CITY OF VISALIA

ENGINEERING STANDARD SPECIFICATIONS

COMMUNITY DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

AUGUST 5, 2013

PREPARED BY:
CITY OF VISALIA
ENGINEERING DIVISION
315 E. ACEQUIA AVE.
VISALIA, CA 93291

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The City of Visalia Engineering Division has recently revised and updated this set of Engineering Standard Specifications. These Standard Specifications have been used as accepted standards for subdivisions, and other building, public works, and parks projects. These Standard Specifications and Engineering Improvement Standards will be considered for updates as practices and materials change, and these updates will occur on an as needed basis and will be approved by the City Engineer; these updates will be automatically incorporated as part of the whole Standard Specifications.

Approved by: _____ R.C.E. 76065
City Engineer

AUGUST 5, 2013

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TABLE OF CONTENTS

Page No.

STANDARD SPECIFICATIONS

Copies of the "City of Visalia Engineering Standard Specifications" may be obtained from the City of Visalia website at: http://www.ci.visalia.ca.us/depts/engineering/engineering_documents/default.asp or from City Hall East, 315 E. Acequia Ave., Visalia, California, 93291, for a nominal fee.

SECTION 1 GENERAL, DEFINITIONS, ABBREVIATIONS AND TERMS

1-1 General

Unless the context otherwise requires, wherever in these Standard Specifications and other Contract Documents the following terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as provided in this Section 1.

Reference to a particular section in these Standard Specifications is made by section number without denoting "of these Standard Specifications." Reference to standard specifications or standards of other agencies or organizations is so noted. See Section 4-8, "Incorporation of Referenced Specifications."

Where a location is not specified with the words "shown," "specified," or "described," interpret:

A. "Shown" as "shown on the plans."
B. "Specified" as "specified in the specifications."
C. "Described" as "described in the Contract." "Described" means "shown, specified, or both."

The specifications are expressed in U.S. customary units except where a referenced document uses the International System of Units as the standard.

These Standard Specifications and Contract Documents are meant to work in direct line with Sections 10-60, Section 73, and Sections 82-95 of the 2010 version of the State Standard Specifications, except as modified by these Standard Specifications and Contract Documents. For terms, specifications, and requirements appearing in these Standard Specifications and Contract Documents and the State Standard Specifications, these Standard Specifications and Contract Documents shall take precedence. Other sections of the State Standard Specifications are included by reference in these Standard Specifications and Contract Documents. In the event where items are not covered or specified in these Standard Specifications or Contract Documents, the State Standard Specification Sections listed above and State Standard Plans shall govern.

1-2 Abbreviations

Where used in these Standard Specifications and Contract Documents, the following abbreviations shall have the titles affixed thereto in the table below.

Abbreviations

Abbreviation	Meaning
AASHTO	American Association of State Highway and Transportation Officials
AB	aggregate base
AC	asphalt concrete
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
AS	aggregate subbase
ASTM	American Society for Testing and Materials
AWG	American Wire Gauge
AWS	American Welding Society[a]
AWWA	American Water Works Association
BBS	battery backup system
Cal/OSHA	California Division of Occupational Safety and Health Administration
CBC	California Building Code
CIP	cast in place
CMP	corrugated metal pipe
CMU	concrete masonry unit
DBE	Disadvantaged Business Enterprise
F	Fahrenheit
FHWA	Federal Highway Administration
HMA	hot mix asphalt
MSDS	material safety data sheet
MUTCD	*California Manual on Uniform Traffic Control Devices*
NPDES	National Pollutant Discharge Elimination System
PCC	portland cement concrete
PLAC	permit, license, agreement, certification, or any combination of these
PG	performance grade
PVC	Polyvinyl Chloride
RAP	reclaimed asphalt pavement
RCP	reinforced concrete pipe
RFI	request for information
RWQCB	Regional Water Quality Control Board
SCM	Supplementary Cementitious Material
SWPPP	storm water pollution prevention plan
TV	target value
UL	Underwriters Laboratories, Inc
WPCP	water pollution control program

[a]Interpret a reference to AWS as a reference to AWS, ANSI/AWS, or AASHTO/AWS

Bid Item List Abbreviations

Abbreviation	Meaning
ACRE	acre
CF	cubic foot
CY	cubic yard
EA	each
(F)	final pay item
GAL	gallon
H	hour
LB	pound
LF	linear foot
LS	lump sum
STA	station (100 feet)
SF	square foot
SQYD	square yard
TON	2,000 pounds
WDAY	working day

1-3 Definitions and Terms

The definitions and terms as used in these Standard Specifications and Contract Documents shall be interpreted and understood as established in this Section 1:

1-3.1 Acceptance

The formal acceptance by the City Council of an entire contract, which has been completed in all parts and requirements in accordance with the Contract Documents and any modifications thereof, previously approved. The "Notice of Completion" shall mean the document recorded with the Tulare County Recorder indicating the formal acceptance of a specified Contract.

1-3.2 Addenda

Written interpretations or revisions to any of the Contract Documents issued by the City before the bid opening.

1-3.3 Base

A layer of specified material of planned thickness placed immediately below the pavement or surfacing.

1-3.4 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. See Section "Subgrade."

1-3.5 Bid

The proposal submitted by the Contractor in response to the invitation to bid made by the City.

1-3.6 Bid Book or Bid Document

These terms shall have the same meaning as Construction Specifications.

1-3.7 Bidder

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

1-3.8 California Manual On Uniform Traffic Control Devices (California MUTCD)

The most current adopted version of The California Manual on Uniform Traffic Control Devices for streets and highways, and amendments thereto, hereinafter referred to as California MUTCD or CA MUTCD. Supersedes the MUTCD and MUTCD California Supplement.

1-3.9 Certificate of Compliance

Certificate stating the material complies with the Contract Documents.

1-3.10 Certified Testing Laboratory

An established laboratory properly certified and approved by the Community Development Director to test materials, specimens, or work involved in the Standard Specifications and Contract Documents, and as specified herein.

The materials laboratory shall be under the responsible management of a California Registered Engineer with experience in sampling, inspection and testing of construction materials. The Engineer shall certify the results of all tests performed by laboratory personnel under the Engineer's supervision. The materials laboratory shall contain certified test equipment capable of performing the tests required.

The materials laboratory used shall provide documentation that the laboratory complies with the following procedures:

A. Correlation Testing Program

The materials laboratory shall be a participant in one or more of the following testing programs:

1. AASHTO Materials Reference Laboratory (AMRL)
2. Cement and Concrete Reference Laboratory (CCRL)
3. Caltrans' Reference Samples Program (RSP)

B. Certification of Personnel

The materials laboratory shall employ personnel who are certified by one or more of the following:

1. Caltrans District Materials Engineer
2. Nationally recognized non-Caltrans organizations such as the American Concrete Institute, Asphalt Institue, National Institute of Certification of Engineering Technologies, etc.
3. Other recognized organizations approved by the State of California and/or Recognized by local governments or private associations.

C. Laboratory and Testing Equipment

The materials laboratory shall only use laboratory and testing equipment that is in good working order. All such equipment shall be calibrated at least once each year. All testing equipment must be calibrated by impartial means using devices of accuracy traceable to the National Institute of Standards and Technology. A decal shall be firmly affixed to each piece of equipment showing the date of the last calibration.

1-3.11 Change Order

An order approved by the City of Visalia Change Order Committee and issued to the Contractor amending the Contract Documents.

1-3.12 City (Owner)

The City of Visalia, California, acting as a municipal corporation and/or a trustee for improvement districts within the City. The term "Owner" and "City" shall have the same meaning.

1-3.13 City Clerk

The legally authorized City Clerk of the City of Visalia, California.

1-3.14 City Council

The City Council of the City of Visalia, California.

1-3.15 City Specifications

The City of Visalia Engineering Standard Specifications and other specifications included in them by virtue of reference, as amended from time to time.

1-3.16 City Standard Drawings or City Standard Plans

The City of Visalia Engineering Design & Improvement Standards, as amended from time to time.

1-3.17 Completion

A. For purposes of a Notice of Completion and Civil Code sections 9200-9208, "completion" means the date of acceptance of the Work as complete by the City Council. The Notice of Completion shall comply with the requirements of Civil Code sections 8100-8118.

B. For purposes of retention release under Public Contract Code section 7107, "completion" means any of the following:

1. The occupation, beneficial use, and enjoyment of a work of improvement, excluding any operation only for testing, startup, or commissioning, by the public agency, or its agent, accompanied by cessation of labor on the work of improvement.
2. The acceptance by the public agency, or its agent, of the work of improvement.
3. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 100 days or more, due to factors beyond the control of the contractor.
4. After the commencement of a work of improvement, a cessation of labor on the work of improvement for a continuous period of 30 days or more, if the public agency files for record a notice of cessation or a notice of completion.

C. For all other purposes (including but not limited to assessment of liquidated damages), "completion" means the point where Contractor has fully and correctly performed all Work in all parts and requirements in accordance with the Plans, Specifications and the Contract Documents, a Final Inspection has been made, all corrective and punch list Work has been performed, all improvements and equipment are in a fully functioning condition, and the Engineer has certified that the Work is ready for acceptance by the City Council. "Completion" does not mean substantial completion or any other form of partial or insufficient performance of the Work.

1-3.18 Contract or Contract Documents

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 or Contract Documents shall include the Contract Agreement, Notice to Contractors, Bid Proposal, Subcontractors List, Plans, the Standard Specifications by virtue of reference, the Construction Specifications, Special Provisions, Description of Bid Items, State & Federal Funding Requirements, Appendices, Contract Bonds, Addenda, documents incorporated by reference, Permits, attached exhibits and documents, and 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.

1-3.19 Construction Specifications or Contract Specifications

The booklet containing the Notice to Contractors, Bid Proposal, Subcontractors List, Bidder's Bond, Standard Specifications by virtue of reference, Special Provisions, Description of Bid Items, State & Federal Funding Requirements, Appendices, documents incorporated by reference, and any other exhibits and documents which may be added to the booklet.

1-3.20 Contractor

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

1-3.21 Days

Unless otherwise specified in these Standard Specifications or the Contract Documents, "days" mean calendar days.

1-3.22 Divided Roadway

A roadway with separated traveled ways for traffic, generally in opposite directions.

1-3.23 Encroachment

Any structure or object of any kind or character placed, without the authority of law, either in, under, or over any City right of way. An encroachment can include, but not be limited to, any tower, pole, pole line, pipe, pipeline, driveway, fence, stand, private roadway, billboard or sign.

Encroachments can also include special events conducted in or on City rights of way, such as street festivals, sidewalk sales, community-sponsored events or activities, or community-approved activities. See "Permit."

Encroachments also include any construction activities in or on City rights of way or other City property.

1-3.24 Engineer

The Engineer of the City of Visalia, California, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.

1-3.25 Engineer's Estimate

The list of estimated quantities of work to be performed as contained in the Bid Proposal Form.

1-3.26 Engineer of Record or Design Engineer

The Engineer in responsible charge of designing and engineering the Plans and Construction Specifications.

1-3.27 Extra Work

Any obligations, construction, or service outside the scope of the contract.

1-3.28 Final Pay Item

See Section 9-3 "Final Pay Items" for a full description.

1-3.29 Finish Grade

The elevation or slope shown on the plans assigned to the design finished surface of an improvement, including earthwork which will receive no paving or other surfacing, after all work on the improvement has been completed.

1-3.30 Grading Plane

The surface of the basement material (subgrade) upon which the lowest layer of subbase, base, pavement, surfacing or other specified layer is placed.

1-3.31 Inspector

A duly authorized agent of the Engineer.

1-3.32 Laboratory or Testing Laboratory

See "Certified Testing Laboratory".

1-3.33 Legal Holidays

Those days designated as City holidays by the Visalia City Council in observance of which City offices are closed.

1-3.34 Line and Grade

The term used to describe the horizontal and vertical lines, elevations and slopes shown on the plans to which all improvements and earthwork are to be constructed.

1-3.35 Liquidated Damages

The amount prescribed in the Special Provisions to be paid to the City or to be deducted from any payments due or to become due the Contractor for each day's delay in completing the whole or any specified portion of the work beyond the time allowed in the Contract Documents.

1-3.36 Median

That portion of a divided roadway separating the traveled ways for traffic in opposite directions including inside shoulders, if any. Medians may be raised or un-raised, paved or unpaved.

1-3.37 Non-Public Work or Non-Public Project

Any improvement being completed by developers, utility companies, other agencies, or any other individual, group, business, or entity within the City of Visalia street right of way or on other City of Visalia property that is not being funded and managed by the City as a public project.

1-3.38 Notice of Award

The document issued to the Contractor along with the official Contract Documents package after the Contract award is issued by the Visalia City Council.

1-3.39 Notice to Proceed

The document issued to the Contractor, after all Contract Documents have been signed and pre-construction contract requirements have been met, authorizing the Contractor to start construction.

1-3.40 Pavement

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

1-3.41 Permit

As used in these Standard Specifications, the document issued by a jurisdictional agency specifying the terms and conditions under which the permittee is authorized to perform certain work typically associated with a Contract awarded by the City. Permits may be issued by one or more agencies which have jurisdiction by law or by ownership over various aspects of the work. Permits may take the form of providing authorization to perform general roadwork, to install, construct, or repair certain encroachments, or govern such things as air pollution and storm water pollution prevention. The term "Encroachment Permit" describes the permit issued by the City Engineering Division and does not apply to Building Permits issued by the City Building Division. See "Encroachment."

1-3.42 Permittee

The person or persons, partnership or corporation, private or public, who has obtained a permit from the City or other jurisdictional agency and who has agreed to do work encompassed by said permit in conformance with the requirements thereof.

1-3.43 Plans

The official Construction Plans which show the location, character, dimensions and details of the work to be performed. Standard Drawings (sometimes referred to as Standard Plans), profiles, typical cross sections, working drawings and supplemental drawings, or reproductions thereof, approved by the Engineer, are to be considered as a part of the Plans. As used in this definition, the term Standard Drawings refers to the City of Visalia Engineering Design & Improvement Standards.

1-3.44 Private Developer

An individual or group proposing to subdivide or improve land within the City and constructing or causing to be constructed improvements to be accepted by the City.

1-3.45 Proposal

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

1-3.46 Proposal Form (Also referred to as Bid Proposal)

The approved document upon which the City requires formal bids be prepared and submitted for the work.

1-3.47 Proposal Guaranty

The cash, cashier's check, certified check or bidder's bond accompanying the proposal submitted by the bidder, as a guarantee that the bidder will enter into a contract with the City for the performance of the work if the contract is awarded to the bidder.

1-3.48 Public Work or Public Project

Any improvement being funded and managed by the City of Visalia.

1-3.49 Right of Way

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

1-3.50 Roadbed

The roadbed is that area upon which a traveled surface will be installed, generally between curbs delineating the edges of the traveled way. The roadbed rises in elevation as each increment or layer of subbase, base, surfacing or pavement is placed.

1-3.51 Roadway

That portion of the right of way included between the outside lines of sidewalks, or curbs, slopes, ditches, or channels, including all the appertaining structures, and other features necessary for proper drainage and protection.

1-3.52 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. Shoulders may be paved or unpaved.

1-3.53 Special Provisions

The Special Provisions and other specifications included in them by virtue of reference.

1-3.54 Specifications

Where used, the term “Specifications” without modifier shall mean collectively these Construction Specifications and the Standard Specifications, embodying all the applicable specification documents therein.

1-3.55 Standard Drawings or Standard Plans

The City of Visalia Engineering Design & Improvement Standards, as amended from time to time.

1-3.56 Standard Specifications

The City of Visalia Engineering Standard Specifications and other specifications included in them by virtue of reference, as amended from time to time.

1-3.57 State of California Standard Specifications

The 2010 version of the Standard Specifications issued by the Department of Transportation (Caltrans) of the Business, Transportation and Housing Agency of the State of California.

1-3.58 State

The State of California Department of Transportation. This term is used interchangeably with Caltrans and has the same meaning.

1-3.59 State Standard Plans

The 2010 version of the State of California, Department of Transportation Standard Plans.

1-3.60 State Standard Specifications

The 2010 version of the Standard Specifications issued by the Department of Transportation (Caltrans) of the Business, Transportation and Housing Agency of the State of California.

1-3.61 Subbase

A layer of specified material of planned thickness between a base and the basement material.

1-3.62 Subgrade

That portion of the roadbed on which pavement, surfacing, base, subbase, or a layer of any other material is placed. See "Basement Material."

1-3.63 Substantial Completion

Substantial completion shall refer to a stage of construction where the Contractor has fully and correctly performed all Work in all parts and requirements in accordance with the Plans, Standard Specifications and the Contract Documents, all improvements and equipment are in a fully functioning condition, the Contractor has performed the final cleanup, and the project is ready for final inspection.

1-3.64 Surety

"Surety" or "Corporate Surety" refers to a corporate surety company included on the State of California, Department of Insurance, Admitted Sureties List, most current edition, and acceptable to the City.

1-3.65 Surfacing

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

1-3.66 Traffic Lane

The portion of a traveled way for the movement of a single line of vehicles.

1-3.67 Traveled Way

The portion of the roadway for the movement of vehicles, generally between faces of curbs.

1-3.68 Unauthorized Work

Work performed beyond the lines and grades described in the Contract or established by the Engineer or extra work performed without authority.

1-3.69 Work

All the obligations and construction specified, indicated, shown, required or contemplated in the Contract Documents, including all alterations, amendments or extensions thereto made by Contract Change Order or other written orders of the Engineer, and including all punch list, corrective work, as-built or as-constructed drawings, and manuals at the end of the construction. The Work shall not include work being performed by the Owner (by itself or through other contractors) that is merely related to the Work.

1-3.70 Working Days

Unless otherwise designated, working day as used in these Standard Specifications and Contract Documents shall mean any day on which the Contractor is not prevented by inclement weather, or conditions resulting therefrom, from proceeding with substantial prosecution of the work, excluding Saturdays, Sundays, legal holidays, and any other day the Contractor is specifically required by the Special Provisions to suspend construction operations.

1-4 References

Where the version of a referenced document is not specified, use the current version in effect on the date of the Notice to Contractors.

State Specifications

Whenever the State Specifications are referenced and terms are used, they shall be understood to mean the following:

"State," or "Department," shall mean "City".

Where "State Highway Engineer" and "Engineer" are used, it is understood that they refer to and mean, the City Engineer of the City of Visalia or his authorized delegate.

Laboratory – For Public projects, the designated laboratory authorized/hired/selected by the City of Visalia to test materials and work involved in the contract. For Non-Public projects the designated laboratory hired by the entity responsible for the project and approved by the City of Visalia.

For terms, specifications, and requirements appearing in the State Specifications and the Contract Documents, the terms, specifications, and requirements in the Contract Documents shall take precedence.

SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS

2-1 General

The City Purchasing Division will receive at the Front Counter at City Hall West, 707 W. Acequia, Visalia, California, 93291 prior to the hour and day specified in the "Notice to Contractors", sealed proposals for furnishing materials, supplies, equipment and labor for performing the work as specified in the Plans, the Specifications, and the Contract Documents. Proposals submitted at or after the hour specified for receipt of bids will be returned unopened.

2-2 Examination of Site of Work, Plans, Specifications and Contract Documents

The bidder is required to carefully examine the site of the proposed work and the Contract Documents, Plans and Specifications for the work contemplated. The work embraced herein shall be done in accordance with the Contract Documents.

Bid submission shows the bidder has investigated the site and is satisfied as to the conditions to be encountered and the scope of work, and understands the requirements of the Plans, Specifications, and other Contract Documents. Bid submission is your acknowledgment that you have examined the job site, plans, construction specifications, and bid documents and are satisfied with:

A. General and local conditions to be encountered

B. Character, quality, and scope of work to be performed

C. Quantities of materials to be furnished

D. Character, quality, and quantity of surface and subsurface materials or obstacles

E. Requirements of the Contract

Prospective bidders must satisfy themselves, by such means as they prefer, as to local conditions and all other matters which influence their bid for the work. The City or Engineer shall not be liable on account of any obstructions of any nature, unforeseen difficulties in construction, or unreliable information from any source.

It is the Contractor's responsibility to inform the Engineer and seek correction or clarification upon discovering any error or omission in the Plans, Specifications, or other Contract Documents prior to proceeding with the described work. The Contractor will be liable for any resultant damage where he "recognized such error, inconsistency or omission and knowingly failed to report it to the Engineer". The Contractor will bear no liability for any errors which he discovers and reports to the Engineer.

Existing improvements visible at the job site, for which no specific disposition is made on the Plans, but which could reasonably be assumed to interfere with the satisfactory completion of the improvements contemplated by the Plans, shall be removed and disposed of by the Contractor at his expense.

The locations of existing facilities that are shown on the Plans are approximate. Exact locations of existing utilities shall be determined by the Contractor by whatever means necessary, including hand digging, with the possible assistance of the utility companies and located in the field by the Contractor prior to the construction of any improvements required by the Contract. Any additional cost incurred because of the Contractor's failure to field verify locations of existing utilities prior to construction shall be paid for by the Contractor.

2-3 Form of Proposal

All proposals must be submitted upon the blank forms included in this bid document which can be obtained from the City Purchasing Division at City Hall West, 707 W. Acequia, Visalia, California, 93291. This bid document must be submitted in its entirety with no pages removed. All addendums issued during the bidding process must be signed and submitted with the bid document. The bid document contains a contract that will be used with the bid proposal. A separate bid bond with appropriate attachments may be stapled to the inside front cover of the bid document in lieu of using the forms provided in the Section "Bidders Bond." All proposals must give the unit price where indicated, or lump sum where unit prices are not called for, for each of the items. Proposals are to be filled out completely and must be signed by the bidder with his address, all as indicated on the proposal form. 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. If made by a corporation, the proposal must show the name of the state under the laws of which the corporation was chartered and the names, titles and business address of the president, secretary, treasurer and manager thereof. The Bid Proposal Form includes the following documents, all of which are to be completed in all respects and submitted as a complete package: Bid Proposal, Bid Proposal Contract, Bid Schedule, Bidder's Information, Subcontractors List, Contractor's Reference Form, Non collusion Affidavit, Drug Free Workplace Certification and Bid Security. Depending on the nature of the project, other documents may be included by the City and shall be completed in all respects and submitted by the bidder with the Bid Proposal Form or as otherwise indicated by the City. All proposals must be submitted under sealed cover. See the Notice to Contractors for additional proposal requirements.

All other forms, exhibits, certifications, declarations, and other documents included in the bid book must be completed by the Contractor and submitted with the bid.

2-4 Conflict of Interest

No employee of the City shall be eligible to submit a proposal for, or to subcontract for any portion of, or to supply any materials for any contract administered by the City.

2-5 Quantities

The estimates of the quantities of work to be performed and materials to be furnished given in the Notice to Contractors, Bid Proposal and in the Construction Specifications are approximate only, being given as a basis for the comparison of bids. The City does not expressly or by implication agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work or to omit portions of the work that may be deemed necessary or expedient by the Engineer. Reference is made to Section 4-10, "Changes," regarding changes to quantities.

2-6 Unit or Lump Sum Prices

The unit or lump sum prices inserted in the bid form by the bidder will be considered to be the bid prices for the various bid items of work performed. In case of a discrepancy between the unit price bid and the calculated total for any bid item, the unit price shall govern. In case of a discrepancy between the unit or lump sum price in words and figures provided on the Bid Proposal, the lump sum or unit price quoted in words shall prevail.

2-7 Proposal Guaranty

All bids shall be presented under sealed cover and shall be accompanied by either a cash, cashier's check, certified check, or Bidder's Bond of a corporate surety authorized to do business in the State of California and acceptable to the City, made payable to the City of Visalia for an amount equal to at least ten percent (10%) of the amount of said bid. No bid shall be considered unless such cash, cashier's check, certified

check, or Bidder's bond is enclosed herewith. Checks or bonds must be made payable to the City of Visalia, such securities to be retained by the City as a guarantee that the Bidder, if his bid is accepted, will enter into a satisfactory contract within ten (10) days, not including Saturday, Sundays and legal holidays, from the date that the bidder has received notice that the contract has been awarded "Notice of Award" is mailed or e-mailed to the Bidder, and will furnish a good and sufficient bond for faithful performance thereof and for payment of labor and material costs in accordance with the requirements of the Contract Documents.

2-8 Designation of Subcontractors

The Contractor shall comply with the California Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the State Public Contract Code. The Contractor shall file with the bid the name and address of each subcontractor who will perform more than one-half of one percent (½ %) of the contract amount, or in the case of a project designated by the City as a Street Project, one half of one percent of the contract amount or ten thousand dollars ($10,000), whichever is greater. To determine the value of work subcontracted, 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.

Only one subcontractor shall be listed for each portion of the work. The portion shall be defined as to its nature and extent. The failure of the Contractor to specify a subcontractor constitutes a statement that the Contractor is qualified and intends to perform said work.

Designation of subcontractors must be made upon forms included with the bid package or to be obtained from the office of the City Engineer at City Hall. The bidder must give the names of all the subcontractors and the form must be signed by the bidder.

The Contractor must have the consent of the City and approval of the Engineer, in writing, to substitute a subcontractor other than that designated in the original bid, to permit any subcontract to be assigned or transferred, to allow a subcontract to be performed by other than the original subcontractor, or to subcontract work for which no subcontractor was designated in the original bid and which is more than one-half of one percent (½ %) of the contract amount, or in the case of a City-designated Street Project, one half of one percent or ten thousand dollars ($10,000), whichever is greater.

Violation of any of the above provisions is a violation of the Contract and cause for ordering any unapproved subcontractor from the work site. The Contractor shall comply with Section 8-3, "Subcontracting," which contains additional regulations regarding subcontractors.

2-8.1 City Right to Reject Subcontractors

Pursuant to state law City may reject subcontractors that the City has determined to not be a responsible contractor and require Contractor to substitute that specific subcontractor.

2-9 Rejection of Non-Responsible Subcontractors

Any bid may be withdrawn at any time prior to the time fixed in the "Notice to Contractors" for the opening of bids only upon 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 the bid does not prejudice the right of the Bidder to file a new bid. A bid will not be received after the time, nor any bid withdrawn after the time fixed in the public notice for the opening of bids until either all bids are rejected, or until the expiration of sixty (60) days set from the date set for the opening of bids, or until the contract

has been executed and the required Contractor's bonds furnished by the successful Bidder or Bidders, whichever occurs first.

2-10 Opening of Proposals

Proposals will be opened and read publicly at the time and place indicated in the "Notice to Contractors". Bids will be opened identifying Bidder and amount. Bidders, or their authorized agent, are invited to be present. City will review bid package for completeness and accuracy subsequent to opening.

2-11 Relief of Bidders

The provisions of Public Contract Code Sections 5100 to 5110, inclusive, applies to all Contracts. If the bidder claims a mistake was made in the bid presented, the bidder shall give the Engineer 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.

2-12 Rejection of Proposals

The City reserves the right to reject any or all proposals. Proposals may be rejected if they show any alteration of form, additions not called for, conditional or alternative bids, incomplete bids, erasures, or irregularities of any kind. Proposals in which the prices are obviously unbalanced may be rejected. The City may reject all bids for budgetary reasons.

More than one proposal from an individual, a firm or partnership, a corporation or an association under the same or different names, will not be considered. Reasonable grounds for believing that any bidder that submitted a bid as a General or Prime Contractor is interested in more than one proposal for a Project will cause the rejection of all proposals in which such bidder is interested. A Contractor who is not submitting a bid as the General or Prime Contractor may submit any number of sub-bids to competing General or Prime Contractors.

This bid document must be submitted in its entirety with no pages removed. All addendums issued during the bidding process must be signed and submitted with the bid document.

A Bid Protest/Dispute/Challenge must be submitted in writing within 5 working days from award of the project to:

Purchasing
707 W. Acequia Avenue
Visalia, CA 93291

2-13 Ineligibility to Contract

The City requires all bidders to comply with the requirements of Public Contract Code Section 10285.1. The City shall have the same rights as a State Agency under Section 10285.1, which provides as follows:

"Any state agency may suspend, for a period of up to three years from the date of conviction, any person from bidding upon, or being awarded, a public works or services contract with the agency under this part or from being a subcontractor at any tier upon the contract, if that person, or any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, has been convicted by a court of competent jurisdiction of any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Section 1101, with any public entity, as defined in Section 1100, including, for the purposes of this article, the Regents of the University of California or the Trustees of the California State University. A state agency may determine the eligibility of any person

to enter into a contract under this article by requiring the person to submit a statement under penalty of perjury declaring that neither the person nor any subcontractor to be engaged by the person has been convicted of any of the offenses referred to in this section within the preceding three years".

2-14 Contractor Qualification Requirements

All Contractors, General Contractors and Subcontractors, working on non-public and public projects within City of Visalia street right of way or other City of Visalia property shall have a minimum of three years of past experience with projects of a similar size and nature to the proposed project unless otherwise approved by the City Engineer. The burden of proof shall be the responsibility of the Contractor. All General Contractors shall be required to submit a complete CONTRACTOR'S REFERENCE FORM with their bid. A blank copy of this form is located in the front end portion of the bidding documents. At the request of the Engineer, the General Contractor shall provide completed CONTRACTOR'S REFERENCE FORMS for any Subcontractor within 4 working days of the request by the Engineer. The Engineer may also request any additional information they deem necessary to verify that the Contractor or Subcontractor has the qualifications and experience to adequately perform the work required by the City in a responsible manner. Additional information may include but is not limited to license certificates, safety certificates, specialty certificates, project construction value, and change order cost percentages for past projects. Additional information shall be provided to the Engineer within 4 working days of the request. Failure to provide the requested information will result in a non-responsive bid.

SECTION 3 AWARD AND EXECUTION OF CONTRACT

3-1 Award of Contract

The award of the Contract, if it is awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements described. For projects with no alternates, the award shall be determined by comparing the base bids. When alternative bids are included in the bid proposal, the award shall be determined by comparing the lowest totals of the base bid plus the bids of those alternatives specifically identified in the bid proposal to be used for the purpose of determining the lowest bid. The City reserves the right to add or subtract any of the alternatives after the lowest bid has been determined.

The award, if made, will be made within fifty (50) calendar days after the opening of the proposals. If the lowest responsible bidder refuses or fails to execute the Contract, the City may award the Contract to the second lowest responsible bidder; the award, if made, will be made within sixty (60) calendar days after the opening of the 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; the award, if made, will be made within seventy-five (75) calendar days after the opening of the proposals. The periods of time specified above may be subject to extension for further periods as agreed upon in writing between the City and the bidder concerned.

All bids will be compared on the basis of the Engineer's Estimate of quantities of work to be done as shown in the bid proposal. Bids shall be submitted on base bids and all alternate bids, if any, in order to be considered responsive.

3-2 Execution of Contract

Four (4) sets of the contract shall be signed by the successful Bidder and returned together with the contract bonds and insurance, within ten (10) days, not including Saturdays, Sundays and legal holidays, after the Bidder has received notice that the contract has been awarded. No proposal shall be considered binding upon the City until the execution of the contract by all parties, including the City.

Failure to execute and submit the Contract within (10) days, not including Saturdays, Sundays and legal holidays after the bidder has received notice that the Contract has been awarded, shall be just cause for the annulment by the City of the award and the forfeiture of the proposal guarantee as liquidated damages. The Contractor shall submit to the Engineer along with the executed Contract, the documents required in Section 3-3, “Required Contract Securities, Insurance Certificate, Business Tax Certificate, Injury and Illness Prevention Plan,” and Section 7-4, “Contractor’s Insurance Requirements and Hold Harmless.”

3-3 Required Contract Securities, Insurance Certificate, Business Tax Certificate, Injury And Illness Prevention Plan

The bidder to whom the Contract has been awarded will be required to furnish a Labor and Material Bond equal to one hundred percent (100%) of the Contract price, and a Faithful Performance Bond equal to one hundred percent (100%) of the Contract price. Said bonds shall be secured from a corporate surety, and are to be submitted to the Engineer with the executed Contract. Corporate Sureties are to comply with the definition of “Surety” as listed in Section 1-3.

In addition to furnishing the above required sureties, the bidder to whom a contract has been awarded shall furnish and submit with the executed contract original Insurance Certificates indicating coverage in compliance with Section 7-4, “Contractor’s Insurance Requirements and Hold Harmless.”

The Contractor shall comply with Section 7-10, “Permits and Licenses.” The Contractor to whom the contract is awarded, and all Subcontractors listed on the Contractor’s Bid Proposal, or any Subcontractor

substituted or added after a contract is awarded and in accordance with these Specifications, must obtain a City of Visalia Business Tax Certificate and pay all fees associated therewith. Business Tax Certificates are to be obtained from the City of Visalia Community Development Department, 315 E. Acequia Avenue, Visalia, CA 93291, call 559-713-4326 for questions. Bidders must contact the Community Development Department to determine fee amounts prior to submitting a bid. This requirement applies regardless of the business address or location of the Contractor or any Subcontractor. Evidence showing the Contractor and all subcontractors have obtained a City of Visalia Business Tax Certificate shall be submitted to the Engineer with the executed Contract.

In compliance with Section 7-12 "Safety Provisions; First Aid; Injury and Illness Prevention Program," the Contractor shall submit with the above documents a copy of the Contractor's Injury and Illness Prevention Plan when requested by the Engineer.

The Contractor shall arrange to have a maintenance bond in effect for a period of one year after the date of recordation of the Notice of Completion. The maintenance bond shall be in an amount equal to ten percent (10%) of the final contract amount and shall be delivered to the Engineer prior to the City acting on the project final acceptance.

3-4 Return of Proposal Guarantees

Within ten (10) days after the award of the contract, the Purchasing Division will return the proposal guarantees, other than Bidder's bonds, accompanying such of the proposals which are not to be further considered in making the award. All other proposal guarantees will be held until the contract has been finally executed, after which all proposal guarantees, except those forfeited, will be returned to the respective Bidders whose proposal they accompany.

3-5 Material Statement, Samples, and Guarantees

As permitted in Section 6, "Control of Materials," before any Contract is awarded, the bidder may be required to furnish a complete statement of the origin, composition, and manufacturer of any or all materials to be used in the construction of the work together with samples which may be subjected to the tests provided for in these Specifications to determine their quality and fitness for the work.

In compliance with Sections 5-23, "Guarantee of Workmanship," 6-10, "Guarantee of Materials," and 7-23, "Guarantee," the Contractor is required to guarantee all materials, equipment and workmanship for a period of one year from the date of Acceptance as denoted in Section 8-14, "Acceptance of Contract." In addition to the overall guarantee, the bidder may also be required by the Contract Specifications to furnish a written or other form of guaranty such as a bond covering certain items of work for varying periods of time from the date of recordation of said Notice of Completion. When the guaranty is required, the form and the time limit of the guaranty shall be as specified in the Contract Specifications. The signed written guaranty or the bond, whichever is required by the Contract Specifications, shall be delivered to the Engineer before Acceptance of the Contract.

All costs for compliance with this Section 3-5 shall be included in the various bid items; no additional payment will be made therefor.

SECTION 4 SCOPE OF WORK

4-1 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. The Contractor shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in completing all of the contract requirements in a satisfactory and workmanlike manner.

The Plans, Specifications and other Contract Documents will govern the work. Anything in the Specifications and not on the Plans, or on the Plans and not in the Specifications, shall be as though shown or mentioned in both.

The Contractor shall keep at the worksite a copy of the Plans and Contract Specifications, to which the Engineer shall have access at all times.

While it is believed that much of the information pertaining to physical conditions which may affect the cost of the proposed work will be shown on the Plans or indicated in the Contract Specifications, the City does not warrant the completeness or accuracy of such information. The Contractor shall ascertain the existence of any such conditions affecting the cost of the work which would have been disclosed by reasonable examination of the site.

No test, investigation, statement or estimate of a factual situation not incorporated in the Contract Documents shall be relied on by the Contractor. Any test, investigation, statement, or estimate of fact incorporated in the Contract shall be considered by the Contractor to be a suggestion only and he shall request equal access to the underlying or background informative material or source and shall arrive at his own opinion thereon, including his determination of how reliable might be any conclusion appearing in or inferred from the Contract Documents.

In general, the Plans will indicate dimensions, position and kind of construction, and the written Specifications will indicate qualities and methods. Any work indicated on the Plans and not mentioned in the written Contract Specifications, or vice versa, shall be furnished by the Contractor as though fully set forth in both. Work not particularly detailed, marked or specified, shall be as similar parts that are detailed, marked or specified.

All alterations authorized by the Engineer which affect the requirements and information given on the approved plans shall be in writing. No changes shall be made in any plan or drawing after the same has been approved by the Engineer, except by direction of the Engineer.

During the course of the work, if the Contractor discovers any discrepancies between the Plans and the conditions in the field, or any errors or omissions on the Plans or in the Specifications which will significantly affect the work, it shall be the Contractor's duty to inform the Engineer immediately in writing, and the Engineer shall promptly verify the same. Any work done after such discovery, until authorized, will be done at the Contractor's risk and will be considered unauthorized work.

4-2 Coordination, Interpretation, and Precedence of Plans and Specifications

The Plans, Specifications, and all supplementary documents are essential parts of the Contract and a requirement occurring in one is as binding as though occurring in all. They are intended to be cooperative, to describe, and to provide for a complete work.

Whenever any conflict appears in any portions of the Contract Documents, it shall be resolved by application of the order of precedence given below, unless the Engineer shall order otherwise.

Change Orders and Supplemental Agreements;
Contract Agreement;
Pre-bid Addenda;
State & Federal Funding Requirements;
Special Provisions;
Construction Specifications excluding Standard Specifications;
Contract Construction Plans or Drawings;
Description of Bid Items;
City of Visalia Encroachment Permit Policy Manual;
Standard Specifications (including General Provisions);
City Standard Drawings;
Any other referenced and incorporated specifications;
Any other referenced and incorporated plans or drawings.

Detailed plans and specifications shall take precedence over standard plans and specifications, even within the same level of precedence. Dimensions called out on the Plans shall control and supersede scaled dimensions. No scaled dimension shall be used in the execution of the work, unless no dimension is called out on the Plans and the use of a scaled dimension is authorized by the Engineer.

For State or Federally funded projects the specifications and requirements listed in the section titled "State & Federal Funding Requirements," shall take precedence over other Standard Specification requirements.

4-3 Interpretations

Should it appear that the work to be done, or any matter relative thereto, is not sufficiently detailed or explained on the Plans or Specifications, the Contractor shall apply to the Engineer for such further explanations as may be necessary, and shall conform to such explanation or interpretation as part of the Contract, so far as may be consistent with the intent of the original Plans and Specifications. In the event of doubt or question relative to the true meaning of these documents, reference shall be made to the Engineer, whose decision thereon shall be final.

All requests for information shall be submitted on the City's Request for Information (RFI) form and each request shall be numbered starting with number one. The RFI shall provide a clear description of the clarification needed, reference the documents in question, verify if Contractor believes extra time or cost will be required, and include other attachments as necessary. By submitting the RFI the Contractor certifies that he has thoroughly reviewed the contract documents and determined that the information requested was not contained in the Contract Documents. The City will be responsible for responding to the RFI within ten (10) working days, unless this time period is extended by mutual agreement between the City and the Contractor. In the event the Contractor believes that a response to an RFI will cause a change to the requirements of the Contract Documents, the Contractor shall immediately give written notice to the City within five (5) working days of receipt of the RFI from the City stating that the

Contractor considers the response a change order. Failure to give such written notice shall waive the Contractor's right to seek additional time or cost.

4-4 Working Drawings

When working drawings or shop drawings are required by the Plans or Specifications, or requested by the Engineer, they shall be prepared in accordance with modern engineering practice by the Contractor at the Contractor's expense. Shop or working drawings shall be of a size and scale to clearly show all necessary details. Unless otherwise specified, four (4) copies of the shop or working drawings shall be submitted to the Engineer for approval or correction at least fifteen (15) days before approved drawings will be required for the work. If corrections are required, the Contractor shall make corrections as directed by the Engineer and shall deliver four (4) copies of the corrected shop or working drawings to the Engineer. Upon final approval, one set will be returned to the Contractor marked "accepted" or "accepted as corrected". For items requiring shop drawings, no materials shall be furnished or work done before approval of the drawings.

Acceptance of shop or working drawings by the Engineer means that there is substantial and acceptable conformance with the Plans and Specifications, but details of design may not necessarily be checked for adequacy or accuracy. An acceptance shall not relieve the Contractor from the responsibility for errors or omissions in the drawings or from deviations from the Contract Documents unless such errors, omissions, or deviations were specifically called to the attention of the Engineer in writing. The Contractor is responsible for the correctness of the shop or working drawings, for shop fits and field connections, and for the results obtained by use of such plans.

In the event of discrepancy between the scaled dimension on any drawing and the figures written thereon, the figures shall be taken as correct, unless otherwise determined by the Engineer.

4-5 Conformity with Plans and Allowable Deviations

Finished surfaces including the completed final surface of earth, concrete, pavement or other material, or the completed top of a layer of subgrade, base or surfacing, in all cases shall conform with the lines, grades, cross sections, and dimensions shown on the Plans. Where tolerances are indicated in the Specifications, the work shall be constructed within the tolerances. Variations within the specified tolerances shall be compensating so that average grade and cross section specified are met. Deviations from the Plans required by the exigencies of construction will be determined in all cases by the Engineer and authorized only in writing.

4-6 Existing Facilities and Structures Shown on Plans

Where underground and surface facilities or structures are shown on the Plans, the locations, depth and dimensions of such facilities or structures are believed to be reasonably correct, but are not guaranteed. Such facilities or structures are shown for the information of the Contractor, but information so given is not to be construed as a representation that such facilities or structures will, in all cases, be found or encountered just where shown, or that they represent all the structures which may be encountered. The Contractor shall comply with the provisions in Section 8-15, "Utility and Non-Street Facilities; Potholing."

4-7 Omissions in Plans and Specifications

Omissions from the Plans or the Specifications of the materials or details of work which are manifestly or obviously necessary to carry out the intent of the Plans and Specifications, or which are customarily furnished or performed, shall not relieve the Contractor of the responsibility for furnishing such omitted materials or performing such omitted work, but shall be furnished or performed as if fully shown or described in the Plans or Specifications.

Any materials or work mentioned in the Specifications and not shown on the Plans, or shown on the Plans and not mentioned in the Specifications, shall be of the same effect as if shown or mentioned in all.

4-8 Incorporation of Referenced Specifications

Where referenced thereto on the Plans or the Specifications, the work embraced herein shall be done in accordance with the provisions of the 2010 version of the "State of California, Department of Transportation Standard Specifications," which Specifications are hereinafter referred to as the State Standard Specifications, in accordance with the following provisions.

In case of a conflict between the City's Standard Specifications and Contract Documents and any other referenced and/or incorporated set of specifications such as the State Standard Specifications, the City's Standard Specifications and Contract Documents take precedence over and shall be used in lieu of such conflicting portions in the other specifications, in accordance with Section 4-2, "Coordination, Interpretation, and Precedence of Plans and Specifications."

4-9 Work To Be Done

The work to be performed under the Contract consists of furnishing all materials, equipment, supplies, labor and transportation, and performing all Work as required by the Contract in strict accordance with the Contract Documents in a satisfactory and workmanlike manner. The Work includes all work, material and services not expressly called for in the Contract Specifications or not shown on the Plans, but which may be necessary for completion and proper construction to carry out the Contract in good faith. The site of Work shall be left in a neat condition. All improvements shall be in a complete and operating condition. The cost of all Work performed, furnished and installed is to be included in the amount bid for the various items of Work with no separate compensation allowed therefor.

4-10 Changes

The City 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 (see Section 2-5, "Quantities") as may be deemed by the Engineer to be necessary or advisable, and to require such Extra Work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated.

No adjustment will be made in the contract unit price of any bid item as a result of quantity changes, unless the quantity of the bid item is increased or decreased by more than 25 percent of the original bid item quantity. If a unit price adjustment is considered to be warranted by the Engineer, the Contractor shall be compensated in accordance with the provisions of Section 9-1.06, "Changed Quantity Payment Adjustments," of the State Standard Specifications. Any references therein to "State" or "Department" shall mean "City." The Contractor will be responsible for submitting detailed cost data for a unit price adjustment for a bid item if (1) the Engineer requests the data or (2) you request a unit price adjustment resulting from a change in accordance with this Section.

All 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 that work. The Contractor will be responsible for submitting detailed cost data including a breakdown of labor, equipment, and materials to the Engineer for approval as listed in Section 9-5 "Payment for Extra Work" and incorporation into the Change Order. A contract change order will not become effective until approved by the City of Visalia Change Order Committee.

The Contractor may seek a Change Order from the City of Visalia Change Order Committee pursuant to this Section 4-10 and Section 4-12.3.

The Contractor shall not commence work covered by the proposed change order prior to approval of the Change Order Committee, unless authorized in writing by the Engineer. The Contractor shall not be entitled to payment for any work performed without written authorization from the Engineer. Until the City approves a Change Order, the Contractor shall continue to perform the work under the Contract unless the Engineer orders the Contractor in writing to start the work described in the Change Order before its approval.

Should the Contractor disagree with any terms or conditions set forth in an approved Contract Change Order not executed by the Contractor, the Contractor shall submit a written protest to the Engineer within five (5) days after the receipt of the approved Contract Change Order and the procedures outlined in Section 4-12 apply.

If a requested change order is sent back to the Contractor for revisions, the Contractor has fifteen (15) days to resubmit. If the Contractor fails to return the revised Change Order to the Engineer within the above mentioned time period, the Contractor shall have waived its rights to compensation for said change order.

Changes shall not invalidate the contract nor release the surety, and the Contractor agrees to accept payment for such changes as if the altered work had been a part of the original contract. These changes which are for work within the general scope of the contract shall be covered by Change Orders issued by the City. Change orders for altered work shall include extensions of contract time where, in the Engineer's opinion, such extensions are commensurate with the amount and difficulty of added work.

Excessive altered work shall be covered by supplemental agreement that is subject to funding agency approval as applicable. If the City and the Contractor are unable to agree on a unit adjustment for any contract item that requires a supplemental agreement, the City reserves the right to terminate the contract with respect to the item and to make other arrangements for its completion.

For all changes, the City shall reasonably compensate Contractor with money (including overhead and profit) and/or time for any Extra Work ordered by the City to be performed; and the City shall receive a reasonable credit for money (including overhead and profit) and/or time saved by any deletion of work.

Changes by Contract Change Order, when ordered and accepted, shall be paid for in accordance with the terms of this Section 4-10 and Section 9-5, "Payment For Extra Work."

4-11 Extra Work

The Contractor is prohibited from doing Extra Work, unless authorized in writing by Engineer before the Extra Work is done. The Engineer should obtain authorization from the Change Order Committee before agreeing to Extra Work requested by the Contractor. In the instances where it is necessary for the Extra Work to be done immediately, the City Engineer may authorize the Extra Work prior to taking the additions to the Change Order Committee. The Contractor shall be responsible for submitting a cost breakdown documenting all labor, equipment, and material costs used to complete the Extra Work in accordance with Section 9-5, " Payment for Extra Work". The cost breakdown shall be submitted in a manner that is satisfactory to the Engineer and shall be submitted to the Engineer within thirty (30) days of completing the extra work. Upon review and acceptance by the Engineer, the Change Order will be submitted to the Change Order Committee. If the Contractor does not submit any documentation within this time period the Engineer may move forward with issuing a Change Order to adjust the contract price.

Payment for approved Extra Work shall be as approved by the Change Order Committee. No additional payment is due for unauthorized Extra Work.

Unless otherwise specifically indicated in the Plans or the Specifications, any work or responsibility of the Contractor set forth in the Specifications or on the Plans and not set forth as a separate bid item shall be considered incidental or appurtenant to the work and full compensation for the cost thereof included in the various bid items of work. Such work or responsibility will in no case be considered as Extra Work.

When work is classified as Extra Work by the Engineer, the Contractor shall do such Extra Work and furnish labor, materials, 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, the Contractor shall not be entitled to payment for such Extra Work.

Extra Work, when ordered and accepted, shall be paid for in accordance with the terms of this Section 4-11 and Section 9-5, "Payment For Extra Work."

4-12 Notices, Change Orders, and Claims

If the Contractor requests additional compensation, whether money or time, or otherwise believes that it is entitled to a modification of the Contract terms and conditions, then Contractor shall follow the procedures for pursuing such requests that are specified herein, otherwise Contractor shall have failed to pursue diligently and exhaust the administrative procedures set forth under this Agreement and shall have waived its rights to such pursue remedies under any later attempts to recover such compensation or modification.

4-12.1 Definition of "Claim"

A "Claim" is a separate demand by the Contractor for (a) a time extension, (b) payment of money or damages arising from work done by, or on behalf of, the Contractor, payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (c) an amount the payment of which is disputed by the local agency. However, a "Claim" does not include a proposed change order submitted pursuant to these provisions since a proposed change order is a less formal procedure that is preliminary to a Claim in some instances. In addition, a "Claim" does not include vouchers, invoices, progress payment applications, or other routine or authorized forms of requests for progress payments on the Contract. The responsibility to substantiate Claims shall rest with the Contractor.

4-12.2 Initial Potential Claim Record Notice Requirements

Contractor shall submit an Initial Potential Claim Record, which may also be referred to as a "Notice of Potential Claim" within five (5) days from the date of the Contractor becoming aware of the facts and/or issue creating the Claim. The Initial Potential Claim Record shall contain a description by the Contractor of the nature of claim, circumstances surrounding the claim and basis of claim. Failure to timely submit an Initial Potential Claim Record shall act as a waiver by Contractor of any right to later submit a proposed change order or pursue a Claim on that issue. Contractor acknowledges that these written notices are critical to the Owner's management of the project and the mitigation of project costs and scheduling. The City is not required to respond to the Initial Potential Claim Record, but may request additional information from the Contractor.

The Initial Potential Claim Record shall indicate whether the subject item of the claim or the "disputed work" is complete. After the Initial Potential Claim Record the Contractor shall in most instances be required to file a Supplemental Potential Claim Record and a Full and Final Potential Claim Record.

The Full and Final Potential Claim Record is required within thirty (30) days of the disputed work being completed or the filing of the Initial Potential Claim Record, whichever is later. The Full and Final Potential Claim Record is required unless the Engineer, after receipt of the Supplemental Potential Claim Record or Full and Final Potential Record requires the Contractor submit the claim as a change order to the Change Order Committee. See the following subsection for a description of claims involving change orders or decisions by the City Change Order Committee.

Throughout the disputed work the Contractor shall maintain records that provide a clear distinction between the incurred direct costs of disputed work and that of undisputed work. The contractor shall provide the Engineer access to the Contractor's project records deemed necessary by the Engineer to evaluate the potential claim upon request by the Engineer.

4-12.3 Claims Involving Change Orders

If Contractor disagrees with an approved change order issued pursuant to Section 4-10, "Changes," then Contractor shall submit an Initial Potential Claim Record within five (5) days of being notified of the approved change order.

The Contractor is also entitled to submit proposed change orders to the City of Visalia Change Order Committee pursuant to this Section 4-12.3 and Section 4-10. If Contractor otherwise believes that it is entitled to additional compensation for money and/or time (including but not limited to grant of a time extension; payment of money or damages arising from work done by, or on behalf of, the Contractor, payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to; or an amount the payment of which is disputed by the local agency), then Contractor shall submit a proposed change order within thirty (30) days of (i) becoming aware of the potential right to additional compensation, or (ii) the date by which it should have become aware of the potential right to additional compensation. Failure to timely submit a proposed change order shall act as a waiver by Contractor of any right to later submit a proposed change order or Claim on that issue. The proposed change order shall indicate the grounds for the additional compensation (money and/or time) requested and the amount of compensation (money and/or time) requested, and Contractor shall include all information supporting the proposed change order. The proposed change order shall be submitted to the City Change Order Committee for review. If the Contractor disagrees with the decision of the Change Order Committee then the Contractor shall submit an Initial Potential Claim Record within five (5) days of being notified of the Change Order Committee decision.

If the Contractor was ordered by the Engineer to have a claim reviewed by the Change Order Committee after filing a Supplemental Potential Claim or a Full and Final Potential Claim and the Contractor disagrees with the Change Order Committee decision, then within five (5) days of being notified of the Change Order Committee decision the Contractor must file another Initial Potential Claim Record indicating the disagreement and referencing the prior claim. Under this circumstance the Contractor is not required and may not file another Supplemental Potential Claim or Full and Final Potential Claim Record and instead must proceed with the dispute resolution process described in Public Contract Code Sections referenced in these specifications.

4-12.4 Supplemental Potential Claim

Within fifteen (15) days of submitting the Initial Potential Claim Record, also known as the Notice of Potential Claim, the Contractor shall, unless an exception applies, submit a Supplemental Potential Claim Record. The Supplemental Potential Claim Record shall include the following:

a. The Complete nature and circumstances causing the potential claim.
b. A description of the Contract Documents that support the basis of the claim.

c. The estimated claim cost and an itemized breakdown of individual costs stating how the estimate was determined.

The Engineer shall review the Supplemental Potential Claim and should provide an initial response within thirty (30) days of receiving the Contractor's submittal. The Engineer may request additional time to respond if necessary. If the nature, circumstances, and basis of the claim have not been reviewed by the Change Order Committee, then the Engineer may require the claim be submitted to the Change Order Committee as a change order request. The Engineer shall otherwise respond to the Contractor that the Supplemental Claim has been received and state the Contractor should file a Full and Final Potential Claim Record when the disputed work is completed. If the Engineer does not respond the Contractor is required to file the Full and Final Potential Claim Record when the disputed work is completed.

If the Engineer, after receipt of the Supplemental Potential Claim Record requires the Contractor submit a change order request to the Change Order Committee, then no Full and Final Potential Claim Record is required. If referred to the Change Order Committee after filing a Supplemental Potential Claim Record and the Contractor disagrees with the Change Order Committee decision then the Contractor shall notify the Engineer of the disagreement and the Contractor's intent to file continue the claim under the Public Contract Code. The Contractor is then required to comply with the dispute resolution procedure described in Public Contract Code Sections referenced in these specifications. See Section 4-12.6 – 4-12.7.

The Supplemental Potential Claim Record is not required if the disputed work has already been completed or is completed within fifteen (15) days of the Contractor filing the Initial Potential Claim Record. In these circumstances the Contractor shall notify the Engineer when the disputed work was completed and file the Full and Final Potential Claim Record within thirty (30) days of the completion of the disputed work.

4-12.5 Full and Final Potential Claim Record

The Contractor shall notify the Engineer that the disputed work is completed within ten (10) days of the disputed item being completed.

The Contractor shall, within thirty (30) days of the completion of the disputed work or thirty (30) days from submitting an Initial Potential Claim Record, whichever is later, submit a Full and Final Potential Claim Record which shall contain the following:

1. A detailed factual account of the events causing the potential claim, including:
   1.1. Pertinent dates
   1.2. Locations
   1.3. Work items affected by the potential claim
2. The Contract Documents supporting the potential claim and a statement of the reasons these parts support entitlement
3. If a payment adjustment is requested, an itemized cost breakdown. Segregate costs into the following categories:
   3.1. Labor, including:
      3.1.1. Individuals
      3.1.2. Classifications
      3.1.3. Regular and overtime hours worked
      3.1.4. Dates worked
   3.2. Materials, including:
      3.2.1. Invoices

3.2.2. Purchase orders
3.2.3. Location of materials either stored or incorporated into the work
3.2.4. Dates materials were transported to the job site or incorporated into the work

3.3. Equipment, including:
3.3.1. Detailed descriptions, including make, model, and serial number and the Model and Code reference listed in the Caltrans Labor Surcharge and Equipment Rental Rates book in effect when the work was performed
3.3.2. Hours of use
3.3.3. Dates of use
3.3.4. Equipment costs (hourly rates and total costs)

4. If a time adjustment is requested:
4.1. Dates for the requested time.
4.2. Reasons for a time adjustment.
4.3. Contract documentation supporting the requested time adjustment.
5. Identification and copies of your documents and copies of communications supporting the potential claim, including certified payrolls, bills, cancelled checks, job cost reports, payment records, and rental agreements
6. Relevant information, references, and arguments that support the potential claim

The City shall not consider a Full and Final Potential Claim Record that does not have the same nature, circumstances, and basis of claim as those specified in the Initial Potential Claim Record and Supplemental Potential Claim Record, if the Supplemental Record was required to be filed.

The Engineer should evaluate the information presented in the Full and Final Potential Claim Record and furnish the Contractor with a response within thirty (30) days of receipt. The Engineer's receipt of the Full and Final Potential Claim Record must be evidenced by postal return receipt or the Engineer's written receipt if delivered by hand.

The Engineer may either respond to the Contractor concerning the Final Claim, or if the nature, circumstances, and basis of the claim have not been reviewed by the City Change Order Committee, the Engineer may require the Contractor submit the matter to the City Change Committee as a change order request. The Contractor, if referred to the Change Order Committee but not satisfied with the decision of the Change Order Committee, must notify the Engineer of their intent to file continue the claim under the Public Contract Code and proceed with the dispute resolution procedure required under the Public Contract Code Sections referenced in these specifications.

If the Contractor is not satisfied with the response by the Engineer, then the Contractor may proceed with the dispute resolution procedures set forth in the Public Contract Code Sections referenced in these specifications.

4-12.6 Procedures for Claims Less than or Equal to $375,000

(Public Contract Code §20104.2)

The Contractor is required to comply with the administrative claim process described above, and if the matter is not resolved, then the Contractor is required to comply with the dispute resolution process set forth in Public Contract Code Sections 20104-20104.6.

If the Contractor disputes the response of the Engineer to the Contractor's Full and Final Potential Claim Record, or if the Contractor filed a claim and was ordered by the Engineer to submit a change order request to the City's Change Order Committee but the Contractor disputes the decision by the Change

Order Committee then the Contractor shall notify the Engineer of their disagreement and that they intend to file a claim pursuant to Public Contract Code Section 20104.2.

The Contractor's Full and Final Potential Claim Record or submission to the Change Order Committee will not be considered a claim under the Public Contract Code although the Contractor may reference or utilize prior submissions in its Public Contract Code claim. Claims under the Public Contract Code must comply with all Public Contract Code requirements, including being made in writing and include the documents necessary to substantiate the claim by the Contractor.

The claim must be filed on or before the date of the final payment to the Contractor by the City. In instances where a decision by the City Change Order Committee on a change order request is after the final payment to the Contractor, then the Contractor has ten (10) days from the date the Change Order Committee notifies the Contractor of its decision to file the claim under the Public Contract Code or the time period permitted under the California Civil Code to file an effective stop payment notice, whichever is longer. Currently the time period for effective stop payment notice is found in California Civil Code Section 9356.

A. Claims Less Than $50,000

For Claims of less than fifty thousand dollars ($50,000), the City shall respond in writing to any written Claim within 45 days of receipt of the Claim, or may request, in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the claim the City may have against the Contractor.

If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the City and Contractor.

The City's written response to the Claim, as further documented, shall be submitted to the Contractor within 15 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

B. Claims Over $50,000 And Less Than $375,000

For claims over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the City shall respond in writing to all written Claims within 60 days of receipt of the Claim, or may request, in writing, within 30 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim the City may have against the Contractor.

If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the City and Contractor.

The City's written response to the Claim, as further documented, shall be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

C. Meet And Confer

If the Contractor disputes the City's written response, or the City fails to respond within the time prescribed, the Contractor may so notify the City, in writing, either within 15 days of receipt of the City's response or within 15 days of the City's failure to respond within the time prescribed,

respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the City shall schedule a meet and confer conference within 30 days for settlement of the dispute. The City Manager, or the City Manager's designee and the Engineer will meet with the Contractor. The conference may take place during regularly scheduled project meetings.

D. Government Code Claims

Following the meet and confer conference, if the Claim or any portion remains in dispute, the Contractor must file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code (a "Government Code Claim"). The process of filing of a Government Code Claim is specifically required in addition to the contractual claims process in these Standard Specifications; such contractual claims process described above does not act as a substitute for the Government Code Claim process, and the two procedures shall be sequential.

Failure to timely file a Government Code Claim shall act as complete waiver by Contractor of the disputed item. The Government Code Claim shall be handled by Contractor and City as required by the Government Code, commencing with Section 900. For purposes of the applicable Government Code provisions, the running of the period of time within which a Government Code Claim must be filed shall be tolled from the time the Contractor submits his or her written Claim pursuant to this Section 4-12 until the time that such Claim is denied as a result of the meet and confer process in Section 4-12.5.C, including any time utilized by such meet and confer process.

4-12.7 Procedures for Claims Over $375,000

Claims over $375,000 shall be handled by Contractor and City in the same manner as Claims of $375,000 or less (see Section 4-12.6, "Procedures for Claims Less Than or Equal to $375,000), except that City shall (a) respond in writing to all written Claims within 90 days of receipt of the Claim, or may request, in writing, within 45 days of receipt of the Claim, any additional documentation supporting the Claim or relating to defenses to the Claim the Owner may have against the Contractor, and (b) respond within 45 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

4-12.8 Closeout Meet and Confer

Before the submission of a final payment application, Contractor may request a closeout meet and confer session with the City to discuss any previously submitted Claims that the City did not grant in full. City is under no obligation to meet and confer, but may in its discretion choose to do so. Nothing related to this closeout meet and confer process tolls the running of the period of time for Contractor to present a Government Code Claim pursuant to Sections 4-12.6, "Procedures for Claims Less Than or Equal to $375,000," and 4-12.7, "Procedures for Claims Over $375,000."

4-12.9 Continuing Contract Performance

Despite submission or rejection of a Claim, the Contractor shall proceed diligently with performance of the Contract as directed by City, and the City shall continue to make any undisputed payments in accordance with the Contract.

4-13 Interim Cleanup and Liability for Failure to Provide

During the construction of the project, the Contractor shall provide periodic cleanup as the work progresses, such cleanup to be accomplished as soon as practicable and as public necessity and convenience require, as determined by the Engineer. Contractor is to avoid creating hazards to the public or visual blight. In general, daily interim cleanup will be required. Daily cleanup during construction

shall include, but not be limited to, the removal of all excess soil and other materials or debris from the construction area, and sweeping and cleaning of affected streets.

If the Engineer orders Contractor to provide cleanup work on the jobsite and the Contractor fails to provide the ordered cleanup measures within a reasonable time period as determined by the Engineer, then the Engineer may enforce a penalty of Two Hundred Fifty Dollars ($250.00) for each calendar day that elapses from the time the penalty is ordered until the cleanup measures ordered by the Engineer are completely carried out. Penalty may not exceed One Thousand Dollars ($1,000.00) although City may add cleanup costs incurred by the City. Such penalty shall be deducted in accordance with Section 9-9, "Stop Notices; City's Right To Withhold Payments," from any monies owed the Contractor, or levied as a fine in the case of non-public work. In addition to the penalty specified above, the Engineer may order other forces to provide interim cleanup. The full cost thereof, in addition to the penalty as herein provided, shall be deducted from any monies owed the Contractor or shall be levied as a fine. Alternatively if City Municipal Codes are violated the Contractor may be subject to a code enforcement action and separate penalty under those provisions.

Full compensation for cleanup during construction shall be included in the prices bid for the various items of work; no separate payment will be made therefor.

4-14 Detours

Detours installed or constructed by the Contractor around the work or any portions thereof, whether requested by the Contractor or required by the Plans or the Specifications for use by traffic shall conform to Sections 7-17, "Public Convenience," 7-18, Public Safety," and Section 12, "Traffic Control; Construction Area Traffic Control Devices." Unless otherwise specified in the Contract Specifications, payment for installing and removing detours shall be included in the price bid for Traffic Control, or if there is no bid item, included in the various bid items of work. No additional payment will be made therefor. The Contractor shall be aware that detours which pass through jurisdictions other than the City of Visalia may be subject to special requirements by those jurisdictions. Any costs thereof shall be paid for by the Contractor.

When traffic is routed through the work, provisions for a passageway through construction operations shall also conform to the foregoing Sections, but will not be considered as detour construction or detour maintenance. This work shall conform to and be paid for as provided in Section 7-17, "Public Convenience," unless otherwise specified in the Contract Specifications.

In accordance with Section 8-11, "Temporary Suspension of Work," the failure or refusal of the Contractor to construct and maintain detours at the proper time or route traffic through the works as required shall be sufficient cause for closing down the work until the detours or rerouting are in satisfactory condition for use by traffic.

Any damage caused by the Contractor's operations or by traffic to detours installed solely for the convenience of the Contractor and not required by the Plans, Specifications, or the Engineer, shall be promptly repaired by the Contractor to the satisfaction of the Engineer at the Contractor's expense.

The Contractor must obtain written authorization from the City of Visalia prior to implementing a detour installed for the convenience of the Contractor.

4-15 As-Built Plans

The Contractor shall prepare and submit to the City a complete set of As-Built Plans documenting all changes and deviations from the Project Plans. The As-Built Plans shall be the same size and scale as the

original Plans and all changes or modifications that were made during the course of construction shall be clearly drawn to scale on the plans in red and noted on the plans in red. The As-Built Plans shall note any proposed improvements that were not constructed with the project and any other items that may be deemed necessary by the Engineer. The As-Built Plans shall also show the locations and depths of all the existing utilities located during construction. The As-Built Plans must be submitted to the City and approved by same prior to the request for final payment. Payment for the "As-Built Plans" and all related costs shall be considered as included in the total Contract price paid for the various items of work and no additional compensation provided.

SECTION 5 CONTROL OF WORK

5-1 Authority of the 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 or 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, including any claims and change orders under Section 4-10, "Changes," Section 4-12, "Notices, Change Orders, and Claims," and Section 9-5, "Payment for Extra Work." The Engineer's decision shall be final and binding upon the Contractor. The Engineer shall also have the authority to enforce and make effective such decisions and orders which the Contractor fails to carry out promptly. In accordance with Section 5-17, "Inspection during Construction; Meetings," the Engineer will delegate authority to representative inspectors to assure compliance with Plans and Specifications.

5-2 Standards

The Engineer shall establish such standards as may be necessary for the proper construction of a finished product. In the absence of specific standards, recognized standards of construction or approved practices shall govern the work.

5-3 Contractor's Responsibility for the Work

Except as specifically provided in these Standard Specifications, until the formal acceptance of the work by the City Council, the Contractor shall have the charge and care thereof and shall bear the risk of injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof, except such injuries or damages occasioned by acts of the Federal Government or the public enemy. The City shall not be held responsible for the care or protection of any material or parts of the work prior to final acceptance, except as expressly provided in the Specifications.

The Contractor shall comply with the requirements of Sections 5-9, "Preservation of Property," and Section 7-16, "Injury or Damage to Persons or Property."

5-4 Contractor's Equipment

The Contractor shall provide adequate and suitable equipment and means of construction to meet all the requirements of the work. When ordered to do so by the Engineer, the Contractor shall remove unsuitable equipment from the work and discontinue the operation of unsatisfactory equipment. The use of any equipment which is obsolete as to type, in bad condition, or worn out will not be permitted on the work.

5-5 Suitable Methods

The Contractor shall use such methods for the performance of the work embraced under these Specifications as will secure a satisfactory quality of work and rate of progress. Such methods shall meet the approval of the Engineer, and shall be submitted for approval before being used on the work. The Engineer reserves the right, during the progress of the work, to make suggestions and revisions in the methods in order that a high quality of work and satisfactory rate of progress may be obtained. When ordered by the Engineer, the Contractor shall discontinue unsuitable methods of work.

5-6 Order of Work

Where required by the Plans or Specifications, the Contractor shall follow the sequence of operations as set forth therein.

Full compensation for conforming to those 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.

5-7 Superintendence and Personnel

The Contractor shall designate in writing before starting work, an authorized representative who shall have the authority to represent and act for the Contractor, to receive suggestions or direction from the Engineer or Inspector and to see them faithfully executed. The Contractor shall provide the name, address, and phone number of each such superintendent or foreman so designated. When the Contractor is comprised of 2 or more persons, firms, partnerships or corporations functioning on a joint venture basis, the 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.

The 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 the Contractor's 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. All superintendents, foreman or other personnel responsible for coordinating with City Staff shall be capable of speaking and communicating fluently in English. If no one is available at the site that can communicate with staff, the City shall have the right to suspend the work until an individual able to effectively communicate arrives. All costs due to this suspension of work shall be at the expense of the Contractor.

If any subcontractor, workman, or person employed by the Contractor shall fail or refuse to carry out the directions of the Engineer, or shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, that person shall be removed from the work immediately upon notice by the Engineer and may not be employed again on the work.

All work shall be under general observation and inspection of the Engineer or the Inspector and any work done without the sanction or presence of the Engineer or Inspector will be subject to rejection.

5-8 Emergency Availability

The Contractor shall furnish to the Engineer, prior to the issuance of a "Notice to Proceed," a list of persons (minimum of 2 persons), together with their addresses and 24-hour telephone numbers, who are authorized to act on behalf of the Contractor in an emergency arising out of conditions at the work site after normal working hours. The Contractor shall conform to the requirements in Section 7-18, “Public Safety.”

5-9 Preservation of Property

In accordance with Sections 5-3, “Contractor’s Responsibility For Work,” and 7-16, “Injury or Damage to Persons or Property,” the Contractor shall be liable for any and all damage done to any public or private property, structure, facility or improvement due to his operations. Due care shall be exercised to avoid injury to existing street improvements or facilities, roadside trees and landscaping that are not to be removed, pole lines, fences, signs, survey markers and monuments, buildings and structures, conduits,

pipelines under or above ground, all street facilities, and any other improvements or facilities within or adjacent to the work area, or on private property adjacent to the work area, and all such facilities shall be protected from injury or damage. The Contractor shall provide and install suitable, approved safeguards to protect property or improvements from injury or damage.

If property or improvements are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored to a like new condition in accordance with the Specifications and Contract Documents under this Contract. In certain cases, where the Contractor damages an existing facility such as a curb return and or landing, the Engineer may require the Contractor at his expense to reconstruct the return to meet current Americans with Disabilities Act (ADA) requirements and standards.

The Engineer may make or cause to be made such temporary repairs as are necessary to restore to service any damaged facility. The cost of such repairs shall be borne by the Contractor and may be deducted by the City from any monies due or to become due to the Contractor under the Contract.

5-10 Protection of the Work

The Contractor shall provide and maintain proper barricades, fences, signal lights or watchmen to properly protect the work, persons, animals, and property against injury. The cost of such protection shall be included in the amount bid for the various items of work.

In accordance with Section 7-18, "Public Safety," the Engineer reserves the right to remedy any situation, condition, or neglect on the part of the Contractor as regards the protection of the work, the public, or property and to deduct the cost of such remedy from money due the Contractor, or levy as a fine in the case of non-public work.

5-11 Rights of Way

The City will provide the right of way for the work to be constructed as shown on the Plans. The Contractor shall bring all areas within temporary construction easements to a condition at least equal to that existing prior to their use, to the satisfaction of the Engineer. The Contractor shall not occupy property outside the right-of-way shown on the Plans, except by written agreement with the owner of said property, a copy of which shall be provided the Engineer.

Nothing in these Standard 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 owner, former owner, or tenant of such land, structure or building.

5-12 Disposal of Material Outside the Right of Way

The Contractor shall make arrangements for the legal disposal of non-hazardous materials outside the right of way and shall pay all costs involved. Disposal of hazardous material shall be handled in accordance with Section 7-14, "Trenches and Excavations; Hazardous Waste." The Contractors shall comply with the applicable diversion and recycling requirements of the City of Visalia Municipal Code for all materials disposed of outside of the right of way.

When any material is to be disposed of outside the right of way, the Contractor shall first obtain a written permit from the property owner on whose property the disposal is to be made and shall file with the Engineer said permit or a certified copy thereof. When material is disposed of as above provided, the Contractor shall conform to all requirements of the City Municipal Code pertaining to grading, hauling and filling of earth, including any permits or bonds so required. Hauling of any materials from the work site shall conform to the provisions in Section 6-12, "Materials Hauling."

The contractor shall clean up and dispose of all excess materials and other debris in any right of way or ground occupied by him and shall restore utilities and improvements on public or private property that has been used or damaged by his operations. Full compensation for all costs involved in disposing of materials as specified in this Section 5-12, including all costs of hauling and any landfill or other fees, shall be considered as included in the price paid for the Contract items of work involving such materials and no additional compensation will be allowed therefor. No additional payment will be granted the Contractor for inconvenience or delays encountered in complying with the requirements of this Section 5-12.

5-13 Electric And Water Service

The Contractor shall provide and pay for electric service for power and lighting required for the construction of the work of the Contract and shall maintain such service until the completion of the Contract.

The Contractor shall make all arrangements for securing any water necessary for the performance of the work. Water will be available from fire hydrants provided a permit and meter are obtained from the California Water Service Company. The Contractor shall be responsible for any fees imposed by the California Water Service Company for the Construction Water.

Water taken from a source other than the California Water Service Company system shall be approved by the Engineer in advance. Such water shall be chemically and biologically suitable for the intended use.

In conformance with the City of Visalia Landscape Standards and Specifications, the water supply for landscape planting and irrigation systems shall be provided by the Contractor in accordance with said document.

All costs for furnishing electric service and water, including water consumed for landscape irrigation and irrigation system testing, shall be included in the various related bid items of work; no additional payment will be made therefor.

5-14 Construction Surveying/Staking

For Non-Public projects the individual, group, or entity constructing the improvements will be responsible for providing the construction surveying/staking, and will be responsible for all costs associated therewith.

Unless otherwise specified in the Special Provisions, construction surveying and staking shall be provided by the City Surveying crew for City of Visalia Public projects.

Surveying and staking shall be conducted only by, or under the immediate supervision of, a person licensed by the State of California to practice Land Surveying. Surveying shall conform to the quality and practice required by the Engineer.

Where the City provides construction staking the exact locations of construction work will be indicated by the City of Visalia with location stakes when necessary. The Contractor shall not commence any construction without such stakes in place. The Contractor shall pay for all re-staking required should any stakes be lost or damaged. **The Contractor shall make all requests for construction staking in writing to the City of Visalia, a minimum of seventy-two (72) hours, not including weekends and holidays, in advance of the requested staking needed.**

The Contractor shall immediately inform the Engineer in writing of any discrepancies discovered during the course of the work between the Plans and the construction staking, and the Engineer shall promptly verify the same. Any work done after such discovery, until authorized, will be done at the Contractor's risk.

Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. Any deviation of constructed facilities from the grades shown on the Plans and staked in the field shall be the responsibility of the Contractor.

Grades for underground conduits will be set at the surface of the ground and the Contractor shall be responsible for transferring such grades to the bottom of the trench.

The Contractor shall preserve property line markers, corner survey markers, and benchmarks except where their destruction is unavoidable when the Contractor is proceeding in accordance with accepted practice. The Contractor shall contact the City Surveyor, Jeff Land, at (559) 713-4630, 72 hours, not including weekends and holidays, prior to disturbing any survey markers/benchmarks. Markers that are lost or disturbed by Contractor's operations shall be replaced at the Contractor's expense by a person appropriately licensed by the State of California for Land Surveying. Corner records for replaced monuments shall be filed with the County Surveyor prior to the final payment being made and/or the Notice of Completion being issued. All work to restore lost or disturbed markers shall be at the expense of the Contractor. The Contractor shall comply with the provisions in Section 37-2, "Survey Monuments."

The costs for replacing any survey markers/monuments damaged or removed during construction shall be included in the amount bid for the various items of work; no separate payment will be made therefor.

5-15 Cooperation

The Contractor shall cooperate in all respects with all public and private agencies, including, but not limited to, Irrigation Districts, Caltrans, Railroads, Schools & School Districts, California Water Service Co., Cable TV and Telephone Companies, Southern California Edison Co., the Visalia City Storm, Sewer, Parks, Solid Waste, Streets, Transit and Traffic Divisions and the respective Fire and Police Departments

The Contractor shall comply with the provisions in Section 8-15, "Utility and Non-Street Facilities; Potholing." 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 those limits, the Contractor shall cooperate with all the 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 2 or more contractors are employed on related or adjacent work, or obtaining materials from the same material source, each shall conduct their 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 their operations, and for loss caused the other due to unnecessary delays or failure to finish the work within the time specified for completion.

5-16 Maintaining Drainage

The Contractor shall provide and maintain drainage to the area of work. Temporary provisions for drainage of any area during construction where existing drainage facilities have been damaged or altered

or where normal drainage patterns of adjacent areas will be interrupted by the Contractor during his operations, shall be made by the Contractor and as directed by the Engineer.

The Contractor shall be responsible for diverting drainage around all proposed improvements during construction until the proposed improvements are accepted by the City. Any damage or additional costs incurred due to the failure of the Contractor to provide adequate drainage/divert drainage shall be repaired and paid for by the Contractor.

The Contractor shall be responsible for all damages to public or private property upstream or downstream of the work incurred due to failure to provide adequate drainage within and through the construction area or due to blockage of existing drainage facilities or pathways at or upstream from the area of work, or for re-routing flows to areas not historically receiving such drainage.

In the performance of Maintaining Drainage, the Contractor shall comply in all respects with Section 7-7, "Water Pollution Prevention."

The costs for Maintaining Drainage by the Contractor shall be included in the amount bid for the various items of work; no separate payment will be made therefor.

5-17 Inspection During Construction; Meetings

As provided in Section 5-1, "Authority of the Engineer," the Engineer will delegate authority to a representative Inspector who shall at all times have access to the work during construction and shall be furnished with every reasonable facility for ascertaining full knowledge relative to the progress, workmanship, and character of materials used and employed in the work. Prior to construction the Contractor shall be responsible for verifying all items that require inspection, sampling, and testing with the City Inspector. The Contractor shall be responsible for providing construction personal to assist the Inspector with completing inspection activities when requested. The Contractor shall provide facilities necessary to ensure the safety of the Engineer, City inspectors, and the personnel of authorized testing laboratories as appropriate. The City and its agents, employees, inspectors and testing laboratories may videotape, audiotape, or photograph any aspect of the Work or Contractor's activities as part of their documentation of the project and certain issues.

Whenever the Contractor varies the day, or period of the day, during which work is performed, he shall give due notice to the Engineer or Inspector so that proper inspection may be provided. Any work done in the absence of the Engineer or Inspector is subject to rejection.

For non-public work conducted under a City Permit, contact the City of Visalia Community Development Department regarding inspection fees and re-inspection fees. Such fees shall be applied in accordance with the fee schedule in effect at the time of permit issuance.

The inspection, approval and/or acceptance of the work shall not relieve the Contractor of any obligations to fulfill the Contract as prescribed. Defective work shall be made good and unsuitable materials may be rejected, even if unsuitable materials may have been previously overlooked by the Engineer or Inspector and accepted, or estimated for payment.

Projects financed in whole or in part with funds from sources other than the City shall be subject to inspection at all times by the agency providing said funds or its authorized agent.

Should a situation occur where an inspector is required to remain on site to inspect construction activities after normal working hours, the Contractor will be charged the full City hourly overtime rate for the

inspector. Should a Contractor request to work hours outside of normal working hours and should this request be granted the Contractor will be charged the full City hourly overtime rate for the inspector unless approved otherwise by the Engineer in writing. These charges will be deducted from the price paid to the Contractor in the case of a Public project. These charges will be levied as a fine in the case of a Non-Public project.

The Contractor shall coordinate with the City's Public Works Inspector during all phases of construction. The Inspector shall be notified a **minimum of forty-eight (48) hours in advance** to when an inspection is needed not including weekends and holidays.

When specified in the Special Provisions, the Contractor shall be required to attend meetings with the City at the frequency noted to review the construction progress and all construction issues. At the Engineer's option, the City may prepare minutes for each meeting and forward them to Contractor; Contractor's failure to correct the minutes within two (2) working days shall be deemed agreement with the content of the minutes. Either party has the right to audiotape or videotape the meeting.

5-18 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 those 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. If you fail to promptly notify the Engineer, you waive the differing site condition claim for the period between your discovery of the differing site condition and your notification to the Engineer. If you disturb the site after discovery and before the Engineer's investigation, you waive the differing site condition claim.

Upon written notification from the Contractor, the Engineer will investigate the conditions, and if the Engineer determines 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 the Engineer's determination whether or not an adjustment of the contract is warranted. No contract adjustment 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 conformance with the provisions in Section 4-10, "Changes," and Section 4-12, "Notices, Change Orders, and Claims."

5-19 Removal of Defective or Unauthorized Work

All work which is defective in its construction or deficient in any of the requirements of the contract documents shall be remedied or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed for such correction.

Whenever the Contractor varies the period during which the work is carried out each day, he shall give due notice to the Engineer, or Inspector, so that proper inspection may be provided. Any work done in the absence of the Engineer or Inspector will be subject to rejection and no compensation will be allowed therefor.

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 and will not be paid for.

5-20 Surface Restoration

The Contractor shall replace all graded surface material adjacent and/or appurtenant to the work removed, disturbed, or damaged by the Contractor's operations, and shall restore paving, curbing, sidewalks, gutters, landscaping, fences, lawn and other surfaces disturbed, to a like new condition in accordance with the Specifications or Plans, and shall furnish all labor and material incidental thereto. Where bid items are not provided for each type of restoration, full compensation therefor shall be included in the amount bid for the various items of Contract work. The Contractor shall comply with the provisions Section 19-3.5, "Restoration of Surfaces."

5-21 Final Cleanup

When construction is substantially complete, and prior to application for acceptance of the work, the Contractor shall clean all work areas and all grounds occupied by him in connection with the work of all debris, excess materials, temporary structures and equipment. All portions of the work shall be left in a neat, presentable condition. The roadways in which construction operations have been accomplished, as well as all haul roads upon which spillage has occurred, shall be swept clean, as directed by the Engineer. Roads adjacent to construction activity which have received dirt or debris tracked from the construction area shall also be swept and cleaned. Upon completion of Final Cleanup, the Contractor shall notify the Engineer in writing that the work is substantially complete in all parts and requirements and ready for final inspection as provided in Section 5-22, "Final Inspection."

If the Contractor fails to provide Final Cleanup to the satisfaction of the Engineer, a final inspection will not be performed by the Engineer until such cleanup is provided. If the contract time is exceeded due to the Contractor's failure to provide, or is late in providing, the required final cleanup, the provisions of Section 8-9, "Liquidated Damages," will be applied.

All costs for providing Final Cleanup shall be included in the various bid items of work; no additional payment will be made therefor.

5-22 Final Inspection

Whenever the Work provided and contemplated by the Contract is substantially complete, and all requirements have been met, and the final cleanup performed in accordance with Section 5-21, "Final Cleanup," the Contractor shall request in writing a final inspection be made by the Engineer. The written request shall include a statement that the Work has been completed in all parts and requirements of the Contract. For projects involving landscaping and irrigation systems, the maintenance period provisions listed in the City of Visalia Landscape Standards and Specifications apply.

The Engineer will determine the adequacy of the final cleanup, and if found not to be in compliance with said Section 5-21, will not make the final inspection and instead direct the Contractor to perform additional cleanup as required until compliance is reached.

Upon making a determination that the final cleanup is in compliance with said Section 5-21, the Engineer will conduct a final inspection. Representatives from various City Departments as well as other agencies who will own, operate, and maintain the improvements constructed by the Contractor will participate in the final inspection. The inspection should be completed within fifteen (15) working days. The time required by the Engineer and others to conduct the final inspection will not be counted against the allotted time for completion of the contract.

Upon completion of the final inspection, a list of items needing correction to comply with the contract documents, if any, will be provided by the Inspector or Engineer to the contractor. The time required to make such corrections will be charged against the allotted time for completion of the Contract. The Contractor shall notify the Inspector when the corrections have been completed and are ready for inspeciton.

Failure to complete the work in all parts and requirements of the contract including providing Final Cleanup in a timely manner to allow sufficient time to accomplish corrective work, any of which results in an overrun in contract time, the provisions of Section 8-9, "Liquidated Damages," will be applied.

5-23 Guarantee of Workmanship

In conformance with Sections 3-5, "Materials Statement, Samples and Guarantees," 6-10, "Guarantee of Materials," and 7-23, "Guarantee," the Contractor shall guarantee all materials, equipment and workmanship of the installation and Work for a period of one year from the recordation date listed on the recorded Notice of Completion approved by the City Council. Additional longer guarantees may be required by the Specifications. Should any material or appliance or any work develop any defect or weakness due, in the opinion of the Engineer, to the use of imperfect materials, equipment or workmanship, or failure to follow the Contract, including the Plans and Specifications, the Contractor shall be notified within the time period of the Guarantee, and shall immediately perform, at Contractor's expense, the necessary repairs or replacements to make the defective item or items suitable and satisfactory. Expiration of the Guarantee time period shall not void an obligation of the Contractor which is based on a timely notice by the City. Should exigencies necessitate the repairs before the Contractor could be notified, or should the Contractor refuse to make the repairs or replacements within a reasonable period of time, the Engineer shall have the right to make the necessary repairs or replacements at the expense of the Contractor, preserving as far as possible all available evidence of the cause of failure.

This guarantee provision applies to all work performed in City right of way or property, whether by contract with the City or work performed under Encroachment Permit by or for utility or communications companies or other private entities. For work done under Encroachment Permit, failure to correct or pay for defective workmanship or materials may result in denial of future permits to perform work in City rights of way or property.

All costs for providing the required Guarantees of Workmanship shall be included in the various bid items; no additional payment will be made therefor.

5-24 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:

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

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

C. 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 were to be paid for on a force account basis as provided in Section 9-1.04, "Force Account," of the State Standard Specifications.

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

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

The provisions of this Section 5-24 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; and the City 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 cost reduction proposal. If a cost reduction proposal is similar to a change in the Plans or Specifications under consideration by the City for the project at the time the proposal is submitted, or if the proposal is based upon or similar to these Specifications, the Contract Documents or Standard Drawings adopted by the City after the advertisement for the contract, the Engineer will not accept the proposal, and the City reserves the right to make the 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 specifies that a decision thereon should be made, or such other date as the Contractor may subsequently have specified in writing, the 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 the proposal. In determining the estimated net savings, the right is reserved to disregard the contract bid prices if in the judgment of the Engineer, those prices do not represent a fair measure of the value of work to be performed or to be deleted.

The City reserves the right where it deems such action appropriate, to require the Contractor to share in the City's costs of investigating a cost reduction proposal submitted by the Contractor as a condition of considering the proposal. Where this condition is imposed, the Contractor shall indicate acceptance thereof in writing, and that acceptance shall constitute full authority for the City to deduct amounts payable to the City from any moneys 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 the acceptance will be by a contract change order, which shall specifically state that it is executed pursuant to this Section 5-24. The change order shall incorporate the changes in the plans and specifications which are necessary to permit the cost reduction proposal or that part of it as has been accepted to be put into effect, and shall include any conditions upon which the City's approval thereof is based if the approval of the City 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 that estimated net savings amount. The Contractor's cost of preparing the cost reduction incentive proposal and the City's costs of investigating a cost reduction incentive proposal, including any portion thereof paid by the Contractor, shall be included in consideration in determining the estimated net savings in construction costs.

Acceptance of the cost reduction proposal and performance of the work thereunder 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 change order.

The City expressly reserves the right to adopt a cost reduction proposal for general use on contracts administered by the City when it determines that the proposal is suitable for application to other contracts. When an accepted cost reduction proposal is adopted for general use, only the Contractor who first submitted that proposal will be eligible for compensation pursuant to this section, and in that case, only as to those contracts awarded to that Contractor prior to submission of the accepted cost reduction proposal and as to which the 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 5-24 if the identical or similar previously submitted proposals were not adopted for general application to other contracts administered by the City. Subject to the provisions contained herein, the City 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.

5-25 Character of Workers

If any subcontractor or person employed by the Contractor shall fail or refuse to carry out the directions of the Engineer or shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the requisition of the Engineer, and such person shall not again be employed on the Work.

SECTION 6 CONTROL OF MATERIALS

6-1 Source of Supply and Quality of Materials

The Contractor shall furnish all materials required to complete the work. Only materials conforming to the requirements of the plans and specifications shall be incorporated in the work. The materials furnished and used shall be new, except as may be provided elsewhere in these specifications, on the plans or in the special provisions. The materials shall be manufactured, handled and used in a workmanlike manner to ensure 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 the Engineer's designated representative. The Contractor shall furnish without charge such samples as may be required.

The Contractor shall furnish the Engineer a list of the Contractor's sources of materials and the locations at which those materials will be available for inspection. The list shall be furnished to the Engineer in sufficient time to permit inspecting and testing of materials to be furnished from the listed sources in advance of their use. The Engineer may inspect, sample or test materials at the source of supply or other locations, but the 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 the Engineer's authorized representative has free access at all times to the material to be inspected, sampled or tested.

It is understood that the 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 the 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 Engineer shall not relieve the Contractor or the Contractor's 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.

6-2 Storage and Protection of Materials

The Contractor shall provide and maintain storage facilities and employ such measures as will preserve the specified quality and fitness of materials to be used in the work. Stored materials shall be reasonably accessible for inspection. The Contractor shall also adequately protect new and existing work and all items of equipment for the duration of the Contract.

The Contractor shall provide adequate equipment and means for construction of the work. The Contractor shall remove such equipment and/or materials when in the opinion of the City, the equipment is unsuitable for performing the work or unsatisfactory, including equipment which is obsolete, in bad repair or worn out.

If the Contractor is storing equipment and materials on private property, the Contractor shall submit to the City a letter of permission signed by the owner of the private property allowing the Contractor to use the private property. Owner authorization is required prior to use of private property.

The Contractor shall provide his own area of storage for equipment and materials used on the project. Such equipment and/or materials shall be stored off the roadway. Equipment and materials shall not be stored within any street right of way unless specifically approved by the Engineer in writing. The storage of said equipment or materials shall be at the exclusive risk of the Contractor and he shall pay all costs for

any loss or damages resulting from the storage. Security fencing or security guards, if required by the Contractor, shall be provided at his own expense. Upon completion of the project the Contractor shall restore the areas used for storage to their original condition.

During construction hot mix asphalt and cold mix asphalt materials shall not be dumped or piled on any existing street improvements in the right of way that are not being removed/replaced. All rubble and other materials shall be cleaned up and removed from the street right of way at the end of each day. When materials and equipment are being temporarily stored in the right of way during the work day the Contractor shall be responsible for parking/placing equipment and materials along the roadway in a manner that provides safe passage for the public.

Full Compensation for conforming to the requirements of this Section shall be considered as being included in the total Contract price and no additional compensation shall be made therefore.

6-3 Defective Material

All materials not conforming to the requirements of the Plans and Specifications shall be considered as defective, and all such materials, whether in place or not, shall be rejected and shall be removed immediately from the site of the work at the Contractor's expense unless otherwise permitted by the Engineer. No rejected material, the defects of which have subsequently been corrected, shall be used until approved by the Engineer.

Upon failure on the part of the Contractor to comply with any order of the Engineer made under the provisions of this article, the Engineer shall have authority to remove and replace defective material, and to deduct the cost of removal and replacement from any monies due or to become due to the Contractor.

6-4 Trade Names or Equal

Whenever the material or article to be furnished is described by trade name, brand name, or other reference is made to specific manufacturer or supplier, "or approved equal," or "City approved equal," it shall be understood that the use of a trade name or brand name is intended to describe a specific quality of material to be used in the project. The City's intention shall not be interpreted to exclude or omit the products of any responsible manufacturer if such products are equal or superior in every respect to those specifically described.

No substitutions shall be used in the work without prior approval of the Engineer. The burden of proof as to the quality and suitability of alternatives shall be upon the Contractor, and the Contractor 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 the Engineer's decision shall be final.

Upon submittal by the Contractor, the Engineer will determine the acceptability of the requested substitution, which may include such samples and tests as may be required by Section 6-8, "Samples and Tests," herein. In such cases of proving equal status, the Contractor shall pay the costs of required testing. No time extension to any Contract will be allowed due to any such proposed substitution, or the time required to determine the acceptability of such substitutions.

6-5 Certificates of Compliance

A Certificate of Compliance stating that the materials to be used in the work comply in all respects with the requirements of the Plans and Specifications shall be supplied to the Engineer upon request, or if required to be submitted by the Contract Documents. The certificate shall be signed by the manufacturer of the material or the manufacturer of assembled material delivered to the work, and the lot so certified

must be clearly identified in the certificate. Certificates of Compliance shall be provided in triplicate and shall be submitted to the Engineer for review prior to the use of the product or material in the work.

All materials used on the basis of a Certificate of Compliance may be tested and sampled 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 form of the Certificate of Compliance and its disposition shall be as directed by the Engineer. No additional payment will be made for furnishing certificates and all costs incurred shall be included in the various bid items; no additional payment will be made therefor.

6-6 Foreign Materials

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 job site. The provisions in Section 8-9, "Liquidated Damages," will apply.

The manufacturer, producer, supplier, or fabricator of foreign material shall furnish to the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-5 "Certificates of Compliance." In addition, certified mill test reports clearly identifiable to the lot of material shall be furnished where required in these specifications, the Contract Documents, or otherwise requested by the Engineer. The Contractor is directed to the State & Federal Funding Requirements section of these Construction Specifications to determine if the project is subject to the "Buy America" requirements. Where the "Buy America" provisions apply, they supersede any specifications listed in this section.

6-7 Local Materials

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 those designated mandatory sources.

The Contractor shall make all arrangements necessary to obtain materials from any local material source other than a mandatory local material source. If the Contractor elects to obtain material from any other non-mandatory source, the Contractor shall furnish the Engineer with satisfactory evidence that the Contractor has entered into an agreement with the property owner for obtaining material from that source and with copies of any necessary permits, licenses and environmental clearances before removing any material from those sources.

The furnishing of local materials from any source is subject to the provisions of Section 2-2, "Examination of Site of Work, Plans, Specifications and Contract Documents." Unless described in the Contract Documents 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 street or highway. No payment will be made for material obtained in violation of this provision.

The Contractor shall, at the Contractor's expense, make any arrangements necessary for hauling over local public and private roads from any source. Local materials will be subject to the provisions of Section 6-8, “Samples and 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 6-7, for furnishing and producing materials from any source shall be considered as included in the price paid for the contract item of work involving the material and no additional compensation will be allowed therefor.

6-8 Samples and Tests

For Non-Public projects the permittee, individual, group, or entity constructing the improvements will be responsible for retaining a Certified Testing Laboratory to complete all sampling, materials tests, and compaction testing required by the City of Visalia. Testing reports shall be submitted to the City for acceptance of all improvements. Reports shall be formatted in a manner that defines the limits of testing, materials tested, and passing or failing results in a manner that is deemed satisfactory by the City. This said individual, group, or entity will be responsible for all costs associated with retaining said testing laboratory and all costs to complete the required testing.

For City of Visalia Public projects payment for testing services will be made in accordance with the remainder of Section 6-8 and Section 6-9.

All sampling and testing shall be done in the presence of the Inspector.

In accordance with Section 6-1, “Source of Supply and Quality of Materials,” at the option of the Engineer, the source of supply of each of the materials shall be approved by the Engineer before delivery is started and before such material is used in the work. Representative preliminary samples of the character and quality prescribed shall be submitted by the Contractor or producer of all materials to be used in the work, for testing or examination as desired by the Engineer. The Contractor shall furnish and deliver such samples of materials as are requested by the Engineer, without charge. No material requiring source testing shall be used until it has been approved by the Engineer. Samples will be secured and tested whenever necessary to determine the quality of materials.

Whenever a reference is made in these Standard Specifications to a specification, manual or test designation either of the ASTM, the AASHTO, Federal Specifications, or any other recognized national organization, and the number or other identification representing the year 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 the specification, manual or test designation provides for test reports (such as certified mill test reports) from the manufacturer, copies of those reports, identified as to the lot of material, shall be furnished to the Engineer by the Contractor. The manufacturer's test reports shall supplement the inspection, sampling and testing provisions in this Section 6, 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 the Engineer's 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 the Contractor's expense. The number of the samples and test specimens shall be entirely at the discretion of the Engineer. Unidentified metal products, such as sheet, plate and hardware shall be subject to the requirements of Section 55-1.02A(6), "Unidentified Stock Material,” of the State Standard Specifications.

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 6-5, "Certificates of Compliance." Samples of material from local sources shall be taken by or in the presence of the Engineer or Inspector; otherwise, the samples will not be considered for testing.

All tests of materials furnished by the Contractor shall be made in accordance with the commonly recognized standards of national organizations, and such special methods and tests as prescribed in these Specifications.

Whenever the specifications require compliance with specified values for the following properties, tests will be made by the American Society for Testing and Materials (ASTM) test or California Test (CT) indicated unless otherwise specified:

ASTM Test or California Test	**Properties**
Soils and Aggregates	
ASTM D1557	Relative Compaction
ASTM C136 or CT 202	Grading (Sieve Analysis)
ASTM C117	Wash Analysis finer than #200 Sieve
ASTM D2419 or CT 217	Soil Sand Equivalent
CT 301	"R" Value Determination
ASTM D3744 or CT 229E	Durability Index of Aggregate
ASTM D6938	In-Place Density & Moisture Content by Nuclear Gauge
Hot Mix Asphalt	
ASTM D2172, D6307 or CT 382	Bitumen Content
ASTM D5444	Gradation of Extracted Sample
CT 309	Maximum Theoretical Density (Rice Method)
CT 366	Stability Value
CT 367	Air Void Content
CT 370	Moisture Content
ASTM D2950 & CT 375	In Place Density and Relative Compaction by Nuclear Gauge

The City reserves the right to perform or have the Contractor perform any additional tests the City requires to verify that all materials and improvements meet the requirements of the Contract Documents. Concrete testing may also be performed including but not limited to slump tests, strength testing or any other material testing required. Any materials or improvements that fail to meet Contract requirements shall be removed and replaced at the expense of the Contractor.

Unless provided otherwise in the Specifications, the cost of original testing shall be borne by the City for work performed under Contract for the City. Any retesting required because of failure of materials to pass the initial test shall be done at the expense of the Contractor. All other tests required for work not under contract with the City, and located in City streets and alleys, or on private property, shall be borne by the Contractor, or permittee in the case of non-public work performed under a City Encroachment Permit.

6-9 Compaction Tests

Relative compaction of soil in roadways, trenches, structural backfills, embankments, and for any other improvement shall be determined by the laboratory standard of test procedure ASTM D1557. To be

considered a "passing" test, all compaction tests must meet the required relative percent compaction and must indicate a moisture content within 2% ± of optimum. The Nuclear Gauge Method (ASTM D6938), Drive-Cylinder method (ASTM D2937), the Sand Cone Method (ASTM D1556), or other methods approved by the Engineer may be used for sampling of compacted soil. The Contractor's responsibility for costs associated with testing shall be in accordance with the provisions of Section 6-8, "Samples and Tests."

The City requires haunch compaction testing in trenches where pipes with an inner diameter of 24 inches or larger are being installed. The Contractor is responsible for planning construction means and methods appropriately and for providing safe access to City and testing staff to perform the required compaction testing in the pipe haunch and trench areas.

Density of Hot Mix Asphalt shall be as required in Section 28 "Hot Mix Asphalt".

The contractor shall give **notice to the Inspector a minimum of two (2) working days not including weekends and holidays** in advance of when the required compaction tests are to be taken. For Public projects, normally, the first series of tests will be taken at the expense of the City. Any further tests needed to check re-compacted areas because of a failure to pass the original test shall be at the expense of the Contractor. The Engineer or Inspector shall specify the locations where compaction tests are to be taken.

6-10 Guarantee of Materials

The Contractor shall comply with the provisions in Sections 3-5, "Materials Statement, Samples and Guarantees," 5-23, "Guarantee of Workmanship," and 7-23, "Guarantee." The Contractor shall guarantee all materials, including landscape plantings and irrigation systems, equipment, and workmanship of the installation for a period of one year from the recordation date listed on the recorded Notice of Completion accepted by the City Council. Additional guarantees may be required by the Contract Documents. Should any material or appliance or any work develop any defect or weakness due, in the opinion of the Engineer, to the use of imperfect materials, equipment or workmanship, or failure to follow the Contract, including the Plans and Specifications, the Contractor shall be notified within the time period of the Guarantee, and shall immediately perform, at Contractor's expense, the necessary repairs or replacements to make the defective item or items suitable and satisfactory. Expiration of the Guarantee time period shall not void an obligation of the Contractor to repair or replace which is based on a timely notice by the City. Should exigencies be such as to necessitate the repairs before the Contractor could be notified, or should the Contractor refuse to make the repairs or replacements within a reasonable period of time, the City shall have the right to make the necessary repairs or replacements at the expense of the Contractor, preserving as far as possible all available evidence of the cause of failure.

All costs for providing guarantees shall be included in the various bid items; no additional payment will be made therefor.

6-11 Salvage of Materials

Where salvage of material is indicated on the Plans or in the Contract Documents, salvaged material shall remain the property of the City and shall be delivered and deposited by the Contractor at the location specified in the Plans, Contract Documents, or by the Engineer. No separate payment will be made for such salvaging and delivering of material; the cost thereof shall be included in the various bid items of work.

6-12 Materials Hauling

Hauling of all materials to, from, or on, the jobsite shall be performed in strict accordance with the California Vehicle Code (CVC) Section 23114 as it relates to covering, spillage, and other requirements. All references to "highway" in the CVC shall mean City streets as well as State highways.

6-13 Material Submittal Package

Four (4) unbound copies of the materials submittal package for the project shall be delivered to the Engineer for acceptance at the preconstruction meeting. The material submittal package shall include a table of contents, manufacturer's submittal data sheets, statements that the products meet the requirements of the Specifications for the project, MSDS safety sheets, and any other items requested by the Engineer to verify compliance with the Contract Documents. The materials submittal package shall be accepted by the Engineer prior to construction.

SECTION 7 LEGAL RELATIONS AND RESPONSIBILITY

7-1 Laws to be Observed

The Contractor shall be and remain fully informed of all existing and future State and Federal laws, City and County ordinances and regulations, and revisions thereto that in any way affect those engaged or employed in or on the work or in any way affect the conduct of the work, and of all orders or decrees of governmental or other bodies or officials having jurisdiction or authority over the same. The Contractor, and all subcontractors, persons, firms or corporations employed by or under the control of the Contractor, shall at all times observe and comply with all such laws, ordinances and regulations, orders and decrees. The Contractor shall protect and indemnify the City and its officers, employees and agents, against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree whether by the Contractor, the Contractor's employees, subcontractors, persons, firms or corporations employed by the Contractor. If any discrepancy or inconsistency is discovered in the Plans or Specifications 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.

7-2 Labor Code Requirements

The following requirements of the State Labor Code apply to all City Contracts:

7-2.1 Hours of Labor

Eight hours labor constitutes a legal day's work. The Contractor or any subcontractor under the Contractor shall forfeit, as a penalty to the State of California, twenty five dollars ($25) or such other amount as may be amended by the Department of Industrial Relations from time to time for each worker employed in the execution of the contract by the respective Contractor or subcontractor for each calendar day during which that worker 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 requirements 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 Section 1815 thereof.

7-2.2 Prevailing Wage

For projects that are fully funded with local monies, the City of Visalia may waive the requirement for Prevailing Wages pursuant to Resolution 83-02, adopted by the City of Visalia City Council on January 3, 1983. See the Notice to Contractors and the Special Provisions to determine if a prevailing wage rate is established for this project. When a project requires prevailing wage rates, the following requirements listed in this Section 7-2.2 shall dictate.

The Contractor and any subcontractor under the Contractor shall comply with Labor Code Sections 1774 and 1775. Pursuant to Section 1775, the Contractor and any subcontractor under the Contractor shall forfeit to the State or political subdivision on whose behalf a contract is awarded a penalty of not more than fifty dollars ($50), or such other amount as may be amended from time to time by the Department of Industrial Relations for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of Industrial Relations for the work or craft in which the worker is employed for any public (City) work done under the contract by the Contractor or by any subcontractor under the Contractor in violation of the requirements 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 on consideration of the mistake, inadvertence, or neglect of the Contractor or subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or subcontractor in meeting their respective prevailing wage obligations, or the willful

failure by the Contractor or subcontractor 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 or subcontractor had knowledge of the obligations under the Labor Code. In addition to the penalty and pursuant to Labor Code Section 1775, the difference between the 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 or subcontractor. If a worker employed by a subcontractor on a public works (City) project is not paid the general prevailing per diem wages by the subcontractor, the prime contractor of the project is not liable for the penalties described above unless the prime contractor had knowledge of that failure of the subcontractor to pay the specified prevailing rate of wages to those workers or unless the prime contractor fails to comply with all of the following requirements:

A. The contract executed between the contractor and the subcontractor for the performance of work on the public works (City) project shall include a copy of the requirements in Sections 1771, 1775, 1776, 1777.5, 1813 and 1815 of the Labor Code.

B. The contractor shall monitor the payment of the specified general prevailing rate of per diem wages by the subcontractor to the employees, by periodic review of the certified payroll records of the subcontractor.

C. Upon becoming aware of the subcontractor's failure to pay the specified prevailing rate of wages to the subcontractor's workers, the contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for work performed on the public works (City) project.

D. Prior to making final payment to the subcontractor for work performed on the public works (City) project, the contractor shall obtain an affidavit signed under penalty of perjury from the subcontractor that the subcontractor has paid the specified general prevailing rate of per diem wages to the subcontractor's employees on the public works (City) project and any amounts due pursuant to Section 1813 of the Labor Code.

Pursuant to Section 1775 of the Labor Code, the Division of Labor Standards Enforcement shall notify the Contractor on a public works (City) project within 15 days of the receipt by the Division of Labor Standards Enforcement of a complaint of the failure of a subcontractor on that public works (City) project to pay workers the general prevailing rate of per diem wages. If the Division of Labor Standards Enforcement determines that employees of a subcontractor were not paid the general prevailing rate of per diem wages and if the City did not retain sufficient money under the contract to pay those employees the balance of wages owed under the general prevailing rate of per diem wages, the contractor shall withhold an amount of moneys due the subcontractor sufficient to pay those employees the general prevailing rate of per diem wages if requested by the Division of Labor Standards Enforcement. The Contractor shall pay any money retained from and owed to a subcontractor upon receipt of notification by the Division of Labor Standards Enforcement that the wage complaint has been resolved. If notice of the resolution of the wage complaint has not been received by the Contractor within 180 days of the filing of a valid notice of completion or acceptance of the public works (City) project, whichever occurs later, the Contractor shall pay all moneys retained from the subcontractor to the City. These moneys shall be retained by the City pending the final decision of an enforcement action.

Pursuant to the requirements in Section 1773 of the Labor Code, 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 the Labor Code, apprenticeship or other training programs authorized by Section 3093 of the Labor 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 general prevailing wage rates and any applicable changes to these wage rates are available at the office of the Purchasing Division, City Hall West, 707 W. Acequia, Visalia, CA 93291. General prevailing wage rates are also available from the California Department of Industrial Relations' Internet Web Site at: http://www.dir.ca.gov.

The wage rates determined by the Director of Industrial Relations 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 indicated in the wage rate determinations to obtain predetermined wage changes. Pursuant to Section 1773.2 of the Labor Code, general prevailing wage rates shall be posted by the Contractor at a prominent place at the site of the work.

Changes in general prevailing wage determinations 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 ten (10) days prior to the date of the Notice to Contractors for the project.

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 increases is one of the elements to be considered by the Contractor in determining the bid, and will not under any circumstances be considered as the basis of a claim against the City on the contract.

7-2.3 Travel and Subsistence Payments

The Contractor shall make travel and subsistence payments to each workman, needed to execute the work, in conformance with the requirements in Labor Code Section 1773.8.

7-2.4 Payroll Records

The Contractor shall conform to the requirements in Labor Code Section 1776, a portion of which is quoted below. Regulations implementing Labor Code Section 1776 are located in Sections 16016 through 16019 and Sections 16207.10 through 16207.19 of Title 8, California Code of Regulations.

A. Each contractor and subcontractor shall keep accurate payroll records, 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 project for which a Contract is awarded by the City. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

   1. The information contained in the payroll record is true and correct.
   2. The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works (City) project.

B. The payroll records 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:

1. 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.
2. A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the awarding body, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.
3. A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (2), 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. The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.

D. A contractor or subcontractor 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.

E. 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 a manner so 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 the subcontractor performing the contract shall not be marked or obliterated.

F. 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.

G. The contractor or subcontractor shall have 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10 day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty five dollars ($25) (or such other amount as may be amended from time to time by the Department of Industrial Relations- added by City) 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. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section."

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

For all prevailing wage projects, 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, the employee's correct classification, total hourly 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 that name appears. The payroll shall be accompanied by a "Statement of Compliance" signed by the employer or the employer's 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 State 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 as requested by the Engineer for all work performed during the monthly period ending on or before the first of that month, the City will retain an amount equal to 10 percent of the estimated value of the work performed during the month from the next monthly estimate, except that this retention shall not exceed $10,000 nor be less than $1,000, or such other amount as may be determined from time to time by the State Department of Industrial Relations. Retentions for failure to submit satisfactory payrolls shall be additional to all other retentions 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 3 years from the date of completion of the contract.

7-2.5 Labor Nondiscrimination

The Contractor shall comply with 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."

The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

7-2.6 Apprentices

For all prevailing wage projects, the Contractor and subcontractors shall comply with the provisions in Sections 1777.5, 1777.6 and 1777.7 of the California Labor Code and Title 8, California Code of Regulations Section 200 et seq. To ensure compliance and complete understanding of the law regarding apprentices, and specifically the required ratio thereunder, the Contractor and each subcontractor should, where some question exists, contact the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, CA 94102, or one of its branch offices prior to commencement of work on the contract. Responsibility for compliance with this section lies with the Contractor. It is State and City policy to encourage the employment and training of apprentices on public works contracts as may be permitted under local apprenticeship standards.

7-2.7 Workers' Compensation

Pursuant to the requirements in Section 1860 of the Labor Code, the Contractor will be required to secure the payment of workers' compensation to the Contractor's employees in conformance with the requirements in Section 3700 of the Labor Code and in accordance with the provisions of Section 7-4, “Contractor’s Insurance Requirements And Hold Harmless.”

7-2.8 Civil Wage and Penalty Assessments

The Contractor is required to comply with applicable portions of the Labor Code related to public works contracts and subject to wage and penalty assessments by the California Labor Commission for failure to abide by those requirements. The City as the awarding body will follow the requirements of the Labor Code, including Section 1727 relating to the withholding of payments due the Contractor in order to satisfy any civil wage or penalty assessments issued by the Labor Commissioner.

7-3 Contractor's Licensing Laws

All bidders and contractors shall be licensed in accordance with the laws of this State, specifically the provisions the Business and Professions Code, Division 3, Chapter 9. Any bidder or contractor not so licensed is subject to the penalties imposed by such laws.

In accordance with the requirements in Public Contract Code Section 10164, in all contracts where Federal funds are involved, the Contractor shall be properly licensed at the time the Contract is awarded.

7-4 Contractor's Insurance Requirements and Hold Harmless

Contractor hereby agrees to indemnify and hold City and its officers, agents, employees and assigns, harmless from any liability imposed for injury (as defined by Government Code 810.8), whether arising before or after completion of the work hereunder, or in any manner directly or indirectly caused, occasioned or contributed to, or claimed to be caused, occasioned or contributed to, in whole or in part, by reason of any act or omission, including strict liability or negligence of Contractor, or of anyone acting under Contractor's direction or control or on its behalf, in connection with or incident to or arising out of the performance of this contract.

It is the intent of the parties that Contractor will indemnify, defend, and hold harmless City and its officers, agents, employees, and assigns, from any and all claims, demands, costs, suits or actions as set forth above regardless of the existence of passive concurrent negligence, on the part of the City or anyone acting under its direction or control or on its behalf. It is further the intent of the parties that this indemnification requirement is not intended to relieve City from liability for the active negligence of City, its officers, agents and employees.

The Contractor shall continuously protect City property, including work under construction, from damage, loss, or liability of any kind to persons or property arising in connection with the contract, direct or indirect, including that arising from rainfall, flood waters, and other action of the elements and all acts of third parties.

This indemnity and hold harmless provision, insofar as it may be adjudged to be against public policy, shall be void and unenforceable only to the minimum extent necessary so that the remaining terms of this indemnity and hold harmless provision may be within public policy and enforceable.

In an emergency affecting the safety of life or limb, work site, or any property, the Contractor is hereby permitted and directed to act at their discretion to prevent such threatened loss of injury, and in the event any instructions are given by the City of Visalia in an emergency, the Contractor shall unconditionally comply therewith.

With respect to the performance of work under this agreement, the Contractor shall maintain and shall require all of its subcontractors to maintain insurance as described below:

Worker's Compensation insurance with statutory limits, and employer's liability insurance with limits of not less than $1,000,000 per accident.

Commercial General Liability insurance with a combined single limit of not less than $1,000,000 per occurrence. Such insurance shall include products/completed operations liability, owner's and Contractor's protective, blanket contractual liability, personal injury liability, broad form property damage coverage and explosion, collapse and underground hazard coverage. Such insurance shall (a) name City, its appointed and elected officials, officers, employees and agents as additional insureds; and (b) be primary with respect to any insurance or self-insurance programs maintained by the City; and (c) contain Standard cross liability provisions. Such additional insured endorsement maintained by contractor and its subcontractors shall not be required to provide coverage for City for the active negligence of City.

Commercial Automobile Liability insurance with a combined single limit of not less than $1,000,000 per occurrence. Such insurance shall include coverage for owned, hired and non-owned automobiles and shall be provided by a business automobile policy.

Contractor shall furnish properly executed certificates of insurance to City prior to commencement of work under this agreement, such certificates shall:

1. Clearly evidence all coverage required above, including specific evidence of a separate endorsement naming the City as an additional insured;

2. Indicate whether coverage provides is on a claims made or occurrence basis; and

3. Provide that such insurance shall not be materially changed, terminated, or allowed to expire except on 30-days prior written notice to City's Purchasing Division, Attention:

Purchasing
707 W. Acequia Avenue
Visalia, CA 93291

Such insurance shall be maintained from the time work first commences until completion of the work under this Agreement if an occurrence policy form is used. If a "claims made" policy is used, coverage shall be maintained during the contract term and for a period extending 5 years beyond the contract date. Contractor shall replace such certificates for policies expiring prior to completion of work under this agreement and shall continue to furnish certificates 5 years beyond the contract term, when Contractor has a "claims made" form(s). If Contractor, for any reason, fails to maintain insurance coverage which is required pursuant to this agreement, the same shall be deemed a material breach of contract. City, at its sole option, may terminate this agreement and/or obtain damages from the Contractor resulting from said breach. Alternatively, City may purchase such required insurance coverage, and without further notice to Contractor, City may deduct from sums due to Contractor any premium costs advanced by City for such insurance.

This insuring provision, insofar as it may be adjudged to be against public policy or in violation of Insurance Code Section 11580.04, shall be void and unenforceable only to the minimum extent necessary so that the remaining terms of the insuring provisions herein may be within public policy and enforceable.

All costs for compliance with this Section 7-4 shall be included in the various items of work; no separate payment will be made therefor.

7-5 Vehicle Code

Pursuant to the authority contained in Vehicle Code Section 591, the City has determined that within those areas that are within the limits of the project and are open to traffic, the Contractor shall comply with all the requirements set forth in Divisions 11, 12, 13, 14 and 15 of the Vehicle Code. In accordance with the statement in Vehicle Code Section 591, this section shall not relieve the Contractor or any person from the duty of exercising due care. The Contractor shall take all necessary precautions for safe operation of the Contractor's equipment and the protection of the public from injury and damage from the Contractor's equipment.

7-6 Air Pollution Control

The Contractor shall refer to the Special Provisions for a listing of the total land disturbance area associated with the project. For all projects, the Contractor shall comply with State 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, specified in Section 11017 of the Government Code. The Contractor shall also comply with all of the requirements of Regulation VIII of the San Joaquin Valley Air Pollution Control District (APCD). It will be the Contractor's responsibility to contact the APCD to determine the requirements of said Regulation and any costs related to compliance therewith. All costs for compliance, including any permit fees, shall be included in the various items of work; no separate or additional payment will be made therefor. Reference is made to Section 7-10, "Permits and Licenses."

For Public projects, in addition to the foregoing requirements, for projects specified in the Contract Specifications to be subject to Rule 9510 of the APCD, the Contractor shall, before submitting a bid, contact the APCD and determine the project-specific requirements of said Rule. Any project-specific permit fee will be paid by the City. All other costs for compliance with the Rule 9510 requirements, including submittal of all required documentation during the life of the project, shall be included in the various items of work. No separate or additional payment will be made therefor. Reference is made to Section 7-10, "Permits and Licenses."

For Non-Public projects, the individual, group, or entity that owns the project will be responsible for all costs associated in complying with APCD Rule 9510.

The Contractor shall also comply with the provisions in Section 10, "Dust Control."

7-7 Water Pollution Prevention

The work for which a Contract is awarded is subject to the provisions and requirements of the State General Construction Activity Storm Water Permit (General Construction Permit). The Contractor shall be responsible for complying with all current General Construction Permit requirements, as adopted and enforced by the State Water Resources Control Board (SWRCB) including any future revisions to that permit. The Contractor shall indemnify, and hold harmless the City for failure to comply with any provision or requirement of the General Construction Permit.

The Contractor shall exercise every reasonable precaution and shall conduct and schedule operations so as to protect all storm drain systems, storm water retention/detention basins, irrigation canals, or natural streams located within, adjacent to, or in any way connected with, the project from pollution with mud, silt, fuels, oils, bitumens, calcium chloride, pesticides, herbicides, and any other harmful materials. The Contractor shall conduct water pollution prevention on all contracts awarded by the City as required by this Section. For Non-Public projects the individual, group, or entity that owns the project will be responsible for performing all permitting and all water pollution prevention in accordance with this

section. The Contractor shall refer to the Special Provisions for a listing of the total land disturbance area associated with the construction project to determine which section applies to this project.

For Projects with a land disturbance area less than 1 acre:
The project is under the minimum threshold of the State Water Resource Control Board (SWRCB) General Construction Permit and does not require a project specific Storm Water Pollution Prevention Plan (SWPPP). However, the contractor shall be responsible for developing a water pollution control drawing and implementing appropriate Best Management Practices (BMP's) throughout construction to eliminate any pollutants from entering the city storm drainage system, irrigation canals, or natural streams. BMP's required for the project may include, but are not limited to: Storm Drain Inlet Protection, Wind Erosion Control, Stabilized Construction Entrance/Exit, Street Sweeping and Vacuuming, Material Delivery and Storage, Stockpile Management, Solid Waste Management, Hazardous Waste Management, Concrete Waste Management, Sanitary/Septic Waste Management, and Liquid Waste Management. A copy of the California Stormwater Quality Association (CASQA) BMP handbook can be printed at the following website address http://www.cabmphandbooks.com/.

For Projects with a land disturbance area greater than 1 acre:
The project results in a land disturbance of greater than one acre and is therefore over the minimum threshold of the State Water Resource Control Board (SWRCB) General Construction Permit and requires a project specific Storm Water Pollution Prevention Plan (SWPPP). The SWPPP shall meet the requirements of California's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Construction General Permit SWRCB Order No. 2009-0009-DWQ as amended from time to time. Construction work shall not commence until the SWPPP is completed, approved, and all fees are paid.

The Contractor shall retain at his own expense a consultant certified as a Qualified SWPPP Developer (QSD) under the requirements of the General Permit to develop the SWPPP and complete all of the required information/uploading on the State's Storm Water Multiple Application and Report Tracking System (SMARTS). A City of Visalia representative will be available to act as the Legally Responsible Person (LRP) under the SMARTS system. Prior to certification, the Contractor shall provide the City with two (2) hard copies of the SWPPP and all associated documents for review and approval. The LRP will review the documents developed by the Contractor and will request revisions/changes as the LRP deems necessary. Upon approval by the city, the Contractor shall upload the final documents to SMARTS and the project will be certified by the LRP. The Contractor will be responsible for providing to the City of Visalia two (2) hard copies of the final SWPPP and all associated documents upon approval by the City. The SWPPP will cover all work within the project limits.

The Contractor shall retain a Qualified SWPPP Practitioner (QSP) at his own expense. The QSP shall be responsible for the implementation and adequate functioning of the various water pollution control practices employed. The QSP shall serve as the primary contact for issues related to the SWPPP or its implementation.

Unless otherwise specified, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing, and disposing of the water pollution control practices and BMP's specified in the SWPPP and in the amendments.

The Contractor will be responsible for complying with all of the requirements of the approved SWPPP. This includes furnishing all the materials and labor necessary for implementation and maintenance of the site. It shall be the Contractor's responsibility to perform all of the record keeping and annual reporting (as required) along with filing the final Notice of Termination (NOT) upon project completion.

Throughout the duration of the project the Contractor shall be responsible for providing two (2) hard copies to the City of all Annual Reports and other required reporting documentation. Upon completion of the project the Contract shall provide two (2) hard copies of the final Notice of Termination, and any documents required to be on file with the project owner according to the requirements of the General Permit.

Small Construction Erosivity Waiver:
Projects that disturb between one and five acres of surface area are eligible for the EPA's Small Construction Erosivity Waiver. If this project is eligible for the waiver, the Contractor will be required to complete all of the on-line SMARTS uploading and documentation noted under this section insofar as it is required to obtain the Erosivity Waiver. A minimum of seven (7) working days prior to construction, the Contractor will be required to submit a Storm Water Pollution Control Plan to the City of Visalia for review and approval. The Storm Water Pollution Control Plan shall show all of the Best Management Practices (BMP's) that will be implemented throughout construction to eliminate any pollutants from entering the city storm drainage system. BMP's required for the Project may include, but are not limited to: Storm Drain Inlet Protection, Wind Erosion Control, Stabilized Construction Entrance/Exit, Street Sweeping and Vacuuming, Material Delivery and Storage, Stockpile Management, Solid Waste Management, Hazardous Waste Management, Concrete Waste Management, Sanitary/Septic Waste Management, and Liquid Waste Management. Upon approval of the Storm Water Pollution Control Plan by the city, the contractor will be responsible for providing to the City of Visalia two (2) hard copies of all of the required Erosivity Waiver documents and the Storm Water Pollution Control Plan.

7-7.1 Payment

Unless otherwise provided by the Construction Specifications, the contract lump sum price paid for Water Pollution Prevention shall include, but not be limited to, full compensation for preparation and implementation of the Stormwater Pollution Prevention Plan (SWPPP), furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing, constructing, maintaining, removing, and disposing of all water pollution control practices and in implementing, developing, obtaining approval of, including associated fees, revising, amending, inspecting and annual reporting necessary to comply with the requirements of this Section 7-7. If no bid item is provided, the cost shall be included in the various items of work; no separate payment will be made therefor.

7-8 Use of Pesticides

The Contractor shall comply with all rules and regulations of the California Department of Food and Agriculture, the Department of Public Health, the Department of Industrial Relations and all other State, Federal or Local 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.

7-9 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 City as to any tax on labor, services, materials, transportation, or any other items furnished pursuant to the contract.

7-10 Permits and Licenses

Unless otherwise provided in the Contract Documents, the Contractor shall procure all required permits and licenses and give all notice necessary and incidental to the due and lawful prosecution of the work prior to commencing any construction activities. The Contractor shall abide by the provisions of said permits and associated reference documents.

The Contractor and all subcontractors must comply with the Insurance and Business Tax Certificate provisions of Section 3-3, "Required Contract Securities, Insurance Certificate, Business Tax Certificate, Injury and Illness Prevention Plan."

For all Non-Public work, an Encroachment Permit is required from the City Engineering Division before any work in the street or other City right of way is commenced. For Public work projects for which a Contract has been awarded by the City, the Contractor must obtain an Encroachment Permit from the City Engineering Division prior to commencing work unless otherwise specified by the Contract Documents. There will not be a fee charged for the Encroachment Permit for a City Public works projects. All Contractors will be required to follow the conditions of the Encroachment Permit and the City of Visalia Encroachment Permit Policy Manual, latest edition.

Satisfactory evidence of obtaining all required permits and licenses, including the Contractor's and subcontractors' Business Tax Certificates, shall be submitted to the Engineer with the executed contract and other documents required by the Construction Specifications prior to commencing construction activities. The Contractor shall abide by the conditions of said permits and licenses and perform all work governed by said permits and licenses in conformance therewith and as directed by the Engineer. Compliance with this Section 7-10 shall be a condition of issuance of the "Notice to Proceed."

Except as provided in Section 7-6, "Air Pollution Control," relating to Rule 9510, and unless otherwise provided in the Contract Specifications, full compensation for all costs involved in procuring all permits and licenses as indicated herein, including all fees and charges therefor, shall be included in the amount bid for the various items of work; no separate payment shall be made therefor.

The Contractor shall be responsible for paying any fees or fines that result from the Contractor's failure to follow the requirements or conditions of any permits, regulations, or associated reference documents. The City reserves the right to deduct any fees or fines from the monies due to the Contractor. The cost shall be levied as a fine in the case of non-public work.

7-11 Sanitary Regulations

Necessary housing accommodations shall be provided by the Contractor for the workmen for changing clothes and for protection during inclement weather. Toilet accommodations shall also be maintained for the use of employees on the work. The accommodations shall be in approved locations properly screened from public observation and shall be maintained in a strictly sanitary manner. The Contractor shall obey and enforce all State, County, and City sanitary regulations and orders, and shall take precautions against infectious diseases and the spread of same, and shall maintain at all times satisfactory sanitary conditions around all shanties, tool and supply houses and on all other parts of the work.

The cost of compliance with this Section 7-11 shall be included in the various bid items of work; no separate payment will be made therefor.

7-12 Safety Provisions; First Aid; Injury/ Illness Prevention Program

The Contractor shall comply with the provisions of the State Labor Code, Division 5, "Safety in Employment," the State Division of Occupational Safety and Health Construction Safety Orders and General Industry Safety Orders of Title 8, California Code of Regulations, as well as all other applicable laws, ordinances and regulations.

In compliance with State Labor Code Section 6708, the Contractor shall maintain adequate emergency first aid treatment for his employees sufficient to comply with the Federal Occupational Safety and Health Act of 1970 (Public Law 91-596).

In compliance with Labor Code Section 6401.7, the Contractor shall have established, implemented, and maintains an Injury and Illness Prevention Plan. The Contractor shall comply with Section 3-3, "Required Contract Securities, Insurance Certificate, Business Tax Certificate, Injury and Illness Prevention Plan," for plan submittal requirements.

Full compensation for all costs involved in providing job safety, worker protection, and emergency first aid treatment shall be included in the amounts bid for the various items of work; no separate payment will be made therefor.

7-13 Worker Protection from Toxic or Explosive Gases; Confined Spaces Entry

In conformance with the provisions of the State Labor Code and the Safety Orders set forth in Section 7-12, "Safety Provisions; First Aid; Injury/Illness Prevention Program," the Contractor shall protect workers from toxic or explosive gases by providing whatever testing equipment and other special equipment that may be needed to detect the presence of and to remove such toxic or explosive gases found or suspected to exist in any above or below ground facilities whether newly constructed or existing, excavations, or other activities involved in the work. Detection and removal shall be accomplished by methods which comply with the regulations governing such detection and removal. The Engineer and the City Fire Department should be notified immediately after detection.

The Contractor shall also comply with the provisions of the California Code of Regulations Title 8 General Industry Safety Orders, Article 108, "Confined Spaces," whenever the contractor or any of his employees must enter a confined space, as defined in said Safety Orders, whether the confined space is new or existing.

The above requirements are minimum requirements. In addition, the Contractor shall provide for the life of the Contract similar protection for any person, including the Engineer or any of his authorized representatives, subcontractors, or any other person authorized or required to enter such underground facilities for inspection, repairs, or any other reason.

If the presence of toxic or explosive gases are due to the actions of the contractor, then all costs for worker protection, detection, removal, or repairs are to be borne by the contractor. If the presence of toxic or explosive gases are the result of latent or other conditions outside the control of the Contractor, then compensation will be paid in accordance with Section 4-10, "Changes." In the event of a dispute, nothing in this Section 7-13 shall free the contractor of the responsibility to immediately take the necessary actions to provide worker protection and to remove or repair the cause of the presence of toxic or explosive gases.

All costs for compliance with this Section 7-13 shall be included in the various bid items; no separate payment will be therefor.

7-14 Trenches and Excavations; Hazardous Waste

7-14.1 Trenches and Excavations 4 Feet or Less In Depth Below the Surface

If the Contractor encounters conditions at the Site which are subsurface or otherwise concealed physical conditions, which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the Contractor shall be given to the City immediately before conditions are disturbed. The City will promptly investigate such conditions, and if they differ materially and cause an increase or decrease in the Contractor's cost of, time required for, or performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum, Contract Time, or both. If the City determines that the conditions at the Site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the City shall so notify the Contractor in writing, stating the reasons. Claims by Contractor in opposition to such determination must be made within five (5) days after the City has given notice of the decision. If the City and the Contractor cannot agree on an adjustment in the Contract Sum or the Contract Time, Contractor shall proceed pursuant to Section 4-12, "Notices, Change Orders, and Claims."

7-14.2 Trenches and Excavations Greater Than 4 Feet In Depth; Hazardous Waste

Pursuant to Section 7104 of the State Public Contract Code, whenever the work requires digging trenches or other excavations that extend deeper than four feet below the surface, the following provisions apply:

A. The contractor shall promptly, and before the following conditions are disturbed, notify the Engineer, in writing, of any:

   1. Material that the contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.
   2. Subsurface or latent physical conditions at the site differing from those indicated by information about the site made available to bidders prior to the deadline for submitting bids.
   3. Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

B. The Engineer shall promptly investigate the conditions, and if he finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the work shall issue a change order in accordance with Section 4-10, "Changes."

C. In the event that a dispute arises between the Engineer and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

The Contractor shall comply with the requirements in Section 5-12, "Disposal of Material Outside the Right of Way."

7-15 Worker Protection from Caving Ground in Excavations

The Title 8 Construction Safety Orders of the Division of Occupational Safety and Health shall apply to all excavations. In compliance with Sections 341 and 341.1 of Title 8, California Code of Regulations, and Section 6500 of the State Labor Code, for any trenches or excavations that are 5 feet or more in depth, the Contractor must obtain a permit from the State Division of Occupational Safety and Health. The permit may be either a Project Permit (project specific) or an Annual Permit. The contractor shall comply with all the requirements of the permit and those of the Safety Orders.

In addition to the above permit requirement, in compliance with the provisions of State Labor Code 6705, the Contractor shall submit to the Engineer, in advance of any excavation, a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of trenches five feet or more in depth. If such plan varies from the shoring system standards of the State Division of Occupational Safety and Health, the plan shall be prepared, stamped and signed by a Civil or Structural Engineer registered in the State of California. Nothing in this subsection shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the DOSH Construction Safety Orders.

The requirements as above set forth by the State Division of Occupational Safety and Health and the State Labor Code for the provision of worker protection from the hazard of caving ground are minimum requirements. In addition, the Contractor shall provide, for the life of the Contract, the same protection for any person, including the Engineer or any of his authorized representatives, subcontractors, certified testing laboratory staff, or any other person required to be exposed to such hazard in the performance of the work, inspection of the work, or any other reason.

Payment for Worker Protection from caving ground in excavations during construction shall be made at the lump sum price bid therefor; no additional payment will be made. Payment shall include all materials, labor and equipment necessary to adequately brace, shore, shield or slope all excavations and trenches as required by the Division of Occupational Safety and Health Title 8 Construction Safety Orders. Also included are any costs incurred by the Contractor in obtaining all required OSHA permits and preparing a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection as required by State Labor Code Section 6705.

If the bid item therefor is based on a lump sum amount, payment will be pro-rated on the basis of the ratio of completed length of trench or other excavation requiring Worker Protection to the total length of trench or other excavation requiring Worker Protection.

If no bid item is included in the bid schedule for the work associated with this Section 7-15, full compensation for conforming to all of the provisions in this Section 7-15 shall be considered as included in the prices paid for the various contract items of work requiring worker protection; no additional compensation will be allowed therefor.

7-16 Injury or Damage to Persons or Property

Reference is made to Section 5-3, "Contractor's Responsibility For The Work," Section 5-9, "Preservation of Property," Section 7-4, "Contractor's Insurance Requirements and Hold Harmless," and Section 7-16, "Injury or Damage to Persons or Property." Neither the City Council, the Engineer, nor any other officer, authorized agent, employee or volunteer shall be personally responsible for any liability arising under the Contract. The Contractor shall indemnify and hold harmless the City, the City Council, the Engineer, and all City Officers, Employees, agents and volunteers from any suits, claims, damages, losses, liability, demands, or actions brought by any person or persons for or on account of any injuries or damage sustained in or arising out of the construction of the Work or in consequence thereof. The City

Council may retain as much of the money due the Contractor as shall be considered necessary until disposition has been made of such suits or claims for damages as aforesaid.

If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, any of the other party's employees or agents, or others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding ten (10) days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a Claim for additional cost or time related to this Claim is to be asserted, it shall be made as provided in Section 4-12, "Notices, Change Orders, and Claims."

7-17 Public Convenience

This Section 7-17 defines the Contractor's responsibility with regard to convenience of the public and traffic in connection with the Contractor's operations. Section 7-18, "Public Safety," provides requirements relating to the Contractor's responsibility for the safety of the public. The provisions in Section 7-18 are in addition to the provisions in this Section 7-17, and the Contractor will not be relieved of the responsibilities as set forth in Section 7-18 by reason of conformance with any of the provisions in this Section 7-17.

The Contractor shall adhere to the provisions of Section 4-14, "Detours," and Section 12, "Traffic Control; Construction Area Traffic Control Devices," concerning traffic control requirements, flagging and traffic handling equipment and devices used in carrying out the provisions in this Section 7-17 and said Section 7-18, and for provisions relating to the passage of traffic over or around the work by detours, and other traffic.

In the event of a suspension of the work, the provisions of Section 8-11, "Temporary Suspension of Work," will apply.

The Contractor shall so conduct operations as to offer the least possible obstruction and inconvenience to the public and shall have under construction no greater length or amount of work than can be prosecuted properly with due regard to the rights of the public. Unless otherwise provided in the Contract Documents or approved by the Engineer, all public pedestrian and vehicular traffic shall be permitted to pass through the work with as little inconvenience and delay as possible. All traffic shall be routed on new or existing paved surfaces, unless approved otherwise by the Engineer in writing.

Existing traffic signals and highway lighting within the project area or affected by the work shall be kept in operation for the benefit of the traveling public during progress of the work. Unless otherwise provided in the Contract Documents, the Contractor shall be responsible for 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 to driveways, houses, and buildings along the line of the work shall be maintained and temporary approaches to crossings or intersecting streets 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. Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately by the Contractor at the Contractor's expense.

Water or dust palliative shall be applied if ordered by the Engineer for the alleviation or prevention of dust nuisance as provided in Section 10, "Dust Control."

The Contractor will be contacted when a situation or condition is identified as a PUBLIC INCONVENIENCE by the Engineer. An appropriate response time will be granted (usually 24 hours) to the Contractor. If the issue is not resolved by the Contractor, then the City may impose a penalty at the rate of Two Hundred and Fifty Dollars ($250.00) per calendar day for each day beyond the specified response time date. Maximum penalty is One Thousand Dollars ($1,000.00). In addition or as an alternative to the penalty the City may impose the costs of corrective actions taken by the City if Contractor fails to remedy the identified PUBLIC INCONVENIENCE. The City may, at its option, take corrective action following the expiration of the response time given to the Contractor unless the issue creates a public hazard, then the City may take action immediately and charge the Contractor. All costs incurred by the City for taking such corrective action, will be deducted from monies owed the Contractor or will be levied as a fine to the Contractor in the case of non-public work being done under permit. Alternatively if City Municipal Codes are violated the Contractor may be subject to administrative fines and penalties under those ordinances.

The provisions of Section 9-9, “Stop Notices; City’s Right to Withhold Payments,” will apply.

Full compensation for conforming to the provisions in this Section 7-17 shall be considered as included in the prices paid for the various contract items of work; no additional compensation will be allowed therefor.

7-18 Public Safety

The Contractor shall provide for the safety of traffic and the public during construction. The Contractor’s attention is directed to the provisions of Section 7-4, “Contractor’s Insurance Requirements and Hold Harmless,” Section 7-16, “Injury or Damage to Persons or Property,” and Section 7-17, “Public Convenience,” relating to the Contractor's responsibility for providing for the convenience and safety of the public in connection with the Contractor's operations.

The provisions of Section 12, "Traffic Control; Construction Area Traffic Control Devices," concerning flagging and traffic handling equipment and devices used in carrying out the requirements of Section 7-17, “Public Convenience,” apply to this Section 7-18.

Whenever the Contractor's operations create a condition hazardous to traffic or to the public, the Contractor shall, at the Contractor's expense and without cost to the City, furnish, erect and maintain those fences, temporary railing (Type K), barricades, lights, signs and other devices and take such other protective measures that are necessary to prevent accidents or damage or injury to the public. Fences, temporary railing (Type K), barricades, lights, signs, and other devices furnished, erected and maintained by the Contractor, at the Contractor's expense, are in addition to any construction area traffic control devices for which payment is provided for elsewhere in these 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 Section 12, “Traffic Control; Construction Area Traffic Control Devices.”

Signs, lights, flags, and other warning and safety devices and their use shall conform to the requirements set forth in Part 6 of the California MUTCD. Signs or other protective devices furnished and erected by the Contractor, at the Contractor's 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 the Contractor's 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 the responsibility for furnishing and maintaining any of the protective facilities herein before specified.

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 and be in conformance with Section 7-5, "Vehicle Code."

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

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 unless noted otherwise in the Special Provisions.

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 those facilities or, if none are specified, with standard design criteria or codes appropriate for the facility involved. Two (2) copies of working drawings and design calculations for the temporary facilities shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California or a traffic control plan designer that is IMSA or ATSSA certified, and shall be submitted to the Engineer for approval pursuant to Section 4-4, "Working Drawings." The submittals shall designate thereon the standard design criteria or codes used. Installation of the 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 the Contractor's expense. Should the Engineer point out the inadequacy of warning devices and protective measures, that action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety or abrogate the obligation to furnish and pay for these devices and measures.

In accordance with Section 5-8, "Emergency Availability" in the event a condition or situation develops either during or after normal work hours which requires the attention of the Contractor, the following process applies:

If the condition or situation presents a clear and imminent public hazard and is deemed by the Engineer to be an EMERGENCY, and in the event the Contractor fails to immediately respond to the Engineer's direction to correct the condition, or attempts to contact the after-hours emergency response personnel of the Contractor fail, or in the event contact is made and the Contractor is either unwilling or unable to respond in a timely manner to the condition or situation deemed an emergency by the Engineer, then the Engineer shall mobilize immediately the resources necessary to respond to the situation. This includes a stop work order until the situation is remedied. In case of such an order any delays will be attributed to the Contractor.

In the event a condition or situation is deemed by the Engineer to present a potential public hazard and is considered to be URGENT, and upon notification thereof by the Engineer to the Contractor the condition is not corrected within 3 hours, or in the event attempts to contact the after-hours emergency response personnel of the Contractor fail, or in the event contact is made and the Contractor is either unwilling or unable to respond within three hours of contact, then the condition or situation deemed a HAZARD will be upgraded to an EMERGENCY by the Engineer, and the appropriate measures as above provided will be taken.

Due care will be taken to effect only those measures necessary to remove the emergency or urgent condition or situation. The Contractor will be invoiced for all direct costs incurred by the City plus the City may impose administrative penalties for violations of City municipal codes requiring the preparation and adherence to a traffic control plan. All costs incurred by the City for taking such corrective action will be deducted from monies owed the Contractor. Parties not under contract to the City but subject to these Standard Specifications will be billed for the City's costs.

The foregoing process shall apply to all Contracts awarded by the City and also to Encroachment Permits issued by the City to Contractors for non-public work projects. The provisions of Section 9-9, "Stop Notices; City's Right to Withhold Payments," will apply.

Except as otherwise provided in this Section 7-18 or in the Construction Specifications, full compensation for conforming to all of the provisions in this Section 7-18 shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

7-19 Patents

The Contractor shall be responsible for the use of patented materials, equipment, devices, or processes used on or incorporated in the work. 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 hold harmless the City, the Engineer, and their duly authorized representatives, from all suits at law, losses, liability, demands, claims, or actions of every nature for, or on account of the use of any patented materials, equipment, devices or processes.

7-20 Property Rights of 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 the soil, or after payment has been made for 90 percent of the value of materials delivered to the site of the work or stored subject to or under the control of the City. All such materials shall become the property of the City upon being so attached or affixed or upon payment of 90 percent of the value of materials delivered to the site of the work or stored subject to or under the control of the City. As provided in Subsection 5-3, "Contractor's Responsibility for the Work," the Contractor shall care for and protect the work until final acceptance of the work by the City.

7-21 Amendments to Contracts

Each and every provision of law and clause required by law to be inserted in the Contract for the work to be done under the Specifications and Contract Documents shall be deemed to be inserted therein, and the Contract shall be read and enforced as though it were included therein; and if, through mere mistake or otherwise, any such provision is not inserted or is not correctly inserted, then upon the application of either party thereto, the Contract shall forthwith be physically amended to make such insertion.

7-22 Verbal Statements not Binding

It is understood and agreed that the written terms and provisions of the Contract shall supersede all verbal statements of the Engineer or other representatives of the City and such statements shall not be effective, or be construed as entering into or forming a part of, or altering in any way whatsoever the written agreement.

7-23 Guarantee

Whether working under a City Contract or under Encroachment Permit for Utility, Communications, or non-public work, the Contractor shall guarantee the proper installation and performance of all equipment, facilities and materials installed, including all landscape plantings and irrigation systems, or work performed pursuant to the Plans, Specifications, these Contract Documents, or City Encroachment Permit, for a period of one year from the date of the Final Acceptance by the City, or other period set forth in the Contract Documents. The Final Acceptance process varies depending on the scope of work done under the Encroachment Permit. For City Public Projects the work shall be guaranteed for a period of one year from the date of recordation of the Notice of Completion approved by the City Council. Any failure of equipment, facilities, landscape planting, or workmanship prior to the end of the one-year or other specified period shall be repaired or corrected by the Contractor at his sole expense in accordance with instructions of the Engineer. The provisions of Sections 3-5, "Material Statement, Samples and Guarantees," 5-23, "Guarantee of Workmanship," and 6-10, "Guarantee of Materials," also apply.

7-24 Firearms Prohibited

Guns may not be carried by contractors/vendors/consultants while working on City of Visalia premises without the expressed written approval of a City of Visalia Department Head, or an exemption in the contract. If a contractor/vendor/consultant is caught carrying a gun, without City permission, their contract will be terminated.

7-25 Sound Control Requirements

The Contractor's work shall conform to all municipal ordinances pertinent to noise, including but not limited to, the City of Visalia's Municipal Code Chapter 8.36.

SECTION 8 PROGRESS AND PROSECUTION

8-1 Sequence and Progress of the Work

Unless otherwise provided in the Contract Documents, the Contractor shall direct the order and sequence of work and coordinate the construction of the several parts of the Contract to a successful completion as rapidly as possible. If the Engineer determines, at any time, that equipment or appliances used, or to be used, are insufficient or improper for securing the quality of work required or the required rate of progress, the Engineer may order the Contractor to increase efficiency, or to improve their character. The Contractor shall conform to such order; but the failure of the Engineer to demand any increase of such efficiency or any improvement shall not release the Contractor from the obligation to secure the quality of work, or the rate of progress specified.

8-2 Assignment of Contract

The Contractor shall not assign the Contract or any part thereof, without the approval of the City or without the consent of surety unless the surety has waived its rights to notice of assignment. Consent will not be given to any proposed assignment which would relieve the original Contractor or the Contractor's surety of their responsibilities under the contract. All assignments of funds are subject to the prior lien for services rendered or materials supplied for the performance of the work called for in favor of all persons, firms, or corporation rendering such services or supplying materials, and all deductions provided for in the contract and particularly all monies withheld, whether assigned or not, shall be subject to being used by the City for the completion of the work in the event that the Contractor should be in default therein.

8-3 Subcontracting

Section 2-8, "Designation of Subcontractors," sets forth the requirement that any subcontractor who performs in excess of one half of one percent (1/2 %) of the original contract price, or in the case of a street project so designated by the City, one half of one percent (1/2 %) or $10,000, whichever is greater, shall be designated on the Bid Proposal Form. As a part of the bid document, 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 subcontracted.

In accordance with Section 4109 of the State Public Contract Code, subcontracting of any portion of the work in excess of one-half of one percent of the Contractor's total bid for which no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity. It will be the Contractor's responsibility to submit to the Engineer the facts constituting a public emergency or necessity. If approved by the Engineer, a finding in writing will be made a part of the public record setting forth the City's decision and the reasons therefor.

The Contractor shall give personal attention to the fulfillment of the contract and shall keep the work under the Contractor's 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 the Contractor will be held responsible for their work, which shall be subject to the provisions of the contract and specifications. When a portion of the work which has been subcontracted by the Contractor is not being prosecuted in a manner satisfactory to the Engineer, the subcontractor shall be removed immediately on the requisition of the Engineer and shall not again be employed on the work. The Contractor shall be responsible for the coordination of all trades, subcontractors, and material handlers engaged in the work. Neither the City nor the Engineer will undertake to settle any differences between the Contractor and its subcontractors or between subcontractors.

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 the contract are incorporated in the subcontract.

Subcontracts shall also contain certification by the subcontractor that the 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.

Pursuant to the provisions of Section 6109 of the Public Contract Code, the Contractor shall not perform work under the contract with a subcontractor who is ineligible to perform work on the project pursuant to Section 1777.1 or 1777.7 of the Labor Code.

The purchase of concrete, liquid asphalt, paving asphalt, pipelines, valves, fire hydrants, casing, or any other materials produced at and supplied from established and recognized commercial plants, together with delivery of such materials to the site of the work by means of vehicles owned or operated by such plants or by recognized commercial hauling companies, shall not be considered as subcontracting under these Standard Specifications.

Nothing contained in the Contract documents shall create any contractual relation between any subcontractor and the City.

8-4 Preconstruction Conference

The City of Visalia should hold a preconstruction conference with the Contractor and other entities affected by the work within ten (10) days after the City Council awards the Contract. The preconstruction meeting shall be the proper time and place for the Contractor to submit to the Engineer required documents including, as a minimum, the following:

Construction Schedule - Section 8-5
Traffic Control Plan - Section 12-2
Names of Superintendent - Section 5-7
Emergency Contact List - Section 5-8
Proposed Notice to Residents - Section 8-7
Completed Encroachment Permit Application - Section 8-6
Material Submittal Package – Section 6-13

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

8-5 Construction Schedule

After notification of award and prior to start of any work, at the pre-construction conference the Contractor shall submit to the Engineer for acceptance his proposed construction schedule. Acceptance or lack of rejection by City of a proposed construction schedule shall not be deemed approval and shall not create responsibility on the part of the City for any defects or mistakes in the schedule. The Contractor bears sole responsibility for the accuracy, utility and reasonableness of the schedule. The construction schedule shall be in the form of a tabulation, chart, or graph in Gantt type format and shall be in sufficient detail to show the chronological relationship of all activities of the project including, but not limited to, estimated starting and completion dates of various activities, (including early and late dates and float for each activity), procurement of materials, the critical path, and scheduling of equipment. The construction schedule shall be consistent in all respects with the time and order of work requirements of the Contract.

The Contractor shall submit an updated schedule on the first working day of the month on a monthly basis that includes an accurate as-built schedule and the current as-planned schedule. If the Contractor

fails to submit the monthly schedule the Engineer shall have the option to suspend the work at the Contractor's expense until such time that a monthly schedule is submitted. The Contractor shall submit its daily logs for the month with the updated schedule. Float shall be used by the parties on a "first come, first serve" basis. If the Contractor desires to make a significant change in his method of operations after commencing construction, he shall submit to the Engineer an updated construction schedule in advance of beginning revised operations. If the Contractor's actual progress falls behind the scheduled progress, within seven (7) days of a City request the Contractor shall prepare and submit an updated schedule showing how the Contractor intends to complete the work within the scheduled completion deadline.

All schedules submitted by the Contractor shall be certified as true and correct.

If extra work is performed under the contract and the Contractor claims that additional time should be granted because the critical path is affected, the Contractor shall be responsible for submitting a full time impact analysis for the project to justify the extension of time requested. The time impact analysis shall be submitted in a format acceptable to the engineer.

The Contractor may not maintain any Claim or cause of action against the City for damages incurred as a result of its failure or inability to complete the Work in a shorter period than established in the Contract. By executing a Contract with the City, the parties stipulate that the period set forth in the Contract is a reasonable time within which to perform the Work.

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

8-6 Beginning of Work

The City of Visalia should hold a preconstruction conference with the Contractor and other entities affected by the work within ten (10) days after the City Council awards the Contract. After this preconstruction conference is held, the Contractor will have fifteen (15) days to obtain an approved Encroachment Permit from the City and furnish all other permits and approvals required to complete the work. The Contractor shall submit the completed Encroachment Permit Application and required documents to the City at the preconstruction meeting or within five (5) days after the meeting. The Contractor shall allow ten (10) days for the City to review and approve/request modifications to the documents. Should the Contractor fail to obtain the required permits and approvals within this fifteen (15) day period, the length of time beyond fifteen (15) days will be subtracted as working days from the Contract. After the Contractor has furnished all of the required permits and documents the Notice to Proceed with Construction will be issued. Unless otherwise provided in the Contract Specifications, the Contractor shall commence work under the contract within ten (10) days after the date the Notice to Proceed is issued by the City and shall diligently prosecute the same to completion within the time limit provided in the Contract Documents. The Contractor shall not begin work in advance of receiving the Notice to Proceed without written authorization from the Engineer. **The Contractor shall notify the Inspector a minimum of 2 working days prior to starting work.** The timelines above apply to the Contract unless noted otherwise in the Special Provisions.

It shall be the obligation of the Contractor to notify the various utility companies at least five (5) working days in advance of closing and/or excavation of any street or alley affecting said companies. The Contractor shall contact Underground Service Alert (USA) at 1-800-227-2600 or 811 a minimum of five (5) working days prior to any excavation.

The locations of existing facilities that are shown on the Plans are approximate. Exact locations of existing utilities shall be determined by the Contractor by whatever means necessary, including potholing

and hand digging, with the possible assistance of the utility companies and located in the field by the Contractor prior to the construction of any improvements required by the Contract. Prior to construction the Contractor will be responsible for verifying that no conflicts exist between existing and proposed street and utility infrastructure improvements. Any additional expenses incurred because of the failure of the Contractor to comply with these requirements shall be borne by the Contractor.

Five (5) working days prior to beginning work and after the USA markings have been completed at the site, the Contractor shall be responsible for scheduling a pre-construction site walk through with the Engineer, Inspector, and any other interested agencies. The purpose of the site walk will be to identify any existing utilities that have the potential to conflict with the proposed improvements.

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

8-7 Notice to Residents

Not less than two (2) calendar days nor more than five (5) calendar days prior to proceeding with the work in any given area, the Contractor shall notify in writing all residents, tenants, and businesses directly affected by the construction work. Such notice shall provide the nature of the work, the approximate time for the completion of work, and any anticipated inconveniences. The notice shall be on the contracting firm's letterhead and shall be signed and shall include the project superintendent's name and telephone number. Prior to commencing work in each given area, the Contractor shall furnish the Engineer a copy of the notice to be given to residents, tenants, and businesses for approval. After the notice is accepted by the Engineer the Contractor shall distribute and certify the date, location and method by which the notice was delivered. The Contractor shall also comply with the requirements of Section 12-2, "Traffic Control Plan; Notifications."

For every occurrence when property access, sewer service or water source is to be interrupted by the Contractor's work, the Contractor shall give written notice to all affected residents, tenants, and businesses not less than two (2) calendar days nor more than five (5) calendar days prior to said interruption. The notice(s) shall be in addition to the initial notice to residents, tenants, and businesses described above. In addition the Contractor will be responsible for informing and coordinating the timing of the interruption with the affected residents, tenants, and businesses. Where a significant interruption will occur, as determined by the Engineer, the Contractor will be required to coordinate with residents at a date earlier than listed in this Section 8-7.

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

8-8 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. The current controlling operation or operations (i.e., the critical path) 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.

For contracts whose completion schedule is based on working days, a working day is defined as any day, except as follows:

Saturdays, Sundays and legal holidays declared by the City;

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 at least 75 percent of the normal labor and equipment force engaged on that operation or operations for at least 50 percent of the total daily time being currently spent on the controlling operation or operations; or

Days on which the Contractor is prevented, by reason of requirements in the Contract Specifications, from working on the controlling operation or operations for at least 50 percent of the total daily time being currently spent on the 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 50 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 that day and the major portion of the day could be considered to be suitable for those construction operations.

Determination that a day is a non working day by reason of inclement weather or conditions resulting immediately therefrom, shall be made by the Engineer. The Contractor will be allowed fifteen (15) working days from the issuance of this determination in which to file a written protest setting forth in what respects the Contractor differs from the Engineer; otherwise, the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct. For Federally funded projects the Engineer will furnish the Contractor a weekly statement (or by other method that accomplishes the same purpose) showing the number of working days charged to the contract for the preceding period, 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 complete the contract and the extended date for completion thereof, except when working days are not being charged in conformance with the provisions in Section 8-11, "Temporary Suspension of Work," of these Specifications. The weekly statement may be furnished to the Contractor for other projects that are not Federally funded when deemed appropriate or required by the Engineer.

For contracts whose completion schedule is based on calendar days, a calendar day shall mean every day of the calendar, including weekends and holidays. Exclusions for inclement weather which prevents the Contractor from performing, as above provided for working days will be permitted unless otherwise specified in the Construction Specifications.

8-9 Liquidated Damages

It is agreed by the parties to the Contract that in case all the Work called for under the Contract is not complete before or upon expiration of the time limit as set forth in the Contract Documents, damage will be sustained by the City. Since it is and will be impractical to determine the actual damage which the City will sustain in the event of and by reason of such delay, and since the delay will cause incalculable inconvenience to the public, it is therefor agreed that the Contractor will pay to the City the sum indicated in the Special Provisions for each and every calendar day's delay beyond the time prescribed to complete the Work; and the Contractor agrees to pay such sum as set forth in the Special Provisions, and in case the same is not paid, agrees that the City may deduct the amount thereof from any money due or that may become due the Contractor under the Contract. Liquidated damages will accrue without notice, and any failure by City to withhold for some or all of them shall not act as a waiver by City of its rights to later

claim the liquidated damages. Any waiver of liquidated damages by the City must be expressed and in writing.

It is further agreed that in case the Work is not finished and completed in all parts and requirements within the specified time, the City shall have the right to extend or not to extend the time for completion as may seem best to serve the interest of the City. If the City decides to extend the time limit for the completion of the Contract, the City 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 the City 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 the cost of final surveys and preparation of the final estimate shall not be included in such charges.

The Contractor shall not be assessed with liquidated damages, or the cost of engineering and inspection, during any delay in the completion of the work caused by acts of God or acts of the public enemy, the City, fire, epidemics, quarantine restrictions, strikes and freight embargoes, provided that the Contractor shall, within five (5) calendar days from the beginning of such delay, notify the Engineer in writing of the causes of delay; and the Engineer's finding of the facts 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 the Contractor has made every effort to obtain the 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 8-5 “Construction Schedule,” that the inability to obtain the 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 8-9, 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 by the City in completion of the Work by reason of changes made under Section 4-10, “Changes,” by failure of the City to acquire or clear right of way, by Extra Work under Section 4-11, “Extra Work,” or by any act of the Engineer or of the City, not contemplated by the contract, an extension of time commensurate with the delay in completion of the work thus caused will be granted, provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of the delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive. In addition see Section 8-10, “Right of Way Delays” and Section 8-15, “Utility and Non-Street Facilities; Potholing” for additional circumstances involving an extension of time.

8-10 Right of Way Delays

The City makes a diligent effort at securing a clear right of way for the performance of the work required by the contract. For some contracts, it is in the best interests of the City and/or the public to award a contract before all utility relocations, utility undergrounding, right of way purchases, removal of obstructions, relocation of underground facilities by others, or other potential causes of delay are removed. Where known, these will be shown on the Plans with the actions to be taken, and enumerated in the Contract Documents. The City will make every effort to ascertain the approximate time required to

clear the right of way and so indicate in the Contract Specifications. The contractor shall include in his costs any delays that can be expected or result from such relocations or acquisitions. The Engineer may grant a time extension deemed warranted due to such delays, or may temporarily suspend the contract in accordance with Section 8-11, “Temporary Suspension of Work.”

If new and unforeseen right of way delays not contemplated before the award of the contract causes the Contractor to sustain a loss there shall be paid to the contractor that amount that the Engineer may find to be a fair and reasonable compensation for that part of the Contractor’s actual loss that, in the opinion of the Engineer, was unavoidable. Payment will be determined on the basis of extra work on a force account basis, or as otherwise agreed to by and between the Engineer and the Contractor, in accordance with Section 4-11, “Extra Work” and Section 9-5 “Payment for Extra Work.”

8-11 Temporary Suspension of Work

The Engineer shall have the authority to suspend the Work wholly or in part for such period as City desires. The Contractor shall immediately obey such order of the Engineer to suspend the Work, and shall not resume the Work until ordered in writing by the Engineer.

In the event that a suspension of Work is ordered as provided above, and should that 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 unsuitable 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 the unsuitable weather conditions had the Contractor diligently prosecuted the Work when weather conditions were suitable; then Contractor shall not be entitled to compensation (money or time) for the suspension, and the Contractor, at the Contractor's expense, shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by traffic during the period of that suspension as provided in Sections 7-17, "Public Convenience," and 7-18, "Public Safety," and as specified in the Contract Documents. In the event that the Contractor fails to perform the Work above specified, the City may perform that 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 4-11, “Extra Work,” or at the option of the Engineer, that Work will be performed by the City 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 (i.e., critical path) 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, then Contractor shall be entitled to a time extension for the period of the suspension. If the portion of Work suspended is not a current controlling operation or operations, but subsequently does become the current controlling operation or operations, the determination of time extension 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 for time extension only if permitted under Section 8-8, "Time of Completion."

8-12 Use of Completed Portions; City's Right to Complete

The City shall have the right to take possession of, use, or maintain and protect any completed portions of the Work. However, such possession, use, or maintenance and protection shall not be deemed as accepting any Work, regardless of whether it has or has not been completed in accordance with the Contract Documents.

The City has the right to perform some or all of the Contractor's remaining Work if the Contractor fails or refuses to carry out the Work in accordance with the Contract Documents. The City may exercise this right at any time during the Contractor's work, including the closeout or punch list phases. The City shall first provide written notice to Contractor of Contractor's failure or refusal to perform in accordance with the Contract Documents, and such notice shall demand commencement or correction of such failure or refusal to perform within a reasonable time not to be less than seven (7) days. Such notice need not specifically refer to this provision.

If the Contractor fails to commence correction within said reasonable time, or ever fails to continue correction after expiration of said reasonable time, the City may instruct Contractor to stop performing such Work and notify Contractor that City shall perform such Work itself. Any direction to Contractor to not perform such Work shall act as a deletion of such Work from Contractor's scope of Work, and City may accept the Contractor's remaining contractual scope of Work as complete (pursuant Section 8-14, "Acceptance of Contract") even though the deleted Work may not have been performed yet by City. City may perform the deleted Work at any time by whatever reasonable method the City may deem expedient without prejudice to other remedies the City may have. In the event the City takes bids to complete the Work so deleted, Contractor shall not be eligible for the award of the contract.

The Contractor will be invoiced for all of the City's costs of performing the deleted Work, including compensation for additional professional and internally generated services and expenses made necessary by such deletion. The City may withhold the estimated costs from any retention release and/or progress payments due the Contractor, pursuant to Section 9-9, "Stop Notices; City's Right to Withhold Payments." If retention and payments withheld then or thereafter due the Contractor are not sufficient to cover the City's actual costs of completing the deleted Work, the Contractor shall pay the difference to the City.

Prior to performing any of the deleted work itself, City may, at its option, tender completion of the work to the Contractor's surety for completion by someone other than Contractor.

8-13 Termination of Contract

If the Contractor files for bankruptcy; if the Contractor makes a general assignment for the benefit of his creditors; if a receiver should be appointed on account of the Contractor's insolvency; if the Contractor or any subcontractors should violate any of the provisions of the Contract; if the Contractor should refuse or should fail, except in cases for which extension of time is provided, to supply enough skilled workmen or proper materials; if the Contractor should fail to make prompt payment to subcontractors or for material or labor; or if the Contractor should disregard laws, ordinances or the instructions of the Engineer, the City may serve written notice upon the Contractor and its surety of the City's intention to terminate the Contract, such notice to contain the reasons for such intention to terminate the Contract and to provide five (5) calendar days for the Contractor to cure such violations and make satisfactory arrangements for correction thereof. In the case of filing for bankruptcy, the Contractor agrees that by entering this Contract it also stipulates that the bankruptcy court may grant relief to the City from any automatic stay as to this Contract (and as to any escrow agreement) so that City may proceed pursuant to this provision and terminate the contract if necessary. If within five (5) calendar days after the serving of the notice of intent

to terminate, such violations do not cease and satisfactory arrangements for correction thereof are not made, then the City may, at its discretion, terminate the Contract at any time thereafter.

In the event of any such termination, the City shall immediately serve written notice thereof upon the Contractor and its surety; and the surety shall have the right to take over and perform the Contract, provided, however, that if the surety within ten (10) calendar days after the serving upon it of notice of termination does not give City written notice of its intention to take over and perform the Contract or does not commence performance thereof within the ten (10) calendar days stated above from the date of the serving of such notice of termination, the City may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable, for the account and at the expense of the Contractor and its surety, and the Contractor and its surety shall be liable to the City for any excess cost incurred by the City. In such event the City may, without liability for so doing, take possession of and utilize in completing the work such materials, appliances, plant and other property belonging to the Contractor as may be on the site of the work and necessary therefor. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price shall exceed the expenses of finishing the work, including compensation for additional managerial and administration services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor and its surety shall pay the difference to the City. The expense incurred by the City, as herein provided and damage incurred through the Contractor's default, shall be certified by the Engineer.

The City may, at any time, terminate the Contract for the City's convenience and without cause. Upon receipt of written notice from the City of such termination for the City's convenience, the Contractor shall (1) cease operations as directed by the City in the notice; (2) take actions necessary, or that the City may direct, for the protection and preservation of the Work; and (3) except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders. The Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, but not overhead and profit on the Work not executed.

Any termination by City under this Section 8-13, or suspension by City under Section 8-11, "Temporary Suspension of the Work," shall not act as a waiver of any claims by City against Contractor or others for damages based on breach of contract, negligence or other grounds.

Contractor does not have the right to terminate the Contract or to suspend or slow down its performance of the Work. If Contractor believes that it is entitled to additional compensation (money and/or time) for any reason, or that it has been wronged for any reason, then it may submit a request for additional compensation and/or modification of the Contract; however, despite such requests as Contractor may make or disputes as may exist, Contractor shall continue to diligently prosecute the Work, and acceptably perform the Work, as required by the Contract through completion.

8-14 Acceptance of Contract

When the Engineer has made the final inspection as provided in Section 5-22, "Final Inspection," and determines that the Work has been fully performed, the Engineer will certify the Work as ready for Acceptance and recommend that the City Council formally accept the Work, and immediately upon and after the Acceptance of the Work by the City Council, the Contractor will be relieved of the duty of maintaining and protecting the work as a whole, except any landscape maintenance period required by the City of Visalia Landscape Standards and Specifications, and the Contractor will not be required to perform any further work thereon except for warranty work; and the Contractor shall be relieved of the responsibility for injury to persons or property or damage to the work which occurs after the formal

Acceptance by the City Council. Within ten (10) days of Acceptance by the City Council, the City shall record a Notice of Completion with the Tulare County recorder's office.

Acceptance of any Work shall not be deemed a waiver of the City's rights to remedy by the Contractor of (a) defective Work covered by warranty or guarantee for which the City gives timely notice to Contractor, and (b) latent defects resulting from defective materials or workmanship discovered after the City's recording of its Notice of Completion.

8-15 Utility and Non-Street Facilities; Potholing

Attention is directed to Sections 4-6, "Existing Facilities and Structures Shown on Plans," and 5-9, "Preservation of Property." The Contractor shall protect from damage utility and other non street facilities that are to remain in place, or to be installed, relocated or otherwise rearranged. As used in this Section 8-15, "non-street facilities" means any above or below ground facilities which are not a part of the roadway structural section, curb and gutter, and sidewalk. Utility shall include, but not be limited to, sewer, water, recycled water, storm drain, and irrigation pipelines, and above and below ground electrical and gas facilities, cable, telephone, or other utilities and communications facilities.

It is anticipated that some or all of the utility and other non street 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 street improvement will be rearranged in advance of construction operations. Where it is not anticipated that the rearrangement will be performed prior to construction, or where the rearrangement must be coordinated with the Contractor's construction operations, the existing facilities that are to be rearranged will be indicated on the plans or in the Contract Documents. Where a rearrangement is indicated on the plans or in the Contract Documents, the Contractor will have no liability for the costs of performing the work involved in the rearrangement unless the Plans or Contract Documents indicate such rearrangement is to be performed by the Contractor.

The right is reserved to the City and the owners of facilities, or their authorized agents, to enter upon the street right of way for the purpose of making those changes that are necessary for the rearrangement of their facilities or for making necessary connections or repairs to their properties. In compliance with Section 5-15, "Cooperation," the Contractor shall cooperate with forces engaged in this work and shall conduct operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by the other forces. Wherever necessary, the work of the Contractor shall be coordinated with the rearrangement of utility or other non street facilities, and the Contractor shall make arrangements with the owner of those facilities for the coordination of the work.

The Contractor shall be aware of the possible existence of underground main or trunk line facilities not indicated on the Plans or in the Contract Specifications 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 Contract Specifications. Prior to commencing any trenching, excavation, or boring operations, or any work that may damage any of the facilities or interfere with their service, the Contractor shall, by potholing or other means approved by the Engineer, ascertain the exact location of underground main or trunk line facilities whose presence is indicated on the Plans or in the Contract Specifications or identified by their use or by USA, the location of their service laterals or other appurtenances, and of existing service lateral or appurtenances of any other underground facilities which can be inferred from the presence of visible facilities such as buildings, meters and junction boxes, vents, lids or manholes. Prior to construction the Contractor will be responsible for verifying that no conflicts exist between existing and proposed street and utility infrastructure improvements. Any additional expenses incurred because of the failure of the Contractor to comply with these requirements shall be borne by the Contractor.

Utility company service laterals are not shown on project plans. Contractor should allow for gas, water, sewer, telephone, and cable TV services for each lot shown. Utility companies will locate services and Contractor shall protect all services and facilities from injury. In case of damage to existing utilities, they shall be restored by the Contractor or by utility company personnel to the same type and quality of improvement at the Contractor's cost and expense without additional compensation.

If the Contractor cannot locate an underground facility whose presence is indicated on the Plans or in the Contract Specifications, the Contractor shall so notify the Engineer in writing. If the facility for which the notice is given is in a substantially different location from that indicated on the plans or in the Contract Documents and extra works is expended by the Contractor to locate the facility, the additional cost of locating the facility will be paid for as extra work as provided in Section 4-11, "Extra Work."

Nothing herein shall relieve the City from the duty of identifying main or trunklines in the plans or Contract Specifications pursuant to Government Code section 4215. If the Contractor discovers underground main or trunk lines not indicated on the plans or in the Contract Specifications, the Contractor shall immediately give the Engineer and the Utility Owner if not the City, written notification of the existence of those facilities. The main or trunk lines shall be located and protected from damage as directed by the Engineer, and the cost of that work will be paid for as extra work as provided in said Section 4-11. The Contractor shall, if directed by the Engineer, repair any damage which may occur to the main or trunk lines. Damage due to the Contractor's failure to exercise reasonable care shall be repaired at the Contractor's cost and expense.

Where it is determined by the Engineer that the rearrangement of an underground facility is essential in order to accommodate the street or underground improvement and the Plans and Specifications do not provide that the facility is to be rearranged, the Engineer will provide for the rearrangement of the facility by other forces or the rearrangement shall be performed by the Contractor and will be paid for as extra work as provided in said Section 4-11. Alternatively, the Engineer may direct the rearrangement of the street or underground improvement if movement of the underground facility is not essential.

Should the Contractor desire to have any rearrangement made in any utility facility, or other improvement, for the Contractor's convenience in order to facilitate the Contractor's construction operations, which rearrangement is in addition to, or different from, the rearrangements indicated on the Plans or in the Contract Specifications, the Contractor shall make whatever arrangements are necessary with the owners of the utility or other non-street facility for the rearrangement and bear all expenses in connection therewith.

The Contractor shall immediately notify the Engineer of any delays to the Contractor's operations as a direct result of underground main or trunk line facilities which were not indicated on the Plans or in the Contract Specifications or were located in a position substantially different from that indicated on the Plans or in the Contract Specifications, 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 the Contractor's construction operations or delays due to a strike or labor dispute). These delays will be considered right of way delays within the meaning of Section 8-10, "Right of Way Delays," and compensation for the delay will be determined in conformance with the provisions in said Section 8-10. The Contractor shall be entitled to no other compensation for that 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 8-15, due to a strike or labor dispute, will entitle the Contractor to an extension of time as provided in Section 8-9, "Liquidated Damages." The Contractor shall be entitled to no other compensation for that delay.

Potholes or other excavations performed to determine the location of Utility and Non-Street Facilities, and which potholes or excavations will remain outside the area to be excavated for improvements shown on the Plans or specified in the Contract Specifications, shall be backfilled, compacted, and the surface thereof restored in accordance with Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration." Exception: Potholes or other excavations in the street area of diameter (or equivalent dimension if non-circular), of 9 inches or less, or any other pothole or excavation because of depth, shape, or other cause determined by the Engineer not to be feasible to apply the methods of said Section 19-3, shall be backfilled in accordance with the Utility Pothole Backfill Detail of the Standard Plans in the following manner: the bottom 1 foot of the pothole or other excavation shall be backfilled with clean sand; the remainder of the pothole or other excavation shall be backfilled with slurry cement conforming to Section 19-3.3C, "Slurry Cement Backfill," of the Specifications or with Class 2 Aggregate Base (AB) compacted in accordance with Section 19-3. In asphalt pavement street areas the pothole shall be resurfaced with a 7 inch thick hot mix asphalt plug with the surface level with or slightly higher than the surrounding existing pavement. The type of surface restoration for potholes outside of the street area shall be directed by the Engineer.

All costs for compliance with this Section 8-15 shall be included in the various bid items of work; no additional payment will be made therefor.

SECTION 9 MEASUREMENT AND PAYMENT

9-1 Measurement of Quantities

A. Units of Measurement

All work to be paid for at a contract price per unit of measurement will be measured by the Engineer in accordance with the U.S. Customary Units of Measurement. A ton shall consist of 2,000 pounds avoirdupois.

B. Quantities

Quantities of work shall be determined from measurements or dimensions in horizontal planes. However, linear quantities of pipe, piling, fencing, and timber shall be considered as being the true length measured along the longitudinal axis.

C. Volumetric Quantities

Volumetric quantities will be determined by the Engineer, and shall be the product of the mean area or vertical or horizontal sections and the intervening horizontal or vertical dimension.

When payment is to be made on the basis of weight, the weighing shall be done on scales furnished by and at the expense of the Contractor, or on other sealed scales regularly inspected by the State of California, Department of Food & Agriculture, Division of Measurements & Standards, or its designated representative. All scales shall be suitable for the purpose intended and shall conform to the Specifications of the State of California, Department of Food & Agriculture, Division of Measurements & Standards. The scales shall be operated by a weigh-master licensed in accordance with the provisions of the California Business and Professions Code. The Contractor shall furnish a Public Weighmaster's certificate, or a Private Weigh-master's certificate of certified daily summary weight sheets. The operator of each vehicle shall obtain a weight or load slip from the weigher and deliver said slip to the Engineer or Inspector at the point of delivery of the material.

Other materials and items of work which are to be paid for on the basis of measurement shall be measured in accordance with the methods stipulated in these Specifications, or the Contract Specifications for the particular items involved.

Full compensation for all expense involved in conforming to the requirements specified for measuring and weighing materials shall be considered as included in the unit price paid for the materials being measured or weighed; no additional compensation will be allowed therefor.

9-2 Cost Breakdown

The Contractor shall submit in a form acceptable to the Engineer, a schedule showing the subdivision of his contract into its various parts, stating quantities and prices for each item, to be made a basis for checking or computing monthly estimates, if such payments are specified. The schedule submitted shall be formatted to match the schedule, item numbers, and quantities in the Contract schedule. The prices shall include all costs of each item and payments for each item will be made on the basis of the unit related to that item. No payment will be made to the Contractor until such schedule has been submitted to and approved by the Engineer. The schedule of values shall be balanced and shall not shift excessive portions of the contract price into any particular part of the Work, especially parts of the Work being performed earlier in the schedule. No partial payment will be made to the Contractor until such schedule has been submitted to and approved by the Engineer. All cost breakdowns for progress payments shall include only that work that has been installed and completed up to the date shown on the Contractor's invoice.

Upon request of the Engineer, the Contractor shall provide a schedule showing the subdivision of any bid item or other work performed as part of the contract.

All costs for compliance with this Section shall be included in the various bid items of work; no additional payment will be made therefor.

9-3 Final Pay Items

When an item of work is designated as (F) in the Engineer's Estimate, or is otherwise indicated in the Contract Specifications as a Final Pay Item, the estimated quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion of the item are revised, and the revisions result in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions. If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

The estimated quantity for each item of work designated as (F) or indicated otherwise as a final pay item in the Engineer's Estimate/Bid Proposal shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No allowance will be made in the event that the quantity based on computations does not equal the estimated quantity. For a Final Pay Item, the Contractor shall accept payment based on the Bid Item List quantity, regardless of actual quantity used unless dimensions are changed by the Engineer.

In case of discrepancy between the quantities shown in the Engineer's Estimate for a final pay item and the quantity or summation of quantities for the same item shown on the Plans, payment will be based on the quantity shown in the Engineer's Estimate.

9-4 Scope of Payment

The Contractor shall accept the compensation provided in the Contract as full payment for furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the Work, 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 City and for all risks of every description connected with the prosecution of the Work; also for the 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 Contract Documents. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of the obligation to make good any defective work or material.

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

The lump sums and/or unit prices shown in the bid proposal shall include full compensation for all Work and expenses appurtenant to the accomplishment of the project described in these Contract Documents in the manner indicated herein, including all items delineated in the Contract Documents for which specific bid items are not set up in the bid proposal. The Contractor shall proportionally spread all incidental costs associated with the work for which there are no separate bid items into the amount bid for those items of work for which there are bid items, and no separate or additional payment will be made for any requirement of the Contract not specifically listed on the bid proposal.

9-5 Payment for Extra Work

Extra Work as defined in Section 4-11, "Extra Work," when ordered and accepted, shall be paid for under a written Contract Change Order in accordance with the terms therein provided. Payment for Extra Work will be made at the unit price or lump sum previously agreed upon by the Contractor and the City by written Change Order. When the Contractor and City cannot agree on the price to be paid for extra work the Contractor shall perform the work on a force account basis only after written approval is received by the Engineer to proceed with the work. No payment will be made to the Contractor for extra work that was completed prior to receiving written approval from the Engineer.

All documentation submitted for Change Order approval or that is performed on a force account basis shall include at a minimum the following information:

1. A detailed factual account of the events causing the extra work, including:
   - 1.1. Pertinent dates
   - 1.2. Locations
   - 1.3. Work items affected by change
2. An itemized cost breakdown. Segregate costs into the following categories:
   - 2.1. Labor, including:
     - 2.1.1. Individuals
     - 2.1.2. Classifications
     - 2.1.3. Regular and overtime hours worked
     - 2.1.4. Dates worked
   - 2.2. Materials, including:
     - 2.2.1. Invoices
     - 2.2.2. Purchase orders
     - 2.2.3. Location of materials either stored or incorporated into the work
     - 2.2.4. Dates materials were transported to the job site or incorporated into the work
   - 2.3. Equipment, including:
     - 2.3.1. Detailed descriptions, including make, model, and serial number and the Model and Code reference listed in the Caltrans Labor Surcharge and Equipment Rental Rates book in effect when the work was performed
     - 2.3.2. Hours of use
     - 2.3.3. Dates of use
     - 2.3.4. Equipment costs (hourly rates and total cost)
3. If a time adjustment is requested:
   - 3.1. Dates for the requested time.
   - 3.2. Reasons for a time adjustment.
   - 3.3. Contract documentation supporting the requested time adjustment.
4. Identification and copies of your documents and copies of communications supporting the extra work, including certified payrolls, bills, cancelled checks, job cost reports, payment records, and rental agreements

Extra work can be paid by force account with and without prevailing wages. For extra work paid on a force account basis on locally funded projects not subject to prevailing wages, the Contractor will be compensated for extra work as negotiated between the City of Visalia and the Contractor. For extra work paid on a force account basis on State and Federally funded projects subject to prevailing wages, the Contractor shall be compensated in accordance with the provisions of Section 9-1.04, "Force Account," of the State Standard Specifications. Any references therein to "State" or "Department" shall mean "City."

In general, the Contractor shall not be compensated more than the amount allowed under Section 9-1.04, "Force Account," of the State Standard Specifications unless there is some unique circumstance and the amount is approved by the City of Visalia Change Order Committee. This applies to all force account and agreed to lump sum or unit price change orders whether the project is subject to prevailing wages or not. For any situation where right of way delays or temporary suspensions of work occur and it is determined that the Contractor is due additional compensation, the delay factors listed in the current Department of Transportation Labor Surcharge and Equipment Rental Rates book shall be utilized to determine the compensation amount.

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. The Contractor shall furnish the Engineer report sheets in duplicate for each day's extra work and extra work paid for by force account no later than the thirty (30) days following the performance of said work. The daily report sheets 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. The daily report sheet 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 by valid copies of vendor's invoices. Such invoices shall be submitted with the daily report sheets, if available. Said daily report sheets shall be signed by the Contractor or his authorized agent. After comparison with the Engineer's records, any necessary adjustments are to be made and agreed upon. When these reports are agreed upon, the final package will be submitted to the Change Order Committee for approval. Payment as provided above shall constitute full compensation for the Contractor for performance of work paid for on a force account basis, and no additional compensation will be allowed therefore.

If the Contractor and the City cannot agree on the force account price to be paid for Extra Work, or if the Contractor and the City cannot agree that certain work is Extra Work, then the Contractor shall follow the claim and change order procedures of Sections 4-10, "Changes," and 4-12, "Notices, Change Orders, and Claims."

Payment as provided herein shall constitute full compensation to the Contractor for performance of Extra Work, and no additional compensation will be allowed therefor.

9-6 Partial ("Progress") Payments And Retentions

By the twentieth (20^{th}) day of each month, the Contractor shall, on forms approved by the Engineer, furnish the Contractor's estimate of work completed prior to that date based on the schedule of values submitted by the Contractor pursuant to Section 9-2, "Cost Breakdown." The estimate and application must include the Contractor's previous month's daily logs, updated monthly schedule, and material tickets/weigh-master certificates where payment is based on weight or the City has the right to reject it. For materials delivered to the site and which are eligible for partial payment, the amount of any 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 forms approved by the Engineer properly filled out and executed, including accompanying documentation as therein required, less the amount of the material incorporated in the work to the time of the 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. Payment requests submitted after the 20th day of the month will not be processed for payment in the following month, but will be processed for payment in the next succeeding monthly payment period, when such payment will become due and payable.

Where a Partial (Progress) payment is being made for a portion of a lump sum bid item the payment will be prorated and paid on the basis of the ratio of the total Contract amount ($) completed to date to the total original Contract amount.

The Engineer shall review, and revise if necessary, the Contractor's progress payment application. If the City determines that the application is not a proper payment request, the City should return it to Contractor as soon as practicable with an explanation of why it is not proper, but not later than fifteen (15) days after receipt. If the Contractor and City cannot agree on the amount of work performed or other aspects of the application, then the Contractor shall resubmit using the Engineer's version. (If the Contractor feels that it should be paid more, it may follow the claims process under Section 4-12, "Notices, Change Orders, and Claims.") The City should make the payment within thirty (30) days of the Contractor's submittal of an undisputed and properly submitted payment application. City shall require Contractor to complete a Conditional Waiver and Release On Progress Payment form prior to payment of a progress payment.

The City shall retain the stated retention amount for this project, normally this amount will be five (5) percent of the estimated value of the work done and five (5) percent of the value of materials so estimated to have been furnished and delivered and unused as part security for the fulfillment of the contract by the Contractor. This amount may be higher if the City has complied with Public Contract Code requirements and designated this project as substantially complex and required a higher retention amount. In those situations the City will withhold the retention amount designated in the Special Provisions. At the discretion of the Engineer, at any time after fifty (50) percent of the work has been completed, if the Engineer finds that satisfactory progress is being made, the City may reduce the amount retained from any of the remaining partial progress payments in accordance with Section 9203 of the State Public Contract Code.

The City 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 monthly 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 monthly estimate or payment shall be construed to be an acceptance of any defective work or improper materials. Attention is directed to the prohibitions and penalties pertaining to unlicensed contractors as provided in Business and Professions Code Sections 7028.15(a) and 7031.

9-7 Required Releases

The Contractor shall not be entitled to any payment specified in its Contract which is undisputed until such time as the Contractor has executed a release, in the following form, releasing the Owner from all claims relating to the work for which the Contractor is being paid. The release form contains space for the Contractor to claim any disputed amount and to designate the retention amount for each period associated with the release. Contractor hereby expressly agrees that failure on its part to designate any disputed amount or to designate the correct retention amount for each release period on the release form shall constitute an express waiver of the right of the Contractor to claim any disputed amount or any retention amount at any later date. The Owner shall have no obligation to pay the Contractor for any work done until the release form attached to these Contract Documents has been executed by the Contractor and submitted to the Owner.

CONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

PAYMENT NOTICE: THIS DOCUMENT WAIVES THE CONTRACTOR'S CLAIMS AGAINST THE CITY OF VISALIA FOR THE WORK PERFORMED IN THE IDENTIFIED PROJECT ON RECEIPT OF PAYMENT UNLESS LISTED AS AN EXCEPTION.

Owner: City of Visalia
Name of Contractor: _____
Project Description: _____
Period Work Performed: _____

Conditional Waiver and Release (Progress Payment)
This document waives and releases the Contractor's claims against the City of Visalia upon receipt of the progress payment for all labor and materials furnished and for all work performed on the above referenced project for the specified period except for the exceptions specified below.

Amount of Progress Payment: _____

Exceptions
This waiver and release does not affect any items described below. If the item does not apply, then it should be left blank. Attach additional pages if needed.

1. Retentions - Retention Amount this Period _____

2. Extra Work for which the Contractor has not received payment:
   _____
   _____
   _____
   _____

3. The following progress payments for which the Contractor has previously provided the City of Visalia with a conditional waiver and release but has not received payment:
   _____

4. Contract rights including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment, summarize any such exception below :
   _____
   _____

Signature
The Contractor expressly waives and releases any claim the Contractor may have arising out of the project described above for the period specified above upon receipt of the progress payment, unless the claim is listed as an exception. This release and waiver has been made voluntarily by the Contractor without any fraud, duress, or undue influence by any person or entity.

Contractor further certifies, warrants, and represents that all bills for labor, materials, and work due subcontractors for the specified period have been paid in full and that the parties signing below on behalf of the Contractor have express authority to execute this waiver and release.

_____ _____
Signature Date

_____
Print Name

9-8 Prompt Progress Payments Due to Subcontractors.

A prime contractor or subcontractor shall pay any subcontractor not later than ten (10) days of receipts of each progress payment in accordance with the provision in Section 7108.5 of the California Business and Professions Code concerning prompt payment to subcontractors. The ten (10) days is applicable unless a longer period is agreed to in writing. Any delay or postponement of payment over thirty (30) days may take place only for good cause and with the agency's prior written approval. Any violation of Section 7108.5 shall subject the violating contractor or subcontractor to the penalties, sanctions and other remedies of that section. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the prime contractor, deficient subcontract performance, or noncompliance by a subcontractor.

The agency shall hold retainage from the prime contractor and shall make prompt and regular incremental acceptances of portions, as determined by the agency, of the contract work and pay retainage to the prime contractor based on these acceptances. The prime contractor or subcontractor shall return all monies withheld in retention from a subcontractor within thirty (30) days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract work by the agency. Federal law (49 CFR26.29) requires that any delay or postponement of payment over thirty (30) days may take place only for good cause and with the agency's prior written approval. Any violation of this provision shall subject the violating prime contractor or subcontractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the Business and Professions Code. These requirements shall not be construed to limit or impair any contractual, administrative or judicial remedies otherwise available to the prime contractor or subcontractor, in the event of a dispute involving late payment or non payment by the prime contractor, deficient subcontract performance or noncompliance by a subcontractor.

9-9 Stop Notices; City's Right to Withhold Payments

In addition to the retention amount withheld pursuant to Section 9-6, "Partial ('Progress') Payments and Retentions," the City may withhold or nullify the whole or any part of any partial or final progress payment or any release of retention, to such extent as may reasonably be necessary to protect the City from loss on account of:

A. Defective work not remedied, irrespective of when any such work be defective;

B. Failure of the Contractor to make proper payments for labor, material, equipment, other facilities, or to subcontractors;

C. Any penalties provided in these Contract Documents for failure of the Contractor to carry out specific orders of the Engineer.

D. Stop Notices pursuant to Civil Code sections 9350-9364, unless the Contractor at its sole expense provides a bond or other security satisfactory to the City in the amount of at least one hundred twenty-five percent (125%) of the claim, in a form satisfactory to the City, which protects the City against such claim. Any stop notice release bond shall be executed by a California admitted, fiscally solvent surety, completely unaffiliated with and separate from the surety on the payment and performance bonds, that does not have any assets pooled with the payment and performance bond sureties. The City may also withhold for the estimated reasonable cost of stop notice litigation to be incurred. For any stop notice resolved and/or released, the City may withhold for any reasonable cost of litigation actually incurred for that stop notice;

E. Liquidated damages against the Contractor, whether already accrued or estimated to accrue in the future;

F. Reasonable doubt that the Work can be completed for the unpaid balance of any Contract Sum or by the completion date;

G. Damage to the property or work of the City, another contractor, or subcontractor;

H. Unsatisfactory prosecution of the Work by the Contractor, and/or failure to perform all required Work;

I. Failure to store and properly secure materials;

J. Failure of the Contractor to submit on a timely basis, proper and sufficient documentation required by the Contract Documents, including, without limitation, monthly progress schedules, shop drawings, submittal schedules, schedule of values, product data and samples, proposed product lists, executed change orders, and verified reports;

K. Failure of the Contractor to maintain and submit record as-built drawings;

L. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;

M. Unauthorized deviations from the Contract Documents;

N. Failure of the Contractor to prosecute the Work in a timely manner in compliance with established progress schedules and completion dates;

O. Subsequently discovered evidence or observations nullifying the whole or part of a previously issued Change Order or Certificate for Payment;

P. Previous overpayment to Contractor;

Q. Credits owed to the City for reduced scope of work or work that the City otherwise permits Contractor to not perform, and such credits will be based on the reasonable bid value of the unperformed work, including markups for overhead and profit;

R. The estimated value of performing work deleted pursuant to Section 8-12, "Use of Completed Portions; City's Right to Complete;"

S. False claims by Contractor;

T. Breach of any provision of the Contract Documents;

U. Potential loss, liability or damages to the City that is potentially caused by the Contractor; and

V. As permitted by other provisions in the Contract.

The City shall provide written notice to Contractor of items for which the City is withholding from a payment at the time that the payment is being processed. To claim wrongful withholding by the City, or if Contractor otherwise disputes any amount being withheld, Contractor must follow the claim procedures of Section 4-12, "Notices, Change Orders, and Claims." Upon request of the Contractor from whose payment or release the City withheld funds, the Contractor shall be given a written copy of the City's reasons for withholding. When the grounds for withholding funds are removed, payment or release shall be made for amounts withheld because of them. No interest shall be paid on any amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

In addition to withholding amounts permitted by the Contract and statutes (including but not limited to Public Contract Code section 7107), the City may withhold an additional 50% contingency from any progress payment or retention release for any unknown, uncertain or estimated withhold amount. Once the withhold amount becomes known and certain, then the City shall continue to withhold the known and

certain amount and credit, pay or release the remainder, if any, to Contractor. If the known and certain amount exceeds the amount previously withheld, then the City may withhold more from Contractor to cover the excess amount, if unpaid contract funds or retention funds are available for withholding.

The City's withholdings of any unpaid or unreleased amounts for costs, damages and claims against the Contractor shall take priority over any third party claims against the unpaid or unreleased amounts, including stop notices.

Any overpayment to the Contractor by the City, and any failure to withhold an amount from payment that the City had the right to withhold, shall not constitute a waiver by the City of its rights to withhold for such amounts from future payments to the Contractor or to otherwise pursue those amounts from the Contractor.

For any stop notice enforcement action against the City filed by any of the Contractor's subcontractors or suppliers of any tier, the Contractor shall defend and indemnify the City, and its officers, agents and employees, against any and all liability, loss, and damages.

9-10 Payment of Withheld Funds (Substitutions for retention)

Reference is made to the retention provisions of Section 9-6, "Partial (Progress) Payments and Retentions." Upon the Contractor's request, pursuant to Public Contract Code Section 22300, the City will make payment of funds withheld from progress payments to ensure performance of the contract if the Contractor deposits in escrow with the City or with a bank acceptable to the City, 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 City will make payment of retentions earned directly to an 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 from the escrow agent all securities, interest and payments received by the escrow agent from the City, pursuant to the terms in Section 22300 of the Public Contract Code.

Securities eligible for investment shall include those listed in Section 16430 of the Government Code, bank or savings 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 City.

The escrow agreement used pursuant to this Section 9-10 shall be substantially similar to the "Escrow Agreement for Security Deposits In Lieu of Retention" in Section 22300 of the Public Contract Code, deemed as incorporated herein by reference. The Contractor shall obtain the written consent of the surety to the agreement.

Any of the alternatives to the retentions normally withheld by the City are subject to the provisions of Section 9-9, "Stop Notices; City's Right To Withhold Payments," and to the approval of the City Finance Director.

9-11 Notice of Potential Claim

In the event that a dispute over the conduct or payment of any portion of the Work was not resolved by issuance of a contract change order or other agreement between the Contractor and the Engineer, and it is the intent of the Contractor to submit a formal claim to resolve the matter, the Contractor shall file with

the Engineer a written notice of such intent pursuant to Section 4-12, "Notices, Change Orders, and Claims."

9-12 Final Progress Payment

Provided no notices of potential claim, proposed change orders, or claims are pending under Section 4-12, "Notices, Change Orders, and Claims," the Engineer shall, after the completion of the Contract, make a final estimate of the amount of work done thereunder and the value of such work; and the City shall pay the entire sum so found to be due after deducting the retention amount from the final estimate, or other amounts as provided in Section 9-6, "Partial (Progress) Payments and Retentions" and Section 9-9, "Stop Notices; City's Right To Withhold Payments," to be retained following completion of the work.

If a notice of potential claim, proposed change order, or claim is pending under Section 4-12, "Notices, Change Orders, and Claims," and is not resolved in time necessary for the processing of the final monthly progress payment as provided in the above paragraph, the Engineer shall cause a semi-final estimate to be prepared, and the Contractor shall be paid any amounts due less any retentions as provided in Section 9-6, "Partial (`Progress') Payments and Retentions, " and Section 9-9, "Stop Notices; City's Right to Withhold Payments." Upon resolution of the procedures under said Section 4-12, a final estimate will be prepared as above provided, and a final progress payment shall be made.

9-13 Final Payment to Release Owner

The acceptance, without notice of potential claim, by the Contractor of the final payment shall be and shall operate as a release to the Owner (City) of all claims and all liability to the Contractor for all things done or performed for or relating to the work and for every act and neglect of the City and others relating to or arising out of the work, excepting only the Contractor's claims, if any, for amounts withheld by the City, upon final payment. However, no payment, final or otherwise, shall operate to release the Contractor or his sureties from any obligation upon or under this Contract or the Contractor's bond.

9-14 Payment of Retention

Retention shall be released at the latest sixty (60) days after the occurrence of any of the definitions of "Completion" for purposes of Public Contract Code Section 7107 (see definitions of "Completion" in Section 1-3.17B). Any final payment and release of retentions will exclude any amounts withheld in conformance with Section 9-9, "Stop Notices; Rights of the City to Withhold Payments," and Public Contract Code section 7107. When specified in the Contract Specifications, certain portions of the amount retained pursuant to Section 9-6, "Partial ('Progress') Payments and Retentions," may be withheld until the satisfactory completion of the maintenance period specified in the City of Visalia Landscape Standards and Specifications for work pertaining to the installation of landscaping and irrigation facilities.

SECTION 10 DUST CONTROL

10-1 Dust Control

This work shall consist of maintaining dust control about the site of the work, including any haul roads to or from the site, by whatever means are necessary, such as watering, vacuuming, sweeping or oiling, so as to cause the least possible dust nuisance to the public. Any dust control measure ordered by the Engineer shall be promptly and immediately carried out. The requirements of Section 7, "Legal Relations and Responsibilities," as it relates to air pollution, water pollution, public convenience, and public safety shall be adhered to as a part of providing Dust Control. The Contractor is responsible for maintaining dust control continuously throughout the duration of the construction project including weekends and holidays, 7 days a week, 24 hours a day.

The Contractor shall make arrangements for and shall acquire and pay all costs for a satisfactory water supply in accordance with Section 5-13, "Electrical and Water Service." The Contractor shall furnish equipment for transporting and applying water for dust control. The equipment shall meet the approval of the Engineer.

The Contractor shall comply with all the requirements of Section 7-6, "Air Pollution Control," and all of the regulations/requirements of the San Joaquin Valley Air Pollution Control District, hereinafter to be referred to as APCD or Air District, as a part of providing Dust Control.

Dust control shall conform to the provisions of this Section and to the adopted rules from the San Joaquin Valley Air Pollution Control District, Regulation VIII to limit fugitive dust emissions from construction, demolition, excavation, and related activities. A copy of the rules and requirements of SJVAPCD Regulation VIII can be obtained at the following website:
http://www.valleyair.org/busind/comply/PM10/compliance_PM10.htm

The Contractor is required to submit a Dust Control Plan and application to the San Joaquin Valley Air Pollution Control District to obtain a District-approved Dust Control Plan at least 30 days prior to the start of construction activity if more than 2,500 CY of materials per day will be moved on at least three days of the project or if the project disturbs a surface area of more than 5 acres (non-residential projects). See the Regulation VIII requirements for residential projects. If a dust control plan is not required for the project, the Contractor shall still be required to file a Construction Notification Form with the SJVAPCD at least 48 hours prior to commencing any earthmoving activities. The Contractor will be responsible for providing the City of Visalia two (2) hard copies of all notification forms and correspondence between the Air District and the Contractor.

Prior to the Contractor submitting a Dust Control Plan and application to the Air District, he shall submit two (2) hard copies of the completed Dust Control Plan and application to the City of Visalia for review and approval. Upon approval by the City, the Contractor shall submit the required documents to the Air District for approval. After the Dust Control Plan and application are approved by the Air District, the Contractor shall provide to the City of Visalia two (2) hard copies of the approved Dust Control Plans, applications, and Air District approval letter prior to the start of construction.

During all phases of the construction and until completion of the project, the Contractor shall keep the work site clean and free from rubbish and debris. The Contractor shall also control dust by sweeping, vacuuming, sprinkling with water, applying dust palliative, or other approved methods. Water for use in dust control will be available from the California Water Service Company fire hydrants. Prior to the use of such water, the Contractor shall obtain a permit and meter from the California Water Service Company. A specific hydrant shall be designated by the California Water Service Company for use by the

Contractor. Contractor shall be responsible for all fees to the California Water Service Company, related to fire hydrant use. If City Municipal Codes are violated the Contractor may be subject a code enforcement action and separate penalty under those provisions, including fines, and penalties. In addition, City personnel or equipment may be used to control the dust at the cost of Contractor, or as per the Municipal Code the City may charge the Contractor double the cost as a penalty.

10-2 Payment

Payment for Dust Control shall include the cost for all labor, materials, and equipment, including the cost of all water used in the performance of the work, necessary to provide dust control and to comply with all regulatory agencies' requirements and this section including completing permits and paying fees. Where the Contract includes a lump sum bid item for Dust Control, full compensation for dust control shall be included in the lump sum price bid therefor. Payment will be prorated on the basis of the ratio of the total Contract amount ($) completed to date to the total original Contract amount less the sum of dust control and any other prorated items.

Where no bid item is provided for Dust Control, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

SECTION 11 MOBILIZATION & DEMOBILIZATION

11-1 Description

Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, buildings, staging yards, and other facilities necessary for the work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site, including, but not limited to permits and bond premiums and insurance premiums.

Demobilization shall consist of all closing work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals off the project site, and all other work and operations which must be performed to complete the project, including clean-up.

11-2 Payment

The contract lump sum price paid for Mobilization & Demobilization shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in this Section 11.

Where no bid item is provided for Mobilization & Demobilization, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

SECTION 12 TRAFFIC CONTROL; CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

12-1 General

This work shall consist of providing for the convenience and safety of traffic and pedestrians in connection with the Contractor's operations. Traffic and pedestrian control shall be furnished, provided and maintained in accordance with this Section 12, by the Contractor at all times throughout the life of the Contract/Construction Project including weekends and holidays, 7 days a week, 24 hours a day. All traffic control devices used in the performance of traffic control shall conform to the requirements of Section 12-2, "Traffic Control", and Section 12-3, "Construction Area Traffic Control Devices." The Contractor shall comply with the provisions of Section 7-17, "Public Convenience," and Section 7-18, "Public Safety." These requirements work in conjunction with the City of Visalia Encroachment Permit Policy Manual. The Contractor will be required to comply with all of the requirements of the current edition of the Encroachment Permit Policy Manual in affect at the time of construction.

12-2 Traffic Control

12-2.1 Traffic Control Plan, Notifications, Portable Changeable Message Signs (PCMS), Construction Notification Signs

A. Traffic Control Plan

Unless otherwise specified in Construction Specifications, a traffic and pedestrian control plan shall be submitted to the City at the preconstruction meeting or 5 days thereafter for Public projects. In the case of a Non-Public project the Contractor shall submit a traffic control plan (TCP) and full Encroachment Permit application for approval a minimum of ten (10) working days prior to the beginning of construction. The Contractor shall have an Encroachment Permit with effective dates prior to the beginning of construction. If any part of the traffic/pedestrian control plan falls within 300 feet of a signalized intersection, an off-duty officer may be required for traffic control at discretion of the City Engineer. Traffic control plans shall be drawn to a size and scale to show clearly all the necessary details. The traffic control plan shall be prepared by a Civil or Traffic Engineer registered by the State of California or an IMSA or ATSSA certified designer. The Traffic Control Plan shall conform to the requirements of this Section 12, "Traffic Control; Construction Area Traffic Control Devices," and Part 6 of the California MUTCD. Where road closures are anticipated or required, the Contractor shall comply with Section 4-14, "Detours," and Section 12-2.4, "Road Closures," for special plan preparation requirements. An accepted TCP will be stamped and a copy returned to the Contractor. A copy of the accepted plan must remain on the job site at all times.

The General Contractor shall be responsible for providing the Traffic Control Plan for all phases of the work, for all his subcontractors, and shall submit a new plan for approval whenever site conditions change from those originally anticipated resulting in different impacts to traffic and pedestrian travel/access. All costs for designing and obtaining an approved TCP and Encroachment Permit shall be included in the lump sum price bid for Traffic Control.

B. Notifications.

At least five (5) working days in advance of beginning work in any street, alley, or other public thoroughfare, the Contractor shall notify the Engineer, the City Police and Fire Departments, City Solid Waste and Transit Departments, all ambulance companies, Schools or School Districts and

any other jurisdictional agencies involved and comply with their requirements regarding traffic control and public convenience and safety.

In addition, the Contractor shall keep the City Fire Department, Police Department, Solid Waste Department, Transit Department, and ambulance companies informed at all times as to the exact location and progress of the work and shall notify them immediately of any streets closed to traffic or impassable for fire fighting or other safety equipment.

In accordance with Section 8-7, "Notice to Residents," residents, tenants and businesses along the work area shall be provided passage as far as practicable, as determined by the Engineer. Convenient access to driveways, houses and businesses along the road, street, alley or other work area shall be maintained; temporary trench crossings shall be provided and maintained in good condition as required to provide said access. All costs for providing all noticing specified herein shall be included in the lump sum price bid for Traffic Control.

C. Portable Changeable Message Signs

Portable Changeable Message Signs (PCMS) shall be installed on all Collector and Arterial streets where lane restrictions, lane closures or road closures will occur. Other streets may require PCMS as directed by the City of Visalia depending on the proposed phasing of work or field conditions. PCMS shall be installed prior to construction in advance of the project boundary on each approaching roadway indicating the start and end dates of construction as follows:

1. PCMS shall be installed a minimum of seven (7) days in advance of roadway lane restrictions and advance notice of a project.
2. PCMS shall be installed a minimum of fourteen (14) days in advance of roadway closures.
3. PCMS shall be installed as directed by the City Engineer.

All PCMS shall remain in place until construction starts. If construction activity stops for a period of greater than fourteen (14) days or if throughout the duration of construction project road closures are planned to occur PCMS shall be re-installed in advance of these construction activities according to the minimum advanced notice requirements of notes 1-3 of this section. The wording shown on the PCMS shall be as follows for the following situations:

Closure Situation:		
ROAD CLOSED AHEAD	BEGINNING DATE TO END DATE	USE POSTED DETOUR
Lane Restriction Situation:		
ROAD WORK AHEAD	BEGINNING DATE TO END DATE	EXPECT DELAYS
Commencing Work Situation:		
ROAD WORK STARTS	BEGINNING DATE TO END DATE	EXPECT DELAYS

The contractor shall be responsible for the placement of any PCMS and all other devices necessary as required by the California MUTCD to assure safety to the public at all times during construction. Each PCMS shall have the proper traffic control measures in advance of each location to alert motorists of a potential obstruction in the roadway. Traffic lanes or sidewalks shall not be obstructed by the PCMS unless approved by the City of Visalia. The Contractor shall check the PCMS daily to ensure they are functioning properly with the appropriate message. The contractor shall repair or replace any PCMS that is not functioning properly within four (4) hours of being notified.

The PCMS signs can be removed following the installation of the Construction Notification Sign when the PCMS are used to identify commencement of work or when the closure or restriction is occurring as the first construction activity. No additional payment will be made to Contractor for CMS signs required to remain due to Contractors failure to furnish and install the Construction Notification Signs. All costs for providing all PCMS as specified herein shall be included in the lump sum price bid for Portable Changeable Message Signs (PCMS).

D. Construction Notification Signs

Construction notification signs shall be installed at or near the locations of the PCMS or as required by the City Engineer, notifying the public of;

1. Project name, and
2. Project duration, and
3. Contractor's company name with contact telephone number.

Construction notification signs shall be installed as required by the Engineer. The sign's overall dimension shall not exceed 48 inches in height by 66 inches in width. The lettering size, sign materials, and related sign configuration is shown in Exhibit A. The contractor shall submit a drawing of the proposed sign showing the wording to be displayed and the size of the lettering prior to the fabricating of the signs. A map shall be included with the submittal showing the location of each construction notification sign.

The contractor is responsible for maintaining the sign for the duration of the project. The sign shall be mounted on posts and conform to the 2010 Standard Plans, pages RS-1 through RS-4, of the State of California Department of Transportation.

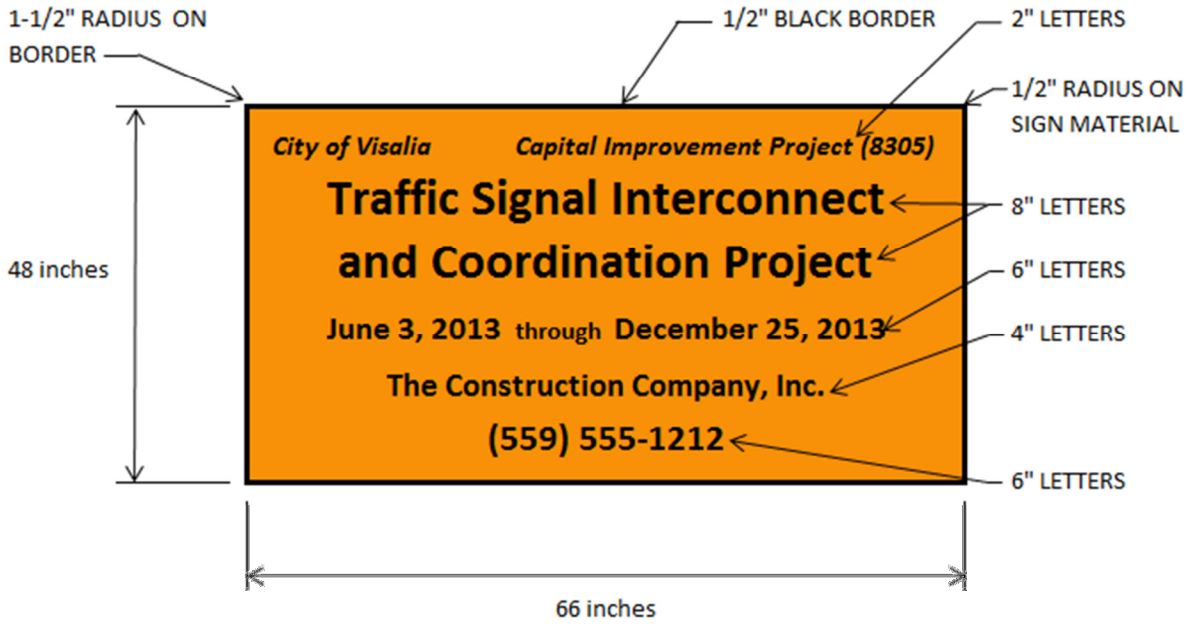
The construction notification signs shall be installed immediately following the removal of the PCMS. The construction notification signs shall be removed within five (5) days of the completion of the project.

If, any sign is damaged or in the opinion of the City needing to be repaired or replaced, the contractor shall repair or replace the sign within twelve (12) hours of being notified. Full compensation for the repair or replacement of the construction notification sign(s) shall be considered as included in the contract price paid for the related item of work and no additional compensation will be allowed therefore.

All costs for providing all Construction Notification Signs as specified herein shall be included in the unit price bid per each for Construction Notification Signs.

Exhibit A – Example Construction Notification Sign

CONSTRUCTION NOTIFICATION SIGN DETAIL



Notes:

1 Sign material shall be 0.08 inches minimum in thickness and shall be aluminim alloy #5052-H38.
2 All sheeting shall be 3M brand Diamond Grade 3 retroreflective material with anti-graffiti coating.
3 The sign shall have black border and legend with the background being orange.
4 The sign shall be mounted on two 4" by 4" wood posts. Each post shall have 3/4" holes drilled through each post at 3" and 6" above the ground line and parallel to the face of the sign.
5 The sign shall be orientated perpendicular to the direction of travel and facing the approaching traffic.

12-2.2 Contractor's Operations

The Contractor shall so conduct his operations as to cause the least possible obstruction and inconvenience to public traffic and abutting property owners (or tenants), and he shall have under construction no greater length or amount of work than he can prosecute properly with due regard to the rights and safety of the public.

Unless other existing streets are specified in the Special Provisions to be used as detours, all traffic shall be permitted to pass through the work area. Two traffic lanes, one in each direction, through the work area shall be maintained. However, as an absolute minimum, one traffic lane shall be kept open with flagperson control, thus maintaining traffic flow. Single lane traffic control shall only be allowed where be approved by the Engineer in writing.

All lanes through the work area shall have a properly maintained all weather surface hereinafter referred to as Temporary Paving. The Temporary Paving shall consist of a minimum of 2" thick cold mix asphalt (cutback asphalt) pavement. Temporary paving in collector and arterial streets shall be replaced with final paving within twenty-one (21) days. Temporary paving in residential streets shall be replaced with final paving within forty-two (42) days. If a surface other than asphalt concrete is planned to be used, prior approval is required from the Engineer. This Temporary Pavement shall be maintained in a safe and reasonably smooth condition until the required final pavement replacement is completed. Temporary paving removed shall be hauled from the job site and disposed of at the Contractor's expense; no additional compensation will be provided therefor.

The Contractor shall provide such flagmen, and furnish, erect, and maintain such fences, barriers, lights, and signs as are necessary to give adequate warning to the public at all times throughout the duration of the contract that the road, street, or other work area is under construction and of any dangerous condition to be encountered as a result thereof. Traffic control conforming to Part 6 of the California MUTCD shall be maintained at all times in, through, and surrounding the construction site continuously throughout the duration of the project including weekends and holidays, 7 days a week, 24 hours a day. Compliance with the requirements of said manual shall be considered as a minimum requirement and the Contractor shall provide additional safety devices when necessary to maintain a safe condition. 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.

Safe, adequate, continuous and unobstructed pedestrian and vehicular access shall be maintained to fire hydrants, residences, commercial and industrial establishments, etc., unless other arrangements satisfactory to the owners have been made. Safe and adequate pedestrian zones and public transportation stops, as well as pedestrian crossings of the work at intervals not exceeding 300 feet also shall be maintained unless otherwise approved by the Engineer.

Where public traffic and/or emergency vehicles must be routed over areas under construction, the contractor's operations shall be conducted in such a manner as to provide a smooth and stable roadway surface at all times when the specific area is not under actual construction. Dust control conforming to Section 10, "Dust Control," shall be provided at all times. Alternating traffic over work areas, use of one-way traffic control with flaggers, or any other methods used by the Contractor shall be approved by the Engineer and shall conform to Part 6 of the California MUTCD.

Construction Area Signs shall be picked up and removed from the street right of way at the end of each work day except where said signs are required to remain overnight to adequately warn the public for convenience or safety. Any signs that are permitted to remain overnight shall be turned and oriented in a manner that does not allow the sign to be read by the adjacent traffic. All signs, delineators, and other traffic control facilities left out overnight shall be retroreflective meeting the requirements of the California MUTCD. All traffic signs and barricades located in any part of the street right of way or pedestrian pathways (sidewalk) that are left out overnight shall have flashing yellow beacons installed on them that meet the specifications listed in the California MUTCD. Exception: Temporary traffic stop signs shall have flashing red beacons instead of yellow.

Contact the City Arborist at (559) 713-4295 prior to installing any construction area sign in any landscaped areas.

In situations where street paveouts are being constructed or other improvements are being constructed that leave a vertical drop along an edge of pavement in the roadway within 6 feet of a travel lane or designated bike path, the Contractor shall be responsible for installing a compacted and stable 4:1 (4 feet horizontal

to 1 foot vertical) fill slope from the existing pavement edge to the adjacent grade unless solid unmovable barricades or K-rails are installed to protect the public and isolate the area. At a minimum, this 4:1 slope shall be in place at the end of each work day and at any other time that work is not being performed at the site.

12-2.3 Flaggers

Flaggers while on duty and assigned to traffic control or to give warning to the public that the street or other area is under construction and of any dangerous conditions to be encountered as a result thereof, shall perform their duties and shall be provided with the necessary equipment in conformance with Part 6 of the California MUTCD. The equipment shall be furnished and kept clean and in good condition by the Contractor at the Contractor's expense. All flaggers shall have the proper training and shall meet the qualification requirements of Section 6E.01 "Qualifications for Flaggers" of the California MUTCD. At the request of the engineer, the Contractor shall be responsible for providing training documentation for each flagger on the jobsite prior to construction.

12-2.4 Road Closures

Where road closures and detours are required by the Contract Specifications or the plans, the Contractor shall implement such closures in accordance with the provisions thereof. Notifications shall be provided in accordance with Section 12-2.1, "Traffic Control Plan; Notifications, PCMS, Construction Notification Signs." The Contractor shall conduct his operations in accordance with Section 12-2.2, "Contractor's Operations."

Where road closures are not prohibited by the Specifications, and the Contractor for his own convenience requests a closure, such request shall be made to the Engineer in writing not less than fifteen (15) working days prior to the requested date of closure. Such request shall be accompanied by a Traffic Management Plan (Road Closure and Detour Plan) prepared by a Civil or Traffic Engineer registered by the State of California or an IMSA or ATSSA certified designer. The Plan shall conform to the appropriate Part(s) of the California MUTCD. The Engineer should respond to the Contractor not less than five (5) working days prior to the requested date of closure. If approved by the Engineer, the Contractor shall implement the plan as prepared, including any amendments made by the Engineer thereto. Notifications shall be made in accordance with Subsection 12-2.1, "Traffic Control Plan, Notifications, PCMS, Construction Notification Signs."

Unless approved otherwise in the Special Provisions or by the City Engineer, all roads shall be re-opened to the public at the end of each work day. Temporary paving shall be installed, the appropriate traffic signage shall be removed or left in place, and the roadway shall be made safe for the public.

Where the Engineer determines that non-emergency traffic or other conditions warrant closure of a road, the Engineer may direct the Contractor to immediately prepare a Traffic Management Plan no later than twenty four (24) hours prior to the closure for review by the Engineer. Alternatively, the City may prepare such Plan. The Contractor shall implement the Plan at the time prescribed by the Engineer.

Changed conditions considered to be dangerous or emergencies requiring immediate closure of a road shall immediately be brought to the Engineer's attention. If deemed warranted by the Engineer, the Contractor shall immediately implement the closure in accordance with the instructions given by the Engineer.

12-2.5 Deficiencies

Should the Contractor appear to be neglectful or negligent in furnishing warning devices and taking protective measures as provided in Section 12-2.2, "Contractor's Operations," the Engineer may direct the

Contractor's 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 the Contractor's expense. Should the Engineer point out the inadequacy of warning devices and protective measures, that action on the part of the Engineer shall not relieve the Contractor from responsibility for public safety or abrogate the obligation to furnish and pay for these devices and measures.

Should the Contractor fail to correct any traffic control deficiency after being notified by the Engineer or Inspector and ordered to correct the deficiency, then the City has the right to remedy the situation and deduct the City's costs from the Contractor's Contract. Contractor will also be responsible if the Engineer or Inspector determines the violation requires an immediate corrective response and the City summarily abates the violation.

If City Municipal Codes requiring compliance with encroachment permits, including an applicable traffic control plan are violated, then the Contractor may be subject a code enforcement action and separate penalty or fine under those provisions.

12-3 Construction Area Traffic Control Devices

12-3.1 Traffic Control Devices

All traffic control devices required in these Specifications and furnished by the Contractor shall conform to the requirements of Section 12-3, "Traffic-Handling Equipment and Devices," of the State Standard Specifications. All references therein to the MUTCD and MUTCD California Supplement shall mean the California MUTCD as defined in Section 1, "Definitions and Terms."

12-4 Measurement and Payment

Unless otherwise provided in the Contract Specifications, all costs for providing Traffic Control and Construction Area Traffic Control Devices as required in this Section 12 shall be measured and paid for at the lump sum price bid for Traffic Control, and includes compensation for furnishing all labor, materials, tools, equipment, signs, devices, pavement markings, channelizers, flaggers as required, road closures and detours, temporary pavement installation and removal and disposal, temporary fences, securing approval of traffic control plans, traffic control plan design, notifications, providing convenient access to adjacent residences and businesses, all devices required for the control of traffic as herein provided, and all incidentals and work required for furnishing Traffic Control and Construction Area Traffic Control Devices as shown on the Plans and specified in the Specifications and the City of Visalia Encroachment Permit Policy Manual.

Full compensation for Portable Changeable Message Signs (PCMS) shall be measured and paid for on a lump sum basis and shall include furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in transporting, installing, maintaining, and removing Portable Changeable Message Signs to the satisfaction of the City of Visalia, and no additional compensation shall be allowed therefore.

Full compensation for Construction Notification Signs shall be paid per each, and shall include furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in transporting, installing, maintaining, and removing Construction Notification Signs to the satisfaction of the City of Visalia, and no additional compensation shall be allowed therefore.

At the discretion of the Engineer, monthly progress payments may be prorated on the basis of the ratio that the completed dollar amount of the work bears to the total contract dollar amount, less any other prorated items.

Where road closures and detours are provided for the convenience of the Contractor which are not otherwise shown on the Plans to be constructed, all costs shall be borne by the Contractor for such road closures and detours, including preparation of the required Traffic Management Plan. No additional payment will be made therefor.

Where the Engineer determines that non-emergency, emergency, or hazardous conditions not created by the Contractor, nor are due to the failure of the Contractor to act or use due diligence and care in performance of the work, warrants road closures and detours which are not otherwise shown on the Plans to be constructed, the cost thereof shall be paid for as extra work in accordance with Section 9-5, "Payment for Extra Work," including preparation of a Traffic Management Plan if so directed by the Engineer.

Where road closures and detours are made necessary due to conditions created by the Contractor, or due to the failure of the Contractor to act or use due diligence and care in the performance of the work, and where no closure or detour was otherwise contemplated, the Contractor shall be responsible for the cost thereof including the cost of preparing a Traffic Management Plan. No additional payment will be made therefor.

SECTION 13 (RESERVED)

SECTION 14 (RESERVED)

SECTION 15 REMOVING EXISTING FACILITIES

15-1 General

15-1.1 Description

This work shall consist of removing existing facilities which interfere with construction within the area to be cleared and grubbed as specified in Section 16, "Clearing and Grubbing," or within any area of construction or reconstruction shown on the Plans or specified in the Specifications, or as directed by the Engineer. Removed facilities shall be disposed of, salvaged, relaid, reset, relocated or reconstructed as shown on the Plans or specified in the Contract Specifications.

Trenches, holes, depressions and pits caused by the removal of existing facilities shall be backfilled with embankment material as provided in Section 19, "Earthwork." Trenches, holes, depressions and pits caused by the removal of street or other facilities that are in surfaced areas, otherwise to remain undisturbed, shall be backfilled with embankment material as provided in Section 19, "Earthwork," and shall be compacted and final paving installed in accordance with the Trench Backfill/Patch Paving Standard Drawing.

15-1.2 Preservation of Property

Existing facilities which are to remain in place shall be protected in conformance with the provisions of Sections 5-3, "Contractor's Responsibility for Work," 5-9, "Preservation of Property," 7-4, "Contractor's Insurance Requirements and Hold Harmless," Section 7-16, Injury or Damage to Persons or property," and Section 8-15, "Utility and Non Street Facilities; Potholing."

A. Traffic Signal Detection Loops

Traffic Signal Detection Loops may exist as far as 300 feet or more from a signalized intersection. After calling for USA mark-outs, the Contractors working within such an area must meet with the City Traffic Signal Technician at the project site to physically review all detection loops in the area in order to minimize damage to the existing loops that are to remain. The Contractor shall be responsible for setting up and having the meeting prior to construction. Any loops that are to remain which are damaged by the Contractor's operation shall, at the Contractor's expense, be replaced in accordance with the provisions in Section 45, "Signals, Lighting and Electrical Systems," and as directed by the Engineer.

15-2 Miscellaneous Facilities

15-2.1 Description

Miscellaneous facilities shall include all structures, drainage, irrigation, water and sewer facilities, water wells or cisterns, drain wells, septic tanks or pits, leach fields, right of way and traffic control facilities including traffic signal detection loops, mail boxes, fences, walls, survey monuments, corners, or other markers, private driveways or approaches, and any other miscellaneous improvements or facilities not mentioned in this Section 15-2 but located within the area to be cleared and grubbed, constructed, or reconstructed, except concrete, bridges and concrete culverts which are provided for in Sections 15-3, "Removing Concrete," and 15-4, "Bridge, Concrete Culvert Removal."

15-2.2 Removal Methods

Removing or abandoning existing facilities which interfere with construction or which are directed to be removed or abandoned by the Engineer shall be performed as shown on the Plans, as specified in the Specifications, or as directed by the Engineer.

A. Well Abandonment

All existing drainage or supply wells, within the limits of the project, which are not in use or intended for future use shall be abandoned in accordance with State of California Bulletin 74-81, Water Well Standards, as amended by Bulletin 74-90, as implemented by the Tulare County Health and Human Services Department. The Contractor performing the well abandonment shall be licensed to perform such work (Class A or Class C-57) in accordance with the provisions of the State Business and Professions Code, Chapter 9, Division 3.

The Contractor shall obtain a permit for the work from the City of Visalia Building Division prior to performing the well abandonment, and shall coordinate with the Building Division for inspection of the work as required. The exposed well shall be securely covered during all periods of inactivity with a suitable cover sufficiently anchored as approved by the County and the City of Visalia to prevent hazard to the public and/or contamination of the well.

B. Obliterating Roads and Detours

Prior to obliteration, all existing bituminous material shall be removed from the roadway and properly disposed of. Unless otherwise specified in the Specifications, obliteration shall consist of rooting, plowing, pulverizing, or scarifying to a minimum depth of 0.5 foot or to the bottom of the impermeable underlying base, whichever is the greater.

After obliteration, the area shall be graded, as shown on the plans or as directed by the Engineer, so that it will blend in with the surrounding terrain and be well drained.

Wherever a portion of existing surfacing is to be obliterated, the outside edge of the existing surfacing, which is to remain in place, shall be sawed to a neat line, prior to obliteration operations.

C. Traffic Stripes and Pavement Markings

Prior to any traffic signs, traffic stripes and pavement markings being removed/modified the Contractor shall have all temporary traffic control measures and signs in place to safely direct traffic through or around the work zone. The City inspector or engineer shall approve the temporary traffic measures prior to any existing street signage, traffic stripes, and pavement markings being removed.

1. Where shown on the Plans or specified in the Specifications, traffic stripes and pavement markings (paint and thermoplastic) to be removed shall be accomplished by wet sandblasting or other approved methods which will cause the least possible damage to the pavement. Dry sandblasting may be used in selected areas only with the permission of the Engineer and with approval of the air pollution control authority having jurisdiction over the area in which the work will be performed. Alternate methods of removal require prior approval of the Engineer.

   Pavement marking images shall be removed in such a manner that the old message cannot be identified. Where grinding is approved by the Engineer for use, the pavement marking image shall be removed by grinding a rectangular area. The minimum dimensions of the rectangle shall be the height and width of the pavement marking. Residue resulting from removal operations shall be removed from pavement surfaces by sweeping or vacuuming before the residue is blown by the action of traffic or wind, migrates across lanes or shoulders, or enters

into drainage facilities. Traffic stripes shall be removed before any change is made in the traffic pattern.

Traffic Stripes and Pavement Markings designated to be removed and not to receive a pavement surface treatment per Section 15-2.2.C.3 shall be removed completely as herein specified. Any voids created by grinding shall be filled using a Type II slurry approved by the Engineer.

All existing striping, stenciling, or other markings, whether shown for removal or not, that will be in conflict with the intent of any new striping shown on the Plans or specified in the Contract Specifications, shall be removed.

2. Removal of Yellow Traffic Striping and Markings that may produce Hazardous Waste Residue:
Where grinding or other authorized methods are used to remove yellow thermoplastic and yellow painted traffic stripe and pavement marking that will produce a hazardous waste residue, immediately contain and collect the removed residue, including dust. Use a HEPA filter-equipped vacuum attachment operated concurrently with the removal operations or other equally effective approved methods for collection of the residue.

   Make necessary arrangements to test the yellow thermoplastic and yellow paint hazardous waste residue as required by the disposal facility and these specifications. Testing methods and procedures shall meet all current applicable state and federal guidelines.

   If analytical test results demonstrate that the residue is hazardous waste, dispose of yellow thermoplastic and yellow paint hazardous waste residue at a Class 1 disposal facility located in California under the requirements of the disposal facility operator within 90 days after accumulating 220 pounds of residue and dust. If the test results demonstrate that the residue is a non-hazardous waste, dispose of the residue at an appropriately permitted CA Class II or CA Class III facility.

3. Traffic stripes and Pavement Markings to be removed for various pavement surface treatment operations shall comply with the following:

   Preparation for Fog Seal or Slurry Seal.
   In addition to the provisions of (1) above, for Fog Seal and Slurry Seal applications, the Contractor shall protect existing permanent raised pavement markers from damage or coating. Damaged or coated markers shall be replaced in accordance with Section 47, "Raised Pavement Markers," at the contractor's expense.

   Preparation for Cape Seal.
   In addition to the provisions of (1) above, for Cape Seal applications the Contractor shall remove permanent raised pavement markers in conformance with Section 15-2.2.D "Pavement Markers," and at the completion of work replace them in accordance with Section 47, "Raised Pavement Markers."

   Preparation for Overlay.
   Unless the Plans or Contract Specifications require otherwise, for Overlay applications, the Contractor shall only remove permanent raised pavement markers in conformance with Section 15-2.2.D "Pavement Markers," and at the completion of work replace them in accordance with Section 47, "Raised Pavement Markers."

4. The Contractor shall remove the existing paint and thermoplastic striping, pavement markings or raised pavement markers where required, no earlier than five (5) days before the start of any of the applications specified in (3) above. After removing the existing paint, markings, or markers, unless otherwise authorized by the Engineer, the Contractor shall immediately install temporary reflectorized markers and temporary reflectorized tape which shall be left in place until beginning the applicable application.

   Extra caution shall be required at locations with traffic signal loops where pavement markings or striping must be removed. Loops are located just below surface grade. Temporary reflective road marker tabs, approved for use by the Engineer, shall be placed in accordance with the manufacturer's specifications but shall not be spaced at more than 15-foot intervals. Temporary reflective road marker tabs shall also be placed at all stop bars that are removed and shall have a minimum of six (6) reflectors or as directed by the Engineer. The Contractor shall also install temporary reflective tape to establish obliterated pavement markings including but not limited to crosswalks, stop bars, stop markings, and turn arrows. The temporary reflective markers and temporary reflective tape shall be the same color as the lane line, centerline, or pavement marking the markers/tape replace. The Contractor shall maintain all temporary reflective markers and temporary reflective tape for the entire duration of the project

   All temporary markers and tape shall be completely removed prior to the applicable applications specified in (3) above and reinstalled upon completion of the application prior to installation of permanent striping. All protective covers of markers left in place shall be removed after the application for nighttime reflectivity and visibility. Prior to the application of paint, thermoplastic striping, and pavement markings, temporary road marker tabs and tape shall be removed completely. Re-installation of Traffic Stripes and Pavement Markings shall comply with Section 46, "Traffic Stripes, Signs, and Pavement Markings."

D. Pavement Markers

Where removal of existing raised pavement markers is called for on the Plans and/or Contract Specifications, markers including underlying adhesive shall be removed by an approved method that will result in the least possible damage to the pavement or other surfacing. Damage to the pavement or surfacing caused by pavement marker removal shall be repaired by the Contractor at the Contractor's expense by methods acceptable to the Engineer. Pavement markers, whether shown for removal or not, that will be in conflict with the intent of any new striping diagram, shall be removed. During the removal of ceramic type pavement markers, screens or other protective devices shall be furnished to contain any fragments as provided for in Section 7-18, "Public Safety." Fragments resulting from the removal of pavement markers shall be removed from the roadway before the lane or lanes are opened to traffic.

Removal shall be at the direction of the Engineer. The cost thereof shall be included in the various items of work; no additional compensation will be paid therefor.

E. Traffic Signs

All traffic signs and street signs within the limits of the improvement project, if required, shall be removed, salvaged and stockpiled at locations designated by the Engineer. Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer. The Contractor shall install (and ultimately remove) temporary traffic control devices,

as required, at locations designated by the Engineer. Traffic control signs and street signs previously removed and salvaged shall be replaced upon completion of the work.

Where the plans indicate the removal of an existing traffic sign from an existing post holding multiple signs, when the top sign is removed, the Contractor shall raise the remaining signs to the top of the existing post.

15-2.3 Disposal

Removed existing facilities that are not to be salvaged or reused in the work shall become the property of the Contractor and shall be disposed of as provided in Section 5-12, "Disposal of Material Outside the Right of Way."

15-2.4 Salvage

Materials from existing facilities which are shown on the Plans or specified in the Contract Specifications to be salvaged, shall remain the property of the City. Salvaging shall include the removal, disassembly, preparation, marking, bundling, packaging, tagging, hauling and stockpiling of salvaged materials or facilities to the location shown on the plans or specified in the Specifications. Materials include parts, articles and equipment of assembled facilities. Salvaging does not include the preparation of existing material that is to be reused in the work.

Materials from an existing facility to be salvaged shall be salvaged; except, when only specific materials from the facility are designated to be salvaged, the remaining materials from that facility shall be removed and disposed of.

Materials to be salvaged shall not be removed until their use is no longer required as determined by the Engineer. Salvaged materials shall be cleaned of earth and other foreign materials. Adhering concrete shall be removed from salvaged materials.

When practicable, salvaged materials shall be hauled directly to the location specified in the Specifications and stockpiled; however, salvaged materials may be temporarily stored at a location selected by the Contractor and approved by the Engineer, and later hauled to and stockpiled at the final location. Materials which are lost for any reason before stockpiling at the final location shall be either replaced by the Contractor at the Contractor's expense, or, at the discretion of the Engineer, the estimated cost of replacement may be deducted from any moneys due or to become due to the Contractor.

Materials designated to be salvaged that are damaged, as determined by the Engineer, shall be segregated from undamaged material. The damaged material shall become the property of the Contractor and shall be disposed of outside the right of way in conformance with the provisions in Section 5-12, "Disposal of Material Outside the Right of Way."

Materials to be salvaged that are damaged as a result of the Contractor's operations shall be repaired by the Contractor, at the Contractor's expense, to the satisfaction of the Engineer. Materials that are damaged beyond repair as a result of the Contractor's operations shall be disposed of outside the street right of way as provided in said Section 5-12 and replaced at the Contractor's expense, or, at the discretion of the Engineer, the estimated cost of replacement may be deducted from any moneys due or to become due to the Contractor. Replacements for lost or damaged materials shall be of the same kind and of the same or better quality and condition as the lost or damaged materials were prior to removal.

Salvaged material shall be packaged and bundled as specified in the Specifications or as directed by the Engineer, except that frames and covers or frames and grates of existing manholes, inlets, or other facilities such as water valve frames and lids, shall be match-marked in pairs.

15-2.5 Reconstruction

Existing facilities that are shown on the Plans or specified in the Contract Specifications to be reconstructed or re-installed at existing or new locations shall conform to the design of the existing facilities and shall be new. The work of reconstruction shall be performed in accordance with the Plans, Contract Specifications, and the requirements of these Specifications for new work of similar character, which apply to the type of facility to be reconstructed, adjusted, modified, remodeled, re-laid, relocated or reset. Where an existing facility not conforming to current Americans With Disabilities Act (ADA) Standards is to be replaced, unless otherwise shown on the Plans or specified in the Contract Specifications, the new facility shall be constructed to meet current ADA standards as directed by the Engineer.

Materials to be reused shall not be removed until their use is no longer required as determined by the Engineer. Materials to be reused in the work shall be cleaned of earth and other foreign materials. Adhering concrete shall be removed from materials to be reused in the work. Materials shown on the Plans or specified in the Contract Specifications to be reused in the work that are damaged as a result of the Contractor's operations shall be repaired by the Contractor, at the Contractor's expense, to the satisfaction of the Engineer. Materials that are damaged beyond repair as a result of the Contractor's operations shall be disposed of outside the right of way in conformance with the provisions in Section 5-12, "Disposal of Material Outside the Right of Way."

Material from existing facilities to be reused in the work that, in the opinion of the Engineer, is unsuitable for use in the work shall become the property of the Contractor and shall be disposed of in conformance with the provisions in said Section 5-12. The unsuitable material shall be replaced with new material. Furnishing of material to replace unsuitable materials as ordered by the Engineer will be paid for as extra work as provided in Section 4-11, "Extra Work."

A. Frames, Covers, Grates, and Manholes

Frames, covers or grates of existing manholes, traffic boxes, inlets or other facilities shall be adjusted to grade with new materials in accordance with the provisions of these Specifications, the Contract Specifications, and the Standard Drawings. In the absence of any requirements set forth by the foregoing, raising existing facilities to grade shall be accomplished using new materials similar in character to those in the original structure. Existing facilities being adjusted to grade shall be cleaned internally of all mud and debris down to and including the bottom of the manhole, other structure, regardless of whether the material was present prior to beginning of construction.

After the existing cover or grate frame has been removed, the top of the structure to be raised shall be trimmed to provide a suitable foundation for the new material. When reconstruction or adjustment of a concrete drainage or other facility requires partial removal of concrete, sufficient concrete shall be removed to permit new reinforcing steel to be spliced to existing reinforcing steel as specified in Section 52-6, "Splicing," of the State Standard Specifications. Existing reinforcement that is to be incorporated in new work shall be protected from damage and shall be thoroughly cleaned of adhering material before being embedded in new concrete.

Concrete removal shall be performed without damage to the portion that is to remain in place. Damage to the existing concrete, which is to remain in place, shall be repaired to a condition

equal to that existing prior to the beginning of removal operations. The cost of repairing existing concrete damaged by the Contractor's operations shall be at the Contractor's expense.

If a manhole cover that is raised to grade is unstable or noisy under traffic, the conditions shall be corrected by placing a coil of asphalt saturated rope, a plastic type washer or asphaltic compounds approved by the Engineer, on the cover seat.

Facilities located in the pavement area shall not be constructed to final grade until the adjacent pavement or surfacing has been completed. All facilities shall be raised to final grade within 10 calendar days of being covered with final paving. The Engineer shall approve the order in which facilities are raised.

Portions of manholes that are to be lowered shall be removed as directed by the Engineer. Where insufficient depth will exist to allow the proper use of grade adjusting rings to raise the cover to final pavement grade, the manhole shall be lowered to an approximate depth of 3.5 feet below finished grade and shall then be reconstructed with the proper taper to finished grade. When existing manholes or inlets are to be abandoned, pipes entering the manhole or inlet 48 inches in inner diameter or less shall be securely closed by a tight fitting plug or wall of minor concrete not less than 0.67 foot thick, or by a tight brick wall not less than 0.67 foot thick with cement mortar joints in accordance with the Standard Drawings. Minor concrete shall conform to the provisions in Section 50, "Portland Cement Concrete," of these Specifications. The bases of manholes or inlets shall be broken in a manner to prevent entrapment of water. Unless otherwise specified by the Contract Specifications, the manhole or inlet shall be demolished to an elevation 3.5 feet below finished grade and backfilled in conformance with the provisions in Section 19-3.3.B, "Structure Backfill."

B. Fences

Corner posts with braces shall be placed at the junctions of reconstructed fences and existing cross fences and the two fences properly fastened thereto. Gates to be reused shall be installed in reconstructed fences at the locations designated by the Engineer. Clearing required for reconstructed fences shall conform to the provisions in Section 16, "Clearing and Grubbing." Removing and reconstructing fence shall be performed in a manner that will prevent the escape of any animals contained within the fenced area.

C. Extending Pipes

Existing pipe shall be extended as shown on the Plans or specified in the Contract Specifications and shall conform to the requirements for installing new pipe. Existing headwalls, endwalls, or other structures shall be removed and disposed of or moved to the extended location as shown on the Plans or directed by the Engineer. When headwalls or endwalls are to be moved, the pipe shall be cut with smooth edges at a point about one foot back of the headwall or endwall along a plane perpendicular to the center line of the pipe. The headwall or endwall shall then be moved and placed in its new location and the new pipe shall be connected to the existing pipe as shown on the plans or as directed by the Engineer.

D. Irrigation and Sprinkler Systems

1. Sprinkler or irrigation lines disturbed by roadway and structure construction shall be temporarily capped when first disturbed. Contractor shall be responsible for irrigating existing lawns, shrubs, trees and other landscaping until the irrigation system is reconstructed. Suitable repairs and reconstruction of irrigations systems shall be completed no later than 10 days from the original disturbance date. Any landscaping that dies or is damaged by the

Contractor's operations shall be replaced to an equivalent level or better than it existed prior to construction at the Contractor's expense.

2. Sprinkler or irrigation lines and facilities disturbed shall be replaced to original condition using similar material as removed. (Galvanized pipe to be replaced with galvanized pipe, brand name heads replaced with same brand name and model.) Sprinkler lines shall be realigned around new improvements and structures in order to duplicate original irrigation coverage.

3. Sprinkler systems disturbed and repaired shall be water-tested by the Contractor, prior to backfilling the trenches, in the presence of the Inspector or Engineer before acceptance of the repair.

15-2.6 Measurement

The work performed under this Section 15-2, "Miscellaneous Facilities," will be measured by units specified in the Contract Specifications for the various work described. In the absence of a contract item setting forth methods of measurement, the cost of the work involved shall be considered as included in the price paid for other various items of work, and no measurement is required.

15-2.7 Payment

When the contract includes separate items with unit or lump sum prices for removing, salvaging, adjusting, modifying, remodeling, abandoning, obliterating, relaying, reconstructing, relocating or resetting any of the miscellaneous facilities, the quantities will be paid for at the contract unit or lump sum price for the item of work involved. If no contract items are provided, then the cost thereof shall be considered to be included in the various other items of work. No additional payment will be made therefor.

Payments shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in completing the operations as shown on the Plans, as specified in the Specifications, and as directed by the Engineer.

Full compensation for all excavation and backfill required to remove, dispose of, salvage, relay, reset, relocate and reconstruct facilities for which payment is not otherwise provided, shall be considered as included in the contract unit or lump sum price paid for the item of work involved and no separate payment will be made therefor. If no contract items are provided, then the cost thereof shall be considered to be included in the various other items of work. No additional payment will be made therefor.

Full compensation for removal of existing striping, pavement markings, and raised pavement markers where required, including additional grinding outside the limits of the existing pavement marking image to obtain a rectangular area, and placement and removal of temporary pavement markings, and repainting or remarking, shall be considered as included in the contract price paid for the item of work involved and no additional compensation will be allowed therefor. If no contract items are provided, then the cost thereof shall be considered to be included in the various other items of work. No additional payment will be made therefor.

Full compensation for removing, preparing, disassembling, packaging, bundling, tagging, hauling and stockpiling of salvaged materials including any temporary storage prior to stockpiling and disposal of unwanted portions of facilities or damaged materials, shall be considered as included in the contract price paid for the item involved and no separate payment will be made therefor. In the absence of a contract

item, the cost thereof shall be considered as included in the various other items of work. No additional payment will be made therefor.

When the contract does not include separate items for removing any of the existing facilities encountered within the area to be cleared and grubbed or the removal is not included in another item, then payment for removing the facilities shall be considered as included in the contract prices paid for Clearing and Grubbing or excavation of the type in which the facilities are located. If the contract does not include items for clearing and grubbing or excavation, then removing the existing facilities within the area to be cleared and grubbed will be considered as being included in the various items of work; and no additional payment will be made therefor.

When an existing facility which is outside the area to be cleared and grubbed is shown on the Plans or specified in the Contract Specifications to be removed and the contract does not include an item for its removal, or its removal is not included in another item, then payment for removing the facility will be considered as included in the contract price paid for Clearing and Grubbing. If the contract does not include an item for clearing and grubbing, then the cost thereof shall be considered as included in the various items of work; no additional payment will be made therefor.

If the Engineer orders the removal of a facility which is not shown on the Plans or specified in the Contract Specifications to be removed, then removing the existing facility will be paid for as extra work as provided in Section 4-11, "Extra Work."

15-3 Removing Concrete

15-3.1 Description

Concrete shall be removed at the locations shown on the Plans or described in the Contract Specifications, or where directed by the Engineer. Removal shall be to the lines and elevations shown, specified, or determined by the Engineer.

Concrete shall be defined as all or portions of mortared rubble masonry, brick or stone curbs, gutters and sidewalks; and portland cement concrete curbs, gutters, sidewalks, gutter depressions, driveways, aprons, slope paving, island paving, barriers, retaining walls, spillways, dams, structures, foundations, footings, and all other portland cement concrete or masonry construction, except bridges, concrete culverts and pavement which are provided for in Section 15-4, "Bridge, Concrete Culvert Removal," and Section 19-1.1, "Description."

Types of existing subbase, base, surfacing and pavement to be removed will be classified for payment as the type of excavation in which the subbase, base, surfacing and pavement are located. The work for removal of concrete shall include removal and disposal of any reinforcing steel except as provided herein.

Concrete pipe and clay pipe will be considered as miscellaneous facilities to be removed, salvaged, relaid or disposed of as provided in Section 15-2, "Miscellaneous Facilities," and will not be paid for as removing concrete.

15-3.2 Removal Methods

Unless otherwise specified in the Contract Specifications, existing concrete shall be removed to a depth of at least three (3) feet below finished grade. Existing concrete shall be cut to a true line where new concrete is to join existing concrete. Explosives shall not be used for any concrete removal. Concrete removal operations shall be performed without damage to any portion that is to remain in place. Damage to the existing concrete, which is to remain in place, shall be repaired to a condition equal to that existing

prior to the beginning of removal operations. The cost of repairing existing concrete damaged by the Contractor's operations shall be at the Contractor's expense.

Existing reinforcement that is to be incorporated in new work shall be protected from damage and shall be thoroughly cleaned of adhering material before being embedded in new concrete.

Unless otherwise provided in the Contract Specifications, removed concrete shall not be buried in adjacent embankments, and shall be disposed of in accordance with Section 5-12, "Disposal of Material Outside the Right of Way." If burial is otherwise provided for, removed concrete shall be broken into pieces which can be readily handled and incorporated into embankments and is placed at a depth of not less than 3 feet below finished grade and slope lines. The removed concrete shall not be buried in areas where piling is to be placed or within ten feet of trees, pipelines, poles, buildings or other permanent objects or structures.

The floors of concrete basements, pits and structures, that are not required to be removed and which are located within the roadway shall be broken in a manner that will prevent the entrapment of water. Full compensation for breaking up concrete will be considered as included in the prices paid for the various contract items of work and no separate payment will be made therefor.

When there is a contract item for shattering concrete, concrete pavement and similar slabs upon which embankments are to be constructed, the concrete shall be broken up into pieces not larger than 2 feet in greatest dimension and left in place.

15-3.3 Measurement

The work performed under this Section 15-3 and paid for by contract items will be measured by the method specified in the Contract Specifications. In the absence of a contract item for Removing Concrete, the cost thereof will be considered as being included in the lump sum price paid for Clearing and Grubbing and no measurement will be made.

No deductions will be made from any excavation quantities for the volume of concrete removed.

15-3.4 Payment

Payment for Removing Concrete will be made at the price per unit of measurement specified in the Contract Specifications. Payment includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work and performing all the operations involved in removal of concrete as shown on the Plans, as specified in the Specifications, and as directed by the Engineer. No additional compensation will be paid for the removal of concrete containing steel reinforcing or other steel where encountered.

In the absence of a contract item for Removing Concrete, the cost thereof shall be considered as included in the contract lump sum price paid for Clearing and Grubbing. If no contract item is provided for Removing Concrete or Clearing and Grubbing, then the cost thereof shall be considered to be included in the various other items of work. No additional payment will be made therefor.

15-4 Bridge, Concrete Culvert Removal

15-4.1 Description

This work shall consist of removing existing bridges, concrete culverts, or portions thereof. The type and general dimensions of the bridges or portions of bridges or concrete culverts to be removed will be shown

on the Plans or described in the Contract Specifications. For purposes of these Standard Specifications, "bridge" shall include concrete box culverts.

Where portions of bridges or culverts are to be removed, the removal operations shall be conducted so that there will be the least interference to public traffic using the structure involved. When complete bridges or culverts are to be removed, removal operations shall not be started until public traffic is no longer routed over the structure to be removed.

15-4.2 Removal Methods

At least 10 working days before beginning bridge or culvert removal, the Contractor shall submit to the Engineer details of the removal operations showing the methods and sequence of removal and equipment to be used. Traffic control conforming to Section 12, "Traffic Control; Construction Area Traffic Control Devices," and as directed by the Engineer shall be provided.

Materials that are to be salvaged shall be carefully removed and stockpiled near the site at a location designated by the Engineer. Material which is to be used in any specified reconstructed bridge work and has been damaged or destroyed as a result of the Contractor's operations shall be repaired or replaced by the Contractor at the Contractor's expense.

Piling, piers, abutments and pedestals shall be removed to at least one foot below ground line or three feet below finished grade, whichever is lower.

Where portions of a bridge or culvert are to be removed, the removal operations shall be performed without damage to any portion of the structure that is to remain in place. In these cases, tools with a manufacturer's rated striking energy in excess of 1,200-foot pounds per blow, a freely falling mass or a falling mass attached to a cable, rope or chain shall not be used for breaking or removing concrete which is attached to or supported by the bridge. Existing reinforcement that is to be incorporated in new work shall be protected from damage and shall be thoroughly cleaned of all adhering material before being imbedded in new concrete.

A freely falling mass or a falling mass attached to a cable, rope or chain shall not be used above any area open to the public. Falling masses shall not be used within 30 feet horizontally of any area open to the public unless adequate protective shields are in place. Protective shields shall be of sufficient size and strength to prevent any debris or equipment from endangering the public. The shields shall be designed and proportioned as required by the size of equipment and method of operations employed, but in no case shall the shields have a strength less than that provided by good, sound 2 inch thick Douglas fir planking supported on posts at 5 foot centers.

Before beginning concrete removal operations involving the removal of a portion of a monolithic concrete element, a saw cut approximately one inch deep shall be made to a true line along the limits of removal on faces of the element which will be visible in the completed work.

15-4.3 Measurement and Payment

Unless otherwise provided in the Contract Specifications, the work to be performed in accordance with this Section 15-4 will be measured and paid for on a lump sum basis price paid for Bridge Concrete Removal or Culvert Removal. Payment shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in removing and disposing of bridges or concrete culverts or portions thereof, including salvaging materials not to be reused in the project when salvaging is specified and not otherwise paid for, as shown on the Plans, as specified in the Specifications, and as directed by the Engineer.

Full compensation for removing materials that are to be reused in the project shall be considered as included in the contract prices paid for reconstructing, relocating or resetting the items involved, or in such other contract pay items that may be designated in the Contract Specifications. No additional payment will be made therefor.

SECTION 16 CLEARING AND GRUBBING

16-1 Description

Clearing and Grubbing shall consist of the removal and disposal of all objectionable materials within the limits of the project as required by the Plans, the Contract Specifications, and as directed by the Engineer. Clearing and Grubbing shall be performed in advance of grading operations and in accordance with the requirements of these specifications. Reference is made to Section 15, "Removing Existing Facilities." Any existing facility not specifically designated on the plans or Contract Specifications to be removed shall remain and be protected in place in accordance with this Section 16. Removal and disposal of existing roadway or alley materials in advance of roadway or alley reconstruction shall be considered as excavation for the associated construction items and not a part of, or to be paid for as, Clearing and Grubbing. Any holes, depressions, or pits resulting from the removal of objectionable material shall be backfilled in accordance with Section 19-4, "Embankment Construction."

16-2 Preservation of Property

The Contractor shall comply with the requirements of Sections 5-3, "Contractor's Responsibility for Work," 5-9, "Preservation of Property," 7-4, "Contractor's Insurance Requirements and Hold Harmless," 7-16, "Injury or Damage to Persons or Property," and Section 8-15, "Utility and Non-Street Facilities; Potholing." Whether shown on the Plans or not, existing improvements, adjacent property, utility and other facilities, and trees and plants that are not to be removed shall be protected from injury or damage resulting from the Contractor's operations. Unless otherwise specified in the Contract Specifications or on the plans, only trees and plants that are designated on the plans or marked for removal by the Engineer shall be removed.

The Contractor shall notify Underground Service Alert at 811 or 1-800-227-2600 a minimum of 5 working days prior to construction and shall make such additional investigations and examinations as necessary to determine the existence and locations of all pipes, conduits, and other underground improvements and shall consult with and advise the owners of the utilities before undertaking any work that might endanger them.

The Contractor shall bear full responsibility for any damage to pipes, conduits, poles, or any other structures or utilities. The Contractor shall not make any claim for inconvenience, delay or added cost of performing the work which may be attributed in any degree to inaccuracy of information furnished by the City of Visalia relative to the locations, sizes, dimensions, depths, and character of any pipes, conduits, poles or other structures and utilities.

Existing survey monuments and stakes shall be fully protected from damage or displacement and they shall not be disturbed unless directed by the Engineer. Any survey monumentation disturbed in connection with the Contractor's operations shall be reset in accordance with Section 37-2, "Survey Monuments." Such re-monumentation shall be replaced at the Contractor's expense with no additional compensation paid therefor.

16-3 Construction

Unless otherwise specified or shown on the Plans or specified in the Contract Specifications, the entire area within the project limits shall be cleared and grubbed by the Contractor. No payment will be made to the Contractor for clearing and grubbing outside these limits, unless such work is authorized by the Engineer.

All of the work shown on the Plans and included in the Specifications that is located in public streets, alleys, parks, trails, or other public rights of way of the City of Visalia shall be done in accordance with

City ordinances regulating the use of public rights of way within the City, except as otherwise provided in these Specifications. The Contractor shall comply with all regulations and requirements of the City of Visalia and shall conduct his operations in compliance therewith.

Within the limits of Clearing and Grubbing, the area above and below the natural ground surface shall be cleared of all vegetation, such as trees, logs, upturned stumps, roots of down trees, brush, grass, weeds or other objectionable material as determined by the Engineer. The grading provisions of the City of Visalia Landscape Standards and Specifications apply for special treatment of grass, weeds, and other organic material in projects involving landscape planting. Trees and other vegetation not to be removed shall be protected from damage in accordance with these specifications

Grubbing shall extend to the outside excavation and fill slope lines. Within the limits of clearing, all stumps, roots 1 1/2 inches in diameter or larger, buried logs, and all other objectionable material shall be removed 3 feet below and parallel with the existing ground surface or subgrade, whichever is deeper.

Trees and plants that are not to be removed shall be protected from injury by the Contractor at his expense. Chapter 12.24 of the City Municipal code regarding the preservation and protection of Oak trees must be complied with.

Within the limits of Clearing and Grubbing, the area below the natural ground surface shall be grubbed to a depth necessary to remove all organic material and other objectionable material as determined by the Engineer, including, but not limited, to concrete or masonry, wood, metal, or other scrap. All recyclable items and materials to be removed shall be removed in a manner that facilitates their recycling.

Trees designated for removal shall be removed in such a manner as not to injure standing trees, plants, and improvements which are to be preserved. Tree branches extending over the roadway which interfere with the work shall be trimmed in a professional manner by the Contractor at the direction of the Engineer.

All concrete, asphalt-concrete and oiled dirt within the right-of-way shall be removed by the Contractor unless designated to remain on the Plans. Said concrete, asphalt-concrete, or oiled dirt located within the roadway, alley, curb and gutter, or sidewalk prism to be replaced, shall be considered as included in the contract lump sum price paid for Roadway Excavation and not as Clearing and Grubbing.

Where a portion of an existing concrete facility is to be removed, it shall be cut to a minimum depth of 1.5 inches with an abrasive type saw at the first scoring line at or outside the planned joint and removed without damage to any portion that is to remain in place. If curbs and gutters cannot be cut off square and neat, the entire curb and gutter shall be removed to the nearest weakened plane or expansion joint. The shortest allowable remaining portion between expansion joints shall be 8 lineal feet. No patching at expansion joints will be permitted. Removal of portions of asphalt concrete shall be done as indicated in the Plans and Specifications.

Where a new concrete facility is to be installed adjacent to an existing facility the Contractor shall install dowels connecting the new and existing facilities as shown on the Plans and Standard Drawings.

Existing manholes, drain wells, drainage structures, structures and headwalls to be abandoned shall be removed in accordance with Section 15, “Removing Existing Facilities.” If no contract item is provided therefor, removal shall be considered as Clearing and Grubbing.

All traffic signs and street signs within the limits to be cleared and grubbed shall be considered as "Miscellaneous Facilities," and if required, shall be removed, salvaged and stockpiled in accordance with Section 15-2, "Miscellaneous Facilities."

16-4 Removal and Disposal of Materials

All materials removed and not otherwise specified to be salvaged or reused in the work shall be lawfully disposed of by the Contractor at disposal sites outside the right-of-way in conformance with. Section 5-12, "Disposal of Material Outside The Right- of-Way."

All existing materials that are designated to be salvaged shall be removed, cleaned and hauled to the location shown on the Plans or specified in the Contract Specifications and in accordance with Sections 6-11, "Salvage of Materials," and 15-2.4, "Salvage." The roadway and adjacent areas shall be left with a neat and finished appearance. No accumulation of flammable material shall remain on, or adjacent to, the right-of-way.

16-5 Measurement

Clearing and Grubbing will be measured on a lump sum basis.

16-6 Payment

The lump sum price paid for Clearing and Grubbing shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in clearing and grubbing as shown on the Plans, set forth in the Contract Specifications, and as directed by the Engineer.

If the Contract does not include a pay item for Clearing and Grubbing as herein specified, and unless otherwise provided in the Contract Specifications, full compensation for clearing and grubbing required to perform the construction operations specified shall be considered as included in the price bid for other various items of work and no additional compensation will be paid therefor.

SECTION 17 WATER USE

17-1 Description

This work shall consist of developing a water supply and furnishing all water required for the work, and applying all water. The Contractor shall comply with the provisions of Section 5-13, "Electric and Water Service."

Water for use in the work shall be potable only.

Potable water may be furnished by the Contractor from an independent source, or may be obtained from the California Water Service Company, hereinafter referred to as CWS, as specified in Section 5-13.

In compliance with the City of Visalia Landscape Standards and Specifications, the water supply for landscape planting and irrigation systems shall be provided by the Contractor. A permanent water meter will be furnished by the California Water Service Company for each irrigation system connection to the City water system unless otherwise shown on the Plans or specified in the Contract Specifications. The Contractor will be responsible for all fees and charges for all water consumed through these connections, including water consumed through the temporary hydrant meter obtained in compliance with this Section 17, and water consumed for irrigation system testing purposes and for landscape irrigation through the maintenance periods specified in the City of Visalia Landscape Standards and Specifications, and up to final acceptance of the work by the Engineer. Water for construction purposes for landscape planting and installation of irrigation systems, such as for dust control, compaction, etc., shall be obtained in accordance with 5-13, "Electrical and Water Service."

17-2 Application

Water shall be applied in the amounts, at the locations, and for the purposes designated in the Contract Specifications and these Standard Specifications, and as ordered by the Engineer. Water for compacting embankment material, soils, subgrade, subbase, base and surfacing material, and for providing dust control shall be applied by means of pressure type distributors or pipe lines equipped with a spray system or hoses with nozzles that will ensure a uniform application of water. Equipment used for the application of water shall be equipped with a positive means of shut off.

Unless otherwise permitted by the Contract Specifications or the Engineer, or unless all the water is applied by means of pipe lines, at least one mobile water distribution unit with a minimum capacity of 1,000 gallons shall be available for applying water on the project at all times.

17-3 Chemical Additives (Not Used)

17-4 Payment

Full compensation for developing and furnishing water in compliance with this Section 17 shall be considered as included in the various contract items of work requiring water, including water required for irrigation systems testing and landscape watering through the maintenance period specified in the City of Visalia Landscape Standards and Specifications. No additional compensation will be paid therefor. In accordance with Section 4-10, "Changes," no separate or additional compensation for developing and furnishing additional water will be made for any increase or decrease in the quantity of water required, regardless of the reason for such increase or decrease.

SECTION 18 DUST PALLIATIVE

18-1 General

Dust palliative shall be as specified in Section 18, “Dust Palliative,” of the State Standard Specifications except that the Payment section will be modified as noted in this Section 18.

18-2 Payment

Full compensation for furnishing Dust Palliative in compliance with this Section 18 shall be considered as included in the various contract items of work requiring dust palliative. No additional compensation will be paid therefor. In accordance with Section 4-10, "Changes," no separate or additional compensation for developing and furnishing additional dust palliative will be made for any increase or decrease in the quantity of dust palliative required, regardless of the reason for such increase or decrease.

SECTION 19 EARTHWORK

19-1 General

19-1.1 Description

This work shall consist of furnishing all labor, materials, equipment and incidentals and for performing all the work that may be required to construct and maintain the roadway, pipeline, or other facilities requiring earthwork as shown on the Plans and Standard Drawings, as specified in the Contract Specifications, and as directed by the Engineer, complete and in place, including but not limited to the following:

A. Excavation, grading, removal and replacement of material, placement of embankment, importing and exporting material, subgrade preparation and compaction and all other operations required in the construction of the finished earth surface for roadways and other surface improvements, including performing all operations necessary to excavate all materials, regardless of character and subsurface conditions, from the roadway or areas adjacent thereto.

B. Excavation, placement, backfill, importing and exporting material, compaction, and restoration of surfaces of trenches for the placement of pipelines, conduits and other utilities including, but not limited to, pipelines for sewer, water, non-potable water, storm drains, irrigation, electrical and fiber optic conduits.

C. Excavation, placement, backfill, importing and exporting material, compaction, and restoration of surfaces for the construction or installation of structures.

D. Excavation, backfill, importing and exporting material and compaction of drainage and irrigation ditches and channels;

E. Excavation of selected material from the roadway and borrow material for use as specified; construction of embankments, including the placing of selected material and imported borrow in connection therewith as specified; backfilling holes, pits and other depressions within the roadway area; applying water; removing and replacing unsuitable material;

F. Excavation, placement, importing and exporting material, compaction and grading road approaches, driveways, and connections; removal of unstable material outside the roadway prism; preparation of basement material for the placing of other material thereon;

For purposes of this Section 19, “roadway” shall include streets, alleys, easements, trails, parking lots, park sites, or the sites of other surface improvement work. Whenever reference to finished grade or finished surface is made, it shall be considered to be the finished surface of the completed facility.

All hauling of material from, to, or on the job site shall comply with Section 6-12, “Materials Hauling.” Where loads are not required to be covered, if directed by the Engineer, the loads shall be watered after trimming to eliminate dust as provided in Section 10, “Dust Control.” The Contractor shall comply with the provisions of Sections 5-9, "Preservation of Property,” and 5-10, "Protection of the Work,” and Section 15, “Removing Existing Facilities,” relative to protection and preservation of property, the work, and other utilities in performing earthwork operations.

Quantities of all types of existing subbase, base, surfacing, or pavement removed will be included in the quantities of the type of excavation in which they are located, and no separate payment will be made therefor.

Clearing and Grubbing for earthwork operations shall conform to the provisions in Section 16, “Clearing and Grubbing.”

Applying water for earthwork operations shall conform to the provisions in Section 17, "Water Use."

19-1.2 Protection of Property

The Contractor shall comply with the provisions of Section 5-3, "Contractor's Responsibility for the Work," Section 5-9, "Preservation of Property," Section 7-4, "Contractor's Insurance Requirements and Hold Harmless," Section 7-16, "Injury or Damage to Persons or Property," and Section 8-15, "Utility and Non Street Facilities; Potholing." Operations shall be conducted in such a manner that existing roadway or other facilities, utilities, railroad tracks, and other non street facilities which are to remain in place, shall not be damaged. The Contractor, at the Contractor's expense, shall furnish and install sheet piling, cribbing, bulkheads, shores or whatever means may be necessary to adequately support material carrying the facilities, or to support the facilities themselves and shall maintain the supports until they are no longer needed. Temporary pavements, facilities, utilities and installations shall also be protected until they are no longer required. When temporary supports and other protective means are no longer required, they shall be removed and disposed of as provided in Section 5-12, "Disposal of Material Outside the Right of Way."

19-1.3 Grade Tolerance

The grading plane shall not vary consistently above or below the design grade. Except for cuts made for roadway prisms, the tops and ends of cuts shall be rounded as directed by the Engineer.

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

A. When asphalt concrete or asphalt concrete base, or concrete pavement, is to be placed on the grading plane, the grading plane at any point shall not vary more than 0.02 foot above or below the grade established by the Engineer.

B. When subbase or base material (other than asphalt concrete base) is to be placed on the grading plane, the grading plane at any point shall not vary more than 0.04 foot above or below the grade established by the Engineer.

C. When sidewalk, curb, curb and gutter, driveways and other road structures are to be placed on the grading plane, the grading plane at any point shall not vary more than 0.02 foot above or below the grade established by the Engineer.

Where surface improvements shall be placed on the grading plane such as sidewalk, curb and gutter, drive approaches, asphalt concrete, concrete pavement, or other improvements the thicknesses shown or called out in the Specifications, Plans and Standard Drawings shall be considered minimum thicknesses and the grading tolerances specified above shall not decrease these required minimum thicknesses.

19-1.4 Removal and Disposal of Buried Man Made Objects

If a buried man made object encountered in excavation is to be removed and its removal and disposal is not included in another item of work, the removal and disposal will be paid for at the contract unit price or lump sum price paid for the type of excavation in which the object is encountered, i.e., roadway excavation, trench or structure excavation, etc. However, if the presence of the object is not indicated on the plans or in the Contract Specifications and its presence could not have been ascertained by visual inspection, the removal and disposal of the object will be paid for as extra work as provided in Section 4-11, "Extra Work," instead of at the applicable contract item price if the Contractor so requests in writing. The request shall be made prior to removal. Unless otherwise specified in the Contract Specifications, no blasting of any kind will be permitted.

Where backfill of a cavity or depression resulting from removal of a buried manmade object is required, it will be paid for in accordance with Section 15, "Removing Existing Facilities," or Section 16, "Clearing and Grubbing," except that backfill for objects removed from within trench or structure excavations will not be paid for separately but included in the price paid for the pipe, conduit or structure requiring the excavation. Where the buried object is not shown on the plans and could not reasonably be ascertained from the surface, and backfill is required but not covered by any other item of work, and the cavity is not located in a trench or structure excavation, payment for backfill shall be made in accordance with said Section 4-11, "Extra Work."

19-1.5 Compaction Testing & Quality Assurance

No compaction tests of finished subgrade shall be made until such time as the surface is finished to within grade tolerances required by Section 19-1.3 "Grade Tolerance" and the Engineer has been notified of the time that such compaction tests will be made. The Inspector or Engineer shall specify the locations where compaction tests are to be made. Compaction testing shall be provided in accordance with Section 6-9 of these Specifications.

Prior to placing any subbase, base, or surfacing materials on the subgrade, the subgrade shall be proof-rolled with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in the direction of travel parallel with the roadway. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle truck or water truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer or Inspector, and replace with compacted backfill or fill as directed.

Proceed with placement of subbase, base, or surfacing materials only after unsatisfactory conditions have been corrected.

19-2 Roadway Excavation

19-2.1 General

Roadway excavation shall consist of all excavation involved in the grading and construction of the roadway, embankments, ditch or channel excavation, except trench and structure excavation and any excavation separately designated and paid for as a separate item. Roadway Excavation shall include the area located within the prism of the roadway to be constructed as shown on the Plans and Standard Drawings. "Roadway" shall have the meaning ascribed by Section 19-1.1, "Description."

19-2.2 Unsuitable Material

Unsuitable material encountered below the natural ground surface in embankment areas or below the grading plane in excavation areas shall be excavated and disposed of as directed by the Engineer. Unsuitable material is defined as material the Engineer determines to be:

A. of such unstable nature as to be incapable of being compacted to specified density using ordinary methods at optimum moisture content; or

B. too wet to be properly compacted and circumstances prevent suitable in place drying prior to incorporation into the work; or

C. otherwise unsuitable for the planned use.

The presence of excessive moisture in a material is not, by itself, sufficient cause for determining that the material is unsuitable.

The removal and disposal of unsuitable material will be paid for as roadway excavation for the quantities involved if the removal of the unsuitable material is shown on the plans or specified in the Contract Specifications.

If the removal of the unsuitable material is not shown on the plans or specified in the Contract Specifications, the removal and disposal of the unsuitable material will be paid for at the contract price for roadway excavation for the quantities involved unless either the Engineer, prior to removal of any unsuitable material, orders the unsuitable material to be removed and disposed of and paid for as extra work as provided in Section 4-11, "Extra Work," or the Contractor, prior to removal of the unsuitable material, requests in writing that the removal and disposal of the unsuitable material be paid for as extra work as provided in said Section 4-11. However, no payment will be made for removal and replacement or re-working of unsuitable material if such condition is deemed by the Engineer to have been caused by the Contractor's operations such as, but not limited to, over-watering or failure to adequately divert drainage around the site of work.

When unsuitable material is removed and disposed of, the resulting space shall be backfilled with material suitable for the planned use. Unless otherwise specified or directed by the Engineer, the material shall be either material conforming to Section 19-2.6, "Selected Material," or conforming to Section 19-4.2, "Imported Borrow." The backfill material shall be placed and compacted in accordance with Section 19-4, "Embankment Construction."

19-2.3 Slopes

Excavation and embankment slopes shall be constructed in conformance with the lines and grades shown on the plans. When completed, the average plane of the slopes shall conform to the slopes indicated on the Plans and no point on the completed slopes shall vary from the designated slopes by more than 0.10 feet measured at right angles to the slope. The tops of excavation slopes and the ends of excavations shall be rounded as shown on the plans or as directed by the Engineer.

19-2.4 Surplus Material/Export Material

Unless otherwise shown on the Plans or specified in the Contract Specifications, surplus excavated material shall be disposed of outside the right of way in accordance with Section 5-12, "Disposal of Material Outside the Right of Way." The Contractor shall not borrow or waste material unless authorized in writing by the Engineer. The surplus excavated material shall be classified as Export Material. The Export Material bid item, where used, shall consist of, but not be limited to, furnishing all labor, materials, equipment and incidentals and for performing all the work that may be required to excavate, stockpile, load, haul, and perform all other work to dispose of surplus excavated material outside the right of way as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer.

Export Material is a final pay item and if listed on the bid schedule will be paid on a lump sum basis. If the quantity of surplus material is shown on the Plans or specified in the Contract Specifications as Export Material, the quantity shown or specified is approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided for work involved with removing and disposing of any surplus material in excess of the quantities shown on the bid item schedule. The Contractor shall be satisfied that there is sufficient suitable material available for the completion of any embankments before disposing of any material outside the right of way. Any shortage of material, caused by premature

disposal of any material by the Contractor, shall be replaced by the Contractor and no compensation will be allowed the Contractor for such replacement.

If the Contract does not include a pay item for Export Material under this Section 19-2.4, and unless otherwise provided in the Contract Specifications, full compensation for Export Material required to perform the construction operations specified shall be considered as included in the lump sum price bid for Roadway Excavation.

19-2.5 Deficiency Material/Import Material

If the quantity of acceptable material from excavation is not sufficient to construct the roadways and embankments required by the work, the quantity of material needed to complete the embankments shall consist of imported borrow conforming to Section 19-4.2, "Imported Borrow," as shown on the Plans, or specified in the Contract Specifications, or as determined by the Engineer. The Contractor shall obtain the imported borrow in conformance with the provisions in said Section 19-4.2. The imported borrow shall be classified as Import Material. The Import Material bid item, where used, shall consist of, but not be limited to, furnishing all labor, materials, equipment and incidentals and for performing all the work that may be required to purchase, load, haul, spread, place, compact and perform all other work to install the import material complete and in place as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer

Import Material is a final pay item and if listed on the bid schedule will be paid on a lump sum basis. If the quantity of surplus material is shown on the Plans or specified in the Contract Specifications as Import Material, the quantity shown or specified is approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided for work involved with hauling and placing any import material in excess of the quantities shown on the bid item schedule.

If the Contract does not include a pay item for Import Material under this Section 19-2.5, and unless otherwise provided in the Contract Specifications, full compensation for Import Material required to perform the construction operations specified shall be considered as included in the lump sum price bid for Roadway Excavation

19-2.6 Selected Material

Selected material shall be defined as material which is excavated from a location within the right of way as specified in the Contract Specifications or shown on the plans, and the Contractor shall have no choice in the selection.

Selected material shall be used as shown on the plans or specified in the Contract Specifications.

Topsoil excavated within the limits of the project shall be considered as selected material and may be reused as topsoil in landscaping areas.

Granular non-expansive native soil from excavations may be used, unless noted otherwise on the Plans or in the Specifications, as selected material for backfill in holes, pits or other depressions caused by removal of existing facilities in conformance with Section 15, "Removing Existing Facilities," Section 16, "Clearing and Grubbing," Section 19-1.4, "Removal and Disposal of Buried Man-Made Objects," or Section 19-2.2, "Unsuitable Material." Selected Material used for backfill or embankment construction shall be granular non-epansive native soil from excavations free from organic, vegetation, and rocks or cobbles larger than 3 inches or shall comply with Section 19-4.2, "Imported Borrow."

When selected material is shown on the Plans or designated in the Contract Specifications as a specified layer in the roadway prism, spreading and compacting the material shall conform to the provisions in Section 25, "Aggregate Subbases," of the Specifications. When practicable, and processing is not specified, selected material shall be hauled directly from excavation to its final position in the roadway prism and compacted in place and the work will be paid for at the contract lump sum price for Roadway Excavation.

When practicable, selected material shall remain in place until it can be excavated and placed in final position as provided above. No additional compensation will be allowed for any delay or inconvenience in excavation operations, except that if ordered in writing by the Engineer, selected material may be excavated and stockpiled at locations designated by the Engineer and later placed in final position in the roadway prism.

Excavating selected material and stockpiling, if required, will be paid for at the contract price for roadway excavation. Removing the selected material from stockpiles for later placement in its final position will not be paid for. Placement and compaction will be paid for at the unit price bid for the type of construction requiring the use of selected material. No payment for stockpiling of selected material will be made.

19-2.7 Subgrade Preparation, Compaction

Reference is made to the definitions in Section 1 for, “Basement Material,” “Grading Plane,” and “Subgrade.” Unless otherwise shown on the Plans or specified in the Contract Specifications, for streets divided by a concrete median island, the grading plane extends from the back of the concrete curb and gutter adjacent to the outside travel lane, parking lane, or bicycle lane (the “outside curb and gutter”), to the back of the concrete median curb. For streets not divided by concrete median island, the grading plane extends from the back of one outside curb and gutter to the back of the opposite outside curb and gutter. For alleys, trails, paths, or other places to receive an improved surface, the grading plane shall extend 12 inches beyond (right of way permitting) either side of the planned finish surface.

The preparation and compaction of the subgrade below the grading plane to receive subbase, aggregate base, asphalt-concrete, concrete or other paving materials shall consist of the following:

The soil material beneath the grading plane shall be bladed or disked to a depth of 6 inches (unless noted otherwise in the Plans, Specifications, or Special Provisions) and all rocks, hardpan chunks or otherwise unsuitable material over 2 inches in greatest dimension, shall be removed and disposed of off the project site in accordance with Section 5-12, “Disposal of Material Outside the Right of Way.”

The material thus disced or bladed shall be thoroughly mixed, watered and rolled to a smooth and even condition to a relative compaction of not less than 95 percent in compliance with Sections 6-8, “Samples and Tests,” and 6-9, “Compaction Tests,” to a depth of not less than 6 inches below the grading plane or as otherwise shown on the Plans or Standard Drawings or specified in the Contract Specifications.

Any soft, spongy or otherwise unstable areas shall be repaired by completely removing the material and replacing it with acceptable materials in accordance with these Specifications. Before subbase, aggregate base, asphalt-concrete, concrete or other paving material is placed, the Engineer will require, at the Contractor’s expense, the subgrade to be proof rolled as required in Section 19-1.5 to ascertain that there are no such soft or spongy areas.

No subsequent layer of a structural section shall be placed until the finished subgrade is in a stable condition satisfactory to the Engineer, regardless if said subgrade passed any prior compaction test. Any trenches cut for pipelines or conduit installation after the subgrade or any other layer of the roadway prism has been stabilized, shall be compacted in compliance with Section 19-3.3E, "Compaction," herein. It shall be the Contractor's responsibility to ensure that others doing work within the area under his control, including subcontractors, utility and communications contractors, comply with this provision.

The relative compaction of the top 6 inches of subgrade or basement material under curb returns including the ramps and adjacent sidewalk, landing, driveway approaches including adjacent sidewalk, valley gutters, paved trails, and alleys shall be no less than 95 percent.

The relative compaction of the top 6 inches of subgrade or basement material under sidewalk shall be no less than 90 percent.

All compacted subgrade soils must indicate a moisture content within 2%± of optimum.

No compaction test of subgrade shall be made until such time as the subgrade is finished to within the grade tolerances specified in these specifications. For Public projects the Contractor shall notify the Inspector a minimum of 2 working days, prior to when the subgrade is ready for compaction testing, and the Inspector will notify the appropriate testing laboratory designated to perform such tests. The Inspector or Engineer shall specify the locations where compaction tests are to be made.

No excavation shall be made below the plane of the bottom of curb or curb and gutter subsequent to installing curb or curb and gutter until backfill has been placed behind the curb.

19-2.8 Measurement & Payment

Roadway Excavation

Roadway Excavation will be paid for at the contract lump sum price. Roadway Excavation is a final pay item. Any quantities shown on the plans or on the bid item schedule are considered approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided therefor.

The price paid for Roadway Excavation shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing Roadway Excavation complete and in place in accordance with this Section 19-1 "General," and 19-2 "Roadway Excavation," as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer, excepting the work performed under the Export Material and Import Material Bid items if used.

Where no bid item is provided for Roadway Excavation, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

Export Material

Export Material will be paid for at the contract lump sum price. Export Material is a final pay item. Any quantities shown on the plans or on the bid item schedule are considered approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided therefor.

The price paid for Export Material shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing Export Material

complete and in place in accordance with Section 19-2.4 "Surplus Material/Export Material," the other applicable portions of Section 19-1 and 19-2, as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer.

If the Contract does not include a pay item for Export Material, and unless otherwise provided in the Contract Specifications, full compensation for Export Material required to perform the construction operations specified shall be considered as included in the price bid for Roadway Excavation. Where no bid item is provided for Roadway Excavation, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

Import Material

Import Material will be paid for at the contract lump sum price. Import Material is a final pay item. Any quantities shown on the plans or on the bid item schedule are considered approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding. No additional compensation will be provided therefor.

The price paid for Import Material shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in performing Import Material complete and in place in accordance with Section 19-2.5 "Deficiency Material/Import Material," the other applicable portions of Section 19-1 and 19-2, and as shown on the Plans, as specified in the Contract Specifications, and as directed by the Engineer.

If the Contract does not include a pay item for Import Material, and unless otherwise provided in the Contract Specifications, full compensation for Import Material required to perform the construction operations specified shall be considered as included in the price bid for Roadway Excavation. Where no bid item is provided for Roadway Excavation, the cost thereof shall be included in the various bid items of work; no separate payment will be made therefor.

19-3 Trench and Structure Excavation, Backfill, and Surface Restoration

19-3.1 General

This work shall consist of all excavation, backfill, importing and exporting material, and compaction necessary for the construction or installation of underground pipelines, conduits, structures and other facilities, and the replacement or restoration of surfaces disturbed by such work, all as set forth in the Plans, Standard Drawings, the Specifications, Contract Documents and as directed by the Engineer. As a minimum, structures shall include manholes, storm drain inlets, water valve boxes, cleanouts, traffic control boxes, pull boxes and any other structures, vaults, or boxes located within the street right of way.

Backfill, compaction, and surface restoration of potholes or other excavations performed to determine the location of underground utilities or facilities as required by Section 8-15, "Utility and Non-Street Facilities; Potholing," shall conform to the applicable portions of this Section 19-3 and to the special backfill requirements of said Section 8-15.

19-3.2 Trench and Structure Excavation

Excavations shall be made to the depths and widths required to accommodate the construction or installation of pipelines, conduits and structures to specified dimensions and to the lines and grades shown on the Plans.

The Contractor shall comply with the provisions of Sections 7-12, "Safety Provisions; First Aid; Injury/Illness Prevention Program," 7-13, "Worker Protection From Toxic Or Explosive Gases, Confined

Spaces Entry," and 7-15, "Worker Protection From Caving Ground In Excavations," and all Safety Orders issued by the State Division of Industrial Safety. Material excavated from trenches or for structures shall be placed to offer minimum obstructions to traffic.

The City has made every effort to locate and show all underground utilities and facilities on the plans. However, before installation of any new improvements shown on the Plans, the Contractor shall be responsible to field verify the locations by calling for USA mark-outs, potholing, and any other means or methods to determine both the horizontal and vertical locations of underground utilities and other facilities, and shall notify the Engineer immediately if conflicts occur. The Contractor shall comply with the provisions of Section 8-15, "Utility and Non-street Facilities; Potholing," relating to existing utilities, and the location and protection thereof. The location of subsurface obstructions found in the field may necessitate a variance in the depth or alignment of proposed facilities.

Prior to commencing construction of the proposed improvements shown on the plans, the Contractor will be responsible for potholing and verifying the horizontal location and vertical elevation of any utility connection points shown on the Plans. Any cost incurred by the Contractor because of his failure to comply with this requirement will be paid for by the Contractor.

When a trench or structure site is to be located in an existing oiled earth or pavement area, the existing surfacing to be removed shall be cut to a clean and neat line by appropriate methods shown on the plans or as approved by the Engineer along each side of the trench or around the structure site. Existing surfacing, when removed, shall be kept separated from the material that is to be returned to the excavation as backfill. Failure to comply with this requirement shall be grounds for rejection of the contaminated material for use as backfill.

General Note: Prior to Construction the Contractor shall be responsible for reviewing the pipe manufacturers recommended installation procedures for the type of pipe being used and comparing the recommended procedures with the City of Visalia's Standard Plans and Standard Specifications. If any discrepancy exists, the Contractor shall be responsible for bringing the discrepancy to the attention of the Engineer. The Engineer shall make the final decision on details of the trench. The Contractor will be responsible for installing the pipe in the manner that provides the highest level of support for the pipe.

All pipe with an inner diameter greater than six inches (6") shall have a prepared and compacted bedding except as follows: bedding preparation is not required for precast rubber gasket reinforced concrete pipe with an inner diameter of twenty-four inches (24") or less where firm and unyielding native soil is present at the bottom of the trench. Trenches shall be over-excavated a minimum of 6 inches below the grade established for the bottom of the pipe and then backfilled to the design pipe grade with granular non-expansive native material meeting the requirements of these specifications and thoroughly compacted to a minimum of 92 percent relative compaction. Trenches shall be uniformly graded and prepared to provide a firm and uniform bearing for the entire length of the barrel of the pipe to be placed therein. Coupling or bell holes are required for all trenches to receive pipes or conduits with couplings or bells, and shall be excavated at each location where pipes are to be joined. Coupling or bell holes shall be of sufficient and of adequate size to permit ease in making the joint and so the coupling or bell does not rest on the bottom of the hole excavated therefor. Except for pipe bells and couplings, any portion of the trench excavated below the approved grade shall be corrected and brought up to grade with approved material and thoroughly compacted.

Trenches for structures such as manholes shall be over-excavated a minimum of 12 inches below the grade established for the bottom of the structure to a distance of 12 inches outside the limits of the structure base and then backfilled to the design bottom grade with granular non-expansive native material

meeting the requirements of these specifications and thoroughly compacted to a minimum of 92 percent relative compaction. Trenches shall be uniformly graded and prepared to provide a firm and uniform bearing for the entire length of the structure to be placed therein.

In all trenches or structure sites where a firm foundation is not encountered, such as soft, spongy, or otherwise unsuitable material, the material shall be removed a minimum depth of 2 feet or to a depth determined by the Engineer, below the normal bottom of the trench or structure excavation. The over-excavated space shall be backfilled with suitable material containing sufficient moisture to produce maximum compaction. The backfill material shall be free from lumps or other unsuitable material, and when compacted to the satisfaction of the Engineer, shall be finish graded as provided herein or as required by the Engineer for pipelines, conduits, or structures. No additional payment will be made for such additional excavation or backfill.

The width of the trench from the bottom to the top of the pipe or conduit shall be a minimum of 9 inches on either side of the pipe, or per the pipe manufacturer's recommendations. The maximum trench width shall be as approved by the Engineer. The Contractor shall make every effort to minimize the width of the trench at the top of the trench. Excessive trench widths, as determined by the Engineer, may require special trench and pipe backfill methods to counteract excessive pipe loads and provide a bond between backfill and trench walls. Reference is made to Sections 19-3.3A.2, "Final Backfill, Precast Pipe," and 19-3.3A.3, "Backfill, Cast-in-Place Pipe." In accordance with Section 6-8 "Samples and Tests," the City requires haunch compaction testing in trenches where pipes with an inner diameter of 24 inches or larger are being installed. The Contractor is responsible for planning construction means and methods appropriately and for providing safe access to City and testing staff to perform the required compaction testing in the pipe haunch and trench areas. No additional payment will be made for such special backfill methods for failure of the Contractor to exercise good construction practices to minimize trench widths.

Trenches for cast-in-place concrete pipe shall be graded and prepared to provide full, firm and uniform support by undisturbed earth or compacted fill throughout the bottom 220º of the pipe periphery.

The Contractor shall be responsible for drainage of trenches and other excavation areas, and such areas shall be kept as dry as practicable throughout the construction period. Pumping or other approved method shall be used to remove any accumulation of water. Trenches damaged because of failure to provide temporary drainage control shall be repaired or reconstructed at the Contractor's expense. The Contractor shall adhere to the provisions of Section 5-16, "Maintaining Drainage." No drainage water may be pumped or otherwise deposited in any sanitary sewer system, unless otherwise approved by the Engineer.

19-3.3 Trench and Structure Backfill and Compaction

Unless otherwise specified, material used for trench or structure backfill shall be granular non-expansive native material, free from debris, lumps, hardpan chunks, paving material, cobbles larger than 3 inches, or organic matter of other deleterious or unsuitable substances or it shall comply with Section 19-4.2, "Imported Borrow." Material shall be approved by the Engineer before use in the work.

A. Trench Backfill

Backfill of trenches shall conform to the Plans, Standard Drawings pertaining thereto, the Specifications, and the directions of the Engineer. Backfill for trenches in which precast pipe, including utility or communications conduits, has been installed shall be placed in two phases, classified as Initial Backfill and Final Backfill. No vibratory equipment shall be used to compact backfill until there is a minimum of 3 feet of cover over the initial backfill.

1. Initial Backfill, Precast Pipe, Conduit

After the bedding is prepared and the precast pipe or conduit has been laid to line and grade, Initial Backfill shall consist of placing by hand and firmly compacting selected granular native material under the haunches and up to the spring line of the pipe so as to form a firm bedding, and then filling with granular native material and compacting to a level 12 inches above the top of the pipe. The method of compacting and obtaining density requirements for initial backfill shall be such that the line and grade of the pipe is not disturbed and the pipe is not damaged. Backfill material shall be returned to the trench in lifts not to exceed 6 inches in depth (loose), and compacted. Jetting or flooding of Initial Backfill to completely fill the space under pipe haunches will not be permitted.

2. Final Backfill, Precast Pipe, Conduit

   Final Backfill for trenches in which precast pipe or conduit has been placed shall consist of placing and compacting backfill material into the remaining trench cavity following completion of initial backfill. Backfill material shall be returned to the trench in lifts not to exceed 8 inches in depth (loose), and compacted. Each lift shall be compacted the full depth of the lift prior to placement of the next lift of backfill material. Jetting or flooding of final backfill will not be permitted. In cases of excessive trench width, soil conditions, and soil type, as determined by the Engineer, to assure proper pipe load distribution and bonding between trench backfill and trench walls, the Contractor may be required by the Engineer to bench, plow, or scarify trench walls prior to placement of backfill. The cost for such trench wall treatment, if so required, shall be included in the price paid per linear foot of pipe. No additional payment will be made therefor.

3. Backfill, Cast-in-Place Pipe

   Backfill material for trenches in which cast-in-place concrete pipe has been constructed shall be returned to the trench in lifts not to exceed 8 inches in depth (loose), and compacted. Initial backfill efforts may proceed no sooner than 48 hours after construction of the pipe, except that compaction efforts using equipment which imparts load on the pipe or structures, shall not proceed for a minimum of seven (7) calendar days following placement of the pipe unless this requirement is specifically waived by the Engineer, or is otherwise specified. Each lift shall be compacted prior to placement of the next lift of backfill material. In cases of excessive trench width, soil conditions, and soil type, as determined by the Engineer, to assure proper pipe load distribution and bonding between trench backfill and trench walls, the Contractor may be required by the Engineer to bench, plow, or scarify trench walls prior to placement of backfill. The cost for such trench wall treatment, if so required, shall be included in the price paid per linear foot of pipe. No additional payment will be made therefor.

B. Structure Backfill

Structure backfill shall consist of placing and compacting backfill material around structures to the lines designated on the Plans or directed by the Engineer. Where cast-in-place structures are constructed, no backfill shall be placed until all forms are removed, all voids in the concrete properly filled, and the exterior of the structure has been inspected by the Engineer and approved for backfilling. Backfill material shall be placed in lifts not to exceed 8 inches in loose depth and compacted. Each lift shall be compacted prior to placement of the next lift of backfill material.

C. Slurry Cement Backfill

Where specified in the Plans or Contract Specifications, and as specified in Section 8-15, "Utility and Non-Street Facilities; Potholing," for backfill of small diameter excavations, slurry cement backfill shall be furnished and placed in conformance with this Section.

- Slurry cement backfill shall consist of a fluid, workable mixture of aggregate, cement and water.
- Slurry cement backfill may be used as structure backfill for pipes only where specifically approved by the Engineer in writing.
- When slurry cement backfill is used for structure backfill, the width of the excavation shown on the plans may be reduced so that the clear distance between the outside of the pipe and the side of the excavation, on each side of the pipe, is a minimum of 6 inches for pipes up to and including 42 inches in diameter or span, or one foot for pipes over 42 inches in diameter or span.
- Slurry cement backfill shall be placed only for that portion of the structure backfill below the original ground or the grading plane or the top of the embankment placed prior to excavating for the pipe. Where necessary, earth plugs shall be compacted at each end of the pipe prior to placing backfill in a manner that will completely contain the slurry in the pipe trench.
- Cement shall be portland cement conforming to the provisions in Section 50.
- Water used for slurry cement backfill shall be free from oil, salts and other impurities which would have an adverse effect on the quality of the backfill material.
- At the option of the Contractor, aggregate shall be either (1) material selected from excavation, imported material or a combination thereof, which is free of organic material and other deleterious substances, or (2) commercial quality concrete sand. Material selected from excavation, imported material or a combination thereof, shall meet the following grading:

Sieve Sizes	Percentage Passing
1 1/2"	100
1"	80 - 100
3/4"	60 - 100
3/8"	50 - 100
No. 4	40 - 80
No. 100	10 - 40

- The aggregate, cement and water shall be proportioned either by weight or by volume. Not less than 188 pounds of cement shall be used for each cubic yard of material produced. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed.
- Materials for slurry cement backfill shall be thoroughly machine mixed in a pugmill, rotary drum, or other approved mixer. Mixing shall continue until the cement and water are thoroughly dispersed throughout the material. Slurry cement backfill shall be placed in the work within one hour after mixing.
- Slurry cement backfill shall be placed in a uniform manner that will prevent voids in, or segregation of, the backfill, and will not float or shift the pipe. Foreign material which falls into the trench prior to or during placing of the slurry cement backfill shall be immediately removed.
- Backfilling over or placing any material over slurry cement backfill shall not commence until 4 hours after the slurry cement backfill has been placed, except that when concrete sand is used for the aggregate and the in place material is free draining, backfilling may commence as soon as the surface water is gone.

D. Pervious Backfill Material

Where specified in the Plans or Contract Specifications, Pervious Backfill Material shall be furnished and placed in conformance with plans and this Section.

- Pervious backfill material shall be placed behind bridge abutments, wingwalls and retaining walls as shown on the plans and in accordance with the following requirements.
- Pervious backfill material shall consist of gravel, crushed gravel, crushed rock, natural sands, manufactured sand or combinations thereof. Pervious backfill material, except for sacked material at wall drain outlets, shall conform to the following grading requirements:

Sieve Sizes	Percentage Passing
2"	100
No. 50	0 - 100
No. 100	0 - 8
No. 200	0 - 4

- Wall drain outlets shall be backed with sacked pervious backfill material, except that the grading for the sacked material shall conform to the grading for the 1-1/2" x 3/4" primary aggregate size specified in State Standard Specification Section 90-1.02C(4)(b), "Coarse Aggregate Grading."

- Pervious backfill material shall be placed in layers along with and by the same methods specified for structure backfill. Pervious backfill material at any one location shall be approximately the same grading, and at locations where the material would otherwise be exposed to erosion shall be covered with at least a one foot layer of earthy material approved by the Engineer.

E. Compaction

Compaction shall conform to the requirements of Section 6-9, “Compaction Tests,” and the applicable Standard Drawings for Trench Backfill/Patch Paving and Resurfacing. All trench and structure backfill, including that for utility or communications conduit whether installed under City Contract or Encroachment Permit, shall be compacted to a relative compaction of not less than 92 percent to within 24 inches of the bottom of the planned structural pavement surfacing section of trench resurfacing, or roadway structural section if the trench or structure is located in a roadway to be reconstructed as part of the work, or the ground surface when the trench or structure is located in an unimproved area. The upper 24 inches of trench and structure backfill as defined in the previous sentence shall be compacted to a relative compaction of not less than 95 percent within the roadway. In landscape areas the top 24 inches of the trench shall be compacted to not less than 85 percent.

For trenches or areas around structures that are to receive an improved surface, the compacted backfill shall be brought to a smooth and level condition so as to receive the full thickness of surfacing. Where the trench or area around a structure is not to be resurfaced, the surface of compacted backfill shall be brought to a smooth condition even with adjacent undisturbed soil. The surface of the finished backfill in all areas shall be made even and uniform, free from depressions or raised areas.

Excess material resulting from backfill and compaction of trenches and structures not used in the work shall be disposed of outside the right-of-way as set forth in Section 5-12, “Disposal of Material Outside the Right of Way,” at the Contractor’s expense.

F. Imported Borrow

If imported borrow material is required to backfill trenches or excavations, the Contractor shall, at his expense, make his own arrangements for obtaining imported borrow and pay all costs

involved. Imported borrow shall be of a quality suitable for the purpose intended, free of vegetable matter or other unsatisfactory material, and shall have a minimum R- value of 40 as determined from tests conducted in accordance with Section 6-8, "Samples and Tests." Selected material from excavation or imported borrow material having a Sand Equivalent value less than 10 shall not be placed within 2.5 feet of finished grade and shall be placed in the lower portions of embankments. Large rocky material, including rocks, broken concrete or other solid materials, or hard lumps such as hardpan or cemented gravel, which cannot be broken readily shall not be used in trenches and excavations. All imported borrow shall meet the requirements of Section 19-4.2 "Imported Borrow," and shall be subject to the approval of the Engineer. The Contractor shall supply to the City, at the Contractor's expense, test results required by the Engineer to determine the suitability of any borrow proposed for import. These tests, which are to be representative of the material delivered to the site, will be required at the original site of the proposed borrow material and also at the delivery site. The Contractor shall remove, at the Contractor's expense, any borrow placed which fails to meet the approval of the Engineer.

G. Water

The use of water in the work shall comply with the requirements of Section 5-13, "Electric and Water Service," and Section 17, "Water Use." The Contractor shall obtain the permission of the California Water Service Company as to which fire hydrants are to be utilized. Jetting of trench backfill is not allowed. Flooding of trenches from the top is not permitted.

19-3.4 Progress of Work, Trench and Structure Excavation, Backfill

All work of excavation and backfilling shall be done as quickly as possible.

Where trench or structure excavation is to occur in an area with improved surfacing, the existing surfacing at any location shall be removed no sooner than 48 hours prior to excavation at that location. No surfacing shall be removed on Friday unless excavation and follow-up work will occur the same day.

Unless authorized in writing by the Engineer, no more than 100 feet of trench in business and commercial districts or 300 feet of trench in all other areas shall be excavated at any location ahead of any preceding trench which has not received pipeline or other conduit and backfilled.

No excavation or trench shall be opened and left open more than 24 hours before: a) the installation of the pipeline or other conduit which is to be placed in said trench; b) the start of construction of a structure in said excavation. The backfilling of said excavation or trench shall be completed within twenty four hours after the installation of the facility for which the excavation was made, except for cast-in-place pipe installations and that portion of trenches or excavations to be used for connecting the extension of the installation, provided said portion is adequately barricaded and protected, and backfilled the following working day. All trenches that remain open at the end of the work day shall be plated in accordance with City Encroachment Permit Policy Manual and Standard Drawing requirements.

Backfill for cast-in-place concrete pipe shall be accomplished as soon as practicable but shall comply with the timing requirements of Section 19-3.3A.3, "Backfill, Cast-in-Place Pipe." Trenches shall be adequately barricaded and access shall be provided for abutting properties and street intersections.

Unless otherwise specified in the Contract Specifications or authorized in writing by the Engineer, where an excavation or trench crosses a street intersection, the excavation, installation, and backfill or bridging shall be conducted in a manner such that the street shall remain open at all times. Alleys may be closed only with written approval from the Engineer, but shall be reopened at the end of the work day.

All excavations located within a street or alley for the purpose of boring or jacking pits shall be properly barricaded and protected, and may be left open for a period of not more than seven (7) calendar days, unless an extension of time is approved by the Engineer in writing.

Immediately after trenches or other excavations have been backfilled and preliminarily compacted in streets or alleys, temporary surfacing shall be placed in conformance with Section 19-3.5, "Restoration of Surfaces," and in accordance with the Plans, Standard Drawings, and Contract Specifications therefor.

19-3.5 Restoration of Surfaces

For trench or structure excavations located in existing paved areas not to be reconstructed as part of the work, final pavement replacement shall be accomplished as soon as possible and practicable, but in no case later than the time limits specified in these Specifications.

Restoration of surfaces shall consist of restoring the surfaces (resurfacing) of all trenches and surfaces at or around structure sites, or any other surfaces damaged or disturbed by the work. Surfaces shall include pavement of any kind including asphalt concrete and portland cement concrete and paving stones, grass, shrubbery or other landscaping, gravel, treated or untreated soil, etc. All work shall be done in accordance with the Plans, Standard Drawing, and the Specifications.

Temporary Trench Resurfacing shall comply with these Specifications and shall be placed and diligently maintained by the Contractor until permanent trench resurfacing is installed. Temporary pavement shall consist of a minimum of 2 inches of temporary asphalt concrete pavement (cutback or cold mix asphalt) and shall be placed immediately following backfilling activities. This temporary pavement shall be maintained in a safe and reasonably smooth condition until required backfill compaction is obtained and final pavement replacement is completed. Temporary surfacing shall be required to be in place whenever the road is opened to vehicular traffic. Temporary surfacing shall be placed in all streets and alleys, and such other locations as specified or shown on the Plans, or directed by the Engineer. Temporary surfacing shall be removed and disposed of by the Contractor prior to placing final resurfacing.

The maximum length of time that temporary trench resurfacing shall remain in paved areas shall be 21days in collector and arterial streets and 42 days in residential streets, unless approved otherwise in writing by the Engineer. Prior to the end of these periods the Contractor shall complete the Final Trench Resurfacing.

Final Trench Resurfacing, replacement of pavement section including subbases, aggregate bases, and hot mix asphalt, shall be performed in a manner consistent with good construction practices and methods which, when completed, shall leave all areas requiring replacement of pavement with a neat and clean appearance. Areas to receive final pavement replacement shall be completely cleaned of all debris, rubbish, dirt, temporary paving, or any other deleterious material which might affect the quality of the work in any way. Cleaning shall be accomplished to a minimum of 6 feet outside the edges of trenches or other areas to receive pavement replacement. This distance may be increased by the Engineer as necessary to prevent contamination of the new work.

All sawcutting and final pavement replacement section construction shall be completed in accordance with the Plans, Standard Drawings, Specifications and Contract Documents.

Where sawcutting of existing pavement edges is not shown on the standard drawing or specified, all damaged existing pavement shall be removed and the edges trimmed to neat lines as directed by the Engineer and by a method approved by the Engineer.

Where sawcutting of existing pavement edges is shown on the standard drawing or is specified, the cut shall be made on a straight line along both sides of trenches, and to neat lines around structures or other locations requiring pavement replacement. The full depth cut shall be made and shall encompass all pavement damaged by the work or specified to be removed or replaced.

The Contractor shall notify the Inspector a minimum of 2 working days prior to sawcutting or trimming operations begin to arrange a site walk through to define the required sawcutting/trimming limits.

All edges of existing pavement, whether trimmed or sawcut, shall be protected from damage. Any edges damaged from any cause prior to or during paving operations, shall be re-cut or re-trimmed as directed by the Engineer. No additional payment will be made therefor.

Where Aggregate Base is specified to be used as part of the resurfacing structural section or backfill, it shall be furnished and placed in conformance with Section 26, "Aggregate Bases," of these Specifications.

Where Portland Cement Concrete is specified to be used as part of the resurfacing structural section or backfill, unless otherwise specified on the Plans or in the Contract Specifications, it shall be Class 2 or 3 as noted on the Plans, Standard Drawings, and these Specifications with 1 inch maximum aggregate, conforming to the requirements of Section 50, "Portland Cement Concrete," of these Specifications. The top surface of the concrete shall be given the appropriate finish based on the improvement type while the mix is still workable.

A paint binder of asphaltic emulsion shall be furnished and applied, in conformance with Section 28 "Hot Mix Asphalt" of these Specifications, to all vertical or other surfaces of existing pavement, curbs, gutters, or other surfaces against which asphalt-concrete pavement is to be placed.

HMA shall be furnished and placed in conformance with Section 28, "Hot Mix Asphalt," of these Specifications. When replacing pavement in existing paved areas, the new pavement shall be placed in accordance with the Plans, Standard Drawings, and Contract Documents therefor which shall apply to replacing pavement around structures as well as within trenches. The Contractor shall not commence surface paving until the subbase and/or base have been inspected, tested and approved. Violation of this requirement shall be cause for rejection of that portion of paving involved.

When compacted, the new asphalt pavement edge shall be one-eighth of one inch (1/8") to one-quarter of one inch (1/4") higher than the existing pavement and edges of adjacent concrete improvements where applicable, except at curb returns where the new pavement edge shall be flush at all accessibility ramp landings. The surface shall be smooth, without humps or depressions. Except where the trench is located in the crown of the road, the top of the finished surfacing shall deviate no more than one-quarter of one inch (1/4") higher, and in no case lower, than a line struck off from two points on the existing road surface, one on each side of the trench. Deviation from this tolerance shall be cause for rejection of the surfacing. The Contractor shall be responsible for removing and re-constructing the trench surfacing that does not meet these tolerances at his own expense.

All cuts in existing pavement that is less than eight years old, or as directed by the City Engineer, shall be required to have seamless joints with the existing pavement by using an approved heater-remix process.

Restoration of miscellaneous surfaces shall consist of replacing or restoring in-kind any surface damaged or disturbed by the work, including but not limited to, grass, landscaping of any kind, gravel, oiled dirt, concrete, or soil, all as directed by the Engineer. The surfaces of all trenches, excavations, existing streets

or other areas damaged or disturbed by the work, upon completion of miscellaneous surface restoration, shall conform to the elevations and character of the areas which existed before work commenced.

In all cases regardless of surface material or type, all existing or new facilities shall be brought to the finish grade of that surface in compliance with Section 15-2.5A, "Frames, Covers, Grates, Manholes." The interior of the existing or new facilities shall be thoroughly cleaned of all debris or dirt, regardless of whether the debris or dirt was present before construction began.

Restoration of surfaces shall comply with Sections 4-13, "Interim Cleanup," 5-20, "Surface Restoration," and 5-21, "Final Cleanup."

19-3.6 Measurement

Trench and structure excavation will not be measured as it is to be included in the work requiring such excavation and backfill. Unless otherwise provided in the Contract Specifications, measurement of Slurry Cement Backfill or Pervious Backfill Material used for trench backfill shall be by lineal foot as measured along the centerline of trench in which such backfill was placed.

Measurement for Temporary or Final Trench Resurfacing will be by the lineal foot as measured along the centerline of the actual trench resurfaced, unless otherwise indicated in the Plans and/or Contract Specifications. The Temporary and Final Trench Resurfacing bid items only apply to the length of trench located in the existing City street pavement section between the lips of curb and gutters or from edge of pavement to edge of pavement in streets with no curb and gutter. Regardless of composition or combination of materials used in trench resurfacing, measurement will be as though only one material is used. Temporary or Final Trench Resurfacing outside of the existing City street pavement limits defined in this paragraph shall be considered restoration of miscellaneous surfaces and no measurement will be made, as no separate payment will be made therefor. Measurement of resurfacing around structures will not be made, as no separate payment will be made therefor.

Temporary and Final Trench Resurfacing for conduit and other items installed in accordance with Section 45 "Signals, Lighting, and Electrical Systems," will not be made, as no separate payment will be made therefor.

Unless otherwise specified in the Contract Specifications, restoration of miscellaneous surfaces for trenches or structures will be included in the cost of the various items of work to which the work relates, and no measurement will be made.

Measurement of facilities raised to grade shall be in accordance with the contract item therefor. In the absence of a contract item(s) for the measurement and payment of raising existing and/or new facilities to grade within the trench surface restoration area, no measurement will be made, and payment therefor shall be included in the various items of work to which the work relates.

19-3.7 Payment

Except for Slurry Cement Backfill and Pervious Backfill Material, payment for trench and structure excavation, backfill and compaction, importing material, exporting material, removal and disposal of materials, maintaining and covering trenches, trench plating, including any benching, plowing, or scarifying required by the Engineer shall be included in the amount bid for installing the pipe, conduit, structure or other facility to be installed in such trench, structure or other excavation. Payment shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals including water, and for doing all the work involved as shown on the Plans, as set forth in these Specifications, the Contract Specifications, and as directed by the Engineer.

The unit price bid per lineal foot for Slurry Cement Backfill and Pervious Backfill Material shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved as shown on the Plans, as set forth in these Specifications, the Contract Specifications, and as directed by the Engineer.

Unless otherwise provided in the Contract Specifications, the unit price bid per lineal foot for Final Trench Resurfacing shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans and Standard Drawings, as set forth in these Specifications, the Contract Specifications, and as directed by the Engineer, including, but not limited to, sawcutting or trimming existing pavement edges, removal and disposal of the existing pavement section, clean up preparation for final trench resurfacing, application of tack coat, installing the final trench resurfacing section (full structural section including subgrade preparation, AS, AB, HMA or Concrete) complete and in place, and providing seamless joints with the existing pavement where required. Payment for Final Trench Resurfacing around structures, sawcutting the existing pavement around structures, removal and disposal, and installation of final trench resurfacing, and providing seamless joints with the existing pavement where required shall be included in the price paid for the structure involved, not in the Final Trench Resurfacing bid item.

Unless otherwise provided in the Contract Specifications, the unit price bid per lineal foot for Temporary Trench Resurfacing shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans and Standard Drawings, as set forth in these Specifications, the Contract Specifications, and as directed by the Engineer, including maintaining temporary surfacing and removing it prior to final resurfacing, hauling, and disposal. Payment for Temporary Trench Resurfacing around structures including removal and disposal shall be included in the price paid for the structure involved, not in the Temporary Trench Resurfacing bid item.

When the Contract does not include a pay item for Temporary or Final Trench resurfacing as above specified, and unless otherwise provided in the Contract Specifications, full compensation for any necessary temporary or final trench resurfacing including required sawcutting shall be considered as included in the prices bid for the various bid items to which the work relates and no separate payment will be made therefor.

Temporary and Final Trench Resurfacing for conduit and other items installed in accordance with Section 45 “Signals, Lighting, and Electrical Systems,” shall be included in the costs for the various bid items to which the work relates under said Section 45 and shall not be included in the Temporary Resurfacing or Final Trench Resurfacing bid items.

Unless otherwise provided in the Contract Specifications, full compensation for restoration of miscellaneous surfaces shall be considered as included in the price bid for the various items of work and no separate payment will be made therefor.

19-4 Embankment Construction

19-4.1 General

Embankment construction shall consist of constructing roadway embankments, including the preparation of the areas upon which embankment materials are to be placed; the construction of temporary surcharge embankment above the grading plane; the construction of earthen dikes within or outside the right of way; the placing and compacting of approved material within the areas to receive embankment where unsuitable material has been removed; and the placing and compacting of embankment material in holes,

pits and other depressions within the area to receive embankment. Embankment material shall be either selected material conforming to Section 19-2.6, “Selected Material,” or imported borrow conforming to Section 19-4.2, “Imported Borrow.”

19-4.2 Imported Borrow

The Contractor shall, at his expense, make his own arrangements for obtaining imported borrow and pay all costs involved. Imported borrow shall be of a quality suitable for the purpose intended, free of vegetable matter or other unsatisfactory material, and shall have a minimum R- value of 40 as determined from tests conducted in accordance with Section 6-8, “Samples and Tests.” Selected material from excavation or imported borrow material having a Sand Equivalent value less than 10 shall not be placed within 2.5 feet of finished grade and shall be placed in the lower portions of embankments. Clods or hard lumps of earth over 8 inches in greatest dimension shall be broken up before compacting the material in embankment. Large rocky material, including rocks, broken concrete or other solid materials, or hard lumps such as hardpan or cemented gravel, which cannot be broken readily shall not be used in embankments. All imported borrow shall be subject to the approval of the Engineer and should consist of non-expansive, inorganic granular soils conforming to the following criteria:

IMPORTED BORROW	
Maximum Plasticity Index	8
Maximum Particle Size (inches)	3
Percentage Passing #200 Sieve	0-40
Sand Equivalent	20 Minimum
Maximum Water Soluble Sulfate (SO_4) in Soil, percent by weight	0.2

The Contractor shall supply to the City, at the Contractor's expense, test results required by the Engineer to determine the suitability of any borrow proposed for import. These tests, which are to be representative of the material delivered to the site, will be required at the original site of the proposed borrow material and also at the delivery site. The Contractor shall remove, at the Contractor's expense, any borrow placed which fails to meet the approval of the Engineer.

19-4.3 Placing

Where shown in the Plans or specified in the Contract Specifications, the Contractor shall provide excavation, grading, placement and compaction for the construction of roadway embankment from approved surplus excavated material (selected material) or from Imported Borrow, to the line, grade and cross-section shown on the Plans, or as directed by the Engineer. Unsuitable surplus excavated material shall be disposed of by the Contractor in accordance with Section 5-12, "Disposal of Material Outside the Right of Way.” If the quantity of selected material is not sufficient to construct the embankments required by the Plans, the quantity of material needed to complete the embankments shall consist of Imported Borrow.

Embankments shall be constructed in layers. The loose thickness of each layer of embankment material before compaction shall not exceed 8 inches. Areas to receive embankment construction shall first be cleared of all debris, bushes, weeds, stumps, or other deleterious material, in accordance with Section 16, “Clearing and Grubbing.” If embankment material is to be placed on existing slope areas, the existing surface shall be benched, plowed, or scarified in accordance with the plans or as directed by the Engineer to produce a bond with the material to be placed.

Attention is directed to Section 19-4.4, "Compacting." Where embankment is to be made and compacted on slopes or where new embankment is to be compacted against existing embankments or where embankment is built one half width at a time, the original slopes and old or new embankments shall be cut into a minimum of 3 feet horizontally as the work is brought up in layers. Material thus cut out shall be re-compacted along with the new embankment material at the Contractor's expense.

Where embankment is to be made and compacted on original slopes, old or new embankments, and end dumping is permitted, the slopes of the original ground or embankment shall be benched, plowed or cut into before starting end dumping.

When embankment is to be placed on an existing roadway, the existing roadbed shall be scarified, watered, graded and rolled in advance of placing new material thereon.

The construction of earthen dikes, the placing and compacting of approved material within the right of way where unsuitable material has been removed, and the filling of holes, pits and other depressions within the right of way, shall conform to the provisions herein and in conformance with the provisions in said Section 19-4.4. Trenches, holes, depressions and pits outside of areas where embankments are to be constructed shall be graded to provide a presentable and well drained area.

Embankments shall be maintained to the grade and cross section shown on the plans until the acceptance of the contract.

19-4.4 Compacting

Embankments shall be constructed in layers of uniform thickness as specified in Section 19-4.3, "Placing." Each layer shall be compacted to a relative compaction of not less than 92 percent, except that any layer within 2.5 feet of finish grade shall be compacted to a relative compaction of not less than 95 percent.

Sidehill embankments, where the width including bench cuts for bonding existing and new embankments is too narrow to accommodate compacting equipment, may be constructed by end dumping if permitted by the Engineer, until the embankment, including benching, is wide enough to permit the use of compacting equipment, after which the remainder of the embankment shall be placed in layers and compacted as specified.

At the time of compaction, the moisture content of embankment material shall be such that the specified relative compaction will be obtained and the embankment will be in a firm and stable condition. Embankment material which contains excessive moisture shall not be compacted until the material is dry enough to obtain the required compaction. Full compensation for any additional work involved in drying embankment material to the required moisture content shall be considered as included in the contract price paid for excavating or furnishing the material and no additional compensation will be allowed therefor.

Any subsequent trenching through completed embankments, including trenching for utility or communications conduits, shall comply with Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration." The Contractor shall assure that others doing work within the area under the control of the Contractor comply with this requirement.

19-4.5 Measurement

Embankment Construction will be measured on a lump sum basis. Where embankment construction is included as backfill for other contract items of work, no measurement will be made.

Any quantities shown on the plans or on the bid item schedule for Embankment Construction are considered approximate only. It shall be the responsibility of the Contractor to verify that he is satisfied with the quantities shown on the bid item schedule prior to bidding.

19-4.6 Measurement & Payment

Embankment construction shall include furnishing all labor, materials, equipment and incidentals and performing all work required for clearing, subgrade preparation for placing embankment, including placing and compacting approved material where unsuitable and unstable embankment foundation material has been removed, benching, plowing, or scarifying as required, excavation, hauling, obtaining imported borrow, placing and compacting local or imported borrow, exporting material and finish grading to the lines and grades shown on the Plans and specified in the Specifications.

Embankment construction will be paid for under the lump sum price paid for Roadway Excavation or the lump sum price paid for Import Material in accordance with Section 19-2.8 "Measurement & Payment." Any work related to importing material required to construct the embankments complete and in place shall be include in the lump sum price paid for Import Material under Section 19-2.8. All other earthwork required to construct the embankment complete and in place that is not involved with importing material shall be included under the lump sum price paid for Roadway Excavation under Section 19-2.8.

Filling and compacting holes, pits and other depressions, backfilling excavations resulting from the removal of structures and other facilities, or replacement of unsuitable material will be paid for in accordance with Section 15, "Removing Existing Facilities," Section 16, "Clearing and Grubbing," and Section 19-2.7, "Subgrade Preparation, Compaction."

SECTION 20 LANDSCAPE CONSTRUCTION SYSTEMS

20-1 General

All materials used and work performed for Landscape Construction Systems shall be done in accordance with the City of Visalia Landscape Standard Specifications, hereinafter referred to as Landscape Specifications, the City of Visalia Landscape Standard Plans, hereinafter referred to as Landscape Standard Plans, these Specifications, Plans and other Contract Documents. The Landscape Specifications and Landscape Standard Plans are incorporated into these specifications and Contract Documents by virtue of reference. The Contractor may obtain a copy of said documents from the City's website at the following address: http://www.ci.visalia.ca.us/depts/parks_n_recreation/urban_forestry/default.asp or by contacting the Urban Forestry Department at (559) 713-4384.

20-2 Measurement

Landscape Construction Systems will be measured on a lump sum basis unless noted otherwise in the Plans, Special Provisions, or other Contract Documents.

20-3 Payment

The lump sum price paid for Landscape Construction Systems shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in Landscape Construction Systems as shown on the Plans, set forth in the Landscape Specifications and Landscape Standard Plans, these Specifications, the Contract Documents, and as directed by the Engineer unless noted otherwise in the Plans, Special Provisions, or other Contract Documents.

Where no bid item for Landscape Construction Systems is provided, all costs for providing Landscape Construction Systems shall be included in the various bid items of work; no additional payment will be made therefor.

SECTION 21 (RESERVED)

SECTION 22 FINISHING ROADWAY

22-1 General

Section 22 includes specifications for finishing the roadway. Perform finishing activities after completing all other construction activities.

22-2 Materials

Not Used

22-3 Construction

Trim and shape graded areas without surfacing to smooth and uniform cross sections and slopes:

A. Between edge of shoulder and hinge point of slopes

B. At medians

For a graded roadbed without surfacing or pavement, trim and shape the entire roadbed to uniform cross sections and slopes.

Trim slopes of gutters without lining or surfacing to the required grade and cross section.

Do not stockpile material on finished pavement or allow material to drift across pavement. Clean finished pavement of dirt and foreign material.

Clear debris and obstructions from ditches and channels constructed under the Contract.

Clean out sewers, culverts, and other drainage facilities and appurtenant structures constructed under the Contract.

Remove debris and excess material next to culverts, headwalls and endwalls, bridge ends, poles, posts, trees, or other objects and leave in a neat and orderly condition.

Remove from slopes any exposed material that might become loose such as rocks and roots.

Remove loose rock larger than 2-1/2 inches in maximum dimension from:

A. Between edge of shoulder and hinge point of slopes

B. At medians

C. Finished roadbed

Dispose of material resulting from finishing activities.

22-4 Payment

Not Used

SECTION 23 (RESERVED)

SECTION 24 (RESERVED)

SECTION 25 AGGREGATE SUBBASES

25-1 General

Section 25 includes specifications for furnishing, spreading and compacting Aggregate Subbases (AS). This Section has been copied from State Standard Specifications Section 25 "Aggregate Subbases" and has been modified for use in the City of Visalia

25-2 Materials

25-2.1 General

Aggregate for Class 1, 2, and 3 AS must be clean and consist of any combination of the following:

A. Broken stone

B. Crushed gravel

C. Natural rough surfaced gravel

D. Sand

E. Reclaimed processed asphalt concrete, portland cement concrete (PCC), lean concrete base (LCB), or cement treated base (CTB).

When recycled materials listed under section 25-2.1E are being used in any mix, the Contractor shall have the material provider stockpile the materials for the project at the manufacturing site for materials testing. After these materials have been deemed acceptable for use on the project, the materials in this stockpile shall be the only materials used at the project site.

25-2.2 Class 1, Class 2, and Class 3 Aggregate Subbases

When tested under California Test 202, aggregate must comply with the grading requirements for the sieve sizes shown in the following table:

Aggregate Grading

Sieve size	Percentage passing					
	Class 1		Class 2		Class 3	
	Operating range	Contract compliance	Operating range	Contract compliance	Operating range	Contract compliance
3"	100	100	100	100	100	100
2 1/2"	90–100	87–100	90–100	87–100	90–100	87–100
No. 4	35–70	30–75	40–90	35–95	50–100	45–100
No. 200	0–20	0–23	0–25	0–29	0–30	0–34

Aggregate must comply with the quality requirements for the classes shown in the following table:

Aggregate Quality

Property	California Test	Class 1		Class 2		Class 3	
		Operating range	Contract compliance	Operating range	Contract compliance	Operating range	Contract compliance
Sand equivalent (min)	217	21	18	21	18	21	18
Resistance (R-value) (min)	301	--	60	--	50	--	40

If the aggregate grading test results, the sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing AS for the remainder of the work day. Do not place additional AS until you demonstrate to the Engineer the AS to be placed complies with the operating range requirements.

If the aggregate grading test results, sand equivalent test results, or both do not comply with contract compliance requirements, remove the AS or request a payment deduction. If your request is authorized, $2.00/CY is deducted for each noncompliant test result. An aggregate grading and a sand equivalent test represents up to (1) 500 CY or (2) 1 day's production if less than 500 CY.

25-3 Construction

25-3.1 General

Water AS under section 17.

25-3.2 Subgrade

Immediately before spreading the AS, the subgrade must comply with the specified compaction and elevation tolerance for the material involved and be free from loose or extraneous material.

Areas of the subgrade lower than the grade established by the Engineer may be filled with AS. AS used to fill low areas of the subgrade is not included in the quantity for payment.

25-3.3 Spreading

Deliver uniform mixtures of AS to the roadbed. Deposit AS in layers or windrows. Spread and shape the AS to such thickness that after watering and compacting, the completed AS is within the tolerances specified. When AS is spread and compacted the moisture content must be uniform and sufficient to obtain the required compaction. Avoid material segregation. AS must be free from pockets of coarse or fine material.

Where the subgrade is cohesionless sand and if authorized, you may dump AS in piles and spread it ahead in sufficient quantities to stabilize the subgrade.

Where the shown subbase thickness is 0.50 foot or less you may spread and compact the AS in one layer.

Where the shown thickness is more than 0.50 foot, spread and compact in 2 or more layers approximately equal in thickness. The compacted thickness of any one layer must not exceed 0.50 foot. At locations inaccessible to spreading equipment, spread and compact AS by any means that will produce the specified results.

25-3.4 Compacting & Quality Control

Compact each AS layer to at least 95 percent relative compaction.

The finished surface of AS must not vary by more than 0.04 foot above or below the grade established by the Engineer.

Correct areas of AS that do not comply with the thickness shown or request a payment deduction. If your request is authorized, the Engineer calculates the deduction by multiplying:

A. Deficient thickness less allowable tolerance

B. Planned width

C. Longitudinal distance of the deficient thickness

D. $11.00/cu yd

Prior to placing any base materials on the subbase, the subbase shall be proof-rolled with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in the direction of travel parallel with the roadway. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle truck or water truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer or Inspector, and replace with compacted backfill or fill as directed.

Proceed with placement of base materials only after unsatisfactory conditions have been corrected.

25-4 Measurement & Payment

Payment for Aggregate Subbase shall be at the contract unit price per cubic yard as calculated from the dimensions shown on the Plans, and shall include full compensation for furnishing labor, materials, tools, equipment and incidentals for doing all work involved for Aggregate Subbase complete and in place as shown on the Plans and as specified in these Specifications and as directed by the Engineer, and no additional compensation will be allowed therefor.

SECTION 26 AGGREGATE BASES

26-1 General

Section 26 includes specifications for Aggregate Base (AB) materials and spreading and compacting, AB. All aggregate base used on City of Visalia projects shall be Class 2 Aggregate Base in accordance with the requirements of this Section 26. This Section has been copied from the State Standard Specifications Section 26 "Aggregate Bases" and has been modified for use in the City of Visalia.

26-2 Materials

26-2.1 General

Aggregate for Class 2 AB must be clean and consist of any combination of the following:

A. Broken stone

B. Crushed gravel

C. Natural rough surfaced gravel

D. Sand

E. Processed reclaimed asphalt concrete, portland cement concrete (PCC), lean concrete base (LCB), or cement treated base (CTB)

When recycled materials listed under section 25-2.1E are being used in any mix, the Contractor shall have the material provider stockpile the materials for the project at the manufacturing site for materials testing. After these materials have been deemed acceptable for use on the project, the materials in this stockpile shall be the only materials used at the project site.

Use 3/4 inch aggregate grading unless approved otherwise by the Engineer. Do not change your selected aggregate grading without authorization.

Aggregate for bases shall be clean from vegetable matter and other deleterious substances, and shall be of such nature that it can be readily compacted under watering and rolling to form a firm, stable base.

Existing aggregate base shall not be re-used in the new project improvements unless specifically approved by the Engineer in writing. The Contractor will be responsible for all testing costs associated with verifying that the existing aggregate meets the requirements of the specifications.

If the aggregate grading test results, sand equivalent test results, or both comply with contract compliance requirements but not operating range requirements, you may continue placing AB for the remainder of the work day. Do not place additional AB until you demonstrate to the Engineer the AB to be placed complies with the operating range requirements.

If the aggregate grading test results, sand equivalent test results, or both do not comply with contract compliance requirements, remove the AB or request a payment deduction. If your request is authorized, $2.00/CY is deducted. If AB is paid by weight, the Engineer converts tons to cubic yards for the purpose of reducing payment for noncompliant AB left in place. An aggregate grading and a sand equivalent test represents up to (1) 500 CY or (2) 1 day's production if less than 500 CY. If the request is not authorized, the AB shall be removed and replaced at the Contractor's expense.

26-2.2 Class 2 Aggregate Base

When tested under California Test 202, aggregate must comply with the grading requirements for the sieve sizes shown in the following table:

Aggregate Grading

Sieve sizes	Percentage passing			
	1-1/2 inch maximum		3/4 inch maximum	
	Operating range	Contract compliance	Operating range	Contract compliance
2"	100	100	--	--
1-1/2"	90–100	87–100	--	--
1"	--	--	100	100
3/4"	50–85	45–90	90–100	87–100
No. 4	25–45	20–50	35–60	30–65
No. 30	10–25	6–29	10–30	5–35
No. 200	2–9	0–12	2–9	0–12

Aggregate must comply with the quality requirements shown in the following table:

Aggregate Quality

Property	California Test	Operating range	Contract compliance
Resistance (R-value) (min)	301	--	78
Sand equivalent (min)	217	25	22
Durability index (min)	229	--	35

Aggregate samples must not be treated with lime, cement, or chemicals before testing for durability index. Aggregate from untreated reclaimed processed asphalt concrete, PCC, LCB, or CTB is not considered treated.

26-3 Construction

26-3.1 General

Water AB under section 17.

26-3.2 Subgrade

Immediately before spreading AB, the subgrade or aggregate subbase must comply with the specified compaction and elevation tolerance for the material involved and be free from loose or extraneous material.

If the subgrade or AS areas are lower than the grade established by the Engineer they must be filled with subgrade or AS materials prior to the placement of AB.

26-3.3 Spreading

Deliver uniform mixtures of AB to the roadbed. Deposit AB in layers or windrows. Spread and shape the AB to such thickness that after watering and compacting, the completed AB is within the tolerances specified in Section 26-3.4. When AB is spread and compacted the moisture content must be uniform and

sufficient to obtain the required compaction. Avoid material segregation. AB must be free from pockets of coarse or fine material.

Where the subgrade is cohesionless sand you may dump AB in piles and spread it ahead in sufficient quantities to stabilize the subgrade, if authorized by the Engineer.

Where the shown AB thickness is 0.50 foot or less you may spread and compact the AB in one layer. Where the shown thickness is more than 0.50 foot, spread and compact in 2 or more layers approximately equal in thickness. The compacted thickness of any one layer must not exceed 0.50 foot. At locations inaccessible to spreading equipment, spread and compact AB by any means that will obtain the specified results.

Any soft, spongy or otherwise unstable areas shall be repaired by completely removing the material and replacing it with acceptable materials in accordance with these Specifications.

26-3.4 Compacting & Quality Control

Compact each AB layer to at least 95 percent relative compaction under ASTM D1557.

The finished surface of AB must not vary by more than 0.02 foot above or below the grade established by the Engineer.

Correct areas of AB that do not comply with the described thickness or request a payment deduction if AB is paid for by volume. If AB is paid by weight, the Engineer converts tons to cubic yards for the purpose of reducing payment for noncompliant AB left in place. If your request is authorized, the Engineer calculates the deduction by multiplying:

A. Deficient thickness less allowable tolerance
B. Planned width
C. Longitudinal distance of the deficient thickness
D. $17.00 per cubic yard or the item bid price adjusted for cubic yards, whichever is higher

Prior to placing any surfacing materials on the AB, the AB shall be proof-rolled with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated base material.

1. Completely proof-roll base in the direction of travel parallel with the roadway. Limit vehicle speed to 3 mph.
2. Proof roll with a loaded 10-wheel, tandem-axle truck or water truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer or Inspector, and replace with compacted base or as directed.

Proceed with placement of surfacing materials only after unsatisfactory conditions have been corrected.

26-4 Measurement & Payment

Payment for Class 2 AB shall be at the contract unit price per ton. The contract price paid for Class 2 AB shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in hauling, placing, grading, compaction and watering, and constructing

aggregate base, complete in place as shown on the plans and as specified in the Specifications, and as directed by the Engineer. Quantities shall be measured in accordance with the provisions of these specifications.

Payment for the weight of material will be determined by deducting from the weight of material delivered to the work, the weight of water in the material at the time of delivery to the job, as determined by Test Method California No. 226, in excess of one percentage (1%) point more than the optimum moisture content as determined by ASTM D1557. Payment for the weight of water deducted as provided herein shall not be made.

Existing aggregate base shall not be re-used in the new project improvements unless specifically approved by the Engineer in writing. The Contractor shall be responsible for all materials testing required to verify that the existing aggregate base is suitable for reuse where proposed. As a part of the Contractor's bid he shall not assume that there is an existing AB layer under the existing pavement, or that this AB layer can be re-used in the project, or that the Contractor can receive money from recycling or selling the existing AB. Any assumptions made by the Contractor are at his own risk and no additional compensation will be provided therefor.

Aggregate base used for items other than the structural street and paving sections shown on the plans shall not be charged as part of the contract line item "Class 2 AB". Aggregate base used for trench and structure backfill in trenches or excavations, temporary traffic lanes, over excavation, or for any use other than the specified street structural section must be considered part of the contract line item related to that work and, unless written authorization is obtained from the Engineer, may not be charged to the line item "Class 2 AB".

SECTION 27 BITUMINOUS SEALS

27-1 General

Bituminous Seals shall be as specified in Section 37, "Bituminous Seals," of the State Standard Specifications.

27-2 Payment

Bituminous Seals will be paid for by the ton in accordance with Caltrans Section 37 or by the square yard as shown on the bid item schedule. If seals are being paid for by the square yard, the deductions listed in Caltrans Section 37 will still apply. The contract price paid for the Bituminous Seals shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in noticing the public, clearing the roadways, cleaning the roadway, preparing the roadway, traffic control, spreading, placing, and curing, striping and pavement marking replacement, and pavement marker replacement complete in place as shown on the Plans and as specified in the Specifications, and as directed by the Engineer.

SECTION 28 HOT MIX ASPHALT

28-1 General

Hot Mix Asphalt shall comply with this Section 28 "Hot Mix Asphalt," and the State Standard Specification Section 39 "Hot Mix Asphalt." Where requirements and provisions are shown in both this Section 28 "Hot Mix Asphalt" and Section 39 "Hot Mix Asphalt" of the State Standard Specifications, the requirements and provisions of this Section 28 shall take precedence and govern over the State Standard Specifications.

28-1.1 Summary

Section 28-1 includes general specifications for producing and placing hot mix asphalt (HMA) by mixing aggregate and asphalt binder at a mixing plant and spreading and compacting the HMA mixture. All HMA shall be Type B and shall conform to the provisions in Section 39 of the State Standard Specifications, these Specifications, and the Contract Specifications.

In the City of Visalia all HMA shall be Type "B" asphalt concrete with 3/4" aggregate gradation and PG 64-10 liquid asphalt binder where the total HMA pavement thickness is equal to or greater than 2" in depth unless approved otherwise by the Engineer with the following exceptions:

A. For City of Visalia Trail projects all HMA shall be Type "B" asphalt concrete with 1/2" aggregate gradation and PG 64-10 liquid asphalt binder.

B. Where not otherwise specified Type "B" asphalt concrete with 1/2" gradation and PG 64-10 liquid asphalt binder shall only be used where noted on the Plans, Standard Drawings, these Specifications, the Contract Specifications or where specifically approved by the Engineer in writing.

C. Where a total HMA pavement thickness of less than 2" is specified on the plans, see the Plans and Contract Specifications for the type of HMA that shall be used.

28-1.2 Definitions

coarse aggregate: Aggregate retained on a no. 4 sieve.

fine aggregate: Aggregate passing the no. 4 sieve.

supplemental fine aggregate: Aggregate passing the no. 30 sieve, including hydrated lime, portland cement, and fines from dust collectors.

28-2 Materials

28-2.1 Geosynthetic Pavement Interlayer

Geosynthetic pavement interlayer must comply with the specifications for pavement fabric, paving mat, paving grid, paving geocomposite grid, or geocomposite strip membrane of the State Standard Specifications.

28-2.2 Tack Coat

Tack coat must comply with the specifications for asphaltic emulsion or asphalts of the State Standard Specifications and shall be as specified in Section 28-6.3.

Notify the Engineer if you dilute asphaltic emulsion with water. The weight ratio of added water to asphaltic emulsion must not exceed 1 to 1.

Measure added water either by weight or volume in compliance with section 9-1.02 of the State Standard Specifications or you may use water meters from the California Water Service Co. If you measure water by volume, apply a conversion factor to determine the correct weight.

With each dilution, submit:

A. Weight ratio of water to bituminous material in the original asphaltic emulsion
B. Weight of asphaltic emulsion before diluting
C. Weight of added water
D. Final dilution weight ratio of water to asphaltic emulsion

28-2.3 Asphalt Binder

Asphalt binder in HMA shall be performance graded PG 64-10 and shall comply with the State Standard Specifications for asphalts.

Asphalt binder for geosynthetic pavement interlayer must comply with the State Standard Specifications for asphalts.

28-2.4 Aggregate

Aggregate must be clean and free from deleterious substances.

The specified aggregate gradation may be determined before the addition of asphalt binder or from hot mix asphalt samples delivered to the site as directed by the Engineer and includes supplemental fine aggregate. The City tests for aggregate grading under ASTM C136 & C117 or California Test 202, modified by California Test 105 if there is a difference in specific gravity of 0.2 or more between the coarse and fine parts of different aggregate blends. The City tests for aggregate gradation of extracted samples using ASTM D5444 or equivalent method.

Choose sieve size TV within each TV limit presented in the aggregate gradation tables.

The proposed aggregate gradation must be within the TV limits for the specified sieve sizes shown in the following tables:

Aggregate Gradation
(Percentage Passing)
HMA Type B

3/4-inch HMA Type B

Sieve sizes	TV limits	Allowable tolerance
1"	100	--
3/4"	95–100	TV ± 4
1/2"	85–95	TV ± 5
3/8”	65-80	TV ± 6
No. 4	45–55	TV ± 7
No. 8	32–40	TV ± 5
No. 30	12–21	TV ± 4
No. 200	2.0–7.0	TV ± 2

The 3/4-inch HMA Type B gradation limits have been modified from the 2010 State Standard Specifications to fit the specific requirements of the City of Visalia.

1/2-inch HMA Type B

Sieve sizes	TV limits	Allowable tolerance
3/4"	100	—
1/2"	95–99	TV ± 6
3/8"	75–95	TV ± 6
No. 4	55–66	TV ± 7
No. 8	38–49	TV ± 5
No. 30	15–27	TV ± 4
No. 200	2.0–8.0	TV ± 2

Before the addition of asphalt binder and lime treatment, aggregate must have the values for the quality characteristics shown in the following table:

Aggregate Quality

Quality characteristic	Test method	HMA type			
		A	B	RHMA-G	OGFC
Percent of crushed particles	California				
Coarse aggregate (% min.)	Test 205				
One fractured face		90	25	--	90
Two fractured faces		75	--	90	75
Fine aggregate (% min)					
(Passing no. 4 sieve and retained on no. 8 sieve.)					
One fractured face		70	20	70	90
Los Angeles Rattler (% max.)	California				
Loss at 100 rev.	Test 211	12	--	12	12
Loss at 500 rev.		45	50	40	40
Sand equivalent (min.) [a]	California Test 217	47	42	47	--
Fine aggregate angularity (% min.) [b]	California Test 234	45	45	45	--
Flat and elongated particles (% max. by weight @ 5:1)	California Test 235	10	10	10	10

[a] Reported value must be the average of 3 tests from a single sample.
[b] The Engineer waives this specification if HMA contains less than 10 percent of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

28-2.5 Reclaimed Asphalt Pavement

HMA may be produced using Reclaimed Asphalt Pavement (RAP) in accordance with Section 39-1.02F of the State Standard Specifications. Section 39-1.02F has been copied below for reference. All RAP must meet the requirements of the State Standard Specifications.

You may produce HMA Type A or B, using RAP. HMA produced using RAP must comply with the specifications for HMA, except aggregate quality specifications do not apply to RAP. You may substitute RAP aggregate for a part of the virgin aggregate in HMA in a quantity not exceeding 15.0 percent of the aggregate blend. Do not use RAP in OGFC and RHMA-G.

Assign the substitution rate of RAP aggregate for virgin aggregate with the JMF submittal. The JMF must include the percent of RAP used. If you change your assigned RAP aggregate substitution rate by more than 5 percent (within the 15.0 percent limit), submit a new JMF.

Process RAP from asphalt concrete. You may process and stockpile RAP during the entire project. Prevent material contamination and segregation. Store RAP in stockpiles on smooth surfaces free of debris and organic material. Processed RAP stockpiles must be only homogeneous RAP.

28-3 Hot Mix Asphalt Design Requirements

HMA mix shall be designed in accordance with Section 39-1.03 of the State Standard Specifications. The Engineer will not be performing testing verification as described in Section 39-1.03E or 39-1.03F of the State Standard Specifications.

The Contractor shall provide the City with HMA mix test results and design mix for approval from the HMA supplier prior to construction. The HMA mix design provided by the supplier must be dated within one-year of the date submitted. A Certificate of Compliance from the Batch Plant is required. The Contractor shall be responsible for providing the City with Certificates of Compliance and any other submittal/information/testing the City feels is necessary to verify that the HMA complies with the Contract Specifications.

28-4 Contractor Quality Control & City Quality Assurance

28-4.1 Contractor Quality Control

The Contractor shall be solely responsible for establishing, maintaining, and changing a quality control system to ensure materials and work comply with the Specifications, Plans, and Contract Documents.

It shall be the responsibility of the Contractor to set up a pre-paving conference with the Inspector and Engineer at a mutually agreed time and place prior to paving activities to discuss methods of performing the production of the paving work.

28-4.2 City Quality Assurance

The City of Visalia will be performing quality assurance testing of the HMA throughout the duration of the construction project for City Public Projects. Acceptance of the material placed will be based on the results of the quality assurance testing performed. Any testing required in addition to the original tests due to the failure of the materials to meet Contract Specifications shall be paid for by the Contractor.

For Non-Public projects, the Contractor shall be responsible for all costs involved with providing samples, material testing, and compaction testing, as required for acceptance by the City Inspector and Engineer. The Contractor shall be responsible for providing all test results to the City for acceptance of the materials placed.

The asphalt content of the HMA mixture will be determined by extraction tests in conformance with the requirements of ASTM D2172, ASTM D6307 or Caltrans Test Method 382. The asphalt binder content percentage bitumen ratio (pounds of asphalt per 100 pounds of dry aggregate including supplemental fine aggregate if used) shall not vary by more than 0.40% of asphalt above or below the amount designated by the approved HMA mix submittals. Compliance with this requirement will be determined by testing samples taken from the mat behind the paver before initial or breakdown compaction of the mat. If the Contractor requests, and if the City authorizes, samples may be taken from the plant, truck, windrow, or paver hopper.

Average in-place density will be determined by nuclear gage in conformance with California Test 375, ASTM D2950, or equivalent method approved by the Engineer. Percent of theoretical maximum density shall be determined by laboratory specimens tested in accordance with California Test 309. The HMA will be tested at intervals as required by the City of Visalia. HMA shall be compacted to a percentage of maximum theoretical density of 91% to 97% when compared to laboratory specimens tested in accordance with California Test 309.

For percent of maximum theoretical density, the Engineer determines a deduction for each test result outside the specifications using the reduced payment factors shown in the following table:

Reduced Payment Factors for Percent of Maximum Theoretical Density

HMA Type A and B and RHMA-G percent of maximum theoretical density	Reduced payment factor	HMA Type A and B and RHMA-G percent of maximum theoretical density	Reduced payment factor
91.0	0.0000	97.0	0.0000
90.9	0.0125	97.1	0.0125
90.8	0.0250	97.2	0.0250
90.7	0.0375	97.3	0.0375
90.6	0.0500	97.4	0.0500
90.5	0.0625	97.5	0.0625
90.4	0.0750	97.6	0.0750
90.3	0.0875	97.7	0.0875
90.2	0.1000	97.8	0.1000
90.1	0.1125	97.9	0.1125
90.0	0.1250	98.0	0.1250
		98.1	0.1375
		98.2	0.1500
		98.3	0.1625
		98.4	0.1750
		98.5	0.1875
		98.6	0.2000
		98.7	0.2125
		98.8	0.2250
		98.9	0.2375
		99.0	0.2500
< 90.0	Remove and replace	> 99.0	Remove and replace

Any HMA that has a percent of maximum theoretical density of less than 90.0% or greater than 99.0% shall be removed and replaced by the Contractor at no cost to the City.

If HMA materials do not meet the requirements of the specifications as determined by quality assurance testing, the Engineer shall have the option to order the Contractor to remove and replace the HMA, as directed by the Engineer, with acceptable materials or reduce the payment for the HMA. Any removals and replacements required shall be paid for by the Contractor.

28-4.3 Dispute Resolution

If any disputes arise concerning HMA density or quality of materials, the disputes shall be resolved by taking density cores and testing briquettes in accordance with State Standard Specification Sections 39-1.04F through 39-1.04G. One density core shall represent up to 250 tons of HMA. The Contractor shall be responsible for providing all materials, equipment, and labor for performing the cores and for repairing all cored locations to the satisfaction of the Engineer. The Contractor will also be responsible for providing all traffic control necessary to perform coring and repairs. The cores shall be taken in the presence of the Inspector and shall be given directly to the testing laboratory. All costs will be paid for by the Contractor at no additional cost to the City.

28-5 Production

Production HMA shall comply with the requirements of Section 39-1.08, "Production" of the State Standard Specifications.

28-6 Subgrade, Tack Coat, and Geosynthetic Pavement Layer

28-6.1 General

Prepare subgrade or apply tack coat to surfaces receiving HMA. If specified, place geosynthetic pavement interlayer over a coat of asphalt binder.

28-6.2 Subgrade

Subgrade and base to receive HMA must comply with the compaction and elevation tolerance specifications in the sections for the material involved. Subgrade and base must be free of loose and extraneous material. If HMA is paved on existing base or pavement, remove loose paving particles, dirt, and other extraneous material by any means including flushing and sweeping. HMA shall not be placed on wet or saturated subgrade or base materials.

28-6.3 Tack Coat

A tack coat of grade SS-1h emulsified asphalt at an approximate rate of 0.05 to 0.10 gallon per square yard (0.23 to 0.45 liter per square meter) shall be uniformly applied upon the existing pavement, any paving course, if the surface is such that a satisfactory bond cannot be obtained between it and a succeeding course, all vertical surfaces, gutters, cold paving joints, manholes and the like, shall be painted immediately before the adjoining HMA is placed.

The surface shall be free of water, foreign material, or dust, when the tack coat is applied. To minimize public inconvenience, no greater area shall be treated in any one day than is planned to be covered by HMA during the same day. Close areas receiving tack coat to traffic. Do not track tack coat onto pavement surfaces beyond the job site.

Unless otherwise specified in the Specifications, SS-1h emulsified asphalt shall be applied at the temperatures of 75 degrees F to 130 degrees F. The SS-1h can be cut back with water at the approximate rate of 50 percent.

Full compensation for tack coat material and application shall be considered as included in the contract unit price paid per ton for hot mix asphalt, and no additional compensation will be allowed, therefore. If no hot mix asphalt bid item is included, the cost will be considered included in the various bid items to which the work is associated with; no additional compensation will be allowed therefor.

28-6.4 Geosynthetic Pavement Interlayer

Geosynthetic pavement interlayer will only be used where shown on the Plans or specified in the Contract Specifications. Place geosynthetic pavement interlayer under the manufacturer's instruction.

Before placing the geosynthetic pavement interlayer and asphalt binder:

A. Repair cracks 1/4 inch and wider, spalls, and holes in the pavement. These repairs are not change order work.

B. Clean the pavement of loose and extraneous material.

Immediately before placing the interlayer, apply 0.25 ± 0.03 gal of asphalt binder per square yard of interlayer or until the fabric is saturated. Apply asphalt binder the width of the geosynthetic pavement interlayer plus 3 inches on each side. At interlayer overlaps, apply asphalt binder on the lower interlayer the same overlap distance as the upper interlayer.

Asphalt binder must be from 285 to 350 degrees F and below the minimum melting point of the geosynthetic pavement interlayer when applied.

Align and place the interlayer with no folds that result in a triple thickness, except that triple thickness layers less than 1 inch in width may remain if less than 1/2 inch in height. Folds that result in a triple layer greater than a 1 inch width must be slit and overlapped in a double thickness at least 2 inches in width.

The minimum HMA thickness over the interlayer must be 0.12 foot thick, including conform tapers. Do not place the interlayer on a wet or frozen surface.

Overlap the interlayer borders from 2 to 4 inches. In the direction of paving, overlap the following roll with the preceding roll at any break.

You may use rolling equipment to correct distortions or wrinkles in the interlayer.

If asphalt binder tracked onto the interlayer or brought to the surface by construction equipment causes interlayer displacement, cover it with a small quantity of HMA.

Before placing HMA on the interlayer, do not expose the interlayer to:

A. Traffic, except for crossings under traffic control, and only after you place a small HMA quantity

B. Sharp turns from construction equipment

C. Damaging elements

Pave HMA on the interlayer during the same work shift.

28-7 Spreading and Compacting Equipment

28-7.1 General

HMA shall be spread with an asphalt paver and shall be compacted by any means to obtain the specified density and surface finish to the lines, grades and cross section shown on the plans.

Paving equipment for spreading must be:

A. Self-propelled

B. Mechanical

C. Equipped with a screed or strike-off assembly that can distribute HMA the full width of a traffic lane

D. Equipped with a full-width compacting device

E. Equipped with automatic screed controls and sensing devices that control the thickness, longitudinal grade, and transverse screed slope

Install and maintain grade and slope references. The screed must produce a uniform HMA surface texture without tearing, shoving, or gouging. The paver must not leave marks such as ridges and indentations, unless you can eliminate them by rolling.

Rollers must be equipped with a system that prevents HMA from sticking to the wheels. You may use a parting agent that does not damage the HMA or impede the bonding of layers.

At locations where the HMA is to be placed over areas inaccessible to an asphalt paver, the HMA shall be spread by any means that will obtain the specified results and shall be compacted to the specified density and to the required lines, grades and cross sections.

28-8 Transporting, Spreading, and Compacting

28-8.1 General

Do not pave HMA on wet or a frozen surface surfaces.

You may deposit HMA in a windrow and load it in the paver if:

A. Paver is equipped with a hopper that automatically feeds the screed

B. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material

C. Activities for deposit, pickup, loading, and paving are continuous

D. HMA temperature in the windrow does not fall below 260 degrees F

In areas less than 5 feet wide and outside the traveled way, including shoulders, you may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

A. Segregation
B. Coarse or fine aggregate pockets
C. Hardened lumps
D. Checking

Longitudinal joints in the top layer must match specified lane edges. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the specified lane edges. You may request other longitudinal joint placement patterns.

Until the adjoining through lane's top layer has been paved, do not pave the top layer of:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets

If the number of lanes changes, pave each through lane's top layer before paving a tapering lane's top layer. Simultaneous to paving a through lane's top layer, you may pave an adjoining area's top layer, including shoulders. Do not operate spreading equipment on any area's top layer until completing final compaction.

If leveling with HMA is specified, fill and level irregularities and ruts with HMA before spreading HMA over the base, existing surfaces, or bridge decks. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

If placing HMA against the edge of existing pavement, sawcut or grind the pavement straight and vertical along the joint and remove extraneous material.

Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving. Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder
2. Below 140 degrees F for HMA with modified binder

If a vibratory roller is used as a finish roller, turn the vibrator off.

Do not allow traffic on new HMA pavement until its surface temperature is below 160 degrees F.

If you request and if authorized, you may cool HMA Type B with water when rolling activities are complete. Apply water under Section 17.

If any deficiencies or irregularities occur within the HMA it shall be removed and replaced at the Contractor’s expense as directed by the Engineer.

28-8.2 Spreading HMA

In addition to the general requirements of these Specifications, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices. When placing HMA to lines and grades established by the Engineer, the automatic controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed and maintained by the Contractor.

HMA shall be spread and compacted in layers according to the following table. All thicknesses shown in the table are compacted thicknesses. The top layer shall not exceed the dimensions listed in the following table. All lower layers shall not exceed 0.25 - foot in compacted thickness. The minimum thickness for each compacted layer shall be 2 inches. These requirements may be modified where specifically approved by the Engineer in writing.

Total Thickness Shown on Plans	No. of Layers	Top Layer Thickness		Next Lower Layer Thickness		All Other Lower Layers Thickness	
		Min.	Max.	Min.	Max.	Min.	Max.
3 or Less	One	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
3-1/2	One*	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
4 through 5	2	2	2-1/2	2	3	- - - -	- - - -
5-1/2 or more	**	2	3	2	3	2	3

* It shall be the Contractor's responsibility to use the appropriate equipment and procedures to meet compaction requirements.

** At least 2 layers if total thickness is 5-1/2 inches. At least 3 layers if total thickness is more than 6 inches and less than 11 inches. At least 4 layers if total thickness is 11 inches or more.

When placing the initial mat of HMA on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device. The end of the screed farthest from centerline shall be controlled by a sensor activated by a similar ski device. When paving contiguously with previously placed mats, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within a 0.01 - foot tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same manner as when placing the initial mat.

Should the methods and equipment furnished by the Contractor fail to produce a layer of HMA conforming to the Section 28-9 "Smoothness" requirements, the paving operations shall be discontinued and the Contractor shall modify his equipment or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during any day's work, the Contractor may use manual control of the spreading equipment for the remainder of that day, however, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the requirements in this section before starting another day's work.

When multiple layers of HMA are required by the Engineer or these Specifications the Contractor shall offset seams of adjacent layers of HMA by twelve inches (12") minimum. The Contractor shall make every effort to lay HMA so that seams on the travel course shall match proposed lane lines as noted on the project striping plans.

28-8.3 Temperatures

HMA shall not be placed when the atmospheric temperature is below 50 degrees F or during unsuitable weather. All HMA paving shall be applied to dry ground.

At the time of delivery to the site of the work, the temperature of mixture shall not be lower than 260 degrees F or higher than 320 degrees F, the lower limit to be approached in warm weather and the higher in cold weather. The temperature of the asphalt at the time it is spread shall be within the above mentioned limits, materials that do not meet these temperature requirements will be rejected, and removed and disposed of at the Contractors expense and no compensation will be allowed for the material.

No layer shall be placed over a layer until the temperature at the surface, of the existing layer, is not more than 160 degrees F.

28-8.4 Compacting

Compacting equipment shall conform to all the general requirements of this Section. HMA shall be thoroughly compacted by rolling. Each roller shall have a separate operator. Rollers must be self-propelled and reversible. It shall be the Contractor's responsibility to determine the type of equipment, number of rollers, number of roller passes, and all other general process means and methods to produce a final HMA section that meets all of the requirements of this Section 28.

Self-propelled compacting rollers shall meet the following criteria:

A. Each roller manufactured after 1998 shall have a Manufacturer's identification plate that is readily accessible and readable with the following information:

   1. Name of Manufacturer.
   2. Model Number.
   3. Static pounds per lineal inch (PLI) (newton per millimeter (N/mm)) of each drum.
   4. Static PLI (N/mm) of ballasted drum
   5. PLI (N/mm) of each drum in vibratory mode.

   Contractors using rollers manufactured prior to 1999 shall have the manufacturer's specifications, providing the information requested above, available to the Engineer upon request. Any roller not having this information shall not be used and shall be removed from the jobsite.

B. Tandem rollers in the static mode used for breakdown or intermediate rolling shall be such that the ballasted or unballasted weight on at least one drum is a minimum of 250 PLI (44 N/mm).

C. Vibratory rollers used for breakdown or intermediate rolling shall have a compactive effort of not less than 250 PLI (44N/mm) of centrifugal force at the setting indicated by the manufacturer's ID plate.

D. Finish rolling shall be performed by static or vibratory steel rollers in static mode

E. Pneumatic-tired rollers used for intermediate rolling shall be the oscillating type having a width of not less than 4 feet and equipped with pneumatic-tires of equal size and diameter, having treads satisfactory to the Engineer. Wobble-wheel rollers will not be permitted. The tires shall be

so spaced that the gap between adjacent tires will be covered by the tread of the following tire. The tires shall be inflated to 90 psi or such lower pressure as designated by the Engineer, and maintained so that the air pressure will vary not more than 5 psi from the designated pressure. Pneumatic-tired rollers shall be so constructed that the total mass of the roller can be varied to produce an operating mass per tire of not less than 2,000 pounds. The total operating mass of the roller shall be varied as directed by the Engineer.

Other rollers may be used subject to approval of the Engineer. All rollers must be maintained in good mechanical condition. Those that cannot be driven along a straight path, operated without jerking, or the amplitude or frequency cannot be adjusted shall not be used and shall be removed from the Work site. No leakage of petroleum products from any roller shall be allowed to come in contact with pavement being constructed, nor shall any roller be permitted to stand motionless on any portion of the work. The surfaces of all roller wheels shall be treated with sufficient water to prevent the pickup of bituminous materials, but under no circumstances shall the quantity of water used be detrimental to the surface of pavement being rolled.

As soon as the layer of HMA has been placed the breakdown rolling shall commence. If the asphalt binder for HMA Type B is unmodified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 250 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 200 degrees F
3. Finish compaction before the surface temperature drops below 150 degrees F

If the asphalt binder for HMA Type B is modified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 240 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 180 degrees F
3. Finish compaction before the surface temperature drops below 140 degrees F

Rolling shall be commenced along the lower edge of the area to be rolled and continued until the edge is thoroughly compacted, after which the roller shall progress toward the highest portion, unless directed otherwise by the Engineer or Inspector. All areas shall be rolled in a like manner.

Rolling shall be performed so that cracking, shoving or displacement will be avoided.

Upon completion of rolling operations, if ordered by the Engineer, the HMA or HMA base may be cooled by applying water.

The completed surfacing shall be thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities. Any ridges, indentations or other objectionable marks left in the surface of the HMA by blading or other equipment shall be eliminated by rolling or other means. The use of any equipment that leaves ridges, indentations, or other objectionable marks in the HMA shall be discontinued, and acceptable equipment shall be furnished by the contractor.

Average in-place density will be determined by nuclear gage in conformance with California Test 375, ASTM D2950, or equivalent method approved by the Engineer. Percent of theoretical maximum density shall be determined by laboratory specimens tested in accordance with California Test 309. The HMA will be tested at intervals as required by the City of Visalia. HMA shall be compacted to percentage of maximum theoretical density of 91% to 97% when compared to laboratory specimens tested in accordance with California Test 309.

28-8.5 Headers

2" x 6" redwood headers or any specie pressure treated wood shall be installed along the unrestrained/free edges of all hot mix asphalt pavement sections. The headers shall have a firm bearing on the header subgrade and the top edges shall be set to conform to the grade of the proposed street grade. Side stakes 2 inches by 3 inches, 18 inches long, or longer, and spaced not over 4 feet apart, shall be driven on the outside of the headers to a depth of 1 inch below the top edge and then nailed to the header with galvanized nails. The joints between the individual boards being used as headers shall be spliced with a 1-inch by 6 inches, 24 inches long board, of the same type as the headers. Payment for furnishing all labor, equipment, tools, and materials to install headers complete in place shall be considered included in the various bid items to which this work is associated with; no additional compensation will be provided therefor.

28-8.6 Joints

Joints between successive runs shall be vertical and at right angles to the line of the improvement. Care shall be exercised in connection with the construction of all joints to ensure that the surface of the pavement is true to grade and cross section. Lapped joints will not be permitted.

When terminating paving operations for the day, the Contractor shall construct temporary hot-mix ramps at all vertical joints which are greater than 1-1/2 inches in height and transverse to through traffic. Temporary hot-mix ramp dimensions and compaction shall be approved by the Engineer. Prior to resuming paving operations, the Contractor shall remove temporary hot-mix ramps to provide for vertical face and a full depth lift joint and apply a tack coat to the faces of the joint.

In locations where new HMA paving abuts existing asphalt concrete that is less than eight years old, or as directed by the City Engineer, all joints shall be required to be finished using an approved heater-remix process to provide a seamless joint with the existing pavement.

28-9 Smoothness

28-9.1 Straightedge

The top layer of HMA pavement must not vary from the lower edge of a 10-foot straightedge:

A. More than 0.01 foot when the straightedge is laid parallel with the centerline

B. More than 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane

C. More than 0.02 foot when the straightedge is laid perpendicular to the centerline and extends edge to edge on any portion of the roadway that is required to have a consistent cross slope

D. More than 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

28-9.2 Smoothness Correction

If the top layer of HMA pavement does not comply with the smoothness specifications, grind and place an overlay of HMA, or remove and replace it. Grind and overlay methods shall only be allowed where specifically approved by the engineer. Do not start corrective work until your choice of methods is authorized by the Engineer.

Corrected HMA pavement areas must be uniform rectangles with edges:

A. Parallel to the nearest HMA pavement edge or lane line

B. Perpendicular to the pavement centerline

Measure the corrected HMA pavement surface with a 10-foot straightedge and correct the pavement to within specified tolerances. All repairs shall be completed to meet the requirements of the Contract Documents at the Contractor's expense and no additional payment will be made therefor.

28-10 Additional Testing and Requirements

When compacted, the new asphalt pavement shall be at the elevations and slopes shown on the plans and shall meet all of the requirements of the Plans, Specifications, and other Contract Documents. Where the new pavement abuts concrete curb and gutter, vee gutter, drive approaches or other concrete improvements used to drain the roadway, the pavement edge shall be one-eighth of one inch (1/8") to three-eights of one inch (3/8") higher than the adjacent concrete improvement, except at the bottom of curb return accessibility ramps or other accessibility ramps where the new pavement edge shall be flush. The surface shall be smooth, without humps or depressions. Deviation from this tolerance shall be cause for rejection of the surfacing. Any areas that are found to be out of compliance with these requirements shall be removed and replaced at the Contractor's expense.

All hot mix asphalt surfaces shall be water tested prior to acceptance. The Contractor shall coordinate with the inspector to schedule the water testing and all testing shall be performed in the presence of the inspector. The entire asphalt surface shall be flooded with water to identify deficient areas. Any areas that are found to be out of compliance with the specification requirements shall be removed and replaced, as approved by the Engineer, at the Contractor's expense.

28-11 Measurement and Payment

Payment for Hot Mix Asphalt used for roadway construction shall be at the contract unit price per ton. The contract price paid for Hot Mix Asphalt shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in sawcutting, grinding, tack coating, hauling, placing, spreading, compacting, finishing, and constructing HMA, complete in place as shown on the plans and as specified in the Specifications, the Contract Documents and as directed by the Engineer. Quantities shall be measured in accordance with the provisions of these Specifications.

Hot Mix Asphalt used for items other than the structural street and paving sections shown on the plans or required by the Contract Documents shall not be charged as part of the contract line item "Hot Mix Asphalt." HMA used for constructing dikes, drive approaches, temporary traffic lanes, trench resurfacing, or for any use other than the specified road structural section must be considered part of the contract line item related to that work and, unless written authorization is obtained from the Engineer, may not be charged to the line item "Hot Mix Asphalt".

Where no bid item for Hot Mix Asphalt is provided, all costs for providing Hot Mix Asphalt shall be included in the various bid items of work to which the work relates; no additional payment will be made therefor.

SECTION 29 STORM DRAINAGE AND SANITARY SEWER FACILITIES

29-1 General

This work shall consist of furnishing all gravity sewer facilities including main pipelines, branch fittings, building or house branches (services), manholes, stub-outs, lampholes, and other sewer facilities and all gravity storm drainage facilities including main pipelines, manholes, laterals, drainage inlets, stub outs, and other storm drainage facilities as shown on the Plans, as specified in the Specifications, and as directed by the Engineer, including testing and internal inspection of all pipes and structures after installation.

QUALITY ASSURANCE: Unless otherwise indicated, all referenced standards shall be the latest edition available at the time of bidding. Any requirements of these Specifications shall in no way invalidate the minimum requirements of the referenced standards.

ASTM C33	Standard Specification for Concrete Aggregates
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM Cl50	Standard Specification for Portland Cement
ASTM C36l	Standard Specification for Reinforced Concrete Low-Head Pressure Pipe
ASTM C443	Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, using rubber gaskets
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM A615	Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement
ASTM F679	Standard Specification for polyvinyl chloride (PVC), Large Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM D3034	Standard Specification for Polyvinyl Chloride PVC Pipe & Fittings
ASTM F1336	Standard Specification for Poly(Vinyl Chloride) (PVC) Gasketed Sewer Fittings
ASTM F477	Elastomeric Seals (Rubber Gaskets) for PVC Pipe
ASTM D3212	Standard Specification for joints for drain and sewer plastic pipes using flexible elastomeric seals
ASTM C700	Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
ASTM C425	Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings

Manufacturer's Qualifications: Firms regularly engaged in the manufacturing of sanitary sewer and storm drainage system products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years, unless approved otherwise by the Engineer.

Installer's Qualifications: Firm with at least 5 years of successful installation experience on projects with sanitary sewer and storm drainage system work similar to that required for this project, unless approved otherwise by the Engineer.

Inspection and Acceptance of Pipe: Acceptance will be on the basis of design, material tests, and inspection of the complete product. The quality of all materials used in the pipe, the process of manufacture, and the finished pipe shall be subject to inspection by the City. Inspection may be made at the place of manufacture, or on the job site after delivery, or at both places and the pipe shall be subject to rejection at any time on account of failure to meet any of the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture. All pipe which is rejected must be immediately removed from the project site by the Contractor at his own expense.

29-2 Submittals

The Contractor shall obtain from the pipe manufacturer and shall furnish to the Engineer, prior to the use of any materials, 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. Other submittal documents may be required on a project by project basis. The Contractor will be responsible for furnishing the Engineer or Inspector with any of the following submittals upon request including, but not limited to the following:

A. Product Data: Submit manufacturer's technical product data and installation instructions for sanitary and storm sewer system materials and products.

B. Maintenance Data: Submit maintenance data and parts lists for sanitary and storm sewer system materials and products. Include this data, product data, shop drawings, and record drawings in a maintenance manual.

C. Shop Drawings; Pipe: Before fabrication, submit for approval drawings showing pipe dimensions, joints, reinforcement and other details.

D. Manufacturer's Certification: Submit design calculations which provide evidence as to the adequacy of the design of pipe proposed for use in the Work. The evidence must be approved in writing by the City before the pipe for the project is manufactured.

E. Mill Certificates; Reinforcing: Submit 2 copies of steel producer's certificates of mill tests for reinforcing steel which indicates that the reinforcing steel meets specified requirements.

F. Mill Certificates; Cement: Submit 2 copies of manufacturer's certification for each shipment of cement used in the manufacturing of pipe indicating that the chemical composition of the cement meets the requirements of ASTM Cl50.

G. Manufacturer's Data; Aggregates: Submit 2 copies of manufacturer's certificates for fine and course aggregates indicating that grading, soundness and abrasion meet the requirements of ASTM C33.

H. Laboratory's Certificate; Pipe: Before delivering pipe to the job site, submit an independent testing laboratory report certifying that the pipe and fittings are in accordance with ASTM

Standards herein referenced. Forward copies of these reports to the City; no pipe will be accepted without these reports.

I. Absorption Test Reports: Submit test reports which demonstrate and certify that the absorption test requirements for pipe to be used on this project are in accordance with ASTM C76.

J. Compression Test Results: Submit test reports which demonstrate and certify that the compression test requirements for pipe to be used on this project are in accordance with ASTM C76.

K. Shop Drawings; Manhole Frames, Grates, and Covers and Manhole Steps: Submit for approval shop drawings for grates, drains, manhole covers, frames and steps.

L. Shop Drawings; Precast Concrete Box and Manhole Sections: Submit for approval shop drawings for each type and size of precast structure. Joints between components and with pipes shall be detailed.

29-3 Materials

Unless otherwise specified in the Contract Specifications or noted on the plans, the Contractor may have the option of using any of the following:

STORM DRAIN (STORM SEWER) PIPE:
Where storm drain (storm sewer) pipe is specified in the approved Plans, the Contractor will be allowed to install Poly Vinyl Chloride Pipe (PVC) or Rubber Gasket Reinforced Concrete Pipe conforming to these Specifications or an approved equal, except where a particular type of pipe is specified in the approved Plans or Contract Specifications. Once pipe laying operations have begun, the Contractor will not be allowed to switch to a type different from that being laid.

SANITARY SEWER PIPE:
Where sanitary sewer pipe is specified in the approved Plans, the Contractor will be allowed to install Poly Vinyl Chloride (PVC) pipe conforming to these Specifications or an approved equal, except where a particular type of pipe is specified in the approved Plans or Contract Specifications. Vitrified Clay pipe will only be allowed as specified in Section 29-3.2. Once pipe laying operations have begun, the Contractor will not be allowed to switch to a type different from that being laid.

29-3.1 PVC Pipe & Fittings

Unless otherwise specified in the Contract Specifications, pipes for sanitary sewer mains, fittings, and building and house branches (services) shall be polyvinyl chloride (PVC), as specified herein.

PVC pipe shall conform to the provisions in the ASTM Standard Specifications tabulated below, for the standard dimension ratio (SDR) or pipe stiffness (PS) designation given, and these specifications.

Pipe Size (Inches)	ASTM	SDR or PS
4-15	D3034	SDR 35
18-30	F679	PS 115

PVC pipe and fittings shall be manufactured of PVC compound containing not more than 10 parts per 100, by weight, of additives and fillers, including but not limited to, stabilizers, antioxidants, lubricants, and colorants.

PVC pipe and fittings for sanitary sewers and sewer services shall be green in color.

Chemical Resistance: PVC pipe shall have the properties in the following table, when tested before and after exposure to certain chemical solutions as specified in the American Public Works Association Standard Specifications for Public Works Construction "Greenbook," Section 207-15.3, as amended.

Property	ASTM Test Method	Allowable Change (After 112-Days Exposure)		
Minimum Yield Strength (psi)	D 638	- 0% (No Reduction)		
Impact Strength (Ft. - lbs/in.) Notch Min.	D 256 Method A (Size ½" x ⅛" x 2½")	- 0% (No Reduction)		
Weight Change % Unconditioned Conditioned	D 543	 ±1.5 max ±1.0 min	 ±1.5 max ±1.0 min	 ±1.5 max ±1.0 min

PVC Pipe shall be clearly marked as follows at intervals of five feet or less:

Manufacturer's name or trademark	Legend "Type PSM SDR-35 PVC Sewer Pipe"
Nominal pipe size	ASTM D3034
PVC cell classification	(12454-B or 12454-C or 13364-B)

PVC pipe fittings shall conform to the provisions in ASTM F1336 and these specifications for gravity sanitary sewer piping. PVC fittings and accessories shall be as manufactured and furnished by the pipe supplier, or approved equal, and have bell and/or spigot configurations identical to that of the pipe. Where shown on the Plans, injection molded PVC wye fittings shall be used for future building or house branch connections at the time of installation of the sanitary sewer main. Where indicated on the Plans or specified in the Contract Specifications, each wye branch for future sewer service connections shall be provided with an end cap or plug approved by the pipe manufacturer for use with its product.

PVC Fittings shall be clearly marked as follows:

Manufacturer's name or trademark	"PSM"
Nominal size	"ASTM D3034"
Material Designation	"PVC"

A. Joints and Gaskets

Joints shall be integral bell and spigot push-on joints conforming to the provisions in ASTM D3212 and these Specifications, with factory installed elastomeric gaskets. Joints shall be configured so as to prevent improper installation of the gasket and ensure that the gasket remains in place during the joining operation. Bell and spigot configurations for fittings and couplings shall be compatible with those used for pipe joints.

Spigots shall have a home mark to indicate proper penetration when the joint is made.

Elastomeric gaskets shall conform to the provisions in ASTM F477 for thermoset elastomeric gaskets, and these specifications. Gaskets shall be factory installed by the pipe manufacturer, and shall be specifically intended for use with the pipe.

Gaskets shall be manufactured from a synthetic elastomer, containing not less than 50% by volume of first-grade synthetic rubber. The remainder of the compound shall consist of pulverized fillers free of rubber substitutes, reclaimed rubber, and deleterious substances.

A gasket shall contain no more than one splice. A splice shall be made by applying a suitable cement to the ends and vulcanizing the splice in a full mold.

B. Test Requirements

During production of the pipe, the pipe manufacturer shall perform the tests specified in ASTM D3034 and F679. A certificate of compliance with specification requirements shall be provided by the manufacturer, for each lot of pipe from which pipe is delivered, and shall be delivered with the pipe. The certificates of compliance shall include the test results. The Contractor shall submit the certificates of compliance to the Engineer prior to commencing excavation for installation of the pipe.

In addition, when so directed by the Engineer, the Contractor shall obtain PVC compound samples and shall provide test specimens in accordance with ASTM D1987. The Contractor shall also provide one test pipe selected at random by the Engineer from each 1200 feet or fraction thereof, or from each pipe lot or fraction thereof. A lot shall be defined as all pipe having identical identification marking. The length of test pipe for each selected pipe shall be a minimum of 8 feet. The Engineer may test the specimens for compliance with specification requirements.

When so directed by the Engineer, the Contractor shall furnish test specimens of gaskets from each batch used in the work.

When the pipe is delivered to the work site, the Engineer may require additional testing to determine conformance with specification requirements for pipe flattening, impact resistance, pipe stiffness, and extrusion quality.

The basis for acceptance will be compliance with specification requirements, as determined by the inspection of pipe, fittings, and couplings, the certificates of compliance, and the results of any tests conducted by the Engineer.

C. Time Limit for Installation

If the Contractor proposes to install any PVC pipe and fittings that are more than 180 days old from the date of manufacture, the Contractor shall retest the materials within 60 days prior to installation, at the Contractor's expense, to demonstrate compliance with specification requirements, unless otherwise directed by the Engineer. The Contractor shall not install any PVC pipe and fittings more than 2 years old from the date of manufacture. PVC pipe that is stored for more than 3 weeks under conditions that may subject the pipe to sunlight or other sources of ultraviolet light shall be covered or otherwise protected from such exposure to prevent pipe material degradation ultraviolet radiation. The foregoing shall also apply to elastomeric gaskets.

29-3.2 Vitrified Clay Pipe

Vitrified clay pipe and fittings shall only be used if required by the Plans or Contract Specifications. In such case, vitrified clay pipe, shall be extra strength, bell and spigot, and shall conform to ASTM Specification Designation C700 with preformed factory fabricated plastisol joints complying with ASTM

Specification Designation C425. Vitrified clay sewer pipe shall also conform to standards of the Clay Products Institute.

29-3.3 Precast Rubber Gasket Reinforced Concrete Pipe

Rubber Gasket Reinforced Concrete Pipe shall be new and comply with ASTM C76, and with the additional requirements specified herein. The cement used in manufacture shall be Type II, as per ASTM C150. Unless otherwise specified in the approved Plans or Contract Specifications, for pipes with inner diameters of 12 inches to 60 inches provide Class III pipe for all pipe buried ten feet (10') or less, Class IV pipe for pipe buried eleven feet to sixteen feet (11'-16'), and Class V pipe for all pipe buried seventeen feet to twenty-seven feet (17'-27'). Pipe class for pipes with inner diameters larger than 60 inches will be determined by the Engineer of Record and will be noted on the Plans or the Contract Specifications. All pipe approved will have an interior surface which is free from roughness, projections, indentations, offsets or irregularities of any kind. Pipe Class could vary depending on native soil type and pipe "D" loads. The Engineer of Record shall be responsible for verifying pipe class for all pipes during the project design stage. If no specific pipe class is called out on the Plans or Contract Specifications the classes above shall be used.

Pipe Lengths: Furnish pipe in standard lengths. Shorter lengths may be used where required by construction details or when approved by the City.

Physical Requirements: Tests shall be performed as described in Section 11, ASTM C76.

Repairs: Pipe may be repaired, if necessary, because of occasional minor imperfections in manufacture or accidental injury during handling and will be acceptable if, in the opinion of the City, the repairs are sound, properly finished and cured, and the repaired pipe conforms to the requirements of ASTM C76. Use mortar for repairs which has a compressive strength of 6,000 psi at the end of 28 days.

Marking: mark all pipe in accordance with ASTM C76; no pipe will be accepted unless these markings appear on all pipe.

Joints: The ends of reinforced concrete pipe sections shall be bell and spigot type and shall be of such design that when properly laid they shall have a smooth and uniform interior surface. Both ends of pipe sections shall be substantially free of cracks and broken edges. Pipe so found to be damaged shall be rejected for use in the work. Each joint shall be sealed to prevent leakage. Sealing of joints shall be accomplished with O-ring rubber gaskets and shall conform to the following specifications:

A. Rubber Gasketed Joints

   Rubber gasketed joints shall conform to the requirements of ASTM C443 and shall be flexible and able to withstand expansion, contraction and settlement.

   The ends of the pipe shall be thoroughly cleaned immediately prior to joining sections of pipe. The two (2) sections joined shall be firmly placed together in such a manner that the tongue or gasket end of the pipe "homes" on the bell end of the pipe. No appreciable gap shall exist at the completed joint, except as permitted by the Engineer at locations where curves in the pipe alignment are specified or required. Excessive gaps in any case shall be cause for rejection of the work, and corrective measures shall be taken when ordered by the Engineer.

B. Construction Joints

   Construction Joints shall only be installed where approved by the Engineer in writing. Whenever two (2) sections of pipe are to be joined where standard joints are not available, such as joining

reinforced concrete pipe to cast-in-place or asbestos cement pipe, a concrete collar shall be constructed around the full periphery of the pipe in accordance with the Standard Drawings. The collar shall be of a minimum thickness equal to that of the concrete pipe, but in no case less than eight inches (8") thick. Rebar may be required depending on the size of pipe being joined, see the Standard Drawings for details. The interior of the joint shall be smoothed with cement mortar and brushed. The area to receive the collar shall be thoroughly cleaned and dampened immediately prior to construction of the collar. Rubber "O" rings shall be installed on each pipe end as shown on the Standard Drawings. After the joint is completed and cured it shall be subjected to exfiltration testing as implemented by the City of Visalia. The cost of constructing concrete collars and testing shall be considered as included in the cost of the items requiring the collar, and no additional payment will be made therefor.

29-3.4 Manhole Materials

Cast-in-Place Concrete:

Concrete for cast-in-place manholes shall be Class 2 concrete conforming to the provisions in Section 50 of these Specifications, unless otherwise shown on the Plans or specified in the Contract Specifications. Portland cement shall be Type II low alkali sulfate resistant conforming to the provisions in ASTM C150. Slump shall not exceed 3 inches. Before using concrete, the Contractor shall submit in writing to the Engineer a copy of all mix designs for acceptance. Cast-in-Place Concrete manholes will only be allowed where approved by the Engineer.

Precast Reinforced Concrete Manhole Sections and Cast-in-Place Manhole Bases

Precast reinforced concrete manhole sections shall conform to the provisions in ASTM C478. Elliptical single line reinforcement is not allowed. The ends of manhole sections shall be in planes at right angles to the longitudinal axis of the section. The ends of manhole sections shall be finished to regular smooth surfaces, and no point on any surface of either the spigot end or bell end shall project beyond, or be more than 1/4 inch short of, the specified plane.

Joints for manhole sections shall be rubber gasket joints of flush bell and spigot design with a contained rubber gasket. Joints and gaskets shall conform to the provisions in ASTM C443 for standard gaskets, except as modified or required otherwise in these Contract Specifications. The gasket shall be confined in a groove or by a shoulder on the spigot end of the manhole section so that neither movement of the section nor hydrostatic pressure can displace the gasket. When the joint is assembled, the gasket shall be compressed to provide a watertight seal.

Rubber gasket joint assemblies shall be formed and accurately manufactured so that installed manhole sections will form a continuous watertight manhole with a smooth and uniform interior surface, and shall provide for slight movements of the sections due to expansion, contraction, settlement, or lateral displacement. The shape and dimensions of the joint shall be such that it shall be self-centering upon closure, and so designed that the gasket will not be required to support the weight of the manhole sections. The rubber gasket shall be the sole element of the joint depended upon to provide water-tightness.

At the Contractor's option Mastic (Kent Seal No. 2) sealants or Ram-Nek flexible sealants conforming to ASTM C990 or equal may be substituted at joints. Mastic shall cover a minimum of 1/2 the compressed surface and shall be installed in accordance with the manufacturer's recommendations. All joints shall be watertight.

Concrete used to construct manhole bases and other facilities shall be Class 2 concrete conforming to the provisions in Section 50 of these Specifications, unless otherwise shown on the Plans or specified in the

Contract Specifications. Portland cement shall be Type II low alkali sulfate resistant conforming to the provisions in ASTM C150. Slump shall not exceed 3 inches. All concrete shall have a 3,000 psi compressive strength at 28 days. Before using concrete, the Contractor shall submit in writing to the Engineer a copy of all mix designs for acceptance. All mix designs shall include break strength data and charts. Concrete manhole bases shall be allowed to cure for a minimum of 24 hours prior to installing manhole barrels. If the Contractor desires to set barrels sooner than 24 hours, the Contractor shall submit an appropriate mix design to the Engineer for approval prior to construction.

Manhole adjustment rings shall be precast concrete manhole adjustment rings conforming to the details shown on the Standard Drawings.

Mortar used in manholes shall be composed of one part, by weight, Portland cement (Type II low alkali conforming to ASTM C150) and 2 parts, by weight, sand. The cement and sand shall be mixed dry and then the water shall be added. All mortar shall be mixed in a proper watertight box, and in no case shall be mixed on the ground. No mortar shall be used that show evidence of having set, and no remixing of mortar or addition of water thereto will be permitted. All manhole joints shall be mortared as shown on the Standard Drawings.

Steel reinforcement bars shall be deformed billet-steel bars of the size called for in the Plans and Specifications, conforming to the provisions in ASTM A615 for Grade 60.

Manhole frames and covers shall be 24" ID Wilkerson and Nutwell or approved equal, and shall be of tough gray iron conforming to the specifications of ASTM A48 for Class No. 30 castings, with the exception that no traverse test will be required. The bearing surfaces of manhole frames and covers shall be machined for bearing and the cover shall seat firmly into the frame without rocking. All castings shall be heavily coated with asphaltum paint with the exception of machined surfaces. All manhole covers shall be marked "City of Visalia" "Storm Drain System" or "Sanitary Sewer System", as shown on the Standard Drawings.

When manholes are constructed in new streets or in areas that require new pavement section installation, they shall be left below grade until the street has been paved in accordance with Section 29-7 "Manhole Construction." After the paving materials have been compacted they will be raised to grade with grade rings. Concrete shall be placed around frame and left two (2) inches below the finished street grade. Type B 1/2 inch aggregate grading hot mix asphalt paving in accordance with the requirements of Section 28 shall be used to fill the final 2" and rolled.

29-4 Trenching and Excavation

Trenching for sanitary sewer and storm drain pipes, laterals, manholes, drain inlets and other facilities shall conform to the requirements of Section 8-15, "Utilities and Non-Street Facilities; Potholing," and Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration."

29-5 Sewer and Storm Drain Pipeline Installation

Construction of sewer or storm drain pipelines connecting to existing sewers or storm drains shall begin at the existing point of connection location and proceed upstream with the spigot end of the pipe in the direction of flow, unless otherwise approved in writing by the Engineer. Existing sewer and storm drain lines shall remain operational at all times, unless approved otherwise in writing by the Engineer. The Contractor shall furnish and install a gasketed stainless steel band-type repair coupling specifically designed for such use and approved by the Engineer where small diameter PVC sewer pipe is to be connected to an existing pipe of similar diameter. A concrete collar shall then be installed around the repair coupling completely encasing the coupling in concrete in accordance with the Standard Plans.

Where larger diameter pipes, concrete pipes or other pipe types are being connected, or pipes of dissimilar materials or diameters are being connected a concrete collar construction joint shall be constructed in accordance with the Standard Plans. All connections from new to existing pipes must be approved by the Engineer in writing prior to construction.

Sewer and Storm Drain pipe and fittings shall be laid to true line and grade, and jointed in compliance with the manufacturer's recommendation and shall be carefully adjusted to grade by scraping away or filling and tamping the trench bottom to eliminate any possible sag or high point in the pipe. Occasional variations as follows will be permitted: above grade, 1/4 inch; below grade, not to exceed 1/2 inch; alignment not to exceed 2 inches if gradual over a distance of 20 feet. Use of blocks to support the pipe is prohibited. Each joint of pipe must be fully pressed into place so that there will be no unevenness or settlement of one length of pipe with the other at the joint.

The Contractor shall furnish and use a laser device for control of alignment and grade of the pipe. When conditions are such that this method is impracticable, such as on short pipe runs, the Contractor shall have an Engineer on the ground to set grade by means of an Engineer's level. The grade line shown on the Plans indicates the flow line or invert of the pipe; all cuts, unless otherwise indicated, refer to this line.

The interior of the pipe shall be kept free from dirt and other foreign material as the laying progresses. Any pipe that shows undue settlement or is damaged shall be taken up and replaced or re-laid at the Contractor's expense. The open ends of all pipes being installed must be covered to keep out animal life, etc., whenever the pipe is left unattended for any length of time, such as overnight. The end of any pipe that does not terminate at a manhole shall be closed at the bell end with a plug manufactured for that purpose.

Pipe exposed to the sun during the summer months must be allowed to cool before connection is made to manholes and other facilities, and prior to backfill.

All pipes shall be handled and joined in accordance with the manufacturer’s recommendations. All pipe joints shall be thoroughly lubricated in accordance with the manufacturer’s recommendations prior to joining.

29-6 Sewer Service Lateral Installation

Sewer service laterals shall be furnished and installed by the Contractor at the locations shown on the Plans, in conformance with the Standard Drawing pertaining thereto, the Contract Specifications, and the directions of the Engineer.

Pipe for sewer service laterals shall conform to the requirements of Section 29-3.1, “PVC Pipe and Fittings,” and shall be installed in accordance with the requirements of Section 29-5, “Sewer and Storm Drain Pipeline Installation.”

House connections, branches and spurs shall be 4 inches in diameter, unless otherwise specified on the plans or in the Specifications. House connections shall be constructed on a straight line and slope of not less than 1/4 inch per foot fall from the point where they join the 1/8 bend at the main sewer to the property line. Maximum grades for house sewers, conditional upon main line depths and necessary depth at curb line, shall be obtained. Wyes may be laid flat where grade is a problem. All house laterals shall have a minimum cover of 5 feet below curb grade at the right-of-way line unless greater depths are shown on the Plans or noted in the Contract Specifications. Where special conditions warrant the Engineer may authorize at a reduced depth. Such approval must be obtained prior to installation.

All trenches under existing curb and gutter or other City structures shall require a slurry cement backfill meeting the requirements of Section 19-3.3C.

Wherever the depth of a side sewer from the invert to the pavement or ground surface is less than 2 feet, cast iron pipe or concrete encasement shall be used.

Sewer service laterals 4 inches or 6 inches in diameter shall be connected to all sewer mains less than 18 inches in diameter at prefabricated wye fittings conforming to Section 29-3.1, "PVC Pipe and Fittings," or shall be connected to similar pipe stub-outs from manholes. Sewer service laterals 4 inches or 6 inches in diameter may be connected directly to existing sewer mains 18 inches in diameter or greater, providing that a machine core is used in connecting to the main sewer. Sewer service laterals 8 inches in diameter or greater connecting to sewer mains shall require the construction of a manhole at the point of connection. All connections shall be of materials and methods as approved by the Engineer. All connections shall be water tight.

Sewer wye fittings, unless otherwise specified or directed, shall be inclined at an angle of not greater than 45° from the horizontal. Service laterals shall extend from the sewer main to the right-of-way line of the street or alley, where the service lateral shall be promptly closed at the bell end with a plug manufactured for that purpose.

The contractor shall cut into top of concrete curb a 3-inch "S" over house branch. In cases where a concrete curb exists, the contractor shall fasten a No. 8 copper wire or a No. 10 galvanized wire to end of lateral. Wire shall be brought up vertically to within four inches of finished grade where it shall be fastened to a metal pin driven into the side of the trench.

Excavations for laying service laterals shall be made in accordance with the Plans, Standard Drawings and Contract Specifications. Where no direction is given, service laterals shall be installed in such a manner that: 1) at no time will an existing street be closed to traffic; 2) Whenever service laterals are to be installed in existing major arterial or collector streets, or in pavement that is in good condition and free of cracking, they shall be installed by boring methods rather than open cut trenches. Laterals crossing over water mains shall comply with Section 29-12 "Alignment Changes."

29-7 Manhole Construction

Manhole structures shall be constructed at the locations shown on the Plans and as specified in the Contract Specifications, and as indicated on the standard drawings pertaining thereto. Construction of Manholes shall comply with Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration," and Section 29-3.5, "Manhole Materials."

Manholes shall be complete structures in place and backfilled including the furnishing and placing of all materials involved. Cast-in-Place Concrete manholes shall consist of a poured-in-place base and riser section, reinforced concrete reducing cone sections. Pre-cast concrete pipe manholes shall consist of a poured in place concrete base section, reinforced concrete pipe riser and reducing cone sections. Both types shall have a cast iron frame and cover and a poured in place concrete collar with paving patch. In Sanitary Sewer manholes invert channels shall be smooth and semicircular in shape conforming to the inside of the adjacent pipe invert, or flow channels may be provided by use of the bottom half of the specified main pipe as shown on the Standard Drawings. The floor and wall of the manhole outside the channels shall be smooth and shall slope toward the channels. Storm Drain manhole bottoms shall be constructed as shown on the Standard Drawings.

The top of the manhole base section shall be keyed to receive the tongue end of the riser section. The key shall be formed in the freshly poured concrete by using a template manufactured to the dimensions of the riser section. If the riser is cast-in-place monolithically with the base section by using a slip form or other means, the key may be omitted between the base and riser. If the base and riser sections are not poured monolithically, but separately, a key shall be provided in the base section. In either case, a key will be required in the top of the riser section to receive the tongue end of the tapered cone. Cast-in-place concrete manhole bases shall be allowed to cure for a minimum of 24 hours prior to installing manhole barrels. If the Contractor desires to set barrels sooner than 24 hours, the Contractor shall submit an appropriate mix design to the Engineer for approval prior to construction.

All joints in the interior and on the exterior of the manhole shall be mortared and troweled smooth as shown on the Standard Drawings. All excess mortar and any other debris shall be removed from the manhole.

In Sanitary Sewer manholes changes in direction of flow shall be made with a smooth curve of as large a radius as the size of the manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly.

Stub-outs shall be installed in manholes at the locations and sizes shown on the Plans. All stub-outs shall be sealed with a plug of a type approved by the manufacturer of the pipe and shall be capable of forming a watertight seal. Seal shall be capable of remaining water tight when subjected to hydrostatic pressure resulting from submerged pipeline situations. For concrete pipes with an inner diameter of 48 inches or less where a pre-manufactured plug is not available the plug may be installed in accordance with the City Pipe End Plug Standard Drawing. End plugs for pipes with an inner diameter larger than 48 inches shall be designed by the Engineer of Record and approved by the City Engineer.

All manholes shall be completed to finish grade with concrete collar and paving patches (where indicated) as shown on the Standard Drawings and as herein specified. In undeveloped areas where no street or alley surfacing is to be done in conjunction with or immediately after utility installation, the manhole cover shall be finished off to a level 1 inch above ground elevation and shall be provided with 12 inches of grade rings. In existing street areas where surfacing exists and no new street re-grading is contemplated in conjunction with or immediately after utility installation, the manhole cover shall be brought to existing street grade and finished off. In areas where street or alley surfacing is to be done in conjunction with or immediately after utility installation, such as new subdivisions, or in existing street/alley areas manholes shall initially terminate with the top of the cone 6 inches below subgrade and shall be brought to street or alley surface with grade adjustment rings and completed after street paving/trench resurfacing is accomplished. Unless specifically otherwise indicated in the Contract Specifications, it will be the responsibility of the Contractor to install the manhole covers to finish grade as specified and as shown on the Plans and Standard Drawings.

The Contractor should be aware that connections to existing sewers will be "wet" and the Contractor shall make whatever arrangements are necessary to complete the manhole connections under the "wet" conditions.

Where necessary, mounds or dikes shall be placed around the perimeter of manhole covers to prevent rainwater or other inflow of water from entering the manholes. No steps shall be installed in manholes unless otherwise noted on the Plans or Specifications.

29-8 Drainage Inlets

29-8.1 General

Drainage inlets shall be cast-in-place concrete as shown on the Plans and Standard Drawings.

29-8.2 Portland Cement Concrete

Portland cement concrete shall conform to the requirements of Section 50 of these Specifications. Portland cement shall be Type II low alkali sulfate resistant conforming to the provisions in ASTM C150. Slump shall not exceed 3 inches. Concrete shall be Class 2 having a minimum 28-day compressive strength of 3000 psi. All concrete shall be ready-mixed and delivered by a supplier acceptable to the City.

29-8.3 Reinforcing Steel

Reinforcing steel, if required, shall conform to ASTM A615, A616, A617, or A706, Grade 40 or Grade 60 and of the applicable size as indicated on the Plans and Standard Drawings.

29-9 Backfill, Compaction, and Surface Restoration

Backfilling, compacting and restoration of surfaces of trenches and excavations for sewer and storm drain facilities shall conform to the requirements of Section 19-3, "Trench and Structure Excavation Backfill, Compaction, and Surface Restoration."

29-10 Existing Utilities

Prior to construction it shall be the responsibility of the Contractor to expose all existing pipelines/utilities or other underground obstructions that have the potential to conflict with gravity pipelines and structures being constructed with the project and verify that there are no grade conflicts or other conflicts. Failure to do so relieves the City from further responsibility of said conflict. Any additional costs incurred as a result of the Contractor's failure to comply with this requirement shall be borne by the Contractor and considered included in the contract unit price.

Utility company service laterals are not shown on project plans. Contractor should allow for gas, water, sewer, telephone, and cable TV services for each lot shown. Utility companies will locate services and Contractor shall protect all services and facilities from injury. In case of damage to existing utilities, they shall be restored by the Contractor or by utility company personnel to the same type and quality of improvement without additional compensation.

Whenever underground conduit is constructed through, under, or across lawns, shrubbery, gardens, or fences, the Contractor shall remove such improvements before excavating, give them proper care and attention, and replace them in their original location upon completion of the backfill.

All curbs, walks, gutters, curb drains and any improvements broken during construction shall be reconstructed by the Contractor, using new material with the same dimensions as the original work, at the Contractor's expense unless otherwise provided in the Specifications. In addition, curb, gutter and walk shall be removed and replaced to a smooth edge or to the next joint or scoring line beyond the actual damaged or broken sections. All work shall be new and shall match as nearly as possible the appearance of the original improvements.

29-11 Pipeline and Structure Acceptance Tests (Sanitary and Storm)

The required acceptance tests are dependent on pipe material type as specified in the following paragraphs. This section describes the acceptance test requirements for mandrel deflection testing, exfiltration testing, low pressure air testing, and video inspection. All tests shall be performed under the supervision of the Inspector or Engineer and utilizing the procedures listed in this section. Test shall not

be made until the section of pipe to be tested, including house branches, have been cleaned, completely backfilled and the trenches compacted as specified in these Specifications. For larger pipes a physical inspection of the pipe may also be made. In such case, the Contractor shall furnish adequate blowers and ventilation equipment to allow passage of personnel through the pipe.

PVC Pipes

PVC pipe shall be subject to mandrel deflection testing, low pressure air testing, and video inspection in accordance with the testing requirements of this section.

Cast in Place and Precast Reinforced Concrete Pipe & Vitrified Clay Pipe

Precast Concrete Pipe, Cast in Place Concrete Pipe and Structures, Storm Drain Manholes and structures, and Vitrified Clay Pipe shall be subject to exfiltration testing and video inspection in accordance with the testing requirements listed in this section. Exfiltration testing is not required for normal City Standard Sewer manholes unless required in the Special Provisions.

29-11.1 Mandrel Deflection Test

Deflection testing shall be provided by the Contractor for all PVC pipe installations. The Contractor shall demonstrate that the maximum pipe deflection does not exceed five percent (5%) of the diameter of the pipe installed by pulling a properly sized solid ball or mandrel or a rigid set of discs, as approved by the Engineer, through the pipe. Where deflection of the pipe exceeds the allowable, the Contractor shall, at his own expense, make suitable repairs to the line before it is offered for retesting and acceptance. All repairs shall be made to the satisfaction of the Engineer.

29-11.2 Exfiltration Test

All precast concrete pipe and manholes and cast-in-place concrete pipe and manholes shall be subject to Exfiltration Acceptance Testing in accordance with ASTM C969, latest edition, as implemented by the City of Visalia Community Development Department. The Contractor may contact the Community Development Department at (559) 713-4414 for further details concerning test procedures and requirements.

29-11.3 Air Test

Air testing shall be provided by the Contractor for all PVC pipe installations without the addition of seals to the pipe interior. The application of mortar, epoxy, caulking compounds, or other material to the pipe will be prohibited unless authorized by the Engineer. Failure to meet the air test will require the Contractor to replace sections as required. Any broken pipe, separation of joints, or any pipe not laid true to line and grade, shall be replaced. All test expenses are to be borne by the Contractor.

Plugs to be used in the test shall be the pneumatic type equipped with pressure gauges for measuring air pressure in the pipe to be tested. The pressure gauges shall be calibrated in one-half of one pound per square inch (½ psi) increments and connected to the plug in such a way that when the plug is placed in the installed line, the gauge can be located outside of the manhole.

All plugs shall be seal tested before being used in the actual test installation. The seal test shall be conducted by placing in both ends of a pipe laying on the ground, the plugs to be tested. The plugs shall then be inflated to twenty-five pounds per square inch gauge (25 psig). The sealed pipe shall then be pressurized to five pounds per square inch gauge (5 psig). The plugs shall not move when subjected to this pressure.

The length of line tested at one time shall be limited to the length between adjacent manholes.

Air test procedure shall be as follows: Pressure the test section to three and one-half pounds per square inch (3½ psi) and hold above three pounds per square inch (3 psi) for not less than five (5) minutes. Add air if necessary to keep pressure above three pounds per square inch (3 psi). At the end of this five (5) minute saturation period, note the pressure (must be 3.0 psi min.) and begin the timed period. If the pressure drops one-half of one pound per square inch (½ psi) in less than the time given in the following table, then the section of pipe shall not have passed the test.

LINE SIZE	MINIMUM TIME (SECONDS)
4"	122
6"	184
8"	245
10"	306
12"	367
15"	460

For larger diameter pipe use the following formula:

Minimum Time (seconds) = 370 multiplied by pipe diameter (feet)

If the test is not passed, the leak shall be found and repaired to the satisfaction of the Engineer and the length of the repaired line retested.

The pressure gauge used shall be supplied by the Contractor, shall have minimum divisions of one tenth of one pound per square inch (0.10 psi) and shall have an accuracy of four hundredths of one pound per square inch (0.04 psi). Accuracy and calibration of the gauge shall be certified by a reliable testing firm at six (6) month intervals or when requested by the Engineer.

A physical inspection of the pipe may also be made. In such case, the Contractor shall furnish adequate blowers and ventilation equipment to allow passage of personnel through the pipe. The Contractor shall promptly repair all defects in workmanship noted in the inspections.

29-11.4 Video Inspection

The contractor shall furnish video inspection of all newly installed storm drain and sanitary sewer mains. The video inspection shall be made after required leakage and deflection tests have been completed and before permanent trench resurfacing. Prior to performance of the camera inspection, the Contractor shall flush the lines with water to provide indication of high or low spots in the flow line grade. The inspection shall be recorded in true color in DVD format. The camera resolution shall be of a quality that will allow pipe joints to be inspected, imperfections in the pipe to be noted and any sag to be detected. The camera equipment shall also provide on screen footage, date, location, and time indication.

A written log shall accompany the recorded inspection. The following information shall be included:

1. Date
2. Tape Number
3. Location and Stationing references from the Plans
4. Pipe Material and Size
5. Name of Equipment Operator
6. Name of Firm Performing the Inspection

7. All deficiencies in the pipe and installation shall be noted and their location referenced to their on-screen footage readout.

The testing company shall provide a map of the tested pipe. Information provided shall clearly correlate between pipeline plans and the recorded video inspection. Lateral lines shall be documented by stationing from centerline of manholes. For Sewer pipes with an inner diameter of 36 inches and larger and for Storm Drain pipes with an inner diameter of 48 inches and larger all pipe joints shall be video recorded in detail to verify that no damage is present, that gaskets are not visibly compressed or jammed in the joint, and that any gaps that exist in the joints meet the pipe manufacturer's requirements.

Within 24 hours of the completion of the video test, **2 hard copies** of the test log and DVD's shall be delivered to the Engineer. The video test and log shall become the property of the City of Visalia.

The City shall be the sole judge as to the acceptability of construction revealed by the video inspection. Any broken, damaged, or deficient pipe, any separation or offset of joints, any pipe exceeding the tolerances for line, grade, or deflection, and any infiltration points shall be replaced or repaired at the Contractor's expense. The repair will then be re-inspected at the Contractor's expense until the repair is satisfactory.

29-12 Alignment Changes (Separation Criteria)

All non-potable water mains, which include sanitary sewers, sewer force mains, recycled water mains, storm drains, and potable water mains must meet the separation standards of the "California Waterworks Standards", contained in Section 64572, Title 22, of the California Administrative Code, or shall be installed in accordance with alternate construction criteria as specified therein. Included by reference is a document titled "Guidance Memo No. 2003-02: Guidance Criteria for the Separation of Water Mains and Non-Potable Pipelines" published by the California Department of Health implementing said Section 64572. This document sets forth minimum spacing requirements between drinking water pipelines and sewer and other non-potable water pipelines, and has been used to set the location of the sewer and storm mains. In the event that field conditions require a change in the planned alignment (horizontal or vertical) of the sanitary sewer or storm sewers, under no circumstances shall a change be made without obtaining the express and written approval of both the City Inspector and the Engineer. Any change so authorized must comply with the Guidance Memo.

29-13 Measurement

Measurement for sanitary sewer and storm drain main installation and service lateral installation shall be by the lineal foot of pipe installed and remaining in place after the project is completed, and shall be the actual horizontal length installed, measured through wye fittings. Wyes will not be measured separately when constructed with a lateral.

Where wyes are to be installed for future lateral connections, measurement for wye fittings shall be per each wye fitting installed.

Measurement for manholes shall be per each manhole installed.

Measurement for drainage inlets shall be per each drain inlet installed.

29-14 Payment

The unit price bid per lineal foot for Sanitary Sewer Mains and Storm Drain Mains shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents,

and as directed by the Engineer. This shall include, but not be limited to, furnishing and installing the pipe, sawcutting, trenching, shoring and bracing (where there is no Worker Protection bid item), backfilling, compacting, plugging and marking, connecting to existing manholes or pipes, and acceptance testing.

The unit price bid per lineal foot for Storm Drain laterals and Sewer Service laterals shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents, and as directed by the Engineer. This shall include, but not be limited to, furnishing and installing the wye fitting, pipe, trenching, sawcutting, shoring and bracing (where there is no Worker Protection bid item), backfilling, compacting, plugging and marking, connecting to existing manholes or pipes, and acceptance testing.

The unit price bid per each for wye fittings, where wye fittings only (no lateral) are to be installed, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents and as directed by the Engineer, in excess of the cost of installing main line pipe. This shall include, but not be limited to, furnishing and installing the wye fitting and plug, trenching, sawcutting, shoring and bracing (where there is no Worker Protection bid item), backfilling, compacting, and acceptance testing.

When the contract does not include a pay item for wye fittings as above specified, and unless otherwise provided in the Contract Specifications, full compensation for wye fittings shown on the plans shall be considered as included in the price bid for the Sanitary Sewer Main item of work and no separate payment will be made therefor.

The unit price bid per each for Sewer Manholes and Storm Drain Manholes shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, and as directed by the Engineer. This shall include, but not be limited to, furnishing and installing the manhole and pipe stub-outs, shoring and bracing (where there is no Worker Protection bid item), excavation, backfill and compaction, sawcutting, returning and adjusting manhole lids and frames to final grade following street or alley construction or reconstruction, temporary and final trench resurfacing, and connections to all pipes, wet or otherwise.

The unit price bid per each for Drainage Inlets shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Specifications, and as directed by the Engineer. This shall include, but not be limited to, furnishing and installing the inlet and pipe stub-outs, shoring and bracing (where there is no Worker Protection bid item), sawcutting, excavation, backfill and compaction, returning, removal and replacement of sidewalks, pavement section, and curb and gutter, and connections to all pipes, wet or otherwise.

SECTION 30 (RESERVED)

SECTION 31 (RESERVED)

SECTION 32 (RESERVED)

SECTION 33 SANITARY SEWER FORCE MAINS (RESERVED)

SECTION 34 BORING AND JACKING PIPE

34-1 General

Description of Work:

This work shall consist of furnishing, boring, and jacking into place at the locations and type of pipe shown on the Plans or specified in the Contract Specifications, and as directed by the Engineer. This section is meant for use with gravity pipelines. See the Plans and Contract Documents for additional requirements related to pressure pipelines.

Reinforced concrete jacking pipe with rubber gasket joints, as a carrier pipe as specified in this Section 34, may be jacked into place directly without a jacked steel casing. All other carrier pipe must be installed within a jacked steel casing.

Job Conditions:

A. Protection of Existing Underground Utilities:

1. The locations of existing utilities are shown in the approved Construction Drawings based upon information and data supplied by the City or by the Owner of the utility. The utilities are shown on the approved Construction Plans for information only and are not guaranteed to be either complete or accurate. It is the Contractor's responsibility to contact all utilities and USA to locate utilities prior to construction. Utilities shall be located by hand digging or potholing prior to construction. Contractor shall be responsible for verifying that no conflicts exist between existing utilities and proposed improvements.

2. Any damaged caused to existing utilities shall be reported to the appropriate utility and repaired in accordance with the utility's standards.

3. The cost to repair/replace damaged utilities shall be borne by the Contractor.

4. If an interruption of utility service results from accidental damage, the Contractor shall take immediate steps as necessary to notify the utility and restore service. Contractor's personnel shall not leave the site until the interruption has been restored.

B. Work Within Railroad or Utility Right-of-Way:

When the Contractor is performing work within the right of way of other jurisdictions such as railroads or utilities, such work shall comply with applicable permits or regulations of such jurisdictions. The Contractor will be responsible for filling casing pipes with sand or a cement-sand slurry as directed by the jurisdiction having authority over the installation.

34-2 Materials

34-2.1 Steel Casing Pipe

Steel casing pipe shall be of the outside diameter (OD) and minimum wall thickness not less than that shown on the Plans and shall be butt welded of sheets conforming to ASTM A36, ASTM A139 Grade B (Tolerance, Yield Strength, and tensile strength with no hydro test), ASTM A53 Grade B, or ASTM A252 Grade 1. The minimum yield strength of all casings shall be thirty-five thousand pounds per square inch (35,000 psi). The Engineer of Record will be responsible for performing design calculations to determine the appropriate yield strength and wall thickness for each situation. All plans shall denote the casing strength and dimensions. The casing diameter shall be sized so that at least 3-inches of clearance is provided between the inside of the casings and outside of the carrier pipes belly, completely around. If the Contractor's operations require a greater wall thickness for successful installation of the steel casing

pipe to line and grade without damage, the Contractor shall provide steel casing pipe of such greater wall thickness at no additional cost to the City.

Steel casing pipe shall be of the size and class (including strength designation) shown on the Plans or specified in the Contract Specifications, except that the class of pipe designated has been determined for vertical loads only. Additional facilities, reinforcement, or strength of pipe required to withstand jacking pressure shall be determined and furnished by the Contractor at his expense.

All field joints also shall be butt welded full circumference or by other means approved by the Engineer. Joints to be field welded shall be shop cut to ensure a true 90° to the longitudinal axis of the pipe. It shall be the Contractor's responsibility to provide joints that are capable of resisting the jacking stresses without failure.

34-2.2 Casing Spacers

Casing spacers are required to be used for all installations. PVC casing spacers shall be attached to the conduits with stainless steel straps to center the pipe in the casing. The spacers shall prevent appreciable movement of the conduit up or down or sideways within the casing. Spacers shall be placed every four feet (4') on center throughout the steel casing.

Redwood Skids may be used instead of PVC spacers. Skids shall be comparable quality and functionality, spaced at four feet (4') on center.

Casing spacer materials shall also conform to the following requirements:

A. Bands shall be 304 stainless steel, 8 inches wide for carrier pipes up to 24 inches in diameter, and 12 inches wide for larger carrier pipes. Bands shall be two segment, 14-gauge bands for carrier pipes less than 42 inches in diameter, and shall be three or more segment, 12-gauge bands for larger carrier pipes. Bands shall be fitted with a flexible PVC liner on the inner surface of the band. The PVC liner shall have a thickness of 0.09 inch, a hardness of 85-90 (ASTM D2240, Durometer "A"), and a dielectric strength of not less than 58,000 volts (ASTM D149).

B. The configuration of the casing spacers shall be as shown on the plan. A maximum of 1-inch gap shall exist between the top of skid and inside of casing.

The casing spacer manufacturer shall have implemented a quality management system, and shall hold a current certificate of registration, issued by a certifying organization acceptable to the Engineer that is applicable to the manufacturing of casing spacers. A copy of the certificate of registration shall be submitted to the Engineer.

34-2.3 Casing End Seals

Each end of the casing shall be plugged with brick and mortar end seals able to withstand backfill pressures during the annular space fill as approved by the Engineer.

34-2.4 Reinforced Concrete Jacking Pipe

Reinforced Concrete Jacking Pipe shall only be used for jacking where shown on the plans or specifically approved by the Engineer. Where reinforced concrete jacking pipe, as a carrier pipe, is specified to be jacked into place directly without a jacked steel casing, said reinforced concrete jacking pipe conforming to ASTM Specification C76, latest revision, shall be furnished. The reinforced concrete jacking pipe shall be constructed such that no bells protrude from the outside periphery of the pipe. Sleeves for joints on reinforced concrete jacking pipe shall be furnished and manufactured of galvanized steel, stainless steel,

or fiberglass, sufficient in strength to withstand all loads, and which will maintain a rubber-gasketed watertight joint.

34-3 Tunnel Safety Orders

Reference is made to the Tunnel Safety Orders of the California Department of Industrial Relations, and to any other applicable safety codes. The tunnel site (jacking location) will be classified as to gas hazard by the California Department of Industrial Relations for casing diameters 30 inches in outside diameter and larger. The classification document issued by the State will be included in the Contract Specifications. The Contractor shall comply with the Tunnel Safety Orders. The Contractor shall contact the California Department of Industrial Relations, Division of Occupational Safety and Health. Reference is made to Section 19-3.2, "Trench and Structure Excavation," of these Specifications for additional safety requirements.

34-4 Excavating Jacking and Receiving Pits

Before starting excavation, the Contractor shall submit drawings or details of jacking pit bracing, casing pipe, jacking equipment, skids or concrete support blocks, bracing to prevent pipe shifting or flotation, and all other equipment or methods to be used.

Excavation for jacking and receiving pits shall conform to the provisions in Section 8-15, Utility and Non-Street Facilities; Potholing," Section 19-3.2, "Trench and Structure Excavation," and to the following provisions.

Jacking and receiving pits shall not extend beyond vertical planes passing through the jacking and receiving pit limits shown on the Plans, and shall be sheathed, shored, sloped or braced in accordance with the Safety Regulations of the State of California, Department of Industrial Relations, Division of Industrial Safety.

The Contractor shall be responsible for furnishing safety fencing and chain link fencing to provide for public safety. Where boring pits are located within existing roadways, the Contractor shall be responsible for providing all traffic barricades and other traffic control devices to safely route traffic around the construction work.

34-5 Boring and Jacking

Unless otherwise specified, the methods and equipment used in jacking operations shall be optional with the Contractor, provided that the proposed method is approved by the Engineer. Such approval, however, shall in no way relieve the Contractor of the responsibility for making a satisfactory installation meeting the criteria set forth on the Plans or specified in the Contract Specifications, or these specifications. Only workers experienced in jacking operations shall be used in performing the work.

Steel casing pipe and carrier pipe shall be installed as shown on the Plans, in conformance with the Contract Specifications, these specifications, and as directed by the Engineer. Steel casing pipe shall be installed such that carrier pipe, when installed to the lines and grades shown on the Plans, will be approximately centered within its casing pipe.

Carrier pipe to be installed within steel casing shall be as indicated on the Plans and specified in the Contract Specifications. Casing spacers shall be installed within 2 feet of each end of the casing pipe, at each side of each carrier pipe joint, and at evenly spaced intermediate locations to provide a maximum distance between casing spacers of 4 feet on center. The carrier pipe shall be supported on skids during the installation of the pipe. The skids shall be installed in such a manner as to relieve the couplings from

all load and bearing. Casing spacers shall be installed in conformance with the manufacturer's recommendations and as specified in these specifications.

Excavation for the casing or concrete pipe not using a casing pipe shall be accomplished by boring. Sluicing or jetting with water will not be permitted. The Contractor may elect to utilize uninterrupted around-the-clock bore and jack operations to prevent "freezing" of the casing or carrier pipe, or to preclude instability at the heading of the bore and jack. The Contractor shall notify the City a minimum of fifteen (15) days prior to performing uninterrupted activities of its intention to do so. All uninterrupted activities must be approved by the Engineer. Full compensation for additional costs incurred as a result of such continuous operations, shall be considered as included in the Contract unit price paid per linear foot for the Steel Casing Pipe or Jacked Reinforced RCP item involved, and no additional compensation will be allowed therefor. In some situations the City may require, such around-the-clock bore and jack operations. The Contractor is directed to the Special Provisions to verify if around-the-clock procedures are required for each project. If the subject is not addressed in the Special Provisions then around-the-clock procedures are not specifically required for the project.

The excavated hole being bored shall not be more than 1 inch in diameter greater than the outside limits of the casing (or reinforced concrete pipe jacked without casing pipe). If the nature of the material is such that caving will likely occur and which may result in a greater space than above specified, a metal shield or jacking head shall be installed which extends a minimum of 18 inches ahead of the jacked casing or pipe. The metal shield shall cover a minimum of the upper 1/2 of the periphery of the jacked casing or pipe. Excavation shall not proceed beyond the shield.

Where ground conditions at the face of the jacking pit are such that sloughing or caving of ground is likely to occur at the face of the excavation upon commencement thereof, the face of the pit shall be made stable so that an excessive void is not carried with the face of the excavation for the length of the casing or pipe. This may be accomplished by solid sheathing at the portal of the jack, or excavating and backfilling the face of the pit with cohesive material.

The Contractor shall diligently monitor soil and groundwater conditions encountered during casing and/or carrier pipe installation, and shall provide any and all necessary groundwater seepage control and dewatering.

Cavities or voids outside the limits specified above, regardless of cause, shall be backfilled with sand, soil, cement, or cement mortar as provided herein or as directed by the Engineer. All casing pipe 30 inches in diameter or larger shall have grout plugs installed suitable for attachment to grout pumping equipment. All reinforced concrete pipe 30 inches in diameter or larger, shall be furnished with preinstalled fittings suitable for attachment to grout pumping equipment. Such grout connections, unless otherwise indicated on the Plans or approved otherwise by the Engineer, shall be placed at 30°, 120°, 240° and 330°, measured clockwise, from vertical around the circumference of the casing or pipe, and at intervals in each row, along the pipe, of not greater than 10 feet. Alternate bottom holes shall be staggered, and alternate top holes shall be staggered, so that one hole will occur at the top every 5 feet and one hole will occur at the bottom every 5 feet.

Immediately after completion of the jacking or boring operation, if in the opinion of the Engineer, excessive voids have been created outside the jacked pipe, lean grout shall be injected through the grout connections in such a manner as to completely fill all voids outside the casing pipe or reinforced concrete pipe resulting from the jacking or boring operation. The lean grout shall consist of one part Portland cement to not more than 4 parts sand by volume, placed at low pressure. Grout pressure is to be controlled so as to avoid deformation of casing pipe and/or avoid movement of the surrounding soil. Sand for grout to be placed outside the casing shall be of such fineness that 100 percent will pass a No. 8

sieve and not less than 35 percent will pass a No. 50 sieve. After completion of grouting, the grout connections shall be closed with cast-iron threaded plugs.

In general, excavated material shall be removed from the casing or reinforced concrete pipe as jacking progresses and no accumulation of excavated material within the casing will be permitted. Should appreciable loss of ground occur in installations where the face of the excavation is accessible, the voids shall be backpacked promptly to the extent practicable with an approved soil cement.

At the successful completion of the installation, casing end seals shall be installed in accordance with Plans and Contract Specifications. Care shall be taken during the placement of these seals that the pipe is not damaged, deflected or displaced.

After the casing and carrier pipe have been installed and inspected for acceptance, dry sand shall then be blown in to fill the annular space between the carrier pipe and casing pipe. All sand must be clean and dry. After the sand has been blown in and inspected the end seals shall be completely sealed.

Special Note: Where boring is located under a waterway including, but not limited to, irrigation ditches, culverts, or creeks the bore shall be completed during a time period when no water is flowing unless approved otherwise by the Engineer. If approved by the Engineer, the Contractor assumes all liability and will be responsible for all damages or costs incurred associated with boring under an active waterway.

34-6 Grade Tolerance

The Contractor's attention is called to the fact that extreme care will be required in placing the casing pipe so as to permit the construction of the carrier pipe to the lines and grades shown on the Plans. It shall be the Contractor's responsibility for selecting a size of casing, at or above the minimum specified, in order that the jacking may be done with a sufficient degree of accuracy to permit installation of the carrier pipe to the grade as shown on the Plans within the tolerances set forth in these Specifications for the particular carrier pipe installed. Any and all increased costs resulting from the Contractor's use of steel casing pipe with greater diameter or thickness than the minimum specified shall be borne solely by the Contractor. Variations from theoretical alignment and grade of the RCP and steel casing pipe at the time of completion of jacking shall be as follows:

Steel Casing Pipe jacked into place shall not vary from theoretical alignment and grade at the time of completion of jacking by more than 3 inches in 100 feet for storm drain, and 1 inch in 100 feet for sanitary sewer carrier pipe, unless approved otherwise by the Engineer.

Reinforced concrete jacking pipe jacked into place without steel casing shall not vary from theoretical alignment and grade at the time of completion of jacking by more than 3 inches in 100 feet for storm drain, and 1 inch in 100 feet for sanitary sewer carrier pipe, unless approved otherwise by the Engineer.

34-7 Frac-Out Contingency Plan

Unless otherwise specified in the Contract Specifications, a Frac-Out Contingency Plan will be required. Such Plan shall be prepared in accordance with the following provisions and submitted to the Engineer.
For jack-and-bore tunneling activities that use drilling lubricants, the Contractor shall prepare and implement a contingency plan that is intended to minimize the potential for a release of drilling lubricant (frac-out) associated with tunneling activities; provide for the timely detection of frac-outs; and ensure an organized, timely, and "minimum-impact" response in the event of a frac-out and release of drilling lubricant. The contingency plan shall include, at a minimum, the following measures:

A. A full-time monitor shall attend all drilling to look for observable frac-out conditions or lowered pressure readings on drilling equipment.

B. If a frac-out is identified, all work shall stop, including the recycling of drilling lubricant. In the event of a frac-out into water, the pressure of water above the tunnel may keep excess mud from escaping through the fracture. The location and extent of the frac-out shall be determined, and the frac-out shall be monitored for 4 hours to determine whether the drilling lubricant congeals (bentonite will usually harden, effectively sealing the frac-out location).

C. If the drilling lubricant congeals, no other actions shall be taken that would potentially suspend sediments in the water column.

D. Surface releases of bentonite shall be allowed to harden and then shall be removed.

E. The contingency plan shall identify additional measures to be taken to contain or remove the drilling lubricant if it does not congeal.

34-8 Backfill, Compaction, Restoration of Surfaces

Jacking and receiving pits shall be backfilled and compacted, and the surface restored, in accordance with Section 19-3, "Trench and Structure Excavation, Backfill, Compaction, and Surface Restoration."

34-9 Measurement

Measurement for Steel Casing Pipe jacked into place shall be by the lineal foot of casing pipe jacked into place as shown on the Plans or directed by the Engineer.

Measurement for Reinforced Concrete Jacking Pipe with rubber gasket joints (without steel casing), jacked into place, shall be by the lineal foot of pipe jacked into place as shown on the Plans or directed by the Engineer.

Where carrier pipe is indicated on the Plans to be placed within a jacked casing pipe, carrier pipe will be measured by the lineal foot of pipe installed.

34-10 Payment

The unit price bid per lineal foot for Steel Casing Pipe, jacked into place, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as specified in the Specifications, Contract Documents and as directed by the Engineer. This shall include excavating, backfilling and compacting the jacking and receiving pits, boring and tunneling, furnishing and installing the casing complete with grout fittings, furnishing and installing metal shields, furnishing and installing skids and tie downs, spacers, bands, grouting and backfill of voids, sealing ends of casing, installing blown in sand, temporary and final trench resurfacing, and all other incidental work over and above that associated with the normal work of furnishing and installing the carrier pipe in a trench situation.

The unit price bid per lineal foot for Reinforced Concrete Jacking Pipe with rubber gasket joints, jacked into place, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, and as directed by the Engineer. This shall include, but not be limited to, excavating, backfilling and compacting the jacking and receiving pits, boring and tunneling, furnishing and installing the pipe complete with grout fittings, furnishing and installing metal shields, grouting and backfill of voids, temporary and final trench resurfacing, and all other incidental work over and above that associated with the normal work of furnishing and installing the carrier pipe in a trench situation.

Carrier pipe to be placed in casing pipe as shown on the Plans will be paid for under the unit price bid per lineal foot for Steel Casing Pipe.

SECTION 35 (RESERVED)

SECTION 36 (RESERVED)

SECTION 37 MISCELLANEOUS IMPROVEMENTS

37-1 General

This work shall consist of constructing or reconstruction of miscellaneous street improvements, including relocation of mail boxes, signs, fences or walls, witnessing and resetting survey monuments, lowering and adjusting existing facilities to finish grade, all as shown on the Plans and applicable Standard Drawings, as specified in the Specifications, and as directed by the Engineer.

37-2 Survey Monuments

The Contractor shall comply with the provisions in Section 5-14, "Construction Surveying/Staking." Survey monuments installed to replace existing known monuments to be damaged or destroyed by the work shall be furnished and installed at the locations shown on the Plans and as directed by the Engineer. The survey monument shall be furnished and constructed in conformance with the applicable Standard Drawings. For City Public projects the Contractor shall contact the City Land Surveyor 3 working days prior to disturbing any monuments. The City surveyor will provide the location for the monument to be reset and it shall be the responsibility of the Contractor to furnish all materials and re-build the monument at his own expense. For Non-Public projects constructing improvements in the City right of way, the Contractor shall retain a licensed land surveyor to survey and reset said monument and furnish and install all appurtenances. A record of survey shall be filed with the Tulare County Recorder at the expense of the Contractor.

All known monuments, corners, or other survey markers to be disturbed by the work shall be tied by temporary survey markers in conformance with professional standards prior to beginning construction. Temporary ties and resetting of monuments, corners, or other markers shall be performed by a licensed land surveyor obtained by the Contractor for Non-Public projects prior to beginning construction. Monuments, corners, or other markers shall be re-set to their original precise location and elevation, and marked as required. Known monuments, corners, or survey markers not to be disturbed by the work shall be protected from damage. Any known monuments, corners or markers damaged or destroyed due to the Contractor's failure to protect them shall be replaced in conformance with the applicable Standard Drawing and this Section 37-2 at the Contractor's expense.

37-3 Adjusting Existing Facilities to Finish Grade

Existing facilities shall include manhole frames and covers, valve boxes, pull boxes, vaults, and any other similar existing facilities that must fit or match the final finished surface of the improvement in which they are located. The facilities shall be adjusted to grade within five (5) working days following the completion of the surfacing in which they are located.

Sewer and storm drain manhole frames and covers shall be temporarily lowered below the grading plane and triangulated or monumented to provide quick location throughout the construction process. The manhole frames and covers, and valve boxes and covers shall then be raised to finish grade, concrete collars poured and asphalt-concrete patch placed, in accordance with the Standard Drawings and as directed by the Engineer.

Other existing facilities shall be adjusted to finish grade in accordance with the applicable utility or facility authority involved, and as directed by the Engineer. Where the utility or facility authority involved desires to do the work with their own forces and/or materials, the Contractor shall pay all the costs associated therewith.

37-4 Relocation of Walls, Fences, and Mailboxes

The Contractor shall be responsible for relocating/re-building all walls, fences, and mailboxes disturbed or noted for relocation. All walls, fences, and mailboxes shall be re-built as shown on the Plans and City Standard Drawings.

During construction operations, the mailboxes shall be moved as necessary to clear the way for the Contractor's operations, but at all times mailboxes shall be accessible for rural delivery.

When construction is complete, the mailboxes shall be placed in final position and the pedestals shall be buried the proper depth as directed by the Engineer. Mailboxes shall not extend into the sidewalk area.

37-5 Measurement and Payment

Unless otherwise specified in the Contract Specifications, Miscellaneous Street Improvements shall be measured and paid for on a lump sum basis. Payment shall include full compensation for all labor, equipment and materials required to complete all the work described herein, as shown on the Plans, Standard Drawings, and as specified in the Contract Specifications.

If the Contract does not include a pay item for Miscellaneous Street Improvements, the cost thereof shall be included in the prices bid for the other various items of work and no separate payment will be made therefor.

SECTION 38 CONCRETE CURBS, SIDEWALKS, SURFACE IMPROVEMENTS

38-1 General

This work shall consist of constructing concrete curbs, gutters, curb and gutters, curb depressions, sidewalks, curb (accessibility) ramps, driveway approaches, alley approaches, valley gutters, fence mowstrips and median caps, and other concrete surface improvements of the form and dimensions shown on the Plans or Standard Drawings, as set forth in the Specifications, Contract Documents and as directed by the Engineer. Curb (accessibility) ramps shall also comply with the most current Federal and State Accessibility Standards, whichever is more restrictive.

All concrete improvements as above defined shall be constructed by using fixed forms, except that curbs, curb and gutters, and alley gutters may be constructed by using an extrusion or slip-form machine.

38-2 Portland Cement Concrete

Concrete for curbs, sidewalks, and other surface improvements shall conform to the requirements of Section 50, "Portland Cement Concrete," of these Specifications, and shall be Class 2 or Class 3 as noted on the Plans and Standard Drawings or as specified in these Specifications.

For extruded or slip-formed concrete improvements, the maximum size of aggregate used shall be at the option of the Contractor, but in no case shall the maximum size be larger than 1 inch or smaller than 3/8 inch. For extruded or slip-formed concrete, the cement content shall be as specified for Class 2 concrete.

38-3 Reinforcement

Where the use of steel reinforcement is indicated on the Plans or Standard Drawings, it shall be furnished and installed in accordance with Section 52, "Reinforcement," of the State Standard Specifications, except that Sections 52-1.04, "Payment" of the State Standard Specifications are hereby deleted. All payment for reinforcement complete in place shall be considered included in the price for the various bid items of work to which the work relates; no additional payment will be made therefor.

38-4 Subgrade Preparation

Subgrade Preparation shall conform to the requirements of Section 19-2.7, "Subgrade Preparation, Compaction," and shall be constructed true to grade and cross-section, as shown on the Plans or directed by the Engineer. It shall be thoroughly watered and rolled or hand tamped to obtain a relative compaction of no less than 95 percent under curbs, gutters, curb and gutters, driveway approaches, valley gutters and curb ramps, and a relative compaction of no less than 90 percent under sidewalks, mowstrips and concrete median caps prior to placing the concrete. All soft or spongy material shall be removed to a depth of not less than 18 inches or to stable soil below subgrade elevation for curbs, gutters, curb and gutters, valley gutters, driveways and 6 inches below for caps, mowstrips, sidewalks and curb ramps, and the resulting space filled with earth, sand or gravel of a quality that when moistened and compacted will form a stable foundation.

The subgrade and forms shall be wet immediately in advance of placing concrete.

38-5 Construction

Concrete shall not be placed on frozen or ice-coated ground or subgrade or on ice-coated forms, reinforcing steel, structural steel, conduits, precast members, or construction joints. Under rainy conditions, placing of concrete shall be stopped before the quantity of surface water is sufficient to damage surface mortar or cause a flow or wash of the concrete surface, unless the Contractor provides adequate protection against damage. All concrete that has been frozen, or damaged by other causes, as determined by the Engineer, shall be removed and replaced by the Contractor at the Contractor's expense.

Fixed form construction shall conform to Section 73-1.03C, "Fixed Forms," of the State Standard Specifications, and as set forth in this Section 38-5. Extruded or slip-formed construction shall conform to Section 73-1.03D, "Extruded or Slipform," of the State Standard Specifications, and as set forth in this Section 38-5. The extrusion machine shall go no faster than the curb and/or gutter or alley gutter can be finished using good workmanlike practices.

Construction Joints

Construction joints shall be as shown on the Plans and Standard Drawings, and as specified below for both fixed form and extruded or slip-formed construction, as follows:

A. Where concrete improvements such as curb and gutter, valley gutters, and sidewalk, are to be placed adjacent to existing asphalt pavement, the pavement shall be sawcut and removed 6 inches to 12 inches beyond the inside edge of the formwork. The edge of the existing asphalt pavement shall not be used as formwork.

B. Weakened plane joints shall be placed at 15 foot intervals or as shown on the Plans and Standard Drawings for the item of work to which the work relates, except that for mowstrips they shall be placed at each post location not having an expansion joint. Weakened plane joints shall be placed at 8 foot intervals for median curbs and landscape curbs. Where spacing is specified on the Plans and Standard Drawings that spacing shall govern over these requirements. Tighter joint spacing will be required in areas like curb ramps and drive approaches. Contractor shall verify with inspector prior to construction. Weakened plane joints shall be a minimum of one inch (1") in depth in sidewalks and ramps and shall be finished with a one-fourth of one inch (¼") maximum radius edger. Weakened joints in curbs, gutters and drive approaches shall be a minimum of one and one half inches (1½") in depth and shall be finished with a one-fourth of one inch (¼") maximum radius edger.

C. The above spacing for construction joints shall be required in lieu of the spacing indicated in Section 73, "Concrete Curbs and Sidewalks," of the State Standard Specifications.

D. Mowstrips may not be poured monolithically with sidewalks or other concrete improvements.

E. Score lines shall be one quarter of one inch (1/4") in depth and width.

F. In areas with existing joint patterns the Contractor and Inspector should collaborate and the inspector may approve an alternate joint pattern when necessary.

The City believes that the Plans and Specifications call out Construction Joint spacing that will prevent the appearance of shrinkage and temperature cracking or other cracking from appearing in locations other than the joints. However, it shall be the sole responsibility of the Contractor to appropriately place all joints to prevent the appearance of shrinkage and temperature cracking or other cracking. If the Contractor believes that a different joint spacing should be utilized, the Contractor shall present a revised joint plan to the Engineer for approval. If no revised joint plan is submitted, this will be the Contractor's verification that he is satisfied with the joint pattern shown on the Construction Documents. Any concrete with cracking in locations other than the joints that is determined to be unacceptable by the Engineer shall be removed and replaced by the Contractor at the Contractor's expense.

Any concrete improvements damaged by the Contractor during construction shall be replaced by the Contractor at the Contractor's expense. Any concrete improvements damaged or visibly disfigured by the public during construction including but not limited to footprints, markings, bike tracks, vehicles and other damage shall be replaced by the Contractor at the Contractor's expense.

The surface of sidewalks, curb ramps and driveway approaches shall be scored, stamped, or otherwise marked as shown on the Plans, Standard Drawings, Contract Specifications, or as directed by the Engineer, utilizing a scoring tool, which will leave the edges rounded. The construction of curb ramps shall include any special surfacing required to be affixed to the concrete surface including detectable warning surfaces.

Where steel dowels are set forth on the Plans or Standard Drawings to anchor proposed concrete curbs to existing pavement or other existing infrastructure, adhesives may not be substituted therefor.

38-6 Finish

Immediately upon stripping curb forms and prior to backfill, all rock pockets or honeycombs shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

Finish of concrete surface improvements shall be free from blemishes and shall be as follows:

A. Curbs - Trowel smooth and finish with a light broom.

B. Sidewalks and mowstrips – Finish with light broom.

C. Gutters, valley gutters and median caps -Finish with light broom.

D. Driveway approaches - Finish with a light broom.

E. Curb (accessibility) ramps - Finish with a heavy broom across the ramp slope or as indicated on the Standard Drawings.

F. Stamped Concrete – Shall be colored, sealed and constructed per the Specifications and Plans and as directed by the Engineer.

Broomed surfaces to be used by pedestrian traffic shall be broomed transverse to the line of traffic.

38-7 Tolerances

The top and face of finished curbs shall be true and straight and the top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. When a straightedge 10 feet long is laid on the top or face of the curb or on the surface or flow line of gutters, valley gutters, drive approaches or other concrete improvements the surface shall not vary more than 0.02 feet from the edge of the straightedge, except at designed grade changes or curves.

All improvements shall be constructed to the slopes and elevations shown on the plans.

Under No Circumstances shall any of the following requirements be violated regardless of tolerances listed in this section:

No sidewalk or curb ramp cross slope shall exceed 2.00 percent along the path of travel. No sidewalk slope shall exceed 5.00 percent in the direction of travel along the path of travel. No curb ramp shall have a slope in the direction of travel greater than 8.33 percent. All curb ramp landings shall have a slope of not greater than 2.00 percent in any direction. If concrete improvements violate any of these requirements or other ADA requirements in effect at the time of construction, the Contractor shall remove and correctly replace the concrete improvements to the proper grades and dimensions at his own expense.

38-8 Curing

All surface concrete improvements shall be cured by application of an approved curing compound in conformance with the requirements of Subsection 90-1.03B(3)B, "Curing Compound Method," of the State Standard Specifications and the Standard Drawings.

38-9 Backfilling

After removal of forms, the area adjacent to the newly constructed concrete improvement shall be cleaned of all surplus concrete and other debris and the area filled with clean earth suitable for planting (except in front of the gutter). Backfill shall be placed behind the curb prior to any excavation in the street area below the plane of the bottom of curb and gutter.

Where there is a planter strip between the curb and the sidewalk, the planter strip shall be filled to within 1 inch of the top of curb and sidewalk with clean earth suitable for planting where grass is to be placed. When the planter strip is to be filled with bark it shall be filled to within 2 inches of the top of curb and sidewalk with clean earth suitable for planting. The area of traffic divider (median) islands not to be capped with concrete shall be backfilled with clean earth suitable for planting to within 2 inches of a line extending between adjacent tops of curb.

38-10 Measurement

Unless otherwise specified in the Contract Specifications, concrete curb, concrete gutter, concrete vee gutter, alley gutter, concrete curb and gutter, and concrete mowstrip shall be measured by the lineal foot. Curb depressions and curb and gutters around curb ramps will be included in the measurement of length of concrete curb, or concrete curb and gutter, as the case may be.

Unless otherwise specified in the Contract Specifications, concrete sidewalks and curb ramps, concrete driveway approaches, concrete alley approaches, concrete valley gutters and concrete median caps shall be measured by the square foot. Measurement of concrete driveway approaches, concrete alley approaches, and curb ramps shall be made from the back of the curb to the back of the approach or sidewalk adjacent to said improvement. Measurement for curb ramps shall include the concrete from the beginning of the curb return to the end of the curb return where curb ramps are being constructed in accordance with the Standard Drawings or ramps are being constructed similar thereto.

38-11 Payment

Payment for Concrete Curb, Concrete Gutter, Concrete Curb and Gutter, Concrete Vee Gutter, and Concrete Mowstrip shall be at the unit price bid per lineal foot and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents, and as directed by the Engineer, including subgrade preparation.

Payment for Concrete Sidewalks and Curb Ramps, Concrete Driveway Approaches, Concrete Alley Approaches, Concrete Valley Gutters and Concrete Median Caps shall be at the unit price bid per square foot and shall include full compensation for furnishing all labor, materials, tools, equipment, special surfacing materials, detectable warning surfaces, and incidentals and for doing all the work involved therein as shown on the Plans, as set forth in the Specifications, the Contract Documents and as directed by the Engineer, including subgrade preparation.

Compensation for steel reinforcement required for drive approaches, concrete valley gutters or any other facilities requiring steel reinforcement shall be included in the cost for the facilities requiring said steel reinforcement. No additional compensation shall be made therefor.

SECTION 39 PERVIOUS CONCRETE PAVEMENT

39-1 General

SCOPE OF WORK: The Work to be completed under this Section includes the furnishing of all labor, materials and equipment necessary for construction of Pervious Concrete Pavement and Baserock including the aggregate baserock and the pervious concrete in conformance with the Plans and Specifications.

SPECIAL EQUIPMENT: Pervious concrete requires specific equipment for compacting, and jointing. Depending upon which placement method listed in section Placing and Finishing is selected, the specific tools listed below are required.

A. Placement by vibratory screed, laser screed, or hand screed

1. The surface shall be compacted to the final elevation by one of three methods.
    a. A minimum 10-inch diameter steel pipe that spans the width of the section placed and exerts a vertical pressure of at least 10 psi on the concrete surface shall be used to compact the concrete surface. Small, irregular areas may be compacted with smaller rollers that do not span edge to edge provided sufficient compaction is attained.
    b. A plate compactor having a minimum base area of 2 square feet and exerting a minimum vertical pressure of 10 psi on the concrete surface. Compaction may be accomplished by placing ¾" thick plywood over the screeded surface prior to application of the plate compactor.
    c. Single tube weighted roller.
    d. Sod rollers shall not be permitted for compaction of pervious concrete.

B. Jointing

1. When rolled joints are placed in pervious pavements, they shall be formed using a small roller to which a fin with a minimum depth of ¼ the thickness of the slab. The fin shall be welded to the circumference of the roller and finished with a smooth fillet or radius.
2. Joints may also be made by hand tooling or saw cutting to a depth of ¼ of the slab thickness.

C. Water fogger

1. Water fogging equipment shall emit a fine mist.
2. Equipment that produces large drops of water that wash cement paste off the aggregate shall not be used.

39-2 Quality Assurance:

The Pervious Concrete Subcontractor:

A. Shall submit:

1. Evidence of two successful pervious concrete pavement projects including: the project name and address, owner's name, contact information and size of each project.
2. Verification of current NRMCA Certification requirements described below:

B. Shall meet, at the time of bidding: one of the following criteria for the minimum certification for each placement crew and submit verification of NRMCA Pervious Concrete Certification with the bid.

(http://www.nrmca.org/Education/Certifications/Pervious_Contractor.htm)

1. The pervious concrete subcontractor shall employ no less than one (1) NRMCA Certified Pervious Concrete Craftsman who must be onsite, actively guiding and working with each placement crew during all pervious concrete placement.
2. The pervious concrete subcontractor shall employ no less than three (3) NRMCA Certified Pervious Concrete Installers who must be onsite, actively guiding and working with pervious concrete for projects.
3. The pervious concrete subcontractor shall employ no less than three (3) NRMCA Pervious Concrete technicians and one (1) Pervious Installer who shall be onsite, actively guiding and working with each placement crew during all pervious concrete placement.

SUBMITTALS:
Prior to commencement of the work the contractor shall submit the following:

A. Concrete materials:

   1. Proposed concrete mixture proportions including all material weights, volumes, density (unit weight), water cement ratio, and void content.
   2. Aggregate type, source and grading.
   3. Cement, fly ash and admixture manufacturer certifications

B. Qualifications: Evidence of qualifications listed under Quality Assurance

C. Project details: Specific plans, details, schedule, construction procedures and quality control plan.

D. Subcontractors: List all materials suppliers and subcontractors to be used on the project.

TEST PANELS:
Prior to construction, test panel(s) shall be placed and approved by the owner. The owner may waive this requirement based on contractor qualifications.

A. Test panel(s) shall be constructed in accordance with the plans and specifications. A minimum 200 sq. ft panel size shall be placed, jointed and cured using materials, equipment, and placing crew proposed for the project.

B. Test panel(s) cost and removal, if necessary, shall be included in the contract price for Pervious Concrete and Baserock.

C. Quality: Test panels shall have acceptable surface finish, joint details, thickness, porosity and curing procedures and shall comply with the acceptance criteria listed in the Quality Control section of this specification.

D. If test panels placed at the site are found to be deficient in thickness, density (unit weight) or percentage of voids, or of an unacceptable appearance, they shall be removed at the contractor's expense and taken to an approved landfill or recycling facility. If test panels are found to be satisfactory, they may be left in-place and included in the completed work.

39-3 Materials

Cement: Portland cement Type II or V conforming to ASTM C150 or Portland cement Type IP or IS conforming to ASTM C595.

SUPPLEMENTARY CEMENTITIOUS MATERIALS:

A. Class F Fly ash conforming to ASTM C618

B. Ground Iron Blast-Furnace Slag conforming to ASTM C989

CHEMICAL ADMIXTURES:

A. Air entraining agents shall comply with ASTM C260.

B. Chemical Admixtures shall comply with ASTM C494.

C. Hydration stabilizers are permitted to be used when it is necessary to increase concrete placement time to 90 minutes and improve finishing operations.

AGGREGATES:

A. Coarse aggregate shall comply with ASTM C33. Size 8 (3/8" to No. 16) or Size 89 (3/8 in. to No. 50) shall be used unless an alternate size is approved for use based on meeting the project requirements. The percentage of material passing the #4 sieve shall be no more than 10%. Fine aggregate complying with ASTM C33 shall not be used.

B. Larger aggregate sizes may increase porosity but can decrease workability. Avoid well graded aggregates as they may reduce porosity, and may not provide adequate void content.

WATER:
Water shall comply with ASTM C 1602.

MIXTURE PROPORTIONS:
The composition of the proposed concrete mixtures shall be submitted to the owner's representative for review and/or approval and shall comply with the following provisions unless an alternative composition is demonstrated to comply with the project requirements.

CEMENTITIOUS CONTENT:
Total cementitious content shall not be less than 630 lbs/cy, unless satisfactory performance with lower cementitious contents has been shown with the aggregates and cementitious material proposed for use.

SUPPLEMENTARY CEMENTITIOUS CONTENT: Fly ash: 15% maximum.

WATER / CEMENTITIOUS RATIO: Maximum 0.30 lb/lb.

AGGREGATE CONTENT:
The bulk volume of aggregate per cubic yard shall be equal to 24 cubic foot when calculated from the dry rodded density (unit weight) determined in accordance with ASTM C29 jigging procedure.

ADMIXTURES:
Admixtures shall be used in accordance with the manufacturer's instructions and recommendations.

39-4 Execution

FOUNDATION

A. SUBGRADE:

1. Material: The subgrade shall not be chemically treated .
2. Compaction: Compact sub-grade to a minimum 90% and a maximum 95%. Compaction shall be in accordance with ASTM D1557.
3. Moisture: The subgrade moisture content shall be 1% - 3% above optimum as determined by ASTM D1557.

B. AGGREGATE BASEROCK :

1. Material: Base material under the pervious concrete shall be 1" or ¾" maximum sized aggregate conforming to ASTM C 33, Size 5, 56, 57, 6 or 67 with a compacted void content of 30% to 40%.
2. Compaction: The aggregate base shall be compacted by proof rolling or plate compactor.

FORMWORK:

A. Form materials are permitted to be of wood or steel and shall be the depth of the pavement. Forms shall be of sufficient strength and stability to support mechanical equipment without deformation spreading, strike-off and compaction equipment. If final compaction of the concrete is with a non-hydraulic steel pipe or plate compactor, the forms shall have a removable spacer of ½" to ¾" thickness placed above the depth of pavement. The spacers shall be removed following placement and vibratory strike-off to allow surface compaction.

MIXING AND HAULING:

A. PRODUCTION: Pervious concrete shall be manufactured and delivered in accordance with ASTM C 94.

B. MIXING: Concrete mixed in truck mixers shall be mixed at the speed designated as mixing speed by the manufacturer for 75 – 100 revolutions.

C. TRANSPORTATION: The pervious concrete mixture may be transported and discharge of individual loads shall be completed within one (1) hour of the introduction of mix water to the cement. Delivery times may be extended to 90 minutes when a hydration stabilizer is used.

D. DISCHARGE: Each truckload will be visually inspected for consistency of the concrete mixture. To replace water lost to evaporation, water addition is permitted during discharge of the concrete to maintain the required mix consistency. A minimum of 70 revolutions at the manufacturer's designated mixing speed shall be required following the addition of any water to the mix. Discharge shall be a continuous operation and shall be completed as quickly as possible. Concrete shall be deposited as close to its final position as practical and such that discharged concrete is incorporated into previously placed plastic concrete.

PLACING AND FINISHING:

A. GENERAL: Pervious concrete shall be deposited over the entire width of the formed area and finished to the designed elevation. The completed pavement section shall contain at least the designed percentage of interconnected voids. Foot traffic shall be prohibited on the fresh pervious concrete during placement and prior to initial compaction.

B. PLACING METHODS: Pervious concrete shall be placed by vibratory screed, single tube hydraulic roller screed, laser screed, or slip form paver. The requirements for each method are specified below. The Contractor shall provide a mechanical vibratory form riding screed or a single tube hydraulic screed to place the concrete unless otherwise approved by the Owner or Engineer in writing. Internal vibration shall not be permitted.

1. Mechanical vibratory form riding screed. The screed shall ride on ½" to ¾" spacers affixed to the tops of the forms. After the concrete has been screeded, the spacers shall be removed and the surface consolidated using a roller or plate compactor. Care shall be taken during

compaction that sufficient compactive force is achieved without excessively working the concrete surface that might result in sealing off the surface porosity.

2. Single tube hydraulic roller. A water-filled steel tube driven by an external power source shall ride on the tops of the forms; spacers are not required but can be used at the contractor's option. Once the concrete is screeded to the final elevation, the screed is rolled over the pervious section to complete consolidation. Care shall be taken during installation and compaction that sufficient compactive force is applied without excessively working the concrete surface to the extent that the surface is sealed.

3. Laser screed. The pervious concrete shall be placed between forms and finished to the planned elevation using the laser machine's internal control system. After the concrete is placed, compactive effort shall be by a steel roller or a plate compactor.

4. Slip form paver. The concrete shall be placed with a spreader box the full-width of the formed section or with a full-depth asphalt paver. Compaction shall be by means of a roller screed or plate compacter.

C. The pervious concrete pavement shall be compacted to the required cross-section and shall not deviate more than +/- 3/8 inch in 10 feet from profile grade. Low spots after the screeding operation shall be filled up and tamped with hand tampers or re-rolled with compacting devices. Placed concrete shall not be disturbed while in the plastic state. Foot traffic shall not be permitted on the uncompacted surface

D. Hand tampers shall be used to compact the concrete along the slab edges immediately adjacent to the forms. After compaction, inspection, and repair, no further finishing shall be performed on the concrete. The surface shall be water fogged prior to covering with 6 mil visqueen. The surface shall be covered immediately and in no case more than 20 minutes after the concrete has come in contact with the grade.

E. The placement at the conclusion of each truck's discharge, the concrete shall be squared off. If the next truck is not immediately available for discharge, the concrete shall be formed and treated as a construction joint. Prior to restarting placement, the form board shall be removed and the exposed face fogged with water prior to continuing the placement.

JOINTING:

A. Control (contraction) joints shall be installed at regular intervals not to exceed 40 feet, or two times the width of the placement. The control joints shall be installed at 1/4 the depth (to a maximum depth of 1½") of the thickness of the pavement. These joints can be installed in the plastic concrete or saw cut after the concrete has hardened.

B. Jointing plastic concrete: Joints installed in the plastic concrete shall be constructed utilizing a small roller as described in section Special Equipment or by hand tooling. When this option is used it shall be performed immediately after roller compaction and prior to curing.

C. Jointing hardened concrete: Saw-cuts shall be made as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking. Early entry sawing occurs later with pervious concrete than with conventional concrete. For either method, the curing cover shall be removed and the surface kept misted to prevent moisture loss. After sawing the concrete shall be thoroughly wetted before the curing cover shall be securely replaced for the remainder of the curing cycle.

D. Transverse construction joints: Transverse construction joints shall be installed whenever placing is suspended or whenever concrete is no longer workable.

CURING:

A. Immediately after screeding, the surface shall be kept moist and evaporation prevented. When the wind is in excess of 5 mph, the surface shall be treated with a spray applied curing compound, evaporation retarder, or water fogging prior to covering with a minimum of six (6) mil thick polyethylene sheet or other approved covering material. The six mil polyethylene sheet or other approved curing material shall be placed over the compacted concrete no later than 20 minutes after the concrete has come into contact with the grade. The cover shall extend at least 8" beyond the edges of the fresh concrete and shall be secured to prevent evaporation of water in the concrete and dislocation due to winds or adjacent traffic conditions.

1. The curing cover shall remain securely in place for a minimum of 7 days. No vehicular traffic shall be permitted on the pavement until curing is complete and no truck traffic shall be permitted for at least 14 days.

39-5 Quality Control:

A. For Public Projects the City shall employ a testing laboratory that conforms to the requirements of ASTM E329 and ASTM C1077. For Non-Public Projects the Contractor shall employ the testing laboratory to perform all testing. All personnel engaged in testing shall be certified by the American Concrete Institute as ACI Concrete Field Technicians or equivalent. Pervious concrete placement inspectors shall be certified by the National Ready Mixed Concrete Association as a "Pervious Concrete Technician".

B. Traditional Portland cement pavement testing procedures for strength and slump control are not applicable to this type of pavement material.

C. Concrete tests shall be performed for each 150 cubic yards or fraction thereof with a minimum of one test for each day's placement.

D. Hardened concrete shall be tested for in-place infiltration rate.

1. The infiltration rate shall be not less than 100 inches per hour when measured using the following procedure:
   The apparatus shall consist of a:
   a. One gallon, minimum size, water container with a spout. The spout shall be able to produce a stream with a circular cross-section and large enough in diameter to discharge the entire contents of the container in 20 seconds or less.
   b. Stopwatch capable of indicating elapsed time to the nearest second.
   c. Tape measure of at least 0.95 m (36 inches) that is graduated in 5 mm (1/4 inch) increments or smaller.
   d. The water shall be free of suspended solids. The volume of water shall be determined to two significant figures
   e. The testing procedure is:
      i. Place a pre-measured amount of water into the container.
      ii. Pour the water onto the pervious concrete surface. Control the discharge rate by manually adjusting the angle of the spout so that the pooling of water on the concrete surface is between 25.4 cm to 76.2 cm (10 to 30 inches). Pour the entire contents of the container onto one spot and hold the spout over the spot until the pool of water vanishes.
      iii. Start the stopwatch when the water initially touches the concrete surface and stop it when the pool disappears from the surface.

iv. Measure the longest dimension of the dampened area. Measure the width of the pool perpendicular to the first measurement.
v. Repeat this procedure in a minimum of 4 separate locations.

f. The calculation of the Infiltration Capacity shall be as follows:
   i. The formula for SI Units is: IC= (V) (14.4X106)/ (pi) (d1) (d2) (t) inches per hour.
   ii. The formula for U.S. Standard Measures is: IC=(V)(3,326,400)/(pi)(d1)(d2)(t) inches per hour

   Where:
   IC is Infiltration Capacity
   V is the volume of water in gallons or liters
   d1 and d2 are the dimensions that were determined in part iv.
   pi is about 3.14159

g. The test report shall include at a minimum:
   i. The time and date of testing.
   ii. The name and affiliation of the person performing the test.
   iii. The location of the site being tested.
   iv. The location of each site tested.
   v. The volume of water used at each test site.
   vi. The length of the two measurements taken at each site.
   vii. The discharge time for the water at each location.
   viii. The infiltration capacity at each location.
   ix. The average infiltration capacity for the site.

39-6 Measurement and Payment

Payment for Pervious Concrete Pavement and Baserock shall be made at the Contract Unit Price per square foot paid for Pervious Concrete Pavement and Baserock and shall include, but not be limited to, full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and doing all work involved in preparing the subgrade, hauling and constructing pervious concrete pavement and aggregate baserock, completed in place, in accordance with these Specifications and as shown on the approved Plans.

SECTION 40 (RESERVED)

SECTION 41 CHAIN LINK FENCE, GATES & TIMBER BARRICADES

41-1 General

This work shall consist of constructing chain link fence and gates at locations and in accordance with the details shown on the Plans and Standard Drawings, as specified in the Specifications, and as directed by the Engineer. Concrete mowstrips for fences shall conform to Section 38, "Concrete Curbs, Sidewalks, Surface Improvements." The work shall also consist of constructing timber barricades at the locations shown on the Plans, and in accordance with the applicable Standard Drawing and the Specifications.

41-2 Materials

All fence and gate materials shall be new, galvanized ferrous materials. Imperfectly galvanized material or material upon which serious abrasions of the galvanizing occur shall not be used in the work. A certificate of compliance is required from the manufacturer of all products used in constructing chain link fence and gates, including posts, and shall be submitted to the Engineer in conformance with Section 6-5, "Certificates of Compliance."

All timber shall be new and first quality and shall be redwood or pressure treated wood with a preservative may be substituted for redwood upon the approval of the Engineer.

41-2.1 Fence, Gate, Posts

Fence, gate, and post materials shall comply with the following:

A. Height: The fence shall stand at a height of 6 feet above the grade indicated on the Plans when erected.

B. Fabric: Chain link fence and gate fabric shall conform to the specifications of ASTM Designation A392, Class 1 zinc coating. The wire used in the manufacture of the fabric shall be 9 gauge, and woven into approximately 2 inch mesh. The fabric shall have a knuckle bottom and twisted top.

C. Posts and Braces: The base material for the manufacture of steel pipe used for posts and braces shall conform to the specifications of ASTM Designation A120, standard weight, and the base material for the manufacture of other steel sections used for posts and braces shall be good commercial quality weldable steel. Posts and braces shall be galvanized in accordance with ASTM Specification Designation A123.

Posts and braces shall conform to the following requirements:

Corner and End Posts (round pipe only):

Pipe: 2-7/8 in. outside diameter (O.D.); 5.79 lb./ft. weight

Line Posts:

Pipe: 1.90 in. O.D.; 2.72 lb./ft. weight

Gate Posts (round pipe only):

Individual Gate Width	O.D.	Weight
Up thru 6 ft.	2-7/8 in.	5.79 lb./ft.

7 ft. thru 13 ft.	4 in.	9.11 lb./ft.
14 ft. thru 18 ft.	6-5/8 in.	18.97 lb./ft.
Over 18 ft.	8-5/8 in.	24.70 lb./ft.
Braces:		
Pipe:	1-5/8 in. O.D.;	2.27 lb./ft. weight

All posts shall be fitted with rainproof caps designed so as to fit securely over the top of the posts, and carry the top tension wire.

All line posts shall be of a total length of not less than 8.5 feet and all other posts shall be of a total length of not less than 9 feet as shown in the Standard Drawings, except that where post caps are used which hold tension wires, the post may be shortened a sufficient amount so that the top of the cap is at the approximate level of the fence fabric, but no lower. In no case, however, shall the post be shorter than 8 feet-8 inches where post caps are used, nor shall the length embedded in the concrete footing, including any mowstrip, be less than 2.5 feet for line posts and 3 feet for all other posts.

Reference is made to Section 6-8, "Samples and Tests," which is modified in this Section 41-2.1. In addition to any of the requirements of said Section 6-8, one post from each lot of posts, and one brace from each lot of braces, to be used in the work shall, at the direction of the Engineer, be tested in accordance with the requirements of ASTM Designation A120. If that post or brace fails, 2 additional posts or braces from the same lots will be tested. If either of the 2 additional sampled posts or braces fails, the entire lot of posts will be rejected. The Contractor shall supply materials for testing, as required, at his own expense.

41-2.2 Extension Arms, Tension Wire, Wire Strands

A. Extension arms, stretcher bars and other required fittings and hardware: Extension arms, stretcher bars and other required fittings and hardware shall be steel or malleable iron or wrought iron and shall be galvanized in accordance with ASTM Specification Designation A153.

B. Tension wires: Tension wires shall be a minimum of 7 gauge coil spring steel of good commercial quality. Tie wires and hog rings shall be at least 9 gauge steel. Post clips shall be at least 6 gauge steel. Tension wires, tie wires, post clips, and hog rings shall be galvanized in accordance with the provisions of ASTM Specification Designation A116, Coating Class 3.

C. Wire Strands for Extensions: Wire strands for extensions shall be 9 gauge (3.8 mm) diameter galvanized steel of a good commercial quality. Three strands shall be installed where extensions are called for on the Plans.

41-2.3 Gates

Drive gates may be single or double, and shall be of the widths designated on the Plans and in the Contract Pay Item. Walk gates shall be 4 feet wide. Gates shall be constructed in accordance with the Standard Drawings.

Gate frames shall be constructed of not less than 1.90 inch inside diameter galvanized standard weight pipe conforming to ASTM Specification Designation A120. Gate frames shall be cross trussed with 3/8

inch diameter adjustable truss rods. The adjuster shall be provided with flat and lock washers and shall be "double-nutted" to lock the adjuster. The corners of gate frames shall be fastened together and reinforced with a malleable iron fitting designed for the purpose, or they may be welded and regalvanized as provided herein.

All abraded and damaged galvanized surfaces or welded areas shall be regalvanized or may be cleaned and painted with two coats of zinc oxide, zinc dust paint conforming to the requirements of Federal Specification MIL-P-15145, the paint to be properly compounded in a suitable vehicle in the ratio of one part zinc oxide to 4 parts zinc dust, by weight.

Chain link fence fabric specified for the fence shall be attached to the gate frame by the use of stretcher bars and the tie wires as specified for fence construction, and suitable tension connectors spaced at approximately one foot intervals.

The gates shall be hung by at least two steel or malleable iron hinges not less than 3 inches in width, so designed as to securely clamp to the gate posts and permit the gate to be swung back against the fence.

Gates shall be provided with a combination steel or malleable iron catch and locking attachment of approved design. Stops to hold gates open and a center rest with catch shall be provided for all double gates. Walk gates shall be provided with stops only.

41-2.4 Concrete

Concrete for post footings shall be Class 3 conforming to the requirements of Section 50, "Portland Cement Concrete," of these Specifications.

41-2.5 Timber

Timber for Timber Barricades shall conform to the requirements shown on the Standard Drawing for Temporary Timber Barricade.

41-3 Clearing and Grubbing

Clearing and Grubbing shall conform to the requirements of Section 16, "Clearing and Grubbing."

41-4 Excavation and Preparation Of Subgrade

Any required excavation or embankment construction shall be to the lines and grades shown on the Plans or established by the Engineer. Excavation, embankment construction and preparation of subgrade shall conform to the requirements of Section 19, "Earthwork." Unless otherwise indicated, minimum relative compaction of finished fence pad shall be 90 percent.

The area around each gate shall be graded to allow all gates to be swung back against the fence without dragging on the ground surface.

41-5 Construction

A. Chain Link Fence, Gates.

Line posts shall be spaced not farther apart than 10 feet from center to center, and unless otherwise specified, shall be set vertically. All posts shall be set in concrete footings conforming to details show on the Standard Drawings. Unless otherwise directed by the Engineer, footings shall be crowned at the top to permit water to flow away from the posts.

End, corner and gate posts shall be braced to the nearest line post as shown on the Standard Drawings, with horizontal braces used as compression members and galvanized 3/8 inch diameter steel adjustable truss rods used as tension members. The adjuster shall be provided with flat and lock washers, and shall be "double-nutted", as directed by the Engineer, to lock the adjuster. Where the distance between corner and/or gate posts is 1,000 feet or greater, line posts shall be braced horizontally and trussed in both directions at intervals not to exceed 1,000 feet, as shown on the Standard Drawings. The tension wires shall be interrupted at this location by cutting and attaching them to one of the braced line posts. Tension wires shall then be continued from this same line post to the next corner or gate post.

Changes in line where the deflection angle is 10 degrees or more shall be considered as corners, and corner posts with bracing specified for corners shall be installed.

Chain link fabric shall be fastened on the outside of the posts surrounding the area being fenced, unless otherwise directed by the Engineer.

The fabric shall be stretched and securely fastened to the posts, and between posts the top and bottom edges of the fabric shall be fastened to the tension wires. Tension wires shall be stretched tight and attached to corner or gate posts in a manner approved by the Engineer.

The fabric shall be fastened to end, corner and gate posts with 1/4 inch wide by 3/4 inch thick stretcher bars and not less than 1/8 inch wide by 3/4 inch thick stretcher bar bands spaced at 1 foot intervals. The fabric shall be fastened to line posts with tie wires or post clips and to tension wires with tie wires or hog rings. The wire or clip fasteners shall be spaced 14 inches apart on line posts, with a minimum of 6 per post, and 18 inches apart on tension wires.

All bolted fixtures, including gate hinge attachments, turnbuckles, or other adjusters, clamps, or any device which is bolted, shall be provided with flat washers behind bolt heads, except where stove bolts are used, and flat and lock washers behind nuts. All turnbuckles or other adjusters shall be "double-nutted" to lock the adjuster.

Where post extensions and strands of wire are specified, the wire shall be stretched tight and fastened to extension arms with tie wires or hog rings. Where the wire terminates, it shall be securely tied to the extension arm.

B. Timber Barricades.

Timber Barricades shall be constructed at the locations shown on the Plans and conforming to the details shown on the Standard Drawing for Temporary Timber Barricade. Use of the word “Temporary” shall not be confused with smaller barricades used for traffic delineation.

Clearing and grubbing for Timber Barricades shall conform to Section 16, “Clearing and Grubbing.” Excavation and preparation of subgrade shall comply with Section 19, “Earthwork.” Excavations for posts shall be backfilled and thoroughly compacted to the satisfaction of the Engineer.

41-6 Measurement

Measurement for 6-foot chain link fence will be by the lineal foot of chain link fence installed as shown on the Plans, to be determined by the Engineer from actual measurements, the width of gate openings being deducted.

Measurement of gates will be per each for each type of gate installed as shown on the Plans. A gate unit complete in place shall include one gate, or in the case of double gates, one double unit, with all necessary fittings, hardware, and gate posts with braces, latches, stops, and other devices required by the Standard Drawings, Plans or Specifications.

Measurement for Timber Barricades shall be on an a per each basis.

41-7 Payment

When the Contract does not include a pay item for clearing and grubbing, or for excavation and preparation of subgrade as above specified, and unless otherwise provided in the Contract Specifications, full compensation for any necessary clearing and grubbing, and any excavation and preparation of subgrade required to prepare the fence pad to the grades shown on the Plans or directed by the Engineer shall be included in the costs for the various fence construction items of work and no separate payment will be made therefor.

Payment for 6 Foot Chain Link Fence shall be paid at the unit price bid per lineal foot and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans and Standard Plans, as set forth in the Specifications, and as directed by the Engineer. This shall include clearing and preparing the fence pad (where no separate item is provided therefor), furnishing and installing the fence and posts, providing samples and tests, furnishing and installing post extension arms and strands of wire where indicated, and all incidentals required to provide a complete fence installation as specified.

Payment for each type of Gate or Double Gate shall be paid on a per each basis and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans and Standard Drawings, as set forth in the Specifications, and as directed by the Engineer. This shall include clearing and preparing the gate opening area (where no separate item is provided therefor), furnishing and installing gates, providing samples and tests, furnishing and installing post extension arms and strands of wire where indicated, and all incidentals.

Payment for Timber Barricades shall be paid on a per each basis shall include full compensation for all labor, tools, materials, and incidentals required for the complete installation as shown on the Plans and applicable Standard Drawings, and as specified in the Specifications, including paint and reflectors.

SECTION 42 CONCRETE MASONRY WALL/FENCE (RESERVED)

SECTION 43 FIBER OPTIC FACILITIES (RESERVED)

SECTION 44 (RESERVED)

SECTION 45 SIGNALS, LIGHTING, AND ELECTRICAL SYSTEMS

45-1 Description

Furnish and install all equipment, materials, and components for traffic signals and lighting system, pursuant to the provisions of the State Standard Specifications Section 86, "Electrical Systems", the State Standard Plans, these Specifications and the Special Provisions.

Special Note: Due to the limited stock inventory of traffic signal poles and associated equipment it is taking a significant length of time for manufacturers to fabricate and deliver signal poles and associated equipment to the job sites. The Contractor shall order all traffic signal poles and associated equipment immediately after the Notice to Proceed is issued and the submittal is approved by the engineer in order to complete the work within the allotted construction duration noted in these specifications.

45-2 Equipment List and Drawings

The controller cabinet schematic wiring diagram and intersection sketch shall be combined into one (1) drawing so that when the cabinet door is fully open, the drawing is oriented with the intersection.

The Contractor shall furnish a maintenance manual for all supplied controller units, auxiliary equipment and vehicle detector sensor units, control units, and amplifiers. The maintenance manual and operation manual may be combined into one (1) manual. The Maintenance Manual or combined Operation and Maintenance (O&M) Manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, previous to purchase. The Maintenance Manual shall include, but need not be limited to, the following items:

A. Specifications,

B. Design characteristics,

C. General operation theory,

D. Function of all controls,

E. Trouble-shooting procedure (diagnostic routine),

F. Block circuit diagram,

G. Geographical layout of components,

H. Schematic diagrams,

I. List of replaceable component parts with stock numbers.

45-3 Certificate of Compliance

The Contractor shall provide the Engineer with a "Certificate of Compliance" from the manufacturer in accordance with the provisions of Section 6-5 "Certificates of Compliance" for all electrical material and equipment.

45-4 Foundations

Foundations shall conform to the provisions in Section 86-2.03, "Foundations," of the State Standard Specifications and these Specifications. Concrete shall have a minimum 28-day compressive strength 3,600 psi. Concrete must contain not less than 590 pounds of cementitious material per cubic yard. The combined aggregate grading must comply with the 1-inch maximum grading, the 1/2-inch maximum

grading, or the 3/8-inch maximum grading specified in Section 90-1.02C(4) of the State Standard Specifications.

No admixtures shall be used without written permission from the City. All concrete shall have a surface finish that is uniform texture and appearance without out bulges, depressions, or other imperfections.

The controller cabinet base shall be 8 inches higher than the surface of controller cabinet pad or sidewalk. Controller pad shall be 0.1 foot above finished grade if placed in unpaved area, unless elevation is stated on plans. If the pad is located in an existing or future sidewalk area, pad shall be placed at sidewalk elevation. The controller cabinet foundation shall be constructed to place the police panel on the cabinet facing the adjacent street. Controller cabinet base shall be Class 2 conforming to Section 50, "Portland Cement Concrete," of the Specifications.

Foundation caps for signal standard bases not in existing sidewalk area shall be as follows:

Pedestrian Push Button posts shall be 18 inch square or round,
Type I-A shall be 24 inch square or round, and
All other foundation caps for signal standard bases shall be 30 inch square or round.

If a square foundation cap is used, the sides of the cap shall be parallel or at right angles to road center line. Foundation caps shall be 3.5 inches in thickness. Top of all foundation caps for signal posts and standards shall be at sidewalk elevation or as stated on plans or as directed by the City Engineer.

After installation of signal standards, anchor bolt threads shall extend three threads beyond the top of the nut.

A mortar mix shall be furnished and placed in recesses and holes between the top of the foundation and the bottom of the base plate. The mortar shall be trowel finished with vertical sides matching the shape of the base plate. The mortar shall be composed of one part Portland Cement and two parts sand by volume. The mortar shall contain only enough water to permit placing and packing. The sand shall be well graded and of such size that all will pass a No. 8 sieve.

The exact location of all foundations for signal equipment, controller and service enclosures shall be approved by the Engineer prior to the start of any excavation work.

45-5 Miscellaneous Concrete Construction and Removal

Contractor shall coordinate traffic signal and lighting construction with access ramp construction to minimize the amount of miscellaneous concrete construction and removal.

Removing concrete shall conform to the provisions in Section 15, "Removing Existing Facilities," of these Specifications and the Special Provisions.

Where no joint exists between concrete to be removed and concrete to remain in place, the concrete shall be cut in a neat line to a minimum depth of seventeen-hundredths of one foot (0.17') with a power-driven saw before concrete is removed. Curb, gutter, and sidewalk shall conform to the provisions in Section 38, "Concrete Curbs, Sidewalks, Surface Improvements".

45-6 Standards, Steel Pedestals, and Posts

Section 86-2.04, "Standards, Steel Pedestals, and Posts," of the State Standard Specifications is amended by adding the following after paragraph seven of Section 86-2.04B(2) "Bolted Connections":

All galvanized nuts used on assemblies with a specific pre-load or torque shall be lubricated in accordance with the requirements specified for galvanized Grade DH nuts in ASTM Designation: A563.

The sign-mounting hardware shall be installed at the locations shown in the approved Construction Drawings. The sign panels shall be furnished by the Contractor.

Where the approved Construction Drawings refer to the side tenon detail at the end of the signal mast arm, the applicable tip tenon detail may be substituted.

45-7 Conduit

All conduit shall be Type 3 Rigid nonmetallic PVC conduit as specified in Section 86-2.05A "Material", of the State Standard Specifications. All conduit shall have a #12 tracer wire installed.

Conduit shall be installed by jacking or drilling in accordance with Section 86-2.05C "Installation" of the State Standard Specifications. Installation of conduit by the trenching method will only be permitted when requested by the Contractor, in writing, and approved by the Engineer. When used, the trenching method shall be as provided below.

Conduit runs shown in the approved Construction Drawings to be located behind curbs may be installed in the street, within three feet (3') of and parallel to the gutter line of the curb, by trenching as provided below. All pull boxes shall be located behind the curb or at the location shown in the approved Construction Drawings.

After conductors have been installed, the ends of conduits terminating in pull boxes and in service and controller cabinets shall be sealed with an approved type of sealing compound.

At locations where conduit is to be installed by jacking or drilling as provided in Section 86-2.05C "Installation" of the State Standard Specifications, and if delay to any vehicle will not exceed five (5) minutes, conduit may be installed by the trenching method, where approved by the Engineer, as follows:

A. Trenching Installation of Conduit:

Conduit shall be placed under existing pavement in a trench approximately two inches (2") wider than the outside diameter of the conduit to be installed. Trench shall not exceed six inches (6") in width. Conduit depth shall not be less than twenty-four inches (24") in depth, except that at pull boxes the trench may be hand dug to required depth. The outline of all areas of pavement to be removed shall be cut to a minimum depth of three inches (3") with a rock-cutting excavator specifically designed for this purpose. Cuts shall be neat and true with no shatter outside the removal area. The conduit shall be placed in the bottom of the trench, and the trench shall be backfilled with two-sack slurry cement, conforming to Section 19-3.3.C. The top of slurry mix shall be two inches (2") below A.C. Pavement, after slurry mix has set-up, the trench shall be patched with one-half of one inch (½") aggregate gradation mix HMA per Section 28.

Prior to spreading HMA, paint binder shall be applied as specified in Section 28-6.3 "Tack Coat." Spreading and compacting of HMA shall be performed by any method that will produce an HMA surfacing of uniform smoothness, texture, and density.

All excavated areas in the pavement shall be backfilled, except for the top two inches (2"), by the end of each work period.

45-8 Pull Boxes

Pull boxes shall be of the type or model shown on the Plans and conforming to the provisions in Section 86-2.06, "Pull Boxes," of the State Standard Specifications and these Specifications. Pull boxes, covers and extensions shall be precast reinforced concrete, except as shown on plans or in the standard drawings. Grout shall be placed in bottom of each pull box.

45-9 Conductors And Wiring

Conductors and wiring shall conform to the provisions in Section 86-2.08, "Conductors and Cables", Section 86-5.01A(3), "Construction Materials", and Section 86-2.09, "Wiring", of the State Standard Specifications and these Specifications.

Splices shall be insulated by "Method B."

45-10 Signal Cable

Where shown in the approved Plans, signal cable shall be installed in lieu of individual conductors.

Signal cable shall conform to the following:

A. The cable jacket shall be black polyethylene with an inner polyester binder sheath and shall be rated for 600 volts and seventy-five degrees Fahrenheit (75° F). All cables shall have clear, distinctive, and permanent markings on the outer surface throughout the entire length of the cable showing the manufacturer's name or trademark, insulation designation, number of conductors, conductor sizes, and the voltage rating of the jacket. Filler material, if used, shall be polyethylene material.

B. Individual conductors in the cable shall be solid copper with Type THWN insulation and shall conform to the requirements in Section 86-2.08, "Conductors and Cables" of the State of California Standard Specifications and ASTM Designation: B 286. The minimum thickness of Type THWN insulation, at any point, shall be thirteen millimeters (13 mils) for conductor sizes No. 14 and No. 12, and eighteen millimeters (18 mils) for conductor size No. 10. The minimum thickness of the nylon jacket shall be four millimeters (4 mils) at any point.

C. Each signal cable shall be marked in each pull box showing the signal standard to which it is connected.

45-11 Service

The new service shall conform to the following:

A. The service equipment enclosure shall be fabricated from aluminum as per Section 86-2.11 of the State of California Standard Specifications. The cabinet door shall have a two thousand pound (2,000 lb.) stress rated aluminum hasp, welded to the cabinet door.

B. Service cabinets, conduits, and pull boxes shall not be installed until the service locations have been verified by the servicing utility.

C. It shall be the Contractor's responsibility to verify the location of and make arrangements for and to pay for all costs to provide the necessary connection for the traffic signal and safety lighting service.

D. The Contractor shall install all necessary service cabinets, conduits and pull boxes to provide electrical service as the first item of construction. AFTER SERVICE HAS BEEN INSPECTED AND TAGGED BY THE CITY, the Contractor shall, within forty-eight (48) hours, request

electrical service from Southern California Edison Company by phone and letter. A copy of the letter shall be sent to the Engineer.

45-12 Functional Testing

The functional test for each lighting system shall consist of not less than fourteen (14) days. If unsatisfactory performance of the system develops, the conditions shall be corrected and the test shall be repeated until the fourteen (14) days of continuous, satisfactory operation is obtained.

45-13 Painting

All exposed metal signal sections, signal head mountings, brackets and fittings, doors, visors, backplates, pedestrian push-button housings, and pedestrian signal sections shall be powder coated by a City-approved process, in lieu of painting.

The minimum requirements are as follows:

A. A 3-5 stage pretreatment consisting of:

1. Degrease
2. Rinse
3. Iron Phosphate
4. Rinse
5. Seal

Note: Items "1" and "3" can be combined thereby eliminating item "C", making this a three-stage process.

B. A dry-off cycle for at least ten (10) minutes at three hundred degrees Fahrenheit (300° F) to four hundred degrees Fahrenheit (400° F).

C. Electrostatically applied powder at 75-90KV.

D. Thermal setting cycle for twenty (20) minutes at four hundred degrees Fahrenheit (400° F).

All parts shall be coated with an ultraviolet-resistant polyester powder. The only exception is for items of flat black that can be coated with a self-cleaning flat black epoxy.

Contractor shall furnish manufacturer's "Certificate of Compliance" with City-approved powder coating process prior to installation of equipment.

45-14 Model 170E Controller Assemblies

Model 170E controller assembly or assemblies shall be furnished by the Contractor. Controllers shall be tested and certified in accordance with Section 86-3, "Controller Assemblies" of the State Standard Specifications and shall be warranted for a period of one (1) year from date of "turn-on."

In addition to the provisions in Section 86-3.01A, "General" of the State Standard Specifications, the complete control system, including the Model 332 cabinet, shall conform to the State Standard Specifications and any subsequent addenda.

The above-referenced document is available from State of California, Bids and Documents Section, in Sacramento for a fee.

The controller cabinet shall be fabricated from aluminum as specified in Section 86-3.04, "Controller Cabinets", of the State Standard Specifications.

The controller assembly shall include a pull-out shelf with internal document storage compartment mounted below the 170E controller position.

Conflict monitor shall be Model 210-P.

The Contractor shall supply the Model 170E controller. The controller unit shall be furnished complete with a Model 412C PROM module configured for Method No. 2, Memory Select No. 4. A full complement of EPROM chips shall be furnished for the controller program module. The software program will be furnished by the City. Two (2) complete manuals and four (4) complete cabinet wiring diagrams shall be supplied in accordance with the above-referenced Specifications and any subsequent addenda.

The Contractor shall provide extra equipment to the City as follows:

A. One (1) extra Model 170E controller.

The Contractor shall furnish and install all other components necessary for proper operation of the traffic signal system, including but not limited to, power supply, switch packs, and loop detector amplifiers.

The signal controller shall include a standard communications protocol which meets or exceeds the requirements of AB 3418 as specified by Caltrans. This protocol shall be selectable by the user as an alternative to the normal protocol when communications with a master supporting the AB 3418 protocol is desired. The AB 3418 protocol in the controller shall not substitute for or alter the operation of the normal communications protocol without the written approval of the Engineer. The normal communications protocol shall be the default protocol enabled on controller start up. Contractor shall certify, in writing, that the controller software complies with -AB 3418.

The protocol shall include support for uploading system detector data using the optional message defined for that purpose.

The Contractor shall arrange to have a Signal Technician, qualified to work on the control equipment and employed by the control equipment manufacturer or his representative, present at the time the equipment is turned on.

Note: Key all locks to match standard City keys. Controller cabinet lock shall match standard City controller cabinet key. Police panel lock shall match standard City police panel key. Battery backup cabinet lock shall match controller cabinet key.

45-15 Modulated Light Signal Detection System

A. A Tomar 2000 Series or better, emergency vehicle pre-emption system shall be installed. The system shall include four (4) detectors mounted on traffic signal mast arms, cable, and any other necessary hardware and/or software to operate the system. The cabinet shall include two (2), 2-channel emergency vehicle pre-emption phase selectors (discriminators) per these Specifications.

B. The modulated light signal detection system shall conform to these plans and specifications.

C. The modulated light signal detection system shall be a Tomar 2000 Series, or approved equal. Cable shall not be spliced between controller and detector and shall be Model 138 or approved equal.

D. Detectors shall be mounted on traffic signal mast arms and shall be centered over the number one lane.

E. The Contractor shall provide extra equipment to the City as follows:

1. One (1) extra optical detector head.

F. System Operation—The Contractor shall demonstrate that all of the components of each system are compatible and will perform satisfactorily as a system. Satisfactory performance shall be determined using the following test procedure:

1. Each system to be used for testing shall consist of an optical emitter assembly, an optical detector, at least two hundred feet (200') of optical detector cable, and a phase selector (discriminator) module.
2. The phase selector (discriminator) modules shall be properly installed in the cabinet.
3. Two (2) tests shall be conducted; one using a Class I signal emitter and a distance of one thousand feet (1,000') between the emitter and the detector, the other using a Class II signal emitter and a distance of one thousand eight hundred feet (1,800') between the emitter and the detector. All range adjustments on the module shall be set to "Maximum" for each test.
4. Each above test shall be conducted for a period of one (1) hour, during which the emitter shall be operated for thirty (30) cycles, each consisting of a one (1) minute "on" interval and a one minute "off" interval. During the total test period,

    a. The emitter signal shall cause the proper responses from the controller unit during each "on" interval

    b. There shall be no improper operation of either the controller unit or the conflict monitor during each "off" interval.

G. Certificates and Warranties – Manufacturers' certificates and warranties shall be presented to the City inspector before traffic signal turn-on.

45-16 Vehicle Signal Faces and Signal Heads

Signal faces, signal heads, and auxiliary equipment as shown in the approved Construction Drawings, and the installation thereof, shall conform to the provisions in Sections 86-4.01 "Vehicle Signal Faces", 86-4.01E "Backplates", and 86-4.04 "Signal Mounting Assemblies" of the State Standard Specifications and these Specifications.

All vehicular signals shall be the "incandescent looking" light emitting diode type, similar to the Leotek Caltrans Series Incandescent Look type, or approved equal. All green and yellow sections shall be provided with a Light Emitting Diode Kit that conforms to Section 45-17 of these Specifications. All red sections shall be provided with a Light Emitting Diode Kit that conforms to Section 45-18 of these Specifications.

Visors on vehicular signals shall be "tunnel" type with open slot at bottom.

All signal heads, housings, directional louvers, visors, and backplates shall be metallic. All vehicle signal lenses shall be twelve inches (12") in diameter.

45-17 Light Emitting Diode Green and Yellow Module

All twelve inch (12") green and yellow circular sections and twelve inch (12") green and yellow arrow sections shall be provided with Type 1 LED Traffic Signal Modules.

All devices must meet the general specifications of the Transportation Electrical Equipment Specifications (TEES), Chapter 1- General Specifications, as well as these Specifications. In case of conflict, these Specifications shall govern over the TEES, Chapter 1 Electrical Power Consumption.

Maximum power consumption requirements are as follows:

GREEN LEDs:

Temperature	77° F	166° F
12" circular	12.0 W	12.0 W
12" arrow	13.0 W	13.0 W

YELLOW LEDs:

Temperature	77° F	166° F
12" circular	22.0 W	25.0 W
12" arrow	10.0 W	12.0 W

A. Operation Voltage:

The modules shall operate from a 60 HZ, ±3 HZ AC, line over a voltage ranging from 95 volts to 135 volts. The fluctuations of line voltage shall have no visible effect on the luminous intensity of the indications.

Operating voltage of the modules shall be 120 VAC. All parameters shall be measured at this voltage.

B. Power Factor:

The LED signal module shall have a power factor of nine-tenths (0.90) or greater.

C. Total Harmonic Distortion (THD):

Total harmonic distortion (current and voltage) induced into an AC power line by a LED signal module shall not exceed twenty percent (20%).

D. Surge Suppression:

The signal module onboard circuitry shall include voltage surge protection to withstand high repetition noise transients as stated in Section 2.1.6 of NEMA Standard TS-2, 1992.
The LED circuitry shall prevent perceptible flicker to the unaided eye over the voltage range specified above.

All wiring and terminal blocks shall meet the requirements of Section 13.02, "Equipment and Material Standards" of the ITE Publication.

The modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors). Review TEES Chapters 3 and 6 for specifications on these devices.

The modules and associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

E. Photometric Requirements:

The minimum initial luminous intensity values for the modules shall be as defined in VTCSH Part 2, Section 4.1 at seventy-seven degrees Fahrenheit (77° F).

The modules shall meet or exceed eighty-five percent (85%) of the standard light output values found in the ITE publication: Equipment and Material Standards, VTCSH Part 2, throughout the useful life based on normal use in a traffic signal operation over the operating temperature range.

The measured chromaticity coordinates of the modules shall conform to the chromaticity requirements of VTCSH Part 2, Section 4.2, throughout the useful life over the operating temperature range.

F. Physical and Mechanical Requirements:

LED traffic signal modules shall be designed as retrofit replacements for existing optical units of signal indications and shall not require special tools for installation. Type 1 modules shall be installed.

G. Environmental Requirements:

The LED signal module shall be rated for use in the operating temperature range of minus forty degrees Fahrenheit (-40°F) to one hundred sixty-five degrees Fahrenheit (165° F). The modules shall meet all specifications throughout this range.

The LED signal module shall be protected against dust and moisture intrusion per the requirements of NEMA Standard 250-1991 for Type 4 enclosures to protect all internal components.

H. Construction:

The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply for the module shall be integral to the unit.

The circuit board and power supply shall be contained inside the module. Circuit boards shall conform to Chapter 1, Section 6 of the "Transportation Electrical Equipment Specifications". The assembly and manufacturing process for the LED signal assembly shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

I. Materials:

Material used for the lens and signal module construction shall conform to ASTM Specifications for the materials.

Enclosures containing either the power supply or electronic components of the signal module shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

J. Module Identification:

Each module shall have:

1. Manufacturer's name,
2. Trademark,
3. Model number,
4. Serial number,
5. Date of manufacture (month-year), and

6. Lot number as identification permanently marked on the back of the module.

The following operating characteristics shall be permanently marked on the back of the module: rated voltage and rated power in Watts and Volt-Ampere.

If a specific mounting orientation is required, each module shall have prominent and permanent marking(s) for correct indexing and orientation within a signal housing. The markings shall consist of an up arrow, or the word "UP" or "TOP".

K. Type 1 Traffic Signal Module:

The following specification requirements apply to the Type 1 module only. All general specifications apply unless specifically superseded in this section.

Type 1 modules can be manufactured under this specification for the following faces:

1. Twelve inch (12") green circular

2. Twelve inch (12") green arrow

L. Physical and Mechanical Requirements:

The module shall fit into existing traffic signal section housings built to the specifications detailed in ITE Publication: Equipment and Material Standards, "Vehicle Traffic Control Signal Heads", with the reflector and lamp socket remaining in place, and without modification to the housing.

Each Type 1 module shall be designed to be installed in the door frame of a standard traffic signal housing. The Type 1 module shall be sealed in the door frame with a one-piece EPDM (ethylene propylene rubber) gasket.

The maximum weight of a Type 1 module shall be one and eight tenths kilograms (1.8kg, or four pounds).

M. Construction:

Each Type 1 module shall be a sealed unit to include all parts necessary for operation (a printed circuit board, power supply, a green lens and gasket, etc.), and shall be weather proof after installation and connection.

N. Conductors:

Two (2) secured, color coded, nine hundred fourteen millimeter (914 mm, or thirty-six inch) long, 600 V, twenty gauge (#20) minimum, jacketed wires, conforming to the National Electric Code, rated for service greater than two hundred twenty degrees Fahrenheit (220° F), are to be provided for electrical connection for each Type 1 LED signal module. Conductors for Type 1 modules shall be one meter (1m) in length, with quick disconnect terminals attached and shall conform to Section 86-4.01B, "Electrical Components" of the State Standard Specifications.

If specified in the purchased order, the module will be equipped with an adapter that will screw into the medium base, lamp socket. The adapter shall be able to accept the quick disconnect terminals at the end of the conductors for the module. The electrical contacts of the adapter shall be made of brass.

O. Lens:

The lens of the Type 1 module shall be integral to the unit, shall be convex with a smooth outer surface and made of plastic or of glass.

The lens may be tinted or may use transparent film or materials with similar characteristics to enhance ON/OFF contrasts.

The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.

The LED signal module lens shall be UV stabilized and shall be capable of withstanding ultraviolet (direct sunlight) exposure for a minimum period of forty-eight (48) months without exhibiting evidence of deterioration. If a polymeric lens is used, a surface coating or chemical surface treatment shall be used to provide front surface abrasion resistance.

P. 12" Arrow:

The following specification requirements apply to the twelve inch (12") arrow module only. All general specifications apply unless specifically superseded in this Section.

1. The arrow module shall meet specifications stated in the VTCSH Section 9.00 for arrow lenses.

2. The LEDs shall be spread evenly across the illuminated portion of the arrow area.

3. Each module shall provide an average luminous intensity of at least five thousand five hundred candelas per square meter (5,500 cd/m2) throughout the useful life over the operating temperature range. Arrow modules shall be tested as per California Test 3001.

Q. Quality Assurance:

The modules shall be manufactured in accordance with a manufacturer quality assurance (QA) program. The QA program shall include two (2) types of Quality Assurance:

1. Design quality assurance

2. Production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of the modules built to meet this specification, and a documented process of how problems are to be resolved.

QA process and test results documentation shall be kept on file for a minimum period of seven (7) years.

LED signal module designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

R. Production Quality Control Testing:

The following Production Quality Assurance tests shall be performed on each new module prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. Test results shall be retained by the manufacturer for seven (7) years.

1. Burn-in period shall consist of each signal module being energized at rated voltage for a thirty (30) minute stabilization period before the measurement is made.

2. Each module shall be tested for rated initial intensity after burn-in.

3. A single point measurement, with a correlation to the intensity requirements of Section 1.04 of the VTCSH for circular modules, may be used.

4. The ambient temperature for this measurement shall be greater than seventy-seven degrees Fahrenheit (77° F). Each module not meeting minimum luminous intensity requirements per Table 1 of VTCSH for circular modules, eleven thousand candela per square meter (11,000 cd/m2) for arrow modules, or three thousand seven hundred fifty candela per square meter (3,750 cd/m2) for pedestrian modules shall be cause for rejection.

5. Each module shall be tested for required power factor after burn-in.

6. Each module shall be measured for current flow in amperes after burn-in. The measured current values shall be compared against rated values resulting from design qualification measurements. The current flow shall not exceed the rated value.

7. Each module shall be visually inspected for any exterior physical damage or assembly anomalies. Careful attention shall be paid to the surface of the lens to ensure there are no scratches (abrasions), cracks, chips, discoloration, or other defects. Any such defect shall be cause for rejection.

S. Warranty:

The manufacturer shall provide a written warranty against defects in materials and workmanship for the modules for a period of sixty (60) months after acceptance of the modules. Replacement modules shall be provided promptly after receipt of modules that have failed at no cost to the City. All warranty documentation shall be given to the City prior to random sample testing.

45-18 Pedestrian Signals

A. Countdown pedestrian signals shall be used and shall be the "incandescent looking" light emitting diode (LED) type, similar to the Leotek CIL Series, or approved equal. The countdown pedestrian signals shall conform to the applicable provisions of Section 86-4.03 "Pedestrian Signal Faces" of the State Standard Specifications.

B. The installation shall not require any special tools or the drilling of any holes in the reflector or housing.

C. The luminous intensity, quantity and color of the LEDs shall be such that the intent of the current ITE specification for Pedestrian Traffic Control Signal Indications is satisfied.

D. The unit shall have a maximum power consumption of fifteen watts (15w) at 120 VAC. The unit shall operate between 92 VAC and 125 VAC and from seventy-seven degrees Fahrenheit (77º F) to one hundred fifty-eight degrees Fahrenheit (158º F).

E. Each assembly shall consist of a minimum of two hundred twenty-five (225) LEDs arranged in minimum of 3 strings. The loss of a single LED shall result in a loss of only that string.

F. LED pedestrian signal face "Upraised Hand & Walking Person" module shall be designed to mount in the standard existing Type A housing. Pedestrian signal face modules shall be designed to mount behind or replace the existing face plate of existing Type A housing as specified by the

requirements of the ITE Standards "Pedestrian Traffic Control Signal Indications" and the MUTCD. The design of the modules shall require a specific mounting orientation.

45-19 Detectors

A. Vehicle detectors shall be a combination of Type D and Type E detectors as indicated in the approved Construction Drawings, and shall conform to the applicable provisions of Section 86-5 "Detectors" of the State Standard Specifications. Loops shall be cut into pavement and installed on the same day. This shall include placement of loops and asphaltic concrete sealant.

B. Loop wire shall be Type 1.

C. Loop detector lead-in cable shall be Type C.

D. The sides of the slot shall be vertical, and the minimum radius of the slot entering and leaving the circular part of the loop shall be one and one-half inches (1½"). Slots in asphalt concrete pavement shall be filled with asphaltic concrete sealant as follows:

1. After conductors are installed in the slots cut in the pavement, sealant shall be applied in accordance with the provisions of the State Standard Specifications.

2. Temperature of sealant material during installation shall be above seventy degrees Fahrenheit (70° F). Air temperature during installation shall be above fifty degrees Fahrenheit (50° F). Sealant placed in the slots shall be compacted by use of an eight inch (8") diameter by one-eighth of one inch (⅛") thick steel hand roller or other tool approved by the Engineer. Compacted sealant shall be flush with the pavement surface. Minimum conductor coverage shall be one inch (1"). Excess sealant remaining after rolling shall not be reused. On completion of rolling, traffic will be permitted to travel over the sealant.

E. Conductors for each inductive loop detector shall be continuous and unspliced from the pull box adjacent to the loop to the field terminals in the cabinet.

45-20 Pedestrian Push Buttons

Pedestrian push-button assemblies shall comply with the Architectural and Transportation Barriers Compliance Board Interim Final Ruling on the Americans with Disabilities Act Accessibility Guidelines and the following requirements:

A. The housing for the unit shall be made of 356 Aluminum heat treated to meet Specification T-6. It shall be of a telescoping, vandal-proof design. The color shall be black matching color #17038, #27038, or #37038 of Federal Standard #595B.

B. The plunger/actuator surface shall have a diameter of two inches (2") or greater. It shall be made of polished stainless steel and assembled with all stainless steel components so as not to be corrosive. The actuator shall be conical in shape with the cone extending four hundred four thousandths of one inch (.404") above the bezel of the switch housing in the neutral position.

C. The microswitch component shall be a dust-proof, water-resistant type. It shall be a single-pole, precision, snap-acting type. It shall also be UL listed and CSA Certified and meet the requirements for NEMA TS-1 and TS-2.

D. The complete switching unit shall have an operating force of three pounds (3 lbs.) and a minimum release force of three pounds (3 lbs.). Pre-travel shall be sixty-two thousandths of one inch (0.062") minimum. Over-travel shall be sixty-two thousandths of one inch (0.062") minimum.

E. Units shall permit recessed mounting in existing standard type pedestrian push-button assemblies without modification.

45-21 Safety and Street Lighting

A. Luminaires used for safety shall be GE #M2AC (200 Watt) S7HGMC31 or equal. A twist-Lock photo-electrical control unit and receptacle shall be installed on each luminaire.

B. All luminaires to be mounted on horizontal mast arms, when tested in accordance with California Test 611, shall be capable of withstanding cyclic loading in:

1. A vertical plane at a minimum peak acceleration level of 3.0 g's peak-to-peak sinusoidal loading (same as 1.5 g's peak) with the internal ballast removed for a minimum of two million cycles without failure of any luminaire parts, and

2. A horizontal plane perpendicular to the direction of the mast arm at a minimum peak acceleration level of 1.5 g's peak-to-peak sinusoidal loading (same as 0.75 g's peak) with the internal ballast installed for a minimum of two million cycles without failure of any luminaire parts.

C. No part of the slipfitter mounting brackets on the luminaires shall develop a permanent set in excess of two hundredths of one inch (0.02") when the four (4) three-eighths of one inch (⅜") diameter cap screws used for mounting are tightened to a torque of ten foot pounds (10 ft. lbs.).

D. Ballasts shall be the lag regulator type.

E. Each light shall have a fuse protection located in the pull box next to the lighting standard.

45-22 Removing, Reinstalling, or Salvaging Electrical Equipment

Salvaged traffic signal equipment and electrical materials shall be hauled to City of Visalia Corporation Yard and stockpiled, unless noted otherwise in the approved Construction Drawings.

45-23 Traffic Signal Street Name Signs

The Contractor shall furnish and install Traffic Signal Street Name Signs and sign mounting brackets as shown in the approved Plans or per the City of Visalia Engineering Improvement Standards and described below. The signs and sign mounting brackets shall be manufactured in accordance with the specifications, drawings, and lists detailing information.

A. Reflective Materials:

Sheeting material, letters, and border materials shall be Diamond Grade LDP (long distance performance) manufactured by 3M Co. NO SUBSTITUTES will be permitted.

All letters and border material shall be white in color similar to 3M Co. #4090. Background color shall be green similar to 3M ElectroCut Film #1177C. All signs shall have an applied 3M #1160 or equal graffiti film. Only die-cut material shall be used for the letters and border material. No silk-screening of signs will be allowed.

Spacing of all letters shall be in accordance with sheeting manufacturer's recommended standard so as to achieve optimum legibility and uniformity under both day and night conditions.

B. Blade Structure:

All aluminum sign blanks shall be 6061-T6 Alloy or 5052H38, eight-hundredths of one inch (0.080") in thickness.

Dimensions of sign blanks shall be forty-eight inches (48") minimum to eighty-four inches (84") maximum wide by eighteen inches (18") high. No splices of sign blanks shall be permitted.

Each sign shall have a one and one-fourth inches by one and one-fourth inches by one-eighth of one inch (1¼"x1¼"x⅛") aluminum angle as stiffeners. One near the top and one near the bottom of the sign. Space between the stiffeners shall be fifteen and three-fourths inches (15¾") outside to outside and centered on the sign. Stiffeners shall be fastened to the sign, with legs of aluminum angle pointing toward the center of the sign, using three-sixteenths of one inch (3/16") rivets placed on six inch (6") centers. No rivet shall be placed closer than one inch (1") nor more than two inches (2") from the edge of the sign. All stiffeners shall be equal in length to the sign. Stiffeners shall be installed after face material has been applied to the aluminum sign blank.

Each stiffener shall have two (2) three-eighths of one inch (⅜") diameter holes spaced four and seven-eighths inches (4⅞") apart. The holes shall be centered on a point one-third (⅓) of the way from the right-hand edge of the sign when facing the legend. Holes shall match those in the sign mounting bracket.

C. Sign Mounting Bracket:

Material used to manufacture sign bracket shall be twelve gallons (12gal), hot-rolled sheet steel, low carbon, commercial quality, specification QQS-663, grade 1010. Bracket shall be hot-dip galvanized after fabrication per specification ASTM-A-123_68.

Tolerances shall be plus or minus one thirty-seconds of one inch (1/32"), for angles plus or minus zero degrees to thirty minutes (±0d30'00").

Four (4) five-sixteenths of one inch (5/16") – thirteen inches by one and one-half inches (13"x1½") bolts with proper nuts and one (1) lock washer per bolt shall be provided as part of the sign mounting bracket.

D. Quality of Work:

All signs fabricated shall conform to the manufacturer of sheeting, letters, and borders application methods. All signs shall be free of wrinkles, cracking, crazing, or blistering upon delivery to the City.

Satisfactory performance of reflective quality of fabricated signs shall be as follows:

1. Minimum Initial Retroreflectivity Brightness

2. Candelas per foot candle per square foot

3. (0.2 degree obs. and -4 degree entrance)

Color	M.I.R.B.
White	800
Green	80

The retroreflective sheeting will be considered unsatisfactory if it has deteriorated due to natural causes to the extent that:

1. The sign is ineffective for its intended purpose when viewed from a moving motor vehicle under normal day and night driving conditions; or

2. The coefficient of retroreflection is less than the minimum specified.

All signs shall be date stamped, at the time of fabrication as per manufacturer's requirements to verify guarantee period. Any sign not so marked shall be replaced at the manufacturer's expense.

Traffic signal street name signs shall be strapped to the signal poles at a height of sixteen feet (16') to the bottom of the sign by the use of three-fourths of one inch (¾") wide, three-tenths of one inch (0.030") thick, AISI Type 201 stainless steel strapping. Strapping shall be placed at the three (3) locations provided by the slots in the mounting bracket. Buckles used shall be designed for three-tenths of one inch (0.030") stainless steel banding. City will supply street name sign and mounting bracket. Contractor is to provide strapping and strapping hardware.

45-24 Traffic Signal Battery Back-Up System

A. General:

This specification establishes the minimum requirements for a complete emergency battery backup system for use with Light Emitting Diode (LED) Traffic Signal Modules. The battery backup system shall be a Dimensions system or approved equal. The battery backup system (BBS) shall include, but not be limited to the following:

1. Inverter/charger,
2. Power transfer relay,
3. Batteries,
4. A separate manually operated non-electronic bypass switch and
5. All necessary hardware and interconnect wiring.

The BBS shall provide reliable emergency power to a traffic signal system (Vehicle and Pedestrian Traffic) in the event of a power failure or interruption.

The BBS shall be capable of providing power for full run-time operation for an "LED-only" intersection (all colors: red, yellow, green and pedestrian heads) or flashing mode operation for an intersection using Red LED's.

The BBS shall be designed for outdoor applications, in accordance with the Caltrans Transportation Electrical Equipment Specifications (TEES), Chapter 1, and Section 8 Requirements.

B. Operation:

The BBS shall provide a minimum two (2) hours of full run-time operation for an "LED-only" intersection (minimum 700W/1000VA active output capacity, with eighty percent (80%) minimum inverter efficiency).

The maximum transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, shall be sixty-five milliseconds (65ms). The same maximum allowable transfer time shall also apply when switching from inverter line voltage to utility line voltage.

The BBS shall provide the user with three (3) sets of normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) dry relay contact closures, available on a panel-mounted terminal block, rated at a minimum 120V/1A, and labeled so as to identify each contact. For typical configuration, see Figure 3 at the end of this Section 45.

1. The first set of NO and NC contact closures shall be energized whenever the unit switches to battery power. Contact shall be labeled or marked "On Batt."

2. The second set of NO and NC contact closures shall be energized whenever the battery approaches approximately forty percent (40%) of remaining useful capacity. Contact shall be labeled or marked "Low Batt."

3. The third set of NO and NC contact closures shall be energized two hours after the unit switches to battery power. Contact shall be labeled or marked "Timer"

Operating temperature for the inverter/charger, power transfer relay and manual bypass switch shall be minus thirty-five degrees Fahrenheit (-35° F) to one hundred sixty-six degrees Fahrenheit (166° F).

Both the Power Transfer Relay and Manual Bypass Switch shall be rated at 240VAC/30 amps, minimum.

The BBS shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 - 4.0 mV/°C per cell.

The temperature sensor shall be external to the inverter/charger unit. The temperature sensor shall come with two meters (2m, or six feet six inches) of wire.

Batteries shall not be recharged when battery temperature exceeds one hundred twenty-two degrees Fahrenheit, plus or minus thirty-eight degrees (122° F ± 38°).

BBS shall bypass the utility line power whenever the utility line voltage is outside of the following voltage range: 100VAC to 130VAC (± 2VAC).

When utilizing battery power, the BBS output voltage shall be between 110 VAC and 125 VAC, pure sine wave output, three percent (3%) THD, 60Hz ± 3Hz.

BBS shall be compatible with Caltrans Model 332 Cabinets, Model 170 Controllers, Model 2070 Controllers and cabinet components for full time operation.

When the utility line power has been restored at above 105 VAC ± 2 VAC for more than thirty (30) seconds, the BBS shall transfer from battery backed inverter mode back to utility line mode. BBS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.

In the event of inverter/charger failure, battery failure or complete battery discharge, the power transfer relay shall revert to the NC (and de-energized) state, where utility line power is connected to the cabinet.

Recharge time for the battery, from "protective low-cutoff" to eighty percent (80%) or more of full battery charge capacity, shall not exceed twenty (20) hours.

C. Mounting / Configuration

1. General:
   Inverter/Charger Unit shall be rack or shelf-mounted.

   Power Transfer Relay and Manual Bypass Switch shall be mounted on the 332 Cabinet standard Electronic Industries Association (EIA) rail.

   All interconnect wiring provided between Power Transfer Relay, Bypass Switch and Cabinet Terminal Service Block shall be no less than two meters (2m, or six feet six inches) of ten gauge (#10) wire.

   Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be two meters (2m, or six feet six inches) of eighteen gauge (#18) wire.

   See Figure 4 that provides clarification as to how BBS Power Transfer Relay and Manual Bypass Switch are interconnected with Model 332A Cabinets in order to ensure interchangeability between all BBS manufacturers.

   All necessary hardware for mounting (shelf angles, rack, etc.) shall be included in the bid price of the BBS. A minimum of six (6) bolts/fasteners shall be used to secure swing-trays to the 332 Cabinet Standard EIA four hundred eighty two and six-tenths millimeters (482.6mm, or 19") rack. All bolts/fasteners and washers shall meet the following requirements:

   a. Screw type: Pan Head Phillips machine screw,
   b. Size and Thread pitch: 10-32,
   c. Material: 18-8 stainless steel (Type 316 stainless steel is acceptable as an alternate),
   d. Washer: Use one (1) flat washer (18-8 stainless steel) under the head of each 10-32 screw (provided that the screws are properly tightened, lock washers are unnecessary),
   e. Number of screws per swivel bracket, minimum: six (6) screws per swivel bracket. Spaced evenly along bracket, with one (1) screw near each end.

2. Internal mounted battery option: Not allowed.

3. External battery cabinet option:

   a. Inverter/Charger, Power Transfer Relay and manually operated Bypass Switch shall fit inside a typical fully equipped Caltrans Model 332 Cabinet that includes one (1) Model 170.

   b. Batteries shall be housed in a NEMA 3R rated cabinet mounted to the side of the Model 332 Cabinet. This external battery cabinet shall conform to TEES, March 29, 2002 Chapter 7, Section 2-Housings for the construction and finish of the cabinet.

   c. Batteries shall be mounted on individual shelves.

   d. Four (4) shelves shall be provided. There shall be a minimum of three hundred four and eight-tenths millimeters (304.8mm, or 12") clearance between shelves. Each shelf shall be a minimum of two hundred twenty-eight and six tenths millimeters by six hundred

thirty five millimeters (228.6mm x 635.0mm, or 9" x 25"), and capable of supporting a minimum of fifty-seven kilograms (57kg, or 125 lbs.)

e. The external battery cabinet shall mount to the Model 332 Cabinet with a minimum of eight (8) bolts. (See Figure 5 at the end of this Section 45.)

f. The external battery cabinet shall be ventilated through the use of louvered vents, filter, and one thermostatically controlled fan as per TEES Chapter 7 Section 2-Housings.

g. External battery cabinet fan shall be AC operated from the same line output of the Manual Bypass Switch that supplies power to the 332 Cabinet.

h. The external battery cabinet shall have a door opening to the entire cabinet. The door shall be attached to the cabinet through the use of a continuous stainless steel piano hinge or four (4), two-bolts per leaf, hinges as per TEES Chapter 7, Section 2. The door shall use a padlock clasp or latch and lock mechanisms as described in the TEES, in order to lock the door.

i. The BBS with external battery cabinet shall come with all bolts, conduits and bushings, gaskets, shelves, and hardware needed for mounting.

4. Maintenance, displays, controls, and diagnostics:

a. The BBS shall include a display and /or meter to indicate current battery charge status and conditions.

b. The BBS shall have lightning surge protection compliant with IEEE/ANSI C.62.41.

c. The BBS shall be equipped with an integral system to prevent battery from destructive discharge and overcharge.

d. The BBS and batteries shall be easily replaced with all needed hardware and shall not require any special tools for installation.

e. The BBS shall include a front-panel event counter display to indicate the number of times the BBS was activated and a front-panel hour meter to display the total number of hours the unit has operated on battery power. Both meters shall have push button resets.

f. Manufacturer shall include a set of equipment lists, Operation and Maintenance (O&M) Manuals, and board-level schematic and wiring diagrams of the BBS, and the battery data sheets. Manual shall conform to TEES March 29, 2002, Chapter 1, Section 1.2.4.2.

5. Battery system:

a. Individual batteries shall be 12V type, 65 amp-hour maximum, and shall be easily replaced and commercially available off the shelf.

b. Batteries used for BBS shall consist of four to eight (4-8) batteries with a cumulative minimum rated capacity of 240 amp-hours.

c. Batteries shall be deep cycle, sealed prismatic lead-calcium based AGM/VRLA (Absorbed Glass Mat/ Valve Regulated Lead Acid).

d. Batteries shall be certified by the manufacturer to operate over a temperature range of minus thirteen degrees Fahrenheit (–13° F) to one hundred sixty-six degrees Fahrenheit (166° F).

e. The batteries shall be provided with appropriate interconnect wiring and corrosion-resistant mounting trays and/or brackets appropriate for the cabinet into which they will be installed.

f. Batteries shall indicate maximum recharge data and recharging cycles.

g. Battery interconnect wiring shall be via modular harness. Batteries shall be shipped with positive and negative terminals pre-wired with red and black cabling that terminates into a typical power-pole style connector. Harness shall be equipped with mating power-pole style connectors for batteries and a single, insulated plug-in style connection to inverter/charger unit. Harness shall allow batteries to be quickly and easily connected in any order and shall be keyed and wired to ensure proper polarity and circuit configuration.

h. Battery terminals shall be covered and insulated so as to prevent accidental shorting.

6. Quality assurance:

a. Each BBS shall be manufactured in accordance with a manufacturer Quality Assurance (QA) Program. The QA program shall include two (2) Quality Assurance procedures:

i. Design QA (see 7 "Design qualifications testing" below) and

ii. Production QA. The Production QA shall include statistically controlled routine tests to ensure minimum performance levels of BBS units built to meet this specification and a documented process of how problems are to be resolved.

b. QA process and test results documentation shall be kept on file for a minimum period of seven (7) years.

c. Battery Backup System designs not satisfying Design QA Testing and Production QA Testing requirements shall not be labeled, advertised, or sold as conforming to this specification.

7. Design qualifications testing:

a. The manufacturer, or an independent testing lab hired by the manufacturer, shall perform Design Qualification Testing on new BBS system(s) offered, and when any major design change has been implemented on an existing design. A major design change is defined as any modification, either material, electrical, physical or theoretical, that changes any performance characteristics of the system, or results in a different circuit configuration. Where a dispute arises in determining if a system is a new design or if the system has had a major design change, the State will make the final determination if Design Qualification Testing is required prior to production consideration.

b. A quantity of two (2) units for each design shall be submitted for Design Qualification Testing.

c. Test units shall be submitted to Caltrans TransLab, Electrical Testing Branch after the manufacturer's testing is complete.

d. Manufacturer's testing data shall be submitted with test units for Caltrans verification Design Qualification Testing.

8. Burn in:

a. The sample systems shall be energized for a minimum of five (5) hours, with full load of 700 watts, at temperatures of minus thirty-five degrees Fahrenheit (–35° F) and one hundred sixty-six degrees Fahrenheit (166° F), excluding batteries, before performing any design qualification testing.

b. Any failure of the BBS, which renders the unit non-compliant with the specification after burn in, shall be cause for rejection.

c. For Design Qualification Testing, all specifications will be measured including, but not limited to:

i. Run time while in battery backup mode, at full load.

ii. Proper operation of all relay contact closures ("On-Batt", "Low-Batt" and "Timer").

iii. Inverter output voltage, frequency, harmonic distortion, and efficiency, when in battery backed inverter mode.

iv. All power transfer voltage levels. See BBS Specifications 1.8, 1.11 and 1.12.

v. Power transfer time, from loss of utility line voltage to stabilized inverter line voltage, from batteries.

vi. Back feed voltage to utility when in battery backed inverter mode.

vii. IEEE/ANSI C.62.41 compliance.

viii. Battery charging time.

ix. Event counter and runtime meter accuracy.

9. Production quality control testing:

a. Production Quality Control tests shall consist of all of the above listed tests and shall be performed on each new system prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. The manufacturer shall retain test results for seven (7) years.

b. Each BBS shall be given a minimum one hundred (100) hour burn in period to eliminate any premature failures.

c. Each system shall be visually inspected for any exterior physical damage or assembly anomalies.

d. Any defects shall be cause for rejection.

Note: Key all locks to match standard City keys. Controller cabinet lock shall match standard City controller cabinet key. Police panel lock shall match standard City police panel key. Battery backup cabinet lock shall match controller cabinet key.

45-25 Traffic Signal Interconnect Conduit

Installation of all equipment, materials, pull rope, and components for traffic signal interconnect system, pursuant to the provisions of the State Standard Specifications, State Standard Plans, these Specifications, Plans and Special Provisions.

All conduits shall be Type 3 rigid nonmetallic PVC conduit per section 86-2.05A of the State Standard Specifications. All conduit shall have a #12 tracer wire installed.

All conduit runs into pull boxes shall have 45° sweeps.

Installation of Type 6E pull boxes shall include the cost of furnishing and installing each new Type 6E pull boxes within the interconnect system as specified by the Plans and the Special Provisions and all work associated with installation of said pull boxes.

Grout shall be placed in bottom of standard pull boxes. Cover markings shall be per Caltrans Standard Plan ES-8 except that the word “Caltrans” shall be omitted. Pull boxes not protected by curb shall be traffic bearing.

Protection and restoration of existing improvements shall comply with Section 5-9, “Preservation of Property” and State Standard Specification 5-1.36, “Property and Facility Preservation.”

The Contractor shall be responsible for the protection of public and private property adjacent to the work and shall exercise due caution to avoid damage to such property.

The Contractor shall contact USA to request marking of all utilities in the project area. The contractor shall determine the exact location and depth of all potentially conflicting utilities or other improvements, prior to doing any work that could potentially interfere with or damage such facilities. This applies to any utility marked via USA, utilities shown any sheet of the plans, or whose presence can be inferred from conditions visible or evident at the job site, including markings, meters, trenches, manholes, handholes, pedestals, structures, valves, or buildings. Where possible, the location of the conduit and pull boxes shall be adjusted in the field to avoid conflicts with any utilities.

The Contractor is required to submit to the Engineer "Drawings of Record" prints, prior to the City's accepting the installations. The prints shall indicate in red all deviations from the contract plans such as location of poles, pull boxes and runs, depths of conduit, number of conductors and other appurtenant work for future references.

45-26 Median Lighting

Description - Install all equipment, materials, and components for traffic signals and highway safety lighting system, pursuant to the provisions of the State Specifications Section 86, “Electrical Systems,” State Standard Plans, these Specifications, Plans and these Special Provisions.

Foundations - Portland cement concrete shall conform to Section 50, "Minor Concrete," and shall be Class 2.

Safety and Street Lighting - Luminaries used for safety and street lighting shall be GE M2AC10S7H2GMC31 or equal. A twist-lock photo-electrical control unit and receptacle shall be installed on each luminaire. Luminaries are to be provided by the Contractor, and installed by the Contractor.

All Luminaries to be mounted on horizontal mast arm(s), when tested in accordance with California Test 611, shall be capable of withstanding cyclic loading in:

1. A vertical plan at a minimum peak acceleration level of 3.0 g's peak-to-peak sinusoidal loading (same as 1.5 g's peak) with the internal ballast removed for a minimum of 2 million cycles without failure of any luminaire parts, and

2. A horizontal plan perpendicular to the direction of the mast arm at a minimum peak acceleration level of 1.5 g's peak-to-peak sinusoidal loading (same as 0.75 g's peak) with the internal ballast installed for a minimum of 2 million cycles without failure of any luminaire parts.

No part of the slip fitter mounting brackets on the luminaries shall develop a permanent set in excess of 0.020-inch when the four 3/8 inch-diameter cap screws used for mounting are tightened to a torque of 10 foot pounds.

Ballast's shall be the lag regulator type.

Lamps used in safety lighting luminaries shall be as specified on the traffic signal plans.

Lamps used in street lighting shall conform to Section 86-6 of the Standard Specifications and be 100 watts, 240-volt, high-pressure sodium, and operate at 9,500 lumens unless stated otherwise on the plans.

Each light shall have a fuse protection located in the pull box next to the lighting standard.

Standards used for street lighting shall be pre-stressed concrete octagonal pole equal to the Ameron 1C1 Series. Pole length shall be 25' 9". Pole finishes shall be blasted black and white aggregates with no protective coating. Concrete lighting poles shall be ordered as double arm as shown on the plans.

The cost to provide and install the Electric Service Pedestal shall be included in the various items for double or single arm street lights.

Luminaire arm(s) shall be 8'-0" long. Material shall be of Carson-Steel sheets and strip structural quality, ASTM Designation A750, Grade C. Arm mounted on poles shall be perpendicular to street.

Material:
Pull Boxes: Caltrans No. 5 with a 12” extension or approved equal

Light standards: Pole length 25' 9"
Arm length 8'0" (single or double mast arm)
Pole - Ameron Series 1C1 pre-stressed concrete pole

Conduit & City Pull Boxes – All conduit and pull boxes located in the medians shall be placed in accordance with the Plans and Standard Drawings and the requirements of this section. For medians running in the north-south direction all conduit and pull boxes shall be installed on the east side of the median. For all medians running in the west-east direction all conduit and pull boxes shall be installed on the north side of the median.

45-27 Measurement and Payment

Traffic Signal Installation and Lighting
Payment for Traffic Signal Installation and Lighting shall be at the contract lump sum price. Full compensation for furnishing all labor, equipment, tools, materials, incidentals and for doing all work complete and in place, including providing the electrical service, to provide a fully functioning system in accordance with the State Standard Specifications and Plans, these Specifications and Plans, and all other Contract Documents shall be included in the lump sum price paid for Traffic Signal Installation and Lighting and no additional compensation will be allowed therefore. All temporary and final trench resurfacing for conduit installation and other items shall be included in the payment for Traffic Signal Installation and Lighting.

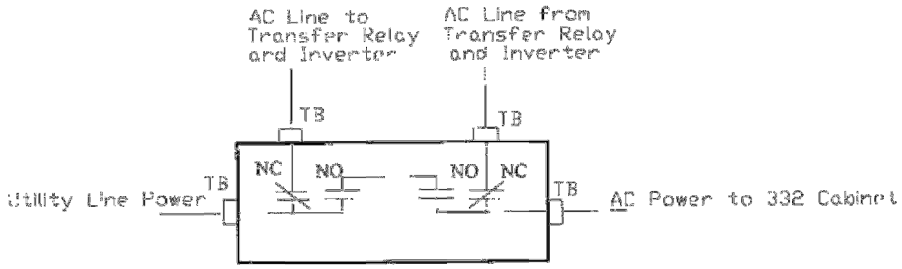
Note: Key all locks to match standard City keys. Controller cabinet lock shall match standard City controller cabinet key. Police panel lock shall match standard City police panel key. Battery backup cabinet lock shall match controller cabinet key.

Traffic Signal Interconnect Conduit
Payment for Traffic Signal Interconnect Conduit shall be at the contract unit price paid per lineal foot of conduit. Measurement shall be from pull box to pull box, along the alignment of the run, as measured in the field. Full compensation for furnishing all labor, equipment, materials, tools, and incidentals including conduits, wiring, pull boxes, sweeps, hardware, trenching, backfilling, paving, temporary and final trench resurfacing, boring, replacement of pavement striping and markers damaged during construction, protection of existing detector loops and leads, in accordance with the Specifications, Plans, and Contract Documents complete and in place shall be included in the unit price paid per lineal foot of conduit for Traffic Signal Interconnect Conduit and no additional compensation will be allowed therefore.

Median Lighting
Payment for Median Lights shall be at the contract unit price paid per each single or double arm street light pole. The contract price paid for each street light shall include full compensation for furnishing all labor, materials, tools, equipment, conduits, wiring, pull boxes, foundations, poles, mast arms, luminaries, trenching, backfilling, paving, temporary and final trench resurfacing, and incidentals and for doing all the work involved for installing each single or double arm street light, complete in-place, including providing the electrical service, as shown on the Plans, as specified in the Specifications, the Contract Documents, and as directed by the Engineer and no additional compensation will be allowed therefore.

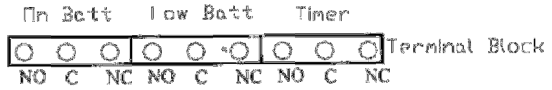
BBS Specification Clarifications

(a) Manual Bypass Switch (shown in non-bypass, or BBS, mode)



Notes:
1. TB - #8 Terminal Blocks
2. NO - Normally Open
3. NC - Normally Closed
4. NO/NC contacts shall all toggle simultaneously with one single manually operated switch.
5. Manual Bypass Switch shall only switch line. Neutral and Equipment Ground are not switched and shall be connected to 332 Cabinet buses.

(b) Relay contacts (NO/NC) available on panel-mounted terminal block (typ)



Notes:
1. NO/NC contacts may either share or use separate commons.

Figure 3

BBS Utility Power Connection Diagram

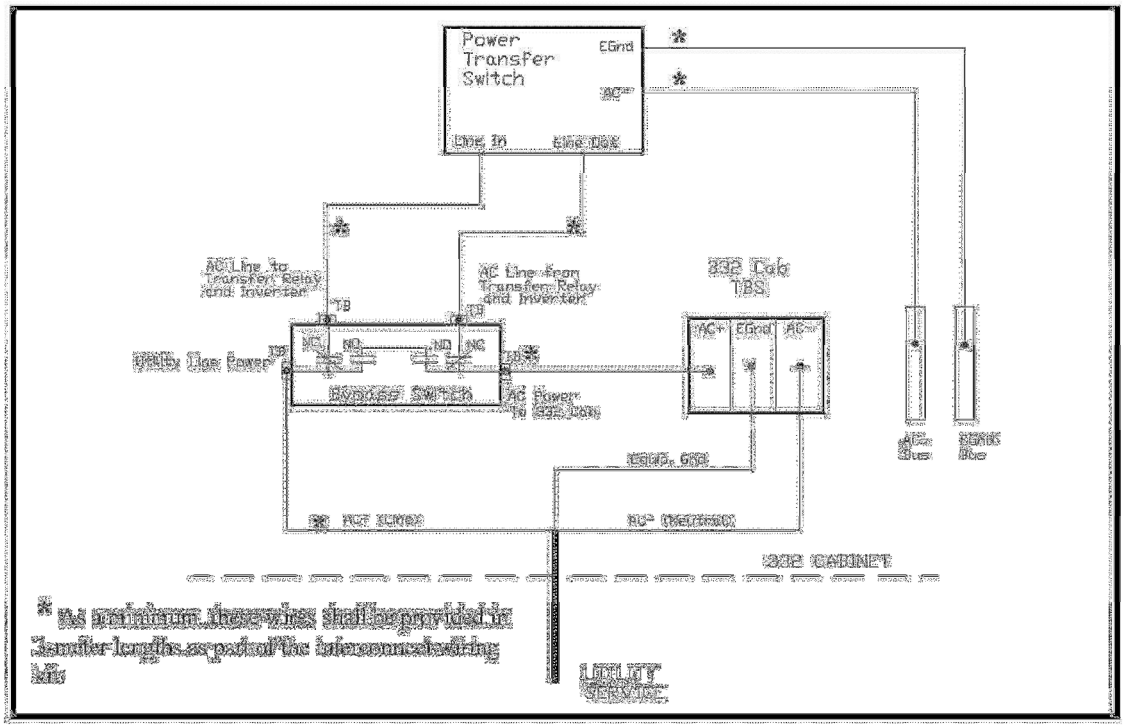


Figure 4

External Battery Cabinet

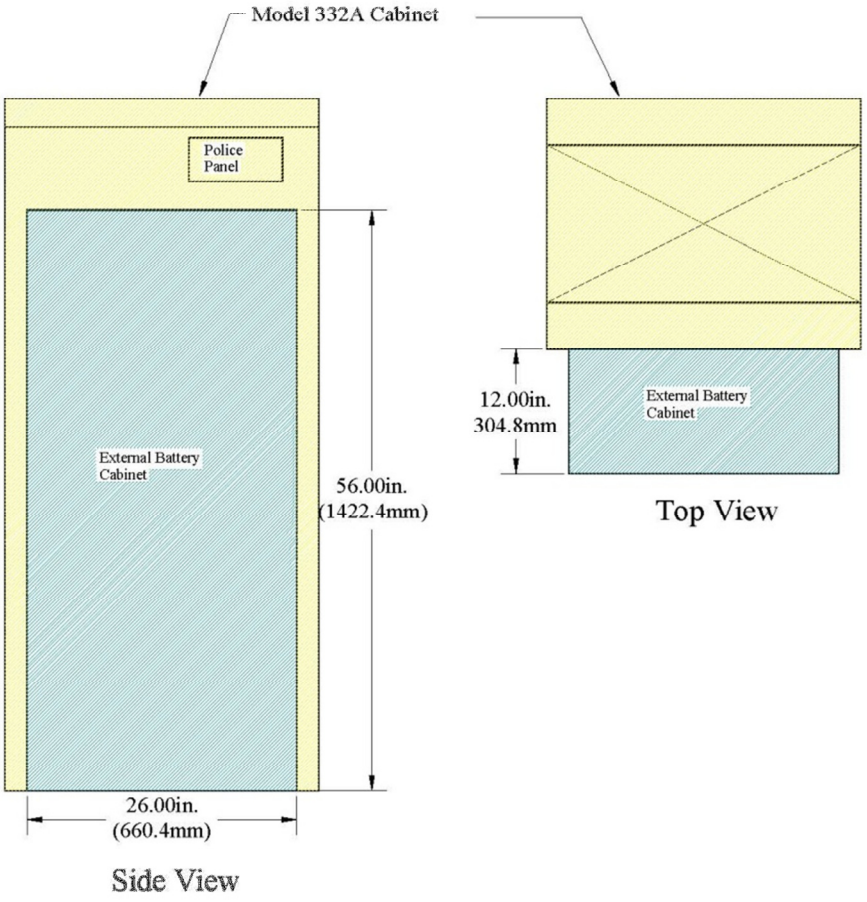


Figure 5

SECTION 46 TRAFFIC STRIPES, SIGNS, AND PAVEMENT MARKINGS

46-1 General

This work shall consist of, but not be limited to, furnishing and installing traffic signs, painted traffic stripes (traffic lines) and pavement markings including glass beads, at the locations and in accordance with the details shown on the Plans, as specified in the Specifications, or as directed by the Engineer. This work shall also include installation, maintenance, and removal of all temporary reflective markers and temporary reflective tape.

For the purposes of these Standard Specifications, traffic stripes (traffic lines) are defined as longitudinal centerlines and lanelines which separate traffic lanes in the same or opposing direction of travel, and longitudinal edgelines which mark the edge of the traveled way or the edge of lanes, or longitudinal lines which mark bicycle lanes. Pavement markings are defined as transverse markings which include, but are not limited to, word and symbol markings, limit lines (stoplines), crosswalk lines, bicycle lane markings, shoulder markings, and parking stall markings.

Permanent striping and marking shall not be placed on any new pavement surfaces until the surface has been in place for a minimum of 20 working days. The Contractor shall install temporary reflectorized markers which shall be left in place until the permanent striping is installed. Temporary reflective road marker tabs, approved for use by the Engineer, shall be installed in accordance with the manufacturer's specifications but shall not be spaced at more than 15-foot intervals. Temporary reflective road marker tabs shall also be placed at all stop bars that are removed and shall have a minimum of six (6) reflectors or as directed by the Engineer. The Contractor shall also install temporary reflective tape to establish obliterated pavement markings including but not limited to crosswalks, stop bars, stop markings, and turn arrows. The temporary reflective markers and temporary reflective tape shall be the same color as the lane line, centerline, or pavement marking the markers/tape replace. The Contractor shall maintain all temporary reflective markers and temporary reflective tape for the entire duration of the project.

The Contractor shall be responsible for cat tracking all traffic stripes and limit lines/crosswalk lines prior to placing permanent striping. Written approval of the temporary cat tracking shall be obtained from the Engineer prior to installing permanent striping and markings. All temporary road marker tabs and reflective tape shall be removed completely just prior to installation of the final striping and pavement marking.

46-2 Materials

46-2.1 Thermoplastic materials

Thermoplastic materials shall not be used unless shown to be required on the Plans or specified for use in the Contract Specifications. Where thermoplastic is required, thermoplastic material shall conform to Section 84-2.02 "Materials," of the State Standard Specifications.

46-2.2 Paints

Paint shall be waterborne unless otherwise shown on the plans or specified in the Contract Specifications. Traffic paint shall be Ennis Paint, EP Series water based, fast dry, Traffic and Parking Lot Paint, or Pervo Paint Company, Traffic water base, PTWB Series (Caltrans) 8000, or approved equal unless noted otherwise. All paint material shall be required to have glass beads applied to provide reflective qualities. All paints waterborne traffic shall be rapid dry, designed for traffic use and shall conform to the latest revisions of the San Joaquin Valley Unified Air Pollution District, Control Architectural Coatings Rule 4601 which requires that traffic paints shall not exceed the limit of 150 grams of volatile organic

compounds (VOC's) per liter of coating as applied, excluding water. Paint shall also comply with any applicable State air pollution regulations.

A. Waterborne Paint

Waterborne paint (rapid dry) shall comply with the following specifications:

Color	White	Yellow	Black
Pigment, % by weight +/- 2%	60	59	58
Vehicle, % by weight	38-42	38-42	38-42
Total Solids, % by weight minimum	76	75	74
Viscosity, K.U. @ 77° F	78-92	78-92	78-92
Fineness of Grind, Hegman minimum	3.5	3.5	3.5
Dry time: 77° F without beads ASMT D-711, minutes maximum	10	10	10
Flexibility, 8 Mils wet, 24 hours are dry ½" Mandrel	No cracking	No cracking	No cracking
Contrast Ratio: 15 Mils wet, min.	.98	.98	.98
Weight per gallon minimum	13.50	13.0	12.50
Reflectance, minimum	85	50	N/A
VOC gms/liter, maximum	150	150	150

B. Solvent Borne Paint

Where shown on the Plans or specified by the Contract Specifications to be applied, solvent borne paint shall comply with the following specifications:

Color	White	Yellow	Black
Pigment, % by weight	57-62	57-62	57-62
Vehicle, % by weight	38-42	38-42	38-42
Total Solids, % by weight minimum	72	72	72
Viscosity, K.U. @ 77° F	70-85	70-85	70-85
Fineness of Grind, Hegman Minimum	4	4	4
Dry time: 77° F without beads ASMT D-711, minutes maximum	3-6	3-6	3-6
Flexibility, 8 Mils wet, 24 hours are dry ½" Mandrel	No cracking	No cracking	No cracking
Contrast Ratio: 15 Mils wet, min.	.98	.98	.98
Reflectance, minimum	85	50	N/A
VOC gms/liter, maximum	150	150	150

46-2.3 Curb and Parking Stall Painting

Curb Painting: curbs shall be painted as shown on the plans. Both the top of the curb and the face of the curb shall be painted. Parking stall "T-markers" and curbs do not require glass beads and reflective qualities.

Curbs shall be clean and dry prior to painting. Contractor shall remove existing curb paint by scraping or grinding prior to application of new paint. Grinding shall not damage the existing concrete improvements.

Curbs shall be painted the color as specified on the plans. Curb paint shall be applied by spraying methods approved by the Engineer.

Curb paint shall be Ennis Paint, EP Series, water based, fast dry, Traffic and Parking Lot Paint, or Pervo Paint Company, Traffic water based, PTWB Series (Caltrans) 8000 Series, or approved equal.

46-2.4 Glass Beads

Glass beads (spheres) shall conform to State Specification No. 8010-004 (Type II) and meet the following requirements.

General: Glass spheres shall lend themselves readily to firm embedment when dropped on freshly placed waterborne and solvent borne traffic paint.

Appearance: A minimum of 85% of the spheres by count shall be true spheres when testing in accordance with applicable ASTM Methods. They also shall be free of air inclusions, milkiness and dark spots. The spheres shall be clean and free of any foreign material.

Coatings: Spheres to be used on Waterborne Paint: The spheres shall be treated with the correct coatings to maximize proper embedment and adhesion in water borne paint.

Spheres to be used on Solvent Borne Paint: The spheres shall be completely uncoated. There shall be no moisture or adhesion coating applied to the spheres.

Gradation: The glass spheres shall conform to the following grading requirements to closely match the AASHTO Designation: M-247.

US Mesh	% By Weight Passing
20	100
30	85 +/- 10%
50	15-35
100	0-5

Physical Properties. Glass spheres shall conform to the following properties:

Refractive Index, minimum 1.50

Moisture Content, maximum 0.01%

46-2.5 Traffic Signs

All traffic signs and the installation thereof shall conform to the current Standards of the California MUTCD and the following:

All traffic signs shall be 0.080 inch thick aluminum.

Stop Signs, Speed Limit Signs, and all School and Pedestrian Signs shall have a 3M #4090 DG3 reflective sheeting with an applied 3M #1160 or equal Graffiti Film. School and Pedestrian Signs shall be Florescent Yellow Green in color.

All other signs shall have 3M 4000 series "Diamond Grade" reflective sheeting with an applied 3M #1160 or equivalent Graffiti Film.

46-2.6 Sign Mounting Hardware

All mounting hardware shall be zinc coated, galvanized, or stainless steel. Aluminum will only be allowed for rivets. Banding shall be ½ inch wide stainless steel. Hose clamps are not permitted.

Signs mounted on street light poles or traffic signal poles shall be mounted with "Band-it Type" 3/4-inch stainless steel strapping material.

46-2.7 Sign Posts

All posts for traffic signs shall be Telespar 2 inch square x 14 gauge galvanized steel, with holes punched on all four sides for the entire length of the post.

All post anchor bases for traffic signs shall be Telespar 2-1/4 inch square x 12 gauge galvanized steel.

46-3 Removal of Existing Markings

Removal of existing striping or pavement markings shall comply with Section 15-2.2C, "Traffic Stripes and Pavement Markings," and the directions of the Engineer.

46-4 Application Equipment

Application equipment for paint shall comply with Section 84-3.02C, "Application Equipment," of the State Standard Specifications and all equipment shall be "No Airspray Equipment".

46-5 Application of Paint and Glass Beads

Preparation of surfaces and application of paint and beads shall conform to the requirements of Sections 84-1 & 84-3 of the State Standard Specifications, and as amended by these Standard Specifications. Tolerances and appearance shall conform to the requirements of Section 84-1.03C, "Tolerances and Appearance," of the State Standard Specifications.

The application rates of waterborne or solvent borne paint provided in Section 84-3 of the State Standard Specifications and as amended by these Standard Specifications. Two coats of paint shall be applied at the rate of 100 square feet per gallon of paint at a thickness of 15 mils wet. Glass beads shall be applied for both coats of paint at a rate of 5 lbs. per gallon of paint.

Word markings, letters, numerals, legends and symbols shall be applied utilizing suitable approved equipment together with approved stencils and templates. All markings shall be standard, and shall be identical with those used by the City of Visalia.

When no previously applied figures, markings, or traffic striping are available to serve as a guide, suitable layouts such as "cat-tracking" shall be spotted in advance of the permanent application. Written approval of temporary layout shall be obtained from the Engineer prior to permanent application. The Contractor shall mark or otherwise delineate the traffic lanes in the new roadway or portion of roadway, or detour, before opening it to traffic.

Alignment and layout of the work by the Contractor shall conform to Sections 84-1 and 84-3 of the State Standard Specifications. The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimensions, and application of the pavement striping and marking.

In areas of high traffic volume, the Contractor shall schedule work to apply traffic lines and markings in off-peak traffic hours, or on weekends. In all cases, the Contractor shall use proper and sufficient directional signs, warning devices, barricades, pedestals, lights, traffic cones, flagpersons, or such other devices to protect the work, workers, and the public.

All markings and striping shall be protected from injury and damage of any kind while the material is drying. All adjacent surfaces shall be protected from disfiguration by spatter, splashes, spillage, and dripping of material. The contractor shall clean any excess materials on the work site as soon practical after the application of the various materials. Damaged stripes or markings shall be cleaned and reapplied by the Contractor at his expense.

46-6 Traffic Sign Installation

Traffic signs shall be installed at the locations, of the type, and at the height shown on the Plans, as specified in the Specifications, as directed by the Engineer, and in conformance with the current California MUTCD.

If a sign is to be installed in existing concrete, the concrete shall be cored with a 8-inch diameter hole.

If a sign is to be placed where new concrete is to be poured, a post anchor base shall be provided in the new concrete. Solid embedment of sign posts in concrete is not permitted.

Sign posts shall be imbedded in the ground to the depth specified in the Plans, Contract Specifications, or California MUTCD as applicable. Any voids around sign posts passed through sleeves in concrete shall be backfilled with soil and thoroughly compacted to the satisfaction of the Engineer.

If the plans call out a new traffic sign post within 20' of an existing sign post, street light pole, or traffic signal pole, the Contractor shall call it to the attention of the Inspector. The Engineer shall determine if the traffic sign can be mounted on the existing post, street light pole, or traffic signal pole. Every effort shall be made to reduce the number of new traffic sign posts within the project limits. Signs mounted on street light poles or traffic signal poles shall be mounted with "Band-it Type" 3/4-inch stainless steel strapping material.

46-7 Measurement

Unless otherwise specified in the Contract Specifications, Striping and Marking Pavement shall be measured on a lump sum basis, and shall include any required removal of existing pavement striping or markings.

Unless otherwise specified in the Contract Specifications, traffic signs will be measured on a per each basis.

46-8 Payment

The lump sum price paid for Striping and Marking Pavement shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as specified in the Specifications, or as directed by the Engineer.

The per each price paid for Signs shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in installing signs as shown on the Plans, as specified in the Specifications, or as directed by the Engineer.

SECTION 47 RAISED PAVEMENT MARKERS

47-1 General

Raised Pavement Markers shall be as specified in Section 85, "Pavement Markers," of the State Standard Specifications, except as modified in this Section 47.

Deletions:

Section 85-1.03D Pavement Recesses is hereby deleted.
Delete from all other sections any reference to pavement recesses.

Additions:

Pavement Marker Protection
In compliance with Sections 7-18, "Public Safety," 15-2.2C, "Traffic Stripes and Pavement Markings," and 15-2.2D, "Pavement Markers," the Contractor shall provide appropriate traffic control measures to protect all newly placed raised pavement markers from damage, up to and including scheduling the installation during off-peak or weekend periods. Any damaged pavement markers shall be immediately replaced at the Contractor's expense. Where existing raised pavement markers are to remain, the Contractor shall take special care to protect existing pavement markers from damage or coating. The Contractor shall, at his expense, replace all damaged or coated markers.

Pavement Marker Removal
Removal of Pavement Markers shall comply with Sections 7-18, "Public Safety," 15-2.2C, "Traffic Stripes and Pavement Markings," and Section 15-2.2D, "Pavement Markers," and the directions of the Engineer.

Measurement and Payment
Measurement and payment for installing Raised Pavement Markers will be made on a lump sum basis and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved therein as shown on the Plans, as specified in the Specifications, or as directed by the Engineer.

SECTION 48 ENGINEERING FABRICS

Engineering fabrics shall be as specified in Section 88, "Engineering Fabrics," of the State Standard Specifications.

SECTION 49 (RESERVED)

SECTION 50 PORTLAND CEMENT CONCRETE

Portland Cement Concrete shall be as specified in Section 90, "Concrete," of the State Standard Specifications, except as modified in this Section 50.

All minor concrete improvements constructed in the City of Visalia including, but not limited to, manhole bases, curbs, gutters, curb and gutter, valley gutters, sidewalks, curb ramps, alley approaches, driveway approaches, mow strips, fence footings, median caps, and other facilities shall be considered "Minor Concrete" in accordance with Section 90-2 of the State Standard Specifications, unless noted otherwise on the Plans or specified in the Contract Specifications.

The following Sections of the State Standard Specifications shall be amended as follows:

90-2.01C Submittals
For all mix designs, submit compressive strength test results that verify the minimum required compressive strength. In addition to the submittals listed in this section, all concrete mix design submittals shall include test history results that show the concrete compressive strength of the concrete mix at 3 days, 7 days and 28 days. Certificates of Compliance will be required for the concrete mix design, aggregates, portland cement, any SCM used in the mix design, and any other item as required by the Engineer.

90-2.02B Cementitious Material
In the City of Visalia the required cementitious content will be determined by Concrete Class as follows:

Class 2 Concrete shall contain not less than 590 pounds of cementitious material per cubic yard with 1-inch maximum aggregate grading. Mix shall have a 5 inch maximum slump with a minimum 28 day compressive strength of 3,000 pounds per square inch.

Class 3 Concrete shall contain not less than 505 pounds of cementitious material per cubic yard with 1-inch maximum aggregate gradation. Mix shall have a 5 inch maximum slump with a minimum 28 day compressive strength of 2,500 pounds per square inch.

Class 4 Concrete shall contain not less than 420 pounds of cementitious material per cubic yard with 1-inch maximum aggregate gradation. Mix shall have a 5 inch maximum slump with a minimum 28 day compressive strength of 2,500 pounds per square inch.

Where no concrete class is specified on the Plans or Standard Drawings or in these Specifications, Class 3 Concrete shall be used.

Where other sections of these Specifications require different concrete mix properties than those shown in this section, the mix properties required in the other Sections shall take precedence.

Unless approved otherwise by the Engineer, a minimum of 85 percent of the cementitious material used in the mix design for each Concrete Class shall be a Type II or V Portland Cement complying with the requirements of ASTM C150 and the State Standard Specifications or a combination thereof. Where approved by the Engineer, up to 15 percent of the cementitious material required in the concrete mix may be Class F Fly Ash meeting the requirements of the State Standard Specifications.

90-2.02C Aggregate
The maximum aggregate size must not be larger than 1 inch. Combined Aggregate Grading for Minor Concrete shall meet the 1-inch maximum grading requirements of Section 90-1.02C(4)(d) "Combined

Aggregate Grading," of the State Standard Specifications. The following Combined aggregate grading table is copied from the State Standard Specifications for reference:

Sieve size	Percentage passing			
	1-1/2 inch max	1 inch max	1/2 inch max	3/8 inch max
2 inch	100	--	--	--
1-1/2 inch	90–100	100	--	--
1 inch	50–86	90–100	--	--
3/4 inch	45–75	55–100	100	--
1/2 inch	--	--	90–100	100
3/8 inch	38–55	45–75	55–86	50–100
No. 4	30–45	35–60	45–63	45–63
No. 8	23–38	27–45	35–49	35–49
No. 16	17–33	20–35	25–37	25–37
No. 30	10–22	12–25	15–25	15–25
No. 50	4–10	5–15	5–15	5–15
No. 100	1–6	1–8	1–8	1–8
No. 200	0–3	0–4	0–4	0–4

Do not change from one aggregate grading to another during the progress of the work.

Section 90-1.01C(2) will apply and the portions of Section 90-1.02C that define aggregate quality will apply to minor concrete.

90-2.04 Payment

No payment will be made for Portland Cement Concrete. Payment will be considered included in the various bid items of work to which the work relates.

SECTION 51 PAINT

Paint shall be as specified in Section 91, "Paint," of the State Standard Specifications.

SECTION 52 ASPHALTS

Asphalts shall be as specified in Section 92, "Asphalts," of the State Standard Specifications.

SECTION 53 LIQUID ASPHALTS

Liquid Asphalts shall be as specified in Section 93, "Liquid Asphalts," of the State Standard Specifications. Section 93-1.04 "Payment" of the State Standard Specifications shall have the following sentence added: Liquid Asphalt will be paid for under other bid items requiring liquid asphalt unless noted otherwise in the Special Provisions.

SECTION 54 ASPHALTIC EMULSIONS

Asphaltic Emulsions shall be as specified in Section 94, "Asphaltic Emulsions," of the State Standard Specifications. Section 94-1.04 "Payment" of the State Standard Specifications shall have the following sentence added: Asphaltic Emulsions will be paid for under other bid items requiring liquid asphalt unless noted otherwise in the Special Provisions.

SECTION 55 EPOXY

Epoxy shall be as specified in Section 95, "Epoxy," of the State Standard Specifications.