CONSTRUCTION SPECIFICATIONS

IMPROVEMENT STANDARDS

STANDARD DRAWINGS

MARCH 2006

(Updated July 2012)

CITY OF ROCKLIN
Community Development Dept./Engineering Division
Department of Public Works
3970 Rocklin Road
Rocklin, CA 95677
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CITY OF ROCKLIN

Community Development Department/Engineering Division
Department of Public Works

This edition of the City of Rocklin Construction Specifications, Improvement Standards, and Standard Drawings has been compiled with the intent that it may be updated on a yearly basis, or as required, to reflect the changing technology and thinking of the engineering profession, the construction industry and the City of Rocklin.

Each and every purchaser of this document shall be responsible for obtaining the updates in loose leaf form from the City of Rocklin, Community Development Dept./Engineering Division.

Copies of this document may be obtained at 3970 Rocklin Road, Rocklin, California 95677.

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ADOPTION OF STATE SPECIFICATIONS

The State of California Department of Transportation ("Caltrans") Standard Specifications, current edition, are hereby adopted as the Construction Specifications of the City of Rocklin, except insofar as they are specifically modified herein.

CITY OF ROCKLIN

PUBLIC WORKS DEPARTMENT

GENERAL SPECIFICATIONS

Numbering in the following General Specifications conforms to that in the Caltrans Standard Specifications:

GS-1. DEFINITIONS AND TERMS

GS1-1.01. GENERAL--Unless the context otherwise requires, wherever in the specifications and other contract documents the following abbreviations and terms, or pronouns in place of them, are used, the intent and meaning shall be as herein defined.

Working titles having a masculine gender, such as "workman" and "journeyman" and the pronoun "he", are utilized in the specifications for the sake of brevity, and are intended to refer to persons of either gender.

GS1-1.02. ABBREVIATIONS

AAN	American Association of Nurserymen.
AASHTO	American Association of State Highway and Transportation Officials.
AISC	American Institute of Steel Construction.
AISI	American Iron and Steel Institute.
ANSI	American National Standards Institute.
APHA	American Public Health Association.
API	American Petroleum Institute.
AREA	American Railway Engineering Association.
ASME	American Society of Mechanical Engineers.
ASTM	American Society for Testing and Materials.
AWG	American Wire Gage.
AWPA	American Wood-Preservers' Association.
AWS	American Welding Society.
AWWA	American Water Works Association.
EIA	Electronic Industries Association.
IEEE	Institute of Electrical and Electronics Engineers.
NEMA	National Electrical Manufacturers Association.
UL	Underwriters' Laboratories Inc.
CF	Cubic Foot
CY	Cubic Yard
EA	Each
GAL	Gallon
LB	Pound
LF	Linear Foot
LS	Lump Sum
MFBM	Thousand Foot Board Measure
MI	Mile
MSYD	Thousand Station Yard
SQFT	Square Foot
SQYD	Square Yard
STA	Station
TAB	Tablet

GS1-1.03. ACCEPTANCE--Shall mean the formal acceptance by resolution of the Rocklin City Council of an entire contract which has been completed in all respects in accordance with the plans, specifications and any modifications thereof previously approved, causing a notice of completion to be filed by the Director.

GS1-1.04. AGENCY--Shall mean the City of Rocklin.

GS1-1.05. BASE--A layer of specified material of planned thickness placed immediately below the pavement or surfacing.

GS1-1.06. BASEMENT MATERIAL--The material in excavation or embankments underlying the lowest layer of subbase, base, pavement, surfacing or other specified layer which is to be placed.

GS1-1.07. BIDDER--Any individual, firm, partnership, corporation, or combination thereof, submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.

GS1-1.08. BRIDGE--Any structure, with a bridge number, which carries a utility facility, or railroad, highway, pedestrian, or other traffic, over a water course or over or under or around any obstruction.

GS1-1.081. CITY--Shall mean the City of Rocklin.

GS1-1.085. CONDUIT--A pipe or tube in which smaller pipes, tubes, or electrical conductors are inserted or are to be inserted.

GS1-1.09. CONTRACT--The written agreement covering the performance of the work and the furnishing of labor, materials, tools, and equipment in the construction of the work. The contract shall include the notice to contractors, proposal, plans, specifications, special provisions and contract bonds; also any and all supplemental agreements amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments or extensions to the contract and include contract change orders.

GS1-1.10. CONTRACTOR--The person or persons, firm, partnership, corporation, or combination thereof, private or municipal, who have entered into a contract with the City of Rocklin as party or parties of the second part or his or their legal representatives.

GS1-1.11. CULVERT--Any structure, other than a bridge, which provides an opening under a roadway for drainage or other purposes.

GS1-1.12. DAYS--Unless otherwise designated, days as used in the specifications will be understood to mean calendar days.

GS1-1.13. DEPARTMENT--Shall mean the Public Works Department of the City of Rocklin. References made to the Department of Transportation otherwise shall mean the State of California Department of Transportation.

GS1-1.14. DETOUR--A temporary route for traffic around a closed portion of a road.

GS1.1.15. DIRECTOR--Shall mean the Director of Public Works and/or City Engineer of the City of Rocklin or his duly authorized representative.

GS1-1.16. DIVIDED HIGHWAY--A highway with separated traveled ways for traffic, generally in opposite directions.

GS1-1.17. DIVISION OF HIGHWAYS--Shall mean the Public Works Department of the of the City of Rocklin.

GS1-1.18. ENGINEER--The City Engineer of the City of Rocklin, Public Works Department.

GS1-1.19. ENGINEER'S ESTIMATE--The estimate prepared by the Engineer for quantities of work to be performed.

GS1-19.5 ENTITY--Shall mean the City of Rocklin.

GS1-1.20. FEDERAL AGENCIES--Whenever, in the specifications, reference is made to any Federal agency or officer, such reference shall be deemed made to any agency or officer succeeding in accordance with law to the powers, duties, jurisdiction, and authority of the agency or officer mentioned.

GS1-1.21. FIXED COSTS--Any necessary labor, material and equipment costs directly expended on the item or items under consideration which remain constant regardless of the quantity of the work done.

GS1-1.22. FRONTAGE ROAD--A local street or road auxiliary to and located generally on the side of an arterial highway for service to abutting property and adjacent areas and for control of access.

GS1-1.23. GRADING PLANE--The surface of the basement material upon which the lowest layer of subbase, base, pavement, surfacing, or other specified layer, is placed.

GS1-1.24. HIGHWAY--The whole right of way or area which is reserved for and secured for use in constructing the roadway and its appurtenances.

GS1-1.25. LABORATORY--The established laboratory of the Department or other laboratories authorized by the Department to test materials and work involved in the contract.

GS1.1255. LEGAL HOLIDAYS--Those days designated as State holidays in the Government Code.

GS1-1.26. LIQUIDATED DAMAGE--The amount to be deducted from payments due or to become due to the Contractor for delay, as set forth in the Special Provisions.

GS1-1.265. MANUAL OF TRAFFIC CONTROLS--The Department of Transportation publication entitled "MANUAL OF TRAFFIC CONTROLS for Construction and Maintenance Work Zones."

GS1-1.27. MEDIAN--That portion of a divided highway separating the traveled ways for traffic in opposite directions including inside shoulders.

GS1-1.28. PAVEMENT--The uppermost layer of material placed on the traveled way or shoulders. This term is used interchangeably with surfacing.

GS1-1.29. PLANS--The official project plans and Standard Drawings and Standard Plans, profiles, typical cross sections, working drawings, and supplemental drawings, or reproductions thereof, approved by the Engineer which show the location, character, dimensions and details of the work to be performed. All such documents are to be considered as a part of the plans whether or not reproduced in the special provisions.

In the above definition, the following terms are defined as follows:

A. **Standard Plans**:

The Standard Plans of the Department of Transportation of the State of California.

B. **Standard Drawings**:

The Standard Drawings of the City of Rocklin Public Works Department.

C. **Project Plans**:

The project plans are specific details and dimension peculiar to the work and supplemented by the Standard Plans and Standard Drawings, insofar as the same may apply.

GS1-1.30. PROCESSING--Any operation or operations of whatever nature and extent required to produce a specified material.

GS1-1.31. PROPOSAL--The offer of the bidder for the work when made out and submitted on the prescribed proposal form, properly signed and guaranteed.

GS1-1.32. PROPOSAL FORM--The approved form upon which the City of Rocklin requires formal bids be prepared and submitted for the work.

GS1-1.33. PROPOSAL GUARANTY--The cash, cashier's check, certified check, or bidder's bond accompanying the proposal submitted by the bidder, as a guaranty that the bidder will enter into a contract with the City of Rocklin for the performance of the work if the contract is awarded to him.

GS1-1.34. ROADBED--The roadbed is that area between the intersection of the upper surface of the roadway and the side slopes of curb lines. The roadbed rises in elevation as each increment or layer of subbase, base, surfacing or pavement is placed. Where the medians are so wide as to include areas of undisturbed land, a divided highway is considered as including two separate roadbeds.

GS1.1.35. ROADWAY--That portion of the highway included between the outside lines of sidewalks, or curbs, slopes, ditches, channels, waterways, and including all the appertaining structures, and other features necessary to proper drainage and protection.

GS1-1.36. SHOULDERS--The portion of the roadway contiguous with the traveled way for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses.

GS1-1.37. SPECIAL PROVISIONS--The special provisions are specific clauses setting forth conditions or requirements peculiar to the work and supplementary to these Standard Specifications. The Department of Transportation publications entitled Labor Surcharge And Equipment Rental Rates and is to be considered as a part of the special provisions.

GS1-1.38A. SPECIFICATIONS--The directions, provisions and requirements contained in the Standard Construction Specifications as supplemented by the Special Provisions. When the term "specifications," "these specifications," or "standard specifications" is used, it means the provisions as set forth in these Standard Construction Specifications together with any amendments thereto that may be set forth in the Special Provisions.

GS1-38B. STANDARD SPECIFICATIONS--Reference to Standard Specifications or to the California Department of Transportation Standard Specifications shall mean the current edition as adopted by the City of Rocklin except insofar as they may be modified herein.

GS1-1.39. STATE--Reference to the State or State of California shall mean City or City of Rocklin unless the reference is to a law, specification or regulation of the State.

GS1-1.40. BLANK

GS1-1.41. SUBBASE--A layer of specified material of planned thickness between a base and the basement material.

GS1-1.42. SUBGRADE--That portion of the roadbed on which pavement, surfacing, base, subbase, or a layer of any other material is placed.

GS1-1.43. SUBSTRUCTURE--All that part of the bridge below the bridge seats, tops of piers, haunches of rigid frames, or below the spring lines of arches. Backwalls and parapets of abutments and wing walls of bridges shall be considered as parts of the substructure.

GS1-1.44. SUPERSTRUCTURE--All that part of the bridge except the bridge substructure.

GS1-1.45. SURFACING--The uppermost layer of material placed on the traveled way, or shoulders. This term is used interchangeably with pavement.

GS1-1.46. TRAFFIC LANE--That portion of a traveled way for the movement of a single line of vehicles.

GS1-1.47. TRAVELED WAY--That portion of the roadway for the movement of vehicles, exclusive of shoulders.

GS1-1.48. WORK--All the work specified, indicated, shown or contemplated in the contract to construct the improvement, including all alterations, amendments or extensions thereto made by contract change order or other written orders of the Engineer.

GS1-1.49. CITY ATTORNEY--The City Attorney of the City of Rocklin.

GS1-1.50. CITY CLERK--Shall mean the City Clerk of the City of Rocklin.

GS-2 PROPOSAL REQUIREMENTS AND CONDITIONS

GS2-1.01. CONTENTS OF PROPOSAL FORMS--Prospective bidders will be furnished with proposal forms which will refer to the special provisions and project plans for the work to be done and will include a schedule of items for which bid prices are asked, showing the approximate estimate of the various quantities and kinds of work to be performed or materials to be furnished.

GS2-1.02. APPROXIMATE ESTIMATE--The quantities given in the proposal and contract are approximate only, being given as a basis for the comparison of bids. The Department does not, expressly or by implication, agree that the actual amount of work will correspond therewith, and reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Engineer.

GS2-1.03. EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK--The bidder shall examine carefully the site of the work contemplated, the plans and specifications, and the proposal and contract forms therefor. The submission of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, the quantities of materials to be furnished, and as to the requirements of the proposal, plans, specifications, and the contract.

Where the Department has made investigations of site conditions including subsurface conditions in areas where work is to be performed under the contract, or in other areas, some of which may constitute possible local material sources, bidders or Contractors may, upon written request, inspect the records of the Department as to such investigations subject to and upon the conditions hereinafter set forth. Such investigations are made only for the purpose of study and design.

Where there has been prior construction by the Department or other public agencies within the project limits, records of such prior construction that are currently in the possession of the Department and which have been used by, or are known to, the designers and administrators of the project will be made available for inspection by bidders or Contractors, upon written request, subject to the conditions hereinafter set forth. Such records may include, but are not limited to, as-built drawings, design calculations, foundation and site studies, project reports and other data assembled in connection with the investigation, design, construction and maintenance of such prior projects.

Inspection of such records of investigation and project records may be made at the Public Works Department. The records of investigations and project records are not a part of the contract and are available solely for the convenience of the bidder or contractor. It is expressly understood and agreed that the Department assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the investigation thus made, the records thereof, or of project records, interpretations set forth therein or made by the Department in its use thereof and there is no warranty or guaranty, either express or implied, that the conditions indicated by such investigation or records are representative of those existing in or throughout such areas, or any part thereof, of that unlooked-for

development may not occur, or that materials other than, or in proportions different from those indicated, may not be encountered.

When a log of test borings or other record of geotechnical data obtained by the Department's investigation of subsurface conditions is included with the contract plans, it is expressly understood and agreed that said record does not constitute a part of the contract, represents only the opinion of the Department as to the character of the materials or the conditions encountered by it in its investigations, is included in the plans only for the convenience of bidders and its use is subject to all of the conditions and limitations set forth in this Section GS2-1.03.

In some instances, information considered by the Department to be of possible interest to bidders or contractors has been compiled as "Materials Information." Said "Materials Information" is not a part of the contract and is furnished solely for the convenience of bidders or contractors. It is understood and agreed that the fact that the Department has compiled information as "Materials Information" shall not be construed as a warranty or guaranty, express or implied, as to the completeness or accuracy of such compilations and the use of such "Materials Information" shall be subject to all of the conditions and limitations set forth in this Section GS2-1.03.

When cross sections are not included with the plans, but are available, bidders or Contractors may inspect such cross sections and obtain copies for their use, at their expense.

When cross sections are included with the contract plans, it is expressly understood and agreed that said cross sections do not constitute part of the contract, do not necessarily represent actual site conditions or show location, character, dimensions and details of work to be performed, and are included in the plans only for the convenience of bidders and their use is subject to all the conditions and limitation set forth in this Section GS2-1.03

When contour maps were used in the design of the project, the bidders may inspect such maps, and if available, they may obtain copies for their use.

The availability or use of information described in this Section GS2-1.03 is not to be construed in any way as a waiver of the provisions of the first paragraph in this Section GS2-1.03 and a bidder or contractor is cautioned to make such independent investigation and examination as he deems necessary to satisfy himself as to conditions to be encountered in the performance of the work and, with respect to possible local material sources, the quality and quantity of material available from such property and the type and extent of processing that may be required in order to produce material conforming to the requirements of the specifications.

No information derived from such inspection of records of investigations or compilation thereof made by the Department or from the Engineer, or his assistants, will in any way relieve the bidder or contractor from any risk or from properly fulfilling the terms of the contract.

GS2-1.04. BLANK

GS2-1.05. PROPOSAL FORMS--The Department will furnish to each bidder a standard proposal form, which, when filled out and executed shall be submitted as his bid. Bids that are not presented on forms so furnished and copies or facsimiles of the bidder's completed and executed proposal forms submitted as a bid will be rejected.

All items shown on schedule of bid items shall be properly filled in and shall include all costs of labor, materials, equipment, state, federal, or other taxes applicable to the transaction. The completed forms shall be without inter lineations, erasures or alterations of any nature. If the proposal is made by an individual, his name and post office address must be shown; if made by a firm or partnership, the name and post office address of each member of the firm or partnership must be shown; or if made by a corporation, the proposal shall show the name of the state under the laws of which the corporation was chartered and the names, titles, and business addresses of the president, secretary, and treasurer of said corporation. If the proposal is signed by an agent, a "Power of Attorney" must be filed with the proposal.

The proposal shall be submitted as directed in the "Notice to Contractors" under sealed cover plainly marked as a proposal, and identifying the project to which the proposal relates and the time and date of the bid opening therefor. Proposals which are not properly marked may be disregarded. Proposal forms shall be obtained from the Director, City of Rocklin, 3970 Rocklin Road, Rocklin, CA, 95677. Proposal forms are not transferable.

GS2-1.054. REQUIRED LISTING OF PROPOSED SUBCONTRACTORS--Each proposal shall have listed therein the name and address of each subcontractor to whom the bidder proposes to subcontract portions of the work in an amount in excess of 1/2 of one percent of his total bid or $10,000, whichever is greater, in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the Pubic Contract Code. The bidder's attention is invited to other provisions of said Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

A sheet for listing the subcontractor, as required herein, is included in the "Proposal and Contract" book.

GS2-1.056. CITY EMPLOYEES AND DESIGN ENGINEERS MAY NOT BID ON CONSTRUCTION CONTRACT--No employee of the City shall be eligible to submit a proposal for, nor to subcontract for any portion of, nor to supply any materials for any contract administered by the Department.

No engineering or architectural firm which has provided design services for a project shall be eligible to submit a proposal for the contract to construct the project nor to subcontract for any portion of the work. The ineligible firms include the prime contractor for design, subcontractors of portion of the design, and affiliates of either. An affiliate of a firm which is subject to control of the same persons, through joint firm ownership or otherwise.

GS2-1.06. REJECTION OF PROPOSALS AND DISQUALIFICATION OF BIDDERS--Proposals may be rejected if they have been detached from the bound books or transferred to

another bidder or if they show any alterations of the forms, additions not called for, conditional bids, incomplete bids, erasures or irregularities of any kind. More than one proposal from an individual, firm, partnership, corporation or association under the same or different names, will not be considered. Reasonable grounds for believing that any bidder is interested in more than one proposal for the work contemplated, will cause the rejection of all proposals in which the bidder is interested. The City reserves the right to reject any and all proposals.

GS2-1.07. PROPOSAL GUARANTY--All bids shall be presented under sealed cover and accompanied by one of the following forms of bidder's security.

A. Cash, a cashier's check, a certified check, or a bidder's bond executed by an admitted surety insurer, made payable to the City.

B. The security shall be in an amount equal to at least 10 percent of the amount bid. A bid will not be considered unless one of the forms of proposal security is enclosed with it.

C. A bidder's bond will not be accepted unless it conforms to a bond form approved by the City Attorney. Upon request "Bidder's Bond" forms may be obtained from the Department.

GS2-1.08. WITHDRAWAL OF PROPOSALS--Any bid may be withdrawn at any time prior to the time fixed in the public notice for the opening of bids only by written request for the withdrawal of the bid filed with the City. The request shall be executed by the bidder or his duly authorized representative. The withdrawal of a bid does not prejudice the right of the bidder to file a new bid. Whether or not bids are opened exactly at the time fixed in the public notice for opening bids, a bid will not be received after that time, nor may any bid be withdrawn after the time fixed in the public notice of the opening of bids.

GS2-1.09. PUBLIC OPENING OF PROPOSALS--Proposals will be opened and read publicly at the time and place indicated in the "Notice to Contractors." Bidders or their authorized agents are invited to be present.

GS2-1.095. RELIEF OF BIDDERS--Attention is directed to the Provisions of Public Contract Code Sections 5100 to 5107, inclusive, concerning relief to bidders and in particular to the requirements therein, that if the bidder claims a mistake was made in his bid, the bidder shall give the Department written notice within 5 days after the opening of the bids of the alleged mistake, specifying in the notice in detail how the mistake occurred. No bidder shall be relieved of any such mistake except at the discretion of the Rocklin City Council.

GS2-1.10. DISQUALIFICATION OF BIDDERS--More than one proposal from an individual, firm, partnership, corporation, or combination thereof under the same or different names will not be considered. Reasonable grounds for believing that any individual, firm, partnership, corporation or combination thereof is interested in more than one proposal for the work contemplated may cause the rejection of all proposals in which such individual, firm, partnership, corporation or combination thereof is interested. If there is reason for believing that collusion exists among the

bidders any or all proposals may be rejected. Proposals in which the prices obviously are unbalanced may be rejected.

GS2-1.105. PREVIOUS DISQUALIFICATION, REMOVAL OR OTHER PREVENTION OF BIDDING-Pursuant to Section 10162 of the Public Contract Code, the bidder shall complete, under penalty of perjury, the questionnaire in the Proposal relating to previous disqualification, removal or other prevention of bidding of the bidder, or officers or employees of the bidder because of violation of law or a safety regulation.

A bid may be rejected on the basis of a bidder, any officer of such bidder, or any employee of such bidder who has a proprietary interest in such bidder, having been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local project because of a violation of law or a safety regulation.

GS2-1.108. COMPLIANCE WITH ORDERS OF THE NATIONAL LABOR RELATIONS BOARD--Pursuant to Public Contract Code Section 10232, the Contractor shall swear by a statement, under penalty of perjury, that no more than one final, unappealable finding of contempt of court by a Federal court has been issued against the Contractor within the immediately preceding 2-year period because of the Contractor's failure to comply with an order of a Federal court which orders the Contractor to comply with an order of the National Labor Relations Board. For purposes of said Section 10232, a finding of contempt does not include any finding which has been vacated, dismissed, or otherwise removed by the court because the Contractor has complied with the order which was the basis for the finding. The City may rescind any contract in which the Contractor falsely swears to the truth of the statement required by said Section 10232.

The statement required by said Section 10232 is on the page preceding the signature page of the Proposal.

GS2-1.11. COMPETENCY OF BIDDERS--If two or more prospective bidders desire to bid jointly as a joint venture on a single project, they must file an affidavit of joint venture with the Bid on a form approved by the City Attorney, and such affidavit of joint venture will be valid only for the specific project for which it is filed. If such affidavit of joint venture is not filed as aforesaid and approved by the City Attorney prior to the time for awarding bids on the specific project for which it is submitted, a joint bid submitted by said bidders will be disregarded. No bid will be accepted from or a contract awarded to any bidder to whom a proposal form has not been issued pursuant to Section GS2-1.05.

G2-1.12. MATERIAL GUARANTY--The Contractor shall guarantee and warrant all materials supplied as being fit for the purpose intended. The Contractor shall guarantee and warrant all work performed as having been accomplished in a proper and workmanlike manner. The guarantee and warranty required by this section shall continue for a period of one year after acceptance of the contract.

Should any failure of the work occur within a period of one year, after acceptance of the project by the City Council due to faulty materials, poor workmanship, or defective equipment, the Contractor shall promptly make the needed repairs at his expense.

The City is hereby authorized to make such repairs if the Contractor fails to make or undertake with due diligence the aforesaid repairs within 10 days after he is given written notice of such failure; provided, however, that in case of emergency where in the opinion of the Engineer, providing a reasonable attempt has been made to notify the Contractor, delay would cause serious loss or damages, or a serious hazard to the public, the repairs may be made or lights, signs, and barricades erected without prior notice to the Contractor, and the Contractor shall pay the entire cost thereof. At the completion of the work the faithful performance bond may be reduced at the discretion of the City Council to not less than 20 percent of the contract price to cover said guarantee.

Additional guarantees or warranties may be required by the Special Provisions.

GS-3 AWARD AND EXECUTION OF CONTRACT

GS3-1.01. AWARD OF CONTRACT--The right is reserved to reject any and all proposals. The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. Such award, if made, will be made within 30 days after the public opening of the proposals. If the lowest responsible bidder refuses or fails to execute the contract, the Rocklin City Council may award the contract to the second lowest responsible bidder. Such award, if made, will be made within 45 days after the public opening of proposals. If the second lowest responsible bidder refuses or fails to execute the contract, the City may award the contract to the third lowest responsible bidder. Such award, if made, will be made within 60 days after public opening of the proposals. The periods of time specified above within which the award of contract may be made shall be subject to extension for such further period as may be agreed upon in writing between the Rocklin City Council and the bidder concerned.

All bids will be compared on the basis of the Engineer's Estimate of the quantities of work to be done.

GS3-1.02. CONTRACT BONDS--The successful bidder, simultaneously with the execution of the contract, will be required to furnish a labor and materials bond in an amount to 100 percent of the contract price, and a faithful performance bond in an amount equal to 100 percent of the contract price; said bonds shall be in a form approved by the City Attorney and shall be secured by a surety company satisfactory to the City Attorney.

GS3-1.03. EXECUTION OF CONTRACT--The contract, in form and contents satisfactory to the City, shall be executed by the successful bidder and returned, together with the contract bonds and certificates of insurance within 8 days, not including Saturday, Sunday and legal holidays, after the bidder has received the contract for execution. No proposal shall be considered binding upon the City until the execution of the contract by the City.

GS3-1.04. FAILURE TO EXECUTE CONTRACT--Failure of the lowest responsible bidder, the second lowest responsible bidder, or the third lowest responsible bidder to execute the contract and file acceptable bonds and insurance as provided herein within 8 days, not including Saturday, Sunday and legal holidays, after such bidder has received the contract for execution shall be just cause for the annulment of the award and the forfeiture of the proposal guaranty to the City as liquidated damages. The successful bidder may file with the Rocklin City Council a written notice, signed by the bidder or his authorized representative, specifying that the bidder will refuse to execute the contract if presented to him. The filing of such notice shall have the same force and effect as the failure of the bidder to execute the contract and furnish acceptable bonds and insurance within the time prescribed by Section 3-1.03.

GS3-1.05. RETURN OF PROPOSAL SECURITIES--The proposal guaranties accompanying the proposals of the first, second and third lowest responsible bidders will be retained until the contract has been finally executed, after which all such proposal guaranties, except bidder's bonds and any guaranties which have been forfeited, will be returned to the respective bidders whose proposals they accompany. The proposal guaranties, other than bidders bonds, submitted by all

other unsuccessful bidders will be returned upon determination, by the Department, of the first, second and third lowest responsible bidders.

GS-4 SCOPE OF WORK

GS4-1.01. INTENT OF PLANS AND SPECIFICATIONS--The intent of the plans and specifications is to prescribe the details for the construction and completion of the work which the Contractor undertakes to perform in accordance with the terms of the contract. Where the plans or specifications describe portions of the work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in executing the contract in a satisfactory and workmanlike manner.

GS4-1.02. FINAL CLEANING UP--Before final inspection of the work, the Contractor shall clean the highway, material sites, and all ground occupied by him in connection with the work of all rubbish, excess materials, falsework, temporary structures, and equipment. All parts of the work shall be left in a neat and presentable condition. Full compensation for final cleaning up will be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefor.

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

GS4-1.03. CHANGES--The Department reserves the right to make such alterations, deviations, additions to or deletions from the plans and specifications, including the right to increase or decrease the quantity of any item or portion of the work or to delete any item or portion of the work, as may be deemed by the Engineer to be necessary or advisable and to require such extra work as may be determined by Engineer to be required for the proper completion or construction of the whole work contemplated.

Any such changes will be set forth in a contract change order which will specify, in addition to the work to be done in connection with the change made, adjustment of contract time, if any, and the basis of compensation for such work. A contract change order will not become effective until approved by the Engineer.

Upon receipt of an approved contract change order, the Contractor shall proceed with the ordered work. If ordered in writing by the Engineer, the Contractor shall proceed with the work so ordered prior to actual receipt of an approved contract change order therefor. In such cases, the Engineer will, as soon as practicable, issue an approved contract change order for such work and the provisions in Section GS4-1.03A, "Procedure and Protest," shall be fully applicable to such subsequently issued contract change order.

When the compensation for an item of work is subject to adjustment under the provisions of this Section GS4-1.03, the Contractor shall, upon request, furnish the Engineer with adequate detailed cost data for such item of work. If the contractor requests an adjustment in compensation for an item of work as provided in Sections GS4-1.03B(1) or GS4-1.03B(2), such costs data shall be submitted with his request.

GS4-1.03A. PROCEDURE AND PROTEST--A contract change order approved by the Engineer may be issued to the Contractor at any time. Should the Contractor disagree with any terms or conditions set forth in an approved contract change order which he has not executed, he shall submit a written protest to the Engineer within 15 days after the receipt of such approved contract change order. The protest shall state the points of disagreement, and, if possible, the contract specification references, quantities, and costs involved. If a written protest is not submitted, payment will be made as set forth in the approved contract change order and such payment shall constitute full compensation for all work included therein or required thereby. Such unprotested approved contract change orders will be considered as executed contract change orders as that term is used in Sections GS4-1.03B to GS4-1.03D, inclusive.

Where the protest concerning an approved contract change order relates to compensation, the compensation payable for all work specified or required by said contract change order to which such protest relates will be determined as provided in Sections GS4-1.03B to GS4-1.03D, inclusive. The Contractor shall keep full and complete records of the cost of such work and shall permit the Engineer to have such access thereto as may be necessary to assist in the determination of the compensation payable for such work.

Where the protest concerning an approved contract change order relates to the adjustment of contract time for the completion of the work, the time to be allowed therefor will be determined as provided in Section GS8-1.07, "Liquidated Damages."

Proposed contract change orders may be presented to the Contractor for his consideration prior to approval by the Engineer. If the Contractor signified his acceptance of the terms and conditions of such proposed contract change order by executing such document and if such change order is approved by the Engineer and issued to the Contractor, payment in accordance with the provisions as to compensation therein set forth shall constitute full compensation for all work included herein or required thereby. A contract change order executed by the Contractor and approved by the Engineer is an executed contract change order as that term is used in Sections GS4-1.03B to GS4-1.03D, inclusive. An approved contract change order shall supersede a proposed, but unapproved, contract change order covering the same work.

The Engineer may provide for an adjustment of compensation as to a contract item of work included in a contract change order determined as provided in Sections GS4-1.03B to GS4-1.03D, inclusive, if such item of work is eligible for an adjustment of compensation thereunder.

GS4-1.03B. INCREASED OR DECREASED QUANTITIES--Increases or decreases in the quantity of a contract item of work will be determined by comparing the total pay quantity of such item of work with the Engineer's Estimate therefor.

If the total pay quantity of any item of work required under the contract varies from the Engineer's Estimate therefor by 25 percent or less, payment will be made for the quantity of work of said item performed at the contract unit price therefor, unless eligible for adjustment pursuant to Section GS4-1.03C, "Changes in Character of Work."

If the total pay quantity of any item of work required under the contract varies from the Engineer's Estimate therefor by more than 25 percent, in the absence of an executed contract change order specifying the compensation to be paid, the compensation payable to the Contractor will be determined in accordance with Sections GS4-1.03B(1), GS4-1.03B(2), or GS4-1.03B(3), as the case may be.

GS4-1.03B(1). INCREASES OF MORE THAN 25 PERCENT--Should the total pay quantity of any item of work required under the contract exceed the Engineer's Estimate therefor by more than 25 percent, the work in excess of 125 percent of such estimate and not covered by an executed contract change order specifying the compensation to be paid, at the request of the Contractor or Engineer, will be paid for by adjusting the contract unit price, as hereinafter provided, or at the option of the Engineer, payment for the work involved in such excess will be made on the basis of force account as provided in Section GS9-1.03.

Such adjustment of the contract unit price will be the difference between the contract unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item. If the costs applicable to such item of work include fixed costs, such fixed costs will be deemed to have been recovered by the Contractor by the payments made for 125 percent of the Engineer's Estimate of the quantity for such item, and in computing the actual unit cost, such fixed costs will be excluded. Subject to the above provisions, such actual unit cost will be determined by the Engineer in the same manner as if the work were to be paid for on a force account basis as provided in Section GS9-1.03; or such adjustment will be as agreed to by the Contractor and the Engineer.

When the compensation payable for the number of units of an item of work performed in excess of 125 percent of the Engineer's Estimate is less than $5,000 at the applicable contract unit price, the Engineer reserves the right to make no adjustment in said price if he so elects, except that an adjustment will be made if requested in writing by the Contractor.

GS4.1.03B(2). DECREASES OF MORE THAN 25 PERCENT--Should the total pay quantity of any item of work required under the contract be less than 75 percent of the Engineer's Estimate therefor, an adjustment in compensation pursuant to this Section will not be made unless the Contractor so requests in writing. If the Contractor so requests, the quantity of said item performed, unless covered by an executed contract change order specifying the compensation payable therefor, will be paid for by adjusting the contract unit price as hereinafter provided, or at the option of the Engineer, payment for the quantity of the work of such item performed will be made on the basis of force account as provided in Section GS9-1.03, provided however, that in no case shall the payment for such work be less than that which would be made at the contract unit price.

Such adjustment of the contract unit price will be the difference between the contract unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item, including fixed costs. Such actual unit cost will be determined by the Engineer in the same manner as if the work were to be paid for on a force account basis as provided in Section GS9-1.03; or such adjustment will be as agreed to by the Contractor and the Engineer.

The payment for the total pay quantity of such item of work will in no case exceed the payment which would be made for the performance of 75 percent of the Engineer's Estimate of the quantity for such item at the original contract unit price.

GS4-1.03B(3). ELIMINATED ITEMS--Should any contract item of the work be eliminated in its entirety, in the absence of an executed contract change order covering such elimination, payment will be made to the Contractor for actual costs incurred in connection with such eliminated contract item if incurred prior to the date of notification in writing by the Engineer of such elimination.

If acceptable material is ordered by the Contractor for the eliminated item prior to the date of notification of such elimination by the Engineer, and if orders for such material cannot be canceled, it will be paid for at the actual cost to the Contractor. In such case, the material paid for shall become the property of the City and the actual cost of any further handling will be paid for by the City. If the material is returnable to the vendor and if the Engineer so directs, the material shall be returned and the Contractor will be paid for the actual cost of charges made by the vendor for returning the material. The actual cost of handling returned material will be paid for.

The actual costs or charges to be paid by the Department to the Contractor as provided in this Section GS4-1.03B(3) will be computed in the same manner as if the work were to be paid for on a force account basis as provided in Section GS9-1.03.

GS4-1.03C. CHANGES IN CHARACTER OF WORK--If an ordered change in the plans or specifications materially changes the character of the work of a contract item from that on which the Contractor based his bid price, and if the change increases or decreases the actual unit cost of such changed item as compared to the actual or estimated actual unit cost of performing the work of said item in accordance with the plans and specifications originally applicable thereto, in the absence of an executed contract change order specifying the compensation payable, an adjustment in compensation therefor will be made in accordance with the following.

The basis of such adjustment in compensation will be the difference between the actual unit cost to perform the work of said item or portion thereof involved in the change as originally planned and the actual unit cost of performing the work of said item or portion thereof involved in the change, as changed. Actual unit costs will be determined by the Engineer in the same manner as if the work were to be paid for on a force account basics as provided in Section GS9-1.03; or such adjustment will be as agreed to by the Contract and the Engineer. Any such adjustment will apply only to the portion of the work of said item actually changed in character. At the option of the Engineer, the work of said item or portion of item which is changed in character will be paid for by force account as provided in Section GS9-1.03.

If the compensation for an item of work is adjusted under this Section GS4-1.03C, the costs recognized in determining such adjustment shall be excluded from consideration in making an adjustment for such item of work under the provisions in Section GS4-1.03B, "Increased or Decreased Quantities."

Failure of the Engineer to recognize a change in character of the work at the time the approved contract change order is issued shall in nowise be construed as relieving the Contractor of his duty and responsibility of filing a written protest within the 15 day limit as provided in Section GS4-1.03A, "Procedure and Protest."

GS4-1.03D. EXTRA WORK--New and unforeseen work will be classed as extra work when determined by the Engineer that such work is not covered by any of the various items for which there is a bid price or by combinations of such items. In the event portions of such work are determined by the Engineer to be covered by some of the various items for which there is a bid price or combinations of such items, the remaining portion of such work will be classed as extra work. Extra work also includes work specifically designated as extra work in the plans or specifications.

The Contractor shall do such extra work and furnish labor, material, and equipment therefor upon receipt of an approved contract change order or other written order of the Engineer, and in the absence of such approved contract change order or other written order of the Engineer he shall not be entitled to payment for such extra work.

Payment for extra work required to be performed pursuant to the provisions in this Section GS4-1.03D, in the absence of an executed contract change order, will be made by force account as provided in Section GS9-1.03; or as agreed to by the Contractor and the Engineer.

GS4-1.04. DETOURS--The Contractor shall construct and remove detours and detour bridges for the use of public traffic as provided in the special provisions, or as shown on the plans, or as directed by the Engineer. Payment for such work will be made as set forth in the special provisions or at the contract prices for the items of work involved if the work being performed is covered by the contract items of work and no other method of payment therefor is provided in the special provisions, otherwise the work will be paid for as extra work as provided in Section GS4-1.03D.

When public traffic is routed through the work, provision for a passageway through construction operations will not be considered as detour construction or detour maintenance and such work shall conform to and be paid for a provided in Section GS7-1.08, "Public Convenience," unless otherwise specified in the special provisions.

Detours used exclusively by the Contractor for hauling materials and equipment shall be constructed and maintained by him at his expense.

The failure or refusal of the Contractor to construct and maintain detours at the proper time shall be sufficient cause for closing down the work until such detours are in satisfactory condition for use by public traffic.

Where the Contractor's hauling is causing such damage to the detour that its maintenance in a condition satisfactory for public traffic is made difficult and unusually expensive, the Engineer shall have authority to regulate the Contractor's hauling over the detour.

GS4-1.05. USE OF MATERIALS FOUND ON THE WORK--The Contractor, with the approval of the Engineer, may use in the proposed construction such stone, gravel, sand or other material suitable in the opinion of the Engineer as may be found in excavation. The Contractor will be paid for the excavation of such materials at the contract price for such excavation, but he shall replace at his expense with other suitable material all of that portion of the material so removed and used which was contemplated for use in the work, except that the Contractor need not replace, at his expense, any material obtained from structure excavation used as structure backfill. No charge for materials so used will be made against the Contractor. The Contractor shall not excavate or remove any material from within the highway location that is not within the excavation, as indicated by the slope and grade lines, without written authorization from the Engineer.

GS-5 CONTROL OF WORK

GS5-1.01. AUTHORITY OF ENGINEER--The Engineer shall decide all questions which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the work; all questions which may arise as to the interpretation of the plans and specifications; all questions as to the acceptable fulfillment of the contract on the part of the Contractor; and all questions as to compensation. His decision shall be final and he shall have authority to enforce and make effective such decisions and orders which the Contractor fails to carry out promptly.

GS5-1.02. PLANS AND WORKING DRAWINGS--The contract plans furnished consist of general drawings and show such details as are necessary to give a comprehensive idea of the construction contemplated. All authorized alterations affecting the requirements and information given on the contract plans shall be in writing.

The contract plans shall be supplemented by such working drawings prepared by the Contractor as are necessary to adequately control the work. No change shall be made by the Contractor in any working drawing after it has been approved by the Engineer.

Working drawings for any part of the permanent work shall include, but not be limited to; stress sheets, anchor bolt layouts, shop details, erection plans, equipment lists and any other information specifically required elsewhere in the specifications.

Working drawings for cribs, cofferdams, falsework, temporary support systems, haul bridges, centering and form work and for other temporary work and methods of construction the Contractor proposes to use, shall be submitted when required by the specifications or ordered by the Engineer. Such working drawings shall be subject to approval insofar as the details affect the character of the finished work and for compliance with design requirements applicable to the construction when specified or called for, but details of design will be left to the Contractor who shall be responsible for the successful construction of the work.

Working drawings shall be approved by the Engineer before any work involving such drawings is performed. It is expressly understood that approval of the Contractor's working drawings shall not relieve the Contractor of any of his responsibility under the contract for the successful completion of the work in conformity with the requirements of the plans and specifications. Such approval shall not operate to waive any of the requirements of the plans and specifications or relieve the Contractor of any obligation thereunder, and defective work, materials and equipment may be rejected notwithstanding such approval.

Full compensation for furnishing all working drawings shall be considered as included in the prices paid for the contract items of work to which such drawings relate and no additional compensation will be allowed therefor.

GS5-1.02A. TRENCH EXCAVATION SAFETY PLANS--Attention is directed to Section GS7-1.01E, "Trench Safety." Excavation for any trench 5 FT or more in depth shall not begin until the Contractor has received approval, from the Engineer, of the Contractor's detailed plan for worker protection from the hazards of caving ground during the excavation of such trench, and any design calculations used in the preparation of such detailed plan. Such detailed plan shall show the details of the design of shoring, bracing, sloping or other provisions to be made for worker protection during such excavation. No such plan shall allow the use of shoring, sloping or a protective system less effective than that required by the Construction Safety Orders of the Division of Occupational Safety and Health. If such plan complies with the shoring system standards established by the Construction Safety Orders, the plan shall be submitted at least 5 days before the Contractor intends to begin excavation for the trench. If such plan varies from the shoring system standards established by the Construction Safety Orders, the plan shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California, and the plan and design calculations shall be submitted at least 3 weeks before the Contractor intends to begin excavation for the trench.

GS5-1.04. COORDINATION OF PLANS AND SPECIFICATIONS--These General Specifications, the Standard Specifications, the Standard Plans, the Standard Drawings, project plans, project Special Provisions (and any addenda), the Agreement, Contract Change Orders, and all supplementary documents are all essential parts of the contract between Contractor and the City. 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.

Project plans shall govern over Standard Plans and Drawings, Standard Plans and Drawings and project plans shall govern over these Standard Specifications; the Special Provisions shall govern over both these Standard Specifications and the plans.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in these specifications, the Special Provisions, or the plans, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform to them as part of the contract. In the event of any doubt or question arising respecting the true meaning of these specifications, the special provisions or the plans, reference shall be made to the Engineer, whose decision thereon shall be final.

In the event of any discrepancy, between any drawing and the figures written thereon, the figures shall be taken as correct. Detail drawings shall prevail over general drawings.

GS5-1.05. ORDER OF WORK--When required by the special provisions or plans, the Contractor shall follow the sequence of operations as set forth therein.

Full compensation for conforming to such requirements will be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

GS5-1.06. SUPERINTENDENCE--The Contractor shall designate in writing before starting work, an authorized representative who shall have the authority to represent and act for the Contractor.

When the Contractor is comprised of two or more persons, firms, partnerships, or corporations functioning on a joint venture basis, said Contractor shall designate in writing before starting work, the name of one authorized representative who shall have the authority to represent and act for the Contractor.

Said authorized representative shall be present at the site of the work at all times while work is actually in progress on the contract. 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 which may be required.

Whenever the Contractor or his 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.

GS5-1.07. LINES AND GRADES--Such stakes or marks will be set by the Contractor as he determines to be necessary to establish the lines and grades required for the completion of the work specified in these specifications, on the plans and in the special provisions.

Stakes and marks set shall be carefully preserved by the Contractor. In case such stakes and marks are destroyed or damaged they will be replaced at the Contractor's earliest convenience at his own expense.

GS5-1.08. INSPECTION--The Engineer shall, at all times, have safe access to the work site during its construction, and shall be furnished with every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements and intentions of these specifications, the special provisions, and the plans. All work done and all materials furnished shall be subject to his inspection.

The inspection of the work or materials shall not relieve the Contractor of any of his obligations to fulfill his contract as prescribed. Work and material not meeting such requirements shall be made good and unsuitable work or materials may be rejected, notwithstanding that such work or materials have been previously inspected by the Engineer or that payment therefor has been included in a progress estimate.

Projects financed in whole or in part with Federal funds shall be subject to inspection at all times by the Federal agency involved.

GS5-1.09. REMOVAL OF REJECTED AND UNAUTHORIZED WORK--All work which has been rejected shall be remedied, or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed him for such removal, replacement, or remedial work.

Any work done beyond the lines and grades shown on the plans or established by the Engineer, or any extra work done without written authority will be considered as unauthorized work and will not be paid for. Upon order of the Engineer unauthorized work shall be remedied, removed, or replaced at the Contractor's expense.

Upon failure of the Contractor to comply promptly with any order of the Engineer made under this Section GS5-1.09, the Department may cause rejected or unauthorized work to be remedied, removed, or replaced, and to deduct the costs from any moneys due or to become due the Contractor.

GS5-1.10. EQUIPMENT AND PLANTS--Only equipment and plants suitable to produce the quality of work and materials required will be permitted to operate on the project.

Plants shall be designed and constructed in accordance with general practice for such equipment and shall be of sufficient capacity to insure the production of sufficient material to carry the work to completion within the time limit.

The Contractor shall provide adequate and suitable equipment and plants to meet the above requirements, and when ordered by the Engineer shall remove unsuitable equipment from the work and discontinue the operation of unsatisfactory plants.

The Contractor shall identify each piece of his equipment, other than hand tools, by means of an identifying number plainly stenciled or stamped on the equipment at a conspicuous location, and shall furnish to the Engineer a list giving the description of each piece of equipment and its identifying number. In addition, the make, model number and empty gross weight of each unit of compacting equipment shall be plainly stamped or stenciled in a conspicuous place on the unit. The gross weight shall be either the manufacturer's rated weight or the scale weight.

The make, model, serial number and manufacturer's rate capacity for each scale shall be clearly stamped or stenciled on the load receiving element and its indicator or indicators. All meters shall be similarly identified, rated and marked. Upon request of the Engineer, the Contractor shall furnish a statement by the manufacturer, designating sectional and weighbridge capacities of portable vehicle scales.

GS5-1.11. ALTERNATIVE EQUIPMENT--While certain of these specifications may provide that equipment of a particular size and type is to be used to perform portions of the work, it is to be understood that the development and use of new or improved equipment is to be encouraged.

The Contractor may request, in writing, permission from the Engineer to use equipment of a different size or type in place of the equipment specified.

The Engineer, before considering or granting such request, may require the Contractor to furnish, at his expense, evidence satisfactory to the Engineer that the equipment proposed for use by the Contractor is capable of producing work equal to, or better than, that which can be produced by the equipment specified.

If such permission is granted by the Engineer, it shall be understood that such permission is granted for the purpose of testing the quality of work actually produced by such equipment and is subject to continuous attainment of results which, in the opinion of the Engineer, are equal to, or better than, that which can be obtained with the equipment specified. The Engineer shall have the right to withdraw such permission at any time that he determines that the alternative equipment is not producing work that is equal, in all respects, to that which can be produced by the equipment specified. Upon withdrawal of such permission by the Engineer, the Contractor will be required to use the equipment originally specified and shall, in accordance with the directions of the Engineer, remove and dispose or otherwise remedy, at his expense, any defective or unsatisfactory work produced with the alternative equipment.

Neither the City nor the Contractor shall have any claim against the other for either the withholding or the granting of permission to use alternative equipment, or for the withdrawal of such permission.

Permission to use alternative equipment in place of equipment specified will only be granted where such equipment is new or improved and its use is deemed by the Engineer to be in furtherance of the purposes of this Section GS5-1.11. The approval for use of particular equipment on any project shall in no way be considered as an approval of the use of such equipment on any other project.

Nothing in this Section GS5-1.11 shall relieve the Contractor of his responsibility for furnishing materials or producing finished work of the quality specified in these specifications or in the special provisions.

GS5-1.115. ALTERNATIVE METHODS OF CONSTRUCTION--Whenever the plans or specifications provide that more than one specified method of construction or more than one specified type of material or construction equipment may be used to perform portions of the work and leave the selection of the method of construction or the type of material or equipment to be used up to the Contractor, it is understood that the City does not guarantee that every such method of construction or type of material or equipment can be used successfully throughout all or any part of any project. It shall be the Contractor's responsibility to select and use the alternative or alternatives which will satisfactorily perform the work under the conditions encountered. In the event some of the alternatives are not feasible or it is necessary to use more than one of the alternatives on any project, full compensation for any additional cost involved shall be considered as included in the contract price paid for the item of work involved and no additional compensation will be allowed therefore.

GS5-1.116. DIFFERING SITE CONDITIONS--During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those

ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

Upon written notification, the Engineer will investigate the conditions, and if the Engineer determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made and the contract modified in writing accordingly. The Engineer will notify the Contractor of his determination whether or not an adjustment of the contract is warranted.

No contract adjustments which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.

No contract adjustment will be allowed under the provisions specified in this section for any effects caused on unchanged work.

Any contract adjustment warranted due to differing site conditions will be made in accordance with the provisions in Section 4-1.03 "Changes", except as otherwise provided.

GS5-1.12. CHARACTER OF WORKMEN--If any subcontractor or person employed by the Contractor shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the request of the Engineer, and such person shall not again be employed on the work.

GS5-1.13. FINAL INSPECTION--When the work has been completed, the Engineer or designated representative will make the final inspection.

GS5-1.14. COST REDUCTION INCENTIVE--The Contractor may submit to the Engineer, in writing, proposals for modifying the plans, specifications or other requirements of the contract for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair, in any manner, the essential functions or characteristics of the project, including but not limited to service life, economy of operation, ease of maintenance, desired appearance, or design and safety standards.

Cost reduction proposals shall contain the following information:

1. A description of both the existing contract requirements for performing the work and the proposed changes.

2. An itemization of the contract requirements that must be changed if the proposal is adopted.

3. A detailed estimate of the cost of performing the work under the existing contract and under the proposed change. The estimates of cost shall be determined in the same manner as if the work where to be paid for on a force account basis as provided in Section GS9-1.03, "Force Account Payment."

4. A statement of the time within which the Engineer must make a decision thereon.

5. The contract items of work affected by the proposed changes, including any quantity variation attributable thereto.

The provisions of this Section GS5-1.14 shall not be construed to require the Engineer to consider any cost reduction proposal which may be submitted hereunder; proposed changes in basic design of a bridge or of a pavement type will not be considered as an acceptable cost reduction proposal; the Department will not be liable to the Contractor for failure to accept or act upon any cost reduction proposal submitted pursuant to this section nor for any delays to the work attributable to any such proposal. If a cost reduction proposal is similar to a change in the plans or specifications, under consideration by the Department for the project, at the time said proposal is submitted or if such a proposal is based upon or similar to Standard Specifications, Special provisions or Standard Plans adopted by the City after the advertisement for the contract, the Engineer will not accept such proposal and the Department reserves the right to make such changes without compensation to the Contractor under the provisions of this section.

The Contractor shall continue to perform the work in accordance with the requirements of the contract until an executed change order, incorporating the cost reduction proposal has been issued. If an executed change order has not been issued by the date upon which the contractor's cost reduction proposal specified that a decision thereon should be made, or such other date as the Contractor may subsequently have specified in writing, such cost reduction proposal shall be deemed rejected.

The Engineer shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in construction costs from the adoption of all or any part of such proposal. In determining the estimated net savings, the right is reserved to disregard the contract bid prices if in the judgment of the Engineer, such prices do not represent a fair measure of the value of work to be performed or to be deleted.

The Department reserves the right where it deems such action appropriate, to require the Contractor to share in the Department's costs of investigating a cost reduction proposal submitted by the Contractor as a condition of considering such. Where such a condition is imposed the Contractor shall indicate his acceptance thereof in writing, and such acceptance shall constitute full authority for the Department to deduct amounts payable to the Department from any monies due or that may become due to the Contractor under the contract.

If the Contractor's cost reduction proposal is accepted in whole or in part such acceptance will be by a contract change order, which shall specifically state that it is executed pursuant to this Section GS5-1.14. Such change order shall incorporate the changes in the plans and specifications which

are necessary to permit the cost reduction proposal or such part of it as has been accepted to be put into effect, and shall include any conditions upon which the Department's approval thereof is based if the approval of the Department is conditional. The change order shall also set forth the estimated net savings in construction costs attributable to the cost reduction proposal effectuated by the change order, and shall further provide that the contractor be paid 50 percent of said estimated net savings amount. The Contractor's cost of preparing the cost reduction incentive proposal and the Department's costs of investigating a cost reduction incentive proposal, including any portion thereof paid by the Contractor, shall be excluded from consideration in determining the estimated net savings in construction costs.

Acceptance of the cost reduction proposal and performance of the work there under shall not extend the time of completion of the contract unless specifically provided for in the contract change order authorizing the use of the cost reduction proposal.

The amount specified to be paid to the Contractor in the change order which effectuates a cost reduction proposal shall constitute full compensation to the Contractor for the cost reduction proposal and the performance of the work thereof pursuant to the said change order.

The Department expressly reserves the right to adopt a cost reduction proposal for general use on contracts administered by the Department when it determines that said proposal is suitable for application to other contracts. When an accepted cost reduction proposal is adopted for general use, only the Con- tractor who first submitted such proposal will be eligible for compensation pursuant to this section, and in that case, only as to those contracts awarded to him prior to submission of the accepted cost reduction proposal and as to which such cost reduction proposal is also submitted and accepted. Cost reduction proposals identical or similar to previously submitted proposals will be eligible for consideration and compensation under the provisions of this Section GS5-1.14 if the identical or similar previously submitted proposals were not adopted for general application to other contracts administered by the Department. Subject to the provisions contained herein, the City or any other public agency shall have the right to use all or any part of any submitted cost reduction proposal without obligation or compensation of any kind to the Contractor.

This Section GS5-1.14 of the specifications shall apply only to contracts awarded to the lowest bidder pursuant to competitive bidding.

GS-6 CONTROL OF MATERIALS

GS6-1.01. SOURCE OF SUPPLY AND QUALITY OF MATERIALS--The Contractor shall furnish all material required to complete the work, except materials that are designated in the specifications to be furnished by the City and materials furnished by the City in accordance with Section GS9-1.03, "Force Account Payment."

Only materials conforming to the requirements of the specifications shall be incorporated in the work.

The materials furnished and used shall be new, except as may be provided else- where in these specifications, on the plans or in the special provisions. The materials shall be manufactured, handled, and used in a workmanlike manner to insure completed work in accordance with the plans and specifications.

Materials to be used in the work will be subject to inspection and tests by the Engineer or designated representatives. The Contractor shall furnish without charge such samples as may be required. The Contractor shall furnish the Engineer a list of his sources of materials and the locations at which such materials will be available for inspection. The list shall be submitted on a City-furnished form and shall be furnished to the Engineer in sufficient time to permit inspecting and testing of materials to be furnished from such listed sources in advance of their use. The Engineer may inspect, sample or test materials at the source of supply or other locations, but such inspection, sampling or testing will not be undertaken until the Engineer is assured by the Contractor of the cooperation and assistance of both the Contractor and the supplier of the material. The Contractor shall assure that the Engineer or his authorized representative has free access at all times to the material to be inspected, sampled or tested. It is understood that such inspections and tests if made at any point other than the point of incorporation in the work in no way shall be considered as a guaranty of acceptance of such material nor of continued acceptance of material presumed to be similar to that upon which inspections and tests have been made, and that inspection and testing performed by the City shall not relieve the Contractor or his suppliers of responsibility for quality control.

Manufacturers' warranties, guaranties, instruction sheets and parts lists, which are furnished with certain articles or materials incorporated in the work, shall be delivered to the Engineer before acceptance of the contract.

Reports and records of inspections made and tests performed, when available at the site of the work, may be examined by the Contractor.

GS6-1.02. CITY-FURNISHED MATERIALS--Materials which are listed as City-furnished materials in the special provisions will be available to the Contractor free of charge.

The Contractor shall submit a written request to the Engineer for the delivery of City-furnished material at least 15 days in advance of the date of its intended use, except that the written request for the delivery of City-furnished sign panels for roadside signs and overhead sign structures shall

be submitted at least 30 days in advance of their intended installation. The request shall state the quantity and the type of each material.

The locations at which City-furnished materials will be available to the Contractor free of charge will be designated in the special provisions. In such cases said materials shall be hauled to the site of the work by the Contractor at his expense, including any necessary loading and unloading that may be involved. If the locations are not designated in the special provisions, the City-furnished materials will be furnished to the Contractor free of charge at the site of the project. In either case, all costs of handling and placing City-furnished material shall be considered as included in the price paid for the contract item involving such City-furnished material.

The Contractor shall be responsible for all materials furnished to him, and shall pay all demurrage and storage charges. City-furnished materials lost or damaged from any cause whatsoever shall be replaced by the Contractor at his expense. The Contractor shall be liable to the Department for the cost of replacing City-furnished material and such costs may be deducted from any monies due or to become due the Contractor.

All City-furnished material that is not used on the work shall remain the property of the City and shall be delivered to the Engineer.

The Engineer may increase the number of sign panels in any shipment to provide economical use of the City's transportation facilities.

The quantity of each type of City-furnished paint required shall be determined by the Contractor subject to verification by the Engineer.

GS6-1.03. STORAGE OF MATERIALS--Articles or materials to be incorporated in the work shall be stored in such a manner as to insure the preservation of their quality and fitness for the work, and to facilitate inspection.

GS6-1.04. 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 the 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. Upon failure of the Contractor to comply promptly with any order of the Engineer made under the provisions in this Section GS6-1.04, the Engineer shall have authority to cause the removal and replacement of rejected material and to deduct the cost thereof from any moneys due or to become due the Contractor.

GS6-1.05. TRADE NAMES AND ALTERNATIVES--For convenience in designation on the plans or in the specifications, certain articles or materials to be incorporated in the work may be designated under a trade name or the name of a manufacturer and his catalogue information. The use of an alternative article or material which is of equal quality and of the required characteristics for the purpose intended will be permitted, subject to the following requirements:

1. The burden of proof as to the quality and suitability of alternatives shall be upon the Contractor and he shall furnish all information necessary as required by the Engineer. The Engineer shall be the sole judge as to the quality and suitability of alternative articles or materials and his decision shall be final.

2. Whenever the specifications permit the substitution of a similar or equivalent material or article, no tests or action relating to the approval of such substitute material will be made until the request for substitution is made in writing by the Contractor accompanied by complete data as to the equality of the material or article proposed. Such request shall be made in ample time to permit approval without delaying the work, but need not be made in less than 35 days after award of the contract.

GS6-1.06. PLANT INSPECTION--The Engineer may inspect the production of materials, or the manufacture of products at the source of supply. Plant inspection, however, will not be undertaken until the Engineer is assured of the cooperation and assistance of both the Contractor and the material producer. The Engineer or his authorized representative shall have free entry at all times to such parts of the plant as concerns the manufacture or production of the materials. Adequate facilities shall be furnished free of charge to make the necessary inspection. The City assumes no obligation to inspect materials at the source of supply.

GS6-1.07. CERTIFICATES OF COMPLIANCE--A Certificate of Compliance shall be furnished prior to the use of any materials for which these specifications or the special provisions require that such a certificate be furnished. In addition, when so authorized in these specifications or in the special provisions, the Engineer may permit the use of certain materials or assemblies prior to sampling and testing if accompanied by a Certificate of Compliance. The certificate shall be signed by the manufacturer of the material or the manufacturer of assembled materials and shall state that the materials involved comply in all respects with the requirements of the specifications. A Certificate of Compliance shall be furnished with each lot of material delivered to the work and the lot so certified shall be clearly identified in the certificate.

All materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the work which conforms to the requirements of the plans and specifications and any such material not conforming to such requirements will be subject to rejection whether in place or not.

The Department reserves the right to refuse to permit the use of material on the basis of a Certificate of Compliance.

The form of the Certificate of Compliance and its disposition shall be as directed by the Engineer.

GS6-1.08. FOREIGN MATERIALS--Materials which are manufactured, produced or fabricated outside of the United States shall be delivered to a distribution point in California, unless otherwise

required in these specifications or the special provisions, where they shall be retained for a sufficient period of time to permit inspection, sampling, and testing.

Attention is directed to the provisions in Section GS8-1.07, "Liquidated Damages." The Contractor shall not be entitled to an extension of time for acts or events occurring outside of the United States and it shall be the Contractor's responsibility to deliver materials obtained from outside of the United States to the point of entry into the continental United States in sufficient time to permit timely delivery to the jobsite.

The Contractor, at no cost to the City, shall supply the facilities and arrange for any testing required in California which the City is not equipped to perform. All testing by the Contractor shall be subject to witnessing by the Engineer.

The manufacturer, producer or fabricator of foreign material shall furnish to the Engineer a Certificate of Compliance in accordance with the provisions in Section GS6-1.07, "Certificates of Compliance." In addition, certified mill test reports clearly identifiable to the lot of material shall be furnished where required in these specifications or otherwise requested by the Engineer.

If the welding of steel for structural steel members or the casting and prestressing of precast prestressed concrete members is to be performed outside of the United States, the following requirements shall apply:

1. Such fabrication shall be performed only within the plants and by fabricators who have previously established, to the satisfaction of the Engineer, that they have the experience, knowledge, trained manpower, quality controls, equipment and other facilities required to produce the quality and quantity of work required. At the option of the Engineer, prequalification of the plant and fabricator will be established either by the submission of detailed written proof thereof or through in-plant inspection by the Engineer or his representative, or both.

2. The Contractor shall make written application to the Engineer for approval for such foreign fabrication at the earliest possible time and in no case later than 50 days in advance of the planned start of fabrication. The application shall list the specific units or portion of a work which will be fabricated outside of the United States.

3. The Contractor shall advise the Engineer, in writing, at least 20 days in advance of the actual start of any such foreign fabrication.

4. All documents pertaining to the contract, including but not limited to, correspondence, bid documents, working drawings and data shall be written in the English language and all numerical data shall use the foot-pound-second system of units of measurements.

The use of steel manufactured outside of the United States as unidentified stock material, will not be allowed.

GS6-1.09. CITY SPECIFICATION NUMBERS--The City Specification number of material furnished on the contract shall conform to the number specified in these specifications or the special provisions for the material involved, except that material conforming to a later specification issue will be acceptable.

GS6-2.0. LOCAL MATERIALS

GS6-2.01. GENERAL--Local material is rock, sand, gravel, earth, or other mineral material, other than local borrow or selected material, obtained or produced from sources in the vicinity of the work specifically for use on the project. Local material does not include materials obtained from established commercial sources.

Local materials shall be furnished by the Contractor from any source the Contractor may elect, except that when mandatory local material sources of certain materials are designated in the special provisions, the Contractor shall furnish material from such designated mandatory sources.

The Contractor shall be responsible for making all arrangements necessary to obtain materials from any local material source other than a mandatory local material source. If the Contractor elects to obtain materials from a possible local material source, subject to the provisions of Section GS6-2.02, "Possible Local Material Sources," he shall comply with the requirements of said section. If the Contractor elects to obtain material from any other nonmandatory source he shall furnish the Engineer with satisfactory evidence that he has entered into an agreement with the property owner for obtaining material from such source and with copies of any necessary permits, licenses and environmental clearances before removing any material from such sources.

The furnishing of local materials from any source is subject to the provisions in Section GS2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," and in Section GS6-2, "Local Materials."

Unless described in the special provisions as a mandatory local material source, or approved in writing by the Engineer, material sources shall not be excavated at locations where the resulting scars will present an unsightly appearance from any highway. No payment will be made for material obtained in violation of this provision.

The Contractor shall, at his expense, make any arrangements necessary for hauling over local public and private roads from any source.

When requested by the Contractor in writing, the Department will test materials from any local material source, which has not been previously tested. If satisfactory material from such local source is used in the work the Contractor will not be charged for the costs of the tests.

In all other cases, the cost of such testing requested by the Contractor shall be at his expense and deductions will be made from any moneys due or to become due the Contractor, sufficient to cover the costs of such tests.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in conforming to the provisions in this Section GS6-2.01, for furnishing and producing materials from any source shall be considered as included in the price paid for the contract item of work involving such material and no additional compensation will be allowed therefor.

GS6-2.02. POSSIBLE LOCAL MATERIAL SOURCES--Where the Department has made arrangements with owners of land in the vicinity of a project for the obtaining of material from an owner's property, such arrangements are made solely for the purpose of providing all bidders an equal opportunity to obtain material from such property. Bidders or Contractors may, upon written request, inspect the documents evidencing such arrangements between property owners and the Department. The Contractor may, if he so elects, exercise any rights that have been obtained, which may be exercised by a Contractor under such arrangements, subject to and upon the conditions hereinafter set forth.

Such arrangements are not a part of the contract and it is expressly understood and agreed that the Department assumes no responsibility to the bidder or Contractor whatsoever in respect to the arrangements made with the property owner to obtain materials therefrom and that the Contractor shall assume all risks in connection with the use of such property, the terms upon which such use shall be made, and there is no warranty or guaranty, either express or implied, as to the quality or quantity of materials that can be obtained or produced from such property or the type or extent of processing that may be required in order to produce material conforming to the requirements of the specifications.

In those instances in which the Department has compiled "Materials Information" as referred to in Section GS2-1.03, "Examination of Plans, Specifications, Contract and Site of Work," said compilation may include the documents setting forth the arrangement made with some of the property owners for the obtaining of material from such owner's properties. The inclusion of such documents therein shall not in any respect operate as a waiver of any of the provisions in this Section GS6-2.02 concerning said documents.

All necessary permits, licenses and environmental clearances needed to enable the Contractor to use a possible local material source for which the "Materials Information" compilation for the project does not include said permits, licenses and environmental clearances issued to the Department (whether or not the arrangement made by the Department with the owner of the property is included in the compilation) shall be obtained by the Contractor and copies thereof shall be furnished the Engineer before any material is removed from such source.

The bidder or Contractor is cautioned to make such independent investigation and examination as he deems necessary to satisfy himself as to the quality and quantity of materials available from such property, the type and extent of processing that may be required in order to produce material conforming to the requirements of the specifications and the rights, duties and obligations acquired or undertaken under such arrangement with the property owner.

Notwithstanding that the Contractor may elect to obtain materials from any such property owner's property, no material may be obtained from such property unless the Contractor has first either:

1. Executed a document that will guarantee to hold such owner harmless from all claims for injury to persons or damage to property resulting from the Contractor's operations on the property owner's premises and also agree to conform to all other provisions set forth in the arrangement made between the Department and the property owner. Said document will be prepared by the Engineer for execution by the Contractor, or

2. Entered into an agreement with the owner of the material source on any terms mutually agreeable to the owner and the Contractor; provided that the Contractor shall furnish to the Engineer a release, in a form satisfactory to the Engineer, executed by the owner, relieving the Department of any and all obligations under the Department's arrangement with the owner.

If the Contractor elects to obtain material under 1), the use of such site shall be subject to the terms, conditions and limitations of the arrangement made between the property owner and the Department and the Contractor shall pay such charges as are provided for in the arrangement made by the Department with the property owner, and deductions will be made from any moneys due or that may become due the Contractor under the contract sufficient to cover the charges for such material removed.

If the Contractor elects to obtain material under 2), he shall pay such charges as are provided for in the agreement between the owner and the Contractor and deductions will not be made from any moneys due or that may become due the Contractor under the contract to cover such charges.

Before acceptance of the contract, the Engineer may require the Contractor to submit written evidence that the owner of the material source is satisfied that the Contractor has satisfactorily complied with the provisions of either 1), the arrangement between the Department and the owner, or 2), the agreement between the owner and the Contractor, as the case may be.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and producing specified materials from possible local material sources, including the construction of any access roads or fences and any clearing, grubbing and stripping of material sources, and all processing of whatever nature and extent required, shall be considered as included in the price paid for the contract item of work involving such material and no additional compensation will be allowed therefor.

GS6-2.03. MANDATORY LOCAL MATERIAL SOURCES--The Contractor shall perform all work required to obtain and produce acceptable materials from the mandatory local material sources designated in the special provisions and he shall have no right to obtain such materials from any other source or sources. As part of such work in producing acceptable materials from the mandatory sources, it will be necessary for the Contractor to perform certain processing of the material as set forth in the special provisions. Any processing of the material required in addition to that specified in special provisions which in the opinion of the Engineer, is necessary to produce

acceptable material from the mandatory sources will be paid for as extra work as provided in Section GS4-1.03D.

If the Engineer determines that the designated mandatory local material source or sources are no longer to be used because they are exhausted or for other reasons, he will designate an alternative mandatory local material source or sources from which the Contractor shall obtain the balance of the material required.

In such case the Department will pay the Contractor for the cost of moving his plant to such new mandatory source and erecting it as extra work as provided in Section GS4-1.03D. Construction of access roads, fences, clearing and grubbing or stripping of such new mandatory source, ordered by the Engineer to be performed, will be paid for as extra work as provided in Section GS4-1.03D. The Department will also allow or deduct, as the case may be, the increase or decrease in haul cost due to an increase or decrease in the length of haul involved. Increased haul costs will be paid for as extra work as provided in Section GS4-1.03D and deductions for decreased haul will be determined in the same manner. No allowance or additional compensation will be made for lost time or for delay in completing the work due to moving the Contractor's plant from the designated mandatory source to the alternative mandatory source, other than an extension of time pursuant to the provisions in Section GS8-1.07, "Liquidated Damages." Any processing of the material required in addition to that specified in the special provisions for the originally designated mandatory source which, in the opinion of the Engineer, is necessary to produce acceptable material from the alternative mandatory source will be paid for as extra work as provided in Section GS4-1.03D. The Contractor will be charged the same royalty as provided in the special provisions for the original designated mandatory local material source.

The Contractor shall, prior to entering a mandatory local material source or an alternative mandatory local material source, execute a document that will guarantee to hold the owner of such property harmless from all claims for injury to persons or damage to property resulting from the Contractor's operations on the property owner's premises. Said document will be prepared by the Engineer for execution by the Contractor.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in obtaining and producing specified materials from mandatory sources, including the construction of any access roads or fences and any clearing, grubbing, and stripping of mandatory local material sources, except as otherwise provided for in this Section GS6-2.03, shall be considered as included in the price paid for the contract item of work involving such material and no additional compensation will be allowed therefor.

GS6.204. MATERIAL SITES--Local material sites used by the Contractor shall be graded so that, at the time of final inspection of the contract, they will drain and will blend in with the surrounding terrain.

GS6-3.0. TESTING

GS6-3.01. GENERAL--Unless otherwise specified, all tests shall be performed in accordance with the methods used by the Department of Transportation and shall be made by the Engineer or his designated representative.

The Department has developed methods for testing the quality of materials and work. These methods are identified by number and are referred to in the specifications as California Test.

Whenever the specifications require compliance with specified values for the following properties, tests will be made by the California Test indicated unless otherwise specified:

Properties	California Test
Relative Compaction	216 or 231*
Sand Equivalent	217
Resistance (R-value)	301
Grading (Sieve Analysis)	202
Durability Index	229

* ASTM D1557 test may be utilized with written approval from the Director.

Whenever a reference is made in the specifications to a California Test by number, it shall mean the California Test in effect on the day the Notice to Contractors for the work is dated.

Whenever the specifications provide an option between two or more tests, the Engineer will determine the test to be used.

Whenever a reference is made in the specifications to a specification, manual, or test designation either of the American Society for Testing and Materials, the American Association of State Highway and Transportation Officials, Federal Specifications, or any other recognized national organization, and the number or other identification representing the years of adoption or latest revision is omitted, it shall mean the specification, manual, or test designation in effect on the day the Notice to Contractors for the work is dated. Whenever said specification manual or test designation provides for test reports (such as certified mill test reports) from the manufacturer, copies of such reports, identified as to the lot of material, shall be furnished to the Engineer. The manufacturer's test reports shall supplement the inspection, sampling and testing provisions in Section GS-6, "Control of Materials," and shall not constitute a waiver of the City's right to inspect. When material which cannot be identified with specific test reports is proposed for use, the Engineer may, at his discretion, select random samples from the lot for testing. Test specimens from the random samples, including those required for retest, shall be prepared in accordance with the referenced specification and furnished by the Contractor at his expense. The number of such samples and test specimens shall be entirely at the discretion of the Engineer. Unidentified metal products such as sheet, plate, hardware, etc. shall be subject to the requirements of the Engineer.

When requested by the Engineer, the Contractor shall furnish, without charge, samples of all materials entering into the work, and no material shall be used prior to approval by the Engineer, except as provided in Section GS6-1.07, "Certificates of Compliance." Samples of material from local sources shall be taken by or in the presence of the Engineer, otherwise the samples will not be considered for testing.

GS6-3.02 TESTING BY CONTRACTOR--The Contractor shall be responsible for controlling the quality of the material entering the work and of the work performed, and shall perform testing as necessary to ensure such control. The test methods used for such quality control testing shall be as determined by the Contractor. The results of such testing shall be made available to the Engineer upon request. Such test are for the Contractor's use in controlling the work and will not be accepted for use as acceptance tests.

Full compensation for performing such tests and making the results available to the Engineer shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

GS-7 LEGAL RELATIONS AND RESPONSIBILITY

GS7.00. GENERAL

Direction made in this Section GS-7 Legal Relations and Responsibility, shall mean the latest edition of the code, section, chapter division, title and clause referenced to herein.

GS7.1.01. LAWS TO BE OBSERVED--The Contractor shall keep himself fully informed of all existing and future State and Federal laws and county and municipal ordinances and regulations which in any manner affect those engaged or employed in the work, or the materials used in the work, or which in any way affect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. He shall at all times observe and comply with, and shall cause all his agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees of bodies or tribunals having any jurisdiction or authority over the work; and shall protect and indemnify the City of Rocklin, and all officers and employees thereof connected with the work, including but not limited to the Director and the Engineer, against any claim or liability arising from or based on the violation of any such law, ordinance, regulations, order, or decree, whether by himself or his employees. If any discrepancy or inconsistency is discovered in the plans, drawings, specifications, or contract for the work in relation to any such law, ordinance, regulation, order or decree the Contractor shall forthwith report the same to the Engineer in writing.

GS7-1.01A. LABOR CODE REQUIREMENTS--Attention is directed to the following requirements of the Labor Code:

GS7-1.01A(1). HOURS OF LABOR--Eight hours labor constitutes a legal day's work. The Contractor shall forfeit, as a penalty to the City of Rocklin, $25 for each workman employed in the execution of the contract by the Contractor or any subcontractor under him for each calendar day during which such workman is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815, thereof, inclusive, except that work performed by employees of Contractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one-half times the basic rate of pay, as provided in said Section 1815.

GS7-1.01A(2) PREVAILING WAGE--The Contractor shall comply with Labor Code Sections 1774 and 1775. Pursuant to said Section 1775 the Contractor shall forfeit to the City or political subdivision on whose behalf the contract is made or awarded a penalty of not more than fifty dollars ($50) for each calendar day, or portion thereof, for each worker paid less than prevailing rates as determined by the Director of Industrial Relations for the work done under the contract by him or her or by any subcontractor under him or her in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. The amount of this forfeiture shall be determined by the Labor Commissioner and shall be based in consideration of the Contractor's mistake, inadvertence or neglect in failing to pay the correct rate of prevailing wages, or the previous record of the Contract on meeting his or her prevailing wage obligation, or a

Contractor's willful failure to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor has knowledge of his or her obligations under the Labor Code. In addition to said penalty and pursuant to said Section 1775, the difference between such prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor.

"Pursuant to the provisions of Section 1773 of the Labor Code of the State of California, the City has obtained the general prevailing rate of wages (which rate includes employer payments for health and welfare, pension, vacation, travel time, and subsistence pay as provided for in Section 1773.8 of said Code, apprenticeship or other training programs authorized by Section 3093 of said Code, and similar purposes) applicable to the work to be done, for straight time, overtime, Saturday, Sunday and holiday work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of workmen concerned."

The wage rates determined by the Director of Industrial Relations included in the Proposal and Contract for the project refer to expiration dates. Prevailing wage determinations with a single asterisk after the expiration date are in effect on the date of advertisement for bids and are good for the life of the contract. Prevailing wage determinations with double asterisks after the expiration date indicate that the wage rate to be paid for work performed after this date has been determined. If work is to extend past this date, the new rate shall be paid and incorporated in the contract. The Contractor shall contact the Department of Industrial Relations as indicted in the wage rate determination to obtain predetermine wage changes.

Pursuant to Section 1773.2 of the Labor Code, general prevailing wage rates included in the Proposal and Contract shall be posted by the Contractor at a prominent place at the site of the work.

Changes in general prevailing wage determination which conform to Labor Code Section 1773.6 and Title 8 California Code of Regulations Section 16204 shall apply to the project when issued by the Director of Industrial Relations at least 10 days prior to the date of the Notice to Contractor for the project. Changes, if any, to the general prevailing wage rates will be available from the department.

The prevailing wage rates to be posted at the job site will be furnished by the Department.

The City will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth in the contract. The possibility of wage increase is one of the elements to be considered by the Contractor in determining this bid, and will not under any circumstances be considered as the basis of a claim against the City on the contract.

GS7-101A(2)(a). <u>TRAVEL AND SUBSISTENCE PAYMENTS</u>--Attention is directed to the requirements of Section 1773.8 of the Labor Code. The Contractor shall make travel and subsistence payments to each workman, needed to execute the work, in accordance with the requirements of said Section 1773.8.

GS7-1.01A(3). PAYROLL RECORDS--The Contractor's attention is directed to the provisions of Labor Code Section 1776, a portion of which is quoted below. Regulations implementing said Section 1776 are located in Sections 16016 through 16019 and Sections 16207.10 through 16207.19 of Title 8, California Code of Regulations. The Contractor shall be responsible for compliance by his subcontractors.

(a) Each contractor and subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work.

(b) The payroll record enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis:

(i) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

(ii) A certified copy of all payroll record enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.

(iii) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or copies thereof made; provided, however, that a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not ben provided pursuant to paragraph (20), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.

(c) Each contractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.

(d) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be

marked or obliterated in such a manner as to prevent disclosure of an individual's name, address and social security number. The name and address of the contractor awarded the contract or performing the contract shall not be marked or obliterated.

(e) The contractor shall inform the body awarding the contract of the location of the records, enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

(f) In the event of noncompliance with the requirements of this section, the contractor shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects the contractor must comply with this section. Should noncompliance still be evident after the 10 day period, the contractor shall, as a penalty to the city or political subdivision on whole behalf the contract is made or awarded, forfeit twenty-five dollars ($25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due."

The penalties specified in subdivision (f) of Labor Code Section 1776 for noncompliance with the provisions of Section 1776 may be deducted from any moneys due or which may become due to the Contractor.

A copy of all payrolls shall be submitted weekly to the Engineer. Payrolls shall contain the full name, address and social security number of each employee, his correct classification, rate of pay, daily and weekly number of hours worked, itemized deductions made and actual wages paid. They shall also indicate apprentices and ratio of apprentices to journeymen. The employee's address and social security number need only appear on the first payroll on which his name appears. The payroll shall be accompanied by a "Statement of Compliance" signed by the employer or his agent indicating that the payrolls are correct and complete and that the wage rates contained therein are not less than those required by the contract. The "Statement of Compliance" shall be on forms furnished by the Department or on any form with identical wording. The Contractor shall be responsible for the submission of copies of payrolls of all subcontractors.

If by the 15th of the month, the Contractor has not submitted satisfactory payrolls for all work performed during the monthly period ending on or before the first of that month, the Department will retain an amount equal to 10 percent of the estimated value of the work performed (exclusive of Mobilization) during the month from the next monthly estimate, except that such retention shall not exceed $10,000 nor be less than $1,000. Retention for failure to submit satisfactory payrolls shall be additional to allow the retention provided for in the contract. The retention for failure to submit payrolls for any monthly period will be released for payment on the monthly estimate for partial payments next following the date that all the satisfactory payrolls for which the retention was made are submitted.

The Contractor and each subcontractor shall preserve their payroll records for a period of three years from the date of completion of the contract.

GS7-1.01A(4). LABOR NONDISCRIMINATION--Attention is directed to Section 1735 of the Labor Code, which reads as follows:

"No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical handicap, medical condition, marital status, or sex of such persons, except as provided in Section 12940 of the Government Code, and every contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter."

Attention is directed to the "Nondiscrimination Clause" that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations, incorporated herein by reference.

GS7-1.01A(5). APPRENTICES--It is City policy to encourage the employment and training of apprentices on public works contracts as may be permitted under local apprenticeship standards. Responsibility for compliance with this section lies with the Contractor.

GS7-1.01A(6). WORKERS' COMPENSATION--Pursuant to the requirements of Section 1860 of the Labor Code, the Contractor will be required to secure the payment of workers' compensation to his employees in accordance with the provisions of Section 3700 of the Labor Code.

Prior to the commencement of work, the Contractor shall sign and file with the Engineer a certification in the following form:

"I am aware of the provisions of Section 3700 of the Labor code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

Said certification is included in the contract, and signature and return of the contract is provided in Section GS3-1.03, "Execution of Contract," shall constitute signing and filing of the said certificate.

GS7-1.01A(7). SUITS TO RECOVER PENALTIES AND FORFEITURES--Attention is directed to Sections 1730 to 1733, inclusive, of the Labor Code concerning suits to recover amounts withheld from payment for failure to comply with requirements of the Labor Code or contract provisions based on such laws.

Said sections provide that a suit on the contract for alleged breach thereof in not making the payment is the exclusive remedy of the Contractor or his assignees with reference to amounts withheld for such penalties or forfeitures; and that such suit must be commenced and actual notice thereof received by the awarding authority prior to 90 days after completion of the contract and the formal acceptance of the job.

Submission of a claim under Section GS9-1.07B, "Final Payment and Claims," for the amounts withheld from payment for such penalties and forfeitures is not a prerequisite for such suits and such claims will not be considered.

GS7-1.01B. BLANK

GS7-1.01C. CONTRACTOR'S LICENSING LAWS--Attention is directed to the provisions of Chapter 9 of Division 3 of the Business and Professions Code concerning the licensing of contractors.

All bidders and contractors shall be licensed in accordance with the laws of this State and any bidder or contractor not so licensed is subject to the penalties imposed by such laws.

GS7-1.01D. VEHICLE CODE--Pursuant to the authority contained in Vehicle Code Section 591, the Department has determined that within such areas as are within the limits of the project and are open to public traffic, the Contractor shall comply with all the requirements set forth in Divisions 11,12,13,14 and 15 of the Vehicle Code.

Attention is directed to the statement in said Section 591 that this section shall not relieve him or any person from the duty of exercising due care. The Contractor shall take all necessary precautions for safe operation of his equipment and the protection of the public from injury and damage from such equipment.

Any other requirements set forth in Divisions 11, 12, 13, 14, and 15 of the Vehicle Code which the Department, pursuant to the authority contained in Vehicle Code Section 591, will require compliance with, will be set forth in the special provisions.

GS7-1.01E. TRENCH SAFETY--Attention is directed to the provisions of Section 6705 of the Labor Code concerning trench excavation safety plans.

GS7-101F. AIR POLLUTION CONTROL--The Contractor shall comply with all air pollution control rules, regulations, ordinances and statutes which apply to any work performed pursuant to the contract, including any air pollution control rules, regulations, ordinances and statutes.

GS7-1.01G. WATER POLLUTION--The Contractor shall exercise every reasonable precaution to protect streams, lakes, and reservoirs from pollution with fuels, oils, bitumens, calcium chloride and other harmful materials and shall conduct and schedule his operations so as to avoid or minimize muddying and silting of said streams, lakes, and reservoirs. Care shall be exercised to preserve roadside vegetation beyond the limits of construction.

In order to provide effective and continuous control of water pollution it may be necessary for the Contractor to perform the contract work in small or multiple units, on an out of phase schedule, and with modified construction procedures. The Contractor shall provide temporary water pollution control measures, including but not limited to, dikes, basins, ditches, and applying straw and seed,

which become necessary as a result of his operations. The Contractor shall coordinate water pollution control work with all other work done on the contract.

Before starting any work on the project, the Contractor shall submit, for acceptance by the Engineer, a program to control water pollution effectively during construction of the project. Such program shall show the schedule for the erosion control work included in the contract and for all water pollution control measures which the Contractor proposes to take in connection with construction of the project to minimize the effects of his operations upon adjacent streams and other bodies of water. The Contractor shall not perform any clearing and grubbing or earthwork on the project, other than that specifically authorized in writing by the Engineer, until such program has been accepted.

If the measures being taken by the Contractor are inadequate to control water pollution effectively, the Engineer may direct the Contractor to revise his operations and his water pollution control program. Such directs will be in writing and will specify the items of work for which the Contractor's water pollution control measures are inadequate. No further work shall be performed on said items until the water pollution control measures are adequate and, if also required, a revised water pollution control program has been accepted.

The Engineer will notify the Contractor of the acceptance or rejection of any submitted or revised water pollution control program in not more than five working days.

The City will not be liable to the Contractor for failure to accept all or any portion of an originally submitted or revised water pollution control program, nor for any delays to the work due to the Contractor's failure to submit an acceptable water pollution control program.

GS7-1.01H. USE OF PESTICIDES--The Contractor shall comply with all rules and regulations of the Department of Food and Agriculture, the Department of Health, the Department of Industrial Relations and all other agencies which govern the use of pesticides required in the performance of the work on the contract.

Pesticides shall include but shall not be limited to herbicides, insecticides, fungicides, rodenticides, germicides, nematocides, bactericides, inhibitors, fumigants, defoliants, desiccants, soil sterilants, and repellents.

Any substance or mixture of substances intended for preventing, repelling, mitigating, or destroying weeds, insects, diseases, rodents, or nematodes and any substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant shall be considered a pesticide.

GS7-1.01I. SOUND CONTROL REQUIREMENTS--The Contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract.

Each internal combustion engine, used for any purpose on the job or related to the job, shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the project without said muffler.

GS7-1.01J. BLANK

GS7-1.02. BLANK

GS7-1.03. PAYMENT OF TAXES--The contract prices paid for the work shall include full compensation for all taxes which the Contractor is required to pay, whether imposed by Federal, State or local government, including, without being limited to, Federal excise tax. No tax exemption certificate nor any document designed to exempt the Contractor from payment of any tax will be furnished to the Contractor by the Department, as to any tax on labor, services, materials, transportation, or any other items furnished pursuant to the contract.

GS7-1.04. PERMITS AND LICENSES--The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work.

The Environmental Quality Act (Public Resources Code, Sections 21000 to 21176, inclusive) may be applicable to permits, licenses and other authorizations which the Contractor must obtain from local agencies in connection with performing the work of the contract. The Contractor shall comply with the provisions of said statues in obtaining such permits, licenses and other authorizations and they shall be obtained in sufficient time to prevent delays to the work.

In the event that the Department has obtained permits, licenses or other authorizations, applicable to the work, in conformance with the requirements in said Environmental Quality Act, the Contractor shall comply with the provisions of said permits, licenses and other authorizations.

GS7-1.04.1. CITY OF ROCKLIN PERMITS--The Contractor for the City of Rocklin need not obtain a separate encroachment permit from the City prior to construction within street rights of way or other City rights of way. Execution of the contract by the City shall be deemed and encroachment permit for work required by the contract within rights of way. All work shall conform to the rules and regulations of encroachment permits and shall be subject to the inspection and approval of the Director of the City of Rocklin Public Works Department.

GS7-1.04.2. CITY OF ROCKLIN BUSINESS LICENSE--THE CONTRACTOR SHALL OBTAIN a business license from the City prior to commencing work.

GS7-1.04.3. PERMIT FOR TRENCHING OR EXCAVATION--For trenches or excavation 5 FT or deeper, the Contractor shall obtain from the Division of Industrial Safety, a permit authorizing such construction.

GS7-1.04.4. OTHER PERMITS--The Contractor shall bear the responsibility for obtaining any necessary permits which the City is not specifically mentioned as obtaining.

GS7-1.05. PATENTS--The Contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work, and agrees to

indemnify and save harmless the City of Rocklin, the Director, the Engineer, and their duly authorized representatives, from all suits at law, or actions of every nature for, or on account of the use of any patented materials, equipment, devices, or processes.

GS7-1.06. SAFETY AND HEALTH PROVISIONS--The Contractor shall conform to all applicable occupational safety and health standards, rules, regulations and orders established by the Federal Government and State of California, and all applicable codes, ordinances and standards of the City of Rocklin.

All working areas utilized by the Contractor to perform work during the hours of darkness, shall be lighted to conform to the minimum illumination intensities established by California Division of Occupational Safety and Health Construction Safety Orders. All lighting fixtures shall be mounted and directed in a manner precluding glare to approaching traffic.

The Contractor including all subcontractors shall conform to the following:

A. Evidence of a written and effective Injury and Illness Prevention Program that includes procedures and active practice must be submitted to the City for review.

B. Provide written documentation to the Public Works Department prior to construction on hazardous or potential hazardous conditions or situations at the project site and in the plans, specifications or special provisions.

Full compensation for conforming to the requirements of this section shall be considered as included in the contract prices paid for the various items of work involved and no separate payment will be made therefor.

GS7-1.07. PROJECT APPEARANCE--The Contractor shall maintain a neat appearance to the work. In any area visible to the public, the following shall apply:

When practicable, broken concrete and debris developed during clearing and grubbing shall be disposed of concurrently with its removal. If stockpiling is necessary, the material shall be removed or disposed of weekly.

The Contractor shall furnish trash bins for all debris from structure construction. All debris shall be placed in trash bins daily. Forms or falsework that are to be reused shall be stacked neatly concurrently with their removal. Forms and falsework that are not to be reused shall be disposed of concurrently with their removal.

Full compensation for confirming to the provisions in this section, not otherwise provided for, shall be considered as included in price paid for the various contract items of work involved, and no additional compensation will be allowed therefore.

GS7-1.08. PUBLIC CONVENIENCE--This Section GS7-1.08 defines the Contractor's responsibility with regard to convenience of the public and public traffic in connection with his operations.

Attention is directed to Section GS4-1.04, "Public Safety," for provisions relating to the Contractor's responsibility for the safety of the public. The requirements in said Section GS7-1.09 are in addition to the requirements of this Section GS7-1.08 and the Contractor will not be relieved of his responsibilities as set forth in said Section GS7-1.09 by reason of his conformance with any of the provisions in this Section GS7-1.08.

Attention is directed to Caltrans State Standard Specification Section 12, "Construction Area Traffic Control Devices," for requirements concerning flagging and traffic handling equipment and devices used in carrying out the provisions of this Section GS7-1.08 and said Section GS7-1.09.

In the event of a suspension of the work, attention is directed to Section GS8-1.05, "Temporary Suspension of Work."

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

Unless otherwise provided in the special provisions, all public traffic shall be permitted to pass through the work with as little inconvenience and delay as possible. Where possible, such traffic shall be routed on new or existing paved surfaces.

Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately by the Contractor at his expense.

Existing traffic signals, and highway lighting shall be kept in operation for the benefit of the traveling public during progress of the work, and other forces will continue routine maintenance of existing systems.

Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners.

Convenient access, including handicap access to driveways, houses, businesses, and buildings along the line of the work shall be maintained and temporary approaches to crossing or intersecting highways shall be provided and kept in good condition. When the abutting property owner's access across the right of way line is to be eliminated, or to be replaced under the contract by other access facilities, the existing access shall not be closed until the replacement access facilities are usable.

The Contractor may be required to cover certain signs which regulate or direct public traffic to roadways that are not open to traffic. The Engineer will determine which signs shall be covered.

Roadway excavation and the construction of embankments shall be conducted in such manner as to provide a reasonably smooth and even surface satisfactory for use by public traffic at all times;

sufficient fill at culverts and bridges to permit traffic to cross shall be placed in advance of other grading operations; and if ordered by the Engineer roadway cuts shall be excavated in lifts and embankments constructed part width at a time, construction being alternated from one side to the other and traffic routed over the side opposite the one under construction. Culvert installation or culvert construction shall be conducted on but one-half the width of the traveled way at a time and that portion of the traveled way being used by public traffic shall be kept open and unobstructed until the opposite side of the traveled way is ready for use by traffic.

Upon completion of rough grading at the grading plane, or placing any subsequent layer thereon, the surface of the roadbed shall be brought to a smooth, even condition free of humps and depressions, satisfactory for the use of public traffic.

After the surface of the roadbed has been brought to a smooth and even condition for the passage of public traffic as above provided, any work ordered by the Engineer for the accommodation of public traffic prior to commencing subgrade operations will be paid for as extra work and provided in Section GS4-1.03D. After subgrade preparation for a specified layer of material has been completed, the Contractor shall, at his expense, repair any damage to the roadbed or completed subgrade, including damage caused by his operations or use by public traffic.

While subgrade and paving operations are underway, public traffic shall be permitted to use the shoulders and, if half-width paving methods are used, shall also be permitted to use the side of the roadbed opposite the one under construction. When sufficient width is available, a passageway wide enough to accommodate at least two lanes of traffic shall be kept open at locations where subgrade and paving operations are in active progress.

When ordered by the Engineer, the Contractor shall furnish a pilot car and driver and flaggers for the purpose of expediting the passage of public traffic through the work under one-way controls, and the cost thereof will be paid for as extra work as provided in Section GS4-1.03D, except that the cost of flaggers furnished for this purpose will be paid for as provided in Section 12 of the State Specifications. At locations where traffic is being routed through construction under one-way controls and when ordered by the Engineer, the movement of the Contractor's equipment from one portion of the work to another shall be governed in accordance with such one-way controls.

Water or dust palliative shall be applied if ordered by the Engineer for the alleviation or prevention of dust nuisance as provided in Section GS10, "Dust Control."

A. "In order to expedite the passage of public traffic through or around the work, the contractor shall install signs, lights, flares, temporary railing (type K), barricades, and other facilities for the sole convenience and direction of public traffic as may be required. Also, as may be required, the contractor shall furnish competent flagmen whose sole duties shall consist of directing the movement of public traffic through or around the work. The cost of furnishing and installing such signs, lights, flares, temporary railing (Type K), barricades, flagmen, and other facilities shall be included in the lump sum paid for traffic control and no additional compensation will be allowed therefor."

B. "In addition to the requirements previously specified for furnishing facilities and flagmen to expedite the safe passage of the public through or around the work, the contractor shall at his expense furnish and erect within or adjacent to the work such warning, regulatory, or guide signs, markers, or devices as are necessary."

The Contractor will be required to pay the cost of replacing or repairing all facilities installed under extra work for the convenience or direction or warning of public traffic that are lost while in his custody, or are damaged by reason of his operations to such an extent as to require replacement or repair, and deductions from any moneys due or to become due the Contractor will be made to cover such costs.

Whenever a section of surfacing, pavement, or the deck of a structure has been completed, the Contractor shall open it to use by public traffic if the Engineer so orders or may open it to use by public traffic if the Engineer so consents. In either case the Contractor will not be allowed any compensation due to any delay, hindrance, or inconvenience to his operations caused by such public traffic, but will thereupon be relieved of responsibility for damage to completed permanent facilities caused by public traffic, within the limits of such use. The Contractor will not be relieved of any other responsibility under the contract nor will he be relieved of cleanup and finishing operations.

Except as otherwise provided in this Section GS7-1.08 or in the special provisions, full compensation for conforming to the requirements in this Section GS7-1.08 and in the special provisions shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

C. "In addition to the requirements hereinbefore specified for furnishing facilities and flagmen for expediting the passage of public traffic through or around the work, the contractor shall furnish and erect, within or adjacent to the limits of the contract, such warning, regulatory, and guide signs as may be required. The contractor shall furnish, install and remove all such signs. Payment for furnishing, installing and removing all such signs shall be included in the lump sum price paid for traffic control and no additional compensation will be allowed therefor."

GS7-1.09. PUBLIC SAFETY--It is the Contractor's responsibility to provide for the safety of traffic and the public during construction. Attention is directed to Section GS7-1.12, "Responsibility for Damage."

Attention is directed to Section GS7-1.08, "Public Convenience," for the provisions relating to the Contractor's responsibility for providing for the convenience of the public in connection with his operations.

Attention is directed to Caltrans State Specification Section 12, "Construction Area Traffic Control Devices," for requirements concerning flagging and traffic handling equipment and devices used in carrying out the provisions of said Section GS7-1.08 and this Section GS7-1.09.

Whenever the Contractor's operations create a condition hazardous to traffic or to the public, he shall, at his expense and without cost to the City, furnish, erect and maintain such fences, temporary

railing (Type K), barricades, lights, signs and other devices and take such other protective measures as are necessary to prevent accidents or damage or injury to the public.

Such fences, temporary railing (Type K), barricades, lights, signs, and other devices furnished, erected and maintained by the Contractor, at his expense, are in addition to any construction area traffic control devices for which payment is provided for elsewhere in the specifications.

The Contractor shall also furnish such flaggers as are necessary to give adequate warning to traffic or to the public of any dangerous conditions to be encountered and payment therefor will be made as provided in Caltrans State Specification Section 12-2.02, "Flagging Costs."

Signs, lights, flags, and other warning and safety devices and their use shall conform to the requirements set forth in the current Manual of Traffic Controls. Signs or other protective devices furnished and erected by the Contractor at his expense, as above provided, shall not obscure the visibility of, nor conflict in intent, meaning and function of either existing signs, lights and traffic control devices or any construction area signs and traffic control devices for which furnishing of, or payment for, is provided elsewhere in the specifications. Signs furnished and erected by the Contractor at his expense shall be approved by the Engineer as to size, wording and location.

The installation of general roadway illumination shall not relieve the Contractor of his responsibility for furnishing and maintaining any of the protective facilities hereinbefore specified.

Construction equipment shall enter and leave the highway via existing ramps and crossovers and shall move in the direction of public traffic. All movements of workmen and construction equipment on or across lanes open to public traffic shall be performed in a manner that will not endanger public traffic.

The Contractor's trucks or other mobile equipment which leave a freeway lane, that is open to public traffic, to enter the construction area, shall slow down gradually in advance of the location of the turnoff to give following public traffic an opportunity to slow down.

When leaving a work area and entering a roadway carrying public traffic, the Contractor's equipment, whether empty or loaded, shall in all cases yield to public traffic.

Lanes, ramps, and shoulders shall be closed in accordance with the details shown on the plans, the provisions of Caltrans State Specification Section 12, "Construction Area Traffic Control Devices," and as provided in the special provisions.

Pedestrian openings through falsework shall be paved or provided with full width continuous wood walks and shall be kept clear. Pedestrians shall be protected from falling objects and curing water for concrete. Overhead protection for pedestrians shall extend not less than 4 FT beyond the edge of the bridge deck. All pedestrian openings through falsework shall be illuminated.

The Contractor shall notify the Engineer not less than 15 days before the anticipated start of each falsework and girder erection operation whenever such falsework or girders will reduce clearances available to public traffic.

Pedestrian openings through falsework shall be paved or provided with full width continuous wood walks and shall be kept clear. Pedestrians shall be protected from falling objects and curing water for concrete. Overhead protection for pedestrians shall extend not less than 4 feet beyond the edge of the bridge deck. All pedestrian openings through falsework shall be illuminated in accordance with the provisions in Section 86 of the State Specifications.

Where the height of vehicular openings through falsework is less than 15 FT, a W34B "Vertical Clearance" sign shall be provided above each opening facing approaching traffic. The signs shall have black letters and numbers on an orange reflectorized background and shall be illuminated so that said signs are clearly visible. The minimum height of the letters and numbers shall be 6 in. and 10 in., respectively.

No material or equipment shall be stored where it will interfere with the free and safe passage of public traffic, and at the end of each day's work and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructions from that portion of the roadway open for use by public traffic.

Temporary facilities which the Contractor uses to perform the work shall not be installed or placed where they will interfere with the free and safe passage of public traffic.

Temporary facilities which could be a hazard to public safety if improperly designed shall comply with design requirements specified in the contract for such facilities or, if none are specified, with standard design criteria or codes appropriate for the facility involved. Working drawings and design calculations for such temporary facilities shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California and shall be submitted to the Engineer for approval pursuant to Section GS5-1.02, "Plans and Working Drawings." Such submittals shall designate thereon the standard design criteria or codes used. Installation of such temporary facilities shall not start until the Engineer has reviewed and approved the drawings.

Should the Contractor appear to be neglectful or negligent in furnishing warning devices and taking protective measures as above provided, the Engineer may direct attention to the existence of a hazard and the necessary warning devices shall be furnished and installed and protective measures taken by the Contractor at his expense. Should the Engineer point out the inadequacy of warning devices and protective measures, such action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety or abrogate his obligation to furnish and pay for these devices and measures.

Provision for the payment for signs, lights, flares, temporary railing (Type K), barricades, and other facilities by extra work as provided in Section GS7-1.08, "Public Convenience," or by contract item as provided in Caltrans State Specification Section 12, "Construction Area Traffic Control Devices," shall in nowise relieve the Contractor from his responsibility as provided in this Section GS7-1.09.

Except as otherwise provided in this Section GS7-1.09 or in the special provisions, full compensation for conforming to all of the provisions in this Section GS7-1.09 and in the special

provisions shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

GS7-1.10. USE OF EXPLOSIVES--When the use of explosives is permitted by the City Engineer, the Contractor shall exercise the utmost care not to endanger life or property. A blasting permit shall be obtained from the Police Department.

In advance of doing any blasting work within 200 FT of any structure, the Contractor shall notify the owner of the location, date, time, and approximate duration of such blasting operations.

GS7-1.11. PRESERVATION OF PROPERTY--Attention is directed to Section GS7-1.12, "Responsibility for Damage," and to Section GS8-1.10, "Utility and 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, pipelines 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 a 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 moneys due or to become due to the Contractor under the contract.

The fact that any underground facility is not shown upon the plans shall not relieve the Contractor of his responsibility under Section GS8-1.10, "Utility and Non-Highway Facilities." It shall be the Contractor's responsibility, pursuant thereto, to ascertain the location of such underground improvements or facilities which may be subject to damage by reason of his operations.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work, involved in protecting or repairing property as specified in this Section GS7-1.11, shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

GS7-1.12. RESPONSIBILITY FOR DAMAGE--The City of Rocklin and its officers, agents, and employees, including but not limited to the Director and the Director, shall not be answerable or accountable in any manner: for any loss or damage that may happen to the work or any part thereof; for any loss or damage to any of the materials or any things used or employed in performing the work; for injury to or death of any person, either workers or the public; or for

damage to property from any cause which might have been prevented by the Contractor, or his workers, or anyone employed by the Contractor or his subcontractors.

The Contractor shall be responsible for all liability imposed by law and for injuries to, or death of, any person including, but not limited to, workers and the public, or damage to property resulting from defects or obstructions, or from any cause whatsoever during the progress of the work or at any time before its completion and final acceptance.

The Contractor shall defend (through counsel acceptable to the City), indemnify, and save harmless the City of Rocklin and its officers, agents, and employees from all claims, suits, or actions of every name, kind, and description, brought forth, or on account of, injuries to or death of any person including, but not limited to, workers and the public, or damage to property resulting from the performance of the contract, except as otherwise provided by statute.

The duty of the Contractor to defend, indemnify, and save harmless includes, but is not limited to, the duties to defend as set forth in Section 2778 of the Civil Code.

The Contractor waives any and all rights to any type of express or implied indemnity against the City, its officers, agents, or employees.

It is the intent of the parties that the Contractor will defend, indemnify, and hold harmless the City of Rocklin, its officers, agents and employees from any and all claims, suits, or actions as set forth above regardless of existence or degree of fault or negligence, whether active or passive, primary, or secondary, on the part of the City, the Contractor, the subcontractor or employee of any of these; except that such duty does not apply where the injury or damage is due to the sole negligence of the City.

In addition to any remedy authorized by law, so much of the money due the Contractor under and by virtue of the contract as shall be considered necessary by the City may be retained by the City until disposition has been made of such suits or claims for damages.

The retention of money due the Contractor shall be subject to the following:

A. The City will give the Contractor 30 days notice of its intention to retain funds from any partial payment which may become due to the Contractor prior to acceptance of the contract. Retention of funds from any payment made after acceptance of the contract may be made without such prior notice to the Contractor.

B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section GS9-1.06, "Partial Payments."

C. If the City had retained funds and it is subsequently determined that the City is not entitled to be indemnified and saved harmless by the Contractor in connection with the matter for which such retention was made, the City shall be liable for interest on the amount retained at the legal rate of interest for the period of such retention.

GS7-1.12.1. INSURANCE COVERAGE

A. **Insurance Requirements for Contractors**:

Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors.

Minimum Scope of Insurance

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (occurrence form CG 0001).

2. Insurance Services Office form number CA 0001 (Ed. 1/87) covering Automobile Liability, code 1 (any auto).

3. Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

Minimum Limits of Insurance

Contractor shall maintain limits no less than:

1. General Liability: $1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

2. Automobile Liability: $1,000,000 per accident for bodily injury and property damage.

3. Employer's Liability: $1,000,000 per accident for bodily injury or disease.

Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the Entity. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Entity, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

Other Insurance Provisions

The general liability and automobile policies are to contain, or be endorsed to contain, the following provisions:

1. The Entity, its officers, officials, employees, agents and volunteers are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Entity, its officers, officials, employees, agents or volunteers.

2. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the Entity, its officers, officials, employees, agents and volunteers. Any insurance or self-insurance maintained by the Entity, its officers, officials, employees, agents or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

3. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the Entity, its officers, officials, employees, agents or volunteers.

4. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

5. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, cancelled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice be certified mail, return receipt requested, has been given to the Entity.

Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII.

Verification of Coverage

Contractor shall furnish the Entity with original endorsements effecting coverage required by this clause. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. The endorsements are to be on forms provided by the Entity. All endorsements are to be received and approved by the Entity before work commences. As an alternative to the Entity's forms, the Contractor's insurer may provide complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by these specifications.

Subcontractors

Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractor shall be subject to all of the requirements stated herein.

B. **Insurance Requirements for Contractors (with Construction Risks)**:

Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors.

Minimum Scope of Insurance

Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (occurrence form CG 0001).

2. Insurance Services Office form number CA 0001 (Ed. 1/87) covering Automobile Liability, code 1 (any auto).

3. Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

4. Course of Construction insurance form providing coverage for "all risks" of loss.

Minimum Limits of Insurance

Contractor shall maintain limits no less than:

1. General Liability: $1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

2. Automobile Liability: $1,000,000 per accident for bodily injury and property damage.

3. Employer's Liability: $1,000,000 per accident for bodily injury or disease.

4. Course of Construction: Completed value of the project.

Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the Entity. At the option of the Entity, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Entity, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

Other Insurance Provisions

The general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

1. The Entity, its officers, officials, employees, agents and volunteers are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, occupied or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Entity, its officers, officials, employees, agents or volunteers.

2. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the Entity, its officers, officials, employees, agents or volunteers. Any insurance or self-insurance maintained by the Entity, its officers, officials, employees, agents or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.

3. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the Entity, it officers, officials, employees, agents or volunteers.

4. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

5. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, cancelled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to the Entity.

Course of construction policies shall contain the following provisions:

1. Entity shall be named as loss payee.

2. The insurer shall waive all rights of subrogation against entity.

Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII.

Verification of Coverage

Contractor shall furnish the Entity with original endorsements effecting coverage required by this clause. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. The endorsements are to be on forms provided by the Entity. All endorsements are to be received and approved by the Entity before work commences. As an alternative to the Entity's forms, the Contractor's insurer may provided complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by these specifications.

Subcontractors

Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

NOTE: THE CITY RESERVES THE RIGHT TO WITHHOLD ANY PROGRESS PAYMENTS TO THE CONTRACTOR IN THE EVENT OF NONCOMPLIANCE WITH ANY INSURANCE REQUIREMENTS.

GS7-1.125 LEGAL ACTIONS AGAINST THE DEPARTMENT--In the event litigation is brought against the Department concerning compliance by the Department with City, State or Federal laws, rules or regulations applicable to highway work, the provisions of this Section GS7-1.125 shall apply.

A. If, pursuant to court order, the Department prohibits the Contractor from performing all or any portion of the work, the delay will be considered a right of way delay within the meaning of Section GS8-1.09, "Right of Way Delays," unless the contract is terminated as hereinafter provided.

B. If, pursuant to court order (other than an order to show cause) the Department is prohibited from requiring the Contractor to perform all or any portion of the work, the Department may, if it so elects, eliminate the enjoined work pursuant to Section GS4-1.03, "Changes," or terminate the contract.

C. If the final judgement in the action prohibits the Department from requiring the Contractor to perform all or any portion of the work, the Department will either eliminate the enjoined work pursuant to Section GS4-1.03, "Changes," or terminate the contract.

D. If the contract is to be terminated, the termination and the determination of the total compensation payable to the Contractor shall be governed by the provisions of Section GS8-1.11, "Termination of Contract."

GS7-1.13. DISPOSAL OF MATERIAL OUTSIDE THE HIGHWAY RIGHT OF WAY--If the Contractor elects to dispose of materials at locations other than those where arrangements have been made by the Department, or, if material is to be disposed of and the Department has not made arrangements for disposal of such material, the Contractor shall make his own arrangements for disposing of materials outside the highway right of way and he shall pay all costs involved. Arrangements shall include, but not be limited to, entering into agreements with property owners and obtaining necessary permits, licenses and environmental clearances. Before disposing of any material outside the highway rights of way, the Contractor shall furnish to the Engineer satisfactory evidence that he has entered into agreements with the property owners of the site involved and has obtained said permits, licenses and clearances.

When any material is to be disposed of outside the highway right of way, and the Department has not made arrangements for disposal of such material, the Contractor shall first obtain written authorization from the property owner on whose property the disposal is to be made and he shall file with the Engineer said authorization or a certified copy thereof together with a written release from the property owner absolving the City from any and all responsibility in connection with the disposal of material on said property, and before any material is disposed of on said property, the Contractor shall obtain written permission from the Engineer to dispose of the material at the location designated in said authorization.

When material is disposed of as above provided and the disposal location is visible from a highway, the Contractor shall dispose of the material in a neat and uniform manner to the satisfaction of the Engineer.

Where the Department has made arrangements with owners of land in the vicinity of a project for the disposal of materials on an owner's property, such arrangements are made solely for the purpose of providing all bidders an equal opportunity to dispose of said materials on such property. Bidders or Contractors may, upon written request, inspect the documents evidencing such arrangements between property owners and the Department. The Contractor may, if he so elects, exercise any rights that have been obtained, which may be exercised by a Contractor under such arrangements, subject to and upon the conditions hereinafter set forth.

Such arrangements are not a part of the contract and it is expressly understood and agreed that the Department assumes no responsibility to the bidder or Contractor whatsoever in respect to the arrangements made with the property owner to dispose of materials thereon and that the Contractor shall assume all risks in connection with the use of such property, the terms upon which such use shall be made, and there is not warranty or guaranty, either express or implied, as to the quantity or types of materials that can be disposed of on such property.

In those instances in which the Department has compiled "Materials Information" as referred to in Section GS2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," said compilation will include the documents setting forth the arrangement made with some of the

property owners for the disposal of material on such owner's properties. The inclusion of such documents therein shall not in any respect operate as a waiver of any of the provisions in this Section GS7-1.13 concerning said documents.

The bidder or Contractor is cautioned to make such independent investigation and examination as he deems necessary to satisfy himself as to the quantity and types of materials which may be disposed of on such property and the rights, duties and obligations acquired or undertaken under such arrangement with the property owner.

Notwithstanding that the Contractor may elect to dispose of materials on any such property owner's property, no material may be disposed of on such property unless the Contractor has first either:

1. Executed a document that will guarantee to hold such owner harmless from all claims for injury to persons or damage to property resulting from the Contractor's operations on the property owner's premises and also agree to conform to all other provisions set forth in the arrangement made between the Department and the property owner. Said document will be prepared by the Engineer for execution by the Contractor, or

2. Entered into an agreement with the owner of the disposal site on any term mutually agreeable to the owner and the Contractor; provided that the Contractor shall furnish to the Engineer a release, in a form satisfactory to the Engineer, executed by the owner, relieving the Department of any and all obligations under the Department's arrangement with the owner.

If the Contractor elects to dispose of material under 1), the use of such site shall be subject to the terms, conditions and limitations of the arrangement made between the property owner and the Department and the Contractor shall pay such charges as are provided for in the arrangement made by the Department with the property owner, and deductions will be made from any moneys due or that may become due the Contractor under the contract sufficient to cover the charges for such material disposed of.

If the Contractor elects to dispose of material under 2), he shall pay such charges as are provided for in the agreement between the owner and the Contractor and deductions will not be made from any moneys due or that may become due the Contractor under the contract to cover such charges.

Before acceptance of the contract, the Engineer may require the Contractor to submit written evidence that the owner of the disposal site is satisfied that the Contractor has satisfactorily complied with the provisions of either - 1), the arrangement between the Department and the owner, or 2), the agreement between the owner and the Contractor, as the case may be.

Full compensation for all costs involved in disposing of materials as specified in this Section GS7-1.13, including all costs of hauling, shall be considered as included in the price paid for the contract item of work involving such materials and no additional compensation will be allowed therefor.

GS7-1.14. COOPERATION--Should construction be under way by other forces or by other contractors within or adjacent to the limits of the work specified or should work of any other nature

be under way by other forces within or adjacent to said limits, the Contractor shall cooperate with all such other contractors or other forces to the end that any delay or hindrance to their work will be avoided. The right is reserved to perform other or additional work at or near the site (including material sources) at any time, by the use of other forces.

When two or more contractors are employed on related or adjacent work, or obtain materials from the same material source, as provided in Section GS6-2.02, "Possible Local Material Sources," or Section GS6-2.03, "Mandatory Local Material Sources," each shall conduct his operations in such a manner as not to cause any unnecessary delay or hindrance to the other.

Each contractor shall be responsible to the other for all damage to work, to persons or property caused to the other by his operations, and for loss caused the other due to his unnecessary delays or failure to finish the work within the time specified for completion.

GS7-1.15. BLANK

GS7-1.16. CONTRACTOR'S RESPONSIBILITY FOR THE WORK AND MATERIALS--Until the acceptance of the contract, the Contractor shall have the charge and care of the work and of the materials to be used herein (including materials for which he has received partial payment as provided in Section GS9-1.06, "Partial Payments," or materials which have been furnished by the City and shall bear the risk of injury, loss, or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work, except as provided in Sections GS7-1.08, "Public Convenience". The Contractor shall rebuild, repair, restore, and make good all injuries, losses, or damages to any portion of the work or the materials occasioned by any cause before its completion and acceptance and shall bear the expense thereof, except as otherwise expressly provided in Section GS7-1.165, "Damage by Storm, Flood, or Earthquake," and except for such injuries, losses, or damages as are directly and proximately caused by acts of the Federal Government or the public enemy. Where necessary to protect the work or materials from damage, the Contractor shall, at his expense, provide suitable drainage of the roadway and erect such temporary structures as are necessary to protect the work or materials from damage. The suspension of the work from any cause whatever shall not relieve the Contractor of his responsibility for the work and materials as herein specified. If ordered by the Engineer, the Contractor shall, at his expense, properly store materials which have been partially paid for by the City or which have been furnished by the City. Such storage by the Contractor shall be on behalf of the City and the City shall at all times be entitled to the possession of such materials, and the Contractor shall promptly return the same to the site of the work when requested. The Contractor shall not dispose of any of the materials so stored except on written authorization from the Engineer.

GS7-1.165. DAMAGE BY STORM, FLOOD, OR EARTH QUAKE--Included herein from the State Specifications by reference.

GS7-1.17. ACCEPTANCE OF CONTRACT IMPROVEMENTS--When the Engineer has made the final inspection as provided in Section GS5-1.13, of the General Specifications, "Final Inspection", and determines that the contract work has been completed in all respects in accordance with the plans and specifications, he will recommend that the Rocklin City Council formally accept

the contract improvements, and immediately upon and after such acceptance by the City, the Contractor will be responsible for the work done for a period of one year, or as specified per the contract.

GS7-1.18. PROPERTY RIGHTS IN MATERIALS--Nothing in the contract shall be construed as vesting in the Contractor any right of property in the materials used after they have been attached or affixed to the work or soil or after partial payment has been made as provided in Section GS9-1.06, "Partial Payments," for material delivered on the ground or stored subject to or under the control of the City and unused. All such material shall become the property of the City of Rocklin upon being so attached or affixed or upon payment for materials delivered on the ground or stored subject to or under the control of the City and unused, as provided in said Section GS9-1.06.

GS7-1.19. RIGHTS IN LAND AND IMPROVEMENTS--Nothing in these specifications shall be construed as allowing the Contractor to make any arrangements with any person to permit occupancy or use of any land, structure, or building within the limits of the contract for any purpose whatsoever, either with or without compensation, in conflict with any agreement between the City and any owner, former owner, or tenant of such land, structure, or building.

The Contractor shall not occupy City owned property outside the right of way as shown on the plans or maps available in the office of the district in which the work is situated, unless he enters into a rental agreement with the Department. The agreement will be based on the fair rental values.

GS7-1.20. PERSONAL LIABILITY--Neither the Director, the Engineer nor any other officer or authorized employee of the City of Rocklin nor any officer or employee of any county, city or district shall be personally responsible for any liability arising under or by virtue of the contract.

GS7-1.21. REPAIR OF EQUIPMENT--The work of installing, assembling, repairing or reconditioning, or other work of any nature on machinery, equipment, or tools used in or upon the work shall be considered a part of the work to be performed under the contract and any laborers, workmen, or mechanics working on such machinery, equipment, or tools, unless employed by bona fide commercial repair shops, garages, blacksmith shops, or machine shops, which have been established and operating on a commercial basis for a period of at least two months prior to the award of the contract, shall be subject to all the requirements relating to labor set forth in these specifications and in the special provisions.

GS7-1.22. MATERIAL PLANTS--The construction, erection, and operation of material production, proportioning, or mixing plants from which material is used wholly on the contract or on contracts under the supervision of the Department shall be considered a part of the work to be performed under the contract and any laborers, workmen, or mechanics working on such plants shall be subject to all of the requirements relating to labor set forth in these specifications and in the special provisions.

GS-8. PROSECUTION AND PROGRESS

GS8-1.01. SUBCONTRACTING--The Contractor shall give his personal attention to the fulfillment of the contract and shall keep the work under his control.

No subcontractor will be recognized as such, and all persons engaged in the work of construction will be considered as employees of the Contractor and he will be held responsible for their work, which shall be subject to the provisions of the contract and specifications.

The Contractor shall perform with his own organization contract work amounting to not less than 50 percent of the original total contract price, except that any designated "Specialty Items" may be performed by subcontract and the amount of any such "Specialty Items" so performed may be deducted from the original total contract price before computing the amount of work required to be performed by the Contractor with his own organization. When items of work in the Engineer's Estimate are preceded by the letter (S), said items are designated "Specialty Items." Where an entire item is subcontracted, the value of work subcontracted will be based on the contract item bid price. When a portion of an item is subcontracted, the value of work subcontracted will be based on the estimated percentage of the contract item bid price, determined from information submitted by the Contractor, subject to approval by the Engineer.

Subcontracts shall include provisions that the contract between the City and the Contractor is part of the subcontract, and that all terms and provisions of said contract are incorporated in the subcontract. Subcontracts shall also contain certification by the subcontractor that said subcontractor is experienced in and qualified to do, and knowledgeable about, the subcontracted work. Copies of subcontracts shall be available to the Engineer upon written request, and shall be provided to the Engineer at the time any litigation against the City concerning the project is filed.

Before work is started on a subcontract, the Contractor shall file with the Engineer a written statement showing the work to be subcontracted, the names of the subcontractors and the description of each portion of the work to be so subcontracted.

When a portion of the work which has been subcontracted by the Contractor is not being prosecuted in a manner satisfactory to the Department, the subcontractor shall be removed immediately on the requisition of the Engineer and shall not again be employed on the work.

The roadside production of materials produced by other than the Contractor's forces shall be considered as subcontracted. Roadside production of materials shall be construed to be production of aggregates of all kinds with portable, semiportable or temporary crushing or screening, proportioning, and mixing plants established or reopened for the purpose of supplying aggregate or material for a particular project or projects. The erection, establishment, or reopening of such plants and the operation thereof in the production of said materials for use on the work shall conform to the requirements relating to labor set forth in these specifications and in the special provisions.

GS8-1.02. ASSIGNMENT--The performance of the contract may not be assigned, except upon the written consent of the Engineer. Consent will not be given to any proposed assignment which would relieve the original Contractor or his surety of their responsibilities under the contract nor will the Engineer consent to any assignment of a part of the work under the contract.

The Contractor may assign moneys due or to become due him under the contract and such assignment will be recognized by the Department, if given proper notice thereof, to the extent permitted by law, but any alignment of moneys shall be subject to all proper set-offs in favor of the Department and to all deductions provided for in the contract and particularly all money withheld, whether assigned or not, shall be subject to being used by the Department for the completion of the work in the event that the Contractor should be in default therein.

GS8-1.03. BEGINNING OF WORK--The Contractor shall begin work within 15 days after issuance of a "Notice to Proceed" by the Engineer, and the Contractor shall thereafter diligently prosecute the work to completion.

The Contractor shall notify the Engineer, in writing, of his intent to commence work at least 72 hours before work is begun. The notice shall specify the date on which the Contractor intends to begin work. If a project has more than one location of work, a separate notice shall be given for each location.

Should the Contractor begin work in advance of issuance a "Notice to Proceed," any work performed in advance of such issuance shall be considered to have been done by him at his own risk and as a volunteer.

GS8-1.04. PROGRESS SCHEDULE--When required by the special provisions, the Contractor shall submit to the Engineer a practicable progress schedule within 20 working days of approval of the contract, and within 10 working days of the Engineer's written request at any other time.

The Contractor may furnish the schedule on a form of his choice or, if requested, the Engineer will furnish a form for the Contractor's use. If the Engineer furnishes a form, he will also furnish to the Contractor, on request, on or before the last day of each month a copy of the form showing the status of work actually completed during the preceding estimate period.

The schedule shall show the order in which the Contractor proposes to carry out the work, the dates on which he will start the several salient features of the work (including procurement of materials, plant, and equipment), and the contemplated dates for completing the said salient features.

The progress schedules submitted shall be consistent in all respects with the time and order of work requirements of the contract.

Subsequent to the time that submittal of a progress schedule is required in accordance with these specifications, no progress payments will be made for any work until a satisfactory schedule has been submitted to the Engineer.

GS8-1.05. TEMPORARY SUSPENSION OF WORK--The Engineer shall have the authority to suspend the work wholly or in part, for such period as he may deem necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the satiable prosecution of the work, or for such time as he may deem necessary due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the contract. The Contractor shall immediately comply with the written order of the Engineer to suspend the work wholly or in part. The suspended work shall be resumed when conditions are favorable and methods are corrected, as ordered or approved in writing by the Engineer.

In the event that a suspension of work is ordered as provided above, and should such suspension be ordered by reason of the failure of the Contractor to carry out orders or to perform any provision of the contract; or by reason of weather conditions being suitable for performing any item or items of work, which work, in the sole opinion of the Engineer, could have been performed prior to the occurrence of such unsuitable weather conditions had the Contractor diligently prosecuted the work when weather conditions were satiable; the Contractor, at his expense, shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by public traffic during the period of such suspension as provided in Sections GS7-1.08, "Public Convenience," and GS7-1.09, "Public Safety," and as specified in the special provisions for the work. In the event that the Contractor fails to perform the work above specified, the Department will perform such work and the cost thereof will be deducted from moneys due or to become due the Contractor.

In the event that a suspension of work is ordered by the Engineer due to unsuitable weather conditions, and in the sole opinion of the Engineer, the Contractor has prosecuted the work with energy and diligence prior to the time that operations were suspended, the cost of providing a smooth and unobstructed passageway through the work will be paid for as extra work as provided in Section GS4-1.03D or, at the option of the Engineer, such work will be performed by the Department at no cost to the Contractor.

If the Engineer orders a suspension of all of the work or a portion of the work which is the current controlling operation or operations, due to unsuitable weather or to such other conditions as are considered unfavorable to the satiable prosecution of the work, the days on which the suspension is in effect shall not be considered working days as defined in Section GS8-1.06, "Time of Completion." If a portion of work at the time of such suspension is not a current controlling operation or operations, but subsequently does become the current controlling operation or operations, the determination of working days will be made on the basis of the then current controlling operation or operations.

If a suspension of work is ordered by the Engineer, due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the contract, the days on which the suspension order is in effect shall be considered working days if such days are working days within the meaning of the definition set forth in Section GS8-1.06, "Time of Completion."

In addition to the requirements specified above, the following shall apply:

If the performance of all or any portion of the work is suspended or delayed by the Engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to

the construction industry) and the Contractor believes that additional compensation or contract time is due as a result of such suspension or delay, the Contractor shall submit to the Engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

Upon receipt, the Engineer will evaluate the Contractor's request. If the Engineer agrees that the cost or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the Contractor, its suppliers, or subcontractors as any approved tier, and not caused by weather, the Engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. The Engineer will notify the Contractor of his determination whether or not an adjustment of the contract is warranted.

No contract adjustment will be allowed unless the Contractor has submitted the request for adjustment within the time prescribed.

No contract adjustment will be allowed under the provisions specified in this section to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any term or condition of this contract.

Any contract adjustment warranted due to suspension of work ordered by the Engineer will be made in the same manner as provided for right of way delays in Section 8-1.09, "Right of Way Delays".

In the event of a suspension of work under any of the conditions set forth in this Section GS8-1.05, such suspension of work shall not relieve the Contractor of his responsibilities as set forth in Section GS7, "Legal Relations and Responsibility."

GS8-1.06. TIME OF COMPLETION--The Contractor shall complete all or any designated portion of the work called for under the contract in all parts and requirements within the time set forth in the special provisions. A working day is defined as any day, except as follows:

A. Saturdays, Sundays, and legal holidays;

B. Days on which the Contractor is prevented by inclement weather or conditions resulting immediately therefrom adverse to the current controlling operation or operations, as determined by the Engineer, from proceeding with a least 75 percent of the normal labor and equipment force engaged on such operation or operations for at lest 60 percent of the total daily time being currently spent on the controlling operation or operations; or

C. Days on which the Contractor is prevented, by reason of requirements in "Maintaining Traffic" of the special provisions, from working on the controlling operation or operations for at least 60 percent of the total daily time being currently spent on such controlling operation or operations.

Should the Contractor prepare to begin work at the regular starting time of any day on which inclement weather, or the conditions resulting from the weather, or the condition of the work, prevents the work from beginning at the usual starting time and the crew is dismissed as a result thereof and the Contractor does not proceed with at least 75 percent of the normal labor and equipment force engaged in the current controlling operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations, the Contractor will not be charged for a working day whether or not conditions should change thereafter during said day and the major portion of the day could be considered to be satiable for such construction operations.

The current controlling operation or operations is to be construed to include any feature of the work (e.g., an operation or activity, or a settlement or curing period) considered at the time by the Engineer and the Contractor, which, if delayed or prolonged, will delay the time of completion of the contract.

Determination that a day is a non-working day be reason for inclement weather or conditions resulting immediately therefrom, shall by made by the Engineer. The Contractor will be allowed 15 days from the issuance of the weekly statement of working days in which to file a written protest setting forth in what respects he differs from the Engineer, otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. The Engineer will furnish the Contractor a weekly statement showing the number of working days charged to the contract for the preceding week, the number of working days of time extensions being considered or approved, the number of working days originally specified for the completion of the contract and the number of working days remaining to compete the contract and the extended date for completion thereof, except when working days are not being charged in accordance with the provisions in Section GS8-1.05, "Temporary Suspension of Work."

GS8-107. LIQUIDATED DAMAGES--It is agreed by the parties to the contract that in case all the work called for under the contract in all parts and requirements is not finished or completed within the number of working days as set forth in the special provisions, damage will be sustained by the City of Rocklin, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the City will sustain in the event of and by reason of such delay; and it is therefore agreed that the Contractor will pay to the City of Rocklin, the sum set forth in the special provisions per day for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed; and the Contractor agrees to pay said liquidated damages herein provided for, and further agrees that the Department may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.

It is further agreed that in case the work called for under the contract is not finished and completed in all parts and requirements within the number of working days specified, the Engineer shall have the right to increase the number of working days or not, as he may deem best to serve the interest of the City, and if he decides to increase the said number of working days, he shall further have the right to charge to the Contractor, his heirs, assigns or sureties and to deduct from the final payment for the work all or any part, as he may deem proper, of the actual cost of engineering, inspection, superintendence,and other overhead expenses which are

directly chargeable to the contract, and which accrue during the period of such extension, except that cost of final surveys and preparation of final estimate shall not be included in such charges.

The Contractor will be granted an extension of time and will not be assessed with liquidated damages or the cost of engineering and inspection for any portion of the delay in completion of the work beyond the time named in the special provisions for the completion of the work caused by acts of God or of the public enemy, fire, floods, earthquakes, epidemics, quarantine restrictions, strike,labor disputes, shortage of materials and freight embargo, provided, that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of any such delay. The Engineer shall ascertain the facts and the extent of the delay, and his finds thereon shall be final and conclusive.

No extension of time will be granted for a delay caused by a shortage of materials unless the Contractor furnishes to the Engineer documentary proof that he has made every effort to obtain such materials from all known sources within reasonable reach of the work in a diligent and timely manner, and further proof in the form of supplementary progress schedules, as required in Section GS8-1.04, "Progress Schedule," that the inability to obtain such materials when originally planned, did in fact cause a delay in final completion of the entire work which could not be compensated for by revising the sequence of the Contractor's operations. The term "shortage of materials," as used in this section, shall apply only to materials, articles, parts or equipment which are standard items and are to be incorporated in the work. The term "shortage of materials," shall not apply to materials, parts, articles or equipment which are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the contract. Only the physical shortage of material will be considered under these provisions as a cause for extension of time. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials.

If the Contractor is delayed in completion of the work by reason of changes made under Section GS4-1.03, "Changes," or by failure of the Department to acquire or clear right of way, or by moving his plant pursuant to Section GS6-2.03, "Mandatory Local Material Sources," or by any act of the Engineer or of the Department, not contemplated by the contract, an extension of time commensurate with the delay in completion of the work thus caused will be granted and the Contractor shall be relieved from any claim for liquidated damages, or engineering and inspection charges or other penalties for the period covered by such extension of time; provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of any such delay. The Engineer shall ascertain the facts and the extent of the delay, and his finding thereon shall be final and conclusive.

Except for the additional compensation provided for in Section GS8-1.09, "Right of Way Delays," and except as provided in Public Contract Code Section 7102, the Contractor shall have no claim for damage or compensation for any delay or hindrance.

It is the intention of the above provisions that the Contractor shall not be relieved of liability for liquidated damages or engineering and inspection charges for any period of delay in completion of the work in excess of that expressly provided for in this Section GS8-1.07.

GS8-1.08. TERMINATION OF CONTROL--Failure to supply an adequate working force, or material of proper quality, or failure to comply with Section 10262 of the State Contract Act, or in any other respect to prosecute the work with the diligence and force specified by the contract, is grounds for termination of the Contractor's control over the work and for taking over the work by the City as provided in the State Contract Act.

If the Contractor's control of the work is terminated or he abandons the work and the contract work is completed in conformance with the provisions of Section 10255 of the State Contract Act, any dispute concerning the amount to be paid by the City to the Contractor or his surety or to be paid to the City by the Contractor or his surety, under the provisions of Section 10258 of said Act, shall be subject to arbitration. The surety shall be bound by the arbitration award and is entitled to participate in such arbitration proceedings.

GS8-1.09. RIGHT OF WAY DELAYS--If, through the failure of the City to acquire or clear right of way, the Contractor sustains loss which could not have been avoided by the judicious handling of forces, equipment and plant, there shall be paid to the Contractor such amount as the Engineer may find to be a fair and reasonable compensation for such part of the Contractor's actual loss, as, in the opinion of the Engineer, was unavoidable, determined as follows:

Compensation for ideal time of equipment will be determined in the same manner as determinations are made for equipment used in the performance of extra work paid for on a force account basis, as provided in Section GS9-1.03A(3), "Equipment Rental," with the following exceptions:

1. The right of way delay factor for each classification of equipment shown in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is a part of the contract, will be applied to such equipment rental rate.

2. The time for which such compensation will be paid will be the actual normal working time during which such delay condition exits, but in no case will exceed 8 hours in any one day.

3. The days for which compensation will be paid will be the calendar days, excluding Saturdays, Sundays and legal holidays, during the existence of such delay, except that when rental of equipment is paid for under the provisions in Section GS9-1.03A (3b), "Equipment not on the Work," no payment will be made for right of way delays in accordance with the provisions in this Section GS8-1.09.

Actual loss shall be understood to include no items of expense other than idle time of equipment and necessary payments for ideal time of men cost of extra moving of equipment, and cost of longer hauls. Compensation for idle time of equipment will be determined as provided in this Section GS8-1.09 and compensation for idle time of men will be determined as provided in Section GS9-1.03A(1), "Labor," and no markup will be added in either case for overhead and profit. The cost of extra moving of equipment and the cost of longer hauls will be paid for as extra work as provided in Section GS4-1.03D.

If performance of the Contractor's work is delayed as the result of the failure of the Department to acquire or clear right of way, an extension of time determined pursuant to the provisions in Section GS8-1.07, "Liquidated Damages," will be granted.

GS8-1.10. UTILITY AND NON-HIGHWAY FACILITIES--Attention is directed to Section GS7.1.11, "Preservation of Property," and Section GS7-1.12, "Responsibility for Damage." The Contractor shall protect from damage utility and other non-highway facilities that are to remain in place, be installed, relocated or otherwise rearranged.

It is anticipated that some or all of the utility and other non-highway facilities, both above ground and below ground, that are required to be rearranged (as used herein, rearrangement includes installation, relocation, alteration, or removal) as a part of the highway improvement will be rearranged in advance of construction operations. Where it is not anticipated that such rearrangement will be performed prior to construction, or where the rearrangement must be coordinated with the Contractor's construction operations, the exiting facilities that are to be rearranged will be indicated on the plans or in the special provisions. Where a rearrangement is indicated on the plans or in the special provisions, the Contractor will have no liability for the costs of performing the work involved in such rearrangement.

The right is reserved to the Department and the owners of facilities, or their authorized agent, to enter upon the highway right of way for the purpose of making such changes as are necessary for the rearrangement of their facilities or for making necessary connections or repairs to their properties. The Contractor shall cooperate with forces engaged in such work and shall conduct his operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by such other forces. Wherever necessary, the work of the Contractor shall be coordinated with the rearrangements of utility or other non-highway facilities, and the Contractor shall make arrangements with the owner of such facilities for the coordination of the work.

Attention is directed to the possible existence of underground main or trunk line facilities not indicated on the plans or in the special provisions and to the possibility that underground main or trunk lines may be in a location different from that which is indicated on the plans or in the special provisions. The Contractor shall ascertain the exact location of underground main or trunk lines whose presence is indicated on the plans or in the special provisions, the location of their service laterals or other appurtenances, and of existing service lateral or appurtenances of any other underground facilities such as buildings, meters and junction boxes prior to doing work that may damage any of such facilities or interfere with their service.

If the Contractor cannot locate an underground facility whose presence is indicated on the plans or in the special provisions, he shall go notify the Engineer in writing. If the facility for which such notice is given is in a substantially different location from that indicated on the plans or in the special provisions, the additional cost of locating the facility will be paid for as extra work as provided in Section GS4-1.03D.

If the Contractor discovers underground main or trunk lines not indicated on the plans or in the special provisions, he shall immediately give the Engineer and the Utility Company written notification of the existence of such facilities. Such main or trunk lines shall be located and protected from damage as directed by the Engineer and the cost of such work will be paid for as

extra work as provided in Section GS4-1.03D. The Contractor shall, if directed by the Engineer, repair any damage which may occur to such main or trunk lines. The cost of such repair work, not due to the failure of the Contractor to exercise reasonable care, will be paid for as extra work as provided in Section GS4-1.03D. Damage due to the Contractor's failure to exercise reasonable care shall be repaired at his cost and expense.

Where it is determined by the Engineer that the rearrangement of an underground facility is essential in order to accommodate the highway improvement and the plans and specifications do not provide that such facility is to be rearranged, the Engineer will provide for the rearrangement of such facility by other forces or such rearrangement shall be performed by the Contractor and will be paid for as extra work as provided in Section GS4-1.03D.

When ordered by the Engineer in writing, the Contractor shall rearrange any utility or other non-highway facility necessary to be rearranged as a part of the highway improvement, and such work will be paid for as extra work as provided in Section GS4-1.03D.

Should the Contractor desire to have any arrangement made in any utility facility, or other improvement, for his convenience in order to facilitate his construction operations, which rearrangement it in addition to, or different from, the rearrangements indicated on the plans or in the special provisions, he shall make whatever arrangements are necessary with the owners of such utility or other non-highway facility for such rearrangement and bear all expenses in connection therewith.

The Contractor shall immediately notify the Engineer of any delays to his operations as a direct result of underground main or trunk line facilities which were not indicated on the plans or in the special provisions or were located in a position substantially different from that indicated on the plans or in the special provisions, or as a direct result of utility or other non-highway facilities not being rearranged as herein provided (other than delays in connection with rearrangements made to facilitate his construction operations or delays due to a strike or labor dispute). Any such delays will be considered right of way delays within the meaning of Section GS8-1.09, "Right of Way Delays," and compensation for such delay will be determined in accordance with said Section GS8-1.09. The Contractor shall be entitled to no other compensation for any such delay.

Any delays to the Contractor's operations as a direct result of utility or other non-highway facilities not being rearranged as provided in this Section GS8-1.10, due to a strike or labor dispute, will entitle the Contractor to an extension of time as provided in Section GS8-1.07, "Liquidated Damages." The Contractor shall be entitled to no other compensation for any such delay.

GS8-1.11. TERMINATION OF CONTRACT--The contract may be terminated by the Engineer when termination is authorized by Section GS7-1.125, "Legal Actions Against the Department," Section GS7-1.165, "Damage by Storm, Flood, or Earthquake," or by other provisions of the contract which authorize termination. The Department also reserves the right to terminate the contract at any time upon a determination by the Engineer that termination of the contract is in the best interest of the City.

If the Engineer elects to terminate the contract, the termination of the contract and the total compensation payable to the Contractor shall be governed by the following:

A. The Engineer will issue the Contractor a written notice signed by the Engineer, specifying that the contract is to be terminated. Upon receipt of said written notice, the Contractor will be relieved of further responsibility for damage to the work (excluding materials) as specified in Section GS7-1.16, "Contractor's Responsibility for the work and Materials," and, except as otherwise directed in writing by the Engineer, the Contractor shall:

1. Stop all work under the contract except that specifically directed to be completed prior to acceptance.

2. Perform work the Engineer deems necessary to secure the project for termination.

3. Remove equipment and plant from the site of the work.

4. Take such action as is necessary to protect materials from damage.

5. Notify all subcontractors and suppliers that the contract is being terminated and that their contracts or orders are not to be further performed unless otherwise authorized in writing by the Engineer.

6. Provide the Engineer with an inventory list of all materials previously produced, purchased or order from suppliers for use in the work and not yet used in the work, including its storage location, and such other information as the Engineer may request.

7. Dispose of materials not yet used in the work as directed by the Engineer. It shall be the Contractor's responsibility to provide the City with good title to all materials purchased by the City hereunder, including materials for which partial payment has been made as provided in Section GS9-1.06, "Partial Payments," and with bills of sale or other documents of title for such materials.

8. Subject to the prior written approval of the Engineer, settle all outstanding liabilities and all claims arising out of subcontracts or orders for materials terminated hereunder. To the extent directed buy the Engineer, the Contractor shall assign to the Department all the right, title and interest of the Contractor under subcontracts or orders for materials terminated hereunder.

9. Furnish the Engineer with the documentation required to be furnished by the Contractor under the provisions of the contract including, on projects as to which Federal funds are involved, all documentation required under the Federal requirements included in the contract.

10. Take such other actions as the Engineer may direct.

B. Acceptance of the contract as herein after specified shall not relieve the contractor of responsibility for damage to materials. The contractor shall continue to be responsible for damage to materials after issuance of the Notice of Termination, except as follows:

1. The Contractor's responsibility for damage to materials for which partial payment has been made as provided in Section GS9-1.06, "Partial Payments," and for materials furnished by the City for use in the work and unused shall terminate when the Engineer certifies that such materials have been stored in the manner and at the locations he has directed.

2. The Contractor's responsibility for damage to materials purchased by the City subsequent to the issuance of the notice that the contract is to be terminated shall terminate when title and delivery of such materials has been taken by the City.

When the Engineer determines that the Contractor has completed the work under the contract directed to be completed prior to termination and such other work as may have ben ordered to secure the project for termination, he will recommend that the Engineer formally accept the contract, and immediately upon and after such acceptance by the Engineer, the Contractor will not be required to perform any further work thereon and shall be relieved of his contractual responsibilities for injury to persons or property which occurs after the formal acceptance of the project by the Engineer.

C. Termination of the contract shall not relieve the surety of its obligation of any just claims arising out of the work performed.

D. The total compensation to be paid to the Contractor shall be determined by the Engineer on the basis of the following:

1. The reasonable cost to the Contractor, without profit, for all work performed under the contract, including mobilization, demobilization and work done to secure the project for termination. In determining the reasonable costs, deductions will be made for the cost of materials to be retained by the Contractor, amounts realized by the sale of materials, and for other appropriate credits against the cost of the work. Deductions will also be made, when the contract is terminated under the authority of Section GS7-1.165, "Damage by Storm, Flood, or Earthquake," for the cost of materials damaged by the "Occurrence."

   When, in the opinion of the Engineer, the cost of a contract item of work is excessively high due to costs incurred to remedy or replace defective or rejected work, the reasonable cost to be allowed will be the estimated reasonable cost of performing such work in compliance with the requirements of the plans and specifications and the excessive actual cost shall be disallowed.

2. A reasonable allowance for profit on the cost of the work performed as determined under Subsection (1), provided the Contractor establishes to the satisfaction of the Engineer that it is reasonably probably that he would have made a profit had the

contract been completed and provided further, that the profit allowed shall in no event exceed 4 percent of said cost.

3. The reasonable cost to the Contractor of handling material returned to the vendor, delivered to the Department or otherwise disposed of as directed by the Engineer.

4. A reasonable allowance for the Contractor's administrative costs in determining the amount payable due to termination of the contract.

All records of the Contractor and his subcontractors, necessary to determine compensation in accordance with the provisions of this Section GS8-1.11, shall be open to inspection or audit by representatives of the Department at all times after issuance of the notice that the contract is to be terminated and for a period of 3 years, thereafter, and such records shall be retained for that period.

After acceptance of the work by the Engineer, the Engineer may make payments on the basis of interim estimates pending issuance of the Final Estimate in accordance with Section GS9-1.07B, "Final Payment and Claims," when, in his opinion, the amount thus paid, together with all amounts previously paid or allowed, will not result in total compensation in excess of that to which the Contractor will be entitled. All payments, including payment upon the Final Estimate shall be subject to deduction for prior payments and amounts, if any, to be kept or retained under the provisions of the contract.

The provisions of this Section GS8-1.11 shall be included in all subcontracts.

GS-9. MEASUREMENT AND PAYMENT

GS9-1.01. MEASUREMENT OF QUANTITIES--Payment for all work bid at a price per unit of measurement will be based upon the actual quantities of authorized work as measured upon completion. The City does not expressly or by implication agree that the actual amount of work or materials of any class will correspond to the estimated quantities given in the proposal. The Contractor shall make no claim nor receive any compensation for anticipated profits, for loss of profit, for damages, or for any extra payment whatever because of any difference between the amount of work actually done or materials furnished and the estimated amount.

Items bid on a "Lump Sum" or "Job" basis shall result in a complete structure, operating plant or system in satisfactory working condition in respect to the functional purposes of the installation and no extra compensation will be allowed for anything omitted but fairly implied.

GS9-1.015. FINAL PAY QUANTITIES--When the estimated quantities for a specific portion of the work are designated on the plans as final pay quantities, said estimated quantities shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the Engineer. If such dimensions are revised, and such revisions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the changes in the dimensions. The estimated quantities for such specific portion of the work shall be considered as approximate only and no guarantee is made that the quantities which can be determined by computations, based in the details and dimensions shown on the plans, will equal the estimated quantities. No allowance will be made in the event that the quantities based on computations do not equal the estimated quantities.

When portions of an item have been designated on the plans as final pay quantities, portions not so designated will be measured and paid for in accordance with the applicable provisions of these specifications and the special provisions.

In case of a discrepancy between the quantities shown on the plans as final pay quantities and the quantity of the same item shown in the Engineer's Estimate, payment will be based on the final pay quantities shown within the contract documents.

GS9-1.02. SCOPE OF PAYMENT--The Contractor shall accept the compensation provided in the contract as full payment for furnishing al labor, materials, tools, equipment, and incidentals necessary to the completed work and for performing all work contemplated and embraced under the contract; also for loss or damage arising from the nature of the work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the acceptance by the Engineer and for all risks of every description connected with the prosecution of the work, also for all expenses incurred in consequence of the suspension or discontinuance of the work as provided in the contract; and for completing the work according to the plans and specifications. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material.

No compensation will be made in any case for loss of anticipated profits.

GS9-1.03. FORCE ACCOUNT PAYMENT--When extra work is to be paid for on a force account basis the labor, materials and equipment used in the performance of such work shall be subject to the approval of the Engineer and compensation will be determined as follows:

GS9-1.03A. WORK PERFORMED BY CONTRACTOR--The Contractor will be paid the direct costs for labor, materials and equipment used in performing the work determined as hereinafter provided in Sections GS9-1.03A(1), "Labor," GS9-1.03A(2), "Materials," and GS9-1.03A(3), "Equipment Rental," except where agreement has been reached to pay in accordance with Section GS9-1.03B, "Work Performed by Special Forces or Other Special Services."

To the total of the direct costs computed as provided in Sections GS9-1.03A(1), "Labor," GS9-1.03A(2), "Materials," and GS9-1.03A(3), "Equipment Rental," there will be added a markup of 33 percent to the cost of labor, 15 percent to the cost of materials, and 15 percent to the equipment rental.

The above markups shall constitute full compensation for all overhead costs which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Sections GS9-1.03A(1), "Labor," GS9-1.03A(2), "Materials," and GS9-1.03A(3), "Equipment Rental." The total payment made as provided above shall be deemed to be the actual cost of such work and shall constitute full compensation therefor.

When extra work to be paid for on a force account basis is performed by a subcontractor, approved in accordance with the provisions in Section 8-1.01, "Subcontracting", an additional markup of 5 percent will be added to the total cost of said extra work including all markups specified in this Section 9-1.03A. Said additional 5 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by the subcontractor.

GS9-1.03A(1). LABOR--The Contractor will be paid the cost of labor for the workmen (including foremen when authorized by the Engineer), used in the actual and direct performance

of the work. The cost of labor, whether the employer is the Contractor, subcontractor, or other forces, will be the sum of the following.

GS9-1.03A(1a). ACTUAL WAGES--The actual wages paid shall include any employer payments to or on behalf of the workmen for health and welfare, pension, vacation, and similar purposes.

GS9-1.03A(1b). LABOR SURCHARGE--To the actual wages, as defined in Section GS9-1.03A(1a), will be added a labor surcharge set forth in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract. Said labor surcharge shall constitute full compensation for all payments imposed by State and Federal laws and for all other payments made to, or on behalf of, the workmen, other than actual wages as defined in Section GS9-1.03A(1a) and subsistence and travel allowance as specified in Section GS9-1.03A(1c).

GS9-1.03A(1c). SUBSISTENCE AND TRAVEL ALLOWANCE--The actual subsistence and travel allowance paid to such workmen.

GS9-1.03A(2). MATERIALS--The Department reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and markup on such materials.

Only materials furnished by the Contractor and necessarily used in the performance of the work will be paid for. The cost of such materials will be the cost to the purchaser, whether Contractor, subcontractor or other forces, from the supplier thereof, except as the following are applicable:

GS9-1.03A(2a). If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the City notwithstanding the fact that such discount may not have been taken.

GS9-1.03A(2b). If materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier to such purchaser, the cost of such materials shall be deemed to be the price paid to the actual supplier as determined by the Engineer plus the actual costs, if any, incurred in the handling of such materials.

GS9-1.03A(2c). If the materials are obtained from a supply or source owned wholly or in part by the purchaser, the cost of such materials shall not exceed the price paid by the purchaser for similar materials furnished from said source on contract items or the current wholesale price for such materials delivered to the jobsite, whichever price is lower.

GS9-1.03A(2d). If the cost of such materials is, in the opinion of the Engineer, excessive, then the cost of such material shall be deemed to be the lowest current wholesale price at which such

materials were available in the quantities concerned delivered to the jobsite, less any discounts as provided in Section GS9-1.03A(2a).

GS9-1.03A(2e). If the Contractor does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof within 60 days after the date of delivery of the material or within 15 days after acceptance of the contract, whichever occurs first, the Department reserves the right to establish the cost of such materials at the lowest current wholesale prices at which such materials were available in the quantities concerned delivered to the location of the work, less any discounts as provided in Section GS9-1.03A(2a).

GS9-1.03A(3). EQUIPMENT RENTAL--The Contractor will be paid for the use of equipment at the rental rates listed for such equipment in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract, regardless of ownership and any rental or other agreement, if such may exit, for the use of such equipment entered into by the Contractor. Except for those pieces of equipment with a rental rate of $10.00 per hour or less as listed in the Labor Surcharge and Equipment Rental Rates publication and which are rented from a local equipment agency, other than Contractor owned, the Contractor will be paid at the hourly rate shown on the rental agency invoice or agreement for the time used on force account work as provided in Section 9-1.03A(3a), "Equipment on the Work". If a minimum equipment rental amount is required by the local equipment rental agency, the actual amount charged will be paid to the Contractor.

If it is deemed necessary by the Engineer to use equipment not listed in the said publication, a suitable rental rate for such equipment will be established by the Engineer. The Contractor may furnish any cost data which might assist the Engineer in the establishment of such rental rate. If the rental rate established by the Engineer is $10.00 per or hour or less, the provisions above concerning rental of equipment from a local equipment agency shall apply.

The rental rates paid as above provided shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

Operators of rented equipment will be paid for as provided in Section GS9-1.03A(1), "Labor."

All equipment shall, in the opinion of the Engineer, be in good working condition and suitable for the purpose for which the equipment is to be used.

Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

Individual pieces of equipment or tools not listed in said publication and having a replacement value of $500 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.

Rental time will not be allowed while equipment is inoperative due to breakdowns.

GS9-1.03A(3a). EQUIPMENT ON THE WORK--The rental time to be paid for equipment on the work shall be the time the equipment is in operation on the extra work being performed, and in addition, shall include the time required to move the equipment to the location of the extra work and return it to the original location or to another location requiring no more time than that required to return it to its original locating, except that moving time will not be paid for if the equipment is used at the site of the extra work on other than such extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the extra work on other than such extra work.

The following shall be used in computing the rental time of equipment on the work:

1. When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation.

2. When daily rates are listed, less than 4 hours of operation shall be considered to be 1/2 day of operation.

GS9-1.03A(3b). EQUIPMENT NOT ON THE WORK--For the use of equipment moved in on the work and used exclusively for extra work paid for on a force account basis, the Contractor will be paid the rental rates listed in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract, or determined as provided in Section GS9-1.03A(3) and for the cost of transporting the equipment to the location of the work and its return to its original location, and in accordance with following provisions:

1. The original location of the equipment to be hauled to the location of the work shall be agreed to by the Engineer in advance.

2. The City will pay the costs of loading and unloading such equipment.

3. The cost of transporting equipment in low bed trailers shall not exceed the hourly rates charged by established haulers.

4. The cost of transporting equipment shall not exceed the applicable minimum established rates of the Public Utilities Commission.

5. The rental period shall begin at the time the equipment is unloaded at the site of the extra work, shall include each day that the equipment is at the site of the extra work, excluding Saturdays, Sundays, and legal holidays unless the equipment is used to perform the extra work on such days, and shall terminate at the end of the day on which the Engineer directs the Contractor to discontinue the use of such equipment. The rental time to be paid per day will be in accordance with the following:

Hours Equipment is in Operation	Hours to be paid
0	0
0.5	4.0
1	4.0
1.5	4.0
2	4.0
2.5	4.0
3	4.0
3.5	4.0
4	4.0
4.5	6.0
5	6.5
5.5	6.75

Hours Equipment is in Operation (Continued)	Hours to be paid
6	7
6.5	7.25
7	7.5
7.5	7.75
8	8
Over 8	Hours in Operation

The hours to be paid for equipment which is operated less than 8 hours due to breakdowns, shall not exceed 8 less the number of hours the equipment is inoperative due to breakdowns.

When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation.

The minimum rental time to be paid for the entire rental period on an hourly basis shall not be less than 8 hours or if on a daily basis shall not be less than one day.

6. Should the Contractor desire the return of the equipment to a location other than its original location, the City will pay the cost of transportation in accordance with the above provisions, provided such payment shall not exceed the cost of moving the equipment to the work.

7. Payment for transporting, and loading and unloading equipment, as above provided, will not be made if the equipment is used on the work in any other way than upon extra work paid for on a force account basis.

When extra work, other than work specifically designated as extra work in the plans and specifications, is to be paid for on a force account basis and the Engineer determines that such extra work requires the Contractor to move on to the work equipment which could not reasonably have been expected to be needed in the performance of the contract, the Engineer may authorize payment for the use of such equipment at equipment rental rates in excess of those listed as applicable for the use of such equipment subject to the following additional conditions.

1. The Engineer shall specifically approve the necessity for the use of particular equipment on such work.

2. The Contractor shall establish to the satisfaction of the Engineer that such equipment cannot be obtained from his normal equipment source or sources and those of his subcontractors.

3. The Contractor shall establish to the satisfaction of the Engineer that the proposed equipment rental rate for such equipment from his proposed source is reasonable and appropriate for the expected period of use.

4. The Engineer shall approve the equipment source and the equipment rental rate to be paid by the City before the Contractor begins work involving the use of said equipment.

GS9-1.03A(3c). OWNER-OPERATED EQUIPMENT--When owner-operated equipment is used to perform extra work to be paid for on force account basis, the Contractor will be paid for the equipment and operator, as follows:

Payment for the equipment will be made in accordance with the provisions in Section 9-1.03A(3), "Equipment Rental".

Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the Contractor to other workmen operating similar equipment already on the project or, in the absence of such other workmen, at the rates for such labor established by collective bargaining agreements for the type of workman and location of the work, whether or not the owner-operated is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein, in accordance with the provisions in Section 9-1.03A(1b), "Labor Surcharge".

To the direct cost of equipment rental and labor, computed as provided herein, will be added the markups for equipment rental and labor as provided in Section 9-1.03A, "Work Performed by Contractor".

GS9-1.03A(3d). DUMP TRUCK RENTAL--Dump truck rental shall conform to the provisions of Section 9-1.03A(3), "Equipment Rental", 9-1.03A(3a), "Equipment on the Work", and 9-1.03A(3b), "Equipment Not on the Work", except as follows:

Fully maintained and operated rental dump trucks used in the performance of extra work paid for on a force account basis will be paid for at the same hourly rate paid by the Contractor for use of fully maintained and operated rental dump truck in performing contract item work.

In the absence of contract item work requiring dump truck rental, the Engineer will establish an hourly rental rate to be paid. The Contractor shall provide the Engineer with complete information on the hourly rental rates available for rental of fully maintained and operated dump trucks.

The provisions in Section 9-1.03A(1), "Labor", shall not apply to operator of rented dump trucks.

The rental rates listed for dump trucks in the Department of Transportation publication entitled Labor Surcharge and Equipment Rental Rates shall not apply.

To the total of the rental costs for fully maintained and operated dump trucks, including labor, there will be added a markup of 15 percent. An additional markup of 5 percent will be added by reason of performance of the work by a subcontractor. No separate markup will be made for labor.

The provisions of Section 9-1.03A(3c), "Owner-Operated Equipment", shall not apply to dump truck rentals.

GS9-1.03B WORK PERFORMED BY SPECIAL FORCES OR OTHER SPECIAL SERVICES--When the Engineer and the Contractor, by agreement, determine that a special service or an item of extra work cannot be performed by the forces of the Contractor or those of any of this subcontractors, such service or extra work item may be performed by a specialist. Invoices for such service or item of extra work on the basis of the current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide such complete itemization.

In those instances wherein a Contractor is required to perform extra work necessitating a fabrication or machining process in a fabrication or machine shop facility away from the jobsite, the charges for that portion of the extra work performed in such facility may, be agreement, be accepted as a specialist billing.

To the specialist invoice price, less a credit to the City for any cash or trade discount offered or available, whether or not such discount may have been taken, will be added 15 percent in lieu of the percentages provided in Section GS9-1.03A, "Work Performed by Contractor."

GS9-1.03C RECORDS--The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct costs of extra work paid for on a force account basis and the costs of other operations.

From the above records, the Contractor shall furnish the Engineer completed daily extra work reports, on forms furnished by the Department, for each day's extra work to be paid for on a force account basis. The daily extra work reports shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, subcontractor, or other forces, except for charges described in section GS9-1.03B, "Work Performed by Special Forces or Other Special Services." The daily extra work reports shall provide names or identifications and classifications of workmen, the hourly rate of pay and

hours worked, and also the size, type and identification number of equipment, and hours operated.

Material charges shall be substantiated buy valid copies of vendor's invoices. Such invoices shall be submitted with the daily extra work reports, or if not available, they shall be submitted with the daily extra work reports, or if not available, they shall be submitted with subsequent daily extra work reports. Should said vendor's invoice not be submitted within 60 days after the date of delivery of the material or within 15 days after the acceptance of the contract, whichever occurs first, the Department reserves the right to establish the cost of such materials at the lowest current wholesale prices at which said materials were available in the quantities concerned delivered to the location of work less any discounts as provided in section GS9-1.03A (2a).

Said daily extra work reports shall be signed by the Contractor or his authorized representative.

The Engineer will compare his records with the completed daily extra work reports furnished by the Contractor and make any necessary adjustments. When these daily extra work reports are agreed upon and signed by both parties, said reports shall become the basis of payment for the work performed, but shall not preclude subsequent adjustment based on a later audit by the Department.

The Contractor's cost records pertaining to work paid for on a force account basis shall be open to inspection or audit by representatives of the Department, during the life of the contract and for a period of not less than 3 years after the date of acceptance thereof, and the Contract shall retain such records for that period. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor shall make every reasonable effort to insure that the cost records of such other forces will be open to inspection and audit by representatives of the Department on the same terms and conditions as the cost records of the Contractor. If an audit is to be commenced more than 60 days after the acceptance date of the contract, the Contractor will be given a reasonable notice of the time when such audit is to begin.

GS9-1.03D PAYMENT--Payment as provided in Sections GS9-1.03A, "Work Performed by Contractor," and GS9-1.03B, "Work Performed by Special Forces or Other Special Services," shall constitute full compensation to the Contractor for performance of work paid for on a force account basis and no additional compensation will be allowed therefor. Such payment will be made in accordance with provisions in Section 9-1.06, "Partial Payments".

GS9-1.04. NOTICE OF POTENTIAL CLAIM--The Contractor shall not be entitled to the payment of any additional compensation for any act, or failure to act, by the Engineer, including failure or refusal to issue a change order, or for the happening of any event, thing, occurrence, or other cause, unless he shall have given the Engineer due written notice of potential claim as hereinafter specified, provided, however, that compliance with this Section GS9-1.04 shall not be a prerequisite as to matters within the scope of the protest provisions in Section GS4-1.03, "Changes," or Section GS8-1.06, "Time of Completion," or the notice provisions in Section GS8-1.07, "Liquidated Damages," or Section GS8-1.10, "Utility and Non-Highway Facilities,"

nor to any claim which is based on differences in measurements or errors of computation as to contract quantities.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. The said notice as above required must have been given to the Engineer prior to the time that the Contractor shall have performed the work giving rise to the potential claim for additional compensation, if based on an act or failure to act by the Engineer, or in all other cases within 15 days after the happening of the event, thing, occurrence, or other cause, giving rise to the potential claim.

It is the intention of this Section GS9-1.04 that differences between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

GS9-1.05. STOP NOTICES--The City may, at its option and at any time, retain out of amounts due the Contractor, sums sufficient to cover claims (including costs and attorney's fees), filed pursuant to California Civil Code Section 3179 et seq.

GS9-1.06. PARTIAL PAYMENTS--The Department, once in each month, shall cause an estimate in writing to be made by the Contractor. The estimate shall include the total amount of work done and acceptable materials furnished, provided such acceptable materials are listed as eligible for partial payment as materials in the special provisions and are furnished and delivered by the Contractor on the ground and not used or are furnished and stored for use on the contract, if such storage is within the City of Rocklin and the Contractor furnished evidence satisfactory to the Engineer that such materials are stored subject to or under the control of the Department, to the time of such estimate, and the value thereof. The estimate shall also include any amounts payable for mobilization. Daily extra work reports furnished by the Contractor less than 5 calendar days, not including Saturdays, Sundays, and legal holidays, prior to the preparation of the monthly progress estimate shall not be eligible until the following month.

The amount of any such material to be considered in making an estimate will in no case exceed the amount thereof which has been reported by the Contractor to the Engineer on City-furnished forms properly filled out and executed, including accompanying documentation as therein required, less the amount of such material incorporated in the work to the time of such estimate. Only materials to be incorporated in the work will be considered. The estimated value of the material established by the Engineer will in no case exceed the contract price for the item of work for which the material is furnished.

"The Department shall retain 10 percent of such estimated value of the work done and 10 percent of the value of materials so estimated to have been furnished and delivered and unused or

furnished and stored as aforesaid as part security for the fulfillment of the contract by the Contractor."

The Department shall pay monthly to the Contractor, while carrying on the work, the balance not retained, as aforesaid, after deducting therefrom all previous payments and all sums to be kept or retained under the provisions of the contract. No such estimate or payment shall be required to be made when, in the judgment of the Engineer, the work is not proceeding in accordance with the provisions of the contract.

No such estimate or payment shall be construed to be an acceptance of any defective work or improper materials.

Attention is directed to the express prohibition against payment to unlicensed contractors contained in Public Contract Code Section 10164, the provisions of which are set forth in Section GS7-1.01C, "Contractor's Licensing Laws."

GS9-1.065. PAYMENT OF WITHHELD FUNDS--Attention is directed to Section GS9-1.06, "Partial Payments", and in particular to the retention provisions of said section.

Upon the Contractor's request, pursuant to Public Contract Code Section 10263, the Department will make payment of funds withheld from progress payments to ensure performance of the contract if the Contractor deposits in escrow with a bank acceptable to the Department, securities equivalent to the amount withheld. The Contractor shall be beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon. Upon satisfactory completion of the contract, the securities shall be returned to the Contractor.

Alternatively, upon the Contractor's request, the Department will make payment of retention earned directly to the escrow agent. The Contractor may direct the investment of the payments into securities and the Contractor shall receive the interest earned on the investments upon the same terms provided for securities deposited by the Contractor. Upon satisfactory completion of the contract, the Contractor shall receive form the escrow agent all securities, interest, and payments received by the escrow agent from the Department, pursuant to the terms in Section 10263 of the Public Contract Code.

Securities eligible for investments shall include those listed in Section 16430 of the Government Code, bank or saving and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the Department.

The escrow agreement used pursuant to this Section 9-1.065 shall be substantially similar to the "Escrow Agreement for Security Deposits in Lieu of Retention" in Section 10263 of the Public Contract Code, deemed as incorporated herein by reference.

The Contractor shall obtain the written consent of the surety to such agreement.

GS9-1.07. PAYMENT AFTER ACCEPTANCE--"Final Payment" shall be made in accordance with this section. The Contractor shall, after the completion of the contract, submit a final estimate of the amount of work done thereunder and the value of such work. Upon approval of the estimate by the Director, the City of Rocklin shall pay the entire sum so found to be due after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment. The final payment shall not be due and payable until the expiration of 35 days from the date of acceptance of the work by the City Council, and 35 days after filing of the Notice of Completion with the City.

No certificate given or payments made under the contract, except the final certificate or final payment, shall be conclusive evidence of the performance of the contract, either wholly or in part, and no payment (including the final payment) or certificate shall be construed to be an acceptance of any defective work or improper materials. Final payment shall not release the Contractor from one year guarantee of the work as provided in Section GS7-1.17, "Acceptance of Contract" and Section GS2-1.12 'Guaranty and Warranty' of these Specifications.

GS9-1.07A PAYMENT PRIOR TO PROPOSED FINAL ESTIMATE--After acceptance of the work by the Engineer, the Engineer will make an estimate of the total amount of work done under the contract and the Department will make a final monthly payment pending issuance of the proposed final estimate. The Department will pay the balance thereon found to be due after deduction of all previous payments, all amounts to be kept or retained under the provisions of the contract, and such further amounts as the Engineer determines to be necessary pending issuance of said proposed final estimate and payment thereon.

GS9-1.07B FINAL PAYMENT AND CLAIMS--After acceptance by the Engineer, the Engineer will make a proposed final estimate in writing of the total amount payable to the Contractor, including therein an itemization of said amount, segregated as to contract item quantities, extra work and any other basis for payment, and shall also show therein all deductions made or to be made for prior payments and amounts to be kept or retained under the provisions of the contract. All prior estimates and payments shall be subject to correction in the proposed final estimate. Within 30 days after said proposed final estimate has been submitted to him, the Contractor shall submit to the Engineer his written approval of said proposed final estimate or a written statement of all claims he has arising under or by virtue of the contract. No claim will be considered that was not included in said written statement of claims, nor will any claim be allowed as to which a notice or protest is required under the provisions in Sections GS4-1.03, "Changes," GS8-1.06, "Time of Completion," GS8-1.07, "Liquidated Damages," GS8-1.10, "Utility and Non-Highway Facilities," and GS9-1.04, "Notice of Potential Claim," unless the Contractor has complied with the notice or protest requirements in said sections.

On the Contractor's approval, or if he files no claim within said period of 30 days, the Engineer will issue a final estimate in writing in accordance with the proposed final estimate submitted to

the Contractor and within 30 days thereafter the City will pay the entire sum so found to be due. Such final estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections GS9-1.03C, "Records," and GS9-1.09, "Clerical Errors."

If the Contractor within said period of 30 days files claims the Engineer will issue a semifinal estimate in accordance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the City will pay the sum so found to be due. Such semifinal estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except insofar as affected by the claims filed within the time and in the manner required hereunder and except as otherwise provided in Sections GS9-1.03C, "Records," and GS9-1.09, "Clerical Errors."

The claims filed by the Contractor shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of said claims. The Engineer will consider and determine the Contractor's claims and it will be the responsibility of the Contractor to furnish within a reasonable time such further information and details as may be required by the Engineer to determine the facts or contentions involved in his claims. Failure to submit such information and details will be sufficient cause for denying the claims.

The City Attorney will make the final determination of any claims which remain in dispute after completion of claim review by the Engineer. The City Council will review such claims and make a written recommendation thereon. The contractor may meet with the City Council to make a presentation in support of such claims.

Upon final determination of the claims, the Engineer shall then make and issue his final estimate in writing and within 30 days thereafter the City will pay the entire sum, if any, found due thereon. Such final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections GS9-1.03C, "Records," and GS9-1.09, "Clerical Errors."

GS9-1.08. ADJUSTMENT OF OVERHEAD COSTS--When the final estimate of the contract cost of the work, including extra work, is made and the total of such final estimate is less than 90 percent of the total bid price for performing the contract work, as submitted by the Contractor in his bid proposal, an adjustment in the final payment to the Contractor to cover overhead costs will me made as set forth below. No adjustment for overhead costs will be made when the total of the final estimate is 90 percent or more to the total bid price for performing the contract work.

Additional payment to the Contractor to cover overhead costs as above provided shall be 10 percent of the difference between a computed amount representing 90 percent of the estimated

cost of the work as submitted by the Contractor in his bid proposal and the final estimate of cost of the work, including extra
work.

The provisions of this Section GS9-1.08 shall not apply to contracts which have been terminated pursuant to Sections GS7-1.125, "Legal Actions Against the Department," GS7-1.165, "Damage by Storm, Flood, or Earthquake," GS8-1.11, "Termination of Contract," or other provisions for terminating the contract.

GS9-1.09 CLERICAL ERRORS--Notwithstanding the provisions in Section GS9-1.07, "Payment After Acceptance," for a period of three years after acceptance of the work, all estimates and payments made pursuant to said Section GS9-1.07, including the final estimate and payment, shall be subject to correction and adjustment for clerical errors in the calculations involved in the determination of quantities and payments. The Contractor and the Department agree to pay to the other any sum due under the provisions of this Section GS9-1.09, provided, however, if the total sum to be paid is less than $200, no such payment shall be made.

GS-10. DUST CONTROL

GS10-1.01. DESCRIPTION--This work shall consist of applying either water or dust palliative, or both, for the alleviation or prevention of dust nuisance.

Dust resulting from the Contractor's performance of the work, either inside or outside the right of way, shall be controlled by the Contractor in accordance with the provisions in GS7, "Legal Relations and Responsibility."

It is understood that the provisions in GS10, "Dust Control," will not prevent the Contractor from applying water or dust palliative for his convenience if he so desires.

GS10-1.02. APPLICATION--Water shall be applied as provided in SS-23 "Water," and dust palliative shall conform to and be applied as provided in SS-29, "Dust Palliative."

GS10-1.03. (BLANK)

GS10-1.04. PAYMENT--No separate payment will be made for any work performed or material used to control dust resulting from the Contractor's performance of the work, either inside or outside the right of way. Full compensation for such dust control will be considered as included in the prices paid for the various items of work involved.

When the Engineer orders the application of water for the purpose of controlling dust caused by public traffic only, such work will be paid for as extra work as provided in GS4-1.03D, except as otherwise provided in GS8-1.05, "Temporary Suspension of Work."

CITY OF ROCKLIN

DEPARTMENT OF PUBLIC WORKS

STANDARD SPECIFICATIONS

SS-1. PRECONSTRUCTION PHOTOGRAPH AND RECORD DRAWINGS

SS1-01. REQUIREMENT--Preconstruction photographs, videotaping or record drawings are not required unless specifically set forth in the Special Provisions for the project.

SS1-02. SPECIFICATION FOR PRECONSTRUCTION PHOTOGRAPHS--When preconstruction photographs are specified in the Special Provisions, the Contractor shall provide preconstruction color prints of the work. The photographs shall be taken by an acceptable photographer and the negatives shall be 135 or larger film size. Each photograph shall be marked to indicate the date, name of work, and the location where the photograph was taken. Before construction may start, two 3-1/2 by 5 inch color prints of each exposure shall be delivered to the Engineer. Preconstruction photographs shall be taken at an approximate average interval of 100 feet as designated by the Engineer. Photographer shall be equipped at all times to take either interior or exterior exposures.

Prints shall be submitted in a three ring photo album binder with clear plastic covered fillers, four photos each side, grouped according to street, lateral or line, and in sequence. Each group of prints shall be identified by a label which projects beyond the edge of filler and is easily recognized. Negatives may be placed within the filler sleeves or submitted separately.

All photographs which do not conform to these specifications and/or which, in the Engineer's estimation, are unsatisfactory, shall be rephotographed.

SS1-03. SPECIFICATION FOR PRECONSTRUCTION VIDEOTAPING--When specified in the special provisions:

A. General:

The Contractor shall provide preconstruction color videotaping of surface features located within the zones of influence of the construction, supported by simultaneous audio description of said features.

Such coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, ditches, streets (including condition of paving for full width), intersections, landscaping, trees, culverts, catch basins, head walls, fences, retaining walls, visible utilities and all buildings and structures located within the zone of influence. Of particular concern are any exiting faults, fractures, defects or other imperfections exhibited by the above-mentioned surface features.

Houses and buildings shall be identified visually by house or building number, when possible, in such manner that the progress of the taping and proposed construction areas may be located by reference to the houses and buildings.

B. Requirements:

1. All video recordings must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recording, the engineering stationing corresponding to the stationing on the plans or as directed by the Engineer, the name of the street, easement or building being documented, the project name, direction of travel and the viewing side. The date and time to appear in the upper left hand corner of the picture -- example:

   Time 8:35:15
   Date 9/9/93

2. All taping shall be done during times of good visibility.

3. All tapes shall be turned over to the Engineer on a regular basis as outlined in the Special Provisions and shall become property of the City.

4. All tapes shall be properly identified by tape, number, location and project name.

5. All equipment, accessories and materials to perform this service shall be furnished by the contractor.

SS1-04. SPECIFICATION FOR RECORD DRAWINGS--When record drawings are specified in the Special Provisions, the Contractor shall maintain a neatly and accurately marked set of record drawings. The drawings shall show the exact location of all underground work. All underground components of sprinkler systems shall be located by field measured dimensions, either from fixed structures or triangulation. These measured dimensions shall be shown on the record drawing.

Drawings shall be subject to the inspection of the Engineer at all times and shall be kept currently weekly with all work instructions, change orders, and construction adjustments shown thereon and initialed by the inspector. Progress payments or portions thereof may be withheld if drawings are not maintained as stated above. At the final inspection the Contractor shall submit to the inspector, for review and comment by the Engineer, two sets of record drawings. The work will not be formally accepted until record drawings are accepted by the Engineer.

SS1-05. PAYMENT--The cost of the preconstruction photographs or record drawings shall be included in the price paid for other items of work in the Proposal, and no separate payment will be made therefor.

SS-2. CLEARING AND GRUBBING

SS2-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a lump sum price for clearing and grubbing. If no item for clearing and grubbing is included in the Proposal, it shall be understood that such work will be done as herein specified, and that the cost for such work will be included in the prices bid for other items of work, and that no additional compensation for clearing and grubbing shall be made.

Unless otherwise specified in the Special Provisions or shown on the plans, clearing and grubbing shall conform to Section 15 and 16 of the State Specifications and shall include, but not be limited to, all the work set forth herein.

SS2-02. DEBRIS--The removal and disposal from the right of way or easement area, of all objectionable materials such as weeds, grass, roots, stumps, trash, broken concrete, and other debris.

SS2-03. SIGNS--The protection and maintenance of existing signs and the removal, protection, storage, and resetting of City of Rocklin traffic signs that are affected by the work shall be the responsibility of the Contractor, as directed by the Engineer, or as specified in the Special Provisions. The Contractor shall inventory all existing City signs prior to the start of work. The Engineer shall confirm the inventory in writing prior to the start of work. Traffic signs and traffic control facilities existing within the limits of the project shall not be moved except as necessary to prevent them from being damaged by construction operations. When a sign needs to be removed because it interferes with the Contractor's work, it shall be done in one of the following described manners:

A. Stop signs shall be maintained in their existing positions as noted in the inventory. Any stop sign which must be moved from its existing position and reinstalled in a new position, must be approved by the Engineer before said stop sign is moved.

B. Traffic signs and traffic control facilities, other than stop signs, necessary for the control of traffic during the project shall be maintained in place in an upright position and located so as to properly control traffic. Whenever it is necessary to remove them from their permanent location due to construction work, they shall be reinstalled in their permanent location at the earliest possible time.

C. Traffic signs and traffic control facilities not necessary for the control of traffic during the project shall be removed and salvaged by the Contractor. When signs are removed and salvaged as provided herein, they shall be stockpiled as noted in Section 15-2.04 of the State Specifications, in an upright position, and the City Maintenance Section shall be notified within 24 hours of such stockpiling. The City will then remove these signs from the project.

The project sign inventory shall indicate which of the above categories applies to each sign, subject to approval of the Engineer.

No additional payment shall be made for the above-described work. It shall be included in the unit prices for other activities.

SS2-04. MAILBOXES--Removal and resetting of all mailboxes and newspaper tubes which are affected by the construction. All mailboxes shall be maintained in an upright position adjacent to the construction area between the time the mailbox is removed and reset in its final location. Mailboxes shall be reset on 4 x 4 redwood posts unless otherwise noted on plans. They shall be set a minimum of 2 feet in concrete. Mailboxes which can be salvaged intact, including ornamental or iron supports, shall be salvaged and reset. The bottom of mailboxes shall be set at a height of 3 feet 6 inches above the back of curb or edge of shoulder. The face of the box shall be set one foot behind the back of sidewalk on Class "A" streets, 1 foot behind the back of curb on Class "B" streets, and 1 foot behind the outside shoulder line on Class "C" streets.

SS2-05. UNDERGROUND--Removal and disposal of abandoned pipes and conduits and other abandoned structures which conflict with the structural section of the roadway or underground installation. The plugging of all other abandoned pipes indicated on the plans or directed by the Engineer.

SS2-06. SURVEY MONUMENTS--The preservation of survey monuments and markers shown on the plans or encountered along the line of the work is mandatory. The Contractor shall notify the Engineer of monuments encountered, and shall not remove, disturb or damage said monument until the monument can be cross referenced and tied out by a licensed surveyor. The Contractor shall allow a minimum of one working day for such referencing to be accomplished. When notified by the Engineer that the ties have been completed, the monument or marker can then be removed. The Contractor is not responsible for the replacement of any monument or marker, the removal of which is necessitated by the work to be performed and which has been referenced and tied as set forth herein. If, through negligence or carelessness on the part of the Contractor, notification is not made as provided above or markers are removed or disturbed which are not in direct conflict with the construction, the Contractor shall be responsible for the cost of referencing, resurveying, and replacement of the monument or marker. Such sums for the replacement shall be deducted from the final contract payment.

SS2-07. DRAINAGE FACILITIES--The Contractor shall be responsible for maintaining all existing drainage and irrigation facilities and to re-establish the drainage and irrigation ditches and facilities to their original location and condition as soon as possible after completion of the work in the area, to the complete satisfaction of the Engineer, except when such realignment or modification of the existing facilities are set forth on the plans and in other items of work.

SS2-08. SPRINKLERS AND LIGHTS--Sprinkler system pipes, heads, hose bibs, and yard lighting systems which interfere with the clearing and grubbing or excavation for roadway or drainage projects within roadway rights of way or drainage easements for channels shall be cut and capped at the right of way line or easement line unless otherwise set forth on the plans and in the Special Provisions. On projects for underground construction of sewer or water facilities and on

drainage projects in public utility easements or other easements, replaced and reconstructed to their original location and condition, unless otherwise set forth in the Special Provisions.

SS2-09. TREES AND SHRUBBERY--On underground construction of all sewer and water facilities and underground construction of drainage facilities within easements where construction is to be performed in the vicinity of trees, shrubbery, and lawns, the work shall be carried out in such a manner which will cause minimum damage to public and private property. Those trees which are to be removed and disposed of shall be so designated on the plans. A permit for tree removal shall be obtained from the City of Rocklin Department of Public Works prior to any tree removal. Prior to the clearing and grubbing operation on a particular property, the Engineer will designate to the Contractor those trees and shrubbery that may be removed. Trees and shrubbery which are not to be removed shall be protected from injury or damage by the Contractor's operations. Trees and shrubs which are to be removed and not specifically designated for disposal, shall be preserved by removing in a ball of natural material and the roots wrapped in burlap and kept moist until the work has progressed enough for the replanting of the tree or shrub. The replanting shall be performed in a careful and professional manner. Roots 2 inches to 4 inches in diameter which are severed during the course of the excavation shall be neatly trimmed and coated with a heavy coat of approved tree seal compound. Roots greater than 4 inches in diameter encountered in the course of excavation for underground facilities which do not interfere with the pipe grade shall be exposed but not severed and shall be wrapped in burlap and kept moist until the backfilling operation is completed. Lawns which are disrupted during the course of the construction shall be regraded to match the existing lawn but not reseeded unless specifically stated otherwise on the plans or in the Special Provisions.

Grading or excavation within the driplines of oak trees shall conform to City of Rocklin Oak Tree Preservation Ordinance.

On roadway construction projects the Contractor shall remove all trees, shrubbery, and lawns within the existing rights of way which interfere with the excavation, embankments slopes, ditches, or structures, unless specifically indicated on the plans, or directed by the Engineer to be saved. Tree branches which extend over the roadway shall be trimmed to provide a minimum clearance of 14 feet above the shoulder point of the roadbed unless specifically permitted otherwise in writing by the Engineer. The tree branches or shrubbery branches removed shall be cut off close to the bole of the tree in a smooth, neat, manner, and the cut treated with a heavy coating of an approved tree seal compound. The Contractor shall remove other branches at the direction of the Engineer in such a manner that the tree or shrubbery will present a uniform balanced appearance.

SS2-10. FENCING--The Contractor shall be responsible for the placing, maintenance, and removal of any temporary fencing that may be necessary along the line of work to confine or protect livestock that may be pastured in areas through which the work is to proceed. All existing fences that intersect a fenced channel easement line or a right of way line at an angle shall be cut and a new end post equal to or better than the existing shall be set at the right of way line and the existing fence attached thereto. Any fences removed for the Contractor's convenience during construction shall be replaced in accordance with Section SS-85.

SS2-11. CONCRETE--Where a portion of a concrete structure, slab, or curb is to be removed, the concrete shall be cut with a concrete saw so that the edge of the remaining concrete shall form a neat, straight line. Where concrete slabs, curbs, ornamental walls, brick work, or similar items are encountered in the course of the construction of underground facilities, except drainage facilities within road rights of way, the structure or facility shall be reconstructed to match the existing portion of the facility. On roadway projects and drainage construction in highway rights of way, the facility shall be removed to the right of way line and the end of the facility shall be reconstructed to provide a neat and workmanlike appearance.

SS2-12. DISPOSAL AND SALVAGE--All materials removed as provided herein shall become the property of the Contractor and shall be disposed of off the rights of way or easement unless otherwise set forth on the plans or in the Special Provisions. Existing public or private improvements which are designated on the plans or in the Special Provisions to be salvaged shall be carefully removed and stockpiled in the right of way or easement for later removal by City forces or the adjacent property owner, as specified.

SS2-13. SILT CONTROL--During construction, provision shall be made to prevent siltation of the downstream drainage system, both from winter runoff or from any dry season flow passing through the construction site. Such provision may include silt basins, silt fences, or other physical means. If the Contractor's methods fail to prevent siltation, or he fails to provide a protection against siltation, he shall clean the downstream drainage system to the satisfaction of the Engineer, and he shall be responsible for any damage which might result.

SS-3. ROADWAY EXCAVATION

SS3-01. ITEM--Under this item of the Proposal, the Contractor shall bid a price per cubic yard for roadway excavation.

SS3-02. PAYMENT--The requirements of this specification shall be as set forth in Sections 15 and 19 of the State Specifications, except that the contract unit price paid per cubic yard for roadway excavation shall include full compensation for compacting natural and original ground, for subgrade preparation, for all haul and overhaul, for excavation, for placing earth embankment as shown on the plans and as directed by the Engineer, and for furnishing all water necessary for the compaction of the material and subgrade preparation. The bid price shall also include shaping and trimming slopes to solid material and to the lines and elevations shown on the plans.

SS3-03. DITCHES AND CHANNELS--Ditches and channels in the median area, between roadway and frontage roads and side ditches contiguous to the roadway and other locations as shown on the plans will be paid for as roadway excavation as specified herein, unless specifically indicated as ditch and channel excavation in the Special Provisions and the Proposal.

SS3-04. SUBGRADE PREPARATION--The requirements for subgrade preparation shall be as set forth in Section 19-5, "Compaction", and Section 19-6, "Embankment Construction", of the State Specifications and in accordance with the following provisions:

A. Relative compaction of not less than 95 percent shall be obtained for minimum depth of 0.5 foot below the subgrade grading plane for the width between the outer edges of shoulders whether in excavation, embankment, or at original ground level. In addition, all other material shall be compacted to a relative compaction of 95 percent, including subgrade under curb and gutter and sidewalk and embankment under bridge and retaining wall footings.

B. When the next layer of material to be placed on the subgrade is an aggregate base or an aggregate subbase, the subgrade grading plane at any point shall not vary more than 0.10 foot above or below the grade established by the Engineer.

C. When the next layer of material to be placed on the subgrade is an asphalt concrete pavement, asphalt concrete base, or asphalt concrete subbase, the subgrade grading plane at any point shall not vary more than 0.05 foot above or below the grade established by the Engineer.

SS3-05. UNSUITABLE ROADWAY EXCAVATION AND BACKFILL--Any unsuitable material encountered within 2 feet below the subgrade or 2 feet below original ground, whichever is lower, shall be brought to the attention of and removed at the direction of the Engineer and the additional excavation greater than that required for preparation of original ground or subgrade shall be computed and paid for at the contract unit price bid per cubic yard of roadway excavations. Unsuitable material excavated more than 2 feet below subgrade shall be paid for as extra work if no item for "unsuitable material excavation" appears in the proposal.

The Contractor shall use extra care in excavating unsuitable material so as not to aggravate the condition. If, in the opinion of the Engineer, the Contractor's methods for excavating are increasing the amount of unsuitable material required to be excavated, the Engineer will require the Contractor to take the necessary steps to correct the condition.

Backfill to replace the unsuitable material removed as roadway excavation shall be placed and compacted to subgrade as specified herein. Suitable backfill material shall be one of the following:

A. Pit run materials as specified in Section SS-14 of these specifications.

B. Cobbles as specified in Section SS-15 of these specifications.

C. Roadway excavation material approved by the Engineer.

D. Imported borrow as specified in Section SS-7 of these specifications.

E. Geotech reinforcing fabric in combination with "A", "B", "C", and "D".

F. Any combination of "A", "B", "C", "D" and "E".

The selection of the proper backfill shall be at the discretion of the Engineer. Backfill, when made with material excavated from the job site, will be paid for at the same contract unit price paid for roadway excavation. The pay quantity will be the same as that computed for unsuitable material excavated as roadway excavation as specified herein. Imported borrow, pit run material and cobbles, and the placing of such materials shall be paid for as specified in these Standard Specifications for those items.

SS3-06. UNSUITABLE MATERIAL IN EMBANKMENTS--Unsuitable material excavated as roadway excavation, which, in the opinion of the Engineer, cannot be worked into the roadway embankment, shall be removed from the job site or wasted within the right of way as directed by the Engineer. No additional compensation will be allowed for removing unsuitable material from the job site. Unsuitable material excavated as roadway excavation, which in the opinion of the Engineer can be used for roadway embankment, shall be placed in embankment below a plane 30 inches below the finished grade and compacted to a minimum relative compaction of 90 percent. No additional compensation will be allowed for placing unsuitable material in the roadway embankment.

SS3-07. RELATIVE COMPACTION--Whenever relative compaction specified in these specifications or the Special Provision, the relative compaction will be determined by Test Method No. California 231 or the latest State test method.

SS3-08. SURPLUS MATERIAL DISPOSAL--The Contractor's attention is directed to Section SS-13 "Surplus Material Disposal" of these specifications for disposal of excess excavation materials outside of easements or right of way.

SS-4. DITCH AND CHANNEL EXCAVATION

SS4-01. ITEM--Under this item of the Proposal, the Contractor shall bid a unit price per cubic yard for ditch and channel excavation when such ditch and channel excavation is specifically indicated on the plans and in the Proposal. Ditches and channels shall be excavated to line and grade and sections as shown on the plans. Material resulting from excavating ditches and channels shall be used in fill and embankment areas as shown on the plans; surplus excavated materials shall become the property of the Contractor, and shall be disposed of as specified in Section SS-13 of these Specifications, unless otherwise shown on the plans or in the Special Provisions. No additional compensation shall be made for disposal of surplus excavated materials. Trees and shrubbery shall be protected as required in Section SS-2.

SS4-02. TOLERANCES--For channels which are not to be lined, allowable deviation in profile shall be 0.10 foot; allowable deviation in slope and alignment shall be 0.15 foot in any 10 foot length of channel. For channels which are to be lined, allowable deviation in excavated channel from profile shall be 0.05 foot; allowable deviation in slope and alignment shall be 0.10 foot in any 10 foot length of channel. The Contractor shall place grade control points at 25 foot intervals along the invert of the shaped channel being prepared for lining to control the grade and thickness of the concrete bottom. For lined channels 12 feet and over in width, the Contractor shall place grade control points at 25 foot intervals along each edge of the bottom. Care shall be taken to prevent excavating below the channel grade line or beyond the slope lines. Areas excavated below grade or beyond the slope shall be filled with suitable materials and thoroughly compacted to 90 percent relative compaction by the Contractor at his own expense.

SS4-03. UNSUITABLE DITCH AND CHANNEL EXCAVATION AND BACKFILL--Any unsuitable material as determined by the Engineer, encountered within 2 feet below the subgrade of the channel shall be removed at the direction of the Engineer and the additional excavation greater than that required for channel subgrade shall be computed and paid for at the contract unit price bid per cubic yard of channel excavation. The Contractor shall use extra care in excavating unsuitable material so as not to aggravate the condition. If, in the opinion of the Engineer, the Contractor's methods for excavating are increasing the amount of unsuitable material required to be excavated, the Engineer will require the Contractor to take the necessary steps to correct the condition. Should the Contractor elect to place cobbles or other material in the channel bottom to provide a working surface, in lieu of dewatering the channel, the cost of furnishing and placing such material shall be at the Contractor's sole expense.

Backfill of unsuitable material removed as channel excavation shall be placed and compacted to subgrade as specified herein. Suitable backfill material shall be one of the following:

A. Pit run materials as specified in Section SS-14 of these Specifications.

B. Cobbles as specified in Section SS-15 of these Specifications.

C. Channel excavation materials approved by the Engineer.

D. Imported borrow as specified in Section SS-7 of these Specifications.

E. Any combination of "A", "B", "C", and "D".

The selection of proper backfill shall be at the discretion of the Engineer. Backfill, when made with material excavated from the job site, will be paid for at the same contract unit price paid for channel excavation. The pay quantity will be the same as that computed for unsuitable material excavated as channel excavation as specified herein. Imported borrow, pit run material, and cobbles, and the placing of such materials, shall be paid for as specified in these Standard Specifications.

SS4-04. UNSUITABLE OR SURPLUS MATERIAL DISPOSAL--Unsuitable or surplus material excavated as channel excavation, which in the opinion of the Engineer, cannot be worked into the required embankments, shall become the property of the Contractor and shall be disposed of as specified in Section SS-13 of these specifications, unless otherwise shown on the plans or in the Special Provisions. No additional compensation shall be made for disposal of surplus material or of surplus unsuitable material.

SS4-05. CHANNEL BACKFILL--In those areas where the bottom of the existing channel is below the proposed grade or beyond the slope lines, the Contractor shall fill and thoroughly compact these areas to 90 percent relative compaction with suitable material. No additional payment will be made for this work, as it shall be considered as included in the price bid for channel excavation.

SS4-06. CHANNEL EMBANKMENTS--Embankments shall be placed as shown on the plans. Embankment areas shall be filled with suitable material, as determined by the Engineer, resulting from channel excavation. The fill shall be placed in a neat and uniform manner, and shall be spread uniformly to the grades as shown on the plans. Where embankment is made on the existing channel or on other slopes, the existing slope shall be plowed or cut into as the embankment is constructed so as to tie the new embankment to the existing slope. All fill slopes shall be trimmed to give a neat and uniform appearance.

In lined channels, fill areas shall be compacted to a relative 90 percent to an elevation one foot above the top of the channel lining, unless otherwise shown on the plans. Fill areas in unlined channels shall be compacted to a relative compaction of 90 percent unless otherwise shown on the plans.

SS4-07. WATER--The method and rate of applying water shall conform to Section 17 of the State Specifications. The Engineer shall determine the necessity for dust control, the areas in which the water is to be applied, and the quantity of water to be applied. Unless specifically set forth in the Special Provisions and in the Proposal, no additional payment will be made for water, and the cost involved for furnishing and applying water shall be included in the price bid for channel excavation.

SS4-08. PIPE ADJUSTMENTS--Existing side drain pipes shall be extended or shortened as required to discharge into the new channel, so that the invert of such pipe is flush with the channel slope. The pipe used for extending existing side drains shall be of the same diameter as the existing pipe, and shall conform to one of the options specified in these Standard Specifications.

Method of placing pipe extensions shall conform to these specifications and the Standard Drawings. Existing side drain pipes to be shortened shall be cut off parallel to the slope of the channel in a neat, workmanlike manner.

SS4-09. PAYMENT--The unit price paid for channel excavation shall include full compensation for earth berms, overhaul, channel fills, sliver fills, access ramps, channel embankment, disposal of surplus channel excavation or unsuitable materials, dewatering, extending and shortening existing side drains and furnishing and applying water for compaction and dust control, and no separate payment will be made for any of these items.

SS-5. RESEEDING

SS5-01. ITEM AND PAYMENT--Under this item of the proposal the Contractor shall bid a lump sum price for reseeding the unlined side slopes on the newly constructed channel and embankments and all other areas disturbed by construction as directed by the City Engineer. If there is no payment item in the proposal for reseeding, and reseeding is called for on the plans or in the Special Provisions, the cost of reseeding shall be included in other items of work.

SS5-02. SPECIFICATION--Seed and fertilizer application rates, deliveries and mixtures shall conform to the specifications set forth in the "latest edition" of *The Erosion and Sediment Control Guidelines for Developing Areas of The Sierra Foothills and Mountains* prepared by the High Sierra RC&D Council.

SS5-03 EXECUTION--Methods and construction practices for seedbed preparation and broadcasting shall conform to the provisions set forth in the "latest edition" of *The Erosion and Sediment Control Guidelines for Developing Areas of The Sierra Foothills and Mountains* prepared by the High Sierra RC&D Council.

SS-6. UNSUITABLE MATERIAL EXCAVATION

SS6-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per cubic yard for excavation of unsuitable material. Unsuitable material, by definition, shall be that material determined by the Engineer to be unsuitable in its natural location and condition for roadway, channel, or structural foundation. Unsuitable material shall be that material below a plane, said plane being two feet below subgrade of roadway, channel or foundation of structure as determined by the structural section, flow line or foundation or two feet below original ground, whichever is lower.

SS6-02. APPROXIMATE QUANTITY--The quantity shown for this item shall be considered as approximate and is indicated for bid comparison only, and no guarantee is made or implied that the quantities as shown will not be reduced or increased or deleted as may be required by the Engineer.

SS6-03. EMBANKMENT AND DISPOSAL--The Contractor shall use extra care in excavating unsuitable material so as not to aggravate the condition. If, in the opinion of the Engineer, the Contractor's methods for excavating are increasing the amount of unsuitable material required to be excavated, the Engineer will require the Contractor to take the necessary steps to correct the condition. Unsuitable material excavation, which in the opinion of the Engineer, cannot be worked into roadway embankment, or other embankments, shall be disposed of as set forth under Section SS-13 of the Specifications. Unsuitable materials, which in the opinion of the Engineer can be used in embankments, shall be placed and compacted in the embankment as set forth in Section SS3.06 of these specifications. No additional compensation will be allowed for the placing of unsuitable material in embankments as required herein.

SS6-04. BACKFILL--Backfill of areas excavated as unsuitable materials shall be placed and compacted to a minimum relative compaction of 95 percent within 30 inches of finished grade on roadways and structural foundations. Below 30 inches of finished grade on roadways and below subgrade in channels, compaction shall be not less than 90 percent. Suitable backfill material shall be one of the following:

A. Pit run materials as specified in Section SS-14 of these specifications.

B. Roadway excavation, structural excavation, or channel excavation material approved by the Engineer.

C. Imported borrow as specified in Section SS-6 of these specifications.

D. Cobbles as specified in Section SS-13 of these specifications.

E. Any combination of "A", "B", "C", and "D".

The selection of the proper backfill shall be at the discretion of the Engineer. Backfill, when made with select material excavated from site, will be paid for at the same contract unit price paid for

roadway excavation or channel excavation, whichever applies, and the pay quantity will be the same as that computed for unsuitable material excavation as specified herein. Imported borrow, pit run materials, and cobbles, and the placing of such materials shall be paid for as set forth in these specifications.

SS-7. IMPORTED BORROW

SS7-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a unit price per cubic yard for imported borrow compacted in place. Imported borrow shall consist of material required for the construction of embankments and shall be obtained from sources listed in the Special Provisions, or if no sources are listed, from sources the Contractor may elect. The Contractor's optional sources shall be approved in advance by the Engineer. Imported borrow shall be free of roots, vegetable matter, and other unsatisfactory material, and be of such character that it will readily bind to form a firm and stable embankment when compacted.

If no item for imported borrow appears in the Proposal, and the Engineer deems it necessary to place imported borrow, the material shall be furnished and placed as extra work in accordance with Section GS4-1.03D of the General Specifications.

SS7-02. AGREEMENTS--The Contractor shall enter into an agreement with the owner of any privately owned material site to hold said owner harmless from any claims for injury to persons or damage to property resulting from the Contractor's operations on said property. The agreement shall contain provisions to relieve the City of any obligation to the owner or claims for injury or damage of persons or property. Before commencing operations at the material site, the Contractor shall deliver satisfactory written evidence of said agreement to the Engineer. The Contractor's attention is directed to Section GS6.2 of the General Specifications in regard to local materials and their sources.

SS7-03. PLACEMENT--The imported borrow material shall have a sand equivalent of not less than the average sand equivalent of the native material that is adjacent to the existing roadbed, or as otherwise set forth in the Special Provisions, and shall be placed and compacted as herein specified for roadway embankment.

SS-8. STRUCTURE EXCAVATION AND BACKFILL

SS8-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per cubic yard for structure excavation. Structure excavation shall conform to Section 19-3 of the State Specifications, except as herein modified. The contract unit price per cubic yard for structure excavation shall include full compensation for all necessary excavation, structure backfill, and pervious backfill within the limits set forth on the plans, Standard Drawings, and in the Special Provisions. Structure and pervious backfill shall conform to Section 19-3.06 of the State Specifications and Chapter 70 of the UBC.

SS8-02. JETTING--Jetting of structure backfill will not be allowed except when specifically set forth in the Special Provisions.

SS8-03. EXISTING STRUCTURES--When removing an existing structure which is to be replaced with a new structure, no payment will be made under this item for the area occupied by the existing structure.

SS8-04. PIPES AND MISCELLANEOUS STRUCTURES--Payment for and method of excavation and backfill for all pipes, manholes, inlets and miscellaneous facilities shall be as set forth elsewhere in these specifications.

SS8-05. UNSUITABLE MATERIALS--Unsuitable materials encountered at the grade elevation of the structural excavation which are directed by the Engineer to be removed and backfilled shall conform to Section SS-6 of these specifications.

SS8-06. FINAL QUANTITY--The quantity of structural excavation shown on the plans and in the proposal shall be the final quantity for which payment will be made as provided in Section GS9-1.015 of the General Specifications.

SS-9. TRENCH EXCAVATION

SS9-01. ITEM--Trench excavation shall include the removal of all materials or obstructions of any nature, and the control of water necessary to construct the work as shown. Unless otherwise indicated on the drawings or permitted by the Engineer, excavation shall be by open cut.

SS9-02. EXPLORATORY HOLES--An encroachment permit must be obtained from the City Department of Public Works prior to any exploratory drilling or excavation within rights of way, or other public easements. The exploratory holes shall be backfilled with sand or native excavated materials, which shall be jetted to prevent subsequent settlement, prior to nightfall of the same day that the exploratory drilling or excavation takes place.

SS9-03. TRENCH WIDTH--Minimum trench width shall be the outside diameter of the pipe plus 16 inches, except for cast-in-place pipe. Maximum trench widths at the top of the pipe shall be as shown on the plans for the designated type bedding. If no maximum is shown, the Contractor shall conduct his operation to limit top trench widths to pipe outside diameter plus 16 inches for pipe 33 inches or smaller, and pipe outside diameter plus 24 inches for pipe 36 inches and larger, except with the specific approval of the Engineer. If trench widths at the top of the pipe as shown on the plans or as specified herein are exceeded by any amount, for any reason, the Contractor shall provide, at his own expense, stronger pipe or improved bedding and backfill conditions, as approved by the Engineer, to meet the load requirements of the changed condition. This requirement shall be a consideration for pipe at manhole excavations and at boring and jacking excavations.

SS9-04. CUTTING OF PAVEMENT-- When the trench is in an existing paved area, the pavement shall be sawed or scored on neat lines parallel and equidistant from the trench centerline. Pavement between the lines shall be broken and removed immediately ahead of the trenching operations. The width of pavement removed shall be sufficient that the trenching operation does not damage the edges of the pavement left in place. When the existing pavement is concrete, it shall be sawed to a neat line 6 inches wider on each side than the actual trench width. When the existing pavement is asphaltic concrete, it shall be sawcut and removed as per the Standard Drawing # 5-3 Trench Excavation & Backfill detail.

Due to the uncertainty of the location of underground utilities, the pavement shall not be cut until the respective utility companies have marked the location of their facilities and the Engineer has given final approval of the trench alignment.

SS9-05. BLANK

SS9-06. MAXIMUM LENGTH OF TRENCH OPEN--At the end of each working day, there shall be a maximum of 300 feet of open trench in unimproved areas, excluding manhole excavations, for each operation unless otherwise authorized by the Engineer. The remainder of the trench shall be backfilled and compacted, and when in streets, opened to traffic as soon as possible. If set forth in the Special Provisions for the interest of public safety and convenience, the entire trench and all excavations shall be backfilled and equipment relocated as directed at the end of each working day. The maximum length of trench open for cast-in-place concrete pipe shall be as specified in Section SS-51 of these specifications.

SS9-07. CONTROL OF WATER--When water is encountered, either ground water or surface run-off, the Contractor shall furnish, install, maintain, and operate all necessary machinery, appliances, and equipment to keep excavation reasonably free from water until the placing of the bedding material, laying and jointing of the pipe, pouring of concrete, and placing of the shading material has been completed, inspected, and approved, and all danger of flotation and other damage is removed. Water pumped from the trench shall be disposed of in such manner as will not cause injury to public or private property or constitute a nuisance or menace to the public, and the

disposal method shall be subject to the approval of the Engineer. Water entering any pipe as a result of ground conditions, the Contractor's use in balling and flushing, storm waters, broken water pipes, or from any other condition shall not be allowed to enter the existing downstream system, except as specified in Section SS62-05.

SS9-08. SPECIAL FOUNDATION TREATMENT--Whenever the bottom of the trench is soft or rocky, or, in the opinion of the Engineer, otherwise unsuitable as a foundation for the pipe, the unsuitable material shall be removed and replaced with crushed rock, gravel, or sand as directed by the Engineer, so as to provide a stable and satisfactory base. When the trench bottom is cobbled or of any other material which might, in the opinion of the Engineer, allow loss of sand backfill, the backfill material shall be crushed rock or gravel graduated so that 100 percent will pass the 3/4 inch sieve and not more than 15 percent will pass the No. 8 sieve. Sand backfill, when permitted by the Engineer, shall conform to the material for Type I bedding, as specified in Section SS9-11 of these specifications. Such backfill material shall be compacted to a minimum relative compaction of 90 percent. If material more than 12 inches below the normal trench bottom as required for proper bedding of the pipe is ordered removed by the Engineer, the excavation below that point and the imported material required to backfill the trench to that elevation shall be paid for as extra work. Before excavation of the pipe trench in fill area or roadway embankments, the fill area or embankment shall be completed to a height above the pipe invert grade line of not less than twice the internal pipe diameter or to final fill or embankment subgrade, whichever is lower, but in no case less than 12 inches above the top of the pipe. Such embankment shall be compacted to a minimum relative compaction of 90 percent for a distance on each side of the pipe equal to at least two pipe diameters. The remainder of the embankment shall be compacted to the minimum relative compaction specified elsewhere in these specifications for the type of construction being done, or as specified in the Special Provisions or on the plans. Special foundation treatment for cast-in-place concrete pipe shall be as specified in Section SS51-05 of these specifications.

SS9-09. EXCAVATION METHOD--Methods used in excavation shall be such as not to cause damage to surrounding property or to unnecessarily damage pavement. Street pads for backhoe outriders and other equipment to prevent unnecessary damage shall be utilized. Protection of trees and shrubbery shall conform to SS-2.

SS9-10. PAYMENT--Full compensation for trench excavation as herein specified, including all equipment, labor, materials, dewatering, special traffic considerations and safety measures required, shall be included in the price bid per lineal foot of the respective sizes, grades, and types of pipes and conduits listed in the Proposal, and no additional compensation will be allowed therefor.

SS-10. SHORING AND BRACING

SS10-01. ITEM--Under these items of the Proposal, the Contractor shall bid a lump sum price for shoring and bracing of trenches and other excavations. If no item for shoring and bracing is included in the Proposal, it shall be understood that such work shall be done as herein specified, and that the cost for such work shall be included in the prices bid for other items of work, and that no additional compensation will be made.

SS10-02. SPECIFICATIONS--The Contractor shall install sufficient shoring and bracing to insure the safety of workmen, protect the work, and protect adjacent improvements. Shoring and bracing shall comply with the rules, orders, and regulations of the California Division of Industrial Safety. The Contractor shall submit a plan for protection of workmen in accordance with Section GS7-1.06 of these specifications.

Insofar as possible, sheeting shall not extend below the bottom of the pipe barrel. All sheeting, timbering, lagging, and bracing shall, unless otherwise required by the Engineer, be removed during backfilling, and in such a manner as to prevent any movement of the ground or damage to the piping or to other structures. When the Engineer requires that sheet piling, lagging, and bracing be left in place, such materials shall be cut off where designated and the upper part withdrawn. If steel piling is utilized, it may be withdrawn with compacting of backfill to proceed as it is removed.

SS10-03. SUSPENSION OF WORK--Failure to comply with any of the rules, orders, or regulations mentioned herein shall be sufficient cause for, but shall not place any responsibility upon, the Engineer to immediately suspend the work. The Contractor shall be responsible for the adequacy of all shoring and bracing and compliance with the law, and failure of the Engineer to suspend the work or notify the Contractor of any inadequacy of shoring and bracing or non-compliance with the law shall not relieve the Contractor of this responsibility. No compensation for losses incurred by the Contractor for any such suspension will be allowed.

SS10-04. PAYMENT--The lump sum price bid for shoring and bracing shall include all labor, materials, equipment, and supplies required for placing and removal of shoring and bracing as herein specified.

SS-11. TRENCH BEDDING AND BACKFILL

SS11-01. BEDDING AND INITIAL BACKFILL (DRAINAGE)--Unless otherwise indicated on the drawings and in the Special Provisions, the pipe shall be placed on a firm, prepared bed of imported materials. All loose material shall be removed from the new trench bottom before placing the bedding material. Bedding shall extend at least 4 inches below the pipe barrel or 1/4 the diameter of the pipe whichever is larger or of a sufficient depth to provide a firm bedding as approved by the Engineer. Other requirements shall be as follows:

A. Drainage:

The pipe shall be bedded uniformly throughout its length. The bearing shall be achieved by shaping the bedding or by lightly "bouncing" the pipe to set it into the bedding. The Contractor shall then place backfill material to the spring line of the pipe, thoroughly compacting it by shovel slicing if gravel or by light tamping if sand, to provide proper support under the pipe haunches. Care shall be used not to disturb or displace the pipe.

When the trench bottom is cobbled or of any other material which, in the opinion of the Engineer, might allow loss of sand bedding, the bedding material shall be crushed rock or gravel graduated so that 100 percent will pass the 3/4 inch sieve and not more than 15 percent will pass the No. 8 sieve.

Where solid rock is encountered and blasting is required near the pipe bottom, the rock shall be removed to a minimum depth of 12 inches below the bottom of the pipe, and the trench backfilled with materials conforming to Section SS8-08 of these specifications and compacted to a minimum relative compaction of 90 percent.

Pipe shall not bear on bells or joints. The trench shall be excavated at the pipe joints as necessary to provide at least 1-1/2 inches of bedding material below the bell. No wedging or blocking of the pipe will be permitted.

Initial backfill shall be the material placed from the top of the bedding to a point 12 inches above the top of the pipe and pipe bell, and shall be placed only with approval of the Engineer.

Unless otherwise noted on the plans, bedding and initial backfill shall be Type 1 with an unlimited trench width allowable, subject to the limitations of Section SS9-03 of these specifications.

SS11-02. BEDDING AND INITIAL BACKFILL MATERIALS: (DRAINAGE) - Imported bedding and initial backfill materials for drainage pipes shall be crushed rock, or coarse sand of which 100 percent shall pass the 3/4 inch sieve, and which shall have a minimum sand equivalent of 50, as determined by Test Method No. Calif. 217.

For pipes less than 24 inches in diameter, imported bedding and initial backfill material, as specified herein, shall be placed to an elevation of 6 inches above the top of the pipe barrel.

For pipes 24 inches or larger in diameter, imported bedding and initial backfill material, as specified herein, shall be placed to the spring line of the pipe. Initial backfill material above the spring line of the pipe shall be either the herein specified imported initial backfill materials, or selected job excavated materials, finely divided and free from debris, organic matter, or pieces larger than 1 inch in diameter. The initial backfill material shall be placed to an elevation 6 inches above the top of the pipe barrel.

For a distance of 3 feet from the open end of a pipe not protected by a headwall or inlet structure, the bedding and initial backfill shall consist of native materials.

Compaction of the bedding and initial backfill material shall be accomplished by shovel slicing, tamping, or other means as directed by the Engineer, to assure that all voids under the pipe haunches and around the pipe are filled. Shaping of the bedding material will not be required. Extra care shall be used in placing and compacting bedding and initial backfill so as not to displace the pipe.

Job excavated material may be used in lieu of the specified imported bedding and initial backfill material provided the job excavated material meets the requirements for imported crushed rock, or coarse sand as specified herein. Should the Contractor elect to use job excavated material in lieu of imported crushed rock, or sand as specified, he shall furnish the Engineer with certified copies of laboratory reports showing the material meets the requirements of these specifications, and can be compacted to a minimum of 90%.

SS11-03. INTERMEDIATE BACKFILL--Trench backfill above the initial backfill and to a point 2 feet below the top of the trench in highway rights of way or traveled areas, or one foot below the top of the trench in areas of horticulture, may be job-excavated material placed in any manner determined by the Contractor. From the top of the initial backfill to 1 foot above the initial backfill all rocks over 3 inches in diameter shall be removed or approved imported backfill material may be used. For the remainder of the trench the maximum rock size shall be 6 inches. Rocks greater than 3 inches in diameter shall not contact each other all voids shall be filled. Until the total backfill above the top of the pipe exceeds 3 feet, machine-placed backfill material shall not be allowed to "free-fall" more than 2 feet. Intermediate backfill shall be placed only with the approval of the Engineer.

The Engineer may designate the use of "Imported Select Backfill" in lieu of job-excavated material. If imported select backfill is required, the material and methods of payment shall conform to Section SS-12 of these specifications unless specified otherwise on the plans or in the Special Provisions.

SS11-04. TRENCH JETTING--Compaction of backfill by jetting will be allowed only when specifically permitted in the Special Provisions as determined by onsite soils investigation and a sand equivalent value furnished by the Contractor for the backfill material and foundation materials is within allowable limits.

The backfill material shall be of such character that it will be self-draining when compacted and that foundation material will not soften or be otherwise damaged by the applied water and no damage from hydrostatic pressure will result to the structure.

When jetting is permitted, material for use as structure backfill shall be placed and compacted in layers not exceeding 4 feet in thickness. The work shall be performed without damage to the structure and embankment, and in such a manner that water will not be impounded. Jetting shall be supplemented by the use of other compaction equipment when necessary to obtain the required compaction.

When the backfilling operation has reached a level 2 feet below the surface of the ground or the subgrade, time shall be given for the excess water to drain away. Approved material shall then be compacted in 8 inch layers to obtain the required compaction.

Basing and paving of jetted trenches will not be allowed until approved by the Engineer.

Backfill material shall be water soaked with suitable pipe jets approved by the Engineer, but in no case shall the pipe jet and hose be less than 1-1/2 inches in diameter.

The pipe jet shall be sent to the bottom of the backfill layer and raised slowly in order to thoroughly saturate the material and cause it to slump to its maximum compaction.

Proceeding upgrade, jet points shall be staggered from side to side of the trench at intervals not to exceed 6 feet, or as necessary to insure that the backfill takes all possible subsidence. All "bridges" in the backfill material shall be completely broken down during the jetting process. No jetting operations will be allowed that will, in the opinion of the Engineer, jeopardize in any manner the stability of the sewer line in the trench. Jetting operations shall not be interrupted between manholes.

Jetting to be performed at times other than normal working hours shall have prior approval of the Engineer.

SS11-05. TOP BACKFILL--In highway rights of way or other traveled areas, the top 2 feet of backfill shall be placed and compacted in layers not exceeding 0.67 feet by mechanical means, to a minimum relative compaction of 90 percent. Jetting will not be allowed in the upper 2 feet rights of way or traveled areas.

If the excavation is through an open area or area used for horticulture, the final 12 inches of backfill shall be essentially the original topsoil which shall have been removed and stockpiled separately. The top backfill shall be thoroughly compacted by wheel rolling, then refilled with topsoil as necessary to bring the trench up to the level of the surrounding ground.

SS11-06. OTHER BACKFILL REQUIREMENTS--Where cribbing is used in the trench, the fill shall be carried to a height sufficient to prevent the surrounding ground from cracking or caving

into the trench before the cribbing is removed. Backfill around manholes and the pit excavated for boring operations shall be made in the same manner as above specified for trenches. However, whenever the excavated space between the outer wall of the manhole and the undisturbed earth is 12 inches or less, the backfill shall be sand, well compacted.

In highway rights of way or traveled areas where cover over the top of the pipe is 24 inches or less, backfill shall consist of aggregate base material conforming to Section SS-21 of these specifications.

If, at any time during a period of one year from the date of final acceptance of the project, there is any settlement of the trenches requiring repairs to be made, the Engineer may notify the Contractor to immediately make such repairs at the Contractor's expense (see Section GS2-1.12, Material Guaranty, of the General Specifications).

SS11-07. STREET CROSSINGS--Class 2 Aggregate Base as specified in Section SS-21 of these Specifications shall be used as backfill within the limits of the roadway prism for the entire depth of cross trenches for sewers, waterlines, drainage lines, conduits and other crossings which are not a part of the original street construction.

SS11-08. PAYMENT--Full compensation for trench bedding and backfill as herein specified, including all equipment, labor, and materials required, shall be included in the price bid per lineal foot for the respective sizes, grades, and types of pipes and conduits listed in the Proposal, and no additional compensation will be allowed therefore.

SS-12. IMPORTED SELECT MATERIAL

SS12-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a unit price per ton for furnishing and placing imported select material for pipe backfill as shown on the plans and in the Special Provisions or as directed by the Engineer.

The quantity shown for this item is approximate and is indicated for bid comparison only and no guarantee is made or implied that the quantities shown will not be reduced, increased, or deleted, as may be required by the Engineer.

Imported select backfill where required shall be measured on horizontal planes from 6 inches above the top of the pipe to 2 feet below ground surface and for the width of the trench not to exceed the minimum trench width for the size of the pipe being installed. No compensation will be made for select imported backfill outside the area specified herein.

SS12-02. MATERIAL--Imported select backfill shall be crushed rock, with 100 percent passing the 3/4 inch sieve and not more than 10 percent passing the No. 8 sieve, or sand having a minimum sand equivalent of 50, as determined by Test Method No. Calif. 217.

SS-13. SURPLUS MATERIAL DISPOSAL

SS13-01. ITEM--Surplus materials, resulting from excavations or trenching operations that are not required for backfill or embankment construction or to satisfy right of way agreements as set forth on the plans and in the Special Provisions, shall become the property of the Contractor, and he shall dispose of the surplus materials off the rights of way or easements unless permitted by the Engineer to be disposed of otherwise.

SS13-02. AGREEMENT--When any materials are to be disposed of outside the rights of way or easements, the Contractor shall obtain written permission from the owner upon whose property the disposal is to be made before any materials are deposited thereon. The agreement shall contain provisions to relieve the City of Rocklin of any obligation to the property owner for any injury or damage to persons or property. The agreement shall also include a sketch showing the location where the material is to be deposited. A copy of the agreement shall be furnished the Engineer a minimum of two working days prior to placing the materials. Excess materials shall not be deposited in any location which will block or restrict a natural or artificial drain. No material shall be deposited within the dripline of any oak tree.

SS13-03. PERMITS--The Contractor or owner of property where excess material is to be deposited shall be responsible for obtaining all required permits from any agency which may have jurisdiction over the proposed disposal site.

When any materials are to be disposed of outside the right of way or easements which would affect any waterway. The Contractor will be required to obtain a permit from the City in addition to the property owner agreement as set forth above.

Material disposed of shall also conform to the City Grading Ordinance. The Contractor or the owner of property on which material is to be disposed of shall obtain a grading permit, if required, prior to disposal of any excess excavated material.

Copies of any required permits shall be furnished to the Engineer. No permits will be required if disposal sites are shown on the plans unless otherwise specified on the plans or in the Special Provisions.

Prior to placing any material within the 100-year floodplain of any Natural Stream the Contractor or property owner shall first obtain a Permit from the City of Rocklin.

SS13-04. PAYMENT--No separate payment will be made for disposal of surplus material and all compensation therefor is to be included in other earthwork items.

SS-14. PIT RUN

SS14-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for clean, granular pit run in place. The quantity shown for this item shall be considered as approximate, and is indicated for bid comparison only, and no guarantee is made or implied that the quantities as shown will not be reduced or increased or deleted as may be required by the Engineer.

If no item for pit run appears in the Proposal and the Engineer deems it necessary to place pit run, the material shall be furnished and compacted as extra work in accordance with Sections GS4 and GS9 of the General Specifications.

SS14-02. MATERIAL--The pit run material is to be used to replace unsuitable material encountered as specified elsewhere in these specifications or as directed by the Engineer. The material shall have a minimum sand equivalent of 25. The pit run material shall be compacted to a minimum of 90 percent. No additional fill shall be placed over the pit run until the Engineer has inspected the pit run, in place, and given his approval for additional fill to be placed.

SS-15. COBBLES

SS15-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for clean cobbles in place. The quantity shown for this item shall be considered as approximate and is indicated for bid comparison only, and no guarantee is made or implied that the quantities as shown will not be reduced or increased or deleted as may be required by the Engineer.

If no item for cobbles appears in the Proposal and the Engineer deems it necessary to place cobbles, the material shall be furnished and placed as extra work in accordance with Section GS4 and GS9 of the General Specifications.

SS15-02. MATERIALS--The cobble material is to be used to replace unsuitable material encountered as specified elsewhere in these specifications or as directed by the Engineer. The material shall have a minimum of 6 inches in its least dimension and maximum of 12 inches in its greatest dimension and have a specific gravity of at least 2.5. Cobbles shall be inspected, placed, and compacted to the satisfaction of the Engineer.

SS-16. QUARRY ROCK

SS16-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for furnishing and placing quarry rock as shown on the plans and as directed by the Engineer.

SS16-02. MATERIALS--Quarry rock shall consist of quarried stones and 65 percent of the stones by weight shall weigh between 800 pounds and 1,400 pounds. No individual stone shall weigh more than 2,500 pounds or less than 20 pounds, except that 18 percent of the stones by weight may pass the 3 inch screen. The stones shall be angular in shape so as to form a stable protection structure of the required section. Rounded boulders or cobbles shall not be used. Breadth or thickness of individual stones shall not be less than 1/3 the length.

SS-17. CLASS "C" SUBGRADE

SS17-01. LOCATION--Those areas of existing pavement as indicated on the plan or as directed by the Engineer to receive an overlay of asphalt concrete shall be prepared as Class "C" subgrade. Class "C" subgrade shall apply to subgrade prepared on an existing roadbed, subbase, base, surfacing or pavement which was not constructed by the Contractor, and on which a layer of subbase, base, surfacing, pavement, or other specified material is to be placed.

SS17-02. PREPARATION--In advance of spreading the new subbase, base, surfacing or pavement material, the existing roadbed, subbase, base, surfacing or pavement shall be cleaned of all dirt and loose material and full compensation for such work shall be considered as included in the contract price or prices paid for the subbase, base, surfacing or pavement material being placed.

If ordered by the Engineer, a leveling course of the material to be placed shall be spread upon the existing roadbed, subbase, base, surfacing, or pavement, in accordance with the specifications for the type of material being placed, and no compensation other than the contract price or prices being paid for the material will be made for such work.

Where shown on the plans or specified or directed by the Engineer, the existing roadbed, subbase, base, surfacing or pavement shall be scarified, watered, and rolled in advance of placing new material thereon.

Broken, failed or other unsatisfactory portions of the existing roadbed, subbase, base, surfacing or pavement, and sections interfering with new construction shall be removed and disposed of. The areas and depths to be removed shall be as ordered by the Engineer. The area in the exposed spaces shall be watered and compacted, after which the space shall be filled with subbase, base, surfacing or pavement material as directed by the Engineer.

SS17-03. PAYMENT--Excavation and disposal of existing pavement and materials shown on the plans necessary for preparation of Class "C" subgrade shall be paid for as roadway excavation as set forth in Section SS-3, unless set forth in the Special Provisions and on the Proposal as a separate pay item.

Full compensation for furnishing all labor, material, tools, equipment, and incidentals and for doing all work involved in preparing Class "C" subgrade, except excavation, as shown on the plans, specified in these specification or as directed by the Engineer, shall be included in the contract unit prices paid for the materials, in place, on the subgrade as specified on the plans, or directed by the Engineer.

SS-18. LIME TREATMENT

SS18.01 ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid unit prices per square yard for lime treatment, for the depths listed in the Proposal and as detailed in the plans, per ton for lime and per ton for asphaltic emulsion curing seal. The materials, preparation, mixing, spreading, compacting and curing shall conform to the provisions of Section 24 of the State Specifications with the exception that no additional compensation will be allowed for removal and disposal of rocks and/or solids larger then 2-1/2 inches as provided in Section 24 of the State Specifications.

SS-19. CEMENT TREATED BASES

SS19.01 ITEM AND PAYMENT--Under these items of the Proposal the Contractor shall bid unit prices per ton for liquid asphalt and per cubic yard for cement treated base of each type and class set for therein. The material preparation, mixing, spreading, compaction and curing shall conform to the provisions of Section 27 of the State Specifications.

SS-20. AGGREGATE SUBBASE

SS20.01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for furnishing Class 1 aggregate subbase material in place as shown on the plans and specified herein.

SS20.02. MATERIAL AND PLACEMENT--Aggregate subbase material and method of placing shall conform to Section 25 of the State Specifications excepting modification as herein specified.

The aggregate subbase shall conform to the grading provided for 2-1/2 inch or 3 inch maximum grading at the Contractor's option, as shown herein.

Sieve Size	Percentage Passing Sieve By Weight	
	21/2" Max.	3" Max.
4"	100	100
3"	100	90-100
2-1/2"	90-100	80-100
No. 4	35-70	25-50
No. 200	0-10	0-10

The weight of material to be paid for will be determined by deducting from the weight of material, the weight of water in the material at the time of weighing, in excess of one percentage point more than the optimum moisture content as determined by Test Method No. Calif. 216 Dry Density Basis. The weight of water deducted as provided herein will not be paid for.

The aggregate subbase shall have sufficient moisture, in the opinion of the Engineer, to prevent undue segregation during the spreading operation and shall be compacted immediately after delivery and the Contractor shall be responsible for maintaining the required moisture content until the next successive layer of materials is placed. No additional compensation will be allowed for water applied to the aggregate subbase after the material has been weighed.

SS-21. AGGREGATE BASE

SS21-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for furnishing Class 2 aggregate base material in place as shown on the plans and as specified herein.

SS21-02. MATERIAL AND PLACEMENT--Aggregate base material and method of placing shall conform to Section 26 of the State Specifications excepting modification as herein specified. The aggregate base shall conform to the grading provided for Class 2 1-1/2 inch maximum grading as specified on the plans or in the Special Provisions.

Class 2 aggregate 3/4-inch maximum base shall conform to the provisions in Section 26, "Aggregate Base", of the California Department of Transportation's Standard Specifications, for Class 2 aggregate base; and these provisions:

The course aggregate (material retained on the No. 4 sieve) shall contain at least 50% by weight of crushed pieces having 2 or more freshly fractured faces with the area of each fracture being at least equal to 75% of the smallest mid-sectional area of the piece. When two fractured faces are adjacent, the angle between the planes of the fractures must be at least 30° to count as two fractured faces. The amount of flat or elongated particles shall not exceed

30%. A flat particle is one having a ratio of width to thickness greater than 3, and a prolonged particle is one having a ratio of length to width greater than 3. The course aggregate shall consist of angular fragments reasonably uniform in density and quality. The specific gravity (bulk saturated surface dry) as determined by California Test 206 shall be at a minimum 2.58, on an average, with not more than 15% by weight consisting of particles with a bulk specific gravity below 2.50.

Sieve Size	Percentage Passing Sieve By Weight	
	1-1/2" Max.	3/4" Max.
2"	100	100
1-1/2"	90-100	100
3/4"	50-85	90-100
No. 4	30-45	35-55
No. 30	10-25	10-30
No. 200	2-9	2-9

The weight of material to be paid for will be determined by deducting from the weight of material, the weight of water in the material, at the time of weighing, in excess of one percentage point more than the optimum moisture content as determined by Test Method No. Calif. 216 Dry Density Basis. The weight of water deducted as provided herein will not be paid for.

The material shall be deposited on the roadbed in such a manner as to provide a uniform section of material within 5 percent tolerance of the predetermined required volume. Deposition shall be by spreader box or bottom dump truck to prevent segregation of the material. The material so deposited on the roadbed shall have sufficient moisture which, in the opinion of the Engineer, is adequate to prevent excessive segregation. It shall then be immediately spread to its planned grade and cross section. Undue segregation of material, excessive drifting or spotting of material will not be permitted and any material in the opinion of the Engineer to be unsuitable segregated, shall be removed from the roadbed or completely reworked to provide the desired uniformity of the material. When the required thickness is more than 6 inches, the base material shall be spread and compacted in two or more layers of approximately equal thickness, the maximum compacted thickness of any one layer is not to exceed 6 inches. Each layer shall be spread and compacted in the above manner.

The Contractor shall be responsible for maintaining the required moisture content until the next successive layer of materials is placed. No additional compensation will be allowed for water applied to the aggregate base after the material has been weighed.

SS-22. ASPHALT CONCRETE - TYPE "B"

SS22-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for furnishing and placing asphalt concrete, Type "B". The grade of the liquid asphalt

to be used shall be determined by the Engineer. Asphalt concrete will be paid for at the contract unit price per ton in place, and not separately as mineral aggregate and paving asphalt.

SS22-02. MATERIAL AND PLACEMENT--The asphalt concrete and the method of placing shall conform to Sections 39 and 92 of the State Specifications, except as herein modified. Asphalt concrete may be placed when the atmospheric temperature is lower than 50° F (but not less than 40°) providing the asphalt concrete is placed directly into the asphalt paver hopper from the truck. The Contractor's attention is specifically directed to finished surface requirements under Section 39-6.03 of the State Specifications.

SS22-03. MISCELLANEOUS AREAS--The contract unit price shall include full compensation for placing overlay areas, driveways, asphalt gutters, spillways, and other incidental areas as indicated in the plans and specifications and as directed by the Engineer.

SS22-04. PAVING AND ROLLING--Prior written approval of the Engineer is required before the Contractor may place asphalt concrete without the use of a paving machine. On subdivisions, when the hourly production rate is less than 125 tons per hour, one tandem roller will be required as set forth in Section 39-5.02 of the State Specifications. On subdivisions, when the hourly production rate is greater than 125 tons per hour, two rollers will be required. When pickup machine or front end loader is used on the paving machine, the Engineer may require the use of an additional 12 ton steel tired roller at the paving site. In lieu of the additional roller, the Contractor may furnish a water truck on stand-by for filling the rollers. After compaction, the asphalt concrete shall have a density of not less than 95 percent of the maximum theoretical unit weight, as determined in the laboratory by Test Method No. Calif. 304.

SS22-05. LEVELING COURSE--In advance of spreading asphalt concrete over existing pavement, the Engineer may order, in writing, a surface course mixture spread to level irregularities, dips, depressions, sags, and excessive crown and to provide a smooth base of uniform grade and cross section in order that the surface course and/or subsequent layers of surfacing will be of uniform thickness and true to grade and cross section. The spreading shall be done with blading equipment acceptable to the Engineer and such manner as directed by the Engineer. Asphalt concrete so spread by blade method shall be compacted as provided herein. No additional compensation will be allowed for spreading asphalt concrete as herein specified, and full compensation for all work incidental to such operations will be considered as included in the contract price paid for asphalt concrete.

SS22-06. PAVING AGGREGATE--Aggregate for asphaltic concrete structural sections of 3 inches or greater shall be 3/4 inch maximum. For all other asphaltic concrete structural sections, 1/2 inch maximum aggregate shall be used, unless otherwise specified on the plans and/or in the Special Provisions. The Engineer may require a lesser sized aggregate where special conditions exist.

SS22-07. EXISTING PAVEMENT--Cut lines made on the existing pavement, both longitudinally and transversely, for the placing of new structural section, shall be straight and smooth. Edges shall be clean and free of dirt and dust prior to placing tack coat. Asphaltic

emulsion shall be used as a tack coat or paint binder on existing pavement that is to receive an asphalt concrete overlay and also along the exposed edges of abutting pavement and concrete curbs and gutters. Its use may also be required between subsequent layers of asphalt concrete placed by the Contractor when ordered by the Engineer. Asphalt emulsion shall conform to Section SS-26 of these specifications. If no item is included in the Proposal for asphaltic emulsion, the payment shall be included in the price bid for asphalt concrete.

SS-23. WATER

SS23-01. ITEM AND PAYMENT--Under this item of the Proposal, the price for water supply shall include furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work necessary in developing a sufficient water supply and furnishing pipe lines or other necessary equipment to supply water as indicated in the construction documents. Payment for water shall be included in the other items of work and no separate payment shall be made.

SS23-02. WATER SOURCE--Arrangements for water needed for construction purposes must be made with the City Engineer. Before drawing any water from a City owned or operated water system, the Contractor shall obtain a permit from the Department of Public Works and such water shall be paid for at the current rate established by the Department of Public Works and shall be included in other items of work.

SS-24. SAND COVER

SS24-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for furnishing and applying sand cover for prime coat. The sand, method, and rate of spreading and payment shall conform to Sections 36 and 39 of the State Specifications.

SS-25. LIQUID ASPHALT

SS25-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for furnishing and applying the liquid asphalt.

SS25-02. GRADES--Liquid asphalt grade shall be as set forth in the Special Provisions or as determined by the Engineer. The liquid asphalt and the method of application shall conform to Sections 39 and 93 of the State Specifications.

SS25-03. RATES--The liquid asphalt when specified shall be used as prime coat for the aggregate base, and as a penetration treatment for the shoulders of the road and driveways. Prime coat shall

be spread at the approximate total rate of 0.25 gallon per square yard of surface covered and penetration treatment shall be spread at a uniform rate not to exceed 0.50 gallon per square yard. The exact rate and number of applications will be determined by the Engineer.

SS-26. ASPHALTIC EMULSION

SS26-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per ton for furnishing and applying asphaltic emulsion. The asphaltic emulsion shall be used in seal coats as indicated on the plans, as a paint binder on existing asphalt concrete pavement that will be given an asphalt concrete overlay, and when ordered by the Engineer to be used on subsequent layers of asphalt concrete placed by the Contractor.

SS26-02. GRADE AND RATE--The asphaltic emulsion shall be of the high viscosity grade and type as set forth in the Special Provisions or as determined by the Engineer, and the method and rate of spreading shall conform to Sections 37, 39, and 94 of the State Specifications.

SS-27. PAVEMENT FABRIC

SS27-01. ITEM AND PAYMENT--Under this item of the proposal, the Contractor shall bid a price per square yard. This price shall include full compensation for furnishing all labor, materials (including the paint binder), tools, equipment and incidentals for doing all work involved in placing the pavement fabric complete in place, as designated in the plans and specifications and as directed by the Engineer. The materials and methods of placing shall conform to Sections 39 and 88 of the State Specifications.

SS-28. SCREENINGS

SS28-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per ton for furnishing and placing screenings of the size and type shown in the Proposal.

SS28-02. GRADE AND RATE--The screenings will be used in double seal coats for the shoulders of the road and for other seal coats as indicated on the plans. The screenings, method and rate of spreading, and the payment shall conform to Section 37 of the State Specifications.

SS-29. DUST PALLIATIVE

SS29-01. APPLICATION--Dust palliative shall be applied to detours, temporary surfacing, and construction sites when, in the opinion of the Engineer, this type of dust control is required. Dust palliative shall be asphaltic emulsion as specified elsewhere in these specifications, and of the type directed by the Engineer.

SS29-02. PAYMENT--The price bid for asphaltic emulsion shall be the price paid for dust palliative, when ordered by the Engineer. If no item is included in the Proposal, the emulsion shall be paid for as force account as stated in GS9-1.03 of the General Specifications.

SS-30. RESTORATION OF SURFACES

SS30-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a lump sum price for restoration of surfaces removed, damaged, or displaced by the construction of the underground facilities set forth in the contract. If there is no item for restoration of surfaces in the Proposal, it shall be understood that such work will be done as herein specified, and that the cost for such work will be included in the prices bid for other items of work, and that no additional compensation for restoration of surfaces will be made.

SS30-02. GENERAL--All curbs, gutters, sidewalks, driveways, road shoulders, pavement, and similar items shall be reconstructed by the Contractor. Reconstruction shall be of the same kind of material and to not less than the original dimensions, subject to minimum requirements specified herein, on the plans, or in the Special Provisions. All work shall match the appearance of the existing improvements as closely as practicable.

SS30-03. PRIVATE ROADS--On private roads, the trench compaction shall meet the same requirements as that for public roads and streets. Where asphalt surfacing exists, the surface restoration shall be a minimum of 4 inches aggregate base and 2 inches asphalt concrete. Where dirt, gravel, stone, or crushed rock surfacing exists, surface restoration shall consist of a minimum of 6 inches aggregate base. The remaining gravel or stone roadway shall be reshaped to preconstruction cross section and given an application of a minimum of 2 inches of 3/4 inch maximum size gravel or crushed rock compacted into place. The surface restoration of private roadways under any circumstances shall be no less than existed in the preconstruction condition.

SS30-04. RESURFACING STREETS--Final asphalt concrete surfacing of roadways and parking lots shall not proceed until 10 days after completion of the backfill and placement of first lift surfacing, unless otherwise set forth in the Special Provisions or approved by the Engineer. The trench area shall be kept level with the adjacent street or shoulder with temporary pavement, and continuously maintained to prevent a traffic hazard, until the permanent pavement is placed.

Repaving of trench areas in bituminous pavement shall be in accordance with the Standard Drawing # 5-3 Trench Excavation & Backfill detail and, if applicable, Special Provisions, but in no case shall pavement replacement consist of less than 4 inches of aggregate base and 8 inches of asphalt concrete in public streets. The first lift of pavement replacement shall be included in the sequence of construction as specified in Section SS62-04 of these specifications.

SS30-04.1 AGGREGATE BASE--After the top 2 feet of trench backfill has been placed and compacted as specified, aggregate base material sufficient to obtain a depth after compaction equal to the required base course plus the paving courses, shall be placed in all trenches which require resurfacing or a seal coat.

The aggregate base materials and placement shall meet the requirements of Section SS-21 of these specifications (except provisions for payment), 3/4 maximum grading. The relative compaction of the base material shall be not less than 95 percent.

SS30-04.2 ASPHALT CONCRETE--Immediately prior to placing the pavement, the top 2 inches of base material, or more where greater depth of paving is indicated, shall be removed, and the surface recompacted to a minimum relative compaction of 95 percent. Additional base or underlying material that is soft or spongy shall be removed and replaced with aggregate base material and compacted in layers not exceeding 6 inches in depth to a minimum relative compaction of 95 percent. Edges of trenches which are broken or damaged shall be removed and neatly trimmed back to stable and undisturbed base and surface materials.

The edges of the existing pavement shall be given a tack coat of asphaltic emulsion as directed by the Engineer. The trench shall then be filled and compacted, in layers not to exceed 2 inches, with asphalt concrete, Type "B", conforming to Section SS-22 of these specifications (except provisions for payment), until the trench has been brought to approximately 3/4 inch below the finish grade

and cross section of the street. The Contractor shall immediately repair any settlement more than 1 inch below finish grade.

Prior to placement of the second lift, the surface of the first lift of pavement and the edges of the existing pavement shall be given a tack coat of asphaltic emulsion as directed by the Engineer. The trench shall then be filled and compacted with asphalt concrete Type "B", 1/2 inch maximum gradation, as specified above, until the pavement has been brought to the final grade and cross section of the street.

SS30-04.3 SEAL COATS--Seal coat treatment shall be applied to trench surfaces at locations hereinafter specified, indicated on the plans to receive this treatment only, or as directed by the Engineer. Seal coat shall not be placed until at least 72 hours after placement of final paving lift.

A. Single Seal

Alternate No.1: The placement of slurry seal as set forth in Section 37-2 of the State Specifications, with the exception that Section 37-2.06, "Placing", shall be modified to provide that the thickness of application of slurry seal shall be adjusted to provide one layer not less than 1/8 inch thick, nor greater than 1/4 inch thick. The requirement for wetting surface prior to placement of slurry seal is waived.

Alternate No.2: Sand seal shall be provided and placed in accordance with the general provisions of Section 37-1, "Seal Coats", of the State Specifications; however, the asphaltic binder and aggregate shall be as follows:

The asphaltic materials for the construction of sand seal shall be CRS 1 conforming to the requirements set forth in Section 94, "Asphaltic Emulsions", of the State Specifications.

The rate of application of CRS 1 shall vary between 0.08 and 0.15 gallon per square yard as directed by the Engineer, depending upon the surface condition and weather.

Aggregate for sand seal shall conform to the provisions of Section 37-2.02C, "Aggregate", of the State Specifications and shall be spread at the rate of 6 to 10 pounds per square yard, and directed by the Engineer.

Preparation for seal coat, applying bituminous binder, spreading, and finishing shall be in accordance with Section 37 of the State Specifications, with the exception that steel wheeled rollers for sand seal may be eliminated and the pneumatic roller used for all seal operations.

All bituminous pavement replacements and seal shoulders sealed under one of the above alternates shall receive the seal coat for the full width of the trench or pavement

replacement, plus a minimum of 24 inches on each side of the trench, except that seals shall not overlap concrete curb and gutter.

B. **Double Seal:**

Those areas indicated on the plans or directed by the Engineer shall receive a double seal coat treatment. The first seal coat of the double seal shall be the coarse seal coat specified in Section 37 of the State Specifications. The final seal shall be as outlined herein for single seal.

SS30-04.4 SHOULDERS--Surface restoration of trenches located in a shoulder within 6 feet of the traveled way, shall consist of a structural section equal to the original, or as set forth on the plans, but in no case less than 5 inches of aggregate base compacted to a relative compaction of 95 percent. This aggregate base shall then receive a double seal coat treatment as outlined herein, unless otherwise specified or directed by the Engineer.

SS30-05. CONCRETE--Repairs to concrete curbs, gutters, sidewalks, driveways, and other concrete surfaces shall be made by removing and replacing the entire portions between joints or scores, and not merely by refinishing the damaged part, except as follows: (1) curb and gutter shall be replaced between saw cuts so that the remaining or new curb and gutter will not be less than 4 feet in length; (2) the entire width of sidewalk shall be replaced between saw cuts for a length of not less than 4 feet providing the remaining sidewalk shall not be less than 4 feet in length; and (3) driveways shall be replaced as directed by the Engineer, either completely or partially by saw cutting in the middle of the driveway. Replacement shall be in accordance with the applicable requirements, except provisions for payment, for the type and classification of work set forth in other sections of these specifications.

SS30-06. PAVEMENT MARKINGS--The Contractor shall be responsible for replacement of crosswalks and other permanent pavement markings and raised markers when disturbed, destroyed, or covered by the work. The Contractor may, when approved by the Engineer, pay the current price per square foot or unit price per marker to the City, and City forces will replace the markers or markings on the completed surface. The Contractor shall contact the Engineer for the verification of the quantity and cost of the replacements and receive written approval.

SS30-07. TEMPORARY PAVING--Temporary paving shall be placed at locations indicated on the plans or directed by the Engineer. Asphalt concrete Type "B", conforming to Section SS-22, of these specifications, shall be used as temporary paving on all streets set forth on the plans or in the Special Provisions. Temporary paving in all other paved areas may be asphalt plant-mix cutback unless otherwise directed by the Engineer. Thickness of temporary paving shall be 1-1/2 inches unless otherwise specified on the plans. Temporary paving shall be maintained at the same level as the existing pavement until the permanent surfacing is placed.

Temporary paving shall be paid for as specified in Section SS-81.

SS-31. CLASS "A" PORTLAND CEMENT CONCRETE (STRUCTURES)

SS31-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per cubic yard for furnishing and placing Class "A" Portland cement concrete for structures as shown on the plans and as directed by the Engineer. The contract unit price bid per cubic yard shall include full compensation for furnishing all labor, materials, tools, equipment, and doing all work necessary to form and place concrete as indicated in the plans and specifications and as directed by the Engineer.

The quantity of Class "A" Portland cement concrete (structures) shown on the plans and in the Proposal shall be the final quantity for which payment will be made, as provided in Section GS9-1.015 of the General Specifications.

If no item is shown in the Proposal for Class "A" Portland cement concrete (structures) and concrete structures are shown on the plans and in the Proposal on a unit price or lump sum price basis, the requirements for Class "A" Portland cement concrete (structures) as set forth in this section shall apply except as to payment and full compensation for adherence to this section shall be included in the lump sum price or unit price bid for the structures.

SS31-02. MATERIAL AND METHOD--Class "A" concrete and method of placing grading and finishing shall conform to Sections 51 and 90 of the State Specifications.

SS31-03. SLUMP--The slump cone method, ASTM Designation: C 143, may be substituted for Test Method No. Calif. 533.

SS31-04. TOLERANCE--All concrete structures which have a roadway deck shall have a smooth riding surface. The finished surface shall be tested by means of a straight edge 12 feet long. The surface shall not vary more than 0.01 foot from the lower edge of the straight edge. All high areas in the hardened surface in excess of 0.01 foot as indicated by the test shall be removed by abrasive means. All low areas in excess of 0.01 foot as indicated by the test shall be cut out to a depth of one inch below the straight edge and patched with epoxy concrete.

SS31-05. PATCHING--Epoxy concrete for patching bridge deck shall consist of a mixture of epoxy binder and aggregate. The epoxy binder and adhesive shall be a two component mixture conforming to Section 95-2.01 of the State Specifications "Binder (Adhesive), Epoxy Resin Base". Aggregate shall conform to the aggregate for Portland cement concrete in Section 90, "Portland Cement Concrete" of the State Specifications. The aggregate size and proportions shall be determined by the Contractor, subject to the approval of the Engineer. Aggregate shall be thoroughly dry when mixed with binder.

When fine aggregate is used, the grout shall consist of one part of binder to approximately five parts fine aggregate, by volume. When both coarse and fine aggregate are used, the concrete shall consist of one part of binder to approximately six parts combined aggregate, by volume.

The aggregate shall be stored and proportioned so as to give a uniform combined material. The aggregate and the epoxy binder shall be mixed in equipment and by methods that result in a homogeneous mixture.

Prior to placing epoxy concrete, the entire area to be patched shall be cleaned free of all loose and deleterious materials by abrasive blasting or machine scarifying and clean aggregate exposed.

The areas shall be surface dry and the surface temperature shall be 50°F, or above, when the epoxy concrete is applied.

The areas to be covered shall be coated with epoxy adhesive applied at the rate of one gallon for each 25 square feet of area.

Immediately after placing, the epoxy concrete shall be thoroughly tamped or rolled into place, to minimize air voids, and struck off to the required grade. The final finish shall conform to Section 51-1.17, Finishing Bridge Decks, of the State Specifications.

SS31-06. ADMIXTURES--Admixtures shall be used only when specified in the Special Provisions or when permitted in writing by the Engineer. When specified or permitted by the Engineer, admixtures shall be governed as set forth in Section 90-4 of the State Specifications.

SS-32. PORTLAND CEMENT CONCRETE

SS32-01. SPECIFICATION--Portland cement concrete shall conform to Section 90 of the State Specifications except as herein modified.

SS32-02. CLASS "A"--Concrete shall conform to either the 1 inch or 1-1/2 inch gradation, at the option of the Contractor, unless otherwise specified in these specifications or in the Special Provisions.

SS32-03. CLASS "B"--Concrete shall conform to either the 1 inch or 1-1/2 inch gradation at the option of the Contractor, unless otherwise specified in these specifications or in the Special Provisions.

SS32.04. CLASS "C"--Concrete shall conform to either the 1 inch or 1-1/2 inch gradation at the option of the Contractor, unless otherwise specified in these specifications or in the Special Provisions.

SS32.05. ADMIXTURES--Admixtures shall be used only when specified in the Special Provisions or when permitted in writing by the Engineer. When specified or permitted by the Engineer, admixtures shall be governed as set forth in Section 90-4 of the State Specifications.

SS32-06. CEMENT--Portland cement shall be Type II Modified and all cement used on a project shall be the same brand.

SS32-07. CEMENT MORTAR OR GROUT--Mortar shall consist of one part of Type II Modified cement and two parts of sand by volume. Grout shall be composed of one part of Type II cement and 1-1/2 parts of sand by volume. Admixtures of hydrated lime, fire clay, diatomaceous earth, or other approved inert material may be used to facilitate workability. Embeco pre-mixed grout or additive, when specified or permitted, shall be prepared and used in strict accord with the manufacturer's directions.

Mortar and grout shall be mixed in a revolving drum or revolving blade type mortar mixer or hand-mixed in a suitable watertight mixing box. When hand mixed, the material shall be thoroughly mixed dry and then sufficient water added to bring the mixture to a workable

consistency. All mortar and grout must be used before it has taken an initial set, and no retempering with additional water will be permitted.

SS-33. BAR REINFORCING STEEL

SS33-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per pound for furnishing and placing the type and grades of bar reinforcing steel as indicated in the plans and specifications and as directed by the Engineer.

If there is no item in the Proposal for bar reinforcing steel, it shall be understood that the steel shall be furnished and placed as specified on the plans and in the specifications and that the cost for such work shall be included in the prices bid for other items of work and that no additional compensation will be allowed therefore.

SS33-02. MATERIAL AND PLACEMENT--Bar reinforcing steel and method of placing shall conform to Section 52 of the State Specifications.

SS33-03. FINAL QUANTITIES--The quantity of bar reinforcing steel shown on the plans and Proposal shall be the final quantity for which payment will be made, as provided in Section GS9-1.015 of the General Specifications.

SS-34 PORTLAND CEMENT CONCRETE CURB AND GUTTER

SS34-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for Portland cement concrete curb and gutter. The materials and methods of placing shall conform to Section 73 of the State Specifications.

SS34-02. MATERIAL--Portland cement concrete curb and gutters may be constructed of Class "A" or Class "B" concrete at the Contractor's option unless otherwise specified on the plans or in the Special Provisions.

SS34-03. TYPES--Curb types shall conform to the Standard Drawings.

SS34-04. CURING--Curb and gutter shall be sprayed uniformly with a white pigmented or clear curing compound. The material, method, and rate of application shall conform to Section 90-7 of the State Specifications.

SS34-05. TESTING--Curb and gutter shall be water tested in the presence of and prior to acceptance by the Engineer.

SS34-06. USE OF EXTRUSION MACHINE--Should the Contractor place the concrete by the extrusion method, Section 73-1.05B of the State Specifications shall apply with the following exceptions:

A. In lieu of sawing, the Contractor may place the "Premolded Expansion Joint Filler" in the wet concrete and hand trowel the concrete to conform.

B. Expansion joints 1/2 inch wide shall be constructed at each side of structures, and at the ends of curb returns, except that expansion joints shall not be installed within 20 feet of an island nose. Expansion joint filler material shall conform to Section 51 of the State Specification. The joint filler shall be shaped to the cross section of the concrete being placed.

SS34-07. AGGREGATE BASE MATERIAL--Where required as subgrade for curb and gutter aggregate base shall be included in the unit price bid for that particular item of the proposal.

SS-35. PORTLAND CEMENT CONCRETE CURB

SS35-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for Portland cement concrete curb. The materials and method of placing shall conform to Section 73 of the State Specifications. Curb types shall conform to Standard Drawings.

SS35-02. MATERIALS--Class "A" or Class "B" concrete may be used at the construction option unless otherwise specified on the plans or in the Special Provisions.

SS35-03. ANCHORING--Type 4 curb shall be anchored to the pavement by means of 1/2 inch bar reinforcing steel dowels 18 inches in length driven firmly into the pavement at 8 feet spacing and a longitudinal 1/2 inch bar wired to dowels. In lieu of placing dowels, curb may be anchored by means of adhesive as specified in Section 73-1.05B of the State Specifications with approval by the City Engineer. If dowel placement shall be such that not more than 100 feet of dowels are left exposed at the end of the day's work. Exposed dowels shall be fully barricaded at the end of the day's work.

SS35-04. CURING--Curb shall be sprayed uniformly with a white pigmented or clear curing compound. The material, method, and rate of application shall conform to Section 90-7.01B of the State Specifications.

SS35-05. MEDIANS AND ISLANDS--Traffic and median islands constructed with Type 4 or 5 curb shall be paved with 2 inches of asphalt concrete. Asphalt concrete and the method of placing shall be as specified in Section SS-22 of these specifications and the price shall be the unit price bid per ton for asphalt concrete. Solid sterilization of all paved island areas shall be included in the price bid per lineal foot of curb. The soil sterilant shall be "polyborchlorate" Pacific Coast Borax,

or equal, and shall be applied at the rate of 6 pounds per 100 square feet of area to be treated, or as directed by the Engineer.

SS35-06. WEEP HOLES--Weep holes shall be constructed in traffic islands over existing pavement. Weep holes shall be constructed by placing 1 inch by 2 inch lumber on the pavement before the curbing is poured. The 1 inch by 2 inch lumber is to be removed after the curb is completed and before backfill is placed. Weep holes are to be placed at the low points and at the lowest end of island, or as directed by the Engineer. One cubic foot of pervious material in a burlap bag shall be placed back of each weep hole. Backfill material shall be compacted to a minimum compaction of 90 percent. The unit price bid per lineal foot shall include full compensation for weep holes, pervious material and backfill.

SS35-07. USE OF EXTRUSION MACHINE--Should the Contractor place the concrete by the extrusion method, Section 73-1.05B of the State Specifications shall apply with the following exceptions:

A. In lieu of sawing, the Contractor may place the "Premolded Expansion Joint Filler" in the wet concrete and hand trowel the concrete to conform.

B. Expansion joints 1/2 inch wide shall be constructed at each side of structures, and at the ends of curb returns, except that expansion joints shall not be installed within 20 feet of an island nose. Expansion joint filler material shall conform to Section 51 of the State Specifications. The joint filler shall be shaped to the cross section of the concrete being placed.

SS-36. SPECIAL PORTLAND CEMENT CONCRETE CURB

SS36-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per lineal foot for special Portland cement concrete curb. The materials and method of placing shall conform to Section 73 of the State Specifications.

SS36-02. MATERIAL--Class "A" or Class "B" concrete may be used at the Contractor's option unless otherwise specified on the plans or in the Special Provisions and the curb shall conform to dimensions and requirements as indicated in the construction plans and/or Special Provisions.

SS36-03. CURING--Curb shall be sprayed uniformly with a white pigmented or clear curing compound. The material, method, and rate of application shall conform to Section 90-7.01B of the State Specifications.

SS36-04. USE OF EXTRUSION MACHINE--Should the Contractor place the concrete by the extrusion method, Section 73-1.05B of the State Specifications shall apply with the following exceptions:

A. In lieu of sawing, the Contractor may place the "Premolded Expansion Joint Filler" in the wet concrete and hand trowel the concrete to conform.

B. Expansion joints 1/2 inch wide shall be constructed at each side of structures, and at the ends of curb returns, except that expansion joints shall not be installed within 20 feet of an island nose. Expansion joint filler material shall conform to Section 51 of the State Specification. The joint filler shall be shaped to the cross section of the concrete being placed.

SS-37. PORTLAND CEMENT CONCRETE SIDEWALK

SS37-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a unit price per square foot for constructing the respective thicknesses of concrete sidewalk or driveway shown on the plans and in the Proposal.

SS37-02. METHOD AND MATERIALS--The method of placing sidewalk or driveway shall conform to Section 73 of the State Specifications except that scoring of the sidewalks shall be at 5 feet maximum intervals. Sure marks shall be adjusted to coincide with joints in the adjacent curb and gutter. After scoring, edges shall be rounded and leave a smooth uniform appearance. Class "A" or Class "B" concrete may be used at the Contractor's option, unless otherwise specified on the plans or in the Special Provisions.

SS37-03. CURING--Sidewalk shall be sprayed uniformly with a white pigmented or clear curing compound. The material, method, and rate of application shall conform to Section 90-70.01B of the State Specifications.

SS37-04. USE OF EXTRUSION MACHINE--Should the Contractor place the concrete by the extrusion method, Section 73-1.05B of the State Specifications shall apply with the following exceptions:

A. In lieu of sawing, the Contractor may place the "Premolded Expansion Joint Filler" in the wet concrete and hand trowel the concrete to conform.

B. Expansion joints 1/2 inch wide shall be constructed at each side of structures, and at the ends of curb returns, except that expansion joints shall not be installed within 20 feet of an island nose. Expansion joint filler material shall conform to Section 51 of the State Specification. The joint filler shall be shaped to the cross section of the concrete being placed.

SS-38. SIDEWALK RAMPS

SS38-01. ITEM AND PAYMENT--Under this item of the proposal, the Contractor shall bid a price per each for constructing sidewalk ramps in existing curb, gutter, and sidewalk as indicated in the plans and specifications and as directed by the Engineer.

This work shall consist of sawcutting and removal of portions of existing curb, gutter, and sidewalk and constructing sloped ramps of Portland cement concrete.

SS38-02. REMOVAL--Removal of existing curb, gutter, and sidewalk shall conform to Section SS-2, "Clearing and Grubbing" of the Standard Construction Specifications.

SS38-03. MATERIAL AND PLACEMENT--The materials and methods of placing shall conform to Section 73 of the State Standard Specifications. Portland cement concrete sidewalk ramps may be constructed of Class "A" or Class "B" concrete at the Contractor's option, unless otherwise specified on the plans or in the Special Provisions.

SS38-04. DETAILS--Sidewalk Ramp details shall conform to the Standard Drawings.

SS38-05. CURING--Sidewalk ramps shall be sprayed uniformly with a white pigmented or clear curing compound. The material, method, and rate of application shall conform to Section 90-7.01B of the State Specifications.

SS38-06. TESTING--Flow in sidewalk ramp curb and gutter shall be water tested in the presence of and prior to acceptance by the Engineer.

SS-39. CHANNEL LINING

SS39-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per square foot of surface area for placing the various thicknesses of channel lining as indicated on the plans and in the Proposal. The price bid per square foot of surface area for channel lining shall include full compensation for all labor, materials, and equipment necessary to place the channel lining and ramp paving, as shown on the plans and as specified herein. The vertical legs of cutoff walls shall not be considered surface area, and no separate payment will be made.

SS39-02. MATERIALS--Materials for poured-in-place concrete lining shall be Class "B" concrete and shall conform to the one inch maximum aggregate gradation as set forth in Section 90 of the State Specifications. Slump for concrete channel lining shall not exceed 4 inches as determined by the slump cone method of ASTM Designation: C 143 or an equivalent slump as determined by Test Method No. Calif. 533. Lesser slumps may be required by the Engineer if the concrete begins

to develop surface cracks. Air blown mortar shall conform to Section SS-40 of these specifications. Air blown mortar may be used for side lining only.

When permitted by the Engineer, concrete conforming to the 3/8 inch maximum aggregate grading as specified in Section 90 of the State Specifications may be used for channel side lining. If used 3/8 inch aggregate concrete shall contain a minimum of 611 pounds of Portland cement per cubic yard.

When specified on the plans or in the special provisions, grouted cobbles conforming to Section SS-75 of these specifications shall be used for side and/or bottom lining. Reinforcing and expansion and contraction joints will not be required in grouted cobble lining.

SS39-03. PLACEMENT AND THICKNESS--The thickness of the bottom lining in channels shall not be less than 4 inches of poured-in-place concrete. The thickness of the side lining in channels shall not be less than 3 inches of poured-in-place concrete or air-blown mortar.

Thickness of Alternate "B" bottom lining shall be 8 inches.

Lining shall be placed as shown on the plans and Standard Drawings.

The appearance of the lining shall be neat and uniform conforming to the lines shown on the plans or as directed by the Engineer. A 2 inch by 4 inch header board placed along the top of the lining or other method approved by the Engineer shall be used as a control while placing the lining.

The surfaces of those areas to be lined shall be evenly graded to the lines and grade and sections as indicated on the plans. The surfaces shall be moistened thoroughly to prevent moisture from being drawn from the freshly placed lining. All surfaces on which lining is to be placed shall be free from water, mud and debris, and shall be firm enough to prevent contamination of the fresh lining by earth or other foreign material. Prior to placing any lining, the Contractor shall secure the Engineer's approval of the excavated channel.

Grade control points shall be placed in accordance with SS4-02.

SS39-04. REINFORCEMENT--The channel lining shall be reinforced with 6 inch by 6 inch gauge welded wire fabric conforming to ASTM Designation: A 185. The welded wire fabric reinforcement shall be embedded in the concrete so that it will be a minimum of one inch clear from either face of the concrete unless otherwise noted. Furnishing and placing welded wire fabric shall be included in the price bid for channel lining and no additional compensation will be allowed. No reinforcement will be required in Alternate "B" bottom lining where concrete thickness is 8 inches or greater unless shown on the plans or in the Special Provisions.

SS39-05. CONSTRUCTION JOINTS--Construction joints shall be square, and shall be edged with a 1/4 inch radius edging tool. The edge shall be thoroughly wetted before the next section of lining is placed. Construction joints shall be constructed whenever the operation is halted for a

period exceeding 30 minutes. Welded wire fabric reinforcing shall extend through the construction joint.

SS39-06. EXPANSION JOINTS--Transverse expansion joints shall be constructed at intervals of not more than 50 feet and shall be filled with premolded expansion joint filler material. The material shall have a minimum thickness of 3/8 inch and shall conform to ASTM Designation: D 1751. Expansion joints shall be edged with a 1/4 inch radius edging tool.

SS39-07. CONTRACTION JOINTS--Transverse contraction joints shall be constructed at intervals of 10 feet and shall be scored by troweling a groove 5/8 inch in depth and 1/4 inch in width. All joints shall be true to a uniform line and neat in appearance.

SS39-08. WEEP HOLES--On channels with side lining extending more than 18 inches vertically above the channel toe, weep holes shall be constructed at intervals of 10 feet midway between contraction joints on each side of the channel. The holes shall be backed by a minimum of one cubic foot of aggregate material tied in a burlap bag. The aggregate shall extend at least 6 inches above and below and to each side of the weep hole, and at least 10 inches into the side slope. The side and back of the burlap sack shall be protected from being coated by mortar or concrete during the placing operation by a suitable means approved by the Engineer. On the day following the placing of the material each weep hole shall be rodded to assure that it has not been blocked. All weepholes shall be 2 inches in diameter and made of galvanized steel pipe, Schedule 40 or greater, polyvinylchloride (PVC) pipe, Schedule 40 or greater, acrylonitrile butadine -styrene (ABS) pipe, Schedule 40 or greater, or other material approved by the Engineer. The pipe shall be cut to fit the channel slope and shall be placed at an elevation of 1 foot above the toe of slope.

SS39-09. CUTOFF WALLS--Cutoff walls shall be constructed around the perimeter at each end of the channel lining and at all locations where the new lining meets structures or existing lining, and in other locations as shown on the plans. The cutoff walls shall be a minimum of 6 inches thick and 18 inches in depth measured from the surface of the lining. The welded wire fabric shall be bent down into the cutoff walls.

SS39-10. FINISHING--Poured-in-place concrete channel lining shall be spread and tamped until it is thoroughly compacted and mortar flushes to the surface. After striking off to grade, the concrete shall be hand floated with wooden floats not less than 4 inches in width and not less than 30 inches in length. The entire surface shall then be broomed with a fine texture hair push-broom to produce a uniform surface. Brooming shall be done when the surface is sufficiently set to prevent deep scarring, and shall be accomplished by drawing the broom parallel to the expansion and contraction joints.

Air blown mortar channel lining shall be placed as early as practicable to the required depth. The surface shall then be checked with a straight-edge, and any low spots or depressions shall be brought up to proper grade by placing additional mortar in such a manner that the finished surface will be reasonably smooth and uniform. Any base materials shall then be struck off with a finishing tool to provide a finish equivalent to a broomed concrete surface.

SS39-11. CURING--Curb and gutter shall be sprayed uniformly with a white pigmented or clear curing compound. The material, method, and rate of application shall conform to Section 90-7.01B of the State Specifications.

SS-40. AIR BLOWN MORTAR

SS40-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a unit price per square foot for air blown mortar of the various thicknesses shown on the plans and in the Proposal.

SS40-02. USES--Air blown mortar may be used for channel side slopes as bid under the items for channel lining. See Section SS-39 of these specifications.

SS40-03. MATERIAL AND PLACEMENT--Air blown mortar shall conform to Section 53 of the State Specifications, except that payment shall be made on the basis of unit price per square foot in place, in lieu of the price per cubic yard set forth in the State Specifications.

SS-41. ASPHALT CONCRETE DIKE

SS41-01. ITEM--Under this item of the Proposal, the Contractor shall bid a unit price per lineal foot for placing asphalt concrete dike.

SS41-02. PLACEMENT--Dikes shall be shaped and compacted with an extrusion machine only, and the machine shall be capable of shaping and compacting the material to the required cross section. Any machine which, in the opinion of the engineer, is not doing a satisfactory job, shall be removed from the project. Asphalt concrete shall be as specified in Section SS-22.

SS41-03. PAYMENT--Quantities of dikes constructed of asphalt concrete will be paid for at the contract price per lineal foot for placing asphalt concrete dikes. Full compensation for any necessary excavation and backfill involved in undercutting cut slopes for constructing dikes, will be considered as included in the contract price paid per linear foot for placing asphalt concrete dikes, and no additional compensation will be allowed therefore.

SS-42. PILING

SS42-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing the respective types of piling, other than cast-in-place concrete piling, as detailed on the plans and indicated on the Proposal. The requirements of the respective types shall conform to Section 49 of the State Specifications. No test piles will be required unless specifically called for in the Special Provisions.

SS-43. DRIVING PILES

SS43-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per each for driving piles of the respective types detailed on the plans and shown on the Proposal. The requirements for driving the respective types of piles shall conform to Section 49 of the State Specifications. No test piles will be required unless specifically called for in the Special Provisions.

SS44. PILES CAST IN PLACE

SS44-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective types of cast-in-place concrete piles. The requirements for the respective types of cast-in-place concrete piling shall conform to Section 49 of the State Specifications. No test piles will be required unless specifically called for in the Special Provisions.

SS-45. METAL BEAM GUARD RAIL

SS45-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a unit price per lineal foot for metal beam guard railing in place. Metal beam guard railing, method of installation, measurement and payment shall conform to special details of the plans and to Section 83 of the State Specifications and to the Standard Plans of the State of California, Department of Transportation or to the latest revisions or editions thereof.

SS-46. METAL RAILING (PIPES AND/OR TUBULAR)

SS46-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a unit price per lineal foot for metal railing (pipe) and/or metal railing (tubular) in place. Metal railing (pipe and/or tubular) method of installation, measurement, and payment shall conform to the special details shown on the plans, to the provisions in Section 83 of the State Specifications, to the latest edition of the Standard Plans of the California Department of Transportation, and to the Special Provisions.

SS-47. PIPE OPTIONS

SS47-01. ALTERNATES--Following are the alternates for drain pipe. On Proposal items where pipe options are shown, the Contractor shall bid only one of the alternates specified.

SS47-01.1 DRAIN PIPE ALTERNATES--The Contractor may, at his option, place cast-in-place concrete pipe, precast concrete pipe, corrugated steel pipe, corrugated aluminum pipe, vitrified clay pipe or asbestos cement pipe, according to the alternates shown on the plans and in the proposal. After award of the contract, should the Contractor elect to place an alternate type, the price bid shall remain in effect. If no alternatives are shown, the Contractor shall furnish and place only the pipes specified.

SS47-02. MEASUREMENT--The unit price bid for pipe will be paid only for the actual length of pipe placed except as noted herein. In locations where pre- cast manholes or saddle type manholes are to be constructed, measurement for payment shall be made from center of manhole. Measurement for payment shall include those portions of the pipeline included in special pipe fittings, except where such fittings are listed separately in the Proposal.

SS47-03. PAYMENT--The unit price bid for pipe per lineal foot shall include the furnishing of all materials, tools, labor, and equipment necessary to excavate the trench, connect to existing facilities, bed, place, and joint the pipe and fittings, backfill the trench, control dust, and perform all other work necessary to produce a complete installation in accordance with the plans and specifications. The unit price bid shall be the average price for the respective size of pipe at all depths and for all types of surface conditions.

SS-48. REINFORCED CONCRETE PIPE (RCP)

SS48-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes and classes of reinforced concrete pipe as indicated on the plans and in the Proposal.

SS48-02. SPECIFICATION--Reinforced concrete pipe shall conform to the specifications of ASTM Designation: C76, latest revision.

SS48-03. JOINTS FOR REINFORCED CONCRETE PIPE--Joints for concrete pipe shall be tongue and groove, bell and spigot, or other approved type, and shall be of such a design that when properly laid, they shall have a smooth and uniform interior surface. Each joint shall be sealed to prevent leakage. Sealing materials shall consist of either cement mortar, rubber gasketed joints, or resilient materials conforming to Section 65-1.06 of the State Specifications. Joints sealed with cement mortar or resilient materials shall be sealed both inside and outside.

If cement mortar is used in sealing the joint, the sealed joint shall be protected and cured in a manner approved by the Engineer. If the sealing material will not adhere to the pipe, or if a portion of the outside of the joint is inaccessible, the Contractor shall use a "diaper" or other method approved by the Engineer to properly seal the joint. Cement mortar shall consist of one part by volume of Type II cement and two parts by volume of sand. Grout shall consist of one part by volume of cement and 1-1/2 parts by volume of sand.

Immediately prior to making a cement mortar joint, the tongue and inside of the groove shall be thoroughly wetted with clean water.

SS48-04. CURVED ALIGNMENT--Curved alignment shall be accomplished by one of the methods described herein. The method to be used shall be as shown on the plans or as approved by the Engineer in writing.

A. Joint Deflection:

Maximum permissible joint deflection for gasketed joints shall be as recommended by the pipe manufacturer and shall be approved by the Engineer. The Contractor shall submit a copy of the pipe manufacturer's recommendations for approval prior to ordering any pipe. Any gasket jointed pipe ordered prior to the Engineer's approval of the joint deflection recommendations shall be at the Contractor's own risk.

Pipe sections of less than standard length to reduce angular deflection of joints will be allowed only with the Engineer's approval.

B. Beveled Pipe:

Sections of pipe with one or both ends beveled may be use for curved alignment. Beveled pipe shall have a maximum deflection of 5° from a plane perpendicular to the pipe axis unless otherwise shown on the plan or approved by the Engineer.

SS-49. POLYVINYL CHLORIDE PIPE

SS49-01. ITEM AND PAYMENT--Under these items of the proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the sizes, and series of polyvinyl chloride pipe, as indicated on the plans and in the Proposal. When fittings are indicated in the Proposal, the Contractor shall bid a unit price per each for the specified fittings. The fittings shall be manufactured and installed as set forth on the plans, in these specifications, and in the Special Provisions. If no item appears in the Proposal for polyvinyl chloride pipe fittings, the cost of furnishing and installing the fittings shall be included in the price bid per lineal foot for the pipe, said measurement to include the centerline length of the fittings installed.

SS49-02. SPECIFICATION--Polyvinyl chloride pipe for drainage shall conform to one of the following specifications:

Diameter	Specifications
8-inches through 15-inches	ASTM Designation: D3034, SDR35
18-inches through 27-inches	ASTM Designation: F679, SDR35

SS49-03. JOINTS AND CONNECTION TO STRUCTURES--Joints shall consist of either an elastomeric gasket coupling or an integral bell and spigot with an elastomeric gasket. The joints shall have seal ring grooves or other approved means for positively holding the gaskets in place. The pipe shall have a stop indicated on the barrel or other approved means to accurately position the pipe end in the joint.

Connections to manholes and concrete structures shall be made by utilizing manhole adapters or elastomeric seal rings embedded in the concrete.

SS49-04. END SECTIONS--PVC pipe shall not be placed in any situation where it will be exposed to the rays of the sun. When used as culverts or as a stub to a ditch or in a similar manner, the exposed end section shall be of another material.

SS49-05. BEDDING AND BACKFILL--Bedding and backfill shall conform to Section SS-9 of the specifications and the manufacturers recommendations.

SS49-06. DEFLECTION TESTING--Maximum allowable deflection (reduction in vertical inside diameter) of the installed pipe shall be 5%. On pipes 21 inches in diameter and smaller the Engineer may require the Contractor to furnish a properly sized "go, no-go" mandrel, sewer ball, deflectometer, or other approved device and check the pipe for maximum allowable deflection. For pipes larger than 21 inches in diameter, deflection may be determined by other means as recommended by the manufacturer. At any location where the deflection is determined to be excessive, the Engineer may require the Contractor to remove, rebed, and if required, replace the pipe.

SS-50. NON-REINFORCED CONCRETE PIPE (CP)

SS50-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes and classes of non-reinforced concrete pipe as indicated on the plans and in the Proposal.

SS50-02. SPECIFICATION--Non-reinforced concrete pipe shall conform to the specifications of ASTM Designation: C14, latest revision.

SS50-03. JOINTS FOR NON-REINFORCED CONCRETE PIPE--Joints shall conform to Section SS48-03 of these Specifications.

SS50-04. CURVED ALIGNMENT--Curved alignment shall conform to Section SS48-04 of these Specifications.

SS-51. CAST-IN-PLACE CONCRETE PIPE

SS51-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes of cast-in-place concrete pipe as indicated on the plans and in the Proposal.

SS51-02. DESCRIPTION--Cast-in-place concrete pipe shall consist of portland cement concrete placed in a prepared trench at the locations shown on the plans, as specified in these specifications and the Special Provisions.

SS51-03. PIPE MAKING EQUIPMENT--The pipe shall be constructed with equipment specially designed for constructing cast-in-place concrete pipe. The equipment shall be acceptable to the Engineer and the Contractor may be required to furnish evidence of successful operation on other work for the equipment he proposes to use. Equipment not suitable to produce the quality of work required for the pipeline will not be permitted to operate on the work.

SS51-04. SPECIAL EXCAVATION--Trench excavation shall conform to Section SS-9 of these specifications and as modified herein. The trench shall be excavated to the lines and grades necessary so that the lines and grades of the completed pipe will be as shown on the plans and within the tolerance specified in Section SS51-10. The trench shall be of the proper width and the bottom of the trench shall be shaped to the external diameter of the pipe to be constructed. The bottom of the trench shall be prepared to provide full, firm, uniform support by undisturbed earth or compacted fill over a minimum of the bottom 210 degrees of the outside of the pipe. Trench width at the top of pipe shall not exceed the outside diameter of the pipe at the spring line.

At the end of each working day, the maximum amount of trench open on any one portion of the project shall be 1-1/2 times the length of open trench necessary for placing pipe the next working day, plus the trench in which pipe was placed during the previous 24 hours, unless otherwise permitted by the Engineer or set forth in the Special Provisions. The remainder of the trench shall be backfilled and compacted, and when in streets or highways, opened to traffic as soon as practicable.

SS51-05. SPECIAL FOUNDATION TREATMENT--Whenever the bottom of the trench is soft, rocky, 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 a suitable material, it will provide a stable and satisfactory foundation. Minimum depth of selected backfill and bedding material shall be 6 inches or 1/4 the outside diameter of the pipe whichever is larger or of too sufficient depth to adequately bed the pipe as approved by the Engineer. Suitable material for backfilling the trench below the pipe shall consist of select material approved by the Engineer and compacted to a relative compaction of not less than 90 percent.

When the material below the normal trench bottom as required for a proper foundation for the pipe is ordered removed by the Engineer, the excavation below that point, and the material required to backfill the trench to that point, shall be paid for as extra work.

Section SS9-08 of these Specifications shall apply to the construction of cast- in-place concrete pipe in fill areas and embankments.

SS51-06. CONCRETE--Concrete shall be Class "A" and shall conform to the requirements of Section SS-32 of these specifications as modified herein.

A. Maximum Aggregate Size

Pipe Size	Maximum Aggregate
48" or less	1"
Over 48"	1-1/2"

B. Slump shall not exceed 2 inches as determined by the slump cone method of ASTM Designation: C143 or an equivalent slump as determined by Test Method No. California 533, unless otherwise permitted by the Engineer.

C. The minimum wall thickness for the various size of pipe shall conform to the following table:

Internal Diameter	Minimum Wall Thickness
24" through 30"	3"
33" and 36"	3-1/2"
42"	4"
48"	5"
54"	5-1/2"
60"	6"
66"	6-1/2"
72"	7"
78"	7-1/2"
84"	8"
90"	8-1/2"
96"	9"
108"	10"
120"	12"
132"	14"
144"	15"

SS51-07. PLACING CONCRETE--The applicable provisions of Section 51-1.09 of the State Specifications shall govern the placing and vibration of the concrete. All surfaces against which concrete is to be placed shall be free from water, mud, debris, and shall be firm enough to prevent contamination of the concrete by earth or other foreign material. Absorptive surfaces against which concrete is to be placed shall be moistened thoroughly so that the moisture will not be drawn from the freshly placed concrete.

An approved method or device shall be used when placing invert concrete to insure that thickness is maintained at not less than minimum wall thickness at any point. Approval of this method or device must be obtained in writing from the Engineer prior to commencement of work.

The cast-in-place pipe shall be constructed in one placement around the complete periphery.

The temperature of concrete when it is being placed shall be not more than 90 and not less than 40°F in moderate weather, or not less than 50° in weather during which the mean daily temperature in the vicinity of the work site falls below 40°F. Whenever the mean daily temperature in the vicinity of the work falls below 40°F for more than one day, the concrete shall be maintained at a temperature not lower than 50°F for at least 72 hours after it is placed. Concrete shall be protected against freezing temperatures for 3 days immediately following the 72 hours of protection at 50°F. Where artificial heat is employed, special care shall be taken to prevent the concrete from drying. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90°F the Contractor shall employ effective means, such as pre-cooling of the aggregates and mixing

water and placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90°F.

SS51-08. START AND CLOSE SECTIONS--A starter section shall be used at the beginning of each run of cast-in-place concrete pipe; such as beginning from an existing structure, or from a manhole, at a change in size or from a manhole at an angle point. Starter sections shall be approximately 6 feet in length and of the same inside diameter as the cast-in-place concrete pipe unless indicated otherwise on the plans or approved by the Engineer.

A closing section shall be used where indicated on the plans or when directed by the Engineer, or where it is not possible to complete a run of cast-in-place concrete pipe because of lack of clearance ahead in the trench.

Starting and closing sections may be either concrete pipe or corrugated steel pipe meeting the strength requirements indicated on the plans; however, if the combined length of the starting and closing sections exceeds 12 feet in one reach between manholes, concrete pipe shall be used.

SS51-09. CONSTRUCTION JOINTS--If construction of the pipe stops short of a manhole, or for a period of time exceeding 20 minutes, the resulting construction joint shall be reinforced with a concrete collar. This collar shall extend 1 foot either side of the joint, and shall be of a minimum thickness equal to that of the pipe. The resulting end of pipe shall be securely closed by a heavy canvas or equal to prevent excessive dehydration of the concrete already placed.

Joints shall be clean and damp when covered with fresh concrete or mortar. Cleaning of construction joints shall consist of removing all latency, loose or defective concrete, coating, and foreign material.

SS51-10. FINISH--Invert elevations of the completed pipe shall not vary more than 0.05 feet from the design grade for pipe 36 inches in diameter or less, and 0.10 feet from the design grade for pipe greater than the 36 inches diameter. Variations in the internal diameter shall not exceed 1/32 inch per diameter inch. Offsets at form laps shall not exceed the limits specified in the following table:

Pipe Diameter	Maximum Offset
24" through 30"	3/8"
33" through 42"	1/2"
48" through 66"	5/8"
72" through 90"	7/8"
96" and 108"	1"
120" and larger	1-1/8"

The finished surface of the concrete pipe shall be substantially free of fractures, cracks, and interior surface roughness.

The Contractor shall hand trowel the bottom 90° of the inside of the pipe unless alternate provisions are made to provide a smooth interior surface satisfactory to the Engineer. The remaining interior surface of the pipe not covered by forms shall be equivalent to a steel screened finish. All extraneous concrete shall be removed from the interior surface as soon as possible after placing.

After removal of forms, the inside of the pipe shall be inspected and any required repairs shall be made. All porous and fractured concrete shall be removed by chipping, and any holes cut in pipe for inspection or to facilitate removing the forms shall be repaired by filling with concrete or dry patching with mortar. Rough offsets at the form laps shall be smoothed by patching with mortar, or by other suitable means. Forms shall be removed within one working day after placing the pipe, and all repairs shall be completed within one working day after removal of forms.

If obvious segregation or honeycombing, cracking, or inadequate wall thickness are encountered during inspection, the pipe may be rejected by the Engineer.

SS51-11. FORMS--Forms shall be strong enough to withstand the vibrating of the concrete and to permit workmen to place the concrete without causing distortion at any point, and form support systems shall be constructed so that previously placed concrete shall not be damaged. Form structure bearing plate indentations shall not exceed 1/8 inch and care shall be taken when removing the forms to prevent damage to the pipe.

The surfaces of the forms against which concrete is to be placed shall be cleaned of all dirt, mortar and foreign material. Forms shall be thoroughly coated with form oil prior to use. The form oil shall be a commercial quality form oil or other equivalent coating which will permit the ready release of the forms.

SS51-12. CURING--Immediately after finishing exposed exterior surfaces, the curing of these surfaces shall be undertaken by any one or a combination of the following methods:

A. Pigmented curing compound, blanketing, cotton mat, or waterproof membrane as specified in Section 90-7.01 of the State Specifications.

B. A 6 inch layer of moist earth may be backfilled over the pipe. Care must be taken to avoid damage to the fresh concrete while placing the backfill. This backfill shall be kept moist for not less than 7 days.

During the period following the placement of the concrete, the ends of the pipeline shall be covered with heavy canvas or other suitable material to maintain a humid condition within the pipe for a minimum of 7 days, except during periods when repair work is actually in progress on the inside of the pipe.

SS51-13. COVER--Where cast-in-place concrete pipe is placed under roadways, driveways, parking areas or other locations used by public traffic, the following cover requirements shall control.

Where cover is 24 inches or less, backfill shall consist of aggregate base material, meeting the requirements of Section SS-21 of these specifications. Concrete curing shall be by methods other than moist loose soil or sand.

Where cover exceeds 24 inches, backfill shall meet the requirements of Section SS-11 of these specifications.

SS51-14. SPECIAL BACKFILL--Depth of backfill over the top of cast-in-place pipe shall not exceed 6 inches until the pipe has been in place at least 24 hours. Loose backfill may then be completed after the pipe has been in place 24 hours. Under these conditions extra care must be taken so as not to damage the pipe during placement of the backfill material. To prevent possible damage to the pipe by placing backfill directly on the pipe, the backfill shall be sloped downward to the top of the pipe. Backfill material may then be placed at the top of the slope and allowed to roll down the slope onto the pipe. Until the height of the backfill exceeds 3 feet, machine placed backfill shall not be allowed to "free-fall" more than 1 foot. The backfill may then be jetted after the pipe has been in place at least 48 hours. The Contractor will be responsible for any damage to the pipe caused by backfilling operations. Light traffic (axle loads less than 6,000 pounds) may be routed over the pipe 48 hours after the pipe has been in place. Unrestricted traffic may be permitted over the pipe after the pipe has been in place at least 72 hours. Intermediate backfill shall be placed only with the approval of the Engineer.

SS51-15. PAYMENT RETENTION--Section GS-9 of these Specifications is modified to provide for the retention of 25 percent of the in-place value of cast-in-place concrete pipe until such time as the provisions of these specifications have been complied with and the pipe is completed, finished, and backfilled and surfaces restored to the satisfaction of the Engineer. This section shall not operate to authorize any progress payment in excess of 90 percent of the total value of the work done. In all other respects, the provisions of Section GS-9 shall apply.

SS51-16. SUITABILITY OF TRENCH--It shall be the responsibility of the Contractor to determine the suitability of the sidewalls of the excavated trench for the placement of cast-in-place concrete pipe. The Contractor shall determine whether the trench walls will provide sufficient lateral support to prevent deflection and cracking of the pipe from backfill and live loads, and that the trench width at the top of the pipe will not be excessive so as to impose additional loading on the pipe.

If, after examining the sides of the trench, the Contractor elects to place cast-in-place concrete pipe, and the pipe subsequently develops longitudinal cracks exceeding 5 feet in length, the Contractor at his own expense shall replace the pipe as directed by the Engineer.

Should the Contractor decide not to place cast-in-place concrete pipe after examination of the trench sidewalls, he shall place one of the pipe alternatives shown on the plans in accordance with Section SS-47 of these Specifications, and no additional payment will be made.

SS-52. CORRUGATED STEEL PIPE (CSP)

SS52-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes and thickness of corrugated steel pipe, as indicated on the plans and in the Proposal. When fittings are indicated in the Proposal, the Contractor shall bid a unit price per each for the respective sizes, thickness and types of corrugated steel pipe fittings. The fittings shall be fabricated and installed as set forth on the plans, in these specifications and in the Special Provisions. If no item appears in the Proposal for corrugated steel pipe fittings the cost for furnishing and installing the fittings shall be included in the price bid per lineal foot for corrugated steel pipe, said measurement to include the centerline length of the fittings installed.

SS52-02. SPECIFICATION--Corrugated steel pipe shall conform to the material and fabrication methods of Section 66 of the State Specifications except as modified herein. All corrugated steel pipe shall be fabricated with helical corrugations and with a continuous lock or weld seam extending from end to end of each length of pipe. Helically corrugated steel pipe shall be fabricated using corrugation profiles as shown in the following table:

CORRUGATION PROFILE

Diameter (inches)	Nominal Pitch (inches)	Maximum Pitch (inches)	Minimum Depth (inches)
8 and 10	1-1/2	1-7/8	1/4
12 through 96	2-2/3	2-3/4	1/2
48 through 120	3	3-1/4	1

The corrugation profile of 2-2/3 by 1/2 inches shall be used for all pipes from 12 inch diameter through 96 inch diameter, unless otherwise specified on the plans or in the Special Provisions.

Lock or welded seams shall develop the full strength of the pipe in accordance with the herein referenced specifications.

Pipe which has been patched shall be rejected.

SS52-03. LATERAL CONNECTIONS--Lateral field connections between metal pipes shall be welded and any galvanizing damaged by welding shall be repaired according to Section 66 of the State Specifications.

SS52-04. PROTECTIVE COATINGS--When specified on the plans or in the Special Provisions, the pipe, couplings, and fittings shall be protected with a bituminous coating as specified in Section 66-1.03 of the State Specifications.

SS52-05. COUPLINGS--Couplings for corrugated steel pipe shall be of durable gasketed design. Couplings shall consist of galvanized steel coupling bands fitted with gaskets fabricated from neoprene or butyl rubber or other durable resilient material approved by the Engineer, and assembled in such a manner as to form a sealed joint. The Engineer may require that the coupling design be submitted for his approval prior to placing, and may require supporting data showing that the coupling is tight and durable. Heat-shrinkable plastic couplings will not be permitted.

SS52-06. FITTINGS--Corrugated steel pipe fittings shall be constructed of the thickness of steel indicated on the plans. The material and method of placing shall conform to the standards for corrugated steel pipe as stated elsewhere in these specifications.

The fittings shall conform to the Standard Drawings or as shown on the plans.

Metered joints shall be welded from the inside where practicable. Welded joints shall be as smooth and even as practicable. Welded joints shall be repaired according to Section 66-3.05 of the State Specifications.

All fabrication shall be done in accordance with generally accepted practice for good workmanship. The Contractor shall notify the Engineer at least 48 hours before delivery of the fittings so that the Engineer may inspect the fittings at the fabrication plant.

Diameter of fittings will depend on the pipe option selected by the Contractor. Upstream diameter of fittings shall match upstream pipe diameter; downstream diameter of fittings shall match downstream pipe diameter.

If the size of the corrugated pipe fitting is too large to conveniently fabricate or transport in one piece, the fitting may be fabricated in two or more parts which will then be jointed at the site with couplings. The joint shall be located sufficiently distant from a welded joint so that there is no interference between the coupling and the welded joint.

SS52-07. CURVED ALIGNMENT--Curved alignment shall be constructed in accordance with good industry practice. Joint deflection in excess of 1/2 inch will not be permitted without the specific approval of the Engineer in writing.

SS52-08. DISTORTION--In advance of placing backfill material around circular pipes 48 inches or larger in diameter, the full length of the pipe shall be distorted from a true circle to provide an increase in the vertical diameter of approximately 5 percent. Distortion may be performed at the fabricating shop or in the field. If struts or other means are required to retain distortion prior to placing the pipe, they shall not be removed until after the intermediate backfill has been placed but shall be removed prior to placing structures at the ends of the pipe.

SS52-09. METAL COLLAR--Excepting for arch pipe, all corrugated steel pipe shall enter concrete structures as a perfect circle. On pipe 42 inches or larger in diameter, a galvanized steel collar, 6 inches in width, and a minimum thickness of 0.109 inch shall be continuously welded to the pipe in such a location that the collar shall be at the approximate center of the wall of the structure. Arch pipe with a span of 50 inches or greater shall also be provided with a metal collar as specified above.

SS-53. CORRUGATED ALUMINUM PIPE (CAP)

SS53-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes and thickness of corrugated aluminum pipe, as indicated on the plans and in the Proposal. When fittings are indicated in the Proposal, the Contractor shall bid a unit price per each for the respective sizes, thicknesses, and types of corrugated aluminum pipe fittings. The fittings shall be fabricated and installed as set forth on the plans, in these specifications, and in the Special Provisions. If no item appears in the Proposal for corrugated aluminum pipe fittings, the cost of furnishing and installing the fittings shall be included in the price bid per lineal foot for corrugated aluminum pipe, said measurement to include the centerline length of the fittings installed.

SS53-02. SPECIFICATION--Corrugated aluminum pipe shall conform to the material and fabrication methods of AASHTO Designation M196 and as modified herein. All corrugated aluminum pipe shall be fabricated with helical corrugations and with a continuous lock seam extending from end to end of each length of pipe.

Helically corrugated aluminum pipe shall be fabricated using corrugation profiles as shown in the following table:

CORRUGATION PROFILE

Diameter (inches)	Nominal Pitch (inches)	Maximum Pitch (inches)	Minimum Depth (inches)
8 and 10	1-1/2	1-7/8	1/4
12 through 96	2-2/3	2-3/4	1/2
48 through 120	3	3-1/4	1

The corrugation profile of 2-2/3 by 1/2 inches shall be used for all pipes from 12 inch diameter through 96 inch diameter, unless otherwise specified on the plans or in the Special Provisions.

SS53-03. INSULATION--Corrugated aluminum pipe shall be insulated from dissimilar metals by a minimum of 6 inches of concrete.

SS53-04. COUPLINGS--Couplings for corrugated aluminum pipe shall be of a durable, tight design. Couplings shall consist of aluminum coupling bands fitted with gaskets fabricated from neoprene or butyl rubber, or other durable resilient material approved by the Engineer and assembled as to form a tight joint. The Engineer may require that the coupling design be submitted for his approval prior to placing, and may require the supporting data showing that the coupling is tight and durable. Heat-shrinkable plastic couplings will not be permitted.

SS53-05. PROTECTIVE COATINGS--When specified on the plans or in the Special Provisions, the pipe, couplings, and fittings shall be protected with a bituminous coating as specified in Section 66-1.03 of the State Specifications.

SS53-06. FITTINGS--Corrugated aluminum pipe fittings shall be constructed of the gauge aluminum indicated. The material and method of placing shall conform to the standards for corrugated aluminum pipe as stated elsewhere in these specifications.

The fittings shall conform to the Standard Drawings or as shown on the plans.

All fabrication shall be done in accordance with generally accepted practice for good workmanship. The Contractor shall notify the Engineer at least 48 hours before delivery of the fittings so that the Engineer may inspect the fittings at the fabrication plant.

Diameter of the fittings will depend on the pipe option selected by the Contractor. Upstream diameter of the fittings shall match upstream pipe diameter; downstream diameter of fittings shall match downstream pipe diameter.

If the size of the corrugated pipe fitting is too large to conveniently fabricate or transport in one piece, the fitting may be fabricated in two or more parts which will then be jointed at the site with couplings. The joint shall be located sufficiently distant from a welded joint so that there is no interference between the coupling and the welded joint.

SS53-07. CURVED ALIGNMENT--Curved alignment shall be constructed in accordance with good industry practice. Joint deflection in excess of 1/2 inch will not be permitted without the specific consent of the Engineer in writing.

SS53-08. DISTORTION--Distortion of corrugated aluminum pipe will be required and shall be in accordance with Section SS52-08 of these Specifications.

SS53-09. METAL COLLAR--Excepting for arch pipe, all corrugated aluminum pipe shall enter concrete structures as a perfect circle. On pipes 42 inches or larger in diameter, an aluminum collar, 6 inches in width, and a minimum of 0.135 inches in thickness shall be continuously welded to the pipe in such a location that the collar shall lie at the approximate center of the wall of the structure. Arch pipe with a span of 49 inches or greater shall also be provided with an aluminum collar as specified above.

SS53-10. END FINISH--Exposed ends of corrugated aluminum pipe located within the road right of way, or where specified on the plans, shall be reinforced in accordance with Section 66-2.04 of the State Specifications.

SS-54. VITRIFIED CLAY PIPE (VCP)

SS54-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes of vitrified clay pipe as indicated on the plans and in the Proposal.

SS54-02. SPECIFICATION--Vitrified clay pipe and fittings shall conform to and meet all of the requirements of ASTM Designation: C700, Standard Specifications for unglazed vitrified clay sewer pipe, extra strength, and shall conform to all materials data contained in the current Clay Pipe Engineering Manual published by the National Clay Pipe Institute. A certification of compliance with these requirements must be furnished by the pipe manufacturer.

SS54-03. JOINTS FOR VITRIFIED CLAY PIPE (SEWER)--Joints in vitrified clay pipe shall be of a factory applied resilient-type plastic compression type which conforms to ASTM

Designation: C425. Compression couplings for plain end pipe shall conform to ASTM Designation: C594.

SS54-04. JOINTS FOR VITRIFIED CLAY PIPE (DRAINAGE)--Cement mortar joints may be used for vitrified clay pipe used for drainage pipe as an alternative to the plastic compression type joints specified in Section SS54-03 of these Specifications. The annular space between the pipe barrel and the inside of the socket shall first be caulked with jute which has been dipped in a cement slurry. The quantity of jute shall be such as to fill not more than one-third the annular space. Cement mortar shall then be firmly caulked into the remainder of the joint space, and then trowelled smooth to a 45° angle from the outside of the socket to the pipe barrel.

SS-55. DUCTILE IRON PIPE (DIP)

SS55-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective sizes and class of ductile iron pipe, as indicated on the plans and in the Proposal.

SS55-02. SPECIFICATION--Ductile iron pipe shall conform to ANS1 A21.51 (AWWA C151) for a minimum working pressure of 150 psi unless otherwise specified. Ductile iron castings shall conform to and be tested in accordance with ASTM A536. Casting grade for pipe shall be 60-42-10. Laying length shall be the manufacturer's standard length, normally 18 feet. Shorter lengths may be used when required for closures and proper location of special sections.

The interior surface of all ductile iron pipe shall be cement-mortar lined and seal coated in conformance with AWWA C104 and the exterior surface shall have a bituminous coating of either coal tar or asphalt base, approximately 1 mil thick.

Fittings shall be push-on, mechanical, or flanged-type ductile iron or cast iron and shall conform to ANSI 21.10 (AWWA C110) or ANSI 21.11 (AWWA C111) designed for a working pressure of 250 or 350 psi. Coating and lining requirements shall be the same as specified for pipe.

All ductile iron pipe and fittings shall be wrapped with poly encasement per AWWA C105 and AWWA C153 unless soil corrosiveness as identified by the Soils Engineer is below acceptable limits.

SS55-03. JOINTS--Joints shall be push-on or mechanical type and shall conform to ANSI 21.11 (AWWA C111) with rubber gaskets unless otherwise specified.

SS-56. BLANK

SS-57. CONDUCTOR CASING PIPES

SS57-01. ITEM AND PAYMENT--Pipe used as a conductor of another conduit under a highway, railroad, or other location, shall be either welded steel pipe, corrugated steel pipe or reinforced concrete pipe, as specified herein. Payment for conductor pipe shall be as specified elsewhere in these specifications for the type of pipe to be conducted.

SS57-02. CORRUGATED STEEL PIPE--Corrugated steel pipe shall conform to and meet all the requirements of Section SS-52 of these specifications. Corrugated steel conductor shall be not less than 0.138 inches in thickness for sizes up to 36 inches, and 0.168 thickness for diameters to 60 inches. The sections of pipe shall be especially prepared for making field joints by bolting with 3/8 inch diameter galvanized bolts.

SS57-03. REINFORCED CONCRETE PIPE--Reinforced concrete pipe shall conform to the requirements of Section SS-48 of these specifications except for joints. The pipe must be designed to safely bear all loads imposed by jacking in addition to the design D-loads. Only pipe using double-rubber gasket, fiberglass reinforced epoxy collar, or approved equal type joints may be used.

SS57-04. WELDED STEEL PIPE--Welded steel pipe shall be manufactured of ASTM Designation A 245, commercial grade steel. All joints shall be butt welded. Welded steel conductor shall have a minimum wall thickness of 1/4 inch for sizes up to and including 24 inches in diameter and 5/16 inch for sizes 27 to 36 inches in diameter.

SS-58. DRIVEWAY CULVERTS

SS58-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing each of the respective sizes of driveway culvert as indicated on the plans and as directed by the Engineer. The Contractor may elect to use reinforced concrete pipe, nonreinforced concrete pipe, corrugated steel pipe, or corrugated aluminum pipe. Corrugated aluminum pipe may not be used where cover is less than 1 foot.

SS58-02. SPECIFICATION--The minimum nominal thickness of 10 inch and larger corrugated steel pipe shall be 0.064 inch. The minimum nominal thickness for corrugated aluminum pipe shall be 0.060 inch for 10 inch corrugated aluminum pipe and 0.075 inch for 12 inch and larger sizes of corrugated aluminum pipe.

SS58-03. JOINTS--The pipe and joints shall conform to the requirements as indicated elsewhere in these specifications for the type of pipe used.

SS58-04. BEDDING AND BACKFILL--Bedding and backfill shall be of native material, free from refuse and individual particles over 2 inches maximum dimension. Compaction of backfill shall be by tamping, wetting, or both, as directed by the Engineer.

SS58-05. END FINISH--Exposed ends of corrugated aluminum pipe culverts shall be reinforced in accordance with Section 66-2.04 of the State Specifications.

SS-59. FLARED END SECTIONS

SS59-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per each for furnishing and placing each of the respective sizes of steel flared end sections and concrete flared end sections as indicated on the plans and in the Proposal.

SS59-02. SPECIFICATION--Materials, method of placing, and payment shall conform to Section 70 of the State Specifications.

SS-60. PIPE FITTINGS AND MISCELLANEOUS PIPE FACILITIES

SS60-01. PAYMENT--Unless otherwise set forth in the Special Provisions, the cost of furnishing and placing all pipe fittings shall be included in the contract unit price bid per lineal foot of the respective type, size, and classification of pipe. The payment for fittings shall be included in the length of pipe and no fittings shall be measured separately unless herein specified.

SS60-02. JOINTING--All pipe fitting and jointing, including the maximum deflection of joints in curved alignment, shall be in accordance with accepted best practice. Care shall be used to prevent chipping, cracking, or deformation of either end of the pipe during installation. Adjacent pipes at each joint are to be concentric. Maximum allowable eccentricity is 1 percent of pipe I.D. or 3/16 inch, whichever is greater. Greater eccentricity shall be corrected.

SS-61. BORING AND JACKING

SS61-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing by boring and jacking the respective sizes and types of pipe as indicated on the plans and in the Proposal. Where specified or permitted, the pipe shall be placed in a conductor. The unit price bid per lineal foot of bored and jacked pipe shall include the conductor pipe, if specified or if permitted, the pipe to be placed in the conductor, all excavation, backfill, and all other tools, material, labor, and equipment to complete the installation in accordance with the plans and specifications.

SS61-02. GENERAL--All conductor pipe, pipe to be conducted and fittings shall conform to the applicable portions of these specifications.

The equipment, method and sequence of operation and conductor pipe grades 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 workmen and any adjacent structure or roadbed. Special backfill requirements may be specified for pipe installed in the area excavated for the boring operation.

Unless expressly specified otherwise, the Contractor may elect to either jack reinforced concrete pipe, or reinforced concrete pipe sewer, directly or place it in a conductor in conformance with these specifications.

SS61-03. DIRECT JACKING OF REINFORCED CONCRETE PIPE OR REINFORCED CONCRETE PIPE SEWER--Only pipe using double-rubber gasket, fiberglass reinforced epoxy collar, or approved equal type joints may be jacked directly. The pipe must be designed to safely bear all loads imposed by jacking in addition to the design D-loads. Guide rails shall be accurately set to line and grade to insure installation within tolerances allowed. Maximum length of direct jacking shall be 100 feet. The diameter of the hole shall not be more than 0.1 foot greater than the outside diameter of the reinforced concrete pipe or reinforced concrete pipe sewer.

SS61-04. 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. Conductor diameter shall be sufficient to allow adjustment of line and grade of the conducted pipe to meet allowable tolerances and to allow sand to be placed between the conductor and the conducted pipe. Minimum conductor diameter shall be 6 inches larger than the outside diameter of the conducted pipe joints.

SS61-05. PLACING PIPE IN CONDUCTOR--Conducted VC sewer pipe, of which any part of the joint is larger in diameter than the barrel of the pipe, shall be strapped to two redwood skids 24 to 30 inches in length with steel straps. The redwood skids shall be near the center of each pipe section and shall be large enough to prevent any part of the joint from bearing on the conductor. Each joint of conducted water pipe or AC sewer pipe shall be strapped to two pairs of redwood skids, 24 to 30 inches in length, centered at points approximately 1/5 the pipe length from each end.

Conducted pipe with joints not larger than the pipe barrel shall be slid into place on two redwood skids which have been securely fastened to the invert of the conductor or strapped to the barrel of the pipe, at locations hereinbefore specified.

Pipe sections shall be joined outside the conductor and then slid into place. The space between the conducted pipe and conductor shall be completely filled with clean, dry sand blown into place. The method of placing sand shall be subject to the Engineer's approval. Necessary adjustments in grade shall be made by adjusting the height of the skids.

SS61-06. BACKFILL 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 or direct jacked pipe than herein allowed, 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 conductor. The jacking head shall cover the upper 2/3 of the conductor and project not more than 1/2 inch beyond the conductor's outer surface. Excavation shall not be made in advance of this jacking head.

Voids greater than allowable 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 conductor, to pressure inject grout to refusal, and then to repair the drilled hole. Grouting pressure shall not exceed 50 psi at the nozzle.

SS61-07. 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 conductor pipe shall be such that line and grade of the conducted pipe can be adjusted a sufficient amount within the conductor pipe 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.

Directly jacked reinforced concrete pipe will be allowed a maximum deviation of 0.25 foot per 100 feet from intended line and grade unless more stringent tolerances are shown on the plans or directed by the Engineer.

SS61-08. DRY BORING UNDER CURB, GUTTER AND SIDEWALK--Portions of sanitary sewers, service sewers, drainage lines, and water mains and services which pass beneath curbs and gutters, sidewalks, and other obstructions may be placed by boring. If under the curb, gutter and

sidewalk, the bore shall begin at the lip of the gutter and continue to slightly past the property line. The end of the pipe shall then be capped or plugged and the pipe pushed into the hole. To determine final line and grade and to install the cleanout or the location post, the property end of the bore for a service sewer shall be exposed. If the pipe material is vitrified clay or asbestos cement, the pipe shall be plain end connected with compression type couplings. The bore shall be just large enough to pass the couplings and need not be backfilled. The maximum length of bore shall be 15 feet unless otherwise specified.

SS61-09. WET BORING OF SMALL DIAMETER PIPELINES--Where expressly specified in the contract documents, 6 inch and smaller pipelines may be installed by wet boring. Pipe material shall be ductile iron as specified herein with push-on joints. PVC Pressure Class 200 (DR-14) pipe conforming to the requirements of AWWA C900 may be used in lieu of ductile iron pipe.

If the diameter of the bored hole is more than 0.1 foot greater than the outside diameter of the pipe to be installed, the void shall be backfilled with sand, soil cement, or grout as directed by the Engineer.

SS61-10. TUNNELING--Tunneling shall not be permitted unless specified in the Special Provisions, indicated on the improvement plans or approved by the Engineer during construction.

SS-62. PIPE INSTALLATION (DRAINAGE)

SS62-01. PIPE LAYING--Pipe shall be laid in strict conformity to the prescribed line and grade, with grade bars set and each pipe length checked to the grade line. Three consecutive points on the same rate of slope shall be used at all times to detect any variation from a straight grade. In case any discrepancy exists, the work shall be stopped and the discrepancy immediately reported to the Engineer. In addition, when requested by the Engineer, a string line shall be used in the bottom of the trench to insure a straight alignment of the sewer pipe between manholes. The maximum deviation from grade shall not be in excess of 1/4 inch. In returning the pipe to grade, no more than 3/8 inch depression shall result.

For drainage pipes less than 36 inches in diameter, allowable deviation in profile shall be 0.05 foot. For drainage pipes greater than 36 inches in diameter, allowable deviation in profile shall be 0.10 foot; allowable deviation in slope shall be 0.15 foot in any 10 feet length of pipeline.

Pipe laying shall proceed upgrade with the bell ends of bell and spigot pipe placed upstream. Each section of pipe shall be laid to line and grade as herein specified and in such a manner as to form a watertight, concentric joint with the adjoining pipe. The interior of the pipe shall be cleared of all dirt and debris and excess joint sealing material as the work progresses. Pipe shall not be laid when the condition of the trench or the weather is unsuitable. All open ends of sewer pipe and fittings shall be adequately and securely closed whenever the work is discontinued for more than 1/2 hour.

If pipe with elliptical or quadrant reinforcement is used, care shall be taken to properly orient the axis.

Where plain end vitrified clay pipe with the compression coupling is installed, the Contractor shall tighten the compression bands as pipe laying proceeds. The first length of pipe laid on any run, except where a connection is made to an existing line, shall be anchored securely to prevent movement when each succeeding length is pushed home. After each compression band is torqued, the Contractor shall replace and tamp any bedding material that may have been displaced under the pipe and particularly under the coupler before proceeding with the initial backfill.

All joint surfaces shall be cleaned before joints are made.

The Contractor shall expose the end of existing pipe to be extended, for verification of alignment and elevation, by the Engineer, prior to trenching for any pipe which may be affected. All cost of such excavation and backfill shall be included in the price paid for various items of work. Trench excavation, bedding and backfill shall conform to Section SS-9 and Section SS-11 of these specifications.

SS62-02. BLANK

SS62-03. EXISTING UTILITIES--All utility, service, or other conflicting lines which are not in direct physical conflict with the facility under construction, are to be worked around by the Contractor, and no additional compensation will be made therefore. However, the Contractor for his convenience, may arrange with the owner of the utility to temporarily disconnect house service lines or other facilities along the line of work, and the cost of disconnecting and restoring such utilities shall be borne by the Contractor.

Utility or other lines which are in direct physical conflict with the structural section of the facility being constructed or appurtenant structures thereto, and which cannot be avoided by rerouting the facility being constructed, or for which relocation is not provided for in the plans and specifications, will be relocated by the owner of the utility prior to or during construction of the project. If these relocations have not been accomplished at the time the contract is awarded, the Contractor shall schedule his work and cooperate with the owner of the utility for the relocation of the conflicting utility so as to cause a minimum of interference with the Contractor's operations.

Should it become necessary to reroute the facility being constructed to avoid an existing utility or other obstruction and such rerouting is ordered by the Engineer, compensation for the installation of such rerouted line shall be made at the unit price bid for the installation of said facility and no additional compensation will be made except as provided for in Section 4 and 9 of the General Specifications.

SS62-04. SEQUENCE--On all drainage projects, excepting new subdivision improvements, no more than 3,000 lineal feet of pipe shall be installed before starting manhole construction and

cleanup with this sequence being maintained throughout the construction period unless otherwise directed by the Engineer. The work set forth above at any given location is to be completed within 15 working days after starting construction at that location. No longer than 30 calendar days shall elapse from the time the trench is backfilled until placement of final paving, unless delayed by weather.

SS62-05. INTERNAL INSPECTION--Upon completion of construction and prior to final inspection, the Contractor shall clean the entire new pipeline of all dirt and debris. Any dirt or debris in previously existing pipes or ditches in the area, which in the opinion of the Engineer resulted from the new installation, shall also be removed by the Contractor. Pipes up to and including 24 inch diameter shall be cleaned by the controlled balling method, except where cover over the top of the pipe at the upstream manhole is 3 feet or less, alternate means of cleaning may be used if approved by the Engineer in writing. Pipes over 24 inch diameter shall be cleaned as approved by the Engineer. Temporary plugs shall be installed and maintained during cleaning operations at points of connection to existing facilities to prevent water, dirt, and debris from entering the existing facility. Water from the drainage system operations shall be routed through a suitable trap to collect any dirt and debris prior to discharging into any downstream facility. The Contractor shall notify the Engineer immediately after completion of the pipe cleaning operations. Cleaning of drainage pipes by the controlled balling method will not be required.

A mandrel test shall be conducted on all non-rigid storm drain pipe less than 24 inches in diameter, following completion of subgrade processing and compaction for curb, gutter and sidewalk and prior to placement of asphalt concrete pavement. Placement of curb, gutter and sidewalk and asphalt concrete pavement (and related aggregate base) shall not occur until the Construction Inspector has approved the mandrel test, who shall be present through the duration of the mandrel testing.

The allowable deflection for all non-rigid pipes shall be 7.5% maximum. The deflection shall be tested by pulling a mandrel which is 92.5% of the inside pipe diameter through all installed pipe. The mandrel shall be the "go/no-go" type and shall be pulled without mechanical assistance. Prior to the mandrel test, the pipe shall be thoroughly flushed and cleaned. At each location in which the mandrel cannot pass, the cause shall be
ascertained. Obstacles in the pipe shall be removed if it is determined that the deflection exceeds 7.5%, that a gasket has been mis-installed or that the pipe has been damaged due to trenching for another utility, the respective section of pipe shall be excavated, replaced using water tight repair couplings, rebedded and backfilled. A passing mandrel retest and an additional TV inspection are required.
All diameters of storm drain mains and laterals, regardless of pipe material, shall be televised to ascertain the integrity of the installed pipe. This requirement is for both public and private projects. The television inspection (TVI) shall occur with a City Construction Inspector present, and shall occur after installation of the joint trench utility crossings and placement of trench backfill material to the finished subgrade elevations have been completed.

TVI shall be required and performed prior to placing asphalt concrete pavement, AND prior to the Notice of Completion for public and private subdivision projects. For commercial projects, which are not part of a subdivision the TVI shall be performed by the Contractor. Costs for said inspection shall be borne by the Contractor. The Construction Inspector shall be notified 48 hours in advance of testing without exception, and shall be present during the television inspection. TVI equipment shall include video cameras, a color monitor, digital recording equipment, sound and voice recording capabilities, gauging tool, cables, power sources, and all equipment necessary to perform a TVI.

The camera shall be a pan and tilt camera with pipe grade verification system (inclinometer), and shall be specifically designed and constructed for storm drain environment. The camera shall include: a solid state color TV camera with a panning and rotational camera head; remote adjustable optical focus and automatic light compensation iris with remote override; camera controller with remote focus, iris and auto centering control; and camera lighting system.

The storm drain system shall be completely cleaned by an approved method prior to TVI. The storm drain system will be rejected if any of the following conditions exist:

a. Sags greater than 1/2-inch in depth
b. Standing water
c. Offset joints
d. Cracked pipes
e. Infiltration
f. Hanging gaskets

SS62-06. MEASUREMENT AND PAYMENT--Measurement of pipe shall be the total distance along the centerline of the pipe as installed from center to center of manholes and shall include the straight run of all wyes and tees where used.

The price per lineal foot of pipe includes the furnishing of all materials for construction of the pipe, fittings and connections and all labor, materials, and equipment necessary to excavate the trench, remove all obstructions, remove and replace all utilities where necessary, bed, place and joint the pipe, backfill the trench, restore the surfaces, test the pipe lines, connect to existing manholes or pipes, furnish preconstruction photographs when applicable, and do all other work necessary to produce a complete and finished job in accordance with the drawings and specifications. The unit price bid shall be the average price for lines of all depths and bedding types of a given size.

SS-63. PRECAST CONCRETE MANHOLES

SS63-01. ITEM--Under these items of the Proposal, the Contractor shall bid a price each for constructing the various sizes and types of precast concrete manholes as indicated on the plans and in the Proposal.

SS63-02. DIMENSIONS--Precast manholes shall consist of cylindrical sections, all with joints and base construction as detailed in the Standard Drawings for sanitary sewer manholes and for drainage manholes.

SS63-03. SPECIFICATION--Precast manhole barrels, risers, cones, flat tops, and grade rings shall conform to ASTM Designation: C478 with the additional requirement that the cement used shall be Type II. Twenty-four inch manholes may be precast or cast-in-place as shown in the Standard Drawings.

Flat slab tops shall be constructed of Class A concrete with Type II cement.

All manholes shall be constructed on a firm non-yielding bed. When water is encountered, or in the opinion of the Engineer, the base material is unsatisfactory, a minimum of 6 inches of crushed rock will be required prior to manhole base construction. The first manhole ring section shall be placed before the concrete is set.

Manhole bases may be precast or cast-in-place. If precast, they shall be placed on a minimum of 4 inches of crushed rock of 3/4 inch maximum size. Elevation differentials of inlets and outlets must conform to the plans. Channelization shall conform to the Standard Drawings and to Section SS63-08 of these specifications. Stubs or couplings provided in precast bases shall be of the same material as the pipe to which they connect unless otherwise approved by the Engineer.

SS63-04. CONES--Standard cones conforming to ASTM Designation: C478 shall be used on all manholes shown on the plans unless otherwise specified. Where depth is insufficient for cones, flat slab tops shall be used. Eccentric cones shall be used where specified on the plans. An 18 inch high cone may be used for a sanitary sewer manhole where the depth is less than 4 feet. The minimum depth of throat shall be 3 inches between the cone and the frame and 12 inch maximum depth except as herein allowed for manholes less than 4 feet in depth.

SS63-05. JOINTS--Joints in precast manhole shafts shall be made by buttering the joint space previously laid with mortar, or shall be made with preformed plastic sealing gaskets conforming to Federal Specifications SS-S-00210 and installed as recommended by the manufacturer. All joint surfaces shall be thoroughly cleaned prior to placing the sealing compound or buttering with mortar. Both the inside and outside of mortared joints shall be plastered with mortar and the inside brushed to a smooth finish with a wet brush. Special precautions shall be taken to see that the entire joint space is filled with mortar and is watertight, particularly between a cast base and precast joints.

SS63-06. FRAMES AND COVERS--Manhole frames and covers shall conform to the Standard Drawings and Section SS-70 of these specifications unless otherwise stated on the plans or in the Special Provisions. Frames and covers shall be set flush with the finish grade unless otherwise herein specified or otherwise stated on the plans or in the Special Provisions. The joint between the manhole frame and the cone or grade ring shall also be made by buttering the joint space with

mortar, except that where a sewer manhole is constructed in a location to remain unpaved, the frame shall in addition be bolted in place using 4-1/2 inch diameter bolts or the joint shall be made using an epoxy adhesive. The adhesive shall be as described in Section 95-2.05 of the State Specifications for Pavement Marker Epoxy Adhesive, Standard Set (Spec. 8040-20J-09). In such unimproved areas, the rim of the frame should be set 12 inches above existing ground level.

SS63-07. CONNECTIONS--Pipe connections to drainage manholes shall be made so that the pipe is flush with the inside face of the manhole. These connections shall be finished so that entrances are smooth. Unless the manhole is cast around the pipe, connections shall be dry packed with cement mortar as directed by the Engineer.

Pipe connections shall not be made into the cone section of the manhole unless approved by the Engineer.

Pipe stubs for lateral sewers shall be built into the structures as shown on the plans. The outer ends of the stubs shall be sealed securely by a cap or stopper of material compatible with the pipe.

SS63-08. FLOW CHANNELIZATION--Unless otherwise indicated, flow channels shall be provided in the sanitary sewer manhole base by fillets as shown the Standard Drawings. Special care shall be taken to form a smooth transition between inlets and outlets, with good hydraulic properties. Any sharp corners or significant departure from the dimensions indicated shall be cause for reconstruction. Pipe may be laid continuously through straight run manholes and the top 1/2 of the pipe subsequently cut out inside the manhole, prior to forming the channelization.

SS63-09. CAST PORTION--The Contractor may, at his option, cast the lower portion of drainage manholes in place. The cast-in-place portion shall not be placed higher than 6 inches above the outside tops of the main incoming and outgoing pipes. Concrete used for construction shall conform to Section SS32-03 of these Specifications. Minimum and maximum wall thickness for the cast-in-place sections shall conform to the following table:

Manhole Diameter	Minimum Wall Thickness	Maximum Wall Thickness
48"	5"	7"
60"	6"	8"
72"	7"	9"

Inside diameters of cast-in-place portions shall equal the diameter of the manhole specified. Standard precast manhole riser sections and/or cones shall be placed above the cast-in-place section to bring the manhole rim up to grade.

Maximum and minimum wall thickness for cast-in-place portion of manholes shall be strictly adhered to. Concrete on the cast portion may be placed neat against the earth, provided wall thickness requirements are met; otherwise, outside forms shall be required.

SS63-10. DROP CONNECTIONS--Outside drop sewer connections are depicted in the Standard Drawings and shall be installed at all manholes where the plans show such sewer connections to be placed. Outside drop connections shall be constructed only at manholes where the plans specifically indicate their construction and as approved by the City Engineer. Inside drop connections shall be allowed only in a 60 inch diameter manhole.

SS63-11. CAST-IN-PLACE GRADE ADJUSTMENT--Grade adjustment may be made by utilization of precast grade rings or in new subdivisions only by a cast-in- place ring. The latter shall have a minimum thickness of 4 inches and a maximum of 12 inches. The concrete pour shall not extend above the top of the base flange of the manhole frame. The minimum height of the ring shall be 3 inches and the maximum 12 inches.

SS63-12. TESTING OF PRECAST MANHOLES--All manholes shall be tested for leakage after assembly but prior to back-filling around the manhole. The Contractor shall furnish all labor, tools and equipment necessary to make the test and to perform any work incidental thereto. The Contractor shall correct any excess leakage, and repair any damage to the manhole and its appurtenances at this own expense.

The manholes shall be tested for leakage by the following method:

> Manhole vacuum test: All lift holes, connections and inside and outside joints shall be sealed as described in these specifications. All pipes entering the manhole shall be plugged, taking care to securely brace the plug from being drawn into the manhole. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendations. 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 of 48 inch diameter manholes, 75 seconds for 60 inch manholes, and 90 seconds for 72 inch manholes. If the manhole fails the initial test, necessary repairs shall be made while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.

SS63-13. PAYMENT--The contract unit price paid for precast reinforced concrete manholes shall include excavation, precast concrete items, pipe and fittings for stubs and stoppers and for inside and outside drop sewer connections as detailed on the Standard Drawings, flat top covers, cast iron frames and cover (bolt on type where specified), concrete, backfill, restoration of street surfaces, testing and all other labor, equipment and material necessary for completion of the structure in accordance with the drawings and specifications. The unit price bid shall be the average price for manholes of all depths and types indicated on the plans and in the Proposal.

SS-64. SADDLE MANHOLES

SS64-01. ITEM--Under these items of the Proposal, the Contractor shall bid a price each for constructing the various types of saddle manholes as indicated on the plans and in the Proposal.

SS64-02. SPECIFICATION--Saddle manholes shall be constructed in accordance with the Standard Drawings. Risers, cones, and grade rings, flat tops, eccentric cones, and other features of the manholes, shall be constructed in accordance with Section SS-63 of these specifications.

Manhole frame and cover, as shown on the Standard Drawings, shall be used unless otherwise specified on the plans or in the Special Provisions.

Portland cement concrete and reinforcing steel shall conform to Section SS32-03 and Section SS-33 of these specifications.

SS64-03. PAYMENT--The contract unit price paid for saddle manholes shall include excavation, concrete, precast items, flat top covers, cast iron frames and cover (bolt-on type where specified), concrete reinforcing backfill, restoration of street surfaces, and all other labor; equipment and material necessary for completion of the structure in accordance with the drawings and the specifications. The unit price bid shall be the average price for manholes of all depths as indicated in the plans and in the Proposal.

SS-65. BLANK

SS-66. DROP INLET

SS66-01. ITEM--Under these items of the Proposal, the Contractor shall bid a price per each for constructing the respective types of drop inlets as indicated in the plans and the Proposal.

SS66-02. SPECIFICATION--Drop inlet types shall conform to City of Rocklin Standard Drawings.

Concrete for inlets shall be Class "B" and conform to Section SS32-03 of these specifications. Reinforcing steel shall conform to Section SS-33 of these specifications. The concrete box portion of the drop inlet shall be cast to the proper grade in a maximum of two placements of concrete. Use of grout to adjust the drop inlet frame to the proper grade will not be permitted without specific approval of the Engineer.

Reinforcing bar supports or other approved means shall be used to hold the frame at proper grade during final placement of concrete. Broken pieces of concrete, or other debris, shall not be used for this purpose.

SS66-03. PAYMENT--The price bid per drop inlet types shown in the Proposal shall include all excavation and backfill, concrete, steel, grate, frame, and connections to place the complete unit as set forth on the plans and specifications. The unit price bid shall be the average price for drop inlets of all depths for the type indicated in the Proposal.

SS-67. INLET AND OUTLET STRUCTURES

SS67-01. ITEM--Under these items of the Proposal, the Contractor shall bid a price each for construction of inlet structures with trash racks and outlet structures with access control racks.

SS67-02. SPECIFICATION--Inlet structures with trash racks and outlet structures with access control racks, shall conform to the Standard Drawings. Concrete for inlet and outlet structures shall be Class "B" and shall conform to Section SS32-03 of these specifications. Reinforcing steel shall conform to Section SS-33 of these specifications.

SS67-03. PAYMENT--The price bid each for construction of inlet and outlet structures with racks shall include full compensation for all materials, labor, equipment, excavation, and backfill necessary to place the unit, complete, as shown on the plans and in the specifications. The unit price bid shall be the average for all sizes of the type of rack shown on the plans.

SS-68. EROSION CONTROL APRONS

SS68-01. ITEM--Under these items of the Proposal, the Contractor shall bid a price each for constructing pipe or ditch erosion aprons in those locations shown on the plans.

SS68-02. MATERIAL AND PLACEMENT--The materials for constructing erosion control aprons shall conform to Section SS-39 and SS-75 of these specifications and the Standard Drawings.

Only when specified on the plans or in the Special Provisions shall erosion control aprons shall be constructed of grouted cobbles conforming to Section SS-76 of these specifications. No reinforcing will be required in grouted cobble aprons.

SS68-03. PAYMENT--The contract unit price paid for pipe or ditch erosion control aprons shall be full compensation for all labor, materials, excavation, backfill and equipment necessary to place

the aprons, complete, in accordance with the specifications and drawings. The unit price bid shall be the average price for all pipe or ditch erosion control aprons of the sizes and types indicated on the plans and in the proposal.

SS-69. AREA DRAINS

SS69-01. ITEM--Under this item of the Proposal, the Contractor shall bid a unit price per each for construction of area drains.

SS69-02. SPECIFICATION--The area drain shall conform to the Standard Drawings.

SS69-03. PAYMENT--The unit price bid shall include full compensation all excavation, backfill, concrete, frame, grate, connecting elbow and all other work necessary to complete the installation.

SS-70. CASTINGS

SS70-01. MATERIALS--Castings for manhole frames and covers, drop inlet and gutter drain frames, flushing branch frames and covers, or other purposes, shall be tough grey iron, free from cracks, holes, swells, and cold sheets, and be of workmanlike finish. A "Certificate of Compliance" signed by an authorized agent of the manufacturer or supplier shall be required and be delivered to the Engineer as specified herein. Each certificate so furnished shall be accompanied by a copy of test results stating that the material has been sampled, tested, and inspected in accordance with the provisions of the latest issue of ASTM A-48, Gray Iron Castings. Test bars shall be cast and tested for the first lot of casting and every 4 months thereafter. If production is interrupted for any period longer than 4 months, test bars shall be cast and tested from the initial lot after production is resumed and every 4 months thereafter. The first lot is defined as the first castings produced after January 1st of each year. The tension tests specified shall be performed and the results certified by an independent testing laboratory located in the United States of America. The cast iron shall meet the requirements of ASTM Designation: A 48, Class 25. The seating faces of manhole covers and frames shall be machined as shown on the drawings to assure a tight fit and prevent rocking. The name of the manufacturer shall be cast on the bottom side of the manhole cover and on the frame. Manhole frames and covers shall conform to the Standard Drawings unless otherwise specified on the plans or in the Special Provisions.

When required by the Engineer, proof-load tests shall be performed on manhole frames and covers in accordance with paragraph 4.7.1 and paragraph 3.11.1 of Federal Specifications RR-F-621C (August 10, 1977) or latest edition.

When locking type covers are specified, they shall be standard covers drilled and tapped on 120 centers and bolted to the frame with 7/16 by 1-1/4 inch brass hex head cap screws.

Exposed edges of castings shall be chamfered or rounded, and all exposed surfaces shall be smooth unless otherwise shown.

SS70-02. PAYMENT--The cost of furnishing and placing manhole frames and covers, flushing branch frames and covers, drop inlet, and gutter drain frames, shall be included in the contract unit price bid for manholes and/or other items of work.

SS-71. ADJUST MANHOLES TO GRADE

SS71-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per each for adjusting manholes and flusher branches to grade or elevation as indicated on the plans and as directed by the Engineer. Adjustment may be made by utilization of precast grade rings or by a cast-in- place ring, in accordance with Section SS63-11 of these specifications.

SS71-02. SPECIFICATIONS--Method and payment for adjusting manholes shall conform to Section 15-2.05A of the State Specifications, except that the unit price bid shall include all necessary excavation and backfill and that the unit price shall be the average of all depths and limits of adjustment required. 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 section of the manhole shall be removed to the first full size manhole section. The upper portion shall be reconstructed as set forth in Section SS-63.

SS71-03. MANHOLES WITHIN TRAFFIC LANES--Adjusting manholes to grade within marked traffic lanes shall be completed, including placing paving material around and to the level of the ring and cover, by the end of the same day on which work is started. If permanent pavement backfill cannot be completed by the end of the work day, the Contractor shall place temporary paving material to the level of the cover.

SS-72. BLANK

SS-73. PIPE CONNECTIONS TO STRUCTURES

SS73-01. METHOD--Pipe connections to existing manholes and other structures shall be made by carefully breaking an opening in the wall of the manhole or structure and inserting the end of the pipe through the opening to flush with the inside wall. After insertion, the annular space shall be tightly packed with a "dry" cement mortar or concrete grout. Surfaces to be in contact with the mortar shall be thoroughly moistened and then scrubbed with Portland cement paste. The mortar shall be trowelled smooth and flush with the interior surface of the manhole or structure.

The Contractor shall notify the Engineer 24 hours in advance before a connection is made to an existing structure. He shall schedule his work so that interruption of flow is held to a minimum.

SS73-02. PAYMENT--The cost for constructing connections to existing manholes or structures shall be included in the cost per lineal foot of the size and type of pipe to be connected and no additional compensation will be allowed therefore.

SS-74. PIPE CONNECTIONS TO OTHER PIPES

SS74-01. FIELD CONNECTIONS--When a lateral drainage pipe is to be connected directly into a larger drainage pipe, the connection shall be made so that the lateral pipe is flush with the inside face of the larger pipe. End to end alignment shall require a manhole if vertical alignment changes dictate. The crowns of the pipe shall match when different diameters are encountered. Field connections between concrete pipes or concrete pipes and metal pipes shall be dry packed with cement mortar and a concrete collar shall be placed around the pipe as shown on the Standard Drawings. Field connections between metal pipes shall be made as specified in Section SS-52 of these specifications.

SS74-02. BLANK

SS74-03. PAYMENT--No separate payment will be made for connections into existing pipes and the cost thereof shall be included in the price bid per lineal foot for the respective sizes, grades and types of pipe to be placed.

SS-75. GROUTED COBBLES

SS75-01. ITEM AND PAYMENT--Under this item of the Proposal, the Contractor shall bid a price per square foot of surface area for grouted cobble in place as shown on the plans and in the Proposal. The vertical legs of cutoff walls shall not be considered as surface area for purposes of payment, but shall be included in the unit price bid for grouted cobbles.

SS75-02. MATERIALS AND PLACEMENT--Cobbles shall conform to the following specifications:

All retained on the 1-1/2 inch sieve; not more than 40 percent passing the 4 inch sieve; and 10 inch maximum size.

Grout shall consist of Class "B" portland cement concrete conforming to the provisions of Section SS-32 of these Specifications. Aggregate shall conform to Section 90-3.03 of the State Specifications.

The cobbles shall be placed in a neat, uniform manner to a thickness of approximately 12 inches. Minimum penetration of the grout into the interstices of the cobbles shall be 4 inches measured from the other surface of the cobble protection. The grout shall be used before it reaches a temperature of 90°F. The water content of the grout shall be such as to permit gravity flow of the grout into the interstices with limited spading and brooming. The amount of water used may be designated by the Engineer. Aggregate size will be limited to that necessary to obtain the required penetration as stated above, and as directed by the Engineer.

The surfaces of the cobbles to be grouted shall be cleaned of adhering dirt and clay and then moistened. The grout shall be placed in a continuous operation for any day's run at any location. Grout shall be brought to the place of final deposit by use of chutes, tubes, or buckets, or may be placed by means of pneumatic equipment or other mechanical methods. In no case shall grout be permitted to flow on the slope protection a distance in excess of 10 feet.

Immediately after depositing, the grout shall be spaded and rodded into place with suitable spades, trowels, or other approved means until the maximum penetration is obtained.

After the grout has been placed, the rocks shall be thoroughly brushed so that their top surfaces are cleaned and exposed. The outer rocks shall project 1/3 to 1/4 their diameter above the grout surface. After completion of any 10 foot strip, no workman or load shall be permitted on the surface for a period of at least 24 hours and longer if so ordered by the Engineer.

Grouted cobbles shall be cured as provided in Section 90-7 "Curing Concrete", of the State Specifications.

SS75-03. MEASUREMENT AND PAYMENT--Payment will be based on the number of square feet of surface area of cobbles grouted in place. No separate payment will be made for the concrete grout material. The contract unit price paid for grouted cobbles shall include cobbles and grout, and all labor, equipment, and other materials necessary for completion of the lining in accordance with the plans, Special Provisions, and these Specifications.

SS-76. METAL DOWNDRAIN ASSEMBLIES

SS76-01. ITEM--Under this item of the Proposal, the Contractor shall bid a price per each for downdrain assemblies of the type and sizes shown on the plans and in the Proposal complete in place at locations shown on the plans.

SS76-02. SPECIFICATIONS--The requirements for downdrain shall conform to Section 69 of the State Specifications and the Standard Drawings, except as to payment.

SS76-03. PAYMENT--The unit price bid per each downdrain assemblies shall include but not be limited to all pipe, joints, inlets, reducers, slip joints, anchor assemblies, excavation and backfill.

SS-77. GRATE ASSEMBLIES

SS77-01. ITEM AND PAYMENT--Under these items of the Proposal, the Contractor shall bid a price per each for the respective type grate assemblies complete in place.

SS77-02. SPECIFICATION--Type of grates and frames shall conform to the Standard Drawings. The material and method of placing shall conform to the requirements of Section 70-1.02E of the State Specifications, except for payment which shall be as stated herein.

SS-78. FIRE HYDRANT ASSEMBLIES

SS78-01. ITEM--Under this item of the Proposal, the Contractor shall bid a unit price per each for fire hydrant assemblies listed in the Proposal.

SS78-02. SPECIFICATION--Standards for installation of fire hydrants shall be in accordance with the City of Rocklin Uniform Fire Code.

A. Hydrant type shall be approved by the City Fire Department.

B. Fire hydrants shall be provided with a minimum of two (2) 2 1/2 in. openings and one (1) 4 1/2 in. opening.

C. Fire hydrants shall be provided with pentagon (five sided) operating nuts and hydrant caps. Dimension from point to flat is 1 1/2 in.

D. Fire hydrants shall open counter clockwise.

E. Fire hydrants shall be located within five (5) feet of the required access roadway or other location approved by the Fire Department.

F. Fire hydrants shall have the 4 1/2 in. port facing the required access. The base flange of the hydrant must not vary more than one (1) foot in elevation from grade level of the required access.

G. If, in the opinion of the Fire Department inspector, fire hydrants are vulnerable to vehicular damage, appropriate crash posts shall be provided. No obstructions shall exist within a 3 foot working area of each required access. Crash posts shall be 4 inch cement filled steel pipe, a minimum of 3 feet in height above grade and a minimum of 2 feet below grade. A block of at least 2 cubic feet of cement shall be poured around the base of the pipe.

H. Underground supplies to fire hydrants must be inspected by either the Fire or Department of Public Works. Such inspection shall include visual inspection of piping and hydrostatic pressure of 200 psi or 50 psi above street main pressure. A flow test will be required when installation is complete.

I. Fire hydrants are required to be maintained in an operable condition at all times and must be repaired or replaced when defective. If privately owned, the property owner is responsible for maintenance and repair of the hydrant.

J. Fire hydrants are required to be fully operational before construction commences above grade level.

SS78-02. INSTALLATION--Installation shall be as shown on the Standard Drawings and in accordance with the City of Rocklin Uniform Fire Code and the manufacturers recommendations.

SS78-03. PAYMENT--The unit price bid for fire hydrants shall include excavation, furnishing and placing the tee in the main, the 6 inch lateral to the hydrant, the gate valve, the fittings, and the hydrant, all as detailed on the drawings, blocking, backfill, restoration of street surfaces, and all other labor, equipment and material necessary for installing the fire hydrant in accordance with the drawings and specifications. The unit price bid shall be the average price for all fire hydrants indicated or required.

SS-79. STREET CLOSURES

SS79-01. REQUIREMENTS--When street closure is required or permitted for the construction of facilities on or under the street, the Contractor shall notify in writing, the occupants of all homes and businesses that require access to that street of the proposed closure two calendar days in advance of the closure. The Contractor shall be prepared to make access available at any time during the day to emergency type vehicles (fire trucks, ambulances, etc.).

Following is the minimum delineation which is required at locations where permission has been granted to temporarily close a public street.

	ROAD CLOSED (2) SIGNS			TYPE "N" REFLECTIVE MARKER (W21) SIGNS		
TYPE OF STREET	NO.	SIZE	LOCATION	NO.	SIZE	LOCATION
40'	1	36" x 24"	Center of travelled way	2	24"	Center of travelled way
50' & 60'	1	48" x 30"	Center of travelled way	2	30"	Center of travelled way
84'	2	48" x 30"	Center of each half of travelled way	4	30"	Center of travelled way

Additional delineation may be required by the Engineer where roadway alignment and/or approach speed potential increase the need for notice to the driver.

SS-80. DEWATERING

SS80-01. PAYMENT--No separate payment will be made to the Contractor for dewatering or temporary drainage facilities unless specifically indicated in the Special Provisions and the Proposal. Such dewatering and temporary drainage facilities shall include but not be limited to provisions for removal and disposal of surface and sub-surface waters either natural or man-made regardless of whether industrial, agricultural or domestic in origin, or storm runoff. The cost of all materials, labor and equipment required for the dewatering or temporary drainage facility shall be included in the price bid for other items of work.

SS-81. TEMPORARY PAVING

SS81-01. ITEM--Under this item of the Proposal, the Contractor shall bid a unit price per ton for temporary paving which shall include furnishing, placing, and removing temporary paving as set forth in Section SS-30, Restoration of Surfaces, of these specifications.

The quantity shown for this item is approximate and is indicated for bid comparison only and no guarantee is made or implied that the quantities shown will not be reduced or increased or deleted as may be required by the Engineer.

SS81-02. PAYMENT--If no unit price is shown in the Proposal for temporary paving, all costs therefore shall be considered as included in the lump sum price bid for restoration of surfaces or other items of work.

SS-82. PROPERTY FENCE AND GATES

SS82-01. ITEM--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing the respective types of property fence and a price per each for gates of the type and widths as indicated on the plans and in the Proposal.

SS82-02. TYPE BW PROPERTY FENCE--Type BW property fence shall consist of five lines of barbed wire on metal posts placed at 12 foot intervals unless wood posts are required on the plans or in the Special Provisions.

SS82-03. TYPE WM PROPERTY FENCE--Type WM property fence shall consist of 32 inch wire mesh and three lines of barbed wire on metal posts placed at 12 foot intervals unless wood posts are required on the plans or in the Special Provisions.

SS82-04. SPECIFICATION--All property fence materials and construction methods shall conform to Section 80 of the State Specifications and the Standard Drawings.

SS82-05. MEASUREMENT--Quantities of property fence to be paid for shall be determined by the linear foot from actual measurements of the completed fence, such measurements to be made parallel to the ground slope along the line of the complete fence, deducting the width of openings.

Quantities of gates shall be determined by actual count. When more than one gate is placed in an opening, each single unit placed will be counted as a gate. A gate unit complete in place shall include one gate with all necessary fittings, hardware, and gate posts with braces.

SS82-06. PAYMENT--Items of work, measured as specified shall be paid for at the contract price per linear foot, for property fence (Type BW or WM) and the contract unit price per property fence gate, if gates are required.

Full compensation for clearing the line of the fence and disposing of the resulting material, excavating high points in the existing ground between posts when wire mesh fence is being constructed, excavating and backfilling holes, disposing of surplus excavated material, and furnishing and placing concrete footings and deadmen, and connecting new fences to structures and existing cross fences, and constructing temporary fences for the protection of stock, shall be considered as included in the contract prices paid for the fence and no additional compensation will be allowed therefore.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved in constructing property fences, complete in place, as shown on the plans, and as specified in these specifications and the Special Provisions, and as directed by the Engineer.

SS-83. CHAIN LINK FENCE

SS83-01. ITEM--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing chain link fence and a price per each for gates, of the height and widths indicated on the plans and in the Proposal.

SS83-02. MATERIALS AND METHODS--All chain link fence, gates, and posts shall conform to the materials and construction methods as set forth in Section 80 of the State Specifications and the Standard Drawings, except as herein modified. The chain link fence fabric for fences and gates shall conform to ASTM Designation: A 392 with Class I zinc coating. Zinc coating is to be applied after the fabric is woven.

Gate posts for gates up through 6 feet in width shall be a minimum of 2-1/2 inches in diameter with a nominal weight of at least 4.95 pounds per foot. Posts for gate widths over six feet in width and up to 12 feet in width shall be a minimum of 4 inches in diameter with a nominal weight of at least 10.79 pounds per foot.

SS83-03. EXTENSION ARMS--When specified on the plans and in the Proposal, extension arms with three lines of barbed wire shall be furnished and rigidly fastened to the posts. The extension arms shall be at an angle of approximately 45°. The barbed wire shall conform to Section 80 of the State Specifications, and shall be securely fastened to the extension arms. The extension arms shall be of a good quality steel and shall be galvanized in conformance with ASTM Designation: A 123.

Where extension arms with barbed wire are specified, the cost shall be included in the price bid for chain link fence.

SS83-04. MEASUREMENT--Quantities of chain link fence to be paid for shall be determined by the lineal foot from actual measurements of the completed fence, such measurements to be made parallel to the ground slope along the line of the complete fence, deducting the width of openings.

Quantities of gates shall be determined by actual count. When more than one gate is placed in an opening, each single unit placed will be counted as a gate. A gate unit complete in place shall include one gate with all necessary fittings, hardware, and gate posts with braces.

SS83-05. PAYMENT--Full compensation for clearing the line of the fence and disposing of the resulting material, excavating high points in the existing ground between posts when chain link fence is being constructed, excavating and backfilling holes, disposing of surplus excavated material, and furnishing and placing concrete footings and deadmen, and connecting new fences to structures and existing cross fences, and constructing temporary fences for the protection of stock, shall be considered as included in the contract prices paid for the fence, and no additional compensation will be allowed therefore.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing chain link fences, complete in place, as shown on the plans, and as specified in these specifications and the Special Provisions, and as directed by the Engineer.

SS-84. CHAIN LINK FENCE WITH REDWOOD PICKETS AND GATES

SS84-01. ITEM--Under these items of the Proposal, the Contractor shall bid a price per lineal foot for furnishing and placing chain link fence and a price per each for gates with redwood pickets of the height and widths indicated on the plans and in the Proposal.

SS84-02. MATERIALS--The fencing fabric shall be woven from No. 9 gauge wire conforming to Sections 3, 4, 7, and 8 of ASTM Designation: A 116, with Class III zinc coating. The fencing fabric shall be a chain link type fabric as defined in Section 3 of ASTM Designation: A 392, and shall be woven into a 3-1/2 by 5-1/2 inch wire mesh.

Pickets shall be 3/8 by 2-1/2 inch standard Grade A stained redwood, and shall be inserted vertically in each mesh of the chain link fabric. Each picket shall extend the full height of the chain link fabric and be attached in a minimum of two locations to the fabric with staples which go through the picket and are cleated on the opposite side. Any pickets with cracks, splits or other blemishes shall be removed and replaced.

SS84-03. POSTS--Line posts shall be 2-1/2 inch outside diameter steel pipe weighing not less than 3.65 lbs. per lineal foot or "H" sections weighing not less than 4.0 pounds per lineal foot. End, gate, pull, and corner posts shall be 3 inch O.D. pipe weighing not less than 5.79 pounds per lineal foot. Top rails and braces shall be 1-5/8 inch O.D. steel pipe or "H" section weighing not less than 2.27 pound per lineal foot. The posts, rails, and braces shall be galvanized and of a good quality weldable steel, with a minimum copper content of 0.20 percent. Galvanizing shall conform to ASTM Designation: A 123.

SS84-04. FITTINGS--The bottom tension wire shall be No. 7 gauge coil spring tension wire. Fittings including top and bottom couplings, finals, gate hinges, holders, locking devices, etc., shall be heavy malleable iron or pressed steel, hot dipped galvanized, and designed to fit the members to which they are attached. Galvanizing shall conform to ASTM Designation: A 123.

SS84-05. GATES--Gates for chain link fence with redwood pickets shall conform to the following special requirements:

Gates shall be made of 2 inch O.D. pipe of the same material as specified for the posts, rails and braces, and weighing not less than 2.72 pounds per lineal foot, adequately braced, and with filler fabric and pickets the same as that used in the fencing. The height of the gate will be the same as that of the fence.

Galvanized gate holders of heavy cast construction shall be provided for each gate section. They shall be of the counter-balanced type adjusted so they will automatically catch and hold the gate by simply pushing the gate open, and will release it by depressing the holder with the foot. The gate holder shall be anchored by a concrete post or a steel support set in concrete.

Gates shall be fitted with heavy hinges and lift bar locking devices arranged for two padlocks. Gates shall be furnished complete with one master keyed padlock as specified by the Engineer.

SS84-06. EXTENSION ARMS--When specified on the plans and in the Proposal, extension arms with three lines of barbed wire shall be furnished and rigidly fastened to the posts and gate frames. The extension arms shall be at an angle of approximately 45° from horizontal. The barbed wire shall conform to Section 80 of the State Specifications, and shall be securely fastened to the extension arms. The extension arms shall be of a good quality steel and shall be galvanized in conformance with ASTM Designation: A 123. Where extension arms with barbed wire are specified, the cost shall be included in the price bid for chain link fence with redwood pickets.

SS84-07. INSTALLATION--Construction methods shall conform to the applicable portions of Section 80 of the State Specifications and as modified herein.

Fence posts shall be set plumb and in true alignment, and be embedded 3 feet in a concrete base. The base shall have a diameter at least three times that of the post, with an 8 inch minimum, and a depth of at least 39 inches.

Concrete shall be Class "B" and allowed to cure not less than five days before the wire fabric is placed. Gate, end and corner posts shall be located where indicated, and the line posts adjusted for spacing accordingly, except that they shall be spaced not more than 10 feet apart.

Braces shall be installed in panels adjacent to gate openings, and at corners or at alignment changes of more than 30°. They shall be located midway between top rail and ground and extend from the end, corner, or gate post to the first adjacent line post. Compression bars and 3/8 inch tension brace to rods with heavy turnbuckles shall be installed at each brace panel.

The fence shall be constructed with a continuous top rail and a bottom tension wire. Top rails shall pass through line post tops to form a continuous brace from end to end of each stretch of fence. Rail shall be provided with expansion couplings approximately every 20 feet and be securely fastened to end, corner, or gate posts by means of suitably pressed steel connections. The bottom tension wire shall be stretched and secured to the posts 6 inches from the bottom edge of the fabric. The fabric shall be secured to the top rail and bottom tension wire every 2 feet with No. 9 gauge tie wire.

The wire fabric shall be stretched taut and secured to the posts by means of aluminum bands spaced 14 inches on center. A terminal posts, the fabric shall be secured by a tension bar and adjustable clamps.

SS84-08. MEASUREMENT--Quantities of chain link with redwood pickets to be paid for will be determined by the lineal foot from actual measurements of the completed fence, such measurements to be made parallel to the ground slope along the line of the complete fence, deducting the width of openings.

Quantities of gates with redwood pickets will be determined from actual count. When more than one gate is placed in an opening, each single unit placed will be counted as a gate. A gate unit complete in place shall include one gate with all necessary fittings, hardware, and gate posts with braces.

SS84-09. PAYMENT--Full compensation for clearing the line of the fence and disposing of the resulting material, excavating high points in the existing ground between posts when the fence is being constructed, excavating and backfilling holes, disposing of surplus excavation material, and furnishing and placing concrete footings and deadmen, and connecting new fences to structures and existing cross fences for the protection of stock, shall be considered as included in the contract prices paid for the fence and no additional compensation will be allowed therefore.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing chain link fences with redwood pickets, complete in place, as shown on the plans, and as specified in these specifications and the Special Provisions, and as directed by the Engineer.

SS-85. RESET EXISTING FENCES

SS85-01. ITEM--Under this item of the Proposal, the Contractor shall bid a unit price for removal and resetting existing fences as indicated in the plans and as directed by the Engineer. If there is no payment item in the Proposal for resetting fences the cost for removal and resetting existing fences shall be included in other items of work.

SS85-02. MATERIALS--Materials removed from the existing fence which, in the opinion of the Engineer, are unsuitable for use in the reconstructed fence, shall be replaced with material of a kind and quality equal to the best of the salvaged material to the extent that when the fence is reconstructed in its new location, it will be equal in all respects to the best portions of the existing fence, using as much material from the salvaged fence as possible. Existing fences to be removed and not reset shall be included in the item for clearing and grubbing.

SS85-03. PAYMENT--Full compensation for clearing the line of the fence and disposing of the resulting material, excavating high points in the existing ground between posts, excavating holes, disposing of surplus excavated material, and furnishing and placing portland cement concrete footings, and connecting the fences to structures and existing cross fences, and constructing temporary fences for the protection of stock, shall be considered as included in the price paid for resetting existing fences and no additional compensation will be allowed therefore.

The above prices and payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in the removal and resetting of the existing fence, complete in place, as shown on the plans, as specified in the specifications and as directed by the Engineer.

SS-86. TRAFFIC SIGNALS, LIGHTING, ELECTRICAL SYSTEMS, TRAFFIC MARKINGS AND SIGNAGE

86-1.01 GENERAL – Signals, lighting, electrical systems shall be constructed/installed in accordance with the approved improvement plans and specifications, these Construction Standards, the City Improvement Standards, The State of California Standard Plans, and the latest edition of The State of California Department of Transportation Standard Specifications hereinafter referred to as the Caltrans Standard Specs.

86-1.06 MAINTAINING EXISTING & TEMPORARY ELECTRICAL SYSTEMS – Refer to Section 86-1.06 of California Standard Specs. Roadway closures requiring restrictions of turning movements and/or signal red flash operations shall not be allowed without the consent of the City of Rocklin Public Works Department. **If any existing loop conductor, including the portion leading to the detector handhole or termination pull box, is damaged by the Contractors operations, the Contractor shall immediately notify the Engineer. The affected loops shall be replaced at the Contractors expense within 24 hours.**

86-2.03 FOUNDATIONS – Placement (locations) of all foundations shall be verified by the Engineer prior to installation.
There shall be a minimum 6-inch high curb around the signal controller/service pad, excluding the sidewalk/roadway side of the pad. The minimum curb height shall increase as necessary to ensure no steeper than a 2:1 slope of the native material around the pad. The Contractor shall be responsible for acquiring building permits for retaining walls if the wall is greater than four feet from base of footing to top of wall. Refer to Drawing #8-1 or 8-2 for further details.
Signal pole anchor bolts shall be aligned to ensure a maximum mast arm offset of two (2) degrees from perpendicular to the roadway.

86-2.04 STANDARD, STEEL PEDESTAL AND POST – Any 1B standard having a signal head display, 4 sections or larger, shall be installed under the following criteria:

Four (4) section display will be side (SV-1-T or SV-2-T) mounted. The 1B standard shall be 13 feet in height. A galvanized pipe cap shall be provided as a pole cap. Special mounting instructions as described in these Standards shall apply. (See Section 86-4.06).
Five (5) section display shall be side (SV-1-T or SV-2-T) mounted. The 1B standard shall be 14 feet in height. A galvanized pipe cap shall be provided as a pole cap. Special mounting instructions as described in these Standards shall apply. (See Section 86-4.06).
Individuals certified by the pole manufacturer shall perform signal standard welding. The contractor shall give seven (7) days advance notification prior to any welding on existing poles installed in the public right-of-way. The contractor shall certify that any welding of signal standards will not degrade the integrity of the standards. Upon completion of welding on a signal mast arm, the contractor shall replace any existing electrical wires in the arm.
All future tenons shall be covered with a plastic cap, and a pull wire shall be installed to the tenon.

86-2.05A CONDUIT MATERIAL – All conduits shall be gray PVC, minimum Schedule 40.

86-2.05B CONDUIT USE – All conduit shall be two (2) inch or larger. The exception is 1" for stand alone pedestrian push button poles.

86-2.05C CONDUIT INSTALLATION – All trenches in existing streets shall be constructed and shall be per Section 31-2 of these Standards and as required in this section.

All new conduit placed in new roadway, with the exception of conduit between detector handholds and the first pull box, shall be buried at a depth of 30" below finished grade. Conduit installed with the rock saw method shall have coverage of 18 inches.
Conduit size shall be limited to 4 inches maximum for new installations.
Unless otherwise specified, all signal interconnect shall be installed using 3 inch conduit with 3 foot radius 90 degree sweeps into each number 6 pull box. End bells shall be installed on the pull box end of each 90-degree sweep conduit into all pull boxes.

After conductors have been installed, the ends of conduits terminating in pull boxes and controller cabinets shall be sealed with a duct seal type of sealing compound.

If delay to motorists will not exceed 10 minutes, conduit may be installed as allowed by "Trenching in Pavement Method" as provided in Section 86-2.05C of the Caltrans Standard Specifications and these requirements.

The trench shall be maximum six inches wide and two inches wider than the outside diameter of the conduit to be installed. There shall be one inch minimum clearance between the conduit and the trench wall. The trench shall be crumbed clean prior to placement of conduit.
Aggregate material in concrete shall be 6-sack cement pea gravel. Concrete shall be thoroughly consolidated around the conduit filling all voids.

86-2.06 PULL BOXES – Pull boxes shall not be placed within the area of an access ramp unless directed by the Engineer. All pull boxes to be installed within 12 inches of the back of sidewalk, and within the concrete cap of the street light pole. The bottoms of pull boxes shall be bedded in 6 inches of clean crushed rock. Grout in the bottom of pull boxes is not required. The pull box rim and lid shall be flush with surrounding surface. All pull boxes shall have a 6 inch concrete collar around them.
All street light conduit crossings at an intersection will have a pull box installed on both sides of the intersection.

All pull boxes will be installed at the end of radiuses, and at property lines. Pull boxes will not be installed within the front area of a private lot.

Conduit termination in the pull box shall be a minimum of 2" from the sides of the pull box, and as close to the center of the pull box as possible above the crushed rock, and at least 8" below the bottom of the pull box cover. Conduits shall enter and exit pull box quadrants relative to the direction of the run.

All pull boxes and lids shall be precast reinforced concrete unless otherwise directed by the Engineer.

All pull boxes shall be minimum number 5 unless otherwise specified.

Traffic Signal Interconnect pull boxes shall be a number 6 and shall be located adjacent to street light pull box locations, or as directed by the Engineer. The "Home Run" pull box (typically adjacent to the controller) shall be number 6 unless otherwise specified.

All pull boxes to be abandoned shall have conductors removed from the pull boxes and conduits, and the pull box shall be removed. The remaining hole shall be backfilled and compacted with similar material as the surrounding material.

86-2.06B COVER MARKING – Strips shall be fastened with ¼ inch stainless steel rivets.

Pull box covers shall read "TRAFFIC SIGNAL", except covers for pull boxes used solely for traffic signal interconnect, which shall read "SIGNAL INTERCONNECT".

86-2.08 CONDUCTORS – Conductors installation in new conduits shall be limited to 26 percent fill of the conduit maximum. Conductors installed in existing conduits shall be limited to 33 percent fill of the conduit maximum.

All traffic signal conduit and interconnect conduit shall have a green continuous No. 10 pull wire.

Equipment grounding conductor shall be # 8 bare copper.

86-2.08A CONDUCTOR IDENTIFICATION – Additional marking of all conductors and cables shall be made at each termination point or as directed by the Engineer. Conductors for each vehicle and pedestrian phase shall be bundled together and banded with plastic tie-wrap labels in all pull boxes and at the signal controller cabinet.

86-2.08B MULTIPE CIRCUIT CONDUCTORS – Multiple circuit conductors shall not be permitted.

86-2.08E SIGNAL INTERCONNECT CABLE – Signal interconnect cable shall consist of twelve (six pairs) number 20, minimum, stranded copper conductors. Each pair shall be wrapped with an aluminum polyester shield and shielded pair. **No splicing of the interconnect cable shall be allowed.**

The signal interconnect cable shall not be placed in any conduit runs or pull boxes containing live conductors, unless otherwise directed by the Engineer.

Six (6) feet of slack shall be provided in each pull box. Fifty (50) feet of slack for each signal interconnect cable run shall be provided in the Home Run pull box in front of each signal controller, or the last pull box before the controller.

86-2.09 WIRING – All wiring shall meet or exceed the current Caltrans Standards and National Electrical Code Standards.

86-2.09B WIRING INSTALLATION – Ends of spare conductors terminated in pull boxes shall be taped and water sealed with Scotch Kote or approved equivalent.

86-2.09C CONNECTORS AND TERMINALS – Field conductor wiring shall not be doubled up on any single wire connector. For all conductors connections shall be spliced by the use of full circle compression connectors.

All field wiring connections shall be soldered after crimping the wire connector.

All crimp connectors shall be sized to accommodate the proper wire gauge.

86-2.09D SPLICING – Grounding conductor splicing shall be water sealed with Scotch Kote sealant or an approved equivalent. Two applications are required.

86-2.09E SPLICE INSULATION – All splices shall be heat-shrink tubing.

86-2.09F FUSED SPLICE CONNECTORS – Field fuses shall be installed in the hand hole of the standard.

All ungrounded conductors shall be fused.

86-2.10 BONDING AND GROUNDING – The second paragraph of Section 86-2.10 of the Caltrans Standard Specifications is amended to read as follows:

Grounding jumper shall be attracted by 3/8 inch or larger galvanized bolt in the signal standard or controller pedestal and shall be run to the conduit, ground rod or bonding wire in adjacent pull box. Grounding jumper shall be visible after cap has been placed on foundation. All ground connections shall be water tight.

Grounding electrodes shall be of copper clad steel road, not less than 5/8 of an inch in diameter x 10 feet in length.

A grounding electrode shall be installed in all electrical services and controller foundations. They shall be spaced a minimum of 6 feet apart.

The grounding electrode rod in the Controller Assembly shall be paralleled with the grounding electrode rod in the Service. This connection shall consist of a continuous solid #6 bare conductor. The ground connection shall be on the line side of the electrical entrance terminal block.

A continuous #6 bare copper conductor shall conductor shall connect the ground bus in the electrical service, the grounding electrode in the service, the grounding electrode in the controller, and the ground entrance lug in the controller cabinet.

The equipment-bonding conductor for all standards shall be visible and accessible after completion of work.

86-2.11 SERVICE – Utility (PG&E) point of connection (POC) shall be NO MORE THAN 5 feet from any service pedestal. Electrical service shall consist of Type III AF or Type III CF, low body configuration service pedestal. Refer to Drawings #7-8 to 7-8C. A 50-amp 120/250-volt Hart Lock receptacle shall be installed two inches below spare circuit breakers. A 60 amp 240 volt fuse block will be installed two inches to the left of the inside door latch, and one inch below door latch, and one inch below the test switch. A mercury contactor shall be used for the 120-volt street lighting circuit control. Refer to drawing number TS-1 for further details. The base shall be reinforced with 3/8 inch aluminum or ¼ inch steel. A 2,000 pound hasp shall be installed in two locations on the circuit breaker door. The meter window will have a metal door cover. The metal shall be anodized aluminum.

The service pedestal shall be installed a minimum of 5 feet from the controller cabinet.

There shall be a 1 inch grouted section between the service and the foundation. A ¼ inch weep drain hole shall be installed in this grout section.

86-2.14 TESTING – The contractor shall contact the Inspector at least five (5) business days prior to installation of a tested controller assembly and/or electrical service.

86-2.14B(2) GROUND – Before electrical power can be connected, the grounding electrode shall be tested for earth ground resistance. The Inspector shall perform this ground resistance testing. The earth ground resistance shall be a maximum of 5 ohms.

86-2.14C FUNCTIONAL TESTING – A shutdown of the electrical system resulting from damage caused by public traffic or from a power interruption shall not constitute discontinuity of the functional test.

During interconnect cable installation, the Contractor shall in the presence of the Inspector, perform a high resistance to ground test, DC resistance test and a dB attenuation loss test. The Contractor shall supply factory specifications prior to the test. The Contractor shall notify the Inspector at least 48 hours prior to interconnect cable installation.

86-3.01 CONTROLLER CABINET ASSEMBLY/BATTERY BACK-UP SYSTEM – Wire connections and/or termination shall comply with the "Signal Controller Standard Specifications" and section 86-2.08.

The traffic signal controller shall have a 1" bead of clear silicone sealant applied immediately before installation between the foundation and the controller cabinet bottom. The bead shall be centered 2" in from the outer edge of the controller cabinet, around the entire perimeter. All excess silicone on the outer edges shall be cleaned off.

The sealant shall be 35 year rated. There shall be no substitution for the silicone sealant.

The field wire entrance section of the controller shall face the intersection or as directed by the Engineer.

No access to the controller shall be permitted without supervision of a City of Rocklin Inspector, unless otherwise directed.

An exterior battery back-up system (BBS) is required for all traffic signal installations. If an existing intersection is being modified, or upgraded, and the existing system does not have an exterior BBS, a new system will be required. TESCO 22 BBS 1400XL or City of Rocklin approved equal.
The BBS shall meet the latest Caltrans' specifications posted on the Caltrans web site: www.dot.ca.gov/hq/esc/ttsb/electrical/Oct2003.pdf. The BBS shall provide a minimum two (2) hours of full run-time operation for an "LED-only" intersection (minimum 1000 w/1000 VA active output capacity with 80% minimum inverter efficiency).

86-3.05 CONTROLLER ASSEMBLY TESTING –
This section is amended to read:
The contractor shall supply certification from the manufacturer of the controller assembly that the controller assembly meets Caltrans specifications prior to turn-on.

86-3.08 EMERGENCY VEHICLE PREEMPTION EQUIPMENT – Contractor shall supply emergency vehicle preemption equipment, and the required cabling from the optical detector to the discriminator in the Controller Cabinet Assembly.

Where existing signals are being modified, and said signals are already equipped with emergency vehicle preemption equipment, the Contractor shall perform any necessary remodel and reinstallation of said equipment as required by the plans, or as directed by the Engineer.

Preemption cables shall be labeled in the following manner:

Phase 2 & 5	single gray band
Phase 4 & 7	double gray band
Phase 1 & 6	triple gray band
Phase 3 & 8	quadruple gray band

Labels shall consist of banded colored tape visible at the preemption detector, signal standard hand hole, adjacent pull box and the Controller Cabinet. Cables in the Controller Cabinet shall have tie wrap labels with appropriate phasing descriptions.

The equipment shall be 3M Opticom 700 Series, or approved equals. If approved equals are substituted, the equipment shall be 100% compatible with the City's existing Opticom system.

86-3.11 MODEL 170 CONTROLLER ASSEMBLY – Each controller assembly shall consist of fully loaded Type 170E controller in aluminum Type 332 cabinet and all necessary equipment to provide for the operation of the traffic signals. The controller assembly shall include an exterior battery back-up system (BBS).

Each controller assembly shall include controller unit, fully wired controller cabinet, and Type 222 (NOT Type 222B) inductive loop detector sensor units. Each controller shall be equipped with Model 412C memory module and Model 400 modem. Each controller shall be configured with the C-20 connector, along with all other standard connections.

Memory module shall conform to Caltrans traffic specification for Model 412C program module dated March 1988. The module shall utilize Method 2 and shall be configured for memory select Number 4, as described in the specification. The Module shall be furnished complete with one 27256 EPROM, two 6264 RAM and one 8K zero power RAM. The Manufacturer of Model 412C memory module shall be listed on the Caltrans Qualified Products List. The latest version of BI Trans Systems, Inc. traffic signal program 200CA shall be installed.

Each controller assembly shall be equipped with power distribution assembly number 2.

Exterior color of each controller cabinet shall be anodized aluminum.

86-3.12 SPARE EQUIPMENT FOR MAINTNANCE PURPOSES - In addition to the required equipment for the operation of each traffic signal, the Contractor shall also supply the following spare equipment for maintenance purposes for each intersection:

QTY	Item
1	Model 170E Controller
2	412C Program Modules with fully licensed BI Trans 200CA Program
2	2 channel detector modules
1	isolation module
1	conflict monitor
2	Model 200 load switch
1	Model 204 flash relay
1	transfer relay
2	pedestrian push button assemblies
2	Countdown pedestrian LED modules
1	battery backup system (BBS)
4	12" Red, Yellow and Green LED Balls
4	12" Red, Yellow and Green LED Arrows
1	3M Model 752 Discriminator Card (or City of Rocklin approved equal)
1	Fully loaded 332 Cabinet with 170E controller w/ 200SA, 3M Model 752 Discriminator *cards*, conflict monitor, etc.

86-4.01 VEHICLE SIGNAL FACES – All signal faces shall be aluminum. Mountings for MAS signal sections shall be bronze metal.
Signal faces shall have 12-inch LED displays, unless otherwise specified.

86-4.01B SIGNAL SECTIONS – All signal sections shall be 12-inch mold-cast aluminum with tunnel visor.

86-4.02 LIGHT EMITTING DIODE SIGNAL AND PEDESTRIAN MODULE – All vehicle and pedestrian displays shall be supplied with LED signal lamps that conform to the latest ITE & Caltrans certifications. All pedestrian modules shall be "Countdown Sequence, Full LED HAND-MAN Leotek Electronics" type display, or City of Rocklin approved equal.

86-4.04 BACKPLATES – All vehicle signal sections shall include aluminum louvered backplates.

86-4.05 PROGRAMMED VISIBILITY VEHICLE SIGNAL FACES (PV DISPLAY) – All programming of the optic display shall be done in accordance with the manufacturer and the Engineers' specifications.

86-4.05B FRONT SCREEN – The front screen shall be plastic.

86-4.06 PEDESTRIAN SIGNAL FACES – Pedestrian signals shall be aluminum Type "A" with international symbols. Pedestrian head mounts shall be clam shell type with bronze mounting hardware. Mounting shall include one Allen head screw for opening and all wiring shall be quick connect type (plug in).

Pedestrian heads shall be mounted on the intersection side of the signal pole unless otherwise directed by the Engineer.

86-4.08 SIGNAL MOUNTING ASSEMBLIES – Terminal compartments (TV & SV) and mast arm slip fitters (MAS) shall be bronze.

Signal mast arm mounted four (4) section displays shall be type MAS-4C.

All mast arm mounts shall be MAS.

Extra support shall be incorporated whenever the following conditions arise:

The use of a SV-3-TA or SV-3-TB display.
If any display on a side mount is larger than a 3-section 12" display.

The extra support method shall consist of a 1" stand off w/ 1/4" x 20 threaded hole. The stand-off shall be banded to the signal standard, 3" below the bottom of the top slip fitting of the displays'

1½ inch riser. A ¼ inch hole shall be drilled in the center of the 1½ inch riser to match the position of the thread hole on the stand-off. The riser shall be attached to the standoff with a ¼" x 20 bolt, which shall included a lock washer and flat washer.

All signal display mounting assembly top members shall be watertight. The watertight sealing method shall be a ½" thick layer of clear silicone around the top jointing member of all displays. Additional sealant shall be installed in the same manner on all plugs installed in the top of any signal display. Rubber washers used for water-sealing the top assembly shall not be permitted on any display framework or MAT mounting.

All MAS mounts shall be sealed with approved clear silicone around the tenon attachment area, including the through bolt and tenon openings.

The sealant shall be 35 year rated. There shall be no substitution for the silicone sealant.

Where no vehicle or pedestrian display is to be installed on the side of a signal pole, a terminal compartment only shall be installed on the signal pole at the vehicle display position. All signal display wiring from the signal mast arm shall terminate at this location.

86-5.01A(4) VEHICLE DETECTORS CONSTRUCTION MATERIALS –All vehicle detectors shall be inductive loop detector Type "A". Bicycle loops shall be Type "B"- 5'x5' with 5 turns. Refer to Drawing #8-5 for further details.

Loop wire shall be Type 2 RHW-USE, neoprene-jacketed, cross-linked polyethylene insulated, # 14 stranded copper.

Lead-in cable shall be Type B copper. Tinned copper shall not be permitted.

Vehicle detector hand holes shall be Type "B".

86-5.01A(5) VEHICLE DETECTORS INSTALLATION DETAILS – The Inspector prior to saw cutting shall verify all loop locations. The contractor shall give 48 hours notice prior to loop verification.

Loop wires shall be labeled in the following manner:

Lane 1 – black
Lane 2 – red
Lane 3 – blue
Lane 4 – white
Lane 5 – yellow

Right Turn Lane – orange

Labels shall consist of banded colored tape visible in the pull boxes, where the loop wire is spliced to the detector lead-in cable.
Loop detectors shall be clearly marked to reference their location in relation to the limit line and lane. The loop closest to the crosswalk in the left most lane shall be labeled as loop number 1-1. The second loop in the same lane shall be labeled 1-2, and so on. Refer to Drawing # 8-5 for further details.
The start and end leads of a loop detector shall be clearly marked by a means of plastic tie wrap labels.

Loop Home Run slots shall be double cut to accommodate the twisted pair (3-turns/foot), or as directed by the Engineer. Sealant for filling slots shall be Hot Melt Rubberized Asphaltic Sealant or equivalent as approved by the Engineer. Asphaltic emulsion sealant shall not be used.
During loop installation, the Contractor shall in the presence of the Inspector perform a high resistance test and an inductive reactance test. The Contractor shall notify the Inspector at least 48 hours prior to loop installation.

All wires for each detector loop shall terminate in the nearest pull box, not the hand hole.
Lead-in cables shall not be spliced between the termination point (the Pull box adjacent to loop detectors) and the controller cabinet terminals.

Where the approved plans call for preformed detector loops, the following shall apply:

The conduit shall be sealed to prevent the entrance of water and the movement of wires within the conduit.
The loop wires from the preformed loop to the adjacent pull box or hand hole shall be twisted together into a pair (at least two turns per foot) and encased in Schedule 40 or Schedule 80 PVC or polypropylene conduit (3/8 inches minimum diameter). The lead-in conduit shall be sealed to prevent the entrance of water at the pull box or hand hole end.
The preformed loop and lead-in conduits shall be placed prior to pouring final concrete. The top of the conduit shall be between 2 and 3 inches below top of finished surface. Where the concrete is steel reinforced, the preformed loops may rest on the steel.
All detector loop shields shall be grounded in the controller cabinet to the ground bus.

86-5.01E DETECTOR LOOP CIRCUITRY – Adjacent loops on the same sensor unit channel shall be wound in opposite directions (refer to Drawing # 8-5 for further details). All loops shall be wound in a manner such that any adjacent loop will be wound in the opposite direction. The loop at the limit line, closest to the center median (lane 1), shall be wound in a clockwise direction. The next loop back in the same lane shall be wound in a counter-clockwise direction and so on. The loop detector in lane 2 closest to the limit line, shall be wound in a counterclockwise direction.

86-5.02 PEDESTRIAN PUSH BUTTON ASSEMBLIES – Pedestrian push buttons shall be aluminum Type "B" with metal international symbol signs. Push buttons shall meet all Americans with Disabilities Act guidelines and be placed 36 inches above the grade of the closest edge of sidewalk, and require a horizontal reach of no more than 18 inches outside the closest edge of sidewalk.

Pedestrian push buttons shall be within five (5) feet from the edge of the access ramp pan.

86-5.03 INDUCTION LUMINAIRES – Unless otherwise noted, all luminaries shall be 150 watt Induction . Specifications for luminaries:
Medium, cutoff, Type II or III lighting distribution (MSII or MSIII).
US Lighting Tech model number AH-120v/277v-150W-5K-FG (Jersey Series) or City Of Rocklin approved equal.

86-6.07 PHOTOELECTRIC CONTROLS – Photoelectric controls shall be Type II and pole top mounted.

The Contractor shall supply all equipment, supplies, and material required for mounting the photoelectric cell.

86-6.07B(4) WIRING – Wiring from the photoelectric cell assembly to the electrical service shall be # 14. Wire color for the PEU shall be as follows: black for ungrounded conductor, red for ungrounded switch-leg conductor, and white for grounded conductor.

86-7.01 REMOVING ELECTRICAL EQUIPMENT – All existing traffic control devices, lighting devices, signs, and equipment to be removed and not reused in the work shall be salvaged, unless otherwise specified or directed by the City Engineer. Salvageable equipment shall remain the property of the City. Equipment determined to be unsalvageable by the City Engineer shall become the property of the Contractor. The Contractor shall deliver salvaged equipment to the City's Corporation Yard located at 4081 Alvis Court, Rocklin, CA 95677.

The Contractor shall contact the Inspector at least 48 hours in advance of delivery of salvaged equipment.

Damaged conduit deemed to not be reusable shall be removed from existing pull boxes and ends plugged solid with grout. Existing conductors shall be removed from said conduits prior to plugging. Contractor shall dispose of said conductors.

Abandoned conduits deemed reusable shall have the line blow out, existing conductors shall be removed, a number 10 green locate wire shall be installed, and the ends of the conduits shall be sealed.

86-8.01 PAVEMENT MARKING/STRIPING – Traffic striping and signage shall be designed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) and the MUTCD California Supplement (CS). All painted traffic stripes, arrows, and pavement markings shall be constructed with thermoplastic material to the specifications set forth in Section 84 of the Caltrans Standard Specifications (latest edition). Non reflective pavement markers shall consist of ceramic markers only conforming to Section 85-1.04A of the same standards.

ALL medians shall have detail 25.

The BIKE LANE legend shall be centered in the lane to ensure the legend does not run into the lane striping.

Traffic stripes and pavement markings shall not be placed over utility covers including, but not limited to, manhole covers, utility boxes, hand holes, or water valve covers.

Pavement arrows shall be one of the following types unless otherwise directed by the Engineer: Type II (L, R, or B), Type III (L, R, or B), Type VI, or Bike Lane Arrow.

All traffic lane striping shall be discontinued through any four way public intersection from crosswalk to crosswalk, marked or unmarked. Striping shall be continuous through private intersections unless there is a striped left turn lane and/or traffic signal. For public "T" intersections, the through and bike lane striping shall be continuous for the non-intersection direction, i.e. "across the top of the T." However, there shall be no striping within the limits of the crosswalk.

At locations where bike lane striping is parallel striping used to channel traffic, right turn acceleration/deceleration lanes and bus turnouts, both stripes shall be detail 38. Reflective pavement markers shall be placed to the outside of the bike lane.

86-8.02 PAVEMENT MARKING AND TRAFFIC STRIPE BIDDING – Under this item of the Proposal the Contractor shall bid a unit price per lineal foot for removal and placement of pavement markings and traffic striping of widths as shown on the drawings. Pavement markings and traffic stripe shall be defined as paint, thermoplastic, or any other stripe material.

86-8.03 PAVEMENT MARKING AND TRAFFIC STRIPE REMOVAL – Traffic stripe removal shall conform to Section 15-2.02B of the State Specifications and the following requirements. Grinding shall be utilized to remove pavement marking and stripes. Symbols and word markings shall be boxed-out as to completely eliminate the symbol or words. The contractor shall slurry seal all locations where existing pavement legends or limit lines have been removed unless otherwise directed by the engineer.

SS-87. STREET NAME SIGNS

SS87-01. GENERAL--These specifications define the minimum requirements and performance of single sheet aluminum highway signs which have been reflectorized with high quality reflective sheeting- HIP (High Intensity Prism).

All items shall be new, the material and workmanship of the best quality for the purpose. All signs shall be made in accordance with drawings furnished by the City of Rocklin, Department of Public Works or sign specification sheets as produced by the State of California D.O.T. and as called for by the Engineer. All sheeting is to be reflective unless otherwise specified.

All materials and finished signs may be subject to inspection. Twelve inch by 12 inch test panels representative of any stage of production shall be furnished on request of the Engineer and these panels shall be processed along with the regular production run and witnessed by the representative. All surfaces exposed to weathering shall be free of any defects in the coating that may impair the serviceability or detract from the general appearance of color matching of the sign. The finished sign panels shall be clean and free from all router chatter marks, burrs, sharp edges, loose rivets, delaminated reflective sheeting and aluminum marks. Panels with any defects or damage that would affect their appearance or serviceability will not be acceptable. No repairs shall be made to the face sheet without the approval of the Engineer.

SS-88. IRRIGATION SYSTEM

SS-88-01 GENERAL

SS-88-01.1 SCOPE OF WORK -- Contractor shall furnish all labor, materials, equipment, and services necessary to install the irrigation system as indicated on the approved drawings and specified herein and shall perform all other incidental work necessary to carry out the intent of this Specification and drawings including the following:

A. Furnish and install all pipe lines and fittings.

B. Furnish and install automatic controller, all electrical connections and control wiring.

C. Furnish, assemble, and install material described in this specification and as indicated on the drawings.

D. Excavate and backfill trenches.

E. Test and inspect system.

F. One-hundred-twenty day maintenance.

G. One-year guarantee.

SS-88-01.2 PRIOR TO STARTING WORK THE CONTRACTOR SHALL:

A. Carefully check all grades and existing utilities to determine that work may safely proceed, keeping within the specified material depths with respect to finish grade and drainage.

B. Verify that irrigation systems may be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards, and the manufacturer's recommendations.

C. Inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

SS-88-01.3 WATER SERVICE -- Coordinate with Placer County Water Agency for connections to the water supply and/or installation of water meters at the locations shown on the drawings. Minor changes caused by actual site conditions shall be made at no additional cost to the City. All changes to the plans shall be approved by the City Engineer.

SS-88-01.4 ELECTRICAL SERVICE -- Coordinate with PG&E for connections to electrical service and/or installations of conduit, electrical wiring and meter pedestal at the locations shown on the drawings. Minor changes caused by actual site conditions shall be made at no cost to the City. All changes to the plans shall be approved by the City Engineer.

SS-88-01.5 PHYSICAL LAYOUT

A. The drawings are essentially diagrammatic. All scaled measurements are approximate. Before proceeding with the work, the contractor shall ascertain all dimensions at the job site. Provide offsets in pipe in and changes in equipment locations as necessary to conform with structures and to avoid obstructions or conflicts with other work.

B. Prior to installation, the Contractor shall stake out all pressure supply lines, routing and location of sprinkler heads, make minor adjustments required due to differences between site and drawings. Where piping is shown on drawings under paved areas but running parallel and adjacent to planted areas, install the piping in planted areas. All layouts shall be certified by the irrigation system designer and approved by the City Inspector prior to installation.

C. Contractor shall coordinate the installation of all irrigation material with the landscape drawings to avoid interfering with existing or new plants.

D. Irrigation head spacing as shown on the drawings shall not be exceeded.

SS-88-01.6 SUBSTITUTIONS

A. Specific reference to manufacturer's names and products specified in this section are used as standards; this implies no right to substitute other materials or methods without written approval of the City Engineer for approval prior to installation.

B. Installation and warranty of any approved substitution shall be the Contractor's responsibility. Any changes required for installation of any approved substitution must be made to the satisfaction of the City without additional cost to the City. Approval by the City of substituted equipment and/or dimension drawings does not waive these requirements.

SS-88-01.7 RECORD AND AS-BUILT DRAWINGS -- The Contractor shall maintain as-built drawings on the job site at all times. He shall record accurately on one set of as-built drawings all changes in the work constituting departures from the original approved drawings. The changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of the City Inspector. Dimensions shall be from two permanent points of reference (building, monuments, sidewalks, curbs, pavements, etc.). Date to be shown on as-built drawings shall be recorded day to day as the project is being installed. All lettering on drawings shall be minimum 1/10 inch in size.

1. Points of connection.

2. Routing of pressure lines (dimension at least every 100 feet along routing).

3. Gate valves.

4. Remote control valves.

5. Quick coupling valves.

6. Routing of control wires.

7. Pressure regulator, strainer, assembly.

8. Water and electric meters.

9. Controllers.

10. Irrigation interconnect.

11. Cluster control units.

12. Sleeves.

13. Related equipment.

14. Central control field components.

SS-88-01.8 SUBMITTALS

A. Prior to Performing Work -- The following items shall be submitted to the City Inspection Services Division 48 hours prior to performing any work.

1. Materials List -- Complete materials list that shall include the manufacturer, model number, and description of all materials and equipment to be used and shall use the following format (double space between each item).

Item No.	Description	Manufacturer	Model
_____	Pressure supply lines	Lasco	Schedule 40
_____	Turf head	Rainbird	1800
_____	Etc.	Etc.	Etc.

2. Notarized Certificates -- Notarized certificates for plastic pipe and fittings manufacturer indicating that material complies with the specifications unless material has been previously approved.

   Approved as-built drawings shall be considered record drawings.

B. Prior to Start of Maintenance Period.

1. Upon completion of the project, the contractor shall submit one complete set of as-built drawings and a Landscape Architect's Certificate of Compliance to the City Inspector for approval.

2. Upon approval of the as-built drawings by the City Inspector, the Landscape Architect shall submit one complete set of record drawings to the City Inspector. Controller charts and microfilm shall be made from the approved record drawings.

C. Prior to Final Acceptance

1. Two Controller Charts for Each Controller -- The controller charts shall be a blackline print of the reduced as-built drawing, hermetically sealed between two 20-mil thick plastic sheets. The chart shall be the maximum size that the controller door will allow and shall show the areas covered by the controller. A different color shall be used to show the area of coverage for each valve. If the controller sequence is not legible when the drawings are reduced, it shall be enlarged to a readable size.

2. Two individually hardbound copies of operation and maintenance manuals. The manuals shall describe the material installed. Each complete manual shall include the following information:

   a. Index sheet stating Contractor's address and telephone number, list of equipment including names and addresses of local manufacturer representatives.

   b. Complete operating and maintenance instruction for all equipment.

   c. Spare parts lists and related manufacturer information for all equipment.

   d. A guarantee for the sprinkler irrigation system. This guarantee shall be typed onto the Contractor's letterhead.

   e. Contractor's performance bond information, including bonding company, bond number, agent and phone number.

   f. Listing of all required warranties and guarantees with effective dates and expiration date.

3. Equipment -- Supply as part of the contract the following items:

   a. Two keys for controller, controller enclosure.

   b. One valve box cover removal tool.

   c. Two quick couplers with hose swivels.

   d. One moisture sensing maintenance kit.

SS-88-01.9 PROTECTION OF WORK AND MATERIALS

A. Contractor shall protect his work and work of others for the duration of the contract. He shall protect pipes and fittings from direct sunlight, and avoid undue bending and any concentrated external loading. Beds on which pipe is stored shall be full length of pipe. Pipe or fittings that have been damaged shall not be used.

B. Contractor shall exercise extreme care in excavating and working near existing utilities. Damage to utilities which are caused by contractor's operation shall be the contractor's responsibility.

C. Contractor shall take necessary precautions to protect site conditions and plant material that is to remain. Should damage be incurred, Contractor shall repair damage to its original condition or furnish and install equal replacements.

D. All existing irrigation systems shall be kept in operation at all times. If the existing system is damaged by Contractor, he shall be responsible for immediate repair of such damage. After each repair, all heads of the repaired system shall be removed so that the lines can be cleared of all dirt and foreign matter.

SS-88-01.10 CORRECTION OF WORK

A. Any and all discrepancies or unsatisfactory work shall be corrected by Contractor at no additional expense to the City. The correction of work shall be finished within a reasonable period mutually agreed upon between the City and Contractor.

SS-88-01.11 CLEANUP

A. Cleanup shall be made as each portion of work progresses. Refuse, extraneous material, and excess dirt shall be removed from the site, all walks and paving shall be broomed or washed down, and any damage sustained on the work of others shall be repaired to original conditions.

B. Upon completion of the work, Contractor shall smooth all ground surfaces; remove excess materials, rubbish, debris, etc., sweep adjacent streets, curbs, gutters, walkways and trails; and remove construction equipment from the premises.

SS-88-02 PRODUCTS

SS-88-02.01 General--Materials or equipment installed or furnished shall be new. Any that do not meet the City standards shall be rejected and shall be removed from the site at no expense to the City.

SS-88-02.02 Pipe

A. Pressure supply line from point of connection through backflow prevention unit for domestic water systems, and through the strainer/pressure regulator assembly on reclaimed water systems shall be brass, copper or other material approved by the City.

B. Above-ground installation shall be UVR-PVC brownline pipe.

C. All threaded pipe shall be threaded by the manufacturer of the pipe.

SS-88-02.03 PVC Pipe and Fittings

A. Pressure supply lines and fittings 2 inches and larger downstream of backflow prevention unit on domestic water systems or strainer/pressure regulator assembly on reclaimed water system shall be Class 315 PVC. Lines 8 inches and larger require prior approval by City Engineer.

B. Pressure supply lines and fittings 1-1/2 inches and smaller downstream of the backflow prevention unit on domestic water systems or strainer/pressure regulator assembly on reclaimed water systems shall be Schedule 40 PVC.

C. Nonpressure lines shall be Schedule 40 PVC.

D. Rubber gasket PVC pipe shall not be permitted.

E. Plastic pipe shall bear the following markings: manufacturer's name, nominal pipe size, schedule or class, type of material, pressure rating in psi, NSF seal of approval, and the date of extrusion.

F. Fittings shall be as manufactured by DURA, or approved equal.

G. PVC solvent weld fittings shall be Schedule 40.

H. Threaded nipples shall be standard weight Schedule 80 with molded threads.

I. Separate primer and solvent cement applications shall be required for all plastic pipe joints per manufacturer's recommendations.

SS-88-02.04 Copper Pipe and Fittings

A. Copper pipe shall be Type "K", hard tempered ASTM B88 and fittings shall be wrought solder joint type in accordance with ANSI B16.22.

B. Joints shall be soldered with silver solder, conforming to ASTM B206.

SS-88-02.05 Brass Pipe and Fittings

A. Brass pipe shall be 85% red brass, ANSI, Schedule 40 screwed pipe.

B. Fittings shall be medium brass, screwed 125-pound class.

SS-88-02.06 Galvanized Steel Pipe and Fittings--Galvanized steel pipe and fittings are not allowed unless prior approval is given by City Engineer. Underground installations will not be allowed under any circumstances.

SS-88-02.07 Asbestos-Cement Pipe (A.C.P.) and Fittings--Asbestos-cement pipe and fittings are not allowed unless prior approval is given by the City Engineer.

SS-88-02.08 Backflow Prevention Units--"Reduced pressure" type backflow preventor shall be as manufactured by Neptune, Cla-val, Febco or approved equal. Unit shall be equipped with ball valves.

SS-88-02.09 Basket Strainer and Pressure Reducing Valve Assembly

A. Basket strainer shall be a Hayward Model #72 with flanged bronze body, tee handle and 20 mesh model or stainless steel screen, basket shall have 1/10 perforations.

B. Pressure reducing valve shall be a Wilkins Models #500FL, or approved equal, with flanged bronzed body. Spring range and pressure setting shall be as noted on irrigation drawings.

C. Gate valves shall conform to AWWA Standards and have a flanged cast iron body and 2 inch operating nut.

D. The flanged assembly shall be bolted together using stainless steel nuts and bolts.

SS-88-02.10 Remote Control Valves and Master Valves

A. Remote control valves shall be Rainbird EFB-CP or approved equal.

B. Master valves shall be Griswald 2030 series with low power, lightning protected solenoid. Master valves relays shall be Potter Brumfield Model #LR42803 or approved equal.

SS-88-02.11 Manual Control Valves--Manual control valves shall not be used without prior approval of the City Engineer.

A. Angle-type valves shall be all bronze with swivel-type replaceable seating members and with brass unions on discharge side.

B. Antisiphon-type valves shall be all bronze with swivel-type replaceable seating members and an approved atmospheric vacuum breaker as an integral part of assembly.

SS-88-02.12 Gate Valves

A. Gate valves, 2 inches or smaller, shall have bronze bodies, rising stems, and brass cross handles. Gate valves shall be Nibco Class 125, T-111, threaded or approved equal.

B. Gate valves 2½ inches and larger shall be AWWA approved and have flanged connections, a 2-inch square operating nut, cast iron bodies, and have an arrow cast in metal indicating the direction of water flow. Gate valves shall be Nibco F-619, Sotckham G-612, Kennedy 561X, or approved equal.

SS-88-02.13 Quick Coupling Valves--For use on domestic water systems, quick coupling valves shall be Rainbird 44LRC or approved equal.

SS-88-02.14 Check Valves--Spring-loaded check valves shall be of plastic construction with soft composition discs. Spring tension shall be adjustable from 4 psi to 15 psi. They shall be located in the swing assembly or shall be integral with sprinkler body. Check valves shall be Valcon ADV, Rainbird SAM, or approved equal.

SS-88-02.15 Valve Box--Valve box shall be fabricated from a durable plastic material resistant to weather, sunlight and chemical action of soils. They shall be green in color. The cover shall be secured with a stainless steel bolt down mechanism. The cover shall be capable of sustaining a load of 1,500 psi.

Valve box extensions shall be by the same manufacturer as the valve box. All valve boxes shall be as manufactured by Ametek, Carson, or an approved equal.

1. Quick coupling valve boxes shall be round. The cover shall be heat branded with the letters "QVC" 2 inches high.

2. Gate valve boxes shall be round. The cover shall be heat branded with the letters "GV" 2 inches high.

3. Remote control valve boxes shall be 12" x 18". The cover shall be heat branded with the letters "RCV" and the valve number in characters 2 inches high.

4. Splice boxes shall be 12" x 18". The cover shall be heat branded with the letters "SB" 2 inches high.

5. Valve boxes for moisture sensing stations shall be Irrometer Turf valve box Cat. #1101 with locking lid. The cover shall be heat branded with the letters "MSS", 2 inches high.

6. Valve boxes for the strainer/pressure reducing valve assembly shall be sized to fit assembly including working space. Boxes shall be Associated Plastics, Model #PC2436-18/24 (22"-33") or Model #3048 with optional cutout (37"-67"), or Brooks products Model #G500-1973-42/48/54 with #500 base slab and parkway type 45 hinged spring assisted, steel door (48"-78").

SS-88-02.16 Equipment Enclosures

A. All equipment enclosures for pumps, backflow preventors, and controllers shall be vandal-resistant, stainless steel, or approved equal and have stainless steel piano hinges. Enclosures shall be as manufactured by La Max, Commerce, CA; Le Meur, Fontana, CA; Ted Sales, Laguna Hills, CA; or approved equal.

B. Automatic controller enclosures shall have louvered vents covered by a brass or stainless steel screen mounted inside the enclosures.

SS-88-02.17 Automatic Controller

A. Automatic Controllers for City maintained irrigation systems shall be Rainbird ISC-B-SAT or approved equal.

B. Automatic Controllers for association maintained irrigation systems shall be Rainbird ISC or approved equal.

C. All controllers shall be pedestal mounted type for exterior installation or wall mounted type for interior installations only.

D. Controllers shall have a 120 volt pump starter relay integral to the controller whenever pumps are required.

E. All controller components shall be fused and have a chassis ground.

F. All controllers shall be equipped with a permanently mounted remote control receiver outlet plug contacts shall be gold plated compatible with T.R.C. Rainmaster, Irritrol, Rainbird, and Econo Radio units. Outlet plug shall be able to operate up to 32 stations.

Wiring shall be done in such a manner to include remote control electric control valve operation and moisture sensor override.

G. All controllers shall be equipped with a 4" x 4" electrical junction box, with an on/off switch, and a grounded receptacle mounted inside the enclosure.

SS-88-02.18 Electrical Meter Pedestal--Electrical meter pedestal and panels shall be manufactured by Myers. Cat. No. MEUG-M125 C/SS with #1248 enclosure or approved equal. The pedestal breaker panel shall be fully enclosed. The pedestal shall be painted the same as equipment enclosures. The meter address shall be painted with black exterior enamel using 1 inch high stenciled characters.

SS-88-02.19 Electrical High Voltage

A. All electrical equipment shall be NEMA Type 3, waterproofed for exterior installations.

B. All high voltage electrical work shall require separate electrical permit and inspections.

SS-88-02.20 Control Wire

A. Control wires shall be direct burial, 600 volt, 14 gauge minimum. Control wires shall be different color wire for each automatic controller. Common wires shall be white with a different color strip for each automatic controller. Each controller shall have an independent common wire.

B. Connections shall be epoxy-sealed packet type connectors. They shall be Scotch-Lok #3576 connector sealing packs or approved equal. Use one sealing pack per connection.

C. Spare control wires shall be blue in color. Spare common wire shall be white in color.

D. Control wires for moisture sensing stations shall be black in color.

SS-88-02.21 Large Turf and Ground Cover Sprinkler Heads

A. Sprinkler heads for large turf and ground cover areas shall be gear driven rotary type pop-up. The body shall be constructed with 3/4 inch or 1 inch N.P.T. bottom inlet. Sprinkler nozzle shall pop-up a minimum of 2-1/2 inches with positive spring retraction. Sprinkler heads shall be Toro, or Hunter (Institutional Series only), or approved equal.

B. Impact drive pop-up type sprinkler heads shall be Rainbird or approved equal and may be acceptable in association maintained areas only. In turf areas sprinkler heads shall have a protective rubber cover.

SS-88-02.22 Small Turf and Ground Cover Sprinkler Heads

A. Sprinkler heads for small turf and groundcover areas shall be Rainbird 1800 SAM-PRS-1800 series or approved equal.

B. All heads shall be a minimum 6-inch pop-up.

SS-88-02.23 Sprinkler Heads for On-Grade Systems

Sprinkler heads for on-grade systems shall be the shrub head type of those sprinklers described above. Impact drive heads shall not be allowed.

SS-88-02.24 Pumps

A. The contractor shall submit full data on all pumps for approval prior to installation.

B. All pumps shall be three-phase and activated by a flow switch assembly.

C. All pumps shall be protected with low pressure inlet pressure sensing device.

D. All pipe and fittings within the pump assembly shall be brass.

E. Enclosure installations may be required by the City Engineer if pump locations adjacent to residential units warrants sound attenuation measures.

F. Pump assemblies located adjacent to a wall shall be installed to allow clearance for servicing the assembly.

SS-88-02.25 Moisture Sensors

Moisture sensors shall be Irrometer Model "TGA" (Turf Automatic) with automatic switching capabilities.

SS-88-03 EXECUTION OF WORK

SS-88-03.1 Trenching

A. Pulling in of pipe and control wires shall not be permitted.

B. Mechanical trenching machines shall be of an approved type to cut trenches with straight sides. Pipes shall be supported continuously on the bottom of the trench and shall be laid to an even grade. Trenching excavation shall follow layout indicated on drawings to the depths below finish grade as noted.

1. Provide minimum cover of 24 inches on pressure supply lines 3 inches and larger.

2. Provide minimum cover of 18 inches on pressure supply lines 2-1/2 inches and smaller.

3. Provide minimum cover of 18 inches for control wires.

4. Provide minimum cover of 12 inches for nonpressure lines.

C. Where it is necessary to excavate adjacent to existing tress, the Contractor shall avoid injury to tress and roots. Excavation in areas where 2 inch or larger roots occur shall be done by hand. All roots 2 inches and larger in diameter shall be tunneled under and shall be heavily wrapped with burlap, to prevent scarring or excessive drying. Where a ditching machine is run close to trees having roots smaller than 2 inches in diameter, the wall of the trench adjacent to the tree shall be hand trimmed, making clean cuts through roots. Roots 1 inch or larger in diameter shall be painted with two coats of Tree Seal, or equal. Trenches adjacent to trees should be closed within 24 hours; and where this is not possible, the side of the trench adjacent to the tree shall be kept shaded with burlap or canvas.

SS-88-03.2 Backfilling

A. Trenches shall not be backfilled prior to approval of all required tests unless specifically directed by City Inspector for trenches that represent an unsafe situation.

B. Excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, or other approved materials shall be free from clods of earth or stones larger than 1 inch shall be tamped in 4 inch layers under the pipe and uniformly on both sides for the full width of the trench and the length of the pipe. Materials shall be sufficiently damp to permit thorough compaction, free of voids. Backfill shall be mechanically compacted to a dry density equal to adjacent undisturbed soil in landscaped areas and shall conform to adjacent grades. Under no circumstances shall truck wheels be used to compact soil.

C. Initial backfill on all lines shall be of finer granular material with no foreign matter larger than 1/2 inch in size.

D. Jetting is an approved method of compacting trenches.

SS-88-03.3 Piping Beneath Paved Areas

A. Sleeves shall be installed a minimum of 6 inches beneath the bottom of the pavement subgrade, and at least as deep as piping requires.

B. Provide and backfill a minimum of 6 inches over and under all sleeves located under paved areas. A compaction test is required to confirm 95% relative density.

C. Piping under pavement shall be installed within a PVC schedule 40 sleeve. The sleeve shall be a minimum of 6 feet beyond such pavement. In-line fittings, including couplings, shall not be permitted under paved surfaces except where the length of the line under paving is 20 feet or greater. The ends of sleeves shall be capped hand tight until piping is laid.

D. Sleeves under existing pavement may be installed by jacking, boring, or hydraulic draining. No hydraulic driving is permitted under asphaltic concrete pavement at depths less than 36 inches.

SS-88-03.4 Piping (General)

A. Carefully inspect all pipe and fittings before installation, removing all dirt, scale, burrs, and reaming. Install pipe with all markings up for visual inspection and verification.

B. Contractor shall install concrete thrust blocking using AWWA standards for location and installation criteria.

C. All lines shall have a minimum clearance of 6 inches from each other and from lines of other trades. Parallel lines shall not be installed directly over one another.

D. Allow solvent welds at least 15 minutes setup time before moving or handling and 24 hours curing time before backfilling.

E. 360° applicators shall be used to apply primer and solvent on sizes 2-1/2 inches and larger.

F. Centerload all plastic pipe prior to pressure testing to resist displacement.

G. All threaded PVC to PVC connections shall be assembled using Permatex #51 pipe joint compound, a nonhardening sealant or approved equal.

H. Threaded PVC female fittings shall not be used with brass or copper pipe. Use a nonhardening pipe dope on all threaded plastic-to-metal connections, except where noted otherwise.

I. All threaded pipe shall be threaded by the manufacturer of the pipe.

SS-88-03.5 Control Wiring

A. Control wires shall be installed in accordance with valve manufacturer's specifications and wire chart.

B. Control wiring located beneath paved areas shall be installed in a separate schedule 40 PVC sleeve.

C. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible. Lay to the side of pipeline. Control wires shall be laid loosely in trench without stress or stretching to allow for contraction of wires. Where more than one wire is placed in a trench, the wiring shall be taped together at intervals of 10 feet.

D. An expansion curl shall be provided within 3 feet of each wire connection. Expansion curl shall be of sufficient length at each splice connection at each electric control valve, so that in case of repair, the valve bonnet may be brought to the surface without disconnecting the control wires.

E. An expansion curl shall be provided every 100 feet on one of more than 100 feet in length. Provide looped slack at valve and changes in direction of 90 degrees.

F. Field splices between the automatic controller and electrical control valves shall not be allowed without prior approval of the City Inspector. Splices shall be vaulted and noted on as-built drawings. An expansion curl of 12 inches shall be provided at each field splice.

SS-88-03.6 Automatic Controller

A. Controller shall be located behind shrubs and/or adjacent to hardscape. Overspray onto controller shall not be accepted. Maintenance access shall be provided.

B. The location of the controller shall be as shown on the drawings and shall be approved by the City Inspector before installation. The electrical service shall be coordinated with this location.

C. City-maintained controllers shall have the irrigation interconnect terminating inside the controller enclosure. All conduits and wiring shall enter the enclosure from the bottom.

SS-88-03.7 Valves and Valve Boxes

A. Valves and valve boxes shall be installed as shown on the drawings and details. The top of valve boxes shall be 2 inches above finish grade in ground cover areas, and 1 inch above finish grade in lawn areas. Install each remote control valve and quick coupling valve in a separate valve box and allow at least 24 inches between valve boxes.

B. Place 3 cubic feet of pea gravel prior to installation of any valve box.

C. Common bricks shall be placed beneath each corner of all rectangular valve boxes for stabilization.

SS-88-03.8 Closing of Trenches and Flushing of Pipes

A. Main Lines -- Mains shall be flushed before installing remote control valves, quick-coupler valves, hose bibs or pressure-relief valves and with pipe centerloaded. All water being discharged shall be temporarily piped up and out of the trenches. Trenches are to be kept dry for pressure tests to follow. Install all valves after approval of flushing procedure by the City Inspector.

B. Lateral Lines -- Prior to installation of sprinkler heads and after all new lateral lines and risers are connected, the valve shall be opened and a full head of water used to flush out the lines and risers. Flushing shall be performed in the presence of the City Inspector until flow is clean and free of all foreign material.

SS-88-03.9 Pressure Tests

A. Irrigation main lines shall be centerloaded prior to conducting hydrostatic pressure test.

B. All hydrostatic tests shall be made in the presence of the City Inspector. No pressure line shall be backfilled until it has been inspected, tested, and approved in writing.

C. All gate valves along main line shall be fully open for testing.

D. Testing or pressure main lines shall occur prior to installation of remote control valves.

E. All pressure lines shall be tested under a hydrostatic pressure of 150 psi for a period of not less than two hours. If leaks develop, joints shall be replaced and test repeated until entire system is proven watertight.

SS-88-03.10 Adjustment of the System

A. The Contractor shall adjust all irrigation components for optimum performance, and to prevent overspray onto walks, roadways, buildings, and equipment as much as possible.

B. If it is determined that adjustments in the irrigation equipment will provide more uniform performance the Contractor shall make such adjustments prior to planting. Adjustments may also include changes in nozzle sizes and degrees of arc as required.

C. Lowering raised sprinkler heads and valve boxes by the Contractor shall be accomplished within 10 days after notification by City Inspector.

D. All sprinkler heads and valve boxes shall be set perpendicular to finished grades unless otherwise designated on the plans.

SS-88-03.11 Coverage Test

A. When the sprinkler system is completed, a coverage test shall be performed in the presence of the City Inspector to determine if the water coverage for planting areas is complete and adequate. If coverage is inadequate, corrections shall be made and another coverage test performed.

B. The entire sprinkler irrigation system shall be under full automatic operations for a period of 7 days prior to any planting.

SS-89. COMPUTERIZED IRRIGATION CONTROL SYSTEM

SS-89-01 GENERAL

SS-89-01.1 -- All materials furnished and installed shall be new and shall conform to Cal Trans Section 6 Standard Specification, current edition, and the Standard Specifications for Public Works construction, current edition, as adopted by the City.

SS-89-01.2 -- All materials except interconnect conductors shall have a 5-year warranty. The Contractor shall submit proof of warranty to the City Inspector prior to the start of the maintenance period. It is the contractors responsibility to obtain the necessary warranty inspections from the equipment supplier. No installations will be accepted without proof of warranty.

SS-89-01.3 -- All existing computerized irrigation control systems and all new computerized irrigation control system components shown on the plans shall be fully operational at final acceptance.

SS-89-01.4 -- All incidental parts which are not shown on the plans or specified herein and are necessary to complete or modify the existing systems shall be furnished and installed as though such parts were shown on plans or specified. All systems shall be in satisfactory operation at the time of completion.

SS-89-01.5 -- Existing interconnect systems shall be maintained in effective operation by the contractor for the duration of the work. The contractor shall notify the City Inspector 48 hours prior to performing any work on an existing system.

SS-89-01.6 -- The contractor shall coordinate with Pacific Bell for connections to the telephone service and/or installations of conduit, telephone conductors, jacks, and modems at the locations shown on the drawings. Minor changes caused by actual site conditions shall be made at no cost to the City. All changes to the plans shall be approved by the City Engineer.

SS-89-02 PRODUCTS

SS-89-02.1 Conduit -- All irrigation interconnect conduit and conduit fittings shall be U.L. Listed PVC Schedule 40, 2 inches in size, unless otherwise noted.

SS-89-02.2 Conductors

A. The two wire path for the irrigation interconnect as required from each Cluster Control Unit (CCU) encoder to the satellite units shall be a twisted, shield, 6-pair No. 19 manufactured by General Cable Company, or it shall be a double-jacketed, two-conductor cable with conductors tin coated, soft annealed, solid copper with 4/64 inches thick PVC insulation. The two insulated conductors shall be laid in parallel and encased in polyethylene having minimum wall thickness of 0.45 inches. The two conductors shall be color-coded with one conductor red and the other black. Wire shall be manufactured by Paige Electric Corporation of Union, New Jersey or approved equal.

B. Each controller, CCU, and sensor encoder shall be grounded by means that conform to the requirements of the National Electrical Code, current edition as adopted by the City, and the manufacturers specifications. No solder connections will be allowed. Resistance to ground shall be no greater than 5 ohms.

C. Flow meter wiring shall be bolden Brand shielded 2 conductor stranded copper SWG 20 with AWG 22 drain wire provided for connection to display or analog transmitter unit, rated to 105° and may be extended to a maximum of 2000 feet. Wire shall be installed in a 3/4 inch UL PVC SCH 40 conduit.

D. All conductors shall be the same type and shall be of the sizes shown on the drawings as required for proper operation of the systems.

SS-89-02.3 CCU-Encoder

A. The number and location of all CCU encoders shall be as shown on the drawings and shall be as manufactured by Rainbird Sprinkler Manufacturing Corporation.

B. Each CCU encoder shall have a separate two-wire path to the controllers under its control. This two-wire communication link shall be of the wire type, installed and tested as herein specified.

C. The CCU encoder shall connect directly to the telephone company lines via standard connector Model RJ11C, in full compliance with Part 68, FCC docket 19528, or Pacific Bell SNI connector.

D. The CCU encoder shall be housed in "Strongbox" stainless steel weatherproof, vandal resistant lockable enclosure with flush mounted handle as manufactured by Ted Sales Inc., or approved equal.

SS-89-02.4 Pull Box

A. Pull boxes for the irrigation interconnect conduit shall be fabricated from a durable plastic material resistant to weather, sunlight, and chemical action of soils. They shall be gray in color. The cover shall be secured with a stainless steel bolt-down mechanism. The cover shall be capable of sustaining a load of 1,500 psi. Pull box extensions shall be by the same manufacturer as the pull box. Valve boxes shall be Ametak with dimensions of 10 3/4 inch x 16 inch x 12 inch or approved equal. The cover shall be heat branded with the letters IRR-COM 2 inches high.

B. In paved areas, the pull box shall be Brooks 3TL concrete box with cast-iron traffic lid. The cover shall be marked with the letters IRR-COM 2 inches high. Markings shall be applied to the cover prior to galvanizing.

SS-89-03 EXECUTION OF WORK

SS-89-03.1 Irrigation Interconnect Conduit

A. The conduit shall be located within the public right of way whenever possible. If the conduit is installed outside of the public right of way, an easement shall be provided to the City prior to city acceptance of the improvements.

B. Conduit runs shall be installed as shown in the approved plans. Any changes shall be approved by the City Engineer prior to installation.

C. The ends of all conduits, whether shop or field cut, shall be reamed to remove burrs and rough edges. Cuts shall be made square and true. Slip joints on running threads shall no be permitted for coupling conduit.

D. The ends of the conduit shall be capped until the pulling of wiring is started. When caps are removed, the threaded ends of the conduit and conduit fittings shall be provided with conduit bushings.

E. Conduit bends, except factory bends, shall have radii of not less than 6 times the inside diameter of the conduit. Conduits that are crimped or flattened shall be rejected. Bending shall be done by methods recommended by the conduit manufacturer.

F. Conduit shall be laid to a depth of not less than 30 inches below finished grade in landscaped areas and in paved areas. The conduit shall be a minimum of 6 inches below the bottom of pavement sections and shall have a minimum of 6 inches clearance from other pipes or conduits. Conduit shall have a minimum of 36 inches clearance from high voltage electrical utilities.

G. Prior to placement of conduit, a bed of clean sand, a minimum of 2 inches thick, shall be placed in the trench. A minimum of 4 inch thick layer of clean sand shall be placed over the conduit prior to back fill with additional material.

H. Existing underground conduit to be incorporated into a new system shall be cleaned with a mandrel or cylindrical wire brush and blown out with compressed air.

I. A nylon or polypropylene pull rope with a minimum tensile strength of 500 pounds shall be installed in all conduits which are to receive future interconnect cable. At least 2 feet of pull wire shall be extended beyond each end of the conduit run and secured.

SS-89-03.2 Irrigation Interconnect Conductors

A. When installing irrigation interconnect conductors within existing traffic signal interconnect conduit, the contractor shall notify the Department of Public Works at least 48 hours prior to installation.

B. A licensed electrical contractor shall be required to perform installations within existing traffic signal interconnect conduit.

C. All irrigation interconnect conductors shall be pulled by hand. Winches or other power actuated pulling equipment shall not be used.

D. A total of 2 feet of slack shall be left at each field satellite and within each pull box. Sufficient slack shall be kept to allow the wire to extend 18 inches above to top of the pull box grade.

E. Small, permanent, identification bands shall be marked "irrigation interconnect" or as specified and securely attached to irrigation interconnect wires in each pull box near the termination of each wire. Permanent identification bands shall be embossed 6-mil oil resistant PVC tape with pressure sensitive backing.

F. The irrigation interconnect wire shall be continuous from controller to controller. All splices shall occur within the controller enclosures unless specifically authorized by the City Engineer. All splices shall be made using approved connectors only. All splices shall be capable of satisfactory operation under continuous submersion in water. All splices shall be 3M Series 3500 Scotch-Lok connector packs or approved equal.

SS-89-03.3 Pull Boxes

A. Pull boxes shall be installed at intervals not to exceed 200 feet and at each location that the installation of the conduit shall be phased, and each point where the conduit crosses a roadway, bridge, or railroad track.

B. Pull boxes shall be installed in areas to be landscaped whenever possible.

C. The bottom of all pull boxes shall be bedded in crushed rock 6 inches deep and 1/2 inch of grout prior to installation of irrigation interconnect. A layer of 15 pound roofing paper shall be placed between the grout and the crushed rock. A one inch diameter drain hole shall be provided through the center of the pull box grout and roofing paper.

D. Where the sump of an existing pull box is disturbed by the contractor's operations, the sump shall be reconstructed. The old grout and roofing paper shall be removed and replaced with new.

SS-89-04 INSPECTION

SS-89-04.1 Interconnect Circuitry -- The contractor shall cause the following warranty tests to be performed by the equipment supplier on all electrical circuits, and shall submit a written approval from the equipment supplier to the City Inspector prior to the start of the maintenance period. All tests shall be made to the satisfaction of the City Inspector.

A. Continuity - Each circuit shall be tested for continuity.

B. Ground - Each circuit shall be tested for leaks to ground with an ohm meter after each interconnect circuit has been installed and connections have been made. No circuit checking lower than 1 megohm will be acceptable. Any underground splices must be buried in the soil and be water settled prior to this test. After the test is completed, splices shall be removed from the soil and left exposed in pull box for future access.

C. Functional - A functional test shall be made in which it is demonstrated that each and every part of the system functions as specified or intended. The test may commence only with the approval of the City Inspector.

The functional test for each new or modified electrical system shall consist of not less than 5 days of continuous, satisfactory operation. If unsatisfactory performance of the system developed, the condition shall be corrected and the test shall be repeated until the 5 days of continuous satisfactory operation are obtained.

D. Faults - Any material revealed by these tests to be faulty in part of the installations shall be replaced or corrected by the contractor at his expense in a manner permitted by the Civil Engineer, and the same test shall be repeated until no fault is evident.

E. Results of circuitry tests shall be recorded and submitted to the City Inspector prior to acceptance of the work.

SS-90 LANDSCAPE PLANTING

SS-90.01 GENERAL

SS-90-01.1 Scope of Work

A. Contractor shall furnish all labor, material, equipment, and services necessary to install all landscape planting, as indicated on the approved drawings and as specified herein, and shall perform all other incidental work necessary to carry out the intent of this specification and drawings including the following:

1. Fine grading, soil preparation, planting of trees, shrubs, vines, ground covers and lawn, guying and staking trees, and weed abatement.

2. Sixty-day maintenance.

3. Provide guarantee.

B. All irrigation work shall be approved by the City prior to any work in this section being performed.

SS-90-01.2 Agronomic Soils Report

A. After completion of rough grading and prior to soil preparation, the developer shall provide testing of planting soils by an independent agronomic soil testing laboratory (member of the California Association of Agricultural Labs). Representative soil samples shall be taken in the field and a written report shall be prepared by the agronomist and shall include recommendations for soil amendments and application rates for soil preparation preplant fertilization, planting backfill mix, hydromulch slurry, any auger hole requirements, and post-maintenance fertilization program.

B. Test results and recommendation shall be approved by the City Engineer prior to soil preparation.

SS-90-01.3 Protection of Existing Trees and Plants to Remain

A. Contractor shall not store materials or equipment, permit burning, operate or park equipment under the branches of any existing plant to remain except as actually required for construction in those areas.

B. Contractor shall provide barricades, fences or other barriers as necessary at the drip line or around tree trunks to protect existing plants from damage during construction.

C. Contractor shall notify City Inspector in any case where Contractor feels grading or other construction called for by the plans may damage existing plants.

D. If existing plants to remain are damaged during construction, Contractor shall replace such plants of the same species and size as those damaged at no cost to the City. Determination of extent of damaged and value of damaged plant shall rest solely with the City.

SS-90-01.4 Substitutions

A. Specific reference to manufacturers names and products specified in this Section are used as standards; this implies no right to substitute other materials or methods without written approval of the City Engineer.

B. Installation and warranty of any approved substitution shall be contractor's responsibility. Any changes required for installation of any approved substitution must be made to satisfaction of the City without additional cost to the City. Approval by the City of substituted equipment and/or dimension drawings does not waive these requirements.

SS-90-01.5 Submittals

A. Prior to installation, the Contractor shall submit to the City Inspector two copies of manufacturers literature, receipts of sale, and laboratory analytical data for the following items:

1. Organic Amendments
2. Topsoil
3. Commercial Fertilizer
4. Mulch
5. Erosion Control Fabric
6. Plant Material
7. Hydroseeding Work Sheets

B. Prior to hydroseeding, the Contractor shall submit a one ounce sample of the certified seed mix and bill of lading for materials.

C. Refer to irrigation specifications for additional submittal requirements.

SS-90-01.6 Product Handling

A. Contractor shall furnish standard products in manufacturer's standard containers bearing original labels showing quantity, analysis, and name of manufacturer. All containers, bags, etc., shall remain on site until work is completed.

B. Contractor shall notify City Inspector 7 days prior to delivery of plant material and submit itemization of plants in each delivery.

SS-90-01.7 Clean Up

A. Upon completion of each phase of work under this section, the Contractor shall clean up and remove from the area all unused materials and debris resulting from the performance of the work. The site shall be left in a broom-clean condition, and wash down all paved areas within the project site. Leave walks in a clean and safe condition.

SS-90.02 PRODUCTS

SS-90-02.1 Plant Material

A. All plants shall be of the size, variety, age, and condition as shown on the drawings and as specified herein.

B. Quality -- Plants shall be in accordance with the California State Department of Agriculture's regulation for nursery inspections, rules, and grading. All plants shall have a normal habit of growth and shall be sound, healthy, vigorous, and free of insect infestations, plant diseases, sun scalds, fresh abrasions of the bark, or other objectionable disfigurements. Tree trunk shall be sturdy and well "hardened" off. All plants shall have normally well-developed branch structure, and vigorous and fibrous root systems which are not root or pot bound. In the event of disagreement as to condition of root system, the root condition of the plants furnished by the Contractor in containers will be determined by removal of earth from the roots of not less than two plants of each species or variety. Where container grown plants are from several sources, the roots of not less than two plants of each species or variety from each source will be inspected. In case the sample plants inspected are found to be defective, the City reserves the right to reject the entire lot or lots of plants represented by the defective samples.

C. Plants shall be measured when branches are in their normal upright position. Height and spread dimensions specified refer to main body of plant and not branch tip to tip. Caliper measurement shall be taken at a point on the trunk 3 inches above natural ground line. If a range of size is given, no plant shall be less than the minimum size and not less than 40% of the plants shall be as large as the maximum size specified. The measurements specified are the minimum size acceptable and are the measurements after pruning, where pruning is required. Plants that meet the measurements specified, but do not posses a normal balance between height and spread, shall be rejected.

D. Plants shall be nursery grown in accordance with good horticultural practices under climatic conditions similar to those of project for at least two years unless otherwise specifically authorized by the City. All plants shall be heavy, symmetrical, tightly knit, so trained or favored in development and appearance as to be in form, number of branches, compactness and symmetry.

E. All plants shall meet the specifications of federal, state, and county laws requiring inspection for plant diseases and insect control. All inspection certificates required by law shall accompany each shipment, invoice, or order for stock; and when such plants arrive at the site, the certificates shall be delivered to the City Inspector.

F. Plants shall be true to species and variety in accordance with the American Association of Nurseryman Standards. Each group of plant materials delivered to the site shall be clearly labeled as to species and variety and nursery source.

G. Plants shall not be pruned before delivery. Trees which have damaged to crooked leaders, or multiple leaders, unless specified, will be rejected. Trees with abrasions of the bark, sun scalds, disfiguring knots, or fresh cuts of limbs over 3/4 inch which have not completely calloused will be rejected.

H. Plants not conforming to the requirements herein specified will be considered defective and such plants, whether in place or not, will be marked as rejected. Contractor shall immediately remove rejected plants from the premises and replace with new acceptable plants at his expense.

I. There shall be no substitutions of plants or sizes for those listed in the accompanying plans except with approval of the City Engineer.

J. Container stock shall have grown in the containers in which delivered for at least six months, but not over two years. Samples shall show no root-bound conditions. Container plants that have cracked or broken balls of earth when taken from container shall be planted except upon special approval by the City Inspector.

SS-90-02.2 Topsoil

A. Soil to be used as planting medium for the project shall be fertile, well-drained, of uniform quality, free of stones over 1 inch diameter, sticks, oils, chemicals, plaster, concrete, and other deleterious materials.

B. Imported topsoil shall be from sources approved by the City Inspector which meet the standards specified above.

C. The developer shall provide for the testing of proposed topsoil by a certified agronomic soils testing laboratory and shall submit soils analysis, recommendations and topsoils sample to the City Inspector for approval. Import topsoil shall not be delivered to the site prior to City approval. The City may request additional testing of imported topsoil at the site to determine conformance to the approved report. Rejected topsoil shall be removed at no cost to the City.

D. If stockpiling is requested, locations and amounts of stockpile shall be approved by the City Inspector.

SS-90-02.3 Soil Amendments and Fertilizer

A. Provide standard, approved and first-grade quality materials, in prime condition when installed and accepted. Deliver commercially processed and packaged material and manufacturer's guaranteed analysis. Supply a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance, or bearing the manufacturer's guaranteed analysis to the City Inspector.

B. Organic Amendments -- Organic amendments shall be derived from redwood or fir, be granular in nature, stabilized with nitrogen, and having the following properties:

1. Organic content - Minimum 90 percent by weight.

2. Nitrogen content - 0.5 percent based on dry weight for redwood sawdust, 0.7 percent based on dry weight for fir sawdust, 1.0 percent based on dry weight for fir bark. Note: Pine sawdust is not acceptable.

3. Particle size - 95 to 100 percent passing 2.33 mm standard sieve.

4. Salinity - Ensure that saturation extract conductivity does not exceed 3.35 millimhos per centimeter at 25 degrees C. as determined by saturation extract method.

5. Iron content - Minimum 0.08 percent dilute acid soluble Fe on dry weight basis.

6. Ash - 0 to 6 percent (dry weight).

C. Soil Amendments

1. Soil sulfur - Agricultural grade sulfur containing minimum of 99 percent sulfur (expressed as elemental).

2. Iron sulfate - 20 percent iron (expressed as metallic iron), derived from ferric and ferrous sulphate, 10 percent sulfur (expressed as elemental).

3. Calcium carbonate - 95 percent lime as derived from oyster shells.

4. Gypsum - Agricultural grade product containing 90 percent minimum calcium sulphate.

5. Dolomite lime - Agricultural grade mineral soils conditioner containing 35 percent minimum magnesium carbonate and 49 percent minimum calcium carbonate, 100 passing No. 65 sieve; provide Kaiser Dolomite 65 AG or other approved.

6. Fine sand - Clean, natural fine sand free from deleterious material, weed seed, clay balls, or rock with minimum of 95 percent passing a No. 4 sieve and maximum of 10 percent passing a No. 100 sieve.

D. Fertilizer

1. Fertilizer shall be pelleted or granular form consisting of the percentage by weight of nitrogen, phosphoric acid and potash as recommended by the approved agronomic report. Planting fertilizer shall be mixed by the commercial fertilizer supplier.

2. Plant tablets shall be slow release type with potential acidity of not more than 5 percent by weight.

SS-90-02.4 Pesticides and Herbicides

A. All chemicals used for weed control shall be registered by the State of California Department of Food and Agriculture and the Environmental Protection Agency with registration identification on the label. Label shall be at job site at all times.

B. All chemicals shall be applied as per registered label instruction and manufacturer's recommendations.

C. Chemicals requiring a licensed applicator must be applied by persons registered with the Placer County Department of Agriculture's Commissioner's Office as possessing a current, valid qualified pest control applicator's license.

D. The use of any restricted materials is forbidden unless special use permit is obtained from the Placer County Department of Agriculture.

E. The nonselective, translocative herbicide shall be "Roundup" or approved equal.

SS-90-02.5 Erosion Control Material

A. Jute Netting

1. Matting - Erosion control matting shall be of open weave, furnished in rolled strips as follows: Length - approximately 225 feet; width - 48 inches plus or minus one inch, with approximate one-tenth-inch-square mesh. Fabric shall average four pounds per linear foot. The erosion control matting shall be manufactured from loosely twisted jute yarn not varying in thickness by more than one-half of its normal

diameter, equal in quality to "Ludlow Soil Saver #48" or approved equal. Color Green (fire retardant).

2. Staples - Staples for erosion control shall be pre-manufactured 11 gauge steel wire bent in a U shape six inches minimum length and one-inch-wide.

B. Excelsior Blanket

1. The excelsior blanket shall consist of a machine-produced mat of curled wood excelsior of 80 percent, 6 inch or longer fiber length with consistent thickness, and the fiber evenly distributed over the entire area of the blanket. Fiber dimensions shall be 0.21 inch x 0.42 inch. Average weight per square yard to be 0.08 pound at time of manufacture.

2. The top side of each blanket shall be covered with a biodegradable extruded mesh. The blanket shall be made smolder-resistant without the use of chemical additives.

3. The staples shall be made of wire, .091 inch in diameter or greater, "U" shaped with legs 6 inches in length and a 1 inch crown. Size and gauge of staples used may vary with soil conditions and shall be reviewed by the City's representative.

4. Excelsior blanket shall be as manufactured by American Excelsior Company, Pico Rivera, California 90660, or approved equal.

SS-90-02.6 Seed

A. Seed shall be of the species and variety specified on the plans. Wet, moldy, or otherwise damaged seed shall not be acceptable.

B. The contractor shall have all seed to be used on the project officially tested by the California State Department of Agriculture and shall submit to the City Inspector prior to hydroseeding, official seed labels, and a signed statement from the Agricultural Department certifying that the seed meets the analysis shown on the labels. Unlabeled collected seed shall be tested and analyzed and the result furnished in lieu of the seed labels.

C. The seed quantities listed shall be on the basis of pure live seed.

$$\text{Total Seed Material} = \frac{\text{Pounds pure, live seed required}}{\text{Percent purity x percent germination}}$$

SS-90-02.7 Turf

A. General -- Turf shall be as shown on the drawings and as specified herein. Turf shall be 100 percent turf type tall fescue variety. Other tall fescue varieties may be considered for

use subject to approval by the City Engineer. Fescue turf shall be installed by hydroseeding.

B. Sod

1. Sod shall be fully mature, well maintained, of the grass variety specified, free of all other grasses or weeds, and shall have been harvested within 24 hours prior to delivery.

2. All sod shall be cut evenly with a conventional sod cutting machine to a thickness of 1 1/2 inches. Sod mat size shall be between 3/8 and 5/8 inches.

3. All sod shall have been treated with appropriate preventative fungicide and insecticides within one week prior to shipment.

4. All sod shall have been inspected by the California Department of Food and Agriculture to ensure conformance with the standards set by the State of California.

C. Stolons

1. Stolons shall be supplied from an approved source or grower and shall be of the grass variety specified, free of weeds, disease, and insect infestations.

SS-90-02.8 Hydromulch

A. Hydromulch material shall be produced from 100% wood cellulose fiber and shall be of such character that it will disperse into a uniform slurry when mixed with water. The fiber shall be of such character that when used in the applied mixture, an absorptive or porus mat, but not a membranae, will result on the surface of the ground. Materials which inhibit germination or growth shall not be present in the mixture.

B. Commercial fertilizers and soil amendments for hydromulch slurry shall be as recommended by the approved agronomic soils report for product and application rates. Products shall conform to specifications herein.

C. Soil and Fiber Mulch Binders shall be Az-Tac, Terra Tac 3, Ecology Control M-Binder, or approved equal.

D. Chemical Germinating Additives shall be Catalytic Pre-Emerge or approved equal.

E. Moisture Retention Additives shall be Humectant HL-80 or approved equal.

F. Urea Formaldehyde shall be Pelletized fertilizer for hydromulch slurry.

SS-90-02.9 Staking Materials

A. Tree stakes shall be straight grained lodgepole pine free of knots, splits, checks, or disfigurements. Stakes shall be 2 inch minimum nominal size in diameter and 10 feet in length, or as required by tree height. Stakes shall have a 10 inch tapered driving point and chamfered top and shall be treated with copper napthanate or pentachlorophenol to heartwood.

B. Supports for double staking shall be Steel Twist Brace as manufactured by V.I.T. Company Inc., Huntington Beach, or approved equal. Supports for single staking shall be a 10 gauge minimum steel wire tie completely covered by a new rubber hose.

SS-90-02.10 Guying Materials

A. Guy wire shall be zinc coated iron, 10 gauge minimum, and solid core.

B. Turnbuckles shall be galvanized or dip-painted and weldless.

C. Cable clamps shall be galvanized or copper, size as required.

D. Plastic guy covers shall be white class 200 PVC 1/2 inch in diameter and shall be 6 feet in length or provide 90 percent cover of guy wire.

E. Guying collar shall be 1/2 inch diameter new 2-ply garden hose (reinforced rubber). The collar shall completely cover the wire and loop around tree limbs. It shall be long enough to permit tree movement within the loop.

F. Deadman shall be Steel Rapid Anchors as manufactured by V.I.T. Company Inc. or approved equal. Size of anchor shall be per manufacturer's recommendations.

SS-90-02.11 Trunk Protectors

Trees within turf areas shall be installed with trunk protection devices. Trunk protectors shall be Arbor Gard as manufactured by Deep Root Corp., Westminster, CA, or approved equal.

SS-90-02.12 Root Control Barriers

A. Root control barriers shall be provided as indicated on the plans, as required in the tree planting guideline, and as specified herein.

B. Barriers shall be constructed of prefabricated high impact polystyrene or polyethylene as manufactured by a Deep Root Corp., Westminster, CA, or approved equal.

C. Barriers shall be a minimum of 12 inch depth when installed adjacent to sidewalk, 24 inch depth when installed adjacent to curb. Barriers may be linear or a box, according to the approved plan.

SS-90-02.13 Redwood Headerboard

A. Provide 2 inch by 4 inch rough construction heart redwood for all headerboards.

B. Provide 2 inch by 4 inch by 18 inch redwood stakes at intervals of not more than five feet.

C. Make splices with 1 inch by 4 inch pieces no less than 24 inches long.

D. On sharp turns and curves four 1/2 inch by 4 inch laminate boards, or two 1 inch by 4 inch laminated boards may be permitted.

Nail stakes and splices with galvanized common nails. Nail as required for solid installation.

SS-90.03 EXECUTION OF WORK

SS-90-03.1 General

A. Perform actual planting only during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice.

B. Confirm location and depth of underground utilities and obstructions. If underground structures or utility lines are encountered in the excavation of planting areas, other locations for planting shall be approved by the City Engineer.

C. All planting layout and staking shall be accurately made in accordance with the plans. All trees shall be a minimum of 3 feet from City maintenance limit line.

D. Plant locations shall be approved by the City Inspector prior to excavation and are subject to spacing and distances required by City standards.

SS-90-03.2 Finish Grading

A. All grading and mounding with the exception of final planting shall be completed prior to soil preparation.

B. Planting areas shall be free of all weeds (plants not specified in planting areas), stones, stumps, roots, or other debris 1 inch in diameter and greater.

C. Soil shall be graded to a smooth and even surface conforming to required finish grade. Finish grade adjacent to walks, paved areas, curbs, manholes, cleanouts, valve boxes, and similar features shall be 1 inch below the surface in turf and 2 inches below in

groundcover/shrub areas. Grades between such features shall be carefully sustained and blended to eliminate abrupt changes.

D. Planting areas to receive sod shall sustain a finish grade of such depth that the top of installed sod shall be flush with finish surfaces (walks, paved areas, etc.).

E. Contractor shall allow for soil amendments when establishing subgrade elevations. All planting areas shall have a finish grade conforming to approved plans and specifications after full settlement has occurred.

F. All planting areas adjacent to buildings shall be graded to drain away from the building at a minimum of 2% slope, for a minimum of 5 feet horizontal distance.

SS-90-03.3 Soil Preparation

A. In all planting areas with gradients less than 2:1, a layer of soil amendments shall be uniformly spread and thoroughly cultivated by means of mechanical tiller into the top 6 inches of soil, or as recommended by the approved agronomic soils report, so that the soil shall be loose, friable, and free from rocks, sticks, and other objects undesirable to planting.

B. Planting areas with slopes 2:1 and steeper shall not be soil prepared unless directed by City Engineer.

C. Contractor shall not work under muddy conditions.

D. Should 30 calendar days elapse between completion of soil preparation and commencement of planting, all areas shall be prepared again.

SS-90-03.4 Weed Abatement

A. If live perennial weeds exist on site at beginning of work, spray with a nonselective translocative herbicide as recommended and applied by an approved licensed pest control advisor and applicator. Leave sprayed plants intact for a least 15 days. Clean and remove these existing weeds by mowing or grubbing off all plant parts at least 1/4 inch below the surface of the soil.

B. Upon completion of soil preparation and planting of all specimen trees, begin weed abatement program by applying 200 pounds of a commercial fertilizer 21-0-0 per acre, per manufacturer's instructions.

C. Water all areas four (4) times daily for twenty-one (21) consecutive days and until weed seeds have germinated. Cease watering for three (3) days. Spray a nonselective translocative herbicide to eradicate the germinated weeds. Translocation shall be 7-10 days or an approved alternate time period.

D. Allow herbicide to kill all weeds. Rake or hoe off all dead weeds to a minimum depth of 1/4 inch below the surface of the soil.

E. If perennial weeds or grasses still exist, rewater four (4) times daily for fourteen (14) consecutive days, until new growth appears. Reapply herbicide. Remove weeds after herbicide has had sufficient time to kill.

SS-90-03.5 Planting of Trees, Shrubs, and Vines

A. Excavation - Planting holes shall have irregular, nonglazed sides, and shall be a minimum of twice the diameter, and one and one-half times the depth of the original plant container.

B. Planting procedure for container grown material.

1. Backfill plant pit with well-tilled on-site soil without amending to the depth of the rootball. Water thoroughly and compact backfill in such a manner so that after settling, the crown of the plant stem is one inch above adjacent grade. Center plant in pit.

2. Uniformly blend amended backfill at a centralized location in minimum (1) cubic yard lots. Backfill amendments shall be as indicated on the approved agronomic soils report. Mixing in plant pits or beds will not be permitted. Make available for inspection, all delivery slips and analytical data from approved laboratories for specified organic amendments.

3. Backfill remainder of plant pit around the rootball with amended backfill. Firm down, eliminating air pockets. Do not pack. Form a shallow basin around the plant to hold enough water to saturate the rootball and backfill.

4. Plant tablets shall be required for all tree, shrub, and vine plantings. Plant tablets shall be placed from 1 to 3 inches below the finish surface within 3 inches of the rootball. Application rate and nutrients shall be per the manufacturer's recommendation.

5. Immediately after planting, apply water to each tree and shrub by means of a hose. Apply water in a moderate stream in the planting hole until the material about the roots is completely saturated from the bottom of the hole to the top of the ground. Add additional amended backfill material as necessary to correct any settlement around rootball. Apply water in sufficient quantities and as often as seasonal conditions require to keep the plant areas moist at all times, well below the root system of grass and plants.

C. Planting procedures for field grown material.

1. Plant in accordance with the above specification; however, do not use nitrogen stabilized organic amendment in the backfill mix.

S-90-03.6Groundcovers

A. Groundcover plants shall not be allowed to dry out before or while being planted. Roots shall not be exposed to the air except while actually being placed in the ground. Wilted plants will not be accepted.

B. Plant groundcovers in straight rows evenly spaced, and at intervals required by drawings, use triangular spacing.

C. Plant each rooted plant with its proportionate amount of flat soil. Immediately water after planting until entire area is soaked to full depth of each hole.

D. Protect plants from damage and trampling at all times.

E. Topdress all goundcover and shrub areas with 1/2 inch layer of approved bark mulch.

SS-90-03.7 Turf

A. General

1. After soil preparation, establishment of final grades, and weed abatement, carefully smooth all surfaces to be planted, roll area to expose soil depressions or surface irregularities. Regrade as required. Prior to planting, the soil shall be loose and friable to receive turf.

2. Immediately prior to planting, evenly broadcast a preplant commercial fertilizer as recommended in the approved agronomic soils report. Rake in lightly. Avoid planting of turf on dry soil.

3. Turf shall be planted be seeding, hydroseeding, stolonizing, or sodding as indicated on the plans.

B. Seeded Turf

1. Seed - A satisfactory method of sowing shall be employed, using an approved mechanical power drawn driller seeder, mechanical hand seeder, or other approved equipment. The rate of application of seed will be specified on the plans.

2. The seed shall be covered by means of a wire drag, spiked toothed harrow, cultipacker or other approved equipment weighing 60 to 90 pounds per linear foot of

roller. Final rolling shall be at right angles to slopes to prevent erosion wherever possible.

C. Sodded Turf

1. Lay first strip of sod slabs along a straight line (using a string in irregular areas). Butt joints tightly; do not overlap edges. On second strip, stagger joints much as in laying masonry. Use a sharp knife to cut sod to fit curves, edges, sprinkler heads. Lay sod in one direction only.

2. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly, preventing drying. Continue to lay sod and to water until installation is complete.

3. After laying sod, roll lightly to eliminate irregularities and to form good contact between sod and soil. Avoid heavy roller or excessive initial watering which may cause roller marks.

4. Water thoroughly the completed lawn surface. Soil should be moistened at least 8 inches deep. Repeat watering at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.

5. All unsuccessfully established sod shall be removed and new sod laid to the satisfaction of the City Inspector.

D. Stolonized Turf

1. A satisfactory method of spreading stolons shall be employed using a mechanical or power drawn stolon planter, or other approved equipment.

2. Soil shall be rototilled so that the soil is loose and free of rocks and debris prior to planting.

3. The rate of application of stolons shall be specified on the plans.

4. Apply stolons during warm seasons only, late spring to early fall.

5. Water thoroughly the completed installation immediately after stolon application.

6. Maintain water saturation of the soil for the duration of the germination period to ensure proper establishment.

7. Reapply stolon application to all areas where the turf is thin or bare after the germination period.

SS-90-03.8 Hydroseeding

A. After soil preparation, establishment of final grades and weed abatement, loosen surface 2 inches of soil by harrow or rototiller and float level, then irrigate prior to planting.

B. Install trees and shrubs and groundcover if they occur in hydroseeded area prior to hydroseeding.

C. An approved hydromulch company shall apply hydroseed in a form of a slurry consisting of wood cellulose fiber, seed, chemical additives, commercial fertilizer and water. When hydraulically sprayed on soil, ensure that hydromulch forms a blotter-like groundcover impregnated uniformly with seed and fertilizer and allows the absorption of moisture and rainfall to percolate to the underlying soil.

D. Begin spraying immediately after tank has been filled with the hydromulch mixture specified. Spray with a uniform visible coat by using the green color of the mulch as a guide. Apply the slurry in a sweeping motion, in an arched stream so as to fall like rain allowing the wood fibers to build on each other until good coat is achieved and the material is spread at required rates.

E. After application of hydromulch, wash excess material from previously planted materials and architectural features. Avoid washing or eroding mulch materials.

F. The slurry shall not be sprayed on undesignated areas. Any slurry spilled or sprayed into areas other than those designated to receive spray shall be cleaned up at the Contractor's expense, to the satisfaction of the City.

G. After completion of hydroseeding, irrigate each area. Irrigate during the germination period of the seed to keep the hydromulch moist at all times without creating run-off, erosion or oversaturation. Irrigation system is not to be used until it is tested and fully operational.

H. Slurry not used within two hours after delivery to the site shall be removed from the site. Daily worksheets shall be filled out by the nozzleman, with the following information: Seed type and amount, fertilizer analysis and amount, mulch type and amount, seeding additive type and amount, number of loads and amount of water, area covered, and equipment used, capacity and license number and deliver to the City Inspector.

I. All bare or unsuccessfully germinated areas shall be reseeded within 10 days. Areas to receive reseeding shall be determined by the City. The contractor shall be responsible for all seeded areas until an acceptable stand of hydroseeded material is realized and approved by the City Inspector.

SS-90-03.9 Erosion Control

A. General - Erosion control measures shall be required for all cut slopes 2:1 and steeper, 5 feet or more on height and fill slopes 2:1 and steeper, 3 feet or more in height. Erosion control measures shall consist of the installation of excelsior blanket, jute netting, hydroseed, groundcover, shrubs, or a combination of methods as approved by the City Engineer.

B. Jute Netting

1. Surface of the slopes shall be uniformly smooth and even with all debris and rocks raked out. The soil shall be sufficiently moist to permit the firm laying of erosion control matting and to prevent sloughing of topsoil.

2. The matting shall be stapled in place and firmly embedded by means of tamping or rolling, as approved by the City to ensure that the matting is in contact with the soil and that no erosion can take place under the matting.

3. The erosion control matting shall be laid with the direction of flow of surface drainage, and in accordance with the manufacturer's recommendations. The matting shall be cut to provide a visually pleasing slope.

C. Excelsior Blanket

1. The area to be covered with excelsior blanket shall be prepared, fertilized, and seeded before the blanket is applied.

2. When the blanket is unrolled, the matting shall be on top and the fibers in contact with the soil over the entire area.

3. On slopes, apply the blankets vertically to the slope. Butt ends and sides snugly and staple.

4. Drive the staples vertically into the ground, space approximately 2 lineal yards apart, on each side, and one row in the center alternately spaced between each side (60 staples on each blanket). Use a common row of staples on adjoining blankets.

SS-91 LANDSCAPE MAINTENANCE

SS-91-01 GENERAL

SS-91-01.1 Scope of Work -- The work required is indicated on the drawings and includes but is not limited to the following:

A. Maintenance of the site, planting, irrigation.

B. Guarantees and replacement.

SS-91-01.2 Tree Replacement -- Any tree shown on the approved plan which is dead or not in a satisfactory growth condition during a one-year period from date of acceptance, shall be removed from the site and replaced within 14 calendar days of notification. Failure to comply will result in appropriate action by the City to assure completion. These and any trees which are missing shall be replaced by the contractor at no expense to the City, with the same variety and size as originally designated on the plans.

SS-91-02 MAINTENANCE PERIOD -- The entire project shall be maintained by the Contractor for a period of not less than 120 days from the date of completion and written notice from the City Inspector.

SS-91-02.1 General

A. During the maintenance period the contractor shall provide all watering, fertilizing, cultivating mulching, spraying, pruning, and mowing necessary to keep all plants and turf in a healthy, weed free growing condition and to keep the planted areas neat, edged, and attractive.

B. After planting and during the maintenance period, fertilizer shall be applied at the rate recommended by the approved agronomic soils report. In the event that ground cover, trees, or shrubs exhibit micronutrient deficiency symptoms, necessary corrective action shall be taken by the Contractor.

C. During the maintenance period, should the appearance of any plant indicate weakness, that plant or cutting shall be replaced immediately by the Contractor with a new healthy plant. Any trees or shrubs with damaged cambium shall be replaced immediately. At the end of the maintenance period, all plant materials shall be in a healthy, growing condition and spaced as indicated on the plans.

SS-91-03 MAINTENANCE OF PROJECT

SS-91-03.1 Trees

A. Prune trees to select and develop permanent scaffold branches that are smaller in diameter than the trunk or branch to which they are attached and which have a vertical spacing of from 18 to 48 inches and radial orientation so as not to overlay one another; to eliminate diseased or damaged growth; to eliminate narrow V-shaped branch forks that lack strength; to reduce toppling and wind damage by thinning out crowns to maintain growth within space limitation; to maintain a natural appearance; and to balance crown with roots.

B. Under no circumstances will stripping of lower branches (raising up) of young trees be permitted. Retain lower branches in tipped back or pinched condition with as much foliage as possible to promote caliper trunk (tapered trunk). Lower branches can be cut to the growth collar on the trunk only after the tree is able to stand erect without staking or other support.

C. Thin out evergreen trees and shape when necessary to prevent wind and storm damage. Do primary pruning of deciduous trees during dormant season. Prune damaged trees or those that constitute health or safety hazards at any time during the year as required.

D. "Stubbing" is not permitted.

SS-91-03.2 Shrubs

A. The objectives of shrub pruning are the same as for trees. Do not clip shrubs into balled or boxed forms unless such is required by the design. Make pruning cuts to lateral branches or buds. Stubbing will not be permitted.

B. Pinch prune as necessary to encourage new growth and to eliminate sucker growth. Old wilted flowers and dead foliage shall be pinched or cut off.

SS-91-03.3 Ground Cover

A. Apply approved pre-emergent herbicide to all broad leaf ground cover areas in accordance to manufacturers instructions.

B. Edge ground cover to keep in bounds; trim top growth as necessary to maintain an overall uniform appearance.

C. Replace dead and missing plants.

D. Remove all weeds including roots, and trash weekly.

SS-91-03.4 Turf

A. The maintenance of turf includes all work required to grow a healthy uniform turf of smooth and even texture and grade. All turf shall be mowed to a height recommended for the species at least once a week. Grass clippings shall be removed off-site. Maintenance height for tall fescue is 2 inches, Bermuda is 1 inch, unless otherwise specified. No more than 1/3 of turf height shall be removed at a mowing. All turf shall be trimmed around sprinklers, valve boxes and trees during entire maintenance period.

B. Control weed growth when necessary using selective herbicides.

SS-91-03.5 Irrigation

A. Contractor shall properly and completely maintain all irrigation systems, automatic and manual. A balanced watering program shall be maintained to ensure proper germination and establishment. Contractor shall be responsible for the irrigation system during periods of operation for the entire maintenance period.

B. All controllers are to have each station individually adjusted on a weekly basis. Systems shall be set considering the application rate each area is capable of receiving. The system shall operate on short intervals, with the cycle repeating at a later time to reduce run-off.

C. Maintain all valve boxes and controllers free of debris. Boxes shall remain locked at all times.

SS-91-03.6 Site Maintenance

A. All planted areas shall be kept neat and clean and free of all clippings, debris, and trash.

B. All subsurface drains shall be periodically flushed with clear water to avoid build up of silt and debris. Keep all drain inlets clear of leaves, trash, and other debris.

C. All paved areas shall be kept free of trash, debris, and silt.

D. The Contractor shall be responsible for the elimination of vertebrate pests determined by the City to be detrimental; and damaging to the area of development. Elimination shall be performed by safe, approved methods.

SS-91-03.7 Utilities

A. All utility costs incurred during the maintenance period shall be the responsibility of the contractor.