shall be returned, stored or disposed of as directed by the Engineer. The Contractor shall continue maintenance of previously applied seal coat.

After the application of a fog seal coat, asphaltic emulsion that becomes tacky shall be sprinkled with water in the amount ordered and as directed by the Engineer.

When more than one type of seal coat is to be applied, the fog seal coat shall be applied at least 4 days in advance of the application of an adjoining seal coat requiring screenings. The seal coats shall be applied in such a manner that the joint between 2 types will present a neat and uniform appearance true to the line shown on the typical cross section and established by the Engineer.

Applying asphaltic emulsion shall be discontinued sufficiently early in the day to permit the termination of traffic control prior to darkness. Asphaltic emulsion shall be applied to only one designated traffic lane at a time, and the entire width of the lane shall be covered in one operation. Asphaltic emulsion shall not be applied a greater distance than can be immediately covered by screenings, unless otherwise permitted by the Engineer.

The cut off of asphaltic emulsion shall be made on building paper or similar material spread over the surface. Paper shall also be placed over the treated surface for a sufficient length at the beginning of a spread to avoid spraying existing pavement or previously placed screenings and so that the nozzles are spreading properly when the uncovered surface is reached. The building paper shall then be removed and disposed of in a manner satisfactory to the Engineer.

The distribution of asphaltic emulsion shall not vary more than 15 percent transversely from the average as determined by tests, nor more than 10 percent longitudinally from the specified rate of application as determined by California Test 339.

37-2.03H Finishing

After the screenings have been spread upon the polymer modified asphaltic emulsion, any piles, ridges or uneven distribution shall be carefully removed prior to initial rolling, to insure against permanent ridges, bumps or depressions in the completed surface. Prior to initial rolling, additional screenings shall be spread in whatever quantities required to prevent picking up of the polymer modified asphaltic emulsion by the rollers or traffic, and to provide a uniform surface and appearance to the roadway.

Rollers shall be pneumatic-tired type. A minimum of three pneumatic-tired rollers conforming to Section 39-1.10, "Spreading and Compacting Equipment," shall be furnished and operating at all times. Rollers shall not exceed speeds of 10 MPH during initial and secondary rolling.

Initial rolling shall consist of one complete coverage and shall begin immediately behind the chip spreader. Polymer modified asphaltic emulsion and screenings shall not be spread more than 2,500 feet ahead of completion of initial rolling operations.

Secondary rolling shall consist of a minimum of two complete coverages, and shall begin immediately after completion of the initial rolling. The amount of secondary rolling shall be sufficient to adequately seat the screenings, and in no case shall be less than two complete coverages.

Upon completion of secondary rolling, traffic will be permitted to travel over the seal coat (fine). Initial sweeping of screenings will be performed by the Contractor. Application of new screenings shall not begin until the Contractor has begun sweeping the previous day's screenings, unless otherwise directed by the Engineer.

On roads requiring pilot-car assisted traffic control, initial sweeping of loose screenings will be done by the Contractor on the same day on which the screenings are placed. The Contractor may begin initial sweeping after the screenings have been in place for a period of approximately 3 1/2 to 4 hours, and after the Engineer has determined the seal coat (fine) is ready for sweeping.

On roads not requiring pilot car assisted traffic control, initial sweeping of loose screenings will be done by the Contractor on the calendar day following the placement of the screenings, unless otherwise approved by the Engineer.

The Contractor will be required to provide operated brooms for sweeping operations (removal of loose screenings) only when so directed in writing by the Engineer. Brooms shall be self-propelled and have a hopper capacity of three cubic yards minimum.

The Contractor shall provide adequate and suitable sweeping equipment to meet the above requirements, and when ordered by the Engineer shall remove unsuitable equipment from the work.

The completed seal coat (fine) surface shall present a uniform appearance and shall be free from ruts, humps, depressions or any other irregularity regardless of cause. All irregularities to the seal coat (fine) shall be repaired prior to fog sealing.

The Contractor shall maintain the seal coat (fine) from the time of application to

application of seal coat (fog). Maintenance of seal coat (fine) shall include providing traffic control, pre-sweeping, distribution and sweeping of screenings to absorb any free bituminous material, to cover any area deficient in seal coat material, and to prevent formation of corrugations. Clean sand may be used in lieu of screenings to cover any excess polymer modified asphaltic emulsion which comes to the surface. The use of roadside material for this purpose will not be permitted.

37-2.03H(3) Sand

Sand shall be placed on the seal coat (fog) if it is necessary to open the roadway to traffic before the seal coat (fog) has completely cured. Sand shall be placed on the seal coat (fog) at a uniform rate of one to three pounds per square yard, the exact rate of sand application will be determined by the Engineer.

A mechanical spreader capable of spreading sand uniformly shall be used to spread the sand cover. The spreader shall be equipped with a mechanism for adjusting the spread rate.

Sand shall be free from clay and organic material, and shall be of such size that from 90 percent to 100 percent will pass a No. 4 sieve, and not more than five percent will pass a No. 200 sieve.

The sanded surface shall be maintained in a smooth and satisfactory condition. Placement of excess sand shall be removed and disposed of, at the Contractor's expense, as directed by the Engineer.

37-3 SLURRY SEAL AND MICRO-SURFACING

The Standard Specifications are incorporated herein by this reference.

SECTION 38: (RESERVED)

SECTION 39: HOT MIX ASPHALT

The Standard Specifications are incorporated herein by this reference.

SECTION 40: CONCRETE PAVEMENT

The Standard Specifications are incorporated herein by this reference.

Add:

40-1.035 Roller Compacted Concrete (RCC) is an option for new road construction, to be

approved at the discretion of the Department.

SECTION 41: CONCRETE PAVEMENT REPAIR

The Standard Specifications are incorporated herein by this reference.

SECTION 42: GROOVE AND GRIND PAVEMENT

The Standard Specifications are incorporated herein by this reference.

SECTION 43 – 45: (RESERVED)

DIVISION VI STRUCTURES

SECTION 46: GROUND ANCHORS AND SOIL NAILS (not adopted)

SECTION 47: EARTH RETAINING SYSTEMS (not adopted)

SECTION 48: TEMPORARY STRUCTURES (not adopted)

SECTION 49: PILING

The Standard Specifications are incorporated herein by this reference.

SECTION 50: PRESTRESSING CONCRETE

The Standard Specifications are incorporated herein by this reference.

SECTION 51: CONCRETE STRUCTURES

The Standard Specifications are incorporated herein by this reference.

SECTION 52: REINFORCEMENT

The Standard Specifications are incorporated herein by this reference.

SECTION 53: SHOTCRETE

The Standard Specifications are incorporated herein by this reference.

SECTION 54: WATERPROOFING

The Standard Specifications are incorporated herein by this reference.

SECTION 55: STEEL STRUCTURES

The Standard Specifications are incorporated herein by this reference.

SECTION 56: SIGNS

The Standard Specifications are incorporated herein by this reference.

SECTION 57: WOOD AND PLASTIC LUMBER STRUCTURES

The Standard Specifications are incorporated herein by this reference.

SECTION 58: SOUND WALLS

The Standard Specifications are incorporated herein by this reference.

SECTION 59: PAINTING

The Standard Specifications are incorporated herein by this reference.

SECTION 60: (RESERVED)

DIVISION VII DRAINAGE

SECTION 61: CULVERT AND DRAINAGE PIPE JOINTS

The Standard Specifications are incorporated herein by this reference.

SECTION 62: ALTERNATIVE CULVERTS

The Standard Specifications are incorporated herein by this reference.

SECTION 63: RESERVED

SECTION 64: PLASTIC PIPE

The Standard Specifications are incorporated herein by the following references, except as noted:

64-1.01 GENERAL

This work shall consist of furnishing and installing corrugated or ribbed plastic pipe for culverts, with all necessary fittings and coupling systems, as shown on the

plans or as determined by the Engineer in accordance with the provisions in these specifications and the special provisions.

64-1.02 MATERIALS

Plastic pipe shall be either: 1) Type S corrugated polyethylene pipe, 2) ribbed profile wall polyethylene pipe, or 3) ribbed polyvinyl chloride drain pipe.

All polyethylene drainage pipe shall be dual wall smooth interior.

Where designated on the plans as smooth interior wall type, plastic pipe shall be, at the option of the Contractor, either Type S corrugated polyethylene pipe, ribbed profile wall polyethylene pipe, or ribbed polyvinyl chloride drainpipe.

Where the type of plastic pipe is not designated on the plans, plastic pipe shall be, at the option of the Contractor, either corrugated or smooth interior wall.

SECTION 65: CONCRETE PIPE

The Standard Specifications are incorporated herein by this reference.

SECTION 66: CORRUGATED METAL PIPE

The Standard Specifications are incorporated herein by this reference.

SECTION 67: STRUCTURAL PLATE CULVERTS

The Standard Specifications are incorporated herein by this reference.

SECTION 68: SUBSURFACE DRAINS

The Standard Specifications are incorporated herein by this reference.

SECTION 69: OVERSIDE DRAINS

The Standard Specifications are incorporated herein by this reference.

SECTION 70: MISCELLANEOUS DRAINAGE FACILITIES

The Standard Specifications are incorporated herein by this reference.

SECTION 71: SEWERS

71-1.00 DEFINITION OF SEWER

Any conduit intended for the reception and transfer of sewage and industrial waste fluid.

71-1.01 DESCRIPTION

This work shall consist of laying sewer pipe and constructing sewer structures as shown on the plans, in accordance with these specifications, the Special Provisions and as directed by the Engineer. The specifications set forth in this section shall be adhered to in the construction of all sewer systems except where a local sewer district or a controlling agency has a higher standard, in which case their requirements shall take precedence. In the case of conflict with the specifications in this section and those of other sections of these General Specifications, the most restrictive specification shall apply.

The type of sewer pipe and sewer structures will be designated in the contract items.

71-1.02 MATERIALS

Identification Marks

All pipe and fittings shall be clearly marked with the name or trademark of the manufacturer, the location of plant, and strength.

Portland cement used in the production of concrete products set forth in this Section 71-1.02 shall conform to the provisions in Section 90, "Concrete."

71-1.02A Clay Sewer Pipe

Clay sewer pipe shall conform to the specifications for extra strength vitrified clay pipe of ASTM Designation C700 except that plain end pipe otherwise complying in all respects with the said specification may be used. See Plate 435 for strength and cover requirements.

The requirements in the specification for scoring of the ends of the pipe; for the shape of the socket; and for the minimum dimensions for the inside diameter of the socket may be waived with the approval of the Engineer when such waiver is conducive to the proper application of the joint to be used.

The ends of the pipe shall be so formed that, when the pipes are laid together and jointed, the pipe will form a continuous line with a smooth interior surface.

At the option of the Contractor, clay sewer pipe shall conform either to the absorption requirements of ASTM C700 or to the permeability requirements as specified and as determined by California Test 672.

Joints for Vitrified Clay Pipe

Joints for vitrified clay pipe and fittings shall be factory applied, mechanical, flexible-compression type and shall conform to ASTM C425.

Fittings

Fittings shall be made to such dimensions as will accommodate the joint system specified. Wye-branch fittings shall be furnished with spurs securely fastened by the manufacturer to the barrel of the pipe. There shall be no projection on the inner surface of the barrel.

Loading Tests

The loading tests shall be documented in accordance with ASTM C301 for 3 edge bearing. VCP pipe shall withstand the minimum following loads:

Minimum Test Loads

Nominal Size (inches)	Load (lb./linear ft.)
4	2000
6	2000
8	2200
10	2400
12	2600
15	3100
18	3600
21	4200
24	4800
27	5200
30	5500
33	5800
36	6300
39	6600
42	7000

71-1.02B Ductile Iron Sewer Pipe

Ductile iron pipe shall be class 50 and comply with ANSI A 21.51 (AWWA C151). Pipe joints shall comply with the following:

Type of Joint

Rubber Gasket Push-on Joint

Mechanical Joint

Flanged Joint

Flanged Joint (Threaded Flanges)

Specifications

ANSI A21.11(AWWA C111)

ANSI A21.11(AWWA C111)

ANSI B16.1,B.16.2,and
A21.10 (AWWA C 110)

ANSI B2.1.

- (1) **Fittings**
All rubber gasket, push-on, mechanical and flanged joint fittings for cast iron or ductile iron sewer pipe shall be manufactured in accordance with ANSI A21.10 (AWWA C110).
- (2) **Lining and Coating**
When specified, the internal surfaces of ductile iron pipe and fittings shall be lined with a uniform thickness of cement mortar then sealed with a bituminous coating in accordance with ANSI A21.4 (AWWA C104). The outside surfaces of ductile iron pipe and fittings for general use shall be coated with a bituminous coating 1 mil thick in accordance with ANSI A21.6 or ANSI A21.51.
- (3) **Inspection and Certification**
The manufacturer shall furnish a certified statement that the pipe has been manufactured and tested in accordance with these specifications.
- (4) **Polyethylene Encasement for External Corrosion Protection**
When loose polyethylene encasement for the protection of ductile pipes, fittings, valves, and appurtenances is specified in the Plans or in the Specifications, it shall be furnished and installed in accordance with the requirements of ANSI A21.5 (AWWA C105).
- (5) **Cast Iron Soil Pipe and Fittings**
Cast iron soil pipe and fittings shall comply with ASTM A74.

71-1.02C Polyvinyl Chloride Sewer Pipe (PVC)

Polyvinyl Chloride Sewer Pipe shall conform to the requirements of ASTM D 3034, SDR 26 pipe (SOLID WALL).

All services and cleanout bends shall be long sweep.

71-1.02D Force Mains

Force mains shall be constructed of Polyvinyl Chloride (PVC) Pressure Pipe.

- (1) **Small Diameter PVC**
Polyvinyl Chloride (PVC) Pressure Pipe, 4" - 12", shall conform to current AWWA C900 and have Underwriters' Laboratories, Factory Mutual and NSF approval. All parts of C900 not in conflict with these specifications shall apply in full force. PVC pipe shall be dimension ratio (DR) 18, class 150 for internal working

pressures up to 130 psi and use DR 14, class 200 for internal working pressures between 130 and 180 psi. For internal working pressures greater than 180 psi, the pipe DR and class shall be determined by the Engineer.

(2) Large Diameter PVC

PVC pipe in sizes 14" through 36," shall be manufactured to AWWA C905 standards. Use dimension ratio (DR) 25, pressure rating (PR) 165 for internal working pressures up to 130 psi and use DR 21, PR 200 for internal working pressures between 130 psi and 180 psi. For internal working pressures greater than 180 psi, the pipe DR & PR shall be determined by the Engineer.

(3) Joints

Lengths of PVC shall be joined by a locked-in flexible elastomeric gasket coupling with bell and spigot configuration. Lubricants intended for use with PVC pipe shall be compatible with the plastic material and not adversely affect the quality of the sewage being transported. Joints between PVC pipe and fittings shall be slip-on type or mechanical type as shown on the plans. Slip-on type joints shall be sealed by means of rubber rings designated for use with the type of pipe being installed.

Joints between PVC pipe and other types of pipe shall be made by means of the proper sized compression type adaptor.

(4) Fittings

Fittings shall be cast or ductile iron fittings or fusion epoxy lined and coated fabricated steel fittings.

71-1.02E Cement Mortar

Cement mortar shall conform to the provisions in Section 65-2.02E, "Joints".

71-1.02F Resilient Joint Material

Flexible compression joints in clay pipe and resilient joint materials to be used therein shall conform to the requirements of ASTM Designation: C 425.

71-1.02G Miscellaneous Iron and Steel

Miscellaneous iron and steel items shall conform to the provisions in Section 75, "Miscellaneous Metal."

71-1.02H Reinforcement

Reinforcement shall conform to the provisions in Section 52, "Reinforcement".

71-1.02I **Concrete**
Concrete shall conform to the provisions in Section 51, "Concrete Structures," and Section 90, "Concrete."

71-1.02J **Material Submittals and Certificates of Compliance**
Material submittals and certificates of compliance shall be submitted by the contractor to the Engineer for all materials incorporated into the work.

71-1.03 **EXCAVATION AND BACKFILL**
Excavation and backfill for all sewers shall conform to the provisions of Section 19-3.01, "DESCRIPTION," 19-2.035, "Trench Excavation," Section 19-3.03E, "Trench Bedding and Initial Backfill," and 19-3.06A(2), "Trench Intermediate Backfill," of the General Specifications.

If the trench is constructed in unsuitable material, as determined by the Engineer, the minimum trench width for PVC pipe shall be the outside diameter of the pipe plus 2.5 pipe diameters on either side of the pipe.

The pipe shall be laid in a trench excavated to the lines and grades designated by the Engineer. The bottom of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe barrel.

Suitable excavation shall be made to receive the bell of the pipe and the joint shall not bear upon the bottom of the trench. All adjustment to line and grade shall be made by scraping away or filling in with approved initial backfill material under the body of the pipe, and not by wedging or blocking. Shovel slicing is the preferred method of insuring that adequate initial backfill will support the bottom of the pipe.

Pipe may be laid in open trenches or in sections of open trenches connected by tunnels, as permitted by the Engineer.

The excavation shall be supported so that it will be safe, and that the ground alongside the excavation will not slide or settle, and all existing improvements, either on public or private property, will be fully protected from damage.

All supports shall be removed after construction is completed, unless otherwise directed by the Engineer, and shall be withdrawn in a manner that will prevent the caving of the sides of the excavation. All openings caused by the removal of supports shall be filled with suitable material properly compacted.

Trench bedding and initial backfill for P.V.C. gravity sewer pipes shall consist of crushed rock, conforming to the following grading: (See Section 19-3.06A(1)).

Sieve Size	Percent Passing (%)
¾"	100
No. 4	0-5

The crushed rock shall have a fractured face.

Trench bedding and initial backfill for sewer force mains shall be select material of sand or decomposed granite with 90% passing the ¾" sieve, and 100% passing the 1" sieve and having a minimum sand equivalent of 25. It shall be free of clay or organic material and shall be placed at 90% compaction. Backfill shall be placed to about the same elevation on both sides of the pipe to prevent unequal loading and displacement of the pipe and then tamped on both sides to obtain compaction.

71-1.04 EXISTING MANHOLES & FACILITIES

Existing manholes shall be adjusted to grade, remodeled or abandoned as shown on the plans and in accordance with the provisions in Section 15, "Existing Facilities."

When designated on the plans, or directed by the Engineer, existing manhole frames and covers shall be reset on new structures.

71-1.04A Remodeling Existing Sewer Facilities

Where the plans indicate construction involving existing sewer facilities, the Contractor shall provide temporary seals, enclosures, forced ventilation or other devices as may be necessary to prevent odor nuisance during construction. Sewers shall be open to the atmosphere only for a reasonable time necessary for construction.

Where a manhole bottom is to be remodeled on an existing sewer, the portion to be remodeled shall be removed to a minimum depth of 3 inches to permit construction of new channels and shelves. Sewage in new and remodeled manholes shall be controlled across the manhole in such a manner that sewage does not flow over concrete channels until they have cured for 24 hours. The controls shall prevent backup of sewage upstream from the manhole unless otherwise approved by the Engineer.

Where required by the plans or specifications, the Contractor shall submit shop drawings for control operations in accordance with section 5-1.23B(2) "Shop

Drawings," of the Standard Specifications.

71-1.04B Existing Facilities Containing Asbestos

Care shall be given in handling, working with, removing, disposing, or abandoning existing pipe and facilities containing asbestos such as asbestos cement pipe (transite pipe). Current federal and state laws and regulations govern how such pipe can be handled and disposed of during construction procedures. The contractor shall follow all applicable federal, state and Cal OSHA regulations while handling the pipe, and it will be his sole responsibility to adhere to these regulations. Only appropriately licensed hazardous waste contractors and subcontractors may do said asbestos work if the asbestos material is friable. The contractor will notify the county prior to doing this work and provide documentation that the material has been properly disposed of.

If any asbestos material is to be removed from the ground for disposal, it shall be considered a hazardous waste, and it shall be properly disposed of in accordance with all current federal, state, and local regulations.

71-1.05 PIPE LAYING

Pipe shall be protected during handling against impact shocks and free fall.

When the new facilities interfere with the existing flow of sewage, the Contractor shall provide satisfactory bypass facilities at his expense.

The pipe shall be laid without break upgrade from structure to structure, with bell end upgrade for bell and spigot pipe, unless otherwise permitted by the Engineer.

Whenever the sewer line horizontal radius is less than 400 feet, the Contractor shall use pipe lengths of 12 linear feet or less in order to have sufficient joints to make up the curve.

The Contractor (including all corporate officers) and employees shall not enter existing Placer County facilities requiring confined space entry unless all such entries comply with applicable U.S. and California OSHA confined space requirements. All entries into active sanitary sewer manholes are considered confined space entries. The Contractor is responsible to ensure that their personnel engaged in confined space entries are adequately trained for this procedure. The Entry Supervisor shall complete a Confined Space Entry Permit prior to confined space entry, and shall provide a copy of each completed Confined Space Entry Permit to the Engineer upon demand. Information regarding training for this procedure, certification of Entry Supervisor, and the Confined Space Entry Permit can be obtained by calling the Sacramento District of Cal OSHA at (916) 263-0704, or visiting their web site at www.dir.ca.gov.

All joints shall be cleaned and then sealed with the type of materials specified or required by the local municipality, utility, or owner. In the absence of such requirements the pipe shall be jointed with materials recommended by the pipe manufacturer for the purposes intended, and approved by the Engineer, in order to obtain a watertight joint against leakage and infiltration under all conditions of expansion, contraction, and settlement.

Whenever the work ceases for any reason, the end of the pipe shall be securely closed with a tight fitting plug or cover so as to prevent infiltration of water.

Whenever existing pipes are to be cut or abandoned, the open end of said pipes shall be securely closed by a permanent tight fitting plug and held in place by a wall of concrete plug not less than 1.0-foot thick.

Stoppers for pipes and branches left unconnected shall be made of the same material as the pipe or of resilient joint material conforming to Section 71-1.02G, "Resilient Joint Material," of the General Specifications. After placing the stopper, it shall be covered with a layer of sealant. The sealant shall be sufficiently fluid to insure free flow around the stopper.

The pipe shall be laid in conformity to the prescribed line and grade, with grade stakes set and each pipe length checked to grade lines. Three consecutive points shown on the same rate of slope shall be used in common, in order to detect any variation from a straight grade. In case any such discrepancy exists, the work shall be stopped and immediately corrected by the Contractor to the satisfaction of the Engineer. In addition, a string line, laser or other method approved by the Engineer shall be used to insure a straight alignment of pipe between manholes.

(1) Horizontal Alignment and Grade Tolerance

The horizontal alignment of the pipe shall be laid such that any point shall not vary more than 0.10 foot from the design alignment established by the Engineer. Note that no section of pipe may vary more than 0.50 degree (30 minutes) of arc in any direction from the engineered design alignment. Immediately prior to back filling the trench the pipe flowline at any point shall not vary more than 0.05 foot above or 0.05 foot below the grade established by the Engineer.

Pipe shall be laid continuously upgrade with the bell of the pipe forward. Each length of pipe shall be laid on a firm bed and shall have a true bearing for the entire length between bell holes. No wedging or blocking up of the pipe will be permitted. Both bell and spigot and inside of pipe shall be clean before the joint is made and care shall be taken that

nothing but the joint-making material enters the joints. Each section of pipe shall be laid true to line and grade in such a manner as to form a watertight, concentric joint with the adjoining pipe.

When, for any reason, pipe laying is discontinued for an hour or more, the open end of all lines shall be closed with a close fitting stopper.

All pipe jointing shall be of an approved type and shall be in accordance with accepted best practice and/or recommendations of the manufacturer and as approved by the Engineer. Chipped or cracked pipes shall be rejected.

(2) Locator Tape and Wire

Locator tape, as approved by the Engineer, will be placed above the pipe once the pipe and trench bedding and initial backfill have been placed. An American Public Works Association (APWA) detectable locator tape or "Alarm Tape" (2 inches minimum width) shall be positioned continuously at a minimum of 1 foot above the top of all types of gravity and pressure sewer pipe, including service sewers. For all gravity sewers, including service sewers, force mains and low pressure sewer pipe, both a locating wire and the locator tape are required. The locator wire, No. 10 THHN, direct burial, insulated copper cable, shall be taped continuously to the top of the pipe and accessible at all manholes, valve boxes, sewer lateral cleanouts, flushing branches and sewer service connections. A continuity test shall be performed before project acceptance.

71-1.05A Connections to Existing Systems

No new sewer line shall be connected to an existing sewer system until the new sewer lines are balled, flushed and satisfactorily tested in accordance with Section 71-1.08, "Testing Sewers," of the General Specifications, unless, due to construction problems, it is necessary that such connection be made during construction. Should a construction connection be necessary a plug shall be placed at the connection to prevent water or debris from entering the existing sewer system. The plug shall remain in place until construction is completed, and the Engineer has authorized its removal.

All debris and testing water shall be removed from the system prior to its entrance into the existing system. Should this not be possible, removal shall be at the nearest clean-out facility of the existing system.

71-1.05B Boring and Jacking

Where specified or permitted the sewer pipe shall be placed in a conductor pipe, which shall have been previously placed under a roadway, railroad, or other

obstruction by boring and jacking. The equipment and method of operation shall be approved by the Engineer before proceeding with the work.

Excavation for the boring operation shall be the minimum necessary to satisfactorily complete the work. Bracing and shoring shall be adequate to protect workers and any adjacent structures or roadbed.

(1) Installation of Conductor

The conductor shall closely follow the boring operation. The bored hole shall not be more than 0.1 foot larger in diameter than the outside diameter of the conductor. Guide rails shall be accurately set to line and grade to insure installation of the conductor within allowable limits. The conductor diameter shall be sufficient to allow adjustment of line and grade of the sanitary sewer pipe to meet allowable tolerances and to allow sand to be placed between the conductor and sewer pipe. Tunnel liner ribs shall have a minimum of 3 inches clearance from the sanitary pipe.

(2) Placing Sewer Pipe in Conductor

If necessary to establish correct line and grade, cement mortar shall be placed on the invert of the conductor. Sewer pipe, of which any part of the joint is larger in diameter than the barrel of the pipe, shall be strapped to 2 redwood or plastic skids with steel straps every five feet. The skids shall adequately support the center of each pipe section and shall be large enough to prevent any part of the joint from bearing on the conductor.

Sewer pipe with joints not larger than the pipe barrel shall be laid into place on 2 skids which have been securely fastened to the invert of the conductor or strapped to the barrel of the pipe. In lieu of skids, pipe with joints smaller than the pipe barrel shall be placed on a cement mortar bed which has been shaped to hold the pipe on correct line and grade. Pipe section shall be joined outside the conductor and then slid into place.

The space between the sewer pipe and conductor shall be completely filled with clean dry sand blown into place, or sand which has been sluiced into place. The method of placing sand shall be subject to the Engineer's approval. The ends of the conductor pipe shall then be sealed, to prevent loss of the sand, by a method approved by the Engineer.

(3) Filling of Voids

Whenever in the opinion of the Engineer, the nature of the soil indicates the likelihood of ground loss which would result in a greater space between the outer surface of the conductor than herein allowed, as determined by the Engineer, the Contractor shall take immediate steps to prevent such occurrences by installing a jacking head extending at least 18 inches from the leading edge of the conduit and project not more than 1/2 inch beyond the conduit's out surface. Excavation shall not be made in advance of this jacking head.

Voids greater than allowable, as determined by the Engineer, shall be filled with sand, soil cement, or grout as directed by the Engineer. Where voids are suspected, the Engineer may direct the Contractor to drill the conduit, to pressure inject grout to refusal and then to repair the drilled hole. Grouting pressure shall not exceed 50 PSI at the nozzle.

When tunnel liner is used as the conductor, the space between the outer earth and the tunnel liner shall be pressure grouted to fill all voids. Grout shall consist of 1 part portland cement to 3 parts clean sand, by volume, and sufficient water to make it workable, all injected at a pressure as approved by the Engineer.

(4) Tolerances

Extreme care shall be exercised by the Contractor to maintain line and grade during jacking operations. Maximum deviation from stated line and grade of tunnel liner or conductor pipe shall be such that the sanitary sewer pipe can be adjusted a sufficient amount within the conductor pipe or tunnel liner to achieve the line and grade shown on the plans. This adjustment shall be made to all pipe deviating from line and grade and not merely to the sections of pipe nearest the end of the conductor or tunnel liner.

Directly jacked conductors will be allowed a maximum deviation of 0.25% (0.25 feet per 100 feet) from intended line and grade unless more stringent tolerances are shown on the plans or indicated by the Engineer.

71-1.05C Service Sewers

Commercial and residential service sewers shall be constructed as shown on Plates 420 to 422 of the Placer County Land Development Manual, and at the locations shown on the plans. Unless otherwise specified, they shall be 4 inches in diameter and constructed to the property line or 24 inches behind the utility trench adjoining and furthest from the right-of-way or easements, or the right-of-

way or easement lines which provide the greatest length of sewer service. A regular manufactured wye fitting shall be used in the lateral sewer for each service sewer and shall be inclined upwards at a minimum angle of 30 degrees from the horizontal. The ends of all service sewers shall be securely sealed by stoppers in such a manner that the stoppers can be removed for extending the line without damage to the pipe. Service sewers shall be flushed and televised.

The depth of cover of the service sewer at the easement or property line shall be as noted on the plans.

An elevation given on the plans with a service sewer represents the invert elevation at the easement or property line. The elevation given shall be the maximum allowable elevation, and the minimum slope of the service shall be 2% (1/4 inch per foot). If the service is to be bored, the tolerance of the operation shall be within these limits.

Service sewers entering a manhole shall be set to an invert to crown match with the outgoing pipe or higher in the manhole with an inside drop connection. New service sewers shall not connect into existing sewers greater than 10 inches. They shall be connected to an existing or new manhole, or a new parallel sewer line will be constructed and the sewer service connected to the parallel line.

71-1.05D Curb Mark and Service Marker

Where concrete curb and/or gutter exists, or is to be constructed concurrently with the sewer facilities, the location of each service sewer shall be permanently indicated by inscribing the letter "S" in the face of the curb directly above the line when the service is perpendicular to the street centerline. Otherwise, the "S" mark for a skewed or angling service shall be placed at a right angle to the end of the service. When service sewers are installed in an existing street, the curb mark shall be placed at the time the service is installed to assure proper location. In new subdivisions when the service sewers are installed before the curb is constructed, it shall be the Contractor's responsibility to establish the exact location of each service sewer and the curb and gutter Contractor's responsibility to place the "S" in the curb after it is poured. Rebar shall be placed at the end of the service as shown on Plate 420 of the Placer County Land Development Manual.

71-1.06 CONCRETE PIPE ENCASEMENT, PIPE REINFORCEMENT, AND BACKFILL

Where shown on the plans or directed by the Engineer, sewer pipe shall be encased in concrete, reinforced concrete, or backfilled with concrete in accordance with the details shown on the plans.

Concrete for pipe encasement, pipe reinforcement, and backfill shall conform to

provisions in Section 90-2, "Minor Concrete," of the Standard Specifications, except that the minor concrete shall contain not less than 470 pounds of cement per cubic yard.

71-1.06A Bracing and Shoring

As required by the "Trench Construction Safety Orders" of the California Construction Safety Orders of the Division of Occupational Safety and Health, bracing and shoring shall be installed in trenches of five feet or greater depth to ensure the safety of workers and to protect and facilitate the work.

The excavation shall be supported so that it will be safe and that the ground alongside the excavation will not slide or settle, and all existing improvements, either on public or private property, will be fully protected from damage.

All support shall be removed after construction is completed, unless otherwise directed by the Engineer, and shall be withdrawn in a manner that will prevent the caving of the side of the excavation. All openings caused by the removal of supports shall be filled with suitable material properly compacted.

71-1.07 SEWER STRUCTURES

New manholes and flushing branches for sewers shall be constructed in accordance with the details shown on the plans, as specified in this Section 71-1.07 and as directed by the Engineer.

Precast concrete pipe manholes shall conform to the provisions in Section 70, "Miscellaneous Drainage Facilities," except for measurement and payment.

Concrete for sewer structures shall be Six sack mix as specified in Section 90-1 unless otherwise shown on the plans.

When the manhole is located in the pavement area, it shall not be constructed to final grade until the pavement has been completed.

The inside bottoms of existing manholes, where new connections are made, and of new manholes shall be shaped to provide channels conforming to the size and shape of the lower portion of the inlets and outlets of the manholes. The channels shall vary uniformly in size and shape from inlet to outlet.

No pipe shall project more than 0.17-foot into a manhole and in no case shall the bell of a pipe be built into the wall of a manhole or structure.

All concrete shall be cured for a period of not less than ten days after being placed and shall be protected from damage.

71-1.07A Manholes

Manholes shall be water-tight structures constructed by placing precast concrete sections on a poured concrete base or a precast manhole base. Precast manhole bases shall only be allowed where precast direction geometry matches all incoming and outgoing lines by +/- 4 degrees. When coating of the inside of manholes is specified by the project plans and specifications, the coating material chosen from a pre-approved list, shall be applied according to the manufacturer's specifications. When manhole coatings are used, the coating manufacturer may require grouting under the coating be an epoxy sand grout. Regular non-shrink grout may not be compatible.

71-1.07B The poured concrete base shall be made of Six sack mix as specified in Section 90-1 with 1-1/2 inch maximum size aggregate.

All manholes shall be constructed on a non-yielding firm bed. The base of a manhole constructed in an engineered fill section shall either extend to one foot below original ground, or a minimum of 95% relative compaction shall be obtained beneath the manhole. Cast-in-place manhole bases shall have an outside form and the concrete shall be vibrated. All precast manhole bases shall be constructed on a minimum of 8 inches of class 2 AB compacted to 95%. When water is encountered, or in the opinion of the Engineer, existing conditions are such that the excavated ground at the base of any manhole is not firm, additional baserock will be required prior to manhole base construction. The first manhole barrel shall be placed before the poured concrete base has set. Backfill around the outside of manholes shall be considered structure backfill and compacted to 95%.

71-1.07C All precast manhole barrels and cones shall conform to ASTM Specification C-478.

All precast sections shall be joined together with pre-formed plastic gaskets.

Pre-formed plastic gaskets shall be equal to "Ram-Nek" and shall comply with the requirements of Federal Specification SSS-210 "Sealing Compound, Pre-formed plastic for Pipe Joints," Type I, Rope Form.

71-1.07D Where sewer lines pass through cast-in-place manholes, the pipe shall be laid continuously as a whole pipe. After the manhole base and precast sections have been placed and sufficient time has elapsed to allow all concrete and grout to set, the top half of the pipe within the manhole shall be carefully cut off and the sides mortared, as shown on Plate 416 of the Placer County Land Development Manual. All channels so formed shall be checked with a template and shall form

a smooth flowing channel at all flow depths.

In sewers of uniform size passing through cast-in-place manholes without a major change in direction or slope, the pipe shall be carried through the manhole on a uniform slope.

To provide flexibility for pipes entering and leaving a manhole, standard couplings shall be placed within the walls of the concrete base. The couplings are to be inspected and approved prior to backfilling. Flexible pipe to manhole connectors may be allowed when the connector is approved by the Engineer.

Lift holes shall be packed and sealed with Ram-Nek or Kent-Seal gasket material or equal. Before backfilling, all joints and lift holes must be grouted with non-shrink grout on the inside and outside of the manhole three inches on either side of the joint. In addition, the manhole interior face shall be grouted with mortar such that all joints and edges are smooth. The exterior manhole face shall have a minimum thickness of 1/2 inch of mortar at the joint, and the grout shall be tapered to the face of the manhole three inches above and below the joint.

Cast in Place manhole bases shall cure a minimum of 14 days prior to any loading being placed on them unless provisions are made to shorten the cure time with admixtures. The manufacturer of pre-cast manhole bases shall provide certification that the bases have cured longer than 28 days prior to their installation.

71-1.07E Temporary covers of 3/8 inch steel plate of sufficient size to adequately cover the opening shall be placed on the cone until the pavement is completed. Suitable locating ribs shall be welded to the underside of the cover to hold it in place during the grading and paving operations. The top of the temporary cover shall have a skid proof surface as determined by the Engineer.

71-1.07F The throat of the manhole (i.e. the top of the manhole cone to the manhole casting) shall be made of precast concrete rings of the proper inside diameter. For new construction the maximum depth of throat permitted shall be 12 inches excluding the frame.

71-1.07G Manhole frame and covers shall conform to Plates 410, 413, and 417 of the Standard Drawings of the Placer County Land Development Manual. When adjusting the manhole frame and covers to grade, the frame shall be wired to a straight edge of sufficient length to span the excavation, and the throat completed to the proper level. Whenever the space between the bottom of the frame and top of a ring is less than 3 inches, the void may be filled with concrete, poured against a suitable form on the inside of the structure.

In snow areas the grade of the manhole cover shall be ½-inch below pavement grade when in the roadway prism.

When the manhole is in the shoulder area or a paved taper, the pavement shall be extended 25 feet to each side of the manhole to meet the existing pavement and the manhole shall be 1/2 inch below finished grade.

Manholes, located in off-road easements shall be a minimum of twelve inches above the natural ground surface, and above anticipated high water levels.

71-1.07H When adjusting an existing manhole to grade and the total depth of the throat from the top of the frame to the bottom of the throat exceeds 24 inches, the upper portion of the manhole shall be removed to the first full size manhole section. The upper portion shall then be reconstructed to grade as outlined above in Sections 71-1.07F and 71-1.07G.

71-1.07I Before any work is started on adjusting or repairing a manhole, the channels in the base shall be covered with strips of wood and the entire base covered with a heavy piece of canvas. This cover shall be kept in place during all work. Upon completion of the work the wood strips and the canvas shall be removed from the manhole allowing no debris to fall or remain in the manhole.

71-1.07J Any new structure to be placed or existing structure to be adjusted shall be temporarily covered with a heavy steel plate below the grading plane before subsequent layers are placed thereon. After completion of paving the structure shall be raised to grade.

71-1.08 TESTING SEWERS

All sewers and sewer services shall be tested by the Contractor and observed by the Engineer for obstructions and leakage as provided for in the General Specifications. Forty-eight (48) hours notice shall be given to the Engineer prior to all sewer and manhole testing. The amount of leakage shall not exceed the rate allowed by the General Specifications. Where the leakage of the sewer exceeds the above amount, it shall be corrected immediately and the amount of leakage reduced to a quantity within the specified amount. In any case, the Contractor shall stop any individual leaks that may be observed.

Testing of the sewer lines for obstructions and leakage shall take place as required in Section 71-1.08A, "Tests for Obstructions" and 71-1.08B, "Tests for Leakage," of the General Specifications.

Testing of manholes shall take place after the manholes have been set to grade

and are complete in place. Additional testing may be required by the Engineer.

In addition to testing as required in Section 71-1.08, "Testing Sewers," of the General Specifications the following will be required for Polyvinyl Chloride (PVC) sewer pipe only:

After balling and flushing and prior to acceptance of the project by the County, the Contractor shall pull a deflection gage or mandrel through each section of pipe. The gage shall be designed to resist movement through the pipe when a deflection of 3 percent of the base inside diameter of the pipe is reached as shown in the following tables:

Pipe Sizes (inches)	Mandrel Diameter (inches)
6	5.60
8	7.50
10	9.37
12	11.15
15	13.65

Pipe Sizes (inches)	Mandrel Diameter (inches) SDR 26
6	5.444
8	7.263
10	9.062
12	10.769
15	13.168

71-1.08A Tests for Obstructions

After construction to subgrade and after manholes are raised to grade all sewer lines shall be cleaned by balling and flushing. The ball shall be controlled by a tag line or rope, or sewer rods, and permitted to move slowly through the sewer. The ball shall be of the inflatable grooved type and inflated to have a snug fit in the pipe.

A swivel will be placed between the rope and the ball in order to allow the ball to rotate and cause the proper flushing action.

In lieu of balling and flushing, the Contractor can use a high pressure sewer cleaning machine to clean the new sewer lines provided the cleaning head is approved for PVC pipe and the hose is retracted no faster than one foot per second.

Any obstructions or irregularities shall be removed or repaired by the Contractor. All testing, cleaning, and repairing shall be done to the satisfaction of the Engineer. The Contractor shall provide all necessary labor, materials, and equipment for the test and shall dispose of all waste, including water.

71-1.08B Tests for Leakage

After laying, backfilling, and compaction to subgrade in accordance with General Specifications and Special Provisions, all sewers shall be tested for leakage. Testing will be done as determined by the Engineer and in accordance with the provisions of these General Specifications. The Contractor shall furnish all labor, tools, and equipment necessary to make the tests and to perform any work incidental thereto. The Contractor shall take all necessary precautions to prevent any joints from drawing while the pipelines or their appurtenances are being tested. He shall correct any excess leakage and repair any damage to the pipe and its appurtenances or to any structures indicated by or resulting from one of the following tests:

(1) Air Test for Leakage

The Contractor shall test all sewers by means of the air test specified herein unless otherwise directed by the Engineer. The length of line tested at one time shall be limited to the length between adjacent manholes or flushing branches. The pressure gauge used shall be supplied by the Contractor, shall have a minimum division of 0.25 PSI, and shall have an accuracy of 0.10 PSI. Accuracy and calibration of the gauge shall be certified by a reliable testing firm at six month intervals or when requested by the Engineer. In addition, the Engineer may compare the Contractor's gauge with County owned gauge at any time.

Air test procedures shall be as follows:

Pressurize the test section to 3.5 PSI and hold above 3.0 PSI for not less than five minutes. Add air if necessary to keep the pressure above 3.0 PSI. At the end of this five minute saturation period, note the pressure (must be 3.0 PSI min.) and begin the time period. During this period the airline between the air supply and the gasket shall be bled off or disconnected from the air supply.

If the pressure drops 0.5 PSI in less than the time given in the following table the section of pipe shall not have passed the test.

Lateral Size (inches)	Minimum Time (seconds)
4	122

6	184
8	245
10	306
12	367
15	460

For larger diameter pipe, use the following formula: Minimum time in seconds = 370 x pipe diameter in feet.

When the prevailing ground water is above the sewer being tested, air pressure shall be increased 0.43 PSI for each foot the water table is above the outlet flowline of the downstream sewer manhole. The elevation of the water table will be taken as the highest water table elevation along the section of pipe being tested. If the time for the pressure to drop 0.5 PSI is 125 percent or less of the time given in the table, the line shall immediately be repressurized to 3.0 PSI and the test repeated.

For 8 inch and smaller pipe only, if, during the 5 minute saturation period, pressure drops less than 0.5 PSI after the initial pressurization and air is not added, the section undergoing the test shall have passed.

If the test is not passed, all leaks shall be found and repaired to the satisfaction of the Engineer.

Sewer Services shall be considered part of the lateral to which they are connected and no adjustment of the test shall be allowed to compensate for the smaller diameter.

(2) Hydrostatic Test

For gravity sewers, the hydrostatic test may be used in lieu of the air test only when authorized by the Engineer.

All sections of sewer shall be tested by inserting stoppers in the lower end of the sewer, the inlet sewer of the upper manhole, and any side sewers at intervening manholes, and filling the pipe and manholes with water to a point in the upper manhole not less than 5 feet above the invert of the pipe or prevailing ground water elevation, whichever is higher. The maximum length of section tested shall be 1,000 feet.

The line shall be filled approximately 4 hours prior to testing. It

shall be tested for at least 2 hours, maintaining the head specified above by measured additions of water. The sum of these additions shall be the leakage for the test period.

Maximum allowable head of water above any portion of sewer being tested shall be 15 feet. Where the difference in elevation between successive manholes exceeds 15 feet, a test tee shall be installed between manholes, and testing shall be carried on between the tee and the manhole.

The allowable leakage shall not exceed 0.066 gallons per minute, per inch diameter, per 1,000 feet of main line sewer being tested. This is equivalent to 500 gallons per day, per inch diameter, per mile.

Where the actual leakage in a section tested exceeds the allowable, the Contractor shall remedy it before the sewer is accepted. If the leakage is less than allowable and leaks are observed, such leaks shall be repaired.

When underground overflow tanks are constructed as part of a sewage lift station, the tanks shall be vacuum tested. If hydrostatic test is required, it shall be in accordance with the hydrostatic test procedures noted above. Leakage shall not exceed the manufacturer requirements or standards.

71-1.08C Force Mains and Low Pressure Sewers

Each section of pipe to be tested shall be slowly filled with water and all air expelled from the pipe. After the pipe has been filled, it shall be allowed to set for a period of not less than 24 hours.

The pipe shall then be refilled to the original water level and subjected to a pressure of not less than 100 pounds per square inch or the service pressure plus 50 pounds per square inch, whichever is greater, for a period of two hours.

All exposed joints, bends, angles, and fittings shall be closely examined during the test. Any part of the line which proves to be defective shall be replaced and the line retested.

The maximum allowable leakage shall not exceed 30 gallons per 24 hours per mile of pipe per inch of nominal diameter.

71-1.08D Manholes

Manholes shall be tested for leakage by the following vacuum procedure:

- (1) The test shall be done after assembly of the manhole, but before backfill.
- (2) All lift holes shall be filled with non-shrink grout.
- (3) All pipes entering the manhole shall be plugged, taking care to securely brace the plug from being drawn into the manhole.
- (4) The test head shall be placed inside the top of the cone section and the seal inflated in accordance with the manufacturer's recommendations. The pressure gage shall be located can be easily read by the inspector without entering the excavation.
- (5) A vacuum of 10 inches of mercury (approximately 5 PSI) shall be drawn and the vacuum pump shut off with the valves closed. The time shall be measured for the vacuum to drop to 9 inches. The manhole shall pass if the time is greater than 60 seconds for a 48-inch manhole, 75 seconds for a 60-inch manhole, and 90 seconds for a 72".
- (6) If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.
- (7) The Contractor is to perform the test and supply all test equipment.
- (8) After passing tests, the manhole joints shall then be mortared inside and out.

71-1.08E TV Inspection

All sewer pipes, service sewers (from the property line cleanout to the wye) and all manholes shall be inspected, after backfill, by means of an inline sewer TV camera. The TV camera used shall have color with a 270 degree articulating lens. All sewer services shall be inspected from the public sewer line to the property line cleanout for detecting defects such as offset joints, sags, etc. Care shall be taken to make sure that the channel of all manholes are televised as well as the first few feet of the sewer pipe leaving the manhole.

The costs of providing this inspection shall be the responsibility of the Contractor and the work shall be done by private forces, not Placer County. All records and

video tapes are to be turned in to and become the property of the Department of Public Works and Facilities. The tapes must be compatible with the Department's viewing equipment. Any irregularities in construction or grade shall be corrected prior to acceptance of the project. In addition all sewer lines are subject to viewing with a TV camera by Department of Public Works and Facilities personnel.

Prior to televising sewer pipes, service sewers and manholes, sufficient clean water will be placed into the pipes to fill all sags and dips. A water stream shall be placed into the pipe until it enters the next downstream manhole. During the televising of the pipes a weighted target, of known size, shall be fixed in front of the TV camera to allow the measurement of the depth of any standing water.

Any deviations from the plans or specifications noted by such viewing shall be corrected by the Contractor at his expense.

In no event will sags or dips in the pipe or manholes creating standing water deeper than 0.05 ft. be considered an acceptable deviation. Offset joints due to rubber "band" couplings which are greater than one half the pipe wall thickness will also be considered an unacceptable deviation.

71-1.09 TRENCH RESURFACING

Trenches shall be resurfaced in accordance with Plates 431 through 434 of the Placer County Land Development Manual.

71-1.09A Clean Up

During the progress of the work, the Contractor shall keep the entire job site in a clean and orderly condition. Excess or unsuitable backfill material, broken pipe, or other waste material shall be removed from the job site. Spillage resulting from hauling operations along or across existing streets or roads shall be removed immediately by the Contractor. All gutters and roadside ditches shall be kept clean and free from obstructions. Any deviation from this practice shall have prior approval from the Engineer.

DIVISION VIII MISCELLANEOUS CONSTRUCTION

SECTION 72: SLOPE PROTECTION

The Standard Specifications are incorporated herein by this reference.

SECTION 73: CONCRETE CURBS AND SIDEWALKS

The Standard Specifications are incorporated herein by this reference, except as noted:

73-1.03E Expansion and Contraction Joints

Expansion Joints

Expansion Joints shall be constructed as shown on the approved plans or as specified herein. Transverse expansion joints of an approved type 0.5-inch wide shall be installed to the full depth of the placed concrete sidewalk, curb or gutter. These joints shall be placed at a maximum of 24-foot intervals or at the location where every 4th weakened plane joint would be required by the criteria set forth in the Weakened Plane Joint section. Additionally, expansion joints shall be located at all curb returns and other transition points.

Joint filler shall be installed to the full depth of the expansion joint and shall completely fill the entire constructed joint. In areas where existing sidewalks are being replaced and where obstacles such as utility poles extend through the walkway, the Engineer may require joint filler to be placed at the contact point between the new walkway and the obstacle.

Weakened Plane Joints

Weakened Plane Joints shall be constructed as shown on the approved plans or as specified herein. Weakened plane joints shall be constructed with a concrete tool 1-1/2 inches deep in all concrete sidewalks, curbs and gutters prior to finishing work and marked. At final finishing, the finished joints shall be completed using an appropriate concrete tool to create a rounded mark not to exceed 1/2-inch in depth at the location of the marked joint.

For sidewalk construction, these joints shall be placed at intervals no greater than 6 feet apart. In areas where the sidewalk is less than 6 feet wide, the joints shall be located a distance apart equal to the width of the sidewalk or as approved by the Engineer.

SECTION 74: PUMPING EQUIPMENT AND CONTROLS

The Standard Specifications are incorporated herein by this reference

SECTION 75: MISCELLANEOUS METAL

The Standard Specifications are incorporated herein by this reference.

SECTION 76: WELLS (RESERVED)

SECTION 77: WATER

77-1.01 DESCRIPTION

This work shall consist of laying water pipe and constructing water structures and appurtenances as shown on the plans, in accordance with these General Specifications, the Special Provisions and as directed by the Engineer.

These specifications apply only in those areas in which a water system is subject to inspection, operations and maintenance, and jurisdiction by Placer County, a County Service Area, or a County Assessment District. In all other cases the specifications of the applicable water purveyor will govern.

The current edition of the Placer County Water Agency Specifications is incorporated herein except as per these General Specifications.

The type of water pipe and water structures will be designated in the contract items.

77-1.02 MATERIALS

Materials shall be as shown on the plans and specified in the Special Provisions conforming to the requirements of the General Specifications.

77-1.03 EXCAVATION AND BACKFILL

Excavation and backfill shall conform to the provisions of Section 19-4.01, "Trench Excavation," Section 19-4.02, "Trench Bedding and Initial Backfill," Section 19-4.03, "Trench Intermediate Backfill," and Section 19-4.04, "Trench Compaction" of the General Specifications.

77-1.04 PIPE LAYING

Pipe shall be laid in conformity to the lines and grades approved by the Engineer.

Water lines shall be installed at a depth which will provide a minimum cover of 30 inches over the top of the pipe as measured from the finished grade.

77-1.05 WATER STRUCTURE

Any new structure to be placed or existing structure to be adjusted shall be temporarily covered below the grading plane before subsequent layers are placed thereon. After completion of paving the structure shall be raised to grade.

Locating tape shall be placed above the pipe once the pipe and the trench bedding and initial backfill have been placed. An American Public Works Association (APWA) detectable locator tape or "Alarm Tape" (2 inches minimum width) shall be positioned continuously at a minimum of 1 foot above the top of all types of pipe. A locator wire, No. 10, direct burial, insulated copper cable, shall be taped continuously to the top of the pipe and accessible at all structures

and valve boxes. Care shall be given in handling, working with, removing, disposing, or abandoning existing pipe or appurtenances containing asbestos such as asbestos cement pipe (transite pipe). Current federal and state laws and regulations govern how such pipe can be handled and disposed of during construction procedures. The Contractor shall follow all applicable federal, state, and Cal OSHA regulations while handling the pipe and it will be his sole responsibility to adhere to these regulations. Only appropriately licensed hazardous waste contractors and subcontractors may do said asbestos work. The Contractor will notify the County prior to doing this work and provide documentation that the material has been properly disposed of.

All such asbestos pipe shall remain in the ground unless otherwise specified in the special provisions. If any of it is to be removed from below the ground for disposal, it shall be considered a hazardous waste, and it shall be properly disposed of in accordance with all current federal, state, and local regulations.

Unless otherwise specified in the special provisions, full compensation for the work involved in working with, removing, handling, disposing, payment of all applicable fees, obtaining all permits and licenses, and all labor, equipment, materials, and appurtenances required, shall be considered as included in the prices paid for the various items of work and no additional compensation will be allowed therefore.

SECTION 78 – 79: (RESERVED)

SECTION 80: FENCES

The Standard Specifications are incorporated herein by this reference.

SECTION 81: MONUMENTS

The Standard Specifications are incorporated herein by this reference, except as noted:

Add:

81-1.01A Corner Record and Record of Survey Requirements

All work to place new or replace existing monuments shall be completed as required by Section 7-1.12A of the General Specifications.

DIVISION IX TRAFFIC CONTROL FACILITIES

SECTION 82: MARKERS & DELINEATORS

The Standard Specifications are incorporated herein by this reference.

SECTION 83: RAILINGS AND BARRIERS

The Standard Specifications are incorporated herein by this reference.

SECTION 84: TRAFFIC STRIPES AND PAVEMENT MARKINGS

The Standard Specifications are incorporated herein by this reference.

SECTION 85: PAVEMENT MARKERS

The Standard Specifications are incorporated herein by this reference.

SECTION 86: ELECTRICAL SYSTEMS

The Standard Specifications are incorporated herein by this reference.

DIVISION X MATERIALS

SECTION 87: MATERIALS-GENERAL (RESERVED)

SECTION 88: GEOSYNTHETICS

The Standard Specifications are incorporated herein by this reference.

SECTION 89: (RESERVED)

SECTION 90: CONCRETE

The Standard Specifications are incorporated herein by the following references, except as noted:

90-1.01 GENERAL

Concrete shall be composed of cementitious material, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in these specifications.

The Contractor shall determine the mix proportions for concrete in conformance with these specifications. Unless otherwise specified, cementitious material shall be a combination of cement and mineral admixture. Cementitious material shall be either:

1. "Type IP (MS) Modified" cement; or

2. A combination of "Type II Modified" portland cement and mineral admixture; or
3. A combination of Type V portland cement and mineral admixture.

Type III portland cement shall be used only as allowed in the special provisions or with the approval of the Engineer.

Seven sack mix concrete shall contain not less than 658 pounds of cementitious material per cubic yard.

Six sack mix concrete shall contain not less than 564 pounds of cementitious material per cubic yard.

Five sack mix concrete shall contain not less than 470 pounds of cementitious material per cubic yard.

Four sack mix concrete shall contain not less than 376 pounds of cementitious material per cubic yard.

Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic yard of concrete in structures or portions of structures shall conform to the following:

Use	Cementitious Material Content pounds/CY
Concrete designated by compressive strength: Deck slabs and slab spans of bridges Roof sections of exposed top box culverts Other portions of structures	674 min., 801 max 674 min., 801 max 590 min., 801 max
Concrete not designated by compressive strength: Deck slabs and slab spans of bridges Roof sections of exposed top box culverts Prestressed members Seal courses Other portions of structures	674 min. 674 min. 674 min. 674 min. 590 min.
Concrete for precast members	590 min., 927 max.

Whenever the 28-day compressive strength shown on the plans is greater than 3,600 pounds per square inch, the concrete shall be designated by

compressive strength. If the plans show a 28-day compressive strength that is 4,000 pounds per square inch or greater, an additional 14 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans that are 3,600 pounds per square inch or less are shown for design information only and are not a requirement for acceptance of the concrete.

Concrete designated by compressive strength shall be proportioned such that the concrete will attain the strength shown on the plans or specified in the special provisions.

Before using concrete for which the mix proportions have been determined by the Contractor, or in advance of revising those mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design.

Compliance with cementitious material content requirements will be verified in conformance with procedures described in California Test 518 for cement content. For testing purposes, mineral admixture shall be considered to be cement. Batch proportions shall be adjusted as necessary to produce concrete having the specified cementitious material content.

If any concrete has a cementitious material, portland cement, or mineral admixture content that is less than the minimum required, the concrete shall be removed.

The requirements of the preceding paragraph shall not apply to minor concrete or commercial quality concrete.

SECTION 91: PAINT

The Standard Specifications are incorporated herein by this reference.

SECTION 92: ASPHALTS

The Standard Specifications are incorporated herein by this reference.

SECTION 93: LIQUID ASPHALTS

The Standard Specifications are incorporated herein by this reference, except as noted:

93-1.03B **Mixing**

Attention is directed to Sections 5-1.36 and 7-1.05, "Property and Facility Preservation," and "Indemnification," respectively. Liquid asphalt shall be

prevented from spraying upon adjacent pavements, that portion of the traveled way being used by traffic, structures, railings and barriers, markers, trees and shrubbery that are not to be removed, adjacent property and improvements, and other highway improvements or facilities not mentioned herein.

Unless otherwise specified in these specifications or in the special provisions, the various grades of liquid asphalt shall be applied at temperatures within the limits specified in the table of application temperatures below. When liquid asphalt is to be mixed with aggregate, the temperature of the aggregate, at the time of adding the liquid asphalt, shall not exceed that shown in the column of pugmill mixing temperatures.

At no time, after loading into a tank car or truck for transportation to the site of the work, shall the temperature of the liquid asphalt be raised above that given in the last column of the following table, unless authorized by the Engineer.

Application Temperatures of Liquid Asphalts

Grade of Liquid Asphalt	Pugmill Mixing Temperature of Aggregate	Distributor Application Temperature	
	Max. ° F	Min. ° F	Max. ° F
SC-70	—	105	175
SC-250	200	140	230
SC-800	225	175	255
SC-3000	260	215	290
MC-70	—	105	175
MC-250	200	140	230
MC-800	225	175	255
MC-3000	260	215	290

Liquid asphalt shall be heated by a retort or by steam coils in such a manner that steam will not be introduced directly into the liquid asphalt during heating. The Contractor shall furnish and keep available at all times, an accurate thermometer suitable for determining the temperature of the liquid asphalt being applied.

93-1.03C Application

Distributor trucks shall be of the pressure type with insulated tanks. The use of gravity distributors will not be permitted. Spray bars shall have a minimum length of 9 feet and shall be of the full circulating type. The spray bar shall be adjustable to permit positioning at various heights above the surface to be treated. The valves shall be operated by levers so that one or all valves may be quickly opened or closed in one operation.

Spreading by means of cab controlled valves will be permitted in the application of seals. The valves which control the flow from nozzles shall act positively so as to provide a uniform unbroken spread of bituminous material on the surface. The distributor shall be equipped with devices and charts to provide for accurate and rapid determination and control of the amount of bituminous material being applied and with a bitumeter of the auxiliary wheel type registering speed in feet per minute, and trip and total distance in meters {feet}. The spreading equipment shall be designed so that uniform application of bituminous material, in controlled amounts, may be made ranging from 0.02 to one gallon per square yard of surface and with a range of pressure from 25 to 75 pounds per square inch. If a spray bar extension is used to cover a greater width, it shall be of the full circulating type. The distributor shall be equipped with a hose and nozzle to be used for spraying areas that are inaccessible to the distributor. The distributor shall also be equipped with pressure gages and an accurate thermometer for determination of temperatures of the bituminous material. Distributor and booster tanks shall be so maintained at all times as to prevent dripping of bituminous material from any part of the equipment.

In order to secure uniform distribution at the junction of 2 applications, the distribution shall be promptly stopped when the uniform flow decreases, indicating the tank is about empty.

The Department reserves the right to order the use of any equipment discontinued which, in the opinion of the Engineer, fails to produce a satisfactory distribution of asphalt in accordance with the specifications.

Spreading liquid asphalt will not be permitted when the surface to be treated is appreciably damp, or when weather conditions are unsuitable, or when the atmospheric temperature is below the minimum temperature specified for the particular type of work.

Disposing of excess liquid asphalt within sight of the highway will not be permitted. Distributors shall stop spreading asphalt while traffic is passing, if directed by the Engineer.

Liquid asphalt delivered to the work shall not be used for any purpose other than that provided for in the specifications.

The Contractor shall provide a satisfactory method of accurately measuring the volume of liquid asphalt in the storage tanks and in each spreading unit at any time.

Each distributor truck shall be equipped, at all times, with its proper measuring stick and calibration card. On-site calibration of the distributor trucks, for determining actual spread rate of asphaltic emulsion, shall be performed when directed by the Engineer.

SECTION 94: ASPHALTIC EMULSIONS

The Standard Specifications are incorporated herein by this reference, except as noted:

94-1.03 CONSTRUCTION

Asphaltic emulsion shall be reheated, if necessary, but at no time after loading into a tank car or truck for transporting to the site of the work shall the temperature of the emulsion be raised above 160° F, unless permitted by the Engineer. During all reheating operations the asphaltic emulsion shall be agitated to prevent localized overheating. Asphaltic emulsion shall be applied in conformance with the provisions in Section 93, "Liquid Asphalts," and the following additional requirements.

Setting Grade 1 asphaltic emulsions, except when used for fog seal coats, shall be applied at a temperature between 75° F and 130° F, and Setting Grade 2 asphaltic emulsions shall be applied at a temperature between 110° F and 185° F, unless otherwise directed by the Engineer.

Asphaltic emulsions shall not be permitted to cool to a temperature of less than 40° F.

The cationic asphaltic emulsion shall be stored in heated circulation tanks at controlled temperatures, between 140° F and 180° F, for a period not to exceed seven calendar days.

The temperature of the asphaltic emulsion shall be between 130° F and 180° F at the time of application.

SECTION 95: EPOXY

The Standard Specifications are incorporated herein by this reference.

SECTIONS 96-98: RESERVED

DIVISION XI BUILDING CONSTRUCTION RESERVED