



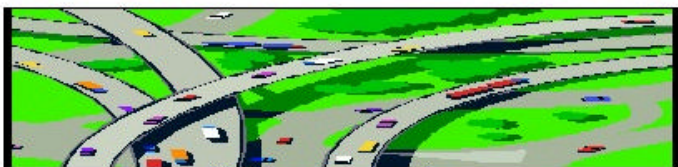
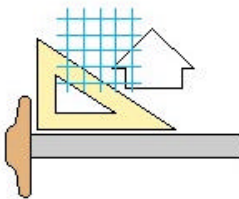
County of Santa Clara

Roads & Airports
Department



STANDARD SPECIFICATIONS

May 2000



<http://www.countyroads.org>

**COUNTY OF SANTA CLARA
ROADS & AIRPORTS DEPARTMENT**

**Standard
Specifications**

May 2000

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Board of Supervisors**

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FOREWORD

This May 2000 edition of the County of Santa Clara Roads & Airports Department Standard Specifications Manual sets forth the requirements for design, construction, inspection, and contract administration of public works projects within the purview of the Roads & Airports Department. This Manual supersedes the November 1993 Transportation Agency Standard Specifications.

Both the International System (SI) of Units and U.S. Customary Units are used in this Manual. The Department encourages the use of SI Units in the project documents. However, if the design and construction project documents are prepared using the U.S. Customary Units, the designer is responsible for ensuring that the applicable Caltrans' July 1992 Standard Specifications that supplement this Manual have been updated accordingly.

Current price for the Manual is \$25.00 and is subject to change at any time. Copies may be purchased at the following locations:

Roads & Airports Department
Plan Counter
101 Skyport Dr.
San Jose, Ca. 95110-1302
Tel. No.:408-573-2440
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Central Permits Office
70 W. Hedding St.
7th Floor, East Wing
San Jose, Ca. 95110
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The Manual is also available for viewing and downloading from the internet at the Department's website <http://www.countyroads.org>.

The Department welcomes comments and suggestions regarding this Manual. Please direct your comments to Tong Hong at 408-494-1309 or the above website.

Sincerely,

Michael J. Murdter
Director, Roads & Airports Department
County Road Commissioner

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SECTION 1
ABBREVIATIONS AND DEFINITIONS

1.01 ABBREVIATIONS

Whenever in these Standard Specifications or in other Contract Documents the following abbreviations are used, the intent and meaning shall be interpreted as follows:

AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
AC	Asphalt Concrete
ACI	American Concrete Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
APHH	American Public Health Institute
API	American Petroleum Institute
APWA	American Public Works Association
AREA	American Railway Engineering Association
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWG	American Wire Gauge
AWWA	American Water Works Association
BU	Bushel
CDAY	Calendar Day
CF	Cubic Foot
CSD	County Standard Details
CSI	Construction Specifications Institute
CSS	County Standard Specifications
CY	Cubic Yard
dBa	Decibel based on the A-weighted network
Ea	Each
EIA	Electronic Industries Association
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
g	Gram
Gal	Gallon

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IAMPO	International Association of Mechanical and Plumbing Officials
ICBO	International Conference of Building Officials
ITE	Institute of Transportation Engineers
IEEE	Institute of Electrical and Electronics Engineers
kg	Kilogram
km	Kilometer
km/h	Kilometer per hour
L	Liter
Lb	Pound
LF	Linear Foot
LRT	Light Rail Transit
LS	Lump Sum
LSSC	Lighting and Signal Systems Center
lx	Lux or Lumen/m ²
m	Meter
MFBM	Thousand Foot Board Measure
MGal	Thousand Gallon
Mi	Mile
mL	Milliliter
MPa	Megapascal
MSYD	Thousand Station Yard
MYD	Thousand Yard
N	Newton
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Agency
Pa	Pascal
PCC	Portland Cement Concrete
PP	Project Plans
PSP	Project Special Provisions
SQFT	Square Foot
SQYD	Square Yard
SSP	State Standard Plans
SSS	State Standard Specifications
Sta	Station
STYD	Station Yard
TAB	Tablet
TMi	Ton Mile
UBC	Uniform Building Code
UL	Underwriters' Laboratory
UPC	Uniform Plumbing Code

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USA Underground Service Alert
USC United States Code

1.02 DEFINITIONS

Whenever in these Specifications or in other Contract Documents the following terms or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

- Abandon: Render unserviceable, in place, by doing some kind of Work as specified in the Contract Documents.
- Acceptance: The formal acceptance by the Board of Supervisors or by the Purchasing Agent, as applicable, of the Work of the Contract which has been completed to the Owner's knowledge as being performed in accordance with the Contract Documents and any modifications thereof previously approved. The date of Acceptance shall be the date of the minute order of the Governing Body accepting the Work provided, however, that as to all items of the Work, which are incomplete upon the date of said minute order, the date of Acceptance shall be the date of final payment under the Contract.
- Addendum: A written change in the Plans or Special Provisions issued prior to the time fixed for opening of the Bids.
- Adjust: Raise or lower a facility to match a new grade line. The work is generally associated with raising frame and grate or frame and cover of facilities on resurfacing projects. It includes raising or lowering of frame and cover, frame and grate of concrete or brick manhole, circular precast concrete pipe structures, or electrical pullboxes, by adding or subtracting raising devices only. Work may require some removal and, in the case of pullbox adjustment, it shall include modification to existing conduit risers and placement of grouting and pervious materials at base of pullbox according to the standard details. Any change to taper of manhole or steps is considered as Remodel.

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Approved, Directed, Ordered or Required:	Whenever these words or their derivatives are used, it is the intent, unless otherwise clearly stated, that approval or direction by the Engineer is indicated.
Architect:	Synonymous with Engineer.
As-built Record Drawings:	Construction plans stamped as such and signed off, containing revisions and design changes from the Redlined Construction Plans upon Project completion.
Auxiliary Lane:	That portion of the Roadway adjoining the Traveled Way for speed change or other purposes supplementary to through traffic movement.
Base:	A layer of specified material of planned thickness placed immediately below the Pavement or Surfacing.
Basement Material:	The material in excavation or embankments underlying the lowest layer of Sub-Base, Base, Pavement, Surfacing or other specified layer which is to be placed.
Bid:	The offer of the Bidder to perform the Work when made out and submitted on the prescribed Bid Forms properly executed and guaranteed.
Bid Form(s):	The approved form(s) upon which the Owner requires Bid be prepared and submitted for the Work.
Bid Guaranty:	The cash, cashier's check, certified check or bidder's bond accompanying the Bid submitted by the Bidder as a guaranty that the Bidder will enter into a Contract with the Owner for the performance of the Work if the Contract is awarded to the Bidder. The Bidder's bond must be submitted on the prescribed form.
Bid Plans:	Project Plans, including Addenda, as approved by the Board of Supervisors or Purchasing Agent for Bid purposes.

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- Bidder:** Any individual, firm, partnership, corporation, or combination thereof, submitting a Bid for the Work contemplated, acting directly or through a duly authorized representative.
- Bidder's Bond** See Bid Guaranty.
- Board of Supervisors:** The Board of Supervisors of the County of Santa Clara.
- Bridge:** Any structure, other than a culvert, which carries a utility facility, or railroad, highway, pedestrian, or other traffic, over a water course or over or under or around any obstruction.
- Calendar Day:** Any day in a calendar year including Saturday, Sunday, Legal Holiday, and Working Day, regardless of inclement weather or other adverse conditions.
- Caltrans:** The State of California Department of Transportation.
- Change Order:** Written amendment to the Contract changing scope of work, time, and/or Contract awarded amount, which requires approval by the Board of Supervisors or the Purchasing Agent.
- Construction Plans:** Conformed Bid Plans with all Addenda included with which the successful Contractor will construct the Project.
- Consultant:** Architect, engineer, construction manager, and other professional specialist engaged to provide professional services for the Project.
- Contract:** The written agreement on the Owner's form covering the performance of the Work and the furnishing of labor, materials, tools, and equipment in the construction of the Work. Synonymous with Agreement.
- Contract Bonds:** The Contract Bonds include the performance bond and payment bond for public works.

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Contract Documents:	The Contract Documents consist of the Special Provisions, Plans, County Standard Specifications and Standard Details, State Standard Specifications and Standard Plans, and any Addenda or written modifications to any of the foregoing.
Contractor:	The person or persons, firm, partnership, corporation, or combination thereof, private or municipal that have entered into a Contract with the Owner as party or parties of the second part or his, her or their legal representatives.
Controlling Operation(s)	Operation(s) which include(s) any feature of the Work (e.g., an operation or activity, or a settlement or curing period) considered at the time by the Project Engineer and the Contractor, which, if delayed or prolonged, will delay the time of completion of the Contract.
County:	The County of Santa Clara, a political subdivision of the State of California.
County Standard Details:	The current Standard Details approved by the Board of Supervisors and issued by the Santa Clara County Roads and Airports Department at the time of the Contract award.
County Standard Specifications:	The current Standard Specifications approved by the Board of Supervisors and issued by the Santa Clara County Roads and Airports Department at the time of the Contract award.
Culvert:	Any structure, other than a Bridge, which provides an opening under a Roadway for drainage or other purposes.
Days:	Days as used in the Contract Documents will be understood to mean Calendar Days, unless otherwise designated.
Detour:	A temporary route for traffic around a closed portion of road.

SECTION 1

Divided Highway:	A highway with separated Traveled Ways for traffic, generally in opposite directions.
Engineer:	The Director of the Roads and Airports Department or Road Commissioner of the County of Santa Clara or the representative of the Director duly authorized and appointed by the Director.
Extra Work	New and unforeseen work determined by the Project Engineer that such work is outside the scope of the Contract Work. In the event that portions of such work are determined by the Project Engineer to be covered by the scope of Contract Work, the remaining portion of such work will be classed as Extra Work.
Federal Agencies:	Whenever, in the Contract Documents, reference is made to any federal agency or officer, such reference shall be deemed made to any agency or officer succeeding in accordance with law to the powers, duties, jurisdiction, and authority of the agency or officer mentioned.
Fixed Costs:	Any necessary labor, material, and equipment costs directly expended on the item or items under consideration which remain constant regardless of the quality of the work done.
Float:	The difference in time between the time required to do the Work and the time allocated for the Work. Float is not specifically for the benefit of either the Owner or Contractor. It is a resource available to both parties.
Force Account:	Method of performing Work by or on behalf of Contractor on a time, materials, and equipment basis.
Formal Contract:	Contract awarded and accepted by the Board of Supervisors.

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Frontage Road:	A local street or road auxiliary to and located generally on the side of an arterial highway for service to abutting property and adjacent areas and for control accesses.
Governing Body:	The Board of Supervisors of the County of Santa Clara.
Grading Plane:	The surface of the Basement Material upon which the lowest layer of Sub-Base, Base, Pavement, Surfacing, or other specified layer is placed.
Highway:	The whole right-of-way or areas, which is or are reserved or secured for use in constructing the Roadway and its appurtenances.
Laboratory:	The established Material and Research Testing Laboratory of the Roads and Airports Department of the County of Santa Clara, or other laboratories authorized by the Engineer to test materials and work involved in the Contract.
Legal Holiday:	Days designated as State holidays in the Government Code.
Liquidated Damages:	The amount prescribed in the Contract Documents to be paid to the Owner 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 plus any approved time extension(s).
Manual of Traffic Controls:	The current manual entitled "Manual Of Traffic Controls for Construction and Maintenance Work Zones" approved and issued by the State of California, Department of Transportation.
Median:	That portion of a divided highway separating the Traveled Ways for traffic in opposite directions including inside Shoulders.

SECTION 1

Minor Contract:	<p>Contract awarded and accepted by the Purchasing Agent and administered under the Uniform Public Construction Cost Accounting Act, which qualifies in one of the following categories:</p> <ul style="list-style-type: none">• Project awarded for no more than \$75,000,• Project under the emergency declaration by the Board of Supervisors.
Modify:	<p>A change that does not affect the basic framework or structure with an addition and/or subtraction to an appurtenant part. It may require some Removal. It includes raising or lowering of frame and cover or frame and grate of drainage inlets by Removing concrete or adding concrete.</p>
Notice of Award:	<p>Letter from the Owner notifying Contractor's Bid acceptance subject to receipt of Contract signed by Contractor, and submission and acceptance of bonds and insurance.</p>
Notice to Bidders:	<p>The public advertisement inviting sealed bids for the Work. For Minor Contracts, it is referred to as Invitation to Bidders.</p>
Notice to Proceed:	<p>Written notice issued by the Owner to Contractor authorizing Contractor to proceed with the Work and specifying the first day charged to the Contract.</p>
Owner:	<p>The County of Santa Clara.</p>
Pavement:	<p>The uppermost layer of material placed on the Traveled Way or Shoulders. This term is used interchangeably with Surfacing.</p>
Plans:	<p>Synonymous with Drawings and Contract Drawings. The official Project Plans, Standard Plans, profiles, typical cross-sections, general cross-sections, working drawings and supplemental drawings, or reproductions thereof, approved by the Project Engineer, which show the location, character, dimensions and details of the Work to be performed.</p>

SECTION 1

All such documents are to be considered as a part of the Plans whether or not reproduced in the Special Provisions. In the above definition, the following terms are defined as follows:

- Standard Plans: The Standard Plans of the Department of Transportation, State of California.
- Project Plans: The project plans are specific details and dimensions peculiar to the work and are supplemented by the County Standard Details or Standard Plans insofar as the same may apply.
- Standard Details: The Standard Details of the Santa Clara County Roads and Airports Department.

Processing: Any operation or operations of whatever nature and extent required to produce a specified material.

Project: The entire public improvement proposed by Owner to be constructed in whole or in part pursuant to the Contract, including any phasing or milestone requirement.

Project Engineer: The Owner's authorized representative to manage the Contract and Project.

Project Inspector: The Project Engineer's authorized field representative and liaison between the Project Engineer and Contractor, who administers the construction contract and inspects the Work in accordance with the Contract Documents.

Purchasing Agent: Owner's authorized agent for Minor Contracts.

Reconstruct: Remove and disassemble and construct again at an existing or new location. New parts or alteration may or may not be required.

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Red-lined Construction Plans:	Construction plans indicating red-lined revisions and/or design changes approved by the Project Engineer made during the construction phase (these plans have sometimes been referred to as field As-Builts).
Relay:	Remove and lay in an existing or new location. It is generally used for pipes or culverts and appurtenances.
Relocate:	Remove and install or place in a new location. No alteration is required.
Remodel:	Rebuild facility in same location. It may require some Removal.
Remove:	Remove and dispose of.
Reset:	Remove and install or place at same station location or move laterally only. No alteration is required.
Roadbed:	The area between the intersection of the upper surface of the Roadway and the side slopes or curb lines. The roadbed rises in elevation as each increment or layer of Sub-Base, Base, Surfacing, Or Pavement is placed. Where the medians are so wide as to include areas of undisturbed land, a divided highway is considered as including two (2) separate Roadbeds.
Roads & Airports Department:	The Department of Roads & Airports of the County of Santa Clara.
Roadway:	That portion of the highway included between the outside lines of sidewalks, or curbs, slopes, ditches, channels, waterways, and including all the appertaining structures, and other features necessary to proper drainage and protection.
Salvage:	Remove and haul to a designated location as specified in the Contract Documents.

SECTION 1

Shoulders:	That portions of the completed Roadbed between the edge of the Traveled Way and side slopes.
Special Provisions:	Specific clauses setting forth conditions or requirements pertaining to the Work and are supplementary to the County Standard Specifications.
Specifications :	Directions, provisions, and requirements contained in these Standard Specifications. They are supplemented by the Contract Documents.
State:	The State of California or the County of Santa Clara, as applicable.
State Standard Plans:	The current Standard Plans approved and issued by the State of California, Department of Transportation. It is also referred to as Standard Plans.
State Standard Specifications:	Sections 10 through 95 inclusive of the current Standard Specifications of the State of California, Department of Transportation. It is also referred to as State Specifications.

Notes:

1. Sections 1 through 9 inclusive of the State Specifications have been deleted and replacement sections have been included in these County Standard Specifications to reflect requirements applying to the Santa Clara County Roads and Airports Department.
2. Whenever reference is made in Sections 10 through 95 of the State Specifications to any provision in Sections 1 through 9 inclusive of the State Specifications, such reference shall apply to the appropriate corresponding sections in the County Standard Specifications. The section is identical to the section number of the State Specifications; however, the subsection number may not be identical. (Example: In the State

SECTION 1

Specifications, Section 11-1.02 “Payment” makes reference to Section 9-1.06 “Partial Payments”. In the County Standard Specifications, Bidder is instructed to refer to Section 9.08 “Timely Progress Payments & Interest”).

State Traffic Manual:	The current Traffic Manual approved and issued by the State of California, Department of Transportation.
Sub-base:	A layer of specified material of planned thickness between Base and the Basement Material.
Subcontractor:	A person or organization having a direct or indirect contract with Contractor and not with Owner for the performance of any Work for the Project.
Sub-grade:	That portion of the Roadbed on which Pavement, Surfacing, Base, Sub-Base, or a layer of any other material is placed.
Substructure:	All that of the bridge below the bridge seats, top of piers, haunches of rigid frames, or above the spring lines of arches.
Supplemental Work	A Bid item established by Owner to be included in the total Bid price. This Bid item is to provide payment for Extra Work items as specified in CSS 4.07 “Extra Work,” and work items specifically designated in the Contract Documents to be paid for under the Bid item “Supplemental Work.”
Surety:	A company that executes Contractor’s bonds for bidding, performance, and payment.
Surfacing:	The uppermost layer of material placed on Traveled Way or Shoulders. This term is used interchangeably with Pavement.
Traffic Lane:	That portion of a Traveled Way for the movement of a single line of vehicles.

SECTION 1

Traveled Way: That portion of the Roadway for the movement of vehicles, exclusive of Shoulders and Auxiliary Lanes.

Work: All the Work specified, indicated, shown or contemplated, in the Contract to construct the improvements, including all alterations, amendments, or extensions thereto made by Contract Change Order or other written orders of the Engineer.

Work Order: Written amendment to the Contract changing scope of work and/or time to be paid for under the supplemental work item, which requires approval by the Project Engineer.

Working Day: A working day is defined as any day, except as follows:

- Saturdays, Sundays, legal holidays;
- Days on which the Contractor is specifically required by the Special Provisions to suspend construction operations, and 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 such operation or operations for at least 60 percent of the total daily time being currently spent on the controlling operation or operations;
- Days on which the Contractor is prevented, by reason of requirements in “Maintaining Traffic” of the Special Provisions, from working on the controlling operation(s) for at least 60 percent of the total daily time being currently spent on the controlling operation(s).

**SECTION 2
BID REQUIREMENTS AND CONDITIONS**

2.01 CONTENTS OF BID FORMS

Prospective Bidders are furnished with Bid Forms. A Bid Form may contain a schedule of items for which only lump sum amounts are asked to be bid. It may contain estimated quantities of various kinds of Work to be performed or materials to be furnished with a schedule of items for which unit prices are asked to be bid. The unit prices and/or lump sum amounts bid shall include full compensation for furnishing all labor, materials, services, tools, and equipment to perform all Work complete in place in accordance with the Contract Documents.

2.02 ESTIMATED QUANTITIES

The quantities given in a schedule of items for which unit prices are asked to be bid are approximate only. They are being given as a basis for the comparison of Bids. The Owner does not, expressly or by implication, guaranty that the actual amount of Work will correspond therewith, and reserves the right to increase or decrease the amount of any class or portion of the Work, or to omit portions of the Work, as may be deemed necessary.

2.03 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK

The Bidder shall examine carefully the site of the Work contemplated, the Bid Forms, Plans, Specifications, and all other Contract Documents therefor. The submission of a Bid will be conclusive evidence that the Bidder has investigated and is fully aware of the conditions and difficulties to be encountered, of the character, quality and quantities of Work to be performed and materials to be furnished, and of the requirements of the Bid, Plans, Specifications, and other Contract Documents.

Bidders or Contractors are cautioned to make any independent investigation and examination as they deem necessary to be satisfied as to conditions to be encountered in the performance of the Work and, with respect to possible local material sources, the quality and quantity of material available from the property and the type and extent of

SECTION 2

processing that may be required in order to produce material conforming to the requirements of the Specifications.

The availability or use of the information, as listed below, shall not be construed in any way as a waiver of the provisions in the first paragraph of this Section 2.03. The information is available for review at the Santa Clara County Roads & Airports Department at 101 Skyport Drive, San Jose, California, and Bidders or Contractors may obtain copies of the information at their expense. It shall be expressly understood and agreed that information made available by Owner, which is not included in the Contract Documents, is solely for the convenience of the Bidders or Contractors, and that it does not constitute part of the Contract Documents and is subject to other conditions and limitations as set forth herein.

- A. Where investigation of subsurface conditions has been made by the Owner in respect to foundation or other design, Bidders or Contractors may inspect the records of the Owner as to such investigation, including examination of samples and drill cores, if any. When a log of test borings or other record of geotechnical data obtained by the Owner's/Owner's Consultant's investigation of subsurface conditions is provided by Owner/ Owner's Consultant, said record represents only the opinion of the Owner as to the character of materials or the conditions encountered in the investigation.

Investigations of subsurface conditions are made for the purpose of design, and the Owner assumes no responsibility whatsoever in respect to the sufficiency of test borings, accuracy of the log of test borings, or other preliminary investigations, or in the interpretation thereof. There is no guaranty, expressed or implied, that the conditions indicated are representative of those existing throughout the Work, or any part of it, or that unforeseen developments may not be encountered.

- B. Where As-Built Record Plans of the prior construction are currently in the possession of the Owner and which have been used by, or are known to, the Project Engineer, they will be made available for review by Bidders or Contractors upon request and subject to the conditions hereinafter set forth.
- C. In some instances, information considered by the Owner to be of possible interest to Bidders or Contractors has been compiled as

SECTION 2

“Materials Information”. It is understood and agreed that the compilation and furnishing of the “Materials Information” by the Owner to the Bidders or Contractors shall not be construed as a warranty or guaranty, expressed or implied, as to the completeness or accuracy of the compilation and that the use of the “Materials Information” shall be subject to all the conditions and limitations set forth in this Section 2.03 and Section 6.05 “Local Materials.”

- D. When cross-sections are not included in the Contract Documents, but are made available by Owner, Bidders or Contractors may inspect the cross-sections.
- E. When contour maps are used in the design of the Project, Bidders or Contractors may inspect those maps.

No information derived from inspection of such records or compilation thereof made by the Owner/Owner’s Consultant or from the Project Engineer will in any way relieve Bidders or Contractors from any risk or from properly fulfilling all the terms of the Contract Documents.

2.04 INTERPRETATION OF DOCUMENTS PRIOR TO BIDDING

If any person, contemplating submitting a Bid for the construction of the Project, is in doubt as to the true meaning of any part of the Plans, Special Provisions or other Contract Documents; or finds discrepancies in, or omissions from the Plans or Special Provisions, that person shall submit to the Project Engineer a written request for an interpretation or correction thereof at least seven (7) days before the deadline for receipt of Bids or as specified in the Contract Documents. A request received by the Project Engineer later than the above said deadline will not be answered. Any interpretation or correction of the Contract Documents will be made only by Addendum and will be mailed or delivered to each person receiving such Contract Documents. The Owner will not be responsible for any other explanation or interpretation of the Contract Documents.

2.05 SECURING DOCUMENTS AND PLAN FEE SCHEDULE

Copies of the Formal Contract Documents are on file and may be examined at the office of the Clerk of the Board of Supervisors, 70 West Hedding Street, San Jose, California. Copies of the Minor Contract

SECTION 2

Documents are on file and may be examined at the Santa Clara County Purchasing Department, 1555 Berger Dr., Bldg. 1, San Jose, California.

Copies of all Contract Documents may be obtained from the Santa Clara County Roads & Airports Department at the address designated on the Notice to Bidders after payment of the following non-refundable document fee. A non-refundable \$15.00 handling and shipping charge will be added to the document fee for mailing Bid Documents when requested.

ESTIMATED VALUE OF CONTRACT

DOCUMENT FEE

\$ 75,000	or	less	\$ 10.00
\$ 75,001	to \$	249,999	\$ 25.00
\$ 250,000	to \$	499,999	\$ 50.00
\$ 500,000	to \$	999,999	\$ 75.00
\$1,000,000	to \$	2,999,999	\$100.00
\$3,000,000	&	over	\$150.00

2.06 BID SUBMITTAL

Each Bid must be submitted on Owner-provided Bid Forms, which shall be completed by the Bidder, executed, and submitted as its Bid.

No facsimiles or electronically transmitted Bid or modification of a Bid will be considered. No Bid received after the date and time fixed for receiving Bids will be considered. Late Bid(s) will be returned to the Bidder(s) unopened.

Each Bid shall be enclosed in a sealed envelope bearing the title of the Work, the name of the Bidder, and the date and time of the Bid opening. Formal Contract Bids shall be addressed to the Chairperson of the Board of Supervisors and shall be delivered to the office of the Clerk of the Board of Supervisors at the address indicated on the Notice to Bidders. Minor Contract Bids shall include the Contract number and shall be delivered to the address indicated on the Invitation to Bidders. All Bids shall be delivered on or before the date and time set for the opening of Bids published in the Notice to Bidders. It is the sole responsibility of the Bidder to insure delivery and receipt of its Bid in proper time.

2.07 REJECTION OF BIDS

Any Bid may be rejected if it shows any alteration of the Bid Form(s), any addition or condition not called for, or any incompleteness, erasure, or irregularity of any kind.

2.08 BID GUARANTY

Each Bid over twenty five thousand dollars (\$25,000) shall be accompanied by cash, a certified or cashier's check, or a Bidder's bond in the sum of not less than 10% of the total aggregate of the Bid including all additives and/or all alternate Bid items. Said check or bond shall be made payable to the order of the County of Santa Clara.

2.09 WITHDRAWAL OF BIDS

Any Bid may be withdrawn at any time prior to the date and time fixed in the published Notice to Bidders for the opening of Bids only by written request for the withdrawal of the Bid filed with the Owner. The Bidder or his/her duly authorized representative shall execute the request. The withdrawal of a Bid does not prejudice the right of the Bidder to file a new Bid. Whether or not Bids are opened exactly at the time fixed in the published Notice to Bidders for the opening of Bids, a Bid will not be received after the date and time fixed, nor may any Bid be withdrawn after the date and time fixed in the said Notice.

2.10 OPENING OF BIDS

Bids will be opened and read publicly at the time and place indicated in the Notice to Bidders. Bidders or their authorized agents are invited to be present.

2.11 PROOF OF COMPETENCY OF BIDDERS

All Bidders must meet all qualification requirements contained in the Bid Documents.

Any Bidder may be required to furnish evidence satisfactory to Owner that the Bidder and its proposed Subcontractors have sufficient means and experience in the type of Work called for to assure completion of the Contract in a satisfactory manner.

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Award may be withheld from any Bidder not satisfactorily demonstrating sufficient means and experience, and the Contract may be awarded to the responsible Bidder submitting the lowest responsive Bid.

2.12 RELIEF OF BIDDERS

Attention is directed to the provisions of California Public Contract Code, Sections 5100 to 5107, inclusive, which set forth the criteria and procedures for relief of Bidders, and for authorizing Contract award to another Bidder.

2.13 DISQUALIFICATION OF BIDDERS

No more than one Bid from an individual, firm partnership, corporation, or combination thereof, as a principal, under the same or different names will be considered. Reasonable grounds for believing that any individual, firm, partnership, corporation or combination thereof is a principal in more than one bid for the Work contemplated may cause the rejection of all Bids in which such individual, firm, partnership, corporation or combination thereof is a principal. If there is reason for believing that collusion exists among the Bidders, any or all Bids may be rejected. Bids in which unit prices obviously are unbalanced may be rejected. A person, firm or corporation submitting a sub-bid to a Bidder, or who has quoted prices on materials to a Bidder, is not thereby disqualified from submitting a sub-bid or quoting prices to other Bidders or from being a principal Bidder for the same work.

2.14 SPECIAL NOTICES

Bidders are required to inform themselves fully of the conditions relating to the construction and labor under which the Work will be or is now performed. And, so far as possible, the successful Bidder must employ such methods and means in carrying out the Work as will not cause any interruption or interference with any other Contractor.

2.15 COMPLIANCE WITH CONTRACTOR'S LICENSING LAWS

Attention is directed to CSS Section 7.02 "Contractor's Licensing Laws," and the requirements of law referred to therein relating to the licensing of contractors.

**SECTION 3
AWARD AND EXECUTION OF CONTRACT**

3.01 AWARD OF CONTRACT

The Contract, if awarded, will be awarded to that responsible Bidder submitting the lowest responsive Bid subject to Owner's right to reject any or all Bids and to waive any informality or irregularity in the Bids or in the bidding procedures.

No Bidder may withdraw its Bid for a period of sixty (60) days after the date set for the opening thereof and the Bid shall be subject to acceptance by the Owner during this period.

3.02 CONTRACT BONDS

As a condition to Owner signing the Contract agreement, the Bidder shall file with the Owner, on the approved forms, the two Surety Bonds in the amounts and for the purposes noted below, duly executed by a Surety company meeting the requirements of the Contract Documents. The successful Bidder shall pay all premiums and costs thereof and incidental thereto. No Contract shall arise until all Bonds and insurance have been approved and the Contract Agreement signed by the Owner.

Each Bond shall be signed by both the Contractor and the Sureties.

The "Payment Bond for Public Works" shall be in an amount of 100 percent of the Contract price as determined from the prices on the Bid Form including the base Bid and all additives and/or Alternate Bid Items specifying in the Award, and shall inure to the benefit of persons performing labor or furnishing materials in connection with the Work of the proposed Contract. This Bond shall be maintained in full force and effect until all Work under the Contract is completed and accepted by the Owner, and until all claims for materials and labor have been paid.

The "Performance Bond" shall be in an amount of 100 percent of the Contract price as determined from the prices in the Bid Form including the base Bid and all additives and/or Alternate Bid Items specifying in the Award, and shall be so conditioned as to insure the faithful performance by the Contractor of all Work under the Contract. It shall

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also insure the replacing of, or making acceptable, any defective materials or faulty workmanship through the end of the guaranty or warranty period.

Should any Surety or Sureties be deemed unsatisfactory at any time by the Owner, notice will be given to the Contractor to that effect and Contractor shall forthwith substitute a new Surety or Sureties satisfactory to the Owner. No further payment shall be deemed due or will be made under the Contract until the new Surety or Sureties shall qualify and be accepted by the Owner.

All alterations, extensions of time, extra and additional work, and other changes authorized by the Special Provisions or any part of the Contract may be made without securing the consent of the Surety or Sureties on the Contract Bonds.

3.03 EXECUTION OF CONTRACT

The form of Contract which the successful Bidder, as Contractor, will be required to execute and the forms of Bonds and insurance coverages, which Bidder will be required to furnish, are included in the Contract Documents furnished to the Contractor and must be carefully examined by each Bidder.

Work shall be commenced only after receipt of the Owner's Notice to Proceed. Contractor shall complete the Work called for in the Contract Documents within the time limit stated in the Notice to Bidders. Regardless of the date of the Notice to Proceed, the first day charged for Formal Contracts shall be the 20th day following the Notice of Award issued by Owner and shall be as specified on the Invitation to Bidders for Minor Contracts. All Work shall be fully completed within the time limit set forth in the Notice to Bidders or the Invitation-to Bidders.

3.03.01 SUBMITTALS FOR FORMAL CONTRACTS PRIOR TO OWNER'S EXECUTION OF CONTRACT AGREEMENT

All Bonds and policies or certificates of insurance shall be delivered at or prior to the delivery of the Contract and shall be approved by the Clerk of the Board of Supervisors.

The Bidder to whom the Contract is awarded by Owner shall, within

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20 days after Notice of Award, execute and deliver the following documents to the Clerk of the Board of Supervisors:

- (a) One (1) original and one (1) counterpart of the signed Contract.
- (b) One (1) original and two (2) counterparts of the Performance Bond.
- (c) One (1) original and two (2) counterparts of the Payment Bond for public works.
- (d) Policies of insurance or insurance certificates as specified in the Contract Documents. The certificate of liability insurance shall be furnished on a standard form provided by the County.

3.03.02 SUBMITTALS FOR MINOR CONTRACTS PRIOR TO OWNER'S EXECUTION OF CONTRACT AGREEMENT

The successful Bidder's Bid proposal on the County-furnished Bid Forms shall become the executed contract upon signing by the Engineer and Purchasing Agent. All Bonds and policies or certificates of insurance must be approved by the Construction Operations Contract Compliance Representative of the Santa Clara County Roads & Airports Department prior to the issuance of the Notice to Proceed. The Bidder to whom the Contract is awarded by the Owner shall, within the time period stated in the Contract Documents, execute and deliver the following documents to the Roads & Airports Construction Operations Contract Compliance Representative:

- (a) One (1) original Performance Bond;
- (b) One (1) original Payment Bond;
- (c) Policies or certificates of insurance as specified in the Contract Documents. The certificate of liability insurance shall be furnished on a standard form provided by the County.

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3.03.03 SUBMITTALS FOR ALL CONTRACTS PRIOR TO CONTRACTOR PERFORMING WORK

The Bidder to whom the Contract is awarded by Owner shall, within the time limit set forth in the Contract Documents or 20 days after Notice of Award, submit the following information to the Contract Compliance Representative:

- (a) A list of material suppliers, including those of the Subcontractor(s), in accordance with CSS Section 6.02 "Source of Supply and Quality of Materials."
- (b) Names and titles of personnel authorized to sign Contract Change Orders, Work Orders, and daily Extra Work record in accordance with CSS Section 5.06 "Superintendent."
- (c) Names and telephone numbers of the superintendent, foreperson, and personnel who can be reached in case of emergencies.
- (d) Names and title of personnel designated to be the Equal Employment Opportunity Officer(s) by the prime Contractor and all Subcontractors holding subcontracts (applicable only to federally funded contracts).
- (e) Request of approval of Subcontractors.
- (f) Name and title of person responsible for the prevention of accidents in accordance with CSS Section 7.09 "Workers' Safety Provisions."
- (g) A progress schedule in accordance with CSS Section 8.04 "Progress Schedule."
- (h) A schedule of the Contractor's and Subcontractors' prevailing wage rates, including fringe benefit statements, containing names, classifications, and hourly rate of pay of workers who are to be employed in the construction of the Project.
- (i) A copy of the prime Contractor's Injury and Illness Prevention Program in accordance with Section 3203 of the General Industry Safety Orders.

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- (j) A Site Safety Plan in accordance with California Code of Regulations, Title 8, including:
 - (1) Map showing route(s) from job site(s) to nearest medical facility;
 - (2) Material Safety Data Sheets (MSDS) for hazardous materials brought on site;
 - (3) Contract specific safety issues not included in Injury and Illness Prevention Plan.
- (k) A Construction Storm Water Pollution Control Plan as specified in the Contract Special Provisions.

A special retention will be withheld by Owner on all Work performed prior to submittal of the aforementioned compliance materials.

3.04 FAILURE TO EXECUTE CONTRACT

Failure of the Bidder to execute the Contract in the form satisfactory to the Owner or to file the documents in accordance with the above CSS Sections 3.03.01 "Submittals For Formal Contracts Prior to Owner's Execution Of Contract Agreement" and Section 3.03.02 "Submittals For Minor Contracts Prior to Owner's Execution Of Contract Agreement" shall be just cause for annulment of the award and the forfeiture of the Bidder's Bond. If the Bidder, to whom the Contract is awarded, fails to file documents required by the Contract Documents or refuses to enter into a Contract within the specified time, the Bidder shall be liable for any difference by which the cost of procuring the Work exceeds the amount of the Bid. The Bidder's Bond or the amount of the cash or cashier's check shall be available to offset such difference.

3.05 RETURN OF BID GUARANTY

If the Bid is not accepted by Owner within sixty (60) days after the date set for the opening of Bids, or if the Bidder, to whom the Contract is awarded, executes and delivers to Owner all the required documents and insurance, Owner shall return the Bid Guaranty to each Bidder.

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SCOPE OF WORK**

4.01 CONTRACT DOCUMENTS

The Contract Documents 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 Contract Documents describe portions of the Work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals, and do all the Work involved in executing the Contract in a manner, which commensurate with trade standards.

4.02 CHANGES

The Owner reserves the right, without notice to the Sureties, to make such alterations, deviations, additions to or omissions from the Plans and Special Provisions, including the right to increase or decrease the quantity of any item or portion of the Work or to omit any item or portion of the Work, as may be deemed by the Project Engineer to be necessary or advisable and to require such Extra Work as may be determined by the Project Engineer to be required for the proper completion or construction of the whole Work contemplated.

Any such changes will be done under the supplemental work item. If not done under the supplemental work item, they will be set forth in a Change Order which may specify in addition to the Work to be done, adjustment of Contract time and the basis of compensation for such Work. A Change Order will not become effective until approved by the Owner.

4.02.01 CHANGES IN CHARACTER OF WORK

If an ordered change in the Contract Documents materially changes the character of the work of a Contract item from that on which the Contractor based the Bid price, and if the change increases or decreases the actual unit cost of the changed item as compared to the

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actual or estimated actual unit cost of performing the work of that item in accordance with the Contract Documents originally applicable thereto, in the absence of an executed Contract Change Order specifying the compensation payable, an adjustment in compensation therefor will be made in accordance with the following.

The basis of the adjustment in compensation will be the difference between the actual unit cost to perform the work of that item or portion thereof involved in the change as originally planned and the actual unit cost of performing the work of the item or portion thereof involved in the change, as changed. Actual unit costs will be determined by the Project Engineer in the same manner as if the work were to be paid for on a Force Account basis as provided in CSS Section 9.02 "Force Account Payment;" or the adjustment will be as agreed to by the Contractor and the Project Engineer. The adjustment will apply only to the portion of the work of the item actually changed in character. At the option of the Project Engineer, the work of the item or portion of item which is changed in character will be paid for by force account as provided in CSS Section 9.02 "Force Account Payment."

If the compensation for an item of work is adjusted under this Section 4.02.01, the costs recognized in determining that adjustment shall be excluded from consideration in making an adjustment for that item of work under the provisions in CSS Section 9.03 "Payment for Increased or Decreased Quantities."

Failure of the Project Engineer to recognize a change in character of the work at the time the approved Contract Change Order is issued shall in no way be construed as relieving the Contractor of the duty and responsibility of filing a written protest within the 15 day limit as provided in CSS Section 4.03 "Change Order or Work Order Procedure and Protest."

4.03 CHANGE ORDER OR WORK ORDER PROCEDURE AND PROTEST

A Change Order or Work Order may be issued to the Contractor at any time. Should the Contractor disagree with any terms or conditions set forth in a Change Order or Work Order, the Contractor may file a written protest in accordance with the requirements in CSS 4.04 "Contract Claims, Protests, and Dispute Resolution."

4.04 CONTRACT CLAIMS, PROTESTS, AND DISPUTE RESOLUTION

4.04.01 PROTESTS & DISPUTED WORK

- A. If Contractor considers any Work demanded to be beyond the Contract's requirements, or if Contractor considers any instruction, ruling, or decision of the Project Engineer to be unauthorized, Contractor shall immediately notify the Project Engineer in writing before proceeding with such Work. Contractor shall sign it with the statement "Signed Under Protest" and attach a written Protest of the points of disagreement, including references to the Contract Documents and itemization of the quantities and costs involved. If a written Protest is not submitted within seven (7) days, changes in compensation and time will be as set forth in the Change Order or Work Order.

If Contractor proceeds with such Work without providing advance written notification pursuant to the first paragraph of this Section 4.04.01A, Contractor shall be deemed to have assented that the Work is within the Contract's requirements, and Contractor shall have forfeited any right to a protest or claim.

- B. If, upon receiving Contractor's written notification pursuant to Section 4.04.01A above, the Project Engineer directs Contractor in writing to proceed, Contractor shall promptly comply with the work demanded, and shall within seven (7) days submit to the Project Engineer all arguments, justification and documentation to support its position. The Project Engineer will review the issue and render its determination within fifteen (15) days after receipt of Contractor's documentation. If Contractor does not submit such documentation within seven (7) days of the Project Engineer's written direction, Contractor shall be deemed to have concurred with Owner's decision and shall have forfeited any right to a protest or claim.

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- C. Where a protest concerning a Change Order or Work Order relates to compensation, the maximum compensation payable for all Work specified or required by such Change Order or Work Order will be determined as provided in CSS Section 4.07 "Extra Work."
- D. Contractor shall keep full and complete records of the cost of such Work, and shall permit Owner to have access thereto as may be necessary to assist in determining the compensation, if any, payable for such Work:
 - 1. Beginning with the first day of the disputed Work, and for each following day, Contractor shall maintain detailed hourly records of labor, construction equipment, and services, and itemized records of materials and equipment used each day in the performance of the disputed Work. Such records shall be of a form approved by Owner, shall be signed by Contractor, and shall be subject to verification by Owner.
 - 2. Failure by Contractor to furnish the aforesaid written notice and records shall constitute a waiver of Contractor's right to submit a claim for the disputed Work.
- E. All changes in compensation and time approved by the Project Engineer during the Contract shall be subject to incorporation into a Final Change Order for approval and execution by the Board of Supervisors upon completion of the Contract.

4.04.02 NOTICE OF POTENTIAL CLAIM

- A. Contractor shall not be entitled to payment of any additional compensation for any cause, including any change, any act or failure to act by Owner, or the happening of any event, thing or occurrence, unless Contractor shall have given Owner due advance written notice of potential claim as hereinafter specified.

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- B. The written notice of potential claim shall set forth the reasons for which Contractor believes additional compensation and/or time will or may be due, the nature of the costs and/or time involved, and, insofar as possible, the amount of the potential claim. The said notice must have been given to Owner before Contractor performs the Work giving rise to the potential claim for additional compensation and/or time, if based on an act or failure to act by Owner, or in all other cases within fifteen days (15) days after the happening of the event, thing or occurrence giving rise to the potential claim.
- C. Compliance with the foregoing shall not be a prerequisite to any claim which is based on differences in measurement or errors of computations as to Contract quantities.

4.04.03 RESOLUTION OF CONSTRUCTION CLAIMS (CLAIMS FOR \$375,000 OR BELOW)

Public Contract Code

Section 20104 Application of Article; Provisions Included In Plans and Specifications

- (a) (1) This article applies to all public works claims of three hundred seventy-five thousand dollars (\$375,000) or less which arise between a contractor and local agency.
- (2) This article shall not apply to any claims resulting from a contract between a contractor and a public agency when the public agency has elected to resolve any disputes pursuant to Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2.
- (b) (1) “Public work” has the same meaning as in Sections 3100 and 3106 of the Civil Code, except that “public work” does not include any work or improvement contracted for by the state or the Regents of the University of California.

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- (2) “Claim” means 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 pursuant to the contract for a public work and 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.
- (c) The provisions of this article or a summary thereof shall be set forth in the plans or specifications for any work that may give rise to a claim under this article.
- (d) This article applies only to contracts entered into on or after January 1, 1991.

Section 20104.2 Claims; Requirements; Tort Claims Excluded

For any claim subject to this article, the following requirements apply:

- (a) (1) The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided by contract for the filing of claims.
- (2) The claim shall be certified as specified in CSS Section 4.04.04 F.
- (b) (1) For claims of less than fifty thousand dollars (\$50,000), the local agency 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

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claim or relating to defenses to the claim the local agency may have against the claimant.

- (2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.
 - (3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the claimant in producing the additional information, whichever is greater.
- (c) (1) For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the local agency 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 local agency may have against the claimant.
- (2) If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the local agency and the claimant.
 - (3) The local agency's written response to the claim, as further documented, shall be submitted to the claimant within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the claimant in producing the additional information or requested documentation, whichever is greater.
- (d) If the claimant disputes the local agency's

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written response, or the local agency fails to respond within the time prescribed, the claimant may so notify the local agency, in writing, either within 15 days of receipt of the local agency's response or within 15 days of the local agency's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issue in dispute. Upon a demand, the local agency shall schedule a meet and confer conference within 30 days for settlement of the dispute.

- (e) Following the meet and confer conference, if the claim or any portion remains in dispute, the claimant may 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. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the claimant submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.
- (f) This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by 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.

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Section 20104.4 Civil Action Procedures; Mediation and Arbitration; Trial De Nova; Witnesses

The following procedures are established for all civil actions filed to resolve claims subject to this article:

- (a) Within 60 days, but no earlier than 30 days, following the filing or responsive pleading, the court shall submit the matter to non-binding mediation unless waived by mutual stipulation of both parties. The mediation process shall provide for the selection within 15 days by both parties of a disinterested third person as mediator, shall be commenced within 30 days of the submittal, and shall be concluded within 15 days from the commencement of the mediation unless a time requirement is extended upon a good cause showing to the court or by stipulation of both parties. If the parties fail to select a mediator within the 15-day period, any party may petition the court to appoint the mediator.
- (b) (1) If the matter remains in dispute, the case shall be submitted to judicial arbitration pursuant to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the code of Civil Procedure, notwithstanding Section 1141.11 of that code. The Civil Discovery Act of 1986 (Article 3 (commencing with Section 2016) of Chapter 3 of Title 3 of Part 4 of the code of Civil Procedure) shall apply to any proceeding brought under this subdivision consistent with the rules pertaining to judicial arbitration.
- (2) Notwithstanding any other provision of law, upon stipulation of the parties, arbitrators appointed for purposes of this article shall be experienced in construction law, and, upon stipulation of the parties, mediators and

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arbitrators shall be paid necessary and reasonable hourly rates of pay not to exceed their customary rate, and such fees and expenses shall be paid equally by the parties, except in the case of arbitration where the arbitrator, for good cause, determines a different division. In no event shall these fees or expenses be paid by state or county funds.

(3) In addition to Chapter 2.5 (commencing with Section 1141.10) of Title 3 of Part 3 of the Code of Civil Procedure, any party who after receiving an arbitration award requests a trial de novo but does not obtain a more favorable judgment shall, in addition to payment of costs and fees under that chapter, pay the attorney's fees of the other party arising out of the trial de novo.

(c) The court may, upon request by any party, order any witnesses to participate in the mediation or arbitration process.

Section 20104.6 Payment on Undisputed Portion of Claim; Interest On Arbitration Awards or Judgments

(a) No local agency shall fail to pay money as to any portion of a claim that is undisputed except as otherwise provided in the contract.

(b) In any suit filed under Section 20104.4, the local agency shall pay interest at the legal rate on any arbitration award or judgment. The interest shall begin to accrue on the date the suit is filed in a court of law.

4.04.04 CLAIMS SUBMISSION & DOCUMENTATION (CLAIMS GREATER THAN \$375,000)

A. Contractor shall furnish claim documentation as herein specified.

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- B. Contractor shall submit three certified copies of all claim documentation. All claims documentation shall be complete when submitted. The evaluation of the Contractor's claim will be based on Owner's records and the claim documentation submitted by Contractor.
- C. Claim documentation shall conform to generally accepted auditing standards and shall be in the following format:
 - 1. Introduction & Background
 - 2. Issues
 - a. Index of Issues
 - b. For Each Issue
 - 1) Background
 - 2) Chronology
 - 3) Contractor's Position (Reason for County's potential liability)
 - 4) Supporting Documentation of Merit
 - 5) Supporting Documentation of Damages
 - 3. Critical Path Method Schedules, As-Planned and As-Built
 - 4. Productivity Exhibits
 - 5. Summary of Issues and Damages
- D. Supporting documentation of merit for each issue shall be cited by reference, photocopies, or explained. Supporting documentation may include, but not be limited to general conditions, technical specifications, drawings, correspondence, conference notes, shop drawing logs, survey books, inspection reports, delivery schedules, test reports, daily reports, subcontracts, fragmentary critical path method schedules, photographs, technical reports, requests for information, field instructions, and other related records.
- E. Supporting documentation of damages for each issue shall be cited, photocopied, or explained. Supporting documentation may include but not be limited to certified detailed labor, materials, equipment, and construction equipment and services costs; purchase orders; invoices;

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project as-planned and as-built costs; subcontractor payment releases; quantity reports; other related records; general ledger and any other accounting materials.

- F. Each copy of claim documentation shall include the following certification, signed in the same manner as the Contract was signed:

"I, _____, being the *(must be an officer)*
of *(general contractor)*, declare under penalty
of perjury under the laws of the State of California, and do personally certify and attest that: I have thoroughly reviewed the attached claim for additional compensation and/or extension of time, and know its contents, and said claim is made in good faith; the supporting data is truthful and accurate; that the amount requested accurately reflects the contract adjustment for which the contractor believes the owner is liable; and, further, that I am familiar with California Penal Code Section 72 and California Government Code Section 12650, et seq., pertaining to false claims, and further know and understand that submission or certification of a false claim may lead to fines, imprisonment and/or other severe legal consequences.
(Signature of officer) _____ *(Date)* _____ "

- G. If Contractor is unable to support any part of a claim and it is determined that such inability is attributable to falsity of such certification or misrepresentation of fact or fraud by Contractor, Contractor shall be liable to Owner for three (3) times the amount of damages which Owner sustains, plus the cost of civil action, and may be liable to Owner for a civil penalty of up to Ten Thousand Dollars (\$10,000) for each false claim.

4.04.05 DECISIONS ON PROTESTS AND CLAIMS

Protests and claims of Contractor arising under the Contract will be decided by the Project Engineer who will furnish the decisions to Contractor in writing.

4.04.06 NEGOTIATIONS

Negotiations on disputed work or claims before mediation are for settlement purposes only and are not binding.

4.04.07 MEDIATION

- A. **AUTHORIZATION:** In the event of a dispute or claim that cannot be resolved by negotiation, Owner and Contractor agree to attempt to resolve it by Mediation. Said Mediation is voluntary, non-binding, and intended to provide an opportunity for the parties to evaluate each other's cases and arrive at a mutually agreeable solution. These provisions relating to voluntary Mediation shall not be construed or interpreted as mandatory arbitration.
- B. **INITIATION OF MEDIATION:** Any party to a dispute or claim may initiate Mediation by notifying the other party or parties in writing.
- C. **REQUEST FOR MEDIATION:** A Request for Mediation shall contain a brief statement of the nature of the dispute or claim, and the names, addresses, and phone numbers of all parties to the dispute or claim, and those who will represent them, if any, in the Mediation.
- D. **SELECTION OF MEDIATOR:** Upon receipt of a Request for Mediation, within fourteen (14) days, the parties will meet and confer to select an appropriate Mediator agreeable to all parties. If the parties cannot agree on a Mediator, they hereby agree to accept a Mediator appointed by a recognized association such as the American Arbitration Association.
- E. **QUALIFICATIONS OF A MEDIATOR:** Any Mediator selected shall have expertise in the area of the dispute and be knowledgeable in the Mediation process.

No person shall serve as a Mediator in any dispute in which that person has any financial or personal interest in the result of the Mediation. Before accepting an appointment, the prospective Mediator shall disclose any

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circumstances likely to create a presumption of bias or prevent a prompt meeting with the parties. Upon receipt of such information, the parties shall meet and confer and decide whether to select another Mediator.

- F. VACANCIES:** If any Mediator shall become unwilling or unable to serve, another Mediator shall be selected unless the parties agree otherwise.
- G. REPRESENTATION:** Any party may be represented by persons of their choice, who shall have full authority to negotiate. The names and addresses of such persons shall be communicated in writing to all parties and to the Mediator.
- H. TIME AND PLACE OF MEDIATION:** The Mediator shall set the time of each Mediation session. The Mediation shall be held at any convenient location agreeable to the Mediator and the parties, as the Mediator shall determine. All reasonable efforts will be made by the parties and the Mediator to schedule the first session within thirty (30) days after selection of the Mediator.
- I. IDENTIFICATION OF MATTERS IN DISPUTE:** At least ten (10) days before the first scheduled Mediation session, each party shall provide the Mediator with a brief memorandum setting forth its position with regard to the issues that need to be resolved. At the discretion of the Mediator, such memoranda may be mutually exchanged by the parties.

At the first session, the parties will be expected to produce all information reasonably required for the Mediator to understand the issue presented. The Mediator may require each party to supplement such information.

- J. AUTHORITY OF MEDIATOR:** The Mediator does not have authority to impose a settlement upon the parties but will attempt to help the parties reach a satisfactory resolution of their dispute. The Mediator is authorized to conduct joint and separate meetings with the parties and

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to make oral and written recommendations for settlement. Whenever necessary, the Mediator may also obtain expert advice concerning technical aspects of the dispute, provided the parties agree and assume the expenses of obtaining such advice. Arrangements for obtaining such advice shall be made by the Mediator or the parties, as the Mediator shall determine. The Mediator is authorized to end the Mediation whenever, in the Mediator's judgement, further efforts at Mediation would not contribute to a resolution of the dispute between the parties.

K. PRIVACY: Mediation sessions are private. The parties and their representatives may attend Mediation sessions. Other persons may attend only with the permission of the parties and with the consent of the Mediator.

L. CONFIDENTIALITY: Confidential information disclosed to a Mediator by the parties or by witnesses in the course of the Mediation shall not be divulged by the Mediator. All records, reports, or other documents received by a Mediator while serving as Mediator shall be confidential. The Mediator shall not be compelled to divulge such records or to testify in regard to the Mediation in any adversary proceeding or judicial forum.

The parties shall maintain the confidentiality of the Mediation and shall not rely on, or introduce as evidence in any arbitration, judicial or other proceedings: (a) Views expressed or suggestions made by the other party with respect to a possible settlement of the dispute; (b) Statements made by the other party in the course of the Mediation proceedings; (c) Proposals made or views expressed by the Mediator; (d) Whether the other party had or had not indicated willingness to accept a proposal for settlement made by the Mediator.

M. NO STENOGRAPHIC RECORD: There shall be no stenographic record of the Mediation.

N. TERMINATION OF MEDIATION: The mediation

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shall be terminated: (a) By the execution of a settlement agreement by the parties; (b) By a written declaration of the Mediator to the effect that further efforts at Mediation are no longer worthwhile; or (c) By a written declaration of a party or parties to the effect that the Mediation proceedings are terminated.

- O. EXCLUSION OF LIABILITY:** No Mediator shall be a necessary party in judicial proceedings related to the Mediation. No Mediator shall be liable to any party for any act or omission in connection with any Mediation conducted hereunder.

- P. INTERPRETATION AND APPLICATION OF THESE MEDIATION PROVISIONS:** The Mediator shall interpret and apply these Mediation provisions insofar as they relate to the Mediator's duties and responsibility.

- Q. EXPENSES:** The expenses of witnesses for either side shall be paid by the party producing the witnesses. All other expenses of the Mediation, including required traveling and other expenses of the Mediator, the expenses of any witness called by the Mediator, and the cost of any proofs or expert advice produced at the request of the Mediator, shall be apportioned as the Mediator finds appropriate or as otherwise agreed to by the parties.

4.04.08 STATUTORY PROCEDURES FOR CLAIMS RESOLUTION

Proceeding with mediation does not in any way waive or extend the applicable statutes of limitations for filing claims against governmental entities pursuant to the California Government Code.

4.04.09 RELEASE OF UNDECIDED CLAIMS

Undecided claims submitted to Owner before execution of the Release of All Claims provided elsewhere in these Specifications and not excepted therefrom, shall be deemed released by Contractor upon execution of such Release and will not be further considered by

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Owner.

4.04.10 NOTICE OF CLAIM

Any notice of claim under the Contract shall be in writing and shall be dated and signed by the party giving such notice or by a duly authorized representative of such party. Any such notice shall not be effective for any purpose whatsoever unless served in the following manner:

1. Notice given to the Owner must be by personal delivery or by depositing the same in the United States mail, enclosed in a sealed envelope, addressed to the Clerk of the Board of Supervisors at the address given in the Notice to Bidders, first class postage prepaid.
2. Deposit of notice in the United States mail shall be deemed the date of receipt thereof.

4.04.11 GOVERNING LAW

This contract shall be interpreted and enforced in accordance with the laws of the State of California. Pursuant to California Code of Civil Procedure §394, proper venue for legal action arising out of this Agreement shall be the County of Santa Clara. Both parties hereto agree that personal and subject matter jurisdiction shall be proper in Santa Clara County, California.

4.05 AS-BUILT RECORD CONSTRUCTION PLANS

1. For Projects with Plans developed by Santa Clara County Roads and Airport Department, construction plans, showing all approved changes made during construction which differ from the approved Plan set for construction, shall be furnished by the Contractor prior to the acceptance of the Work. Redlined construction plans furnished shall be in the form of redlined drawings clearly and neatly indicating all changes made with the approval of the Project Engineer. During the construction period, redlined construction plans shall be maintained by the Contractor and made available to the Project Engineer for review on a daily basis.

SECTION 4

A special retention may be withheld or the final acceptance of the Work will not be made by Owner until the redlined plans are accepted by the Project Engineer.

2. For Projects with Plans developed by Consultants, including encroachment permit type projects, one (1) set of Mylar reproducible as-built record plans along with 1.4 MB diskettes containing AutoCAD (Version 14 or later) files of same, showing all approved changes made during construction, shall be furnished to the County prior to the acceptance of the Work or sign-off of the permit by the County. As-built record plans shall be signed by the Consultant's Engineer.

4.06 SUBMITTALS FOR MATERIALS AND EQUIPMENT

Within 10 calendar days after the award of a Minor Contract, or 20 calendar days after the award of a Formal Contract, Contractor shall furnish to the Project Engineer material and/or equipment submittals specified in the Contract Documents. Contractor's attention is directed to CSS section 6.09 "Trade Names And Alternatives" for material substitutions.

Contractor's submittals shall be as follows:

1. The Contractor shall submit to the Project Engineer for review such information and drawings as required or as are necessary or the performance of the Work or as required by laws, ordinances, or regulations governing the Work.
2. Before transmittal to the Project Engineer, the Contractor shall review all submittals. By this review, the Contractor represents that he/she has determined and verified that all materials, catalog numbers, and similar data, and that he/she has checked and coordinated each drawing with the requirements of the Contract Documents. The Contractor's review of each drawing shall be indicated by stamp, date, and signature of a person authorized by the Contractor.
3. The Contractor shall make all submittals to the Project Engineer in an orderly sequence for review. The Contractor shall notify the Project Engineer of any deviations in the submittals from the Contract requirements.

SECTION 4

4. A separate Submittal Cover Letter form, furnished by Owner, shall be used for each material and/or equipment and shall include 7 legible copies of all applicable attachments, such as specifications, drawings and pertinent data on the proposed material and/or equipment. All attachments shall be provided with a 125-mm by 150-mm (approximately 5 in. by 6 in.) block with blank space for the acceptance stamp.
5. The Submittal Cover Letter shall be numbered in a sequential order beginning with "001". Re-submittal of an alternative to an item which is previously rejected shall be numbered with the same originally assigned number followed by a second sequential number beginning with "1". As an example, first re-submittal of an item with a submittal originally numbered as "002" shall be listed as "002-1", and any subsequent re-submittal as "002-2", "002-3", etc...
6. Reviewed submittals will be stamped as follows:
 - **NO EXCEPTION TAKEN:** Work shall be carried out per the accepted submittal. No further change shall be made by the Contractor except upon written instructions of the Project Engineer.
 - **MAKE CORRECTIONS NOTED:** Corrections to the submittal are required for acceptance. Work may be carried out and shall conform to the noted comments on the submittal.
 - **AMEND AND RESUBMIT:** Corrections to the submittal and resubmission are required for acceptance. Work shall not start until the submittal is accepted. Field installation shall not proceed with the proposed material and/or equipment without the approved submittal of the applicable material and/or equipment. Work installed without the approved submittal, when required by the Contract Documents, shall be at the Contractor's risk and shall be removed at the Contractor's expenses if directed by the Project Engineer.

SECTION 4

4.07 EXTRA WORK

The Contractor shall do such Extra Work and furnish labor, material, and equipment under the “Supplemental Work” bid item shown on the Bid Form or under a Work Order.

Attention is directed to CSS Section 8.06 “Time of Completion.”

Extra Work shall be paid for under the “Supplemental Work” bid item. Payment for Supplemental Work shall be made as follows:

1. On a force account basis (labor, materials and equipment) as detailed in:
 - CSS Section 9.02.01 “Work Performed By Contractor,”
 - CSS Section 9.02.02 “Work Performed By Special Forces or Other Special Services,” or
2. As agreed to by the Project Engineer and Contractor.

4.08 (BLANK)

4.09 DETOURS

The Contractor shall construct and remove detours and detour- bridges for the use of public traffic as specified in the Contract Documents, or as directed by the Project Engineer. Payment for such Work will be made as set forth in the Special Provisions or at the Contract prices for the items of Work involved if the Work being performed is covered by those Contract’s items of Work and no other method of payment therefore is provided in the Special Provisions. Otherwise the Work will be paid for as Extra Work.

When public traffic is routed through the Work area, provision for a passageway through construction operations will not be considered as detour construction or detour maintenance.

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

SECTION 4

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

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

4.10 USE OF MINERAL MATERIALS FOUND ON THE WORK

Unless designated as selected material(s), the Contractor may use in the proposed construction such stone, gravel, sand or other material, suitable in the opinion of and approved by the Project Engineer, as may be found in excavation. The Contractor will be paid for the excavation of such materials at the Contract price for such excavation, but all material so removed shall be replaced at the Contractor's expense with other suitable material as required to complete the Work to the specified lines and grades. No charge for materials so used will be made against the Contractor. The Contractor shall not excavate or remove any material from within the road location that is not within the excavation, as indicated by the slope and grade lines, without written authorization from the Project Engineer.

Selected material is defined as material that is excavated from a location within the right-of-way as specified in the Contract Documents or as designated by the Project Engineer.

**SECTION 5
CONTROL OF WORK**

**5.01 AUTHORITY OF PROJECT ENGINEER AND
PROJECT INSPECTOR**

The Project Engineer shall decide all issues which may arise as to the quality or acceptability of materials furnished and work performed and as to the manner of performance and rate of progress of the work; all issues which may arise as to the interpretation of the Contract Documents; all issues as to the acceptable fulfillment of the Contract on the part of the Contractor, and all decisions as to the compensation and Contract time. The Project Engineer's decision shall be final, and the Project Engineer shall have authority to enforce and make effective such decisions and orders.

The Project Inspector is the Project Engineer's authorized field representative and liaison between the Project Engineer and Contractor, who administers the construction contract and inspects the Work in accordance with the Contract Documents.

5.02 PLANS AND WORKING DRAWINGS

The Contract Plans furnished consist of general drawings and show such details as are necessary to give a comprehensive idea of the construction contemplated. All authorized alterations affecting the requirements and information given on the Contract Plans shall be in writing.

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

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

Working drawings for cribs, cofferdams, falsework, temporary support

SECTION 5

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

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

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

5.02.01 TRENCH EXCAVATION SAFETY PLANS

Attention is directed to CSS Sections 7.04 "Trench Safety," and 7.09 "Workers' Safety Provisions." Excavation for any trench 1.5 m (5 feet) or more in depth shall not begin until the Contractor has received approval, from the Project Engineer, of the Contractor's detailed plan for worker protection from the hazards of caving ground during the excavation of that trench, and any design calculations used in the preparation of the detailed plan. The detailed plan shall show the details of the design of shoring, bracing, sloping or other provisions to be made for worker protection during the excavation. No plan shall allow the use of shoring, sloping or a protective system less effective than that required by the Construction Safety Orders of the Division of Occupational Safety and Health. If the plan complies with the shoring system standards established by the Construction Safety Orders, the plan shall be submitted at least 5 days before the Contractor intends to begin excavation for the trench. If the plan varies from the shoring system standards established by the

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Construction Safety Orders, the plan shall be prepared and signed by an engineer who is registered as a Civil Engineer in the State of California. Plan design calculations shall be submitted at least 3 weeks before the Contractor intends to begin excavation for the trench.

5.03 (BLANK)

5.04 CONFORMITY WITH CONTRACT DOCUMENTS AND ALLOWABLE DEVIATIONS

Work and materials shall comply with all governing codes, including all standards under such codes as to the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown in the Contract Documents. Although measurement sampling and testing may be considered evidence as to such conformity, the Project Engineer shall be the sole judge as to whether the work or materials deviate from the Contract Documents, and the Project Engineer's decision as to any allowable deviations therefrom shall be final.

5.05 ORDER OF WORK

When required by the Contract Documents, the Contractor shall follow the sequence of operations as set forth therein.

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

5.06 SUPERINTENDENT

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

When the Contractor is comprised of two (2) or more persons, firms, partnerships, or corporations functioning on a joint venture basis, said Contractor shall designate in writing before starting work, the name of one authorized representative who shall have the authority to represent and act for the Contractor.

Said authorized representative shall be present at the site of the Work at

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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 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 Project 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.

5.07 WORKING AREA, STORAGE OF MATERIALS AND PROJECT REAL PROPERTY

5.07.01 WORKING AREA AND STORAGE OF MATERIALS

Contractor shall confine its apparatus, storage of materials, and construction operations to such limits as may be directed by the Project Engineer and shall not unreasonably encumber the premises and roads with its materials and equipment. Contractor shall enforce any instruction of the Project Engineer regarding signs, advertising, fires, danger signals, barricades, and smoking, and shall require all persons employed on the Work to comply with all building or institutional regulations, vehicle, street and highway codes while on the premises and roads.

5.07.02 PROJECT REAL PROPERTY

Only project site real property will be provided by the Owner to the Contractor, free of charge, for Project construction purposes during the Contract duration. Should the Contractor require additional real property over that provided, the Contractor shall be responsible for securing this additional real property. The Roads & Airports Department Property Section can be contacted to determine if Owner's property is available for lease close to the Project site and the lease costs for that real property. Clean-up of Project site real property and/or any property occupied by Contractor shall be in compliance with CSS Section 22 "Clean-up."

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5.08 LINES AND GRADES

Such stakes or marks will be set either by the Owner or Contractor as the Project Engineer determines to be necessary to establish the lines and grades required for the completion of the Work specified in the Contract Documents.

When the Contractor requires such stakes or marks to be set by the Owner, the Contractor shall notify the Project Engineer in writing a reasonable length of time in advance of starting operations that require such stakes or marks. In no event, shall a notice of less than two (2) days be considered a reasonable length of time. Stakes and marks set by the Owner shall be carefully preserved by the Contractor. In case such stakes and marks are destroyed or damaged, they will be replaced at the Owner's earliest convenience. The Contractor will be charged for the cost of necessary replacement or restoration of stakes and marks which, in the judgment of the Project Engineer, were carelessly or willfully destroyed or damaged by the Contractor's operations. This charge will be deducted from any moneys due or to become due the Contractor.

5.09 INSPECTION

The Project Engineer shall at all times have access to the Work site during its construction, and shall be furnished with every reasonable facility for ascertaining that the materials and the workmanship are in accordance with the requirements and intentions of the Contract Documents. All Work done and all materials furnished shall be subject to the inspection by the Owner.

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

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

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5.10 REMOVAL OF REJECTED AND UNAUTHORIZED WORK

All Work, which has been rejected, shall be remedied, or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed to the Contractor for such removal, replacement, or remedial work.

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

Any work covered without the Project Engineer's approval must, if requested by the project Engineer, be uncovered for inspection and be replaced at the Contractor's expense.

Upon failure of the Contractor to comply promptly with any order of the Project Engineer made under this Section 5.10, the Project Engineer may cause rejected or unauthorized work to be remedied, removed, or replaced, and to deduct the costs from any moneys due or to become due the Contractor.

5.11 EQUIPMENT AND PLANTS

Only equipment and plants suitable to produce the quality of work and materials required will be permitted to operate on the Project.

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

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

The Contractor shall identify each piece of its equipment, other than hand tools, by means of an identifying number plainly stenciled or stamped on the equipment at a conspicuous location, and shall furnish to the Project

SECTION 5

Engineer a list giving the description of each piece of equipment and its identifying number. In addition, the make, model number and empty gross weight or each unit of compacting equipment shall be plainly stamped or stenciled in a conspicuous place on the unit. The gross weight shall be either the manufacturer's rated weight or the scale weight.

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

5.12 ALTERNATIVE EQUIPMENT

While certain sections of the Special Provisions may provide that equipment of a particular size and type is to be used to perform portions of the Work, it is to be understood that the development and use of new or improved equipment is to be encouraged.

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

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

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

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remedy, at its expense, any defective or unsatisfactory work produced with the alternative equipment.

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

Permission to use alternative equipment in place of equipment specified will only be granted where such equipment is new or improved and its use is deemed by the Project Engineer to be in furtherance of the purposes of this CSS Section 5.12. The approval for use of particular equipment on any project shall in no way be considered as an approval of the use of such equipment on any other project.

Nothing in this Section CSS 5.12 shall relieve the Contractor of its responsibility for furnishing materials or producing finished work of the quality specified in the Contract Documents.

5.13 DIFFERENT 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 Documents 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 Documents, are encountered at the site, Contractor shall promptly notify the Project Engineer in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

Upon written notification, the Project Engineer will investigate the conditions, and if the Project 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 Project Engineer will notify the Contractor of the Project 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.

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

Any Contract adjustment warranted due to differing site conditions will be made in accordance with the provisions in Section 4.02 "Changes" except as otherwise provided.

5.14 CHARACTER OF WORKERS

If any Subcontractor or person employed by the Contractor shall appear to the Project Engineer to be incompetent or to act in a disorderly or improper manner, he/she shall be discharged immediately on the request of the Project Engineer, and such person shall not again be employed on the Work.

5.15 WORKING ENVIRONMENT

The Contractor shall ensure and maintain a working environment free of personal harassment and intimidation.

Conduct that creates an intimidating, hostile, or offensive working environment is prohibited. Such conduct includes, but is not limited to, the following:

- Verbal harassment, e.g., epithets, derogatory comments or slurs;
- Physical harassment, e.g., assault, impeding or blocking movement, gestures, or any physical interference with normal work or movement;
- Visual forms of harassment, e.g., derogatory posters, letters, poems, graffiti, cartoons, or drawings.

Unwelcome and unwanted sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature, for example, constitutes sexual harassment which is prohibited.

It is the responsibility of the Contractor to:

- Inform its employees and Subcontractors that behavior

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which creates an intimidating, hostile, or offensive working environment is prohibited;

- Create a working environment that is free from harassment; and,
- Take corrective action to stop prohibited behavior/conduct.

The Contractor's attention is also directed to CSS Sections 7.01 "Compliance with Laws and Regulations," and 7.03 "Equal Opportunity Requirements." In the event that the Contractor fails to comply with these provisions, the Contractor shall be subject to the requirements stated in, but not limited to, CSS Sections 5.14 "Character of Workers," 8.05 "Temporary Suspension of Work," 8.09 "Owner's Right to Terminate Contract," and such other remedies as are provided in these Specifications or by law.

5.16 FINAL INSPECTION

When the Work has been completed and written request has been submitted, the Project Engineer will make the final inspection.

5.17 CORRECTION OF WORK AND GUARANTEE

5.17.01 GENERAL

Neither the final acceptance nor payment, nor any provisions in the Contract Documents shall relieve the Contractor of its responsibility for faulty materials or workmanship.

Contractor shall guarantee all workmanship and materials for a period of one (1) year or as specified in the Contract Documents. The Contractor may be required to furnish a written guaranty covering all or certain items of Work for varying periods of time from the date of Acceptance of the Contract. The Work to be guaranteed, the form, and the time limit of the guaranty will be specified in the Special Provisions. Said guaranty shall be signed and delivered along with 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 Project Engineer before acceptance of the Work.

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The warranty/guarantee period shall be counted from the date of recording of the Notice of Completion by Owner. Contractor shall repair or replace any or all defective Work together with any other Work which may be displaced in so doing, that is or becomes defective during the period of said guaranty without expense whatsoever to Owner.

The aforesaid one-year warranty/guarantee period does not in any way limit or waive Owner's rights to legal recourse for latent construction defects, pursuant to California Civil Code of Procedure 337.15 nor for latent construction defects pursuant to 337.1.

In the event of failure of Contractor to comply with the requirements of any guaranty required by the contract within seven (7) days after being notified in writing, it is understood that Owner is authorized to proceed to have the defects remedied and made good at the expense of the Contractor who shall pay the cost and charges therefor immediately on demand.

5.17.02 YEAR 2000 COMPLIANCE WARRANTY

Contractor represents and warrants that each hardware, software and firmware product delivered under this Contract shall, upon installation, accurately process without error date/time (including, but not limited to, calculating comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000, and leap year calculations, to the extent that other information technology, used in combination with the information technology being acquired, properly exchanges date/time data with it. If this Contract requires that specific listed products must perform as a system, then this warranty shall apply to those products as a system. The duration of this warranty and the remedies available to the County for breach of this warranty shall be subject to the terms and limitations of Contractor's standard warranties contained in this Contract, provided that, notwithstanding any provision to the contrary in such warranty or warranties, the remedies available to County under this warranty shall include, but not be limited to, repair or replacement at Contractor's expense of any product whose non-compliance is discovered and made known to Contractor within ninety (90) days after the date of acceptance, or after January 1, 2000, whichever date is later. Nothing in this warranty shall be construed to limit any rights or remedies the County may otherwise have under

SECTION 5

this Contract with respect to defects other than Year 2000 performance.

As further explanation of the Year 2000 compliance standard required by County Contractor's products shall meet the definition of Year 2000 conformity prepared by the British Standards Institution, in that they shall operate in such a manner that neither performance nor functionality is affected by dates prior to, during, and after the year 2000. Specifically, (1) no value for current date will cause any interruption in operation, (2) date-based functionality must behave consistently for dates prior to, during and after Year 2000, (3) in all interfaces and data storage, the century in any date must be specified either explicitly or by unambiguous algorithms or inferring rules, and (4) Year 2000 must be recognized as a leap year.

5.18 COST REDUCTION INCENTIVE

The Contractor may submit to the Project Engineer, in writing, proposals for modifying any requirement of the Contract Documents for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair, in any manner, the essential functions or characteristics of the Project, including but not limited to service life, economy of operation, ease of maintenance, desired appearance, or design and safety standards.

Cost reduction proposals shall contain the following information:

1. A description of both the existing Contract requirements for performing the Work and the proposed changes.
2. An itemization of the Contract requirements that must be changed if the proposal is adopted.
3. A detailed estimate of the cost of performing the Work under the existing Contract and under the proposed change.
4. A statement of the time within which the Project Engineer must make a decision hereon.
5. The Contract items of work affected by the proposed changes, including any quantity variation attributable thereto.

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The provisions of this Section 5.18 shall not be construed to require the Project Engineer to consider any cost reduction proposal, which may be submitted hereunder. Proposed changes in basic design of a Bridge or of a Pavement type will not be considered as an acceptable cost reduction proposal. The Owner will not be liable to the Contractor for failure to accept or act upon any cost reduction proposal submitted pursuant to this Section 5.18 nor for any delays to the Work attributable to any such proposal. If a cost reduction proposal is similar to a change in Contract Documents for the Project under consideration by the Owner at the time said proposal is submitted or if such a proposal is based upon or similar to the Contract Documents adopted by the Owner after the advertisement of the Project, the Project Engineer will not accept such proposal and the Owner reserves the right to make such changes without compensation to the Contractor under the provisions of this Section 5.18.

The Contractor shall continue to perform the Work in accordance with the requirements of the Contract Documents until an executed Work Order incorporating the cost reduction proposal has been issued. If an executed Work 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, such cost reduction proposal shall be deemed rejected.

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

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

If the Contractor's cost reduction proposal is accepted in whole or in part,

SECTION 5

such acceptance will be by a Work Order, which shall specifically state that it is executed pursuant to this Section 5.18. Such Work Order shall incorporate the changes in the Contract Documents, which are necessary to permit the cost reduction proposal or such part of it as has been accepted to be put into effect, and shall include any conditions upon which the Owner's approval thereof is based if the approval of the Owner is conditional. The Work Order shall also set forth the estimated net savings in the cost of performing the Work attributable to the cost reduction proposal effectuated by the Work Order, and shall further provide that the Contractor be paid 50 percent of said estimated net savings amount.

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 Work Order authorizing the use of the cost reduction proposal.

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

The Owner expressly reserves the right to adopt a cost reduction proposal for general use on contracts administered by the Department of Roads & Airports when it determines that said proposal is suitable for application to other contracts. When an accepted cost reduction proposal is adopted for general use, only the Contractor who first submitted such proposal will be eligible for compensation pursuant to this Section 5.18, and in that case, only as to those contracts awarded to him prior to submission of the accepted cost reduction proposal. Cost reduction proposals identical or similar to previously submitted proposals would be eligible for consideration and compensation under the provisions of this Section 5.18 if the identical or similar previously submitted proposals were not adopted for general application to other contracts administered by the Department of Roads & Airports. Subject to the provisions contained herein, the Owner or any other public agency shall have the right to use all or any submitted cost reduction proposal without obligation or compensation of any kind to the Contractor.

This CSS Section 5.18 shall apply only to Contracts awarded to the lowest Bidder pursuant to competitive bidding.

5.19 COORDINATION, INTERPRETATION AND ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS

The Contract Documents are intended to be complementary, and to describe and provide for a complete Work. The following order of precedence shall govern the interpretation of the Contract Documents:

1. Special Provisions (see CSS Section 1.02 “Definitions”),
2. Project Plans (see CSS Section 1.02 “Definitions”),
3. County Standard Details (see CSS Section 1.02 “Definitions”),
4. County Standard Specifications (see CSS Section 1.02 “Definitions”),
5. State Standard Plans (see CSS Section 1.02 “Definitions”),
6. State Standard Specifications (see CSS Section 1.02 “Definitions”).

Should it appear that the Work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the Contract Documents, the Contractor shall apply to the Project Engineer for such further explanations as may be necessary and shall conform to them as part of the Contract. In the event of any doubt or question arising respecting the true meaning of any requirements of the Contract Documents, reference shall be made to the Project Engineer, whose decision thereon shall be final.

In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct. Detailed Drawings shall prevail over general Drawings. Scaled drawings, full-sized drawings, Plans and Specifications are intended to be complimentary and to agree. Figured dimensions shall have precedence over undimensioned work; full-sized drawings shall have precedence over scale drawings in the details of the construction.

**SECTION 6
CONTROL OF MATERIALS**

6.01 MATERIALS

No material, supplies or equipment for the Work under the Contract shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or the supplier.

Contractor warrants free and clear title to all material supplied and equipment installed or incorporated in the Work. Contractor agrees, upon completion of the Work, to deliver the premises together with all improvements and appurtenances constructed or placed thereon by the Contractor, to Owner free from any claims, liens, or charges. Contractor further agrees that neither the Contractor, nor any person, firm or corporation, furnishing any materials or labor for any Work covered by the Contract, shall have any right to lien upon the premises or any improvement or appurtenances therein, except that Contractor may install metering devices and other equipment of utility companies or of political subdivisions the title to which is commonly retained by utility company or the political subdivision. In the event of the installation of any such metering device or equipment, Contractor shall advise Owner as to the ownership thereof.

Nothing contained herein, however, shall defeat or impair the right of persons furnishing material or labor under any bond given by Contractor for their protection or any rights under any law permitting such persons to look to funds due Contractor held by Owner.

The provisions of this Section 6.01 shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing material for the Work when no formal contract is entered into for such material.

6.02 SOURCE OF SUPPLY AND QUALITY OF MATERIALS

The Contractor shall furnish all materials required to complete the Work, except materials that are designated in the Contract Documents to be

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furnished by the Owner and materials furnished by the Owner in the performance of Extra Work.

All materials furnished shall be new, except as may be provided elsewhere in the Contract Documents.

The Contractor shall furnish the Project Engineer a list of the sources of materials including those of its Subcontractors. The list shall be submitted on an Owner-furnished form and shall be submitted to the Project Engineer within 20 days after Notice of Award or within the time specified in the Contract Documents. The Contractor shall furnish without charge such samples as may be required. Inspection and tests will be made by the Project Engineer or his/her designated representative. Such inspections and tests, if made at any point other than the point of incorporation in the Work, in no way shall be considered as a guaranty of acceptance of such material nor of continued acceptance of material presumed to be similar to that upon which inspections and tests have been made. Such inspections and testing performed by the Project Engineer shall not relieve the Contractor or its suppliers of responsibility for quality control.

No materials or equipment of which samples are required to be submitted for approval shall be used until such approval has been given by the Project Engineer, except only at the Contractor's risk and expense. The approval of any sample shall be only for the characteristics thereof or for the uses named in such approval and no other. No approval of any sample shall be deemed a change or modification of any requirement of the Contract Documents. Upon approval of any sample of material, no additional sample of that material shall be considered and no change in brand or make shall be permitted without a resubmittal and approval by the Project Engineer.

Operation and maintenance manuals, instruction sheets and parts lists, which are furnished with certain articles or materials incorporated in the Work, shall be delivered to the Project Engineer before acceptance of the Contract.

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

6.03 OWNER-FURNISHED MATERIALS

Owner-furnished materials at locations designated in the Contract Documents shall be hauled to the site of the Work by the Contractor at its expense, including any necessary loading and unloading that may be involved. If the locations are not designated in the Contract Documents, the Owner-furnished materials will be delivered to the Contractor free of charge to the Project site or as directed by the Project Engineer. In either case, all costs of handling and placing Owner-furnished material shall be considered as included in the price paid for the Contract item involving such Owner-furnished material.

All Owner-furnished material that is not used on the Work shall remain the property of the Owner and shall be returned and delivered by the Contractor to the locations designated by the Project Engineer. Compensation for this Work shall be considered as being included in the Bid price for clean-up indicated on the Bid Form or, if no separate Bid item for clean-up is provided, it shall be considered as incidental work and included in the Bid price for the applicable item of work.

The Contractor will be held responsible for all materials furnished to the Contractor and he/she shall pay all demurrage and storage charges. Owner-furnished materials lost or damaged from any cause whatsoever shall be replaced by the Contractor. The Contractor will be liable to the Owner for the cost of replacing Owner-furnished material and such costs may be deducted from any moneys due or become due the Contractor.

6.04 FOREIGN MATERIALS AND ASSEMBLIES

Materials or assemblies which are manufactured or fabricated outside of the United States shall be delivered to a distribution point in Santa Clara County, unless otherwise directed in the Contract Documents, where they shall be retained for a sufficient period of time to permit inspection, sampling, and testing.

Attention is directed to the provisions in CSS Section 8.07 "Liquidated Damages." The Contractor shall not be entitled to an extension of time for acts or events occurring outside of the United States and it shall be the Contractor's responsibility to deliver materials obtained from outside of the United States to the point of entry into the continental United States in sufficient time to permit timely delivery to the job site.

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

The manufacturer or fabricator of foreign material or assemblies shall furnish to the Project Engineer a certificate of compliance in accordance with the provisions in the following CSS Section 6.11 "Certificates of Compliance." In addition, certified mill test reports clearly identifiable to the lot of material shall be furnished where required in the Contract Documents or otherwise requested by the Project Engineer.

The use of steel manufactured outside of the United States shall be restricted to material which can be positively identified as having been rolled from a given heat on which certified mill tests can be produced.

Where manufactured materials requiring mill test reports or fabricated assemblies involving the welding of steel for structural steel members or the casting and pre-stressing of precast pre-stressed concrete members is to be performed outside of the United States, such manufactured materials or fabricated structural members shall be furnished only from those foreign manufacturers and fabricators who have previously established, to the satisfaction of the Project Engineer, that they have the experience, knowledge, trained man power, quality and quantity of work required. At the option of the Project Engineer, pre-qualification of the plant and manufacturer or fabricator will be established either by the submission of detailed written proof thereof or through in-plant inspection by the Project Engineer or his/her representative, or both.

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

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

All documents pertaining to the Contract, including, but not limited to, correspondences, bid documents, shop drawings and data shall use the system of units of measurement consistent with the Contract Documents.

6.05 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.

The Contractor shall furnish local material from any source the Contractor may elect, except that when mandatory local material sources of certain materials are designated in the Contract Documents, the Contractor shall furnish material from such designated mandatory sources.

The Contractor shall be responsible for making all arrangements necessary to obtain materials from any local material source other than a mandatory local material source. If the Contractor elects to obtain materials from a possible local material source, subject to the provisions of CSS Section 6.06 "Possible Local Material Sources," he/she shall comply with the requirements of the said section. If the Contractor elects to obtain material from any other non-mandatory source, he/she shall furnish the Project Engineer with satisfactory evidence that he/she has entered into an agreement with the property owner for obtaining material from such source and with copies of any necessary permits, licenses and environmental clearances before removing any material from such sources.

The furnishing of local material from any source is subject to the provisions in CSS Section 2.03 "Examination of Plans, Specifications, and Site of Work," and this Section 6.05. Unless described in the Contract Documents as a mandatory local material source, or approved in writing by the Project Engineer, local material sources shall not be excavated at locations where the resulting scars will present an unsightly appearance from any road. No payment will be made for local material obtained in violation of this provision.

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

The Owner will test local material at no cost to the Contractor.

The Contractor shall comply with the requirements of the Santa Clara

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County Ordinance Code, Title C, Chapter III "Grading."

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 6.05, for furnishing and producing materials from any source shall be considered as included in the price paid for the Contract item of work involving such material and no additional compensation will be allowed therefor.

6.06 POSSIBLE LOCAL MATERIAL SOURCES

Where the Owner has made arrangements with landowners in the vicinity of the Project for the obtaining of local material from a landowner's property, such arrangements are made solely for the purpose of providing all Bidders an equal opportunity to obtain material from such property. Contractors may, upon written request, inspect the documents evidencing such arrangements between landowners and the Owner. The Contractor may, if he/she so elects, exercise any rights that have been obtained, which may be exercised by a Contractor under such arrangements, subject to and upon the conditions hereinafter set forth.

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

In those instances in which the Owner has investigated subsurface conditions as referred to in CSS Section 2.03 "Examination of Plans, Specifications, and Site of Work", said investigation may include the documents setting forth the arrangement made with some of the landowners for the obtaining of local material from such landowners' properties. The inclusion of such documents therein shall not in any respect operate as a waiver of any of the provisions in this Section 6.06 concerning said documents.

All necessary permits, licenses and environmental clearances needed to

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enable the Contractor to use a possible local material source shall be obtained by the Contractor and copies thereof shall be furnished the Project Engineer before any material is removed from such source.

The Contractor is cautioned to make such independent investigation and examination as he/she deems necessary as to the quality and quantity of local material available from such property, the type and extent of processing that may be required in order to produce local material conforming to the requirements of the Contract Documents and the rights, duties and obligations acquired or undertaken under such arrangement with the landowner.

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

1. Executed a document that will guarantee to hold such landowner harmless from all claims for injury to persons or damage to property resulting from the Contractor's operations on the landowner's premises and also agree to conform to all other provisions set forth in the arrangement made between the Owner and the landowner. Said document will be prepared by the Project Engineer for execution by the Contractor, or
2. Entered into an agreement with the landowner of the local material source on any terms mutually agreeable to the landowner and the Contractor provided that the Contractor shall furnish to the Project Engineer a release, in a form satisfactory to the Project Engineer, executed by the landowner, relieving the Owner of any and all obligations under the Owner's arrangement with the landowner.

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

If the Contractor elects to obtain material under (2), the Contractor shall

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pay the charges as are provided for in the agreement between the landowner and the Contractor, and deductions will not be made from any moneys due or that become due the Contractor under the Contract to cover the charges.

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

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

6.07 MANDATORY LOCAL MATERIAL SOURCES

The Contractor shall perform all work required to obtain and produce acceptable materials from the mandatory local material sources designated in the Contract Documents and shall have no right to obtain the materials from any other source or sources. As part of the work in producing acceptable materials from the mandatory sources, it will be necessary for the Contractor to perform certain processing of the material as set forth in the Contract Documents. Any processing of the material required in addition to that specified in the Contract Documents which, in the opinion of the Project Engineer, is necessary to produce acceptable material from the mandatory sources will be paid for as Extra Work as provided in CSS Section 4.07 "Extra Work."

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

In this case the Owner will pay the Contractor for the cost of moving the

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Contractor's plant to the new mandatory source and erecting it as Extra Work as provided in CSS Section 4.07 "Extra Work". Construction of access roads, fences, clearing and grubbing or stripping of the new mandatory source, ordered by the Project Engineer to be performed, will be paid for as Extra Work as provided in CSS Section 4.07 "Extra Work." The Owner will also allow or deduct, as the case may be the increase or decrease in haul cost due to an increase or decrease in the length of haul involved. Increased haul costs will be paid for as Extra Work as provided in CSS Section 4.07 "Extra Work," and deductions for decreased haul will be determined in the same manner.

No allowance or additional compensation will be made for lost time or for delay in completing the Work due to moving the Contractor's plant from the designated mandatory source to the alternative mandatory source, other than an extension of time pursuant to the provisions in CSS Section 8.07 "Liquidated Damages." Any processing of the material, required in addition to that specified in the Contract Documents for the originally designated mandatory source that, in the opinion of the Project Engineer, is necessary to produce acceptable material from the alternative mandatory source, will be paid for as Extra Work as provided in CSS Section 4.07 "Extra Work." The Contractor will be charged the same royalty as provided in the Contract Documents for the original designated mandatory local material source.

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

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in obtaining and producing specified materials from mandatory sources, including the construction of any access roads or fences and any clearing, grubbing, and stripping of mandatory local material sources, except as otherwise provided for in this Section 6.07, 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.

6.08 DEFECTIVE MATERIALS

All materials, which the Project Engineer has determined that they do not conform to the requirements of the Contract Documents, will be rejected whether in place or not. Contractor shall remove all rejected materials immediately from the site of the Work, unless otherwise permitted by the Project Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used in the Work, unless approval in writing has been given by the Project Engineer. Upon failure of the Contractor to comply promptly with any order of the Project Engineer made under the provisions in this Section 6.08, the Project Engineer shall have authority to cause the removal and replacement of rejected material and to deduct the cost thereof from any moneys due or to become due the Contractor.

6.09 TRADE NAMES AND ALTERNATIVES

Whenever in the Contract Documents, any material, process, or article is indicated or specified by grade, patent, or proprietary name or by name of manufacturer, such specification shall be deemed to be followed by the words "or equal".

Contractor may offer at any time prior to the award of Contract, and no later, any material, process or article, which shall be substantially equal or better in every respect to that so indicated or specified; provided, however, that if the material, process or article offered by Contractor is not, in the opinion of the Project Engineer, substantially equal or better in respect to that specified, then Contractor must furnish the material, process or article specified or one that, in the opinion of the Project Engineer, is substantially equal or better in every respect.

The burden of proof as to the equality of any material, process, or article shall rest with Contractor.

The Project Engineer's opinion of the substantial equality or superiority of an article proposed for substitution shall be based upon but need not be limited to consideration of such factors as: physical characteristics of weight, gauge, composition, hardness, toughness, ductility, brittleness, etc., as delineated in the Contract Documents; dimensional compatibility with other materials with which it combines to produce a unified design system; all aspects of finished appearance including form, texture, and color, as it significantly affects other design elements. The Project

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Engineer shall respond in writing to alternative submittals within 15 days after receipt.

Owner will consider proposals for substitution of materials, equipment, methods and services only when such proposals are accompanied by full and complete technical data, and all other information requested is provided, in order to evaluate the proposed substitution. Each request for substitution shall include a statement of cause. Owner may require substantiating documents to prove quality, delivery time, and cost.

6.09.01 REQUIREMENTS FOR SUBMISSION OF ALTERNATIVES

- A. Contractor assumes full responsibility that substitutions and/or alternate items or procedures proposed meet all Contract and Project requirements.
- B. Contractor is responsible for the cost of redesign and modifications to any parts of the Work caused by the substitutions or alternates furnished.
- C. Submit data comparing item(s) to be deleted with proposed substitution(s). Include drawings to same (or larger) scale as pertinent portion of Contract Documents, marked to show how differences will be accommodated.
- D. Show complete system/assembly as revised to accommodate proposed alternate, and identify difference(s) in performance, size, configuration, connections, service, accessibility, or any other significant characteristics.
- E. Show complete layout of system unless it is identical to Contract Documents. Show unchanged portion to indicate clearances, etc. relative to changed portion.
- F. Wherever applicable, include complete detail drawings of supports for all substitute equipment and complete load calculations for adequacy of support prepared and signed by a Registered Engineer.
- G. Contractor's submittals which do not comply with the requirements of the Contract Documents, or which indicate

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proposed substitutions were selected without proper regard for the Project requirements will be rejected.

- H. Substitutions submitted that do not comply with the foregoing requirements shall be returned to Contractor without review, and Contractor shall furnish the originally specified items.

6.09.02 REQUIREMENTS FOR INSTALLATION OF ALTERNATIVES

- A. Contractor shall replace any substitution(s) installed without the Project Engineer's consent with the specified item(s) at Contractor's expense.
- B. Contractor shall not proceed with any substitution or change until the Project Engineer has completed all reviews, made recommendations and granted consent.
- C. If the Project Engineer accepts a substitution, Contractor shall make all changes in the Work including changes to Contract and Record Documents at no additional cost to Owner.
- D. If an approved substitution is more expensive than the specified material, process, or article Contractor shall bear all additional costs of such material, process, or article so furnished.

6.10 PLANT INSPECTION

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

6.11 CERTIFICATES OF COMPLIANCE

A certificate of compliance shall be furnished prior to the use of any

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materials for which these Specifications or the Contract Documents require that such certificate be furnished. In addition, when so authorized in these Specifications or in the Contract Documents, the Project Engineer may permit the use of certain materials or assemblies prior to sampling and testing if accompanied by a certificate of compliance. The certificate shall be signed by the manufacturer of the material or the manufacturer of assembled materials. A certificate of compliance must be furnished with each lot of material delivered to the work and the lot so certified must be clearly identified in the certificate.

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

The Owner reserves the right to refuse to permit the use of material on the basis of a certificate of compliance.

The form of the certificate of compliance and its disposition shall be as directed by the Project Engineer.

6.12 MATERIAL TESTING

Unless otherwise specified, all tests shall be performed in accordance with the methods used by the State of California, Department of Transportation. All tests that are performed shall be made by the Project Engineer or his/her designated representative.

The State of California, Department of Transportation has developed test methods for testing the quality of materials and work. These test methods are identified by the prefix "Calif." followed by the serial number.

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

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Properties

California Test

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

Whenever a reference is made in the Contract Documents to a test method of Calif. number, it shall mean the test method in effect on the day the Notice to Proceed for the project is dated.

Whenever the Contract Documents provide an option between two (2) or more tests, the Project Engineer will determine the test to be used.

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

Contractor shall furnish, without additional cost, adequate samples of all materials necessary for testing. Tests and inspections shall be performed by a laboratory selected by the Project Engineer. The Contractor shall furnish adequate samples of the materials proposed for use and designate the source. Costs of testing and inspection will be paid for by the Owner

with the following exception:

Testing and inspection of materials that do not conform to specification requirements, unidentified materials, or materials substituted for those previously tested and approved. Costs for which will be paid by the Owner and deducted from any moneys due or to become due the Contractor.

6.12.01 TESTING BY CONTRACTOR

Whenever specified in the Contract Documents, Contractor shall provide material and/or work quality control testing services in accordance with the following:

- (a) Contractor shall retain a certified and qualified testing agency to perform such work.
- (b) Contractor shall furnish to the Project Engineer for review and approval of the qualifications of the testing agency in accordance with the requirements in CSS Section 4.06 "Submittals For Materials and Equipment."
- (c) Contractor and its testing agency shall agree that copies of all test results, test reports, or written correspondences between the testing agency and Contractor for test(s) as required by the Contract Documents or requested by the Project Engineer shall be furnished directly to the Project Engineer by the testing agency.
- (d) All test results and/or reports shall be prepared and certified by the testing agency prior to submitting to the Owner.
- (e) Materials and/or work, which require interim testing, must successfully pass the required test(s) prior to installation by the Contractor and/or acceptance by the Project Engineer. In the event that any material or work fails the required test(s), Contractor shall be responsible for re-testing after providing corrective measures to that material or work in accordance with CSS Sections 5.10 "Removal of Rejected and Unauthorized Work," and 6.08 "Defective Materials."

Testing of material and/or work will be paid for on a lump-sum basis at

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the Contract price therefor. When there is no separate Contract pay item provided but testing is called for in the Contract Documents, compensation for this work shall be considered as included in the item of work which requires such test(s). Compensation shall include all labor, equipment, services, and incidentals pertaining to field and office work as required by these Specifications and the Contract Documents. No additional compensation shall be allowed for any re-test resulting from material or work failure of the initial test

**SECTION 7
LEGAL RELATIONS AND RESPONSIBILITY**

7.01 COMPLIANCE WITH LAWS AND REGULATIONS

7.01.01 GENERAL

The Contractor shall keep fully informed of all existing and future state and federal laws and county and municipal ordinances and regulations which in any manner affect those engaged or employed in the Work, or the materials used in the Work, or which in any way affect the conduct of the Work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. The Contractor shall observe and comply with and shall cause all agents, employees, and Subcontractors to observe and comply with said regulations. Contractor shall save harmless and indemnify Owner and all its officers and employees against any liability or claim arising from or based upon the violation of said regulations, whether by Contractor, Contractor's agents, employees, or Contractor's Subcontractors.

Attention is directed to the current County of Santa Clara Ordinance Code, Title C, Chapter III "Grading" concerning grading on private property in the unincorporated areas of the County.

7.01.02 CONTRACTING PRINCIPLES

Public works construction contracts are Type I service contract, subject to the Resolution of Contracting Principles adopted by the Board of Supervisors on October 28, 1997. Accordingly, Contractor shall comply with all of the following:

- Contractor shall, during the term of the Contract, comply with all applicable federal, state, and local rules, regulations and laws.
- Contractor shall maintain adequate financial records to show that County funds paid under the Contract were used for purposes consistent with the terms of the Contract. These records shall be maintained during the term of the Contract and for a period of three (3) years from termination of the Contract or until all

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claims, if any, have been resolved, whichever period is longer, or longer if otherwise required under the other provisions of the Contract.

The failure of the Contractor to comply with this Section or any portion thereof may be considered a material breach of the Contract and may, at the option of the Owner, constitute grounds for the termination and/or non-renewal of the Contract. The Contractor shall be provided with reasonable notice of any intended termination or non-renewal on the grounds of noncompliance with this Section, and the opportunity to respond and discuss the Owner's intended action.

7.02 CONTRACTOR'S LICENSING LAWS

Attention is directed to the provisions of Chapter 9 of Division 3 of the Business and Professions Code concerning the licensing of contractors.

All Bidders and Contractors shall possess the required classification of Contractor's License, as specified in the Contract Documents, at the time the Bid is submitted (per Business and Professions Code Section 7028.15). If federal funds are involved in this Project, the Contractor shall possess the required classification of Contractor's License, as specified in the Contract Documents, at the time of Contract award (per Public Contract Code Section 20103.5). If the Bidder does not possess the required Contractor's License at the time a Bid is submitted or at the time the Contract is awarded in the case of a federally funded Project, the Bid shall be considered non-responsive and shall be rejected by the Owner. The Owner may require forfeiture of the Bidder's Bond.

7.03 EQUAL OPPORTUNITY REQUIREMENTS

The County of Santa Clara is an equal opportunity employer. Contractor shall comply with all applicable federal, state, and local laws and regulations including Santa Clara County's equal opportunity requirements. Such laws include but are not limited to the following:

- Title VII of the Civil Rights Act of 1964 as amended;
- Americans with Disabilities Act of 1990;
- The Rehabilitation Act of 1973 (Sections 503 and 504);
- California Fair Employment and Housing Act (Government Code Sections 12900 et seq.);

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- California Labor Code Sections 1101 and 1102.

Contractor shall not discriminate against any Subcontractor, employee, or applicant for employment because of age, race, color, national origin, ancestry, religion, sex/gender, sexual orientation, mental disability, physical disability, medical condition, political beliefs, organizational affiliations, or marital status in the recruitment, selection for training including apprenticeship, hiring, employment, utilization, promotion, layoff, rates of pay, or other forms of compensation.

7.04 TRENCH SAFETY

Contractor's attention is directed to the provisions of Section 6705 of the Labor Code, which is contained in the following CSS Section 7.09 "Workers' Safety Provisions," and CSS Section 5.02.01 "Trench Excavation Safety Plans."

7.05 APPRENTICES

Attention is directed to the provisions in Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning the employment of apprentices by the Contractor and any Subcontractor under him/her. The Contractor and any Subcontractor under him/her shall comply with the requirements of said Sections in the employment of apprentices; however, the Contractor shall have full responsibility for compliance with said Labor Code sections, for all apprenticeable occupations, regardless of any other contractual or employment relationship alleged to exist.

It is the Owner's policy to encourage the employment and training of apprentices on public works contracts as may be permitted under local apprenticeship standards.

7.06 HOURS OF LABOR

Eight hour labor constitute a legal day's work. The Contractor shall forfeit, as a penalty to the Owner \$25 for each worker employed in the execution of the Contract by the Contractor or any Subcontractor for each calendar day during which such 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 provisions of the Labor Code, and in particular, Section 1810 Section 1815, thereof, inclusive, except that work performed by employees of Contractor in excess of 8 hours per day,

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and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one-half times the basic rate of pay, as provided in said Section 1815.

Unless specifically provided or required in the Contract, a Work Order, or a Change Order, Contractor shall receive no additional compensation for any overtime work (i.e., work in excess of eight hours in any one day, forty hours in any one week, or night or weekend work). Also, Contractor shall provide sufficient advance notice to Owner before performing any overtime, night or weekend work, to allow for scheduling of Owner's personnel and, where necessary, public notification.

Contractor shall pay all overtime costs of inspections performed by Owner during overtime work by Contractor that is allowed solely for Contractor's convenience, including work to maintain or recover time on the Project schedule.

7.07 PREVAILING WAGE AND PAYROLL RECORDS

The Contractor shall comply with the Labor Code Sections 1774 and 1775. In accordance with said Section 1775, the Contractor shall be assessed a penalty for each calendar day or portion thereof, for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed for any work done under the Contract by him/her or by any Subcontractor under him/her in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. In addition to said penalty and pursuant to said Section 1775, the difference between such stipulated 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 stipulated prevailing wage rate shall be paid to each worker by the Contractor.

In accordance with Section 1776 of the Labor Code, the Contractor and each Subcontractor shall furnish a certified weekly statement within seven (7) days after the regular payroll date of actual payment of wages of each worker employed on the Project. Such statement shall include a breakdown of all fringe benefits included in such wage for each worker.

Pursuant to the provisions of Section 1770 of the Labor Code of the State of California, the Director of the California Department of Industrial Relations has ascertained the general prevailing rate of wages (which rate

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includes employer payments for health and welfare, vacation, pension, 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 worker concerned. Said prevailing wage rates are on file in the office of the Clerk of the Board of Supervisors, incorporated herein by reference. Copies of which are available to any interested party on request.

If Contractor uses a craft or classification not shown on the prevailing wage determinations, Contractor may be required to pay the wage rate of the craft or classifications most closely related to it as shown in the general determinations effective at the time of the call for Bids. Pursuant to Labor Code Section 1773.2, Contractor shall post a copy of such prevailing wages at each job site.

In the event of noncompliance with the requirements of this Section, the Contractor shall have 10 days in which to comply subsequent to receipt of Owner's written notice specifying in what respects the Contractor must comply with this Section. Should noncompliance still be evident after the 10-day period, the Contractor shall, as a penalty to the Owner, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties will be withheld by Owner from progress payments then due. Owner may also withhold payment for any work for which Contractor has not submitted certified weekly payrolls.

7.08 WORKERS' TRAVEL AND SUBSISTENCE PAYMENTS

Attention is directed to the requirements of Section 1773.8 of the Labor Code.

The Contractor shall make travel and subsistence payments to each worker, needed to execute the Work, in accordance with the requirements in said Section 1773.8.

7.09 WORKERS' SAFETY PROVISIONS

Contractor is solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of

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the Work. This requirement applies continuously and is not limited to normal working hours. No act, service, drawing or construction review, approval or other act by Owner's representative or Owner's Consultant is intended to include review of the adequacy of Contractor's safety measures at or near the Project site, at any place of fabrication, or anywhere else.

Contractor shall take all necessary precautions for the safety of employees on the Work, and shall comply with all applicable provisions of federal, state, and local safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all appropriate safeguards for the protection of workers and the public and shall post danger signs warning against the hazards created by such features of construction (such as fire, toxics, chemicals, odors, noise, vibration, equipment operations, obstructions, falling objects, falls, and all other construction hazards) and Contractor shall designate a responsible member of its organization whose duty shall be the prevention of accidents. Contractor shall report the name and position of the person so designated to the Project Engineer.

The Contractor shall comply with the applicable provisions of the California Occupational Safety and Health Act of 1973 and the Labor Code. Applicable sections from the Labor Code include, but are not limited to, the following:

“6500. For those employment or places of employment which by their nature involve a substantial risk of injury, the Division of Industrial Safety shall require the issuance of permit prior to the initiation of any practices, work, method, operation, or process of employment. Such employment or places of employment shall be limited to:

- a. Construction of trenches or excavations which are 5 feet (1.5 m) or deeper and into which a person is required to descend.
- b. The construction of any building, structure, falsework, or scaffolding more than three stories high or the equivalent height.

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- c. The demolition of any building, structure, falsework, or scaffold more than three stories high or the equivalent height.”
- d. The underground use of diesel engines in confined spaces.

“6705. No contract for public works involving an estimated expenditure in excess of twenty-five thousand dollars (\$25,000) for the excavation of any trench or trenches 5 feet (1.5 m) or more in depth shall be awarded unless it contains a clause requiring submission by the Contractor and acceptance by the awarding body, to whom authority to accept has been delegated, in advance of excavation, of 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 such trench or trenches. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer. The Contractor shall be required at all times during any excavation work to have a CAL-OSHA approved "Competent Person" on the site. The Owner will require proof of certification prior to commencing any excavation work.”

“6707. Whenever the state, a county, city and county, or city issues a call for bids for the construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are 5 feet (1.5 m) or deeper, such call shall specify that each bid submitted in response thereto shall contain, as a bid item, adequate sheeting, shoring, and bracing or equivalent method, for the protection of life or limb, which shall conform to applicable safety orders.”.

Nothing in this CSS Section 7.09 shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders.

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

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Full compensation for conforming to the requirements of this Section except as specified below shall be considered as included in the Contract prices paid for the various items of Work involved and no separate payment will be made therefor.

7.09.01 CONFINED SPACES

Contractor shall comply with all State and Federal OSHA requirements, and all of Owner's requirements regarding entry into confined spaces including, but not limited to, the following:

- Before starting any work on the Contract, Contractor shall submit for Owner's review and acceptance a confined space entry program applying to all existing permit-required confined spaces identified by Owner in the Contract Documents, or defined by regulations, and any confined spaces identified or created by Contractor or Owner during the Contract. Owner shall have the right to identify additional spaces to be treated as confined spaces by Contractor at any time during the Contract, without changing the Contract price or time if such additional spaces were created by Contractor.
- Contractor shall maintain written records of all entries into confined spaces and all activities conducted in confined spaces.
- Contractor shall coordinate all entry operations with Owner when both Contractor's personnel and Owner's personnel will be working in or near a confined space in the contract area. Owner shall endeavor to give Contractor at least twenty-four (24) hours advance notice of such entry except in unforeseen emergencies.
- Contractor shall inform Owner in writing at the conclusion of entry operations regarding the permit space program followed and any hazards confronted or created in permit spaces during entry operations.

7.10 WORKERS' COMPENSATION

Pursuant to the requirements of Section 1860 of the Labor Code, the Contractor will be required to secure the payment of the workers'

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compensation to his employees in accordance with the provisions of Section 3700 of the Labor Code.

7.11 WORKERS' SANITARY PROVISIONS

Contractor shall conform to the rules and regulations for sanitary provisions established by the State, the County of Santa Clara, and any other applicable jurisdictions.

Contractor shall provide and maintain enclosed toilets for use by its employees. These accommodations shall be maintained in a neat and sanitary condition, and shall comply with all applicable laws, ordinances, and regulations pertaining to public health and sanitation.

7.12 EQUIPMENT REPAIR LABOR

The work of installing, assembling, repairing or reconditioning, or other work of any nature on machinery, equipment, or tools used in or upon the Work shall be considered a part of the Work to be performed under the Contract. Any laborers, workers, or mechanics working on such machinery, equipment, or tools, unless employed by bona fide commercial repair shops, garages, blacksmith shops, or machine shops, which have been established and operating on a commercial basis for a period of at least 2 months prior to the award of the Contract, shall be subject to all the requirements relating to labor set forth in these Specifications and in the Special Provisions.

7.13 MATERIAL PLANT LABOR

The construction, erection, and operation of material production, proportioning, or mixing plants from which material is used wholly on the Contract or on contracts under the supervision of the Owner shall be considered a part of the Work to be performed under the Contract and any laborers, workers, or mechanics working on such plants shall be subject to all of the requirements relating to labor set forth in these Specifications and in the Special Provisions.

7.14 SOUND CONTROL REQUIREMENTS

The Contractor shall comply with all local sound control and noise level rules, regulations, and ordinances, which apply to any work performed pursuant to the Contract.

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

Noise level from and hours of Contractor's nighttime operations, which are located within city limits, shall comply with city ordinances or requirements. Contractor's operations in the county's unincorporated areas or areas which border a city, town or other county shall comply with the noise level requirements per the Santa Clara County Ordinance Code or requirements adopted by other jurisdictions, whichever are more stringent. Contractor's attention is directed to the current Santa Clara County Ordinance Code, Section B11-194 2.6 "Construction/ Demolition" for the maximum acceptable noise levels. Noise level requirements shall apply to all equipment used in the Project including, but not limited to, trucks, transit mixers, or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of warning lights except those required by safety laws for the protection of personnel.

All nighttime work shall require prior approval of the Project Engineer unless specified otherwise in the Contract Documents.

7.15 AIR AND WATER POLLUTION CONTROL ACT

Contractor shall be deemed to agree that any facility to be utilized in the performance of the Contract, unless such Contract is exempted under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub. L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub. L. 92-500), Executive Order 11783, and regulations in implementation thereof (40 C.F.R., Part 15), is not listed on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 C.F.R. 15.20.

7.15.01 AIR POLLUTION CONTROL

The Contractor shall comply with all air pollution rules, regulations, ordinances and statutes of the Bay Area Air Pollution Control District, and all other regulatory agencies, which apply to any work performed pursuant to the Contract.

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Unless otherwise specified in the Contract Documents, material to be disposed of shall not be burned, either inside or outside the Roadway right-of-way.

7.15.02 WATER POLLUTION CONTROL

Contractor shall comply with all Federal, State and local water pollution prevention and storm drain pollution prevention rules, regulations, ordinances, statutes, and guidelines.

The Contractor shall exercise every reasonable precaution to protect streams, lakes, reservoirs, bays, and coastal waters from pollution with fuels, oils, bitumen, calcium chloride and other harmful materials and shall conduct and schedule operations so as to avoid or minimize muddying and silting of said streams, lakes, reservoirs, bays, and coastal waters.

Nothing in the terms of the contract documents shall relieve the Contractor of the responsibility for compliance with Sections 5650 and 12015 of the Fish and Game Code, applicable regulations of the Regional Water Quality Control Board, Santa Clara Valley Water District requirements, or other applicable statutes relating to prevention or abatement of water pollution.

7.16 (BLANK)

7.17 PESTICIDES & HAZARDOUS MATERIALS

7.17.01 PESTICIDES

The Contractor shall comply with all rules and regulations of the Department of Food and Agriculture, the Department of Toxic Substances Control, the Department of Industrial Relations, and all other agencies, which govern the use of pesticides required in the performance of the Work on the Contract.

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

Any substance or mixture of substances intended for preventing,

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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.

7.17.02 HAZARDOUS MATERIALS

“Hazardous material” means any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment.

Disposal of Hazardous Materials shall be in compliance with all regulatory requirements, including, but not limited to, containerization, labeling, manifesting, transportation, treatment, disposal site, and use of properly trained personnel.

Contractor shall, as a condition of final Acceptance of the Work, provide copies of all Uniform Hazardous Waste Manifests signed by owner(s) of the toxic substance facilities receiving the hazardous materials. Owner may require Certificates of Disposal to prove that Contractor has legally disposed of such materials.

Contractor shall comply with all Federal, State, County and local laws, statutes, ordinances, and other regulations covering the use, storage, transportation, and disposal of any hazardous materials on the Project. Contractor shall obtain all permits and pay all fees for all services and materials required to perform the Work.

Contractor shall submit Material Safety Data Sheets (MSDS) for all hazardous materials being brought onto the Project site including, but not be limited to, asphalt, solvents, adhesives, epoxy resins, and in particular those products used to perform the Work.

Contractor shall safely contain and store all its hazardous materials, and in the event of spill or discharge, shall immediately notify all required Federal, State, County and local agencies including the fire department. Contractor shall protect personnel from exposure and provide treatment as necessary.

Contractor shall immediately advise Owner of any potentially hazardous materials encountered at the Project site and shall take all

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necessary action to prevent exposure of personnel until the material is identified and proper action can be taken.

Contractor shall not store or use any hazardous materials near air intakes or doors and windows serving persons on or off the Project site without proper protection and safeguards to preclude exposure.

Contractor shall exercise all required precautions and safeguards in the storage, use, and disposal of hazardous materials. Nothing in this Section shall relieve Contractor of responsibility for compliance with all applicable laws and statutes, or other provisions of the Contract, particularly Contractor's responsibility for damage and preservation of life and property.

7.18 DISPOSAL OF MATERIAL OUTSIDE THE HIGHWAY RIGHT-OF-WAY

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

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

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

Where the Owner has made arrangements with owners of land in the vicinity of a project for the disposal of materials on an owner's property, such arrangements are made solely for the purpose of providing all bidders an equal opportunity to dispose of said materials on such property. Bidders or Contractors may upon written request, inspect the documents evidencing such arrangements between property owners and the Owner. The Contractor may, if he/she so elects, exercise any rights that have been obtained, which may be exercised by a Contractor under such arrangements, subject to and upon the conditions hereinafter set forth. Such arrangements are not a part of the Contract. It is expressly understood and agreed that the Owner assumes no responsibility to the Bidder or Contractor, whatsoever, in respect to the arrangements made with the property owner to dispose of materials thereon, and that the Contractor shall assume all risks in connection with the use of such property, the terms upon which such use shall be made. There is no warranty or guaranty, either expressed or implied, as to the quantity or types of materials that can be disposed of on such property.

In those instances, in which the Owner has compiled "Materials Information" as referred to in CSS Section 2.03 "Examination of Plans, Specifications, and Site of Work," the compilation will include the documents setting forth the arrangement made with some of the property owners for the disposal of material on those owners' properties. The inclusion of the documents therein shall not in any respect operate as a waiver of any of the provisions in this Section 7.18 concerning the documents.

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

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

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1. Executed a document that will guarantee to hold such Owner harmless from all claims for injury to persons or damage to property resulting from the Contractor's operations on the property owner's premises and also agree to conform to all other provisions set forth in the arrangement made between the Owner and the property owner. Said document will be prepared by the Project Engineer for execution by the Contractor, or,
2. Entered into an agreement with the owner of the disposal site on any terms mutually agreeable to the owner of the disposal site and the Contractor; provided that the Contractor shall furnish to the Project Engineer a release, in a form satisfactory to the Project Engineer, executed by the owner of the disposal site, relieving the Owner of any and all obligations under the Owner's arrangements with the owner of the disposal site.

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

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

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

The County's Excavation and Grading Ordinance may require a permit or clearance prior to doing the work.

Full compensation for all costs involved in disposing of materials as

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specified in this Section 7.18, including all costs of hauling, shall be considered as included in the price paid for the Contract item of work involving such materials and no additional compensation will be allowed therefor.

7.19 PERMITS AND FEES

Contractor shall obtain all necessary permits and licenses, give all necessary notices, and comply with all laws, ordinances, rules, and regulations relating to the Work, and to the preservation of the public health and safety unless otherwise directed by the Project Engineer. Contractor will not be charged for any permit required by county ordinances. Contractor will be reimbursed for any fees charged by other jurisdictions as specified in the Contract Documents.

7.20 PAYMENT OF TAXES AND UTILITIES

The Contractor shall pay all taxes whether imposed by federal, state, or local government. 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 Owner as to any tax on labor, services, materials, transportation, or any other items furnished pursuant to the Contract. Contractor shall pay all utilities used on the Project until acceptance by Owner.

The Owner will secure and pay all charges required for the use of utilities where such charges are based on acreage, front footage, or linear feet of service line. This shall not relieve the Contractor of securing all necessary permits required for inspection purposes.

7.21 COOPERATION

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

When two (2) or more contractors are employed on related or adjacent

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work, each shall conduct its 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 their unnecessary delays or failure to finish the work within the time specified for completion.

7.22 PUBLIC CONVENIENCE AND PUBLIC SAFETY

7.22.01 PUBLIC CONVENIENCE

This section defines the Contractor's responsibilities with regard to the convenience of the public and public traffic in connection with the Contractor's operations.

Contractor's attention is directed to others sections as follows:

- CSS Section 4.09 "Detours" for provisions relating to the passage of traffic around the Work area.
- CSS Sections 7.22.02 "Public Safety" and 7.22.03 "Intersection or Lane Closure" for provisions relating to the Contractor's responsibilities for public safety.
- CSS Section 12 "Construction Area Traffic Control Devices" for provisions relating to the Contractor's responsibilities for traffic control.
- CSS Section 8.05 "Temporary Suspension of Work" for requirements in the event of a work suspension.

The Contractor shall so conduct its 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 the Contractor can prosecute properly with due regard to the rights of the public. Unless otherwise provided in the Special Provisions, all public traffic shall be permitted to pass through the Work with as little inconvenience and delay as possible. Where possible, such traffic shall be routed on new or existing paved surfaces.

Spillage resulting from hauling operations along or across any

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public traveled way shall be removed immediately by the Contractor at its expenses.

Existing traffic signal and highway lighting systems shall be kept in operation for the benefit of the traveling public during progress of the Work. Other forces will continue routine maintenance of existing systems.

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

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 highways shall be provided and kept in good condition. When the abutting property owner's access across the right-of-way line is to be eliminated, or to be replaced under the Contract by other access facilities, the existing access shall not be closed until the replacement access facilities are usable.

Roadway excavation and construction of embankments shall be conducted in such a manner as to provide a reasonably smooth and even surface satisfactory for use by public traffic at all times. Sufficient fill at culverts and bridges to permit traffic to cross shall be placed in advance of other grading operations. If ordered by the Project Engineer, Roadway cuts shall be excavated in lifts, and embankments constructed part width at a time, construction being alternated from one side to the other and traffic routed over the side opposite the one under construction. Culvert installation or culvert construction shall be kept open and unobstructed until the opposite side of the Traveled Way is ready for use by traffic.

After the surface of the Roadbed has been brought to a smooth and even condition for the passage of public traffic as above provided, any work ordered by the Project Engineer for the accommodation of public traffic prior to commencing sub-grade operations will be paid for as Extra Work. After sub-grade preparation for a specified layer of material has been completed, the Contractor shall, at its expenses, repair any damage to the Roadbed or completed sub-grade, including

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damage caused by its operations or use by public traffic.

While sub-grade and paving operations are underway, public traffic shall be permitted to use the shoulders and, if half-width paving methods are used, shall also be permitted to use the side of the Roadbed opposite the one under construction. When sufficient width is available, a passageway wide enough to accommodate at least 2 lanes of traffic shall be kept open at locations where sub-grade and paving operations are in active progress. Contractor shall perform any shaping of shoulders or reshaping of sub-grade necessary for the accommodation of public traffic thereon during sub-grade preparation and paving operations.

When ordered by the Project Engineer, the Contractor shall furnish a pilot car and driver and flaggers for the purpose of expediting the passage of public traffic through the Work under one-way controls. At locations where traffic is being routed through construction under one-way controls and when offered by the Project Engineer, the movement of the Contractor's equipment from one portion of the Work to another shall be governed in accordance with such one-way controls.

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

In order to expedite the passage of public traffic through or around the Work and where ordered by the Project Engineer, the Contractor shall install signs, light flares, barricades, and other facilities for the sole convenience and direction of public traffic. Also where directed by the Project Engineer, the Contractor shall furnish competent flaggers or uniformed police officer whose sole duties shall consist of directing the movement of public traffic through or around the Work as specified in CSS Section 12.02 "Flaggers And Police Officers."

In addition to the requirements hereinbefore specified for furnishing facilities and flaggers or uniformed police officers for expediting the passage of public traffic through or around the Work, the Contractor shall erect, within or adjacent to the limits of the Contract, such warning, regulatory, and guide signs. If signs are furnished by the County, the Project Engineer will inform the Contractor where such County-furnished signs are stored. The Contractor shall load and

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haul the signs from such storage to the site of the Work and erect them, including any necessary framing. The Contractor shall also return and unload said signs at the storage locations designated by the Project Engineer at the completion of the Project.

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

By reason of the Contractor's conformance with any of the provisions in this CSS Section 7.22.01 "Public Convenience," the Contractor shall not be relieved from its responsibility as set forth in said CSS Section 7.22.02 "Public Safety."

7.22.02 PUBLIC SAFETY

It is the Contractor's responsibility to provide for the safety of public during construction.

Contractor's attention is directed to:

- CSS Section 7.09 "Workers' Safety Provisions;"
- CSS Section 7.22.01 "Public Convenience" for provisions relating to the Contractor's responsibility for providing for the convenience of the public in connection with the Contractor's operations;
- CSS Section 7.22.03 "Intersection or Lane Closure;"
- CSS Section 7.38 "Responsibility for Damage;"
- CSS Section 12 "Construction Area Traffic Control Devices" for

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requirements concerning flagging and traffic-handling equipment and devices used in carrying out the provisions of CSS Section 7.22.01 “Public Convenience,” this Section 7.22.02 and Section 7.22.03 “Intersection or Lane Closure.”

Whenever the Contractor’s operations create a condition hazardous to traffic or to the public, the Contractor shall, at the Contractor’s expenses and without cost to the Owner, 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.

The Contractor shall install temporary railing (type K) between any lane carrying public traffic and any excavation, obstacle, or storage area when the following conditions exist:

(a) **Excavations**

Any excavation, the near edge of which is 3.6 m (12 feet) or less from the edge of the lane, except:

- Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by the traffic or public.
- Excavations of less than 300 mm (1 foot) deep.
- Trenches of less than 300 mm (1 foot) wide for irrigation pipe or electrical conduit or excavations of less than 300 mm (1 foot) in diameter.
- Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
- Excavations in side slopes where the slope is steeper than 4:1.
- Excavations protected by existing barrier or railing.

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(b) **Temporarily Unprotected Permanent Obstacles**

Whenever the Work includes an installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or whenever the Contractor, for his or her convenience and with permission of the Project Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.

(c) **Storage Areas**

Whenever material or equipment is stored within 3.6 m (12 feet) of the lane and such storage is not otherwise prohibited by the Contract Documents.

The approach end of temporary railing (Type K), installed in accordance with the requirements in this section 7.22.02 "Public Safety" shall be offset a minimum of 4.5 m (15 feet) from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than 300 mm (1 foot) transversely to 3 m (10 feet) longitudinally with respect to the edge of the traffic lane. If the 4.5 m (15 feet) minimum offset cannot be achieved, the temporary railing shall be installed on the 10:1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08 "Temporary Railing (Type K)" of the State Standard Specifications.

Temporary crash cushion modules shall conform to the requirements as specified in the Contract Documents.

Except for installing, maintaining and removing traffic control devices, the Contractor shall close the adjacent traffic lane whenever work is performed or equipment is operated in the following work areas, unless otherwise provided in the Contract Documents:

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Approach Speed of Public Traffic (Posted Speed Limit)

Work Areas

55 to 70 km/h
(35 to 45 MPH)

Within 900 mm (3 feet) of a traffic lane but not on a traffic lane.

Over 70 km/h (45
MPH)

Within 1.8 m (6 feet) of a traffic lane but not on a traffic lane.

The lane closure provision of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of traffic lane, the line of cones or delineators shall be considered to be the edge of traffic lane; however, the Contractor shall not reduce the width of an existing lane to less than 3 m (10 feet) without written approval from the Project Engineer.

When work is not in progress on a trench or other excavation that requires a lane closure, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall not be more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over the public traffic or pedestrians.

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 in the Contract Documents.

The Contractor shall also furnish such flaggers or uniformed police officers as are necessary, specified in the Contract Documents, or directed by the Project Engineer, 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 CSS Section 12 "Construction Area Traffic Control Devices."

Signs, lights, flags, and other warning and safety devices and their use

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shall conform to the requirements set forth in the current Caltrans' Manual of Traffic Controls. 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 Contract Documents. Signs furnished and erected by the Contractor, at the Contractor's expense, shall be approved by the Project 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 hereinbefore specified.

Construction equipment shall enter and leave the roadway via existing ramps, intersections, and approved access by the Project Engineer, and shall move in the direction of the public traffic. All movements of workers and construction equipment on or across lanes open to public traffic shall be performed in a manner that will not endanger public traffic.

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

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

Lanes, ramps, and shoulders shall be closed in accordance with the details shown in the Contract Documents and the provisions of CSS Section 12 "Construction Area Traffic Control Devices."

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

Pedestrian openings through falsework shall be paved or provided with

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full width continuous wood walks and shall be kept clear. Pedestrians shall be protected from falling objects and curing water for concrete. Overhead protection for pedestrians shall extend not less than 1.2 m (4 feet) beyond the edge of the bridge deck. All pedestrian openings through falsework shall be illuminated in accordance with the provisions in SSS Section 86-6.11 "Falsework lighting."

Where the height of vehicular openings through falsework is less than 4.6 m (15 feet), a W34B "Vertical Clearance" sign shall be provided above each opening facing approaching traffic. The signs shall have black letters and numbers on an orange reflective background and shall be illuminated so that the signs are clearly visible. The minimum height of the letters and numbers shall be 150 mm (6 in.) and 250 mm (12 in.), respectively.

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

Temporary facilities, which are used by the Contractor 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 Documents for those facilities or, if none are specified, with standard design criteria or codes appropriate for the facility involved. 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 and shall be submitted to the Project Engineer for approval pursuant to CSS Section 5.02 "Plans and Working Drawings." The submittals shall designate thereon the standard design criteria or codes used. Installation of the temporary facilities shall not start until the Project 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 Project 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

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

Provision for the payment for signs, lights, flares, temporary railing (Type K), barricades, and other facilities by Extra Work as provided in CSS Section 7.22.01 "Public Convenience" or by Contract item as provided in CSS Section 12 "Construction Area Traffic Control Devices" shall in no way relieve the Contractor from the responsibility as provided in this Section 7.22.02 "Public Safety."

7.22.03 INTERSECTION OR LANE CLOSURE

Lane or intersection closures shall be made in accordance with the current Caltrans Manual of Traffic Controls for Construction and Maintenance Work Zones and the following:

- (a) Traffic control/detour plan shall be prepared by the Contractor as per CSS Section 4.06 "Submittals For Materials And Equipment" and submitted to the Project Engineer for review and acceptance.
- (b) Traffic signal operations shutdown shall be limited to one intersection per a two (2) mile radius limit. In no case, shall two (2) adjacent intersections be closed concurrently.
- (c) No lane closure on expressways shall be permitted between the hours of 6:00 AM - 9:00 AM and 3:00 PM - 7:00 PM.
- (d) A minimum of two (2) expressway lanes per direction shall be kept open at all times.
- (e) Shutdown of the traffic signal shall be limited to the normal off-peak hours. Uniformed police officer(s) shall be provided as specified in CSS Section 12.02 "Flaggers and Police Officers" to direct traffic during shutdown.
- (f) Pedestrian and mobility-impaired access shall be provided during construction.

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- (g) Upon completion of all work requiring lane closure, traffic cones and telescoping flag trees shall be removed from the site of the work. Any Owner-furnished signs, when no longer required, shall be delivered to a location designated by the Project Engineer.

Unless otherwise specified in the Special Provisions, compensation for preparing traffic control/detour plan, furnishing, placing, maintaining and removing construction signs, traffic cones or delineators, and telescoping flag trees with flags which are required for lane or intersection closure, and for moving and placing any Owner-furnished signs, shall be considered as included in the Contract price for traffic control.

7.22.04 MEASUREMENT AND PAYMENT

Except as otherwise provided in this Section, CSS Section 12 "Construction Area Traffic Control Devices" or in the Special Provisions, full compensation for conforming to the requirements in this Section shall be considered as included in the Contract prices paid for the various Contract items of Work and no additional compensation will be allowed therefor.

The Contractor will be required to pay the cost of replacing or repairing all facilities installed for the convenience or direction or warning of public traffic, whether furnished and installed under Extra Work, or furnished by the County and installed by the Contractor as above specified, that are lost while in the Contractor's custody, or are damaged by reason of its operations to such an extent as to require replacement or repair, and deductions from any moneys due or to become due the Contractor will be made to cover such cost.

7.23 USE OF EXPLOSIVES

When the use of explosives is necessary for the prosecution of the Work, the Contractor shall use the utmost care not to endanger life or property.

In advance of doing any blasting work within 60 m (200 feet) of any railroad's tracks or structures, the Contractor shall notify the railroad of the location, date, time, and approximate duration of such blasting operations.

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7.24 ASSIGNMENT OF ANTITRUST ACTIONS

The Contractor's attention is directed to the following provision of Public Contract Code 7103.5 and Government Code Sections 4550 and 4554, which shall be applicable to the Contractor and its Subcontractors:

"In entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the contractor, without further acknowledgment by the parties."

7.25 (BLANK)

7.26 VEHICLE CODE

Within such areas as are within the limits of the Project and are open to public traffic, the Contractor shall comply with all the requirements set forth in Divisions 11, 12, 13, 14, and 15 of the Vehicle Code. Attention is directed to the statement in Section 591, Division 1 of the Vehicle Code, that Section 591 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 its equipment and the protection of the public from injury and damage from such equipment.

7.27 CONTRACTOR'S RESPONSIBILITY FOR THE WORK AND MATERIALS

Until the Acceptance of the Work, the Contractor shall have the charge and care of the Work and the materials to be used therein (including materials for which they have received partial payment or materials which have been furnished by the Owner) and shall bear the risk of injury, loss, or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the Work, except as otherwise expressly provided for.

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The Contractor shall rebuild, repair, restore, and make good all injuries, losses, or damages to any portion of the Work or the materials occasioned by any cause before its completion and acceptance.

The Contractor shall not be responsible for injuries, losses, or damages as are directly and proximately caused by acts of any governmental agency or the public enemy.

Contractor shall not be responsible for the cost of repairing or restoring damage to the Work caused by act of God. Owner may require Contractor to obtain insurance as part of a separate Bid item to indemnify Owner for any such damage to the Work.

Where necessary to protect the Work or materials from damage, the Contractor shall provide suitable drainage and erect such temporary structures as are necessary to protect the Work or materials from damage. The suspension of the Work from any causes whatever shall not relieve the Contractor of its responsibility for the Work and materials as herein specified. If ordered by the Project Engineer, the Contractor shall properly store materials which have been partially paid for by the Owner or which have been furnished by the Owner. Such storage by the Contractor shall be on behalf of the Owner and the Owner shall at all times be entitled to the possession of such materials, and the Contractor shall promptly return the same to the site of the Work when requested. The Contractor shall not dispose of any of the materials so stored except on written authorization from the Project Engineer.

7.28 PERSONAL LIABILITY

Neither the Owner, nor any other officer or authorized employee of the Owner, nor any officer or employee of any city or district shall be personally responsible for any liability arising under or by virtue of the Contract.

Nothing in the Contract is intended to create the public or any member thereof a third party beneficiary hereunder, nor is any term and condition or other provision of the Contract intended to establish a standard of care owed to the public or any member thereof.

7.29 NON WAIVER

Neither Acceptance of, nor payment for, the Work or any part thereof,

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nor any extension of time nor any possession taken by Owner, shall operate as a waiver of any of the provisions of the Contract, nor shall a waiver of any breach of the Contract be held to be a waiver of any other or subsequent breach.

Conformance with any of the provisions in one part of the Contract Documents shall not relieve the Contractor from its responsibilities as set forth elsewhere in the Contract Documents.

7.30 VERBAL AGREEMENTS

No verbal agreement or conversation with any officer, employee, agent or Consultant of Owner, either before, during or after the execution of this Contract, shall affect or modify any of the terms or obligations contained in the Contract Documents, nor shall such verbal agreement or conversation entitle Contractor to any additional payment whatsoever under the terms of the Contract.

7.31 NOTICES

Any notice from one party to the other under the Contract shall be in writing and shall be dated and signed by the party giving such notice or by a duly authorized representative of such party. Any such notice shall not be effective for any purpose whatsoever unless served in the following manner:

- (1) If the notice is given to Owner, it must be by personal delivery thereof to Owner's authorized representative or by depositing the same in the United States mail, enclosed in a sealed envelope, addressed to Owner for the attention of said authorized representative, 101 Skyport Dr., San Jose, California 95110-1302, first class, and postage prepaid.
- (2) If the notice is given to Contractor, it must be by personal delivery thereof to Contractor, or to Contractor's superintendent at the site of the Work, or by depositing the same in the United States mail, enclosed in a sealed envelope addressed to Contractor at its regular place of business or at such other address as may have been established for the conduct of the Work, first class and postage prepaid.
- (3) If the notice is given to the Surety or any other person, by

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personal delivery to such Surety or by depositing the same in the United States mail, enclosed in a sealed envelope, addressed to such Surety or person at the address of such Surety or person last communicated by him/her to the party giving the notice, first class and postage prepaid.

- (4) Deposit of notice in the United States mail shall be the date of receipt thereof.

7.32 PROPERTY RIGHTS IN MATERIALS

Nothing in the Contract Documents shall be construed as vesting in the Contractor any right of property in the materials used in the Work after they have been attached or affixed to the Work or in the soil, or after payment has been made for ninety (90) percent of the value of materials delivered to the site of the Work, or stored subject to or under the control of the Owner. All such materials shall become the property of the Owner upon being so attached or affixed or upon payment of ninety (90) percent of the value of materials delivered to the site of the Work or stored subject to or under the control of the Owner.

7.33 RIGHTS IN LAND AND IMPROVEMENTS

Nothing in these Contract Documents 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. Contractor shall not make any arrangement in conflict with any agreement between the Owner and any owner, former owner, or tenant of such land, structure, or building.

The Contractor shall not occupy Owner-owned property outside the Project limits as shown on the Plans or maps available in the office of the Owner in which the Work is situated, unless he/she enters into an agreement with the Owner.

7.34 PATENTS

The Contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the Work, and agrees to indemnify and save harmless the Owner and their duly authorized representatives, from any claim, liability, litigation, or

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actions of any nature for, or an account of the use of any patented materials, equipment, devices, or processes.

7.35 (BLANK)

7.36 WEIGHT LIMITATIONS

Construction equipment or vehicles of any kind which, laden or un-laden, exceed the maximum weight limitations set forth in Division 15 of the Vehicle Code, shall not be operated over completed or existing treated base, surfacing, pavement or structures in any areas within the limits of the project unless expressly permitted in the Contract Documents or except as hereinafter provided.

Within the limits of the Project and subject to the control of the Project Engineer, and provided that the Contractor, at its expense, shall provide such protective measures, as are deemed necessary by the Project Engineer, and shall repair any damage caused by such operations, the Contractor will be permitted to:

- (1) Make transverse crossings of such portions of an existing public road or street with construction equipment, which exceeds the size or weight limitations, set forth in Division 15 of the Vehicle Code.
- (2) Make transverse crossings of treated bases, surfacing, or pavement which are under construction or which have been completed, with construction equipment which exceeds the size or weight limitations set forth in Division 15 of the Vehicle Code.
- (3) Cross bridge structures that are not open to public traffic and which are designed for HS20-44 live loading (culverts and pipes excluded), with construction equipment which exceeds the size or weight limitations set forth in Division 15 of the Vehicle Code, but not exceeding the weight limitations hereinafter specified, provided that the Contractor furnishes to the Engineer the dimensions and maximum axle loads of equipment proposed for use on bridge structures:
 - (a) The loading on bridge structures due to 2 and 3 axle pneumatic-tired earthmovers shall not exceed that shown

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on the following table:

<u>Spacing Of Bridge Girders</u> (center to center)	<u>Maximum Axle</u> <u>Loading</u>
1.2 m(4 ft)	12,700 kg (28,000 lb.)
1.5 m(5 ft)	13,100 kg (29,000 lb.)
1.8 m(6 ft)	13,600 kg (30,000 lb.)
2.1 m(7 ft)	14,500 kg (32,000 lb.)
2.4 m(8 ft)	15,400 kg (34,000 lb.)
2.7 m(9 ft)	16,700 kg (37,000 lb.)
3.0 m(10 ft) & Over	18,100 kg (40,000 lb.)

Minimum axle spacing:

- For 3-axle earth-movers:
Axles 1 to 2 = 2.4 m (8 feet)
Axles 2 to 3 = 6.1 m (20 feet)
- For 2-axle earth-movers:
Axles 1 to 2 = 6.1 m (20 feet)

(b) The maximum loading on bridge structures due to pneumatic-tired truck and trailer combinations shall not exceed (1) 12,700 kg (28,000 lb.) for single axles, (2) 21,700 kg (48,000 lb.) for tandem axles, nor (3) 27,200 kg (60,000 lb.) total gross load for single vehicles or 50,000 kg (110,000 lb.) total gross load for truck and trailer or semi-trailer combinations.

(c) The Contractor may be allowed to cross bridge structures with any construction equipment in accordance with the limitations and conditions contained in the "Permit Policy" of the County.

Within the limits of the Project and subject to the condition that the Contractor shall repair at their expense any damage cause thereby, the Contractor will be permitted to cross culverts and pipes with construction equipment which exceed the size or weight limitations set in Division 15 of the Vehicle Code.

Should the Contractor desire to increase the load carrying capacity of a structure or structures which are to be constructed as part of the Contract, in order to facilitate its own operations, he/she may request the Project

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Engineer to consider redesigning the structure or structures. The request shall include a description of the structure or structures involved and a detailed description of the overloads to be carried, the date the revised Plans would be required, and a statement that the Contractor agrees to pay all costs involved in the strengthening of the structure or structures, including the cost of revised plans, and further that the Contractor agrees that no extension of time will be allowed by reason of any delay to the Work which may be due to the alteration of the structure or structures. If it is determined that strengthening of the structure or structures is feasible, the Project Engineer will inform the Contractor of the estimated cost of the alterations, including engineering, and the date that revised plans could be furnished. If the cost and date are satisfactory to the Contractor, the Project Engineer will prepare a Work Order providing for the agreed upon alterations.

7.37 PROTECTION AND RESTORATION OF PROPERTY

State of California Civil Code Section 832, as amended, provides requirements relating to lateral and subjacent support and excavations. In addition to these requirements, and any other requirements imposed by law, Contractor shall shore up, brace, underpin, and protect, as may be necessary, all foundations and other parts of all existing structures adjacent to and adjoining the site of the Work, which are in anyway affected by the excavations or other operations connected with the completion of the Work under this Contract. Whenever any notice is required to be given by Owner or Contractor to any adjoining or adjacent landowner or other party before commencement of any Work under this Contract, such notice shall be given by Contractor.

Contractor shall indemnify Owner and hold Owner harmless from any damages for which Owner may become liable in consequence of such injury or damage to adjoining or adjacent structures and premises. Payment shall be determined in accordance with CSS Section 9.01.04 "Scope Of Payment."

Any damage, arising from or in consequence of the performance of the Contract, to improvements or property whether above or below the ground, private or public, within or adjacent to the Project limits, shall be repaired at once by Contractor. If, in the opinion of Project Engineer, the best interests of Owner requires such repair to be made prior to the execution of any part of the Work included in this Contract, Project Engineer will so notify Contractor who shall delay or discontinue the

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performance of that part of the Work until the necessary repair has been made. Such delay shall not be considered unavoidable, and no extension of time for completion of the Contract will be recommended therefore.

When ordered by the Project Engineer to make any such repair, Contractor shall start work thereon within four (4) hours and shall prosecute the same with diligence to completion. Upon failure of Contractor to so comply with such order, or upon Contractor's failure to make immediate emergency repairs, which are necessary in the best interests of Owner or of the public, the Project Engineer shall have authority to cause such repair to be made and to deduct the costs thereof from any money due, or which may become due Contractor.

Roadside trees, shrubs, and other plants that are not to be removed shall be protected from injury. Pole lines, fences, signs, markers and monuments, buildings and structures, conduits, pipelines under or above ground, sewer and water lines, all highway facilities, and any other improvements or facilities within or adjacent to the highway shall be protected from damage. If ordered by the Project Engineer, the Contractor shall provide and install suitable safeguards, approved by the Project Engineer, to protect such objects from injury or damage.

In an emergency affecting the safety of life or property including adjoining property, Contractor, without special instructions or authorization from Project Engineer, is authorized to act at Contractor's discretion to prevent such threatened loss or injury. Contractor shall so act whether or not he/she is instructed to do so by Project Engineer.

Contractor shall, until final Acceptance, maintain adequate protection against damage to life and property involved in the Work and on property adjacent thereto. Contractor shall provide all necessary watchmen, guards, barricades, nightlights, and other protective devices upon construction operations, and facilities, tools, equipment, and materials used in the construction of the Work.

Contractor shall, until final Acceptance, maintain adequate protection of all its work and work performed by others under the Contract from damage, loss, or defacement. Contractor shall repair or replace any such damage and remove any damaged or defaced material or equipment from the premises at no extra cost to Owner except such as may be due directly to errors in the Contract Documents or caused by agents or employees of Owner.

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Upon completion of the Work, Contractor shall remove from the site all material used in fencing, planking, or barricades.

7.38 RESPONSIBILITY FOR DAMAGE

The Owner, including, but not limited to, all officers and employees of the Owner thereof connected with the Work, shall not be answerable or accountable in any manner for: any loss or damage that may happen to the Work or any part thereof; any loss or damage to any of the materials or other things used or employed in performing the Work; injury to or death of any person either workers or the public; or damage to property from any cause which might have been prevented by the Contractor, or the Contractor's work forces, or anyone employed by the Contractor.

The Contractor shall be responsible for any liability imposed by law and for injuries to or death of any person or damage to property resulting from defects or obstructions or from any cause whatsoever during the progress of the Work or at any time before its completion or final Acceptance.

The Contractor shall indemnify and hold harmless the Owner and all officers and employees thereof connected with the Work, from all claims, suits, or actions of every name, kind and description, brought for, or on account of, injuries to or death of any person, including but not limited to workers and the public or damage to property resulting from the performance of the Contract or by or in consequence of any negligence in guarding the Work; use of improper materials in construction of the Work; or by or on account of any act or omission by the Contractor or their agents during the progress of the Work or at any time before its completion and final Acceptance.

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

The Contractor shall be responsible for any liability imposed by law and for injuries to or death of any person or damage to property and shall indemnify and hold harmless any city or district, its officers and employees connected with the Work, within the limits of which city or district the Work is being performed hereunder, all in the same manner

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and to the same extent as provided above for the protection of the Owner and all officers and employees thereof connected with the Work, except that no retention of money due the Contractor under and by virtue of the Contract will be made by the Owner pending disposition of suits or claims for damages brought against the said city or district.

Nothing in the Contract is intended to create the public or any member thereof a third party beneficiary hereunder, nor is any term and condition or other provision of the Contract intended to establish a standard of care owed to the public or any member thereof.

7.39 (BLANK)

7.40 DAMAGE BY STORM, FLOOD, TIDAL WAVE OR EARTHQUAKE

Attention is directed to CSS Section 7.27 "Contractor's Responsibility For The Work And Materials" above. In the event that damage to the Work is caused by storm, flood, tidal wave, or earthquake, and other natural disasters (hereinafter called "Occurrence"), and the damage is not due to the failure of the Contractor to take reasonable precautions or exercise sound engineering and construction practices in the conduct of the Work, the provisions of this Section shall be applicable and the Contractor may apply in writing to the Project Engineer for the Owner to participate in the cost of repairing damage to the Work from such causes, or, in lieu thereof and at the sole discretion of the Owner, terminate the Contract and relieve the Contractor of further obligation to perform the Work, subject to the following.

7.40.01 PROCLAMATION BY GOVERNOR

The Occurrence causing the damage to the Work shall be one as to which the Governor of the State proclaimed a State of Emergency pursuant to Government Code Section 8625 and the damaged Work shall be located within the territorial limits to which such the proclamation is applicable or, which were, in the opinion of the Project Engineer, of a magnitude at the site of the Work sufficient to have caused such a proclamation had they occurred in a populated area or in an area in which such a proclamation was not already in effect.

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7.40.02 APPLICATION BY CONTRACTOR

The Contractor's written request for the Owner to participate in the cost of rebuilding, repairing, restoring, or otherwise remedying the damage to the Work caused by the Occurrence, shall be submitted to the Project Engineer before performing any work other than emergency work, including emergency work necessary to provide for passage of public traffic.

7.40.03 REPAIR WORK

Repair of damaged Work under the provisions of this Section 7.40 shall be pursuant to a Work Order issued hereunder and specifying the repair work to be performed. Repair to the Work shall consist of restoring the in-place construction (erected falsework shall be considered in-place construction) to the same state of completion to which such Work had advanced prior to the Occurrence. Emergency work, which the Project Engineer determines would have been part of the repair work if it had not previously been performed, will be considered to be part of the repair work.

The Owner reserves the right to make changes in the Contract Documents applicable to the portions of the Work to be repaired, and if such changes will increase the cost of repairing the damage over the Engineer's estimate of the cost of repair without the changes, the Contractor will be paid for such increased cost in accordance with the following Section 7.40.04 "Determination of Costs" and the increased cost amount will not be considered in determining the Owner's participation in the cost of repair under the following Section 7.40.05 "Owner Participation In Cost Of Repair."

Nothing in this Section shall be construed to relieve the Contractor of full responsibility for the risk of injury, loss or damage to materials not yet incorporated in the Work and to materials, tools and equipment (except erected falsework and formwork) used to perform the Work, or to relieve the Contractor of responsibility under Section 7.38 "Responsibility For Damage." The provisions of this section shall not be applicable to the repair of damage caused by an Occurrence to any portion of the Work as to which the Contractor has been granted relief from maintenance and responsibility pursuant to Section 7.42 "Relief From Maintenance And Responsibility," or to the removal of slides and slipouts or the repair and restoration of

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damage to the Work resulting from slides and slipouts pursuant to Section 19.02.02 "Slides And Slipouts."

7.40.04 DETERMINATION OF COSTS

Unless otherwise agreed between the Project Engineer and the Contractor, the costs of the Work performed pursuant to this Section 7.40 "Damage By Storm, Flood, Tidal Wave, Or Earthquake" will be determined in accordance with the provisions in CSS Section 9.02 "Force Account Payment" except that there shall be no markup allowance pursuant to CSS Section 9.02.01 "Work Performed By Contractor." Emergency work performed in advance of authorization which the Project Engineer determines would have been part of the repair work will be paid for in the same manner as authorized repair work.

7.40.05 OWNER PARTICIPATION IN COST OF REPAIR

The Owner's participation in the cost of repair, determined as provided in Section 7.40.04 above will be in accordance with the following:

1. On projects for which the amount of the Contractor's bid for bid comparison purposes if \$100,000 or less, the Owner's participation will be 90 percent of the cost of repair that exceeds \$5,000.
2. On projects for which the amount of the Contractor's bid for bid comparison purposes if from \$100,000 to \$2,000,000, the Owner's participation will be 90 percent of the cost of repair that exceeds 5 percent of the Contractor's Bid for bid comparison purposes.
3. On projects for which the amount of the Contractor's bid for bid comparison purposes is greater than \$2,000,000, the Owner's participation will be 90 percent of the cost of repair that exceeds \$100,000.

7.40.06 TERMINATION OF CONTRACT (DUE TO OCCURRENCE)

If the Owner elects to terminate the Contract and relieve the

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Contractor of further obligation to perform the Work as a result of the Occurrence, a Change Order so providing will be issued. Such Change Order may provide for the Contractor to perform any work deemed by the Project Engineer as necessary to put the Project in satisfactory condition for the termination of all work, and the Contractor will be paid for such work in accordance with CSS Section 9.02 "Force Account Payment."

Payment after Acceptance will be subject to the provisions in CSS Section 9.10 "Final Payment." The Contractor will be paid for the work done prior to the occurrence at the applicable Contract prices; the Project Engineer will determine the value of partially completed work by apportioning such price. If the Contractor has placed orders prior to the occurrence for materials specially manufactured for the Project and which are not suitable for use in other county highway projects, or sale to others in the ordinary course of the seller's business, the Contractor will be paid the actual cost to the Contractor for such material or the ordinary course of the seller's business, the Contractor will be paid the actual cost to the Contractor for such material or the cancellation charges, if any, for such order made by the vendor. The Project Engineer shall make the determination of whether the order shall be completed or canceled. Any material paid for shall become the property of the County and the actual cost of any further handling will be paid for. The actual cost or charges to be paid will be computed in the same manner as if the work were to be paid for on a Force Account basis, as provided in CSS Section 9.02 "Force Account Payment." No payment will be made for materials that have been damaged or are not acceptable for incorporation in the Work or in accordance with the requirements of the Contract. The Contractor shall pay the Owner any amount previously paid for such unacceptable material, and agrees that the Owner may deduct the amount thereof from any moneys due or which may become due to the Contractor under the Contract.

7.40.07 PROTECTING THE WORK FROM DAMAGE

Nothing in this Section shall be construed to relieve the Contractor of its responsibility to protect the Work from damage. The Contractor shall bear the entire cost of repairing damage to the Work caused by an Occurrence which the Project Engineer determines was due to the failure of the Contractor to comply with the requirements of the Contract Documents, take reasonable and adequate measures to

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protect the Work or exercise sound engineering and construction practices in the conduct of the Work, and such repair costs shall be excluded from consideration under the provisions of this Section 7.40.

7.41 (BLANK)

7.42 RELIEF FROM MAINTENANCE AND RESPONSIBILITY

Upon the written request of the Contractor and consent of the Project Engineer or by order of the Project Engineer, the Contractor may be relieved of the duty of maintaining and protecting portions of the Work which have been completed in all respects in accordance with the requirements of the Contract and to the satisfaction of the Project Engineer, and thereafter except with his/her consent, the Contractor will not be required to do further work thereon. The consent or order of the Project Engineer to such action will relieve the Contractor of responsibility for injury or damage to said completed portions of the Work resulting from use by public traffic or from the action of the elements or from any other cause, but not from injury or damage resulting from the Contractor's own operations. However, nothing in this Section 7.42 will be construed as relieving the Contractor of full responsibility for making good any defective work or materials found at any time before the formal written Acceptance.

7.43 ACCEPTANCE OF THE WORK

Upon receipt of written notice from the Contractor that the Work is ready for final inspection and Acceptance, the Project Engineer shall promptly make the final inspection and when he/she finds the Work fully performed and acceptable under the Contract, he/she shall advise the Governing Body of the Owner or the Purchasing Agent, as applicable, stating that the Work provided for in the Contract has been completed and is accepted by him/her under the terms and conditions thereof. Acceptance of the Work will be made by the Governing Body of the Owner only in regular session or by the Purchasing Agent, as applicable, and only upon recording a Notice of Completion and Acceptance of Work.

After the Owner has formally accepted the Work, the Contractor will be relieved of the duty of maintaining and protecting the Work as a whole,

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and will not be required to perform any further work thereon. The Contractor shall be relieved of responsibility for injury to persons or property or damage to the Work, which occurs after the formal Acceptance by Owner. The final Acceptance shall not relieve the Contractor of responsibility for defective materials or workmanship or of complying with the requirements of written guarantees.

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PROSECUTION AND PROGRESS**

8.01 SUBCONTRACTING

The Contractor shall give its personal attention to the fulfillment of the Contract and shall keep the Work under its control.

No Subcontractor will be recognized as such, and all persons engaged in the work of construction will be considered as employees of the Contractor and he/she will be held responsible for their work, which shall be subject to the provisions of the Contract Documents.

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

With the exception of architectural-type contracts, the Contractor shall perform with its own organization Contract Work amounting to not less than 50 percent of the original total Contract price, excluding the Supplemental Work allowances and any designated "Specialty Items," both of which may be deducted from the original Contract price before computing the amount of Work required to be performed by the Contractor with its own organization.

Pursuant to Public Contract Code Section 6109, the Contractor shall not perform work on this public works Project with any Subcontractor who is ineligible to perform work on public works project pursuant to Section 1777.1 or 1777.7 of the Labor Code. Any contract on a public works project entered into between the Contractor and a debarred Subcontractor is void as a matter of law. A debarred Subcontractor may not receive any public money for performing work as a Subcontractor on a public works contract, and any public money that may have been paid to a debarred Subcontractor by the Contractor on this Project shall be returned to the

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Owner. The Contractor shall be responsible for the payment of wages to workers of a debarred Subcontractor who has been allowed to work on the Project.

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 the approval by the Owner.

Before Work is started on a subcontract, the Contractor shall file with the Owner 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.

If, through acts or neglect on the part of Contractor or Subcontractor, any other Contractor or any Subcontractor shall suffer damage on the Work, Contractor shall agree to settle with such other Contractor or Subcontractor and shall assert any claim against Owner. On account of any damage alleged to have been so sustained, Owner shall notify Contractor who shall indemnify and save harmless Owner against such claim.

The production of aggregates of all kinds with portable, semi-portable or temporary crushing or screening, proportioning, and mixing plants established or reopened for the purpose of supplying aggregate or material for a particular project or projects shall be considered as subcontracted if produced by other than the Contractor's forces.

The erection, establishment, or reopening of such plants and the operation thereof in the production of said materials for use on the Work shall conform to the requirements relating to labor set for the Contract Documents.

8.02 ASSIGNMENT

The performance of the Contract may not be assigned, except upon the written consent of the Owner. 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 nor will the Owner consent to any assignment of a part of the work under the Contract.

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

8.03 BEGINNING OF WORK

The Contractor shall not commence work until the written Notice to Proceed is issued. The Contractor shall notify the Owner at least 24 hours prior to commencement of the Work.

Should the Contractor begin work in advance of receiving notice that the Contract has been approved as above provided, any work performed by the Contractor in advance of the date of approval shall be considered as having been done by the Contractor at the Contractor's own risk and as a volunteer unless the Contract is approved. No work shall be performed by Contractor on Owner's properties or right of way prior to the issuance of the Notice to Proceed.

8.04 PROGRESS SCHEDULE

The Contractor shall submit a progress schedule satisfactory to the Project Engineer within ten (10) days after Notice of Award of a Minor Contract or twenty (20) days after Notice of Award of a Formal Contract. The Contractor may furnish the schedule on a form of the Contractor's choice if an Owner schedule format is not specified in the Contract Documents. The schedule shall show the order in which the Contractor proposes to carry out the Work, the dates on which he/she will start the several salient features of the Work (including submittals, procurement of materials, plant, and equipment), and the contemplated dates for completing the said salient features.

The progress schedules submitted shall be consistent in all respects with the time and order of work requirements of the Contract. A revised schedule shall be submitted whenever it becomes apparent that the established schedule cannot be met or whenever directed by the Project Engineer.

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Once each month, or more frequently if deemed necessary by the Project Engineer, the Contractor shall review and update the schedule to incorporate all current information, including progress, granted extensions of time and proposed changes in sequence or logic. The updated schedule shall be submitted to the Project Engineer for approval on or before the last day of each month, or in the case of an intermediate update, within such time as the Project Engineer may require.

If the current schedule indicates that Contract progress is behind the planned schedule, the Contractor shall submit to the Project Engineer for approval a revised schedule which shows corrective actions to be taken by the Contractor in order to complete the Project within the time specified.

The Contractor agrees that if the Contractor's initial Project schedule duration is less than the time allowed by the Contract for the completion of the Work, the Contract completion time may be shortened to equal the Contractor's schedule duration by a Change Order at no cost to the Owner and provided that the Owner is in agreement with the schedule. A schedule found to be impractical by the Project Engineer for any reason will be rejected and shall be revised by the Contractor and resubmitted. A schedule, showing the Work completed in less than the Contract time, which is found to be practical by the Project Engineer, shall be considered to have Float.

Satisfactory schedule or updated schedule, as required, shall be submitted to the Project Engineer. Failure to comply shall result in payment retention.

Full compensation for furnishing, updating and submitting schedules for the Project shall be considered as included in the various items of work involved and no additional compensation will be allowed therefor.

8.05 TEMPORARY SUSPENSION OF WORK

The Project Engineer shall have the authority to suspend the Work, wholly or in part, for any time period as the Project Engineer deems necessary, due to unsuitable weather, or to such other conditions considered unfavorable for the suitable prosecution of the Work, or for any time period as the Project Engineer deems necessary due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the Contract. The Contractor shall immediately

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comply with the written order of the Project Engineer to suspend the Work wholly or in part. The suspended Work shall be resumed when conditions are favorable and methods are corrected, as ordered or approved in writing by the Project 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 Project 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; the Contractor, at its own expense, shall do all the work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by public traffic during the period of that suspension as provided in CSS Sections 7.22.01 "Public Convenience," and 7.22.02 "Public Safety," and as specified in the Contract Documents. In the event that the Contractor fails to perform the Work above specified, the Owner will 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 Project Engineer due to unsuitable weather conditions, and in the sole opinion of the Project 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 CSS Section 4.07 "Extra Work" or, at the option of the Project Engineer, that Work will be performed by the Owner at no cost to the Contractor.

If the Project Engineer orders a suspension of all of the Work or a portion of the Work which is the current Controlling Operation(s), due to unsuitable weather or to other conditions considered unfavorable to the suitable prosecution of the Work, the days on which the suspension is in effect shall not be considered working days as defined in CSS Section 8.06 "Time of Completion." If a portion of Work at the time of the suspension is not a current Controlling Operation, but subsequently does become the current Controlling Operation(s), the determination of working days will be made on the basis of the then current Controlling Operation(s).

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If a suspension of Work is ordered by the Project Engineer, due to the failure on the part of the Contractor to carry out orders given or to perform any provision of the Contract, the days on which the suspension order is in effect shall be considered working days if those days are working days within the meaning of the definition set forth in CSS Section 8.06 "Time of Completion."

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

If the performance of all or any portion of the Work is suspended or delayed by the Project Engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the Contractor believes that additional compensation, or Contract time, or additional compensation and contract time, is due as a result of that suspension or delay, the Contractor shall submit to the Project Engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for the adjustment.

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

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

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

Any Contract adjustment warranted due to suspension of Work

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ordered by the Project Engineer will be made in the same manner as provided for right of way delays in CSS Section 8.12 "Right of Way Delays."

In the event of a suspension of Work under any of the conditions set forth in this Section 8.05, the suspension of Work shall not relieve the Contractor of the responsibilities as set forth in Section 7 "Legal Relations And Responsibility."

8.06 TIME OF COMPLETION

The Contractor shall complete all or any designated portion of the Work called for under the Contract in all parts and requirements within the time set forth in the Special Provisions.

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(s) for at least 60 percent of the total daily time being currently spent on the Controlling Operation(s), 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 Project Engineer. The Contractor will be allowed 15 days from the issuance of the weekly statement of Working Days in which to file a written protest setting forth in what respects the Contractor differs from the Project Engineer, otherwise the decision of the Project Engineer shall be deemed to have been accepted by the Contractor as correct. The Project Engineer will furnish the Contractor a weekly statement showing the number of Working Days charged to the Contract for the preceding week, the number of Working Days of time extensions being considered or approved, the number of Working Days originally specified for the completion of the Contract and the number of Working Days remaining to complete the Contract and the extended date for completion thereof.

There shall be no adjustment of the Contract time for changes that do not

impact the Controlling Operation(s).

8.07 LIQUIDATED DAMAGES

- A. If Contractor fails to complete the Work in the time or times specified in the Contract Documents, or any authorized extension thereof, it is understood that Owner will suffer damage; and, it being impractical and extremely difficult to determine the amount of actual damage, it is agreed that Contractor shall pay as fixed and liquidated damages, and not as a penalty, the sums set forth in the Notice to Bidders for each calendar day of delay until the Work is completed, and Contractor and its Sureties shall be liable for the amount thereof. However, Contractor shall not be charged liquidated damages because of any delay beyond the control and without the fault or negligence of Contractor, including but not limited to, Acts of God or of the public enemy, acts of Government, acts of Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather, or delays of Subcontractors or suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of both Contractor and such Subcontractors or suppliers; provided, that the Contractor shall notify the Project Engineer in writing of the causes of delay within 15 days from the beginning of that delay. The Project Engineer shall ascertain the facts and the extent of the delay, and the Project Engineer's findings thereon shall be final and conclusive.
- B. Contractor shall, within twenty-four (24) hours from the beginning of any known delay of scheduled activities, notify Owner in writing of the delay.
- C. The Contractor will be granted an extension of time and will not be assessed with liquidated damages or the cost of engineering and inspection for any portion of the delay in completion of the Work beyond the time named in the Special Provisions for the completion of the Work caused by acts of God or of the public enemy, fire, floods, tsunamis, earthquakes, epidemics, quarantine restrictions, strikes, labor disputes, shortage of materials and freight embargoes, provided, that the Contractor shall notify the Project Engineer in writing of the causes of delay within 15 days from the beginning of that delay. The Project Engineer shall ascertain the facts and the extent of the delay, and the Project Engineer's findings thereon

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shall be final and conclusive.

- D. Owner may withhold said liquidated damages from payments as such damages accrue, or, at Owner's discretion, withhold liquidated damages from any payments due or that may become due under the Contract, including retention and final payment (pursuant to California Government Code §53069.85).

8.08 TERMINATION OF CONTROL

Failure to supply an adequate working force, or material of proper quality, or in any other respect to prosecute the Work with the diligence and force specified by the Contract, is cause for termination of the Contractor's control over the Work.

Owner may, by written notice of at least seven (7) days to Contractor, terminate the Contractor's right to proceed with the Work if Contractor should persistently or repeatedly refuse or should fail to supply an adequate work force, or proper materials, or otherwise refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will ensure its completion within the time specified in this Contract or authorized extension thereof, or if Contractor should persistently disregard laws, ordinances, or Owner's instructions.

Contractor and its Sureties shall be liable to Owner for any additional cost of completing the Work, including compensation for additional managerial, administrative and consulting services, plus liquidated damages collectible under CSS Section 8.07 "Liquidated Damages" for the period from the Contract completion date, as extended by authorized time extensions, to the date of final completion, or the date on which the Work could reasonably have been completed by Owner, whichever is earlier.

8.09 OWNER'S RIGHT TO TERMINATE CONTRACT

Owner may terminate the Contract at any time upon a determination by Owner that termination of the Contract is in the best interest of the Owner, or when conditions encountered during the Work make it impossible or impracticable to proceed, or when Owner is prevented from proceeding with the Contract by act of God, by law, or by official action of a public authority.

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In such event, Owner may take over the Work and prosecute the same to completion, by contract or otherwise.

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

- A. The Owner will issue the Contractor a written notice signed by the Director of the Roads & Airports Department, specifying that the Contract is to be terminated. Upon receipt of the written notice, the Contractor will be relieved of further responsibility for damage to the Work (excluding materials) as specified in CSS Section 7.27 "Contractor's Responsibility for the Work and Materials," and, except as otherwise directed in writing by the Project Engineer, the Contractor shall:
 1. Stop all Work under the Contract except that specifically directed to be completed prior to acceptance for termination.
 2. Perform Work the Project Engineer deems necessary to secure the Project for termination.
 3. Remove its equipment and plant from the site of the Work.
 4. Take action that is necessary to protect materials from damage.
 5. Notify all Subcontractors and suppliers that the Contract is being terminated and that their contracts or orders are not to be further performed unless otherwise authorized in writing by the Project Engineer.
 6. Provide the Project Engineer with an inventory list of all materials previously produced, purchased, or ordered from suppliers for use in the Work and not yet used in the Work, including its storage location, and such other information as the Project Engineer may request.
 7. Dispose of materials not yet used in the Work as directed by the Project Engineer. It shall be the Contractor's responsibility to provide the Owner with good title to all materials purchased by the Owner hereunder, including materials for which partial payment has been made as provided in CSS Section 9.08

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“Progress Payments,” and with bills of sale or other documents of title for those materials.

8. Subject to the prior written approval of the Project Engineer, settle all outstanding liabilities and all claims arising out of subcontracts or orders for materials terminated hereunder. To the extent directed by the Project Engineer, the Contractor shall assign to the Owner all the right, title and interest of the Contractor under subcontracts or orders for materials terminated hereunder.
9. Furnish the Project Engineer with the documentation required to be furnished by the Contractor under the provisions of the Contract including, on projects as to which Federal funds are involved, all documentation required under the Federal requirements included in the Contract.
10. Take other actions directed by the Project Engineer.

When the Project Engineer determines that the Contractor has completed Work directed to be completed prior to termination of Contract and such other work as may have been ordered to secure the Project for termination, the Project Engineer will recommend that the Owner formally accept such Work. After such Acceptance by the Owner, the Contractor will not be required to perform any further Work thereon and shall be relieved of contractual responsibilities for injury to persons or damage to property.

- B. Termination of the Contract shall not relieve the Contractor of responsibility for damage to materials. The Contractor shall continue to be responsible for damage to materials, except as follows:
 1. The Contractor’s responsibility for damage to materials for which partial payment has been made as provided in CSS Section 9.08 “Progress Payments,” and for materials furnished by the Owner for use in the Work and unused shall terminate when the Project Engineer certifies that those materials have been stored in the manner and at the locations the Project Engineer has directed.
 2. Contractor’s responsibility for damage to materials purchased

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by the Owner subsequent to the issuance of the notice that the Contract is to be terminated shall terminate when title and delivery of those materials has been taken by the Owner.

- C. Termination of the Contract shall not relieve the Surety of its obligation for any just claims arising out of the Work performed.
- D. The total compensation to be paid to the Contractor shall be determined by the Project Engineer on the basis of the following:
 - 1. The reasonable cost to the Contractor, without profit, for all Work performed under the Contract, including mobilization, demobilization and work done to secure the Project for termination. In determining the reasonable cost, deductions will be made for the cost of materials to be retained by the Contractor, amounts realized by the sale of materials, and for other appropriate credits against the cost of the Work. Deductions will also be made, when the Contract is terminated under the authority of CSS Section 7.40 "Damage by Storm, Flood, Tidal Wave or Earthquake" for the cost of materials damaged by the occurrence.

When, in the opinion of the Project Engineer, the cost of a Contract item of Work is excessively high due to costs incurred to remedy or replace defective or rejected Work, the reasonable cost to be allowed will be the estimated reasonable cost of performing that Work in compliance with the requirements of the Contract Documents and the excessive actual cost shall be disallowed.

- 2. A reasonable allowance for profit on the cost of the Work performed as determined under Subsection (1), provided the Contractor establishes to the satisfaction of the Project Engineer that it is reasonably probable that the Contractor would have made a profit had the Contract been completed and provided further, that the profit allowed shall in no event exceed 4 percent of the cost.
- 3. The reasonable cost to the Contractor of handling material returned to the vendor, delivered to the Owner, or otherwise disposed of as directed by the Project Engineer.

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

All records of the Contractor and the Contractor's Subcontractors, necessary to determine compensation in accordance with the provisions of this Section 8.09, shall be open to inspection or audit by representatives of the Owner at all times after issuance of the notice that the Contract is to be terminated and for a period of 3 years, thereafter, and those records shall be retained for that period.

After Acceptance of the Work by the Owner, the Project Engineer may make payments on the basis of interim estimates pending issuance of the final estimate in accordance with Section 9.10 "Final Payment" when, in the Project Engineer's opinion, the amount thus paid, together with all amounts previously paid or allowed, will not result in total compensation in excess of that to which the Contractor will be entitled. All payments, including payment upon the final estimate shall be subject to deduction for prior payments and amounts, if any, to be kept or retained under the provisions of the Contract.

The provisions of this Section 8.09 shall be included in all subcontracts.

8.10 CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

Contractor may, upon fifteen (15) days' written notice to Owner, stop work or terminate the Contract and recover from Owner payment for all Work executed to date of termination if:

- A. The Work is stopped under an order of any court or other public authority for a period of three (3) months, through no act or fault of Contractor or of anyone employed by Contractor; or,
- B. Owner, without justification or good cause, fails to pay Contractor within sixty (60) days after a complete payment application has been received and approved by Owner's authorized representative.

Work stoppage or termination by Contractor in accordance with the above provisions does not excuse or relieve Contractor from any of its

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obligations pertaining to Work in place or completed.

The provisions of this Section 8.10 shall be in addition to all other rights and remedies available to Owner under the law.

8.11 UTILITIES AND OTHER FACILITIES

Attention is directed to CSS Sections 7.37 “Protection and Restoration of Property” and 7.38 “Responsibility for Damage.”

The Contractor shall protect from damage utilities and any other facilities that are to remain in place, to be installed, relocated or otherwise rearranged.

It is anticipated that some or all of the utilities and other 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 improvement, will be rearranged in advance of construction operations. Where it is not anticipated that such rearrangement will be performed prior to construction, or where the rearrangement must be coordinated with the Contractor's construction operations, the existing utilities and other facilities that are to be rearranged will be indicated in the Contract Documents.

The right is reserved to the County and owners of utilities and other facilities or their authorized agents, to enter upon the Project with the approval of the Owner for the purpose of making such changes as are necessary for the rearrangement of their utilities and other facilities or for making necessary connections or repairs to their properties. The Contractor shall cooperate with other forces engaged in such work and shall conduct their operations in such a manner as to avoid any unnecessary delay or hindrance to the work being performed by such other forces. Wherever necessary, the Work of the Contractor shall be coordinated with the rearrangement of utilities and other facilities and the Contractor shall make arrangements with the owner(s) of such utilities and other facilities for the coordination of the work.

Should the Contractor desire to have any rearrangement made of any utility or facility for its convenience in order to facilitate its construction operations, which rearrangements is in addition to, or different from the rearrangements indicated in the Contact Documents, he/she shall make whatever arrangements are necessary with the owners of such utilities or

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facilities for such rearrangement and bear all expenses in connection therewith.

Contractor shall obtain authorization from the owners of utilities and other facilities involved and shall notify Owner at least 72 hours in advance, when it is necessary to interrupt any existing service to make connections. Interruption in service shall be of the shortest possible duration for the Work at hand and shall be approved in advance by Owner.

Where it is determined by the Project Engineer that the rearrangement of an utility or other facility, the existence of which is not shown in the Contract Documents, is essential in order to accommodate the improvement, the Project Engineer will provide for the rearrangement of such utility or other facility by other forces or such rearrangement shall be performed by the Contractor and will be paid for as Extra Work.

Attention is directed to Sections 4215 and 4216 of the Government Code concerning the protection of public utilities in public contracts.

Attention is directed to the possible existence of underground main or trunk line facilities not indicated in the Contract Documents and to the possibility that underground main or trunk lines may be in a location different from that, which is indicated in the Contract Documents. The Contractor shall ascertain the exact location of underground main or trunk lines whose presence is indicated in the Contract Documents, the location of their service laterals or 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 prior to doing work that may damage any of the facilities or interfere with their service.

The Contractor shall not be assessed Liquidated Damages for delay in completion of the Project when such delay is caused by the failure of the Owner or the owner of the utility or other facility to provide for removal or relocation of existing utilities or other facilities.

There may be utilities and other facilities not known to the Owner or in a location different from that, which is indicated in the Contract Documents. The Contractor shall take steps to ascertain the exact location of all utilities and other facilities prior to doing work that may damage such utilities or facilities or interfere with their service. If the

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Contractor discovers utilities and other facilities not indicated in the Contract Documents, he/she shall immediately give the Project Engineer and owners of utilities or facilities written notification of the existence of such utilities or facilities. No further disturbance of the site shall be made except as authorized by the Project Engineer.

8.11.01 UNDERGROUND SERVICE ALERT (USA)

Attention is directed to Section 4216 of the Government Code concerning the protection of public utilities in public contracts.

The Contractor shall contact the USA at a minimum of 48 hours in advance for field location and identification of the underground utilities and facilities. No excavation shall be permitted until USA or respective utilities or facilities owners have located and identified their utilities or facilities. USA marking paint shall be of washable type and shall be removed as specified in CSS Section 4.08 "Clean-up."

There may be underground utilities and facilities not known to the Owner or in a location different from that, which is indicated in the Contract Documents. The Contractor shall take steps to ascertain the exact location of all underground utilities and facilities prior to doing work that may damage such utilities or facilities or interfere with their service. If the Contractor discovers underground utilities and facilities not indicated in the Contract Documents, he/she shall immediately give the Project Engineer and owners of underground utilities or facilities written notification of the existence of such utilities or facilities. No further disturbance of the site shall be made except as authorized by the Project Engineer.

Payment for locating and identifying underground utilities and other facilities will not be made separately and its costs shall be included in the Bid prices of the applicable items of work. Payment for the removal of USA markings shall be included in the Bid price for the applicable item of work.

8.11.02 UNDERGROUND STORAGE TANKS

Upon discovering or unearthing any underground storage tank, the person making such discovery shall immediately notify the Project Engineer who shall notify the Roads & Airports Environmental

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Compliance Specialist. No further disturbance of the area may be made except as authorized by the Environmental Compliance Specialist and representatives of the County Health Department in accordance with California Administrative Code, Title 23, Chapter 3, Subchapter 16, Article 7; Environmental Protection Agency Regulations 40 CFR Part 280.71; and the Santa Clara County Hazardous Materials Storage Ordinance, Section N11-303.04.

8.12 RIGHT-OF-WAY DELAYS

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

Compensation for idle time of equipment will be determined in the same manner as determinations are made for equipment used in the performance of Extra Work paid for on a force account basis, with the following exceptions:

- (1) The right-of-way delay factor for each classification of equipment shown in the State of California, Department of Transportation publication entitled "Equipment Rental Rates and General Prevailing Wage Rates," which is a part of the Contract, will be applied to such equipment rental rate.
- (2) The time, for which such compensation will be paid, will be the actual normal working time during which such delay condition exists but in no case will exceed 8 hours in any one-day.
- (3) The days, for which compensation will be paid, will be determined as follows:
 - Calendar days for calendar-day contracts;
 - Calendar days, excluding Saturdays, Sundays, and Owner-designated holidays for working-day contracts.

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When rental of equipment is paid for under the provisions in CSS Section 9.02.01C(c) "Equipment Not On the Work," no payment will be made for right-of-way delays.

Actual loss shall be understood to include no items of expense other than idle time of equipment and necessary payments for idle time of workers, cost of extra moving of equipment, and cost of longer hauls. Compensation for idle time of equipment will be determined as provided in this Section 8.12 and compensation for idle time of workers will be determined as force account labor and no markup will be added in either case for overhead and profit. The cost of extra moving of equipment and the cost of longer hauls will be paid for as Extra Work.

If performance of the Contractor's work is delayed as the result of the failure of the Owner to acquire or clear right-of-way, an extension of time determined pursuant to the provisions in CSS Section 8.07 "Liquidated Damages" above will be granted.

8.13 TREE PRESERVATION AND REMOVAL

Attention is directed to the County of Santa Clara Code, Division C16 "Tree Preservation and Removal" which regulates the preservation of *protected trees*.

A *protected tree* shall consist of any of the following:

- A. Any tree having a main trunk or stem measuring 957 mm (37.7 inches) or greater in circumference [304 mm (12 inches) or more in diameter] at a height of 1.3 m (4.5 feet) above ground level, or in the case of multi-trunk trees a total of 1.9 m (75.4 inches) or more in circumference [609 mm (24 inches) or more in diameter] of all trunks in the following areas of the County:
 1. Parcels zoned "Hillsides" (three (3) acres or less);
 2. Parcels within a "-d" (Design Review) combining zoning district;
 3. Parcels within the Los Gatos Specific Plan Area.
- B. Any heritage tree. Heritage tree shall include any tree which, because of its history, girth, height, species, or other unique quality,

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has been recommended for inclusion on the heritage resource inventory by the Historic Heritage Commission and found by the Board of Supervisors to have special significance to the community, and which has therefore been included in the heritage resource inventory adopted by resolution of the Board Of Supervisors. Heritage tree shall also refer to trees regulated by Section 31-9.13 and Section 31-9.13 of the County Zoning Ordinance relating the New Almaden Historic District.

- C. Any tree required to be planted as a replacement for an unlawfully removed tree, pursuant to Section C16-17(e) of the County of Santa Clara Code, Division C16.
- D. Any tree that was required to be planted or retained by the conditions of approval for any use permit, building site approval, grading permit, architectural and site approval, design review, special permit or subdivision.
- E. Any tree on any property owned or leased by the County, which measures over 957 mm (37.7 inches) in circumference [304 mm (12 inches) or more in diameter] measured 1.3 m (4.5 feet) above the ground, or which exceeds 6 m (20 feet) in height.
- F. Any tree, regardless of size, within road rights-of-way and easements of the County, whether within or outside the unincorporated territory of the County.

The Contractor shall notify the Project Engineer 24 hours prior to performing any work within 3 m (10 feet) of a *protected tree*. The County of Santa Clara Planning Office shall be contacted for information regarding the latest heritage resource inventory. No tree shall be removed without first obtaining the proper permit from the County of Santa Clara Planning Office or Department of Roads and Airports.

8.14 PRESERVATION OF CULTURAL RESOURCES

Pursuant to the National Historic Preservation Act of 1966, State laws, and County ordinances, the following provisions shall apply to insure historic preservation and fair compensation to Contractor for construction delays that may occur due to cultural resources discoveries.

- A. In the event that potentially historical, architectural, archaeological

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or cultural resources (hereinafter "resources") are discovered during subsurface excavations at the Project site, the following procedures shall apply:

1. All work within 10 m (33 ft) of the discovered resources shall be halted. The Contractor shall immediately notify the Project Engineer. Construction activities within 10 m (33 ft) of the discovered resources shall remain halted until authorization is obtained from the Project Engineer that construction in the vicinity of the discovered resources may recommence.
 2. Owner shall issue a "Stop Work Order" directing Contractor to temporarily suspend all operations at the location of such discovered resources.
 3. Such "Stop Work Order" shall be effective until such time as a qualified Consultant can assess the value of such discovered resources and make recommendations. Any "Stop Work Order" shall contain the following:
 - a. A description of the discovered resources, its location, and the area where Contractor's work shall be suspended;
 - b. A description of what part or all of Contractor's work is to be suspended;
 - c. Instructions regarding suspension of orders by Contractor for materials and services;
 - d. Guidance regarding action to be taken by Subcontractors;
 - e. Estimated duration of the temporary suspension.
 4. If the Consultant determines that the discovered resource is a bona fide cultural resource, Owner shall, as expeditiously as possible, advise Contractor in writing of the action to be taken regarding the find, and the anticipated time frame and extent of any work stoppage.
- B. Adjustment to the Contract shall be as follows:
1. If, in the Contract Documents, the Work site has been deemed

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"archaeologically sensitive", then the Contract time includes four (4) weeks of temporary suspension for cultural resources finds and there will be no payment for such suspension or any inefficiencies related thereto, up to a maximum of four (4) weeks duration. If such suspension occurs, the Contract time will be extended by the actual duration of the suspension.

2. If a cultural resource discovery was unforeseen (i.e. if the Work site was not deemed "Archaeologically Sensitive" in the Contract Documents), or if a work suspension because of a discovery at an archaeologically sensitive site exceeds four (4) weeks, then Contractor shall be entitled to an adjustment of the Contract in the following manner:
 - a. Time Extension:
 - (1) If the work temporarily suspended affects the Controlling Operations, the total number of days for which the suspension is in effect shall be added to the Contract time.
 - (2) If a portion of work at the time of such suspension does not affect the Controlling Operations, but subsequently does affect the Controlling Operations, the allowable Contract time will be computed from the date such work is classified as on the Controlling Operations.
 - b. Compensation:
 - (1) Beginning with the first day of suspension, and for each following day, Contractor shall maintain detailed hourly records of the labor and equipment idled by such suspension, plus substantiation as to why such labor and equipment could not be used on other parts of the Work if such were the case. Such records shall be of a form approved by Owner, shall be signed by Contractor, and shall be subject to verification by Owner.
 - (2) If, as a result of a temporary suspension, Owner agrees that Contractor sustains a loss which could

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not have been avoided by judicious handling of its forces or equipment, or by redirection of forces or equipment to perform other work on the Contract, Contractor shall be paid for idle time of equipment and labor as provided in CSS Section 9.02 "Force Account Payment."

- (3) Failure by Contractor to furnish the aforesaid records shall constitute a waiver of Contractor's right to compensation.

8.15 PARTNERING

The County will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the Contract to the benefit of both parties. The purpose of this relationship will be to maintain cooperative communication and mutually resolve conflicts at the lowest possible level.

This partnership will be bilateral in make-up, and participation will be totally voluntary. Any cost associated with effectuating this partnering will be agreed to by both parties and will be shared equally.

The Contractor may request the formation of such a "Partnering" relationship by submitting a request in writing to the Project Engineer after approval of the Contract. The scheduling of a "Partnering" workshop, selecting the "Partnering" facilitator and the workshop site, and other administrative details shall be as agreed to by both parties.

The costs involved in providing a facilitator and a workshop site will be borne equally by the Owner and the Contractor. The Contractor shall pay all compensation for the wages and expenses of the facilitator and of the expenses for obtaining the workshop site. The Owner's share of such costs will be reimbursed to the Contractor in a Change Order written by the Project Engineer. Markups will not be added. All other costs associated with the "Partnering" relationship will be borne separately by the party incurring the costs.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the Contract and will not relieve either party of the legal requirements of the Contract.

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MEASUREMENT AND PAYMENT**

9.01 MEASUREMENT AND FINAL PAY QUANTITIES

9.01.01 MEASUREMENT OF QUANTITIES

All work to be paid for at a Contract price per unit of measurement will be measured in accordance with the International System of Units (SI) or United States Standard Measures as specified in the Contract Documents. A ton, when specified in the US Standard Measures, shall consist of 2,000 pounds avoirdupois.

Unless shipped by rail, material paid for by mass or weight shall be weighed on scales furnished by and at the expense of the Contractor or on other sealed scales regularly inspected by the Bureau of Weights and Measures or its designated representative.

All weighing, measuring and metering devices used to measure the quantity of materials used in the Work shall be suitable for the purpose intended and shall conform to the tolerances and specifications as outlined in Title 4, Chapter 9 of the California Code of Regulations, the provisions of the California Business and Professions Code, Division 5, and these Standard Specifications. Devices not Type-approved by the Division of Measurement Standards shall be Type-approved in accordance with California Test 109.

All vehicle scales shall be of sufficient size to permit the entire vehicle or combination of vehicles to rest on the scale deck while being weighted. Combination vehicles may be weighed as separate units provided they are disconnected while being weighed. The maximum concentrated load shall not exceed the manufacturer's designed sectional capacity of the scale.

All weighing, measuring or metering devices used to determine the quantity of materials to be paid for will be considered to be "commercial devices," and shall be sealed by the Bureau of Weights and Measures or its authorized representative as often as the Project Engineer may deem necessary. The installation of all portable vehicle

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scales must be approved by the Project Engineer prior to sealing.

All weighing, measuring or metering devices required by these Standard Specifications for the purpose of proportioning a material or product will be considered to be “non-commercial devices”, and shall be tested and approved in accordance with California Test 109, unless the device has been sealed by the Bureau of Weights and Measures in accordance with the preceding paragraph. This testing shall be done by one of the following, in the presence of the Project Engineer, as often as the Project Engineer deems necessary:

- A County Sealer of Weights and Measures
- A Scale Service Agency
- A Bureau of Weights and Measures Official

The Contractor shall notify the Project Engineer at least twenty-four (24) hours in advance of testing the device.

All under-supports for vehicle scale bearing points shall be constructed of Portland cement concrete, produced from commercial quality aggregates and cement, which contains not less than 275 kg of cement per cubic meter (470 pounds of cement per cubic yard). Under-supports shall be constructed in a manner to prevent any shifting or tilting of the support. They shall have a minimum height of 350 mm (14 in.) above ground line. The footings shall have a minimum depth of 150 mm (6 in.) below the ground line. The bearing surface of the footings shall have a minimum width of 760 mm (30 in.) and shall be of such area that the pressure does not exceed 200 kPa (4,000 lb/ft²). Adequate drainage shall be provided to prevent saturation of the ground under the scale. Scale bulkheads shall be of adequate material and strength to resist displacement. If timber bulkheads are used, the minimum cross section shall be 200 mm by 200 mm (8 in. by 8 in.). Wedges shall not be used to shim the supports. If shimming is necessary, it shall be done by securely attached metal shims, or by grouting. Shimming shall not exceed 75 mm (3 in.). The approach ramps shall be level with the scale deck for a distance of not less than one-half the length of the scale deck. The mechanical indicating elements shall be installed level and plumb and shall be rigidly mounted upon a concrete foundation.

The lever system and mechanical indicating elements of hopper scales shall be rigidly attached to non-yielding supports in such a

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manner as to prevent any loss in weight due to bending and distortion of the supports.

Weighing and measuring systems including remote controls shall be type-approved by the Bureau of Weights and Measures for use in highway construction.

When a multiple beam type scale is used in proportioning materials, an over and under indicator shall be provided which will give positive visible evidence of the amount of any over and under weight. The indicator shall be so designed that it will operate during the addition of the last 90 kg (200 pounds) of any weighing. The over-travel of the indicator shall be at least one-third of the loading travel. Indicators shall be enclosed against moisture and dust.

All over and under, dial, and other indicators for weighing and measuring systems used in proportioning materials shall be grouped so that the smallest increment for each indicator can be accurately read from the point at which the proportioning operation is controlled.

The Contractor shall bear the expense of all service fees for testing and approving of "non-commercial devices." The cost of the equipment, labor, and materials furnished by the Contractor to assist in the testing of weighing, measuring or metering devices will be considered as included in the Contract prices paid for the various Contract items requiring said weighing, measuring or metering and no separate payment will be made therefor.

Whenever pay quantities of material are determined by weighing, the scales shall be operated by a weighmaster licensed in accordance with the provisions of the California Business and Professions Code, Division 5, Chapter 7. The Contractor shall furnish a Public Weighmaster's certificate, or certified daily summary weigh sheets. A representative of the Owner may, at the discretion of the Project Engineer, be present to witness the weighing of material to be supplied to construction work administered by the Owner; or a weighmaster who is appointed and compensated by the Owner shall weigh on such scales the material for the construction work. Such scales shall comply with the following requirements:

1. The scales shall be installed within the limits of the Project and within or immediately adjacent to the highway right-of-way, at

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a location, or locations, where weighing operations will not interfere with public traffic. The exact location or locations shall be selected by the Contractor and approved by the Project Engineer. The scales may be moved by the Contractor, at its expense, to any other location or locations approved by the Project Engineer within the above limits.

2. A weatherproof scale house shall be constructed for the convenience and use of the weighmaster and to protect the scale beams or dials. The scale house shall meet the following minimum requirements:
 - (a) It shall have a rectangular or square floor area of at least 7.5 square meter (80 square feet) and at least 2.5 m (8 feet) wide by 2.5 m (8 feet) high.
 - (b) It shall have at least 0.7 square meter (8 square feet) of window area facing the platform, half of which can be opened; 0.4 square meter (4 square feet) of window areas in each end wall, and a door in the wall opposite the platform.
 - (c) It shall be furnished with one table and two 300 mm (12 in.) shelves, one along the entire length of each end wall.
 - (d) Electric power shall be furnished, with outlets, to provide electricity for a 100-watt lamp and a 1,500-watt heater.
3. Upon completion of the project or when the scales are no longer required, the scales, the scale house, and the above described furnishings shall remain the property of the Contractor and shall be removed from the site.

When required by the Project Engineer, the operator of each vehicle weighed shall obtain a weight or load slip from the weigher and deliver said slip to the Project Engineer at the point of delivery of the material.

If material is shipped by rail, the car mass or weight will be accepted provided that actual mass or weight of material only will be paid for and not minimum car mass or weight used for assessing freight tariff, and provided further that car mass or weight will not be acceptable

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for material to be passed through mixing plants.

Vehicles used to haul material being paid for by mass or weight shall be weighed empty daily and at such additional times as the Project Engineer may direct. Each vehicle shall bear a plainly legible identification mark. Vehicles may from time to time be required by the Project Engineer to have the mass or weight of the material to be paid for verified by weighing the empty and loaded vehicle on such other scales as the Project Engineer may designate.

Unless otherwise provided in the Contract Documents, material paid for by the cubic meter or cubic yard will be measured in the vehicle at the point of delivery on the roadbed or at a mixing plant, as the case may be. All materials which are specified for measurement by the cubic meter or cubic yard and to be measured in the vehicle shall be hauled in vehicles of such type and size that the actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. All vehicles shall be loaded to at least their water level capacity and all loads shall be leveled when vehicles arrive at the point of delivery. Loads hauled in vehicles not meeting the above requirements or loads of a quantity less than the capacity of the vehicles, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.

When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by Contractor in writing and approved by the Project Engineer in writing, the material will be weighed in accordance with the requirements specified for weight measurement and such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Project Engineer and shall be agreed to by the Contractor before such method of measurement of pay quantities will be adopted.

Quantities of material wasted or disposed of in a manner not called for under the Contract; or rejected loads of material, including material rejected after it has been placed by reason of the failure of the Contractor to conform to the provisions of the Contract; or material not unloaded from the transporting vehicle; or material

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placed outside of the lines indicated on the Plans or established by the Project Engineer; or material remaining on hand after completion of the Work will not be paid for and such quantities will be deducted from the final total quantities. No compensation will be allowed for hauling and disposing of rejected material.

The mass or weight of all aggregate or other roadway material which is to be paid for on a mass or weight basis except imported borrow, imported topsoil, straw, fiber, aggregate sub-bases, aggregate bases, or aggregate for cement treated bases, will be determined by deducting from the mass or weight of the material, the mass or weight of water in the material at the time of the weighing in excess of 3 percent of the dry mass or dry weight of the material.

The mass or weight of aggregate base and aggregate sub-bases to be paid for will be determined by deducting from the mass or weight of material delivered to the Work, the mass or weight of water in the material, at the time of weighing in excess of 1 percent more than the optimum moisture content as determined by Test Method No. Calif. 216.

When imported borrow or imported topsoil is being paid for on mass or weight basis, the mass or weight to be paid for will be determined by deducting from the mass or weight of the material, the mass or weight of water in the material at the time of weighing in excess of 6 percent of the dry mass or dry weight of the material.

When straw is being paid for on a mass or weight basis, the mass or weight to be paid for will be determined by deducting from the mass or weight of straw, the mass or weight of water in the straw at the time of weighing in excess of 15 percent of the dry mass or dry weight of the straw. When fiber is being paid for on a mass or weight basis, the mass or weight of water in the fiber at the time of weighing shall not exceed 15 percent of the dry mass or dry weight of the fiber.

The percentage of water in the material shall be determined by California Test 226. The mass or weight of aggregate base and aggregate for cement treated bases which are to be paid on a mass or weight basis, will be determined as provided in CSS Section 26 "Aggregate Bases" and Section 27 "Cement Treated bases," respectively.

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The mass or weight of water deducted as provided in this Section 9.01.01 will not be paid for.

Full compensation for all expense involved in conforming to the requirements specified in this Section 9.01.01 shall be considered as included in the unit prices paid for the materials being measured or weighed and no additional compensation will be allowed therefor.

9.01.02 PAY QUANTITIES

All quantities shown in the Contract Documents, unless specifically designated as final pay quantities (see CSS Section 9.01.03 “Final Pay Quantity Item”) are estimated quantities and will be measured and paid for in accordance with the applicable provisions of the Contract Documents. The estimated quantities shall be considered as approximate only and no guaranty is made that the quantities which can be determined by computations, based on the details and dimensions on the Plans, will equal the estimated quantities as shown in the Contract Documents.

9.01.03 FINAL PAY QUANTITY ITEM

Provisions for this Section relating to final pay quantity items will only apply to items of Work shown in the Contract Documents with the symbol “(F)” or “(S-F)”

The estimated quantity for each specific item of Work designated in the Contract Documents as a final pay quantity item shall be considered as approximately only and no guarantee is made that computed or actual quantities will equal these estimated quantities. No allowance will be made in the event that computed or actual quantities do not equal the estimated quantities.

All quantities specifically designated in the Contract Documents as final pay quantities shall be measured and paid for as final quantities, unless the Project Engineer revises the dimensions shown on the Plans. If such dimensions are revised, and such revisions result in an increase or decrease in the quantities of such Work, the final quantities for payment will be revised in the amount represented by the changes in the dimensions. If the specific portion of the Work is eliminated, the final pay quantity designated for that specific portion of the Work will be eliminated.

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In case of a discrepancy between final pay quantities shown on the Plans and in the Special Provisions, payment shall be based on the quantities shown in the Special Provisions.

9.01.04 SCOPE OF PAYMENT

The unit prices and/or lump sum amounts bid shall include full compensation for furnishing all labor, materials, tools, and equipment and doing all Work complete in place in accordance with the Contract Documents.

Contractor shall accept the compensation provided in the Contract Documents as full payment:

- (a) For furnishing all labor, materials, tools, equipment, and incidentals necessary to the completed Work;
- (b) For performing all Work contemplated and embraced under the Contract;
- (c) For loss or damage arising from the nature of the Work, 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 Owner;
- (d) For all risks of every description connected with the prosecution of the Work;
- (e) For all expenses incurred in consequence of the suspension or discontinuance of the Work as provided in the Contract; and,
- (f) For completing the Work according to the Contract Documents.

Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to correct any defective work or material.

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

9.02 FORCE ACCOUNT PAYMENT

Payment as provided herein shall constitute full compensation to the Contractor for performance of Extra Work paid for on a Force Account basis and no additional compensation will be allowed therefor. Force Account payment shall be made as detailed in CSS Section 9.01.01 "Measurement of Quantities" above, and the following CSS Section 9.02.02 "Work Performed by Special Forces or Other Special Services." When Extra Work is to be paid for on a Force Account basis, the labor, materials, and equipment used in the performance of such Extra Work shall be subject to the approval of the Project Engineer.

9.02.01 WORK PERFORMED BY CONTRACTOR

The Contractor will be paid the direct costs for labor, materials, and equipment used in performing the Extra Work determined as hereinafter provided except where agreement has been reached to pay in accordance with the following Section 9.02.02 "Work Performed by Special Forces or Other Special Services." To the total of the direct costs computed as provided in CSS Sections 9.02.01A "Labor," 9.02.01B "Materials," and 9.02.01C "Equipment Rental," there will be added a markup of 33 percent of the cost of labor, 15 percent to the cost of materials, and 15 percent to the equipment rental.

The above markups shall constitute full compensation for all overhead costs (general overhead, supervision, office expenses, field office facilities, utilities, and transportation) which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in CSS Sections 9.02.01A "Labor," 9.02.01B "Materials," and 9.02.01C "Equipment Rental." The total payment made as provided above shall be deemed to be the actual cost of such Extra Work and shall constitute full compensation therefor.

When Extra Work to be paid for on a Force Account basis is performed by a Subcontractor, approved in accordance with CSS Section 8.01 "Subcontracting," an additional markup of 5 percent will be added to the total cost of said Extra Work including all markups specified in this Section 9.02.01. Said additional 5 percent markup shall be reimbursed to Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the Extra Work by a Subcontractor.

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9.02.01A LABOR

The Contractor will be paid for the cost of labor for the workers (including first-line supervision) when authorized by the Project Engineer) used in the actual and direct performance of the Extra Work. The cost of labor, whether the employer is the Contractor, Subcontractor, or other forces, will be sum of the following:

- (a) **ACTUAL WAGES.** The actual wages paid shall include any employer payments to or on behalf of the workers for health and welfare, pension, vacation, and similar purposes.
- (b) **LABOR SURCHARGE.** To the actual wages, as defined in Section 9.02.01A(a) "Actual Wages" will be added a labor surcharge set forth in the Department of Transportation publication set forth in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates" which is in effect on the date upon which the Work is accomplished and which is a part of the Contract. Said labor surcharge shall constitute full compensation for all payments imposed by state and federal laws and for all other payments made to, or on behalf of, the workers, other than actual wages as defined in Section 9.02.01A(a) and subsistence and travel allowances as specified in Section 9.02.01A(c).
- (c) **SUBSISTENCE AND TRAVEL ALLOWANCES.** The actual subsistence and travel allowances paid to such workers.

9.02.01B MATERIALS

The Owner reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and markup on such materials.

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

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- (a) If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the Owner notwithstanding the fact that such discount may not have been taken.
- (b) If materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier to such purchaser, the cost of such materials shall be deemed to be the price paid to the actual supplier as determined by the Project Engineer. No markup except for actual costs incurred in the handling of such materials will be permitted.
- (c) If the materials are obtained from a supply source owned wholly or in part by the purchaser, payment therefor will not exceed the price paid by the purchaser for similar materials furnished from said source on Contract items or the current wholesale price for such materials delivered to the job site, whichever price is lower.
- (d) If the cost of such materials is, in the opinion of the Project Engineer, excessive, then the cost of such material shall be deemed to be the lowest current wholesale price at which such materials are available in the quantities concerned delivered to the job site, less any discounts as provided in Section 9.02.01B(a).
- (e) If Contractor does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof, the cost shall then be determined in accordance with Section 9.02.01B(d).

9.02.01C EQUIPMENT RENTAL

- (a) **RENTAL RATE.** Contractor will be paid for the use of equipment at the rental rate listed for such equipment in the latest edition of the California Department of Transportation, Labor Surcharge and Equipment Rental Rates, regardless of ownership and any rental or other agreement, if such may exist for the use of such equipment entered into by Contractor. If it is deemed

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necessary by the Project Engineer to use equipment not so listed, a suitable rental rate for such equipment will be established by Project Engineer prior to the Work being done. Contractor may furnish any cost data which might assist the project Engineer in establishing such rental rate.

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

Operators of rental equipment will be paid for as provided in CSS Section 9.02.01A "Labor" above.

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

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

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

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

- (b) **EQUIPMENT ON THE WORK.** The rental time to be paid for equipment on the Work shall include the time during which the equipment is in operation on the Extra Work being performed; and in addition, it shall include the time required to move the equipment to the location of the Extra Work, and return it to the original location or to another location requiring no more time than that required to return it to its original location, except that

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moving time will not be paid for if the equipment is used at the site of Extra Work on other work besides Force Account work.

Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the Extra Work on other work besides Force Account work.

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

1. When hourly rates are listed, less than 30 minutes of operation shall be considered to be one-half (1/2) hour of operation.
2. When daily rates are listed, less than 4 hours of operation shall be considered to be one-half (1/2) day of operation.

(c) **EQUIPMENT NOT ON THE WORK** For the use of equipment moved in on the Work and used exclusively for Extra Work paid for on a Force Account basis, the Contractor will be paid the rental rates listed in the Special Provisions or determined as provided in this section and for the cost of transporting the equipment to the location of the Work and its return to its original location, all in accordance with the following provisions:

1. The original location of the equipment to be hauled to the location of the Work shall be agreed to by the Project Engineer in advance.
2. The Owner will pay the costs of loading and unloading such equipment.
3. The cost of transporting equipment in low bed trailers shall not exceed the hourly rates charged by established haulers.
4. The cost of transporting equipment shall not exceed

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the applicable minimum established rates of the Public Utilities Commission.

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

<u>Hours equipment is in operation</u>	<u>Hours to be paid</u>
0	4
0.5	4.25
1	4.5
1.5	4.75
2	5
2.5	5.25
3	5.5
3.5	5.75
4	6
4.5	6.25
5	6.5
5.5	6.75
6	7
6.5	7.25
7	7.5
7.5	7.75
8	8
Over 8	Hours in operation

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

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When hourly rates are listed, less than 30 minutes of operation shall be considered to be one-half hour of operation.

When daily rates are listed, payment for one-half day will be made if the equipment is not used. If the equipment is used, payment will be made for one day.

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

6. Should the Contractor desire the return of the equipment to a location other than its original location, the Owner will pay the cost of transportation in accordance with the above provisions, provided such payment shall not exceed the cost of moving the equipment to the Work.
7. Payment for transporting, and loading and unloading equipment, as above provided, will not be made if the equipment is used on the Work in any other way than upon Extra Work paid for on a Force Account basis.

When Extra Work, other than work specifically designated as Extra Work in the Contract Documents, is to be paid for on a Force Account basis and the Project Engineer determines that such Extra Work requires the Contractor to move on to the Work equipment which could not reasonably have been expected to be needed in the performance of the Contract, the Project Engineer may authorize payment for the use of such equipment at equipment rental rates in excess of those listed as applicable for the use of such equipment subject to the following additional conditions:

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

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2. The Contractor shall establish to the satisfaction of the Project Engineer that such equipment cannot be obtained from its normal equipment source or sources and those of his Subcontractors.
3. The Contractor shall establish to the satisfaction of the Project Engineer that the proposed equipment rental rate for such equipment from its proposed source is reasonable and appropriate for the expected period of use.
4. The Project Engineer shall approve the equipment source and the equipment rental rate to be paid by the Owner before the Contractor begins work involving the use of said equipment.

(e) **INDEPENDENTLY-OWNED-AND-OPERATED EQUIPMENT.**

When independently-owned-and-operated equipment is used to perform Extra Work to be paid for on a force account basis, the Contractor will be paid for the equipment and operator, as follows:

1. Payment for the equipment will be made in accordance with the provisions in CSS Section 9.02.01C "Equipment Rental" above.
2. Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the Contractor to other workers operating similar equipment already on the project, or, in the absence of such other workers, at the rates for such labor established by collective bargaining agreements for the type of worker and location of the Work, whether or not the owner-operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein, in accordance with provisions in CSS Section 9.02.01A(b) "Labor Surcharge."

To the direct cost of equipment rental and labor, computed as provided herein, will be added that

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markups for equipment rental and labor as provided in CSS Section 9.02.01 "Work Performed by Contractor."

- (e) **DUMP TRUCK RENTAL.** Dump truck rental shall conform to the provisions of CSS Sections 9.02.01C(a) "Rental Rate," 9.02.01(b) "Equipment on the Work," and 9.02.01(c) "Equipment not on the Work," except as follows:

Fully maintained and operated rental dump trucks used in the performance of Extra Work paid for on a Force Account will be paid for at the same hourly rate paid by the Contractor for use of fully maintained and operated rental dump trucks in performing the Contract item work.

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

The provisions in CSS Section 9.02.01A "Labor" shall not apply to operators of rented dump trucks.

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

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

The provisions of CSS Section 9.02.01C(d) "Independently-Owned-and-Operated Equipment" shall not apply to dump truck rentals.

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9.02.02 WORK PERFORMED BY SPECIAL FORCES OR OTHER SPECIAL SERVICES

When the Project Engineer and the Contractor, by agreement, determine that a special service or an item of Extra Work cannot be performed by the forces of the Contractor or those of any of its Subcontractors, such service or Extra Work item may be performed by a specialist. Invoices for such service or item of Extra Work on the basis of the current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide such complete itemization.

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

To the specialist invoice price, less a credit to the Owner for any cash or trade discount offered or available, whether or not such discount may have been taken, will be added 15 percent in lieu of the percentages provided in CSS Section 9.02.01 "Work Performed by Contractor" above.

9.03 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

Increase or decrease in the quantity of a Contract item of Work will be determined by comparing the total pay quantity of that item of Work with the Engineer's Estimate therefor.

If the total pay quantity of any item of Work required under the Contract varies from the Engineer's Estimate therefor by 25 percent or less, payment will be made for the quantity of Work of the item performed at the Contract unit price therefor, unless eligible for adjustment pursuant to CSS Section 4.02.01 "Changes in Character of Work."

If the total pay quantity of any item of Work required under the Contract varies from the Engineer's Estimate therefor by more than 25 percent, in the absence of an executed Extra Work Order or Change Order

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specifying the amount to be paid, the compensation payable to the Contractor will be determined in accordance with the following.

9.03.01 INCREASES OF MORE THAN 25 PERCENT

Should the total pay quantity of any item of Work required under the Contract exceed the Engineer's Estimate therefor by more than 25 percent, the Work in excess of 125 percent of the estimate and not covered by an executed Extra Work Order or an executed Change Order specifying the compensation to be paid therefor will be paid for by adjusting the Contract unit price, as hereinafter provided, or at the option of the Project Engineer, payment for the Work involved in the excess will be made on the basis of force account as provided in CSS Section 9.02 "Force Account Payment."

The adjustment of the Contract unit price will be the difference between the Contract unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item. If the costs applicable to the item of Work include fixed costs, the fixed costs will be deemed to have been recovered by the Contractor by the payments made for 125 percent of the Engineer's Estimate of the quantity for the item, and in computing the actual unit cost, the fixed costs will be excluded. Subject to the above provisions, the actual unit cost will be determined by the Project Engineer in the same manner as if the Work were to be paid for on a Force Account basis as provided in CSS Section 9.02 "Force Account Payment," and the Contractor shall provide documentation as requested by the Project Engineer; or the adjustment will be as agreed to by the Contractor and the Project Engineer.

When the compensation payable for the number of units of an item of Work performed in excess of 125 percent of the Engineer's Estimate is less than \$5000 at the applicable Contract unit price, the Project Engineer reserves the right to make no adjustment, unless requested in writing by the Contractor.

9.03.02 DECREASES OF MORE THAN 25 PERCENT

Should the total pay quantity of any item of Work required under the Contract be less than 75 percent of the Engineer's Estimate therefor, no adjustment in compensation will be made unless requested in writing by the Contractor. If the Contractor so requests, the quantity of the item

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performed, unless covered by an executed Extra Work Order or an executed Change Order specifying the compensation to be paid therefor, will be paid for by adjusting the Contract unit price, as hereinafter provided, or at the option of the Project Engineer, payment for the Work involved in the excess will be made on the basis of force account as provided in CSS Section 9.02 "Force Account Payment," provided, however, that in no case shall the payment for that Work be less than would have been made at the Contract unit price.

The adjustment of the Contract unit price will be the difference between the Contract unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item, including fixed costs. The actual unit cost will be determined by the Project Engineer in the same manner as if the Work were to be paid for on a Force Account basis as provided in CSS Section 9.02 "Force Account Payment," and the Contractor shall provide documentation as requested by the Project Engineer; or the adjustment will be as agreed to by the Contractor and the Project Engineer.

The payment for the total pay quantity of the item of Work will in no case exceed the payment that would have been made for performance of 75 percent of the Engineer's Estimate of the quantity for the item at the Contract unit price.

9.03.03 ELIMINATED ITEMS

Should any item of the Work be eliminated in its entirety, payment will be made to the Contractor for actual costs incurred in connection with such eliminated item if incurred prior to the date of notification in writing by the Project Engineer of such elimination. No allowance will be made for anticipated profits on Work that is deleted.

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

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The actual cost of handling the returned material will be paid for.

The actual costs or charges to be paid by the Owner to the Contractor as provided in this Section 9.03.03 will be computed in the same manner as if the work were to be paid for on a Force Account basis.

Should any Contract item of Work be eliminated in its entirety, in the absence of an executed Extra Work order or an executed Change Order covering the elimination, payment will be made to the Contractor for actual costs incurred in connection with the eliminated Contract item if the costs were incurred prior to the date of notification in writing by the Project Engineer. No payment will be made for anticipated profits on eliminated Work.

If acceptable material is ordered by the Contractor for the eliminated item prior to the date of notification of the elimination, and if orders for that material cannot be cancelled, the material will be paid for at the actual cost to the Contractor. The material paid for shall become the property of the Owner, and shall be delivered as directed by the Project Engineer. If the material is returnable to the vendor and the Project Engineer so directs, the material shall be returned and the Contractor shall be paid for the actual cost of any charges made by the vendor for returning the material. Any additional costs of handling material associated with eliminated items shall be paid for.

The actual costs to be paid will be determined by the Project Engineer in the same manner as if the Work were to be paid for on a Force Account basis as provided in CSS Section 9.02 "Force Account Payment." Contractor shall provide documentation as requested by the Project Engineer.

9.04 (BLANK)

9.05 RECORDS

The Contractor shall maintain its records in such a manner as to provide a clear distinction between the direct costs of Extra Work paid for on a Force Account basis and the costs of other operations.

From the above records, the Contractor shall furnish the Project Engineer completed daily Extra Work reports, on forms furnished by the Owner for each day's work to be paid for on a Force Account basis. The daily

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Extra Work reports shall be submitted not later than 3 days following the performance of said Work. The daily Extra Work reports shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, Subcontractor, or other forces, except for charges described in CSS Section 9.02.02 "Work Performed by Special Forces or Other Special Services." The daily Extra Work reports shall provide names or identifications and classifications of workers, the hourly rate of pay and hours worked, and also the size, type, and identification number of equipment and hours operated. Before presenting the daily Extra Work reports to the Project Engineer for payment, the Contractor shall compile the cost of the Work to be paid for on a Force Account basis. The Extra Work report number shall be left blank for completion by the Project Engineer.

Material charges shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily Extra Work reports, or if not available, they shall be submitted with subsequent daily Extra Work reports. Should said vendor's invoices not be submitted within 60 days after the date of delivery of the material or within 15 days after the final inspection of the Work, whichever occurs first, the Owner reserves the right to establish the cost of such materials at the lowest current wholesale prices at which said materials are available in the quantities concerned delivered to the location of the Work less any discounts provided in CSS Section 9.02.01B (a) above.

Said daily Extra Work reports shall be signed by the Contractor or its authorized representative.

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

The Contractor's cost records pertaining to the Work shall be open to inspection or audit by representatives of the Owner during the life of the Contract and for a period of not less than 3 years after the date of Acceptance thereof, and the Contractor shall retain such records for that period. Where payment for materials, equipment, or labor is based on the cost thereof to forces other than the Contractor, the Contractor shall make every reasonable effort to insure that the cost records of such other forces

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will be open to inspection and audit by representative of the Owner on the same terms and conditions as the cost records of the Contractor. If an audit is to be commenced more than sixty (60) days after the Acceptance date of the Contract, the Contractor will be given a reasonable notice of the time when such audit is to begin.

9.06 SUBSTITUTION OF SECURITIES

Attention is directed to CSS Section 9.08 "Progress Payments" relating to the retention of funds during the performance of the Contract, and to the requirements of California Public Contract Code Section 22300.

Contractor may substitute securities in lieu of the retention specified in CSS Section 9.08 "Progress Payments." At Contractor's request and expense, securities equivalent to the amount retained shall be deposited with Owner, or with a State or Federally chartered bank as escrow agent, who shall pay such moneys to Contractor upon satisfactory completion of the Contract.

Securities eligible for substitution hereunder shall be limited to those listed in California Government Code Section 16430, or to bank or savings and loan certificates of deposit. Contractor shall be the beneficial owner of any securities so substituted for moneys retained, and shall receive any interest or income thereon.

Any Escrow Agreement entered into pursuant to this Section shall be executed on the form provided in the Agreement Forms section of the Contract Documents.

9.07 STOP NOTICES

Owner will comply with California Civil Code Title 15, Chapter 4, Section 3179 and following, regarding Stop Notices. All Preliminary and Stop Notices shall be sent to the Clerk of the Board of Supervisors at 70 W. Hedding St., East Wing, 10th Floor, San Jose, California 95110, in accordance with the "Stop Notice Information" sheet set forth in the Bid Forms section of the Contract Documents.

9.08 PROGRESS PAYMENTS

The Contractor shall be paid for the actual field accepted quantities for the various items of Work in accordance with the provisions below.

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However, the total payment shall not exceed the total Contract amount.

On or before the day immediately following the end of each payment period, the Owner shall prepare and forward to the Contractor an estimated progress payment in writing of the total amount of Work done and the acceptable materials on hand. Payment for the Work shall be based on a four-week period.

Materials on hand are:

- Acceptable materials furnished and delivered by the Contractor to the Work site but not yet used; or
- Acceptable materials furnished and stored in a location that is subject to or under the control of Owner for use in the performance of the Contract during the payment period.

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 Project Engineer on Owner-furnished forms 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 Project Engineer will in no case exceed the Contract price for the item of Work for which the material is furnished.

Owner will retain ten (10) percent of such estimated value of the Work done, and ten (10) percent of the value of the materials so estimated to have been furnished and delivered and unused or furnished and stored as aforesaid as part security for the fulfillment of the Contract by Contractor. Owner will pay to 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 and applicable laws.

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

After 50% completion of the Work, if satisfactory progress has been made in accordance with the approved schedule of operations, the Owner

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may make the remaining progress payments in full, without retention, for actual Work completed.

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

Work completed in place as estimated shall be an estimate only, and no inaccuracy or error in said estimates shall operate to release Contractor or any Surety from damages arising from such Work or from enforcing each and every provision of the Contract. Owner shall have the right subsequently to correct any error made in any estimate for payment.

No such estimate or payment shall be required to be made when, in the judgment of the Project Engineer, the Work is not proceeding in accordance with the provisions of the Contract; or when in his/her judgment the total value of the Work done since the last estimate amounts to less than \$500.

9.08.01 TIMELY PROGRESS PAYMENTS AND INTEREST

California Public Contract Code Section 20104.50 sets forth the Legislature's intent for prompt payment to contractors and established the following procedures for timely progress payments and payment of interest.

- A. Any local agency which fails to make any progress payment within thirty (30) days after receipt of an undisputed and properly submitted payment request from a contractor on a construction contract shall pay interest to the contractor equivalent to the legal rate set forth in subdivision (a) of Section 685.010 of the Code of Civil Procedure.
- B. Upon receipt of a payment request, each local agency shall act in accordance with both of the following:
 - (1) Each payment request shall be reviewed by the local agency as soon as practicable after receipt for the purpose of determining that the payment request is a proper payment request.

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- (2) Any payment request determined not to be a proper payment request suitable for payment shall be returned to the contractor as soon as practicable, but not later than seven (7) days, after receipt. A request returned pursuant to this paragraph shall be accompanied by a document setting forth in writing the reasons why the payment request is not proper.
- C. The number of days available to a local agency to make a payment without incurring interest pursuant to Section 20104.50 shall be reduced by the number of days by which a local agency exceeds the seven-day return requirement set forth in Paragraph B(2) above.
- D. A "progress payment" includes all payment due contractors, except that portion of the final payment designated by the Contract as retention earnings.
- E. A payment request shall be considered properly executed if funds are available for payment of the payment request, and payment is not delayed due to an audit inquiry by the financial officer of the local agency.
- F. Contractor must make prompt payments to both Disadvantaged Business Enterprise (DBE) and other Subcontractors in compliance with state prompt payment laws, US Department of Transportation regulations, and Owner's contract documents. A DBE may participate as a subcontractor, joint venture partner with a contractor or subcontractor, vendor of material or supplies, or trucking. If a Contractor fails to make prompt payments to its Subcontractors, including DBEs, he/she may be in violation of federal and state regulations and statutes. Such violation may be cause for penalties imposed in accordance with the provisions established in the respective regulations and statutes.

9.09 PAYMENTS WITHHELD

Owner may decline to certify payment and may withhold its certificate, or any certificate for payment previously issued, in whole or in part to such extent as may be necessary to protect Owner from loss because of:

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- (a) Defective work not remedied;
- (b) Third party claims filed or reasonable evidence indicating probable filing of such claims;
- (c) Payments which may be past due and payable for just claims against Contractor or any Subcontractor for labor, materials or equipment furnished in or about the performance of the Work on the Project;
- (d) Failure of Contractor to make payments properly to Subcontractors for labor, materials or equipment;
- (e) Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract amount, including any liquidated damages thereby due;
- (f) Damage to Owner or another contractor, or to other work or property;
- (g) Reasonable evidence that the Work had not been or will not be or completed within the Contract time;
- (h) Failure to carry out the Work in accordance with the Contract Documents, including failure to submit required reports;
- (i) Failure to provide certified weekly payrolls;
- (j) Stop Notices filed, as more specifically provided in CSS Section 9.07 "Stop Notices;"
- (k) Failure or refusal of Contractor to fully comply with the Contract;
- (l) Costs to Owner resulting from failure of Contractor to complete the Work within the proper time.

Whenever Owner will, in accordance herewith, withhold any monies otherwise due Contractor, herein referred to as special retention, Owner shall give written notice of the amount withheld and the reasons therefore to Contractor. And when Contractor removes the grounds for such

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withholding, Contractor shall submit an invoice therefor, pursuant to CSS Section 9.08 "Progress Payments."

9.10 FINAL PAYMENT

Provided that Owner has recorded a Notice of Completion, final payment for the Work done under the Contract shall be made thirty five (35) days after recording of the Notice of Completion by Owner and after Contractor has submitted the following satisfactory to the Project Engineer:

- (a) Evidence that all payrolls, material bills and other indebtedness connected with said Work have been paid;
- (b) Record drawings in accordance with CSS Section 4.05 "As-Built Record Construction plans," and
- (c) Uniform Hazardous Waste Manifests, if applicable in accordance with CSS Section 7.17.02 "Hazardous Materials."

However, Owner will withhold from final payment such amounts, which are in dispute between Owner and Contractor, amounts subject to offset/setoff and all other amounts which must be withheld by law (such as Stop Notice sums).

Acceptance by Contractor of final payment of all undisputed Contract amounts shall constitute a release of all claims against Owner arising by virtue of the Contract related to those amounts.

Notwithstanding the provisions in this part, for a period of three years after Acceptance of the Work, all estimates and payments made, including the final estimate and payment, shall be subject to correction and adjustment for clerical errors in the calculations involved in the determination of quantities and payments. Contractor and Owner agree to pay to the other any sum due under the provisions of this Section.

9.10.01 RETENTION PROCEEDS, WITHHOLDING, DISBURSEMENT

- A. Pursuant to California Public Contract Code Section 7107, within sixty (60) days after the date of completion of the Work, the retention withheld by Owner shall be released,

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subject to all withholds required and authorized by law including stop notice claims and liquidated damages (pursuant to California Government Code §53069.85). In the event of a dispute between Owner and Contractor, Owner may withhold from the final payment an amount not to exceed 150 percent (150%) of the disputed amount. For purposes of this Part 10.08 "completion" means any of the following:

- (1) The occupation, beneficial use, and enjoyment of the entire Work, accompanied by cessation of labor on the work of improvement.
 - (2) The Acceptance by Owner of the Work.
 - (3) After the commencement of Work, a cessation of labor on the Work for a continuous period of one hundred (100) days or more, due to factors beyond Contractor's control.
 - (4) After the commencement of Work, a cessation of labor on the Work for a continuous period of thirty (30) days or more, if Owner files for record a notice of cessation or a notice of completion.
- B. Subject to Part C below, within seven (7) days from the time that all or any portion of the retention proceeds are received by Contractor, Contractor shall pay each of its Subcontractors from whom retention has been withheld, each Subcontractor's share of the retention received. However, if a retention payment received by Contractor is specifically designated for a particular Subcontractor, payment of the retention shall be made to the designated Subcontractor, if the payment is consistent with the terms of the Subcontract.
- C. Contractor may withhold from a Subcontractor its portion of the retention proceeds if a bona fide dispute exists between the Subcontractor and Contractor. The amount withheld from the retention payment shall not exceed 150 percent (150%) of the estimated value of the disputed amount.
- D. In the event that retention payments are not made within the time periods required by Section 7107, Owner and Contractor

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withholding the unpaid amounts shall be subject to a charge of 2 percent (2%) per month on the improperly withheld amount, in lieu of any interest otherwise due. Additionally, in any action for the collection of funds wrongfully withheld, the prevailing party shall be entitled to attorney's fees and costs.

9.11 JOINT CHECKS

Owner reserves the right to make payments to Contractor in the form of checks payable jointly to Contractor and to any of its Subcontractors or suppliers.

**SECTION 10
DUST CONTROL**

Dust control shall conform to the provisions in Section 10 “Dust Control” of the most current edition of the State Standard Specifications.

**SECTION 11
MOBILIZATION**

11.01 DESCRIPTION

Mobilization shall consist of the following:

- 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 and others facilities necessary for Work on the Project;
- Application of all necessary permits when required by the Contract Documents; and,
- All other work and operations which must be performed prior to beginning work on the various Contract items at the Project site.

11.02 PAYMENT

Attention is directed to CSS Sections 9.08 “Progress Payments,” and 9.10 “Final Payment.” Payments for Mobilization will be made as follows:

- A. When the monthly progress payment for the amount earned, not including the amount earned for Mobilization, is 5 percent or more of the awarded Contract amount, 50 percent of the Contract item for Mobilization or 5 percent of the original awarded Contract amount less supplemental work item, whichever is the lesser, will be included in said progress payment.
- B. When the monthly progress payment for the amount earned, not including the amount earned for Mobilization, is 10 percent or more of the awarded Contract amount, the total amount earned for Mobilization shall be 75 percent of the Contract item price for Mobilization or 7.5 percent of the awarded Contract amount less supplemental work item, whichever is the lesser, and said amount will be included in said progress payment.
- C. When the monthly progress payment for the amount earned, not

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including the amount earned for Mobilization, is 20 percent or more of the awarded Contract amount, the total amount earned for Mobilization shall be 95 percent of the Contract item price for Mobilization or 9.5 percent of the awarded Contract amount less supplemental work item, whichever is the lesser, and said amount will be included in said progress payment.

- D. When the monthly progress payment for the amount earned, not including the amount earned for Mobilization, is 50 percent or more of the awarded Contract amount, the total amount earned for Mobilization shall be 100 percent of the Contract item price for Mobilization or 10 percent of the awarded Contract amount less supplemental work item, whichever is the lesser, and said amount will be included in said progress payment.
- E. The amount, if any, of the Contract item price for Mobilization in excess of 10 percent of the awarded Contract amount will be included for payment in the last progress payment in accordance with CSS Section 9.08 "Progress Payment."

The Contract lump sum price paid for Mobilization shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Mobilization as specified herein.

The adjustment provisions in CSS Section 4.02 "Changes," and the retention of funds provisions in said CSS Section 9.08 "Progress Payments" shall apply to the Contract lump sum item of Mobilization pursuant to Public Contract Code § 9203.

When other Contract items are adjusted as provided in said CSS Section 4.02 "Changes," if the costs applicable to such item of work include Mobilization costs, such Mobilization costs will be deemed to have been recovered by the Contractor by the payments made for Mobilization, and will be excluded from consideration in determining compensation under said CSS Section 4.02 "Changes."

When the Contract does not include a Contract pay item for Mobilization as above specified, full compensation for all necessary Mobilization shall be considered as included in the prices paid for the various Contract items of work involved and no additional compensation will be allowed therefor.

**SECTION 12
CONSTRUCTION AREA TRAFFIC CONTROL
DEVICES**

Construction area traffic control devices shall conform to the provisions in Section 12 “Construction Area Traffic Control Devices” of the most current edition of the State Standard Specifications and as follows.

Contractor’s attention is also directed to CSS Section 7.22 “Public Convenience and Public Safety.”

12.01 CONSTRUCTION SIGNS

Contractor shall furnish, install, maintain, and remove, upon the completion of the Work, construction area signs of types C13 (or C14) and C18 (or C23) at all approaches to the Work area in accordance with Chapter 5 of the State Traffic Manual. On high-speed arterials, type W36 sign shall be provided. The Engineer will determine the applicable advisory speed limit to be indicated on such signs. At intersections where the signal system is inoperative and crosswalks are delineated, temporary C36 and W54 signs shall be provided for the duration of the non-functional signal system. The requirements of this section shall apply to any other signs required in the Contract Documents.

12.02 FLAGGERS AND POLICE OFFICERS

Flaggers, while assigned to traffic control, shall perform their duties and shall be provided with the necessary equipment in accordance with the current “Instructions to Flaggers” of the State of California Department of Transportation. The equipment shall be furnished and kept clean and in good condition by the Contractor at Contractor’s expense.

Contractor shall be responsible for providing uniformed police officers through the local enforcement agency to direct traffic as specified in CSS Sections 7.22 “Public Convenience and Public Safety” and 7.22.03 “Intersection or Lane Closure.” When expressways with High-Occupancy-Vehicle lanes are involved, Contractor shall contact California Highway Patrol for traffic control.

**SECTION 15
EXISTING HIGHWAY FACILITIES**

Existing highway facilities shall conform to the provisions in Section 15 “Existing Highway Facilities” of the most current edition of the State Standard Specifications and as follows.

15.01 SALVAGING

All material designated to be salvaged in the Contract Documents shall be delivered to the County maintenance facility as directed by the Project Engineer.

Compensation for this work shall be considered as being paid for in other applicable item(s) of work.

**SECTION 16
CLEARING AND GRUBBING**

Clearing and grubbing shall conform to the provisions in Section 16 "Clearing and Grubbing" of the most current edition of the State Standard Specifications and as follows.

16.01 REMOVAL AND DISPOSAL OF MATERIALS

Burning shall comply with air pollution regulations and fire prevention ordinances.

16.02 MEASUREMENT AND PAYMENT

Clearing and grubbing will be paid for as a combined item on the basis of a lump sum Contract price as provided in SSS Section 16-1.06 "Payment" except that no adjustment as provided in SSS Section 16.1.07 "Adjustment of Lump Sum Item" will be allowed.

**SECTION 17
WATERING**

Watering shall conform to the provisions in Section 17 “Watering” of the most current edition of the State Standard Specifications.

**SECTION 18
DUST PALLIATIVE**

Dust palliative shall conform to the provisions in Section 18 “Dust Palliative” of the most current edition of the State Standard Specifications.

**SECTION 19
EARTHWORK**

Earthwork shall conform to the provisions in Section 19 “Earthwork” of the most current edition of the State Standard Specifications and as follows.

19.01 GRADE TOLERANCE

Roadway excavation shall conform to SSS Section 19 except that SSS Section 19-1.03 “Grade Tolerance” is hereby amended to read as follows:

“Immediately prior to placing subsequent layers thereon, the grading plane at any point shall not vary more than 9 mm (0.03 foot) above or below the grade established by the Project Engineer.”

19.02 ROADWAY EXCAVATION

19.02.01 SLIDES AND SLIPOUTS

The fourth paragraph in SSS Section 19-2.04 “Slides And Slipouts” shall be amended to read as follows:

“The cost of pioneering work necessary to make slide or slipout areas accessible to normal excavation equipment and the cost of necessary clearing and grubbing will be included in the lump sum price bid for clearing and grubbing. When the Bid item is not specified in the Contract Documents, it shall be paid for as Extra Work as specified in CSS Section 4.07 “Extra Work”.”

19.03 STRUCTURE EXCAVATION AND BACKFILL

The following shall be added to SSS Section 19-3.01 “Description”:

“Structure excavation which requires trench excavation of 1.5 m (5 feet) or more shall conform to CSS Sections 5.02.01 “Trench Excavation Safety Plans” and 7.09 “Workers’ Safety Provisions”.”

**SECTION 20
EROSION CONTROL AND HIGHWAY PLANTING**

Erosion control and highway planting shall conform to the provisions in Section 20 “Erosion Control and Highway Planting” of the most current edition of the State Standard Specifications.

**SECTION 22
CLEAN-UP (FINISHING ROADWAY)**

Clean-up (Finishing Roadway) shall conform to the provisions in Section 22 “Finishing Roadway” of the most current edition of the State Standard Specifications and as follows.

1. During construction, the Contractor shall keep the site clean from all rubbish and debris.
2. Before final inspection of the Project, the Contractor shall clean the material sites and all ground occupied by the Contractor in connection with the Project of all rubbish, excess materials, falsework, forms, temporary structures, and equipment. All parts of the Project shall be left in a neat and presentable condition.
3. Clean-up shall include but not be limited to the following work:
 - Existing street name signs, and existing guide, warning, and regulatory signs shall be restored and/or relocated;
 - Existing monuments, if disturbed, shall be repaired or replaced;
 - All manholes, drop inlets, valves, pull boxes, monuments, and other obstructions out of the Traveled Way shall be marked as directed elsewhere in these Specifications or as directed by the Project Engineer;
 - USA markings on PCC or AC pavements, curb and gutter, sidewalk shall be removed by pressure wash or by an acceptable method;
 - As called for in the Contract Documents.
4. Contractor shall be responsible for maintaining any occupied real property until a written release from further clean-up is issued by the Project Engineer or Project Inspector.

**SECTION 24
LIME TREATMENT**

Lime treatment shall conform to the provisions in Section 24 “Lime Stabilization” of the most current edition of the State Standard Specifications.

**SECTION 25
AGGREGATE SUBBASES**

Aggregate subbases shall conform to the provisions in Section 25 “Aggregate Subbases” of the most current edition of the State Standard Specifications and as follows.

25.01 AGGREGATE SUBBASE, CLASS

Aggregate subbase shall be Class 1 aggregate subbase, unless otherwise specified.

The furnishing and applying of water shall be considered as paid for in the price bid per metric tonne or ton (2,000 pounds avoir-du-poids) of Class 1 aggregate subbase.

25.02 TOLERANCE OF PLACEMENT

SSS Section 25-1.05 “Compacting” shall be amended to read as follows:

“The surface of the finished subbase at any point shall not vary more than 25 mm (0.08-foot) above or below the grade established by the Project Engineer.”

**SECTION 26
AGGREGATE BASES**

Aggregate base shall conform to the provisions in Section 26 “Aggregate Bases” of the most current edition of the State Standard Specifications and as follows.

26.01 AGGREGATE BASES, CLASS

Aggregate base shall be Class 2 aggregate base. When specified, Class 3 aggregate base shall conform to the requirements of Class 2 aggregate base, except that the durability index shall be waived.

**SECTION 27
CEMENT TREATED BASES**

Cement treated bases shall be either road-mixed or plant-mixed and shall conform to Section 27 “Cement Treated Bases” of the most current edition of the State Standard Specifications and as follows.

27.01 CEMENT TREATED BASES, TYPE

Cement treated base shall be Class A. Plant-mixed cement treated base may be substituted for road-mixed cement treated base at the option of the Contractor.

**SECTION 28
LEAN CONCRETE BASE**

Lean concrete base shall conform to the provisions in Section 28 “Lean Concrete Base” of the most current edition of the State Standard Specifications.

**SECTION 29
TREATED PERMEABLE BASES**

Treated permeable bases shall conform to the provisions in Section 28 “Treated Permeable Bases” of the most current edition of the State Standard Specifications.

**SECTION 36
PENETRATION TREATMENT**

Penetration treatment shall conform to the following provisions.

36.01 DESCRIPTION

This work shall consist of furnishing and applying liquid asphalt and covering the treated area as specified in these Specifications. Penetration treatment shall be applied to areas shown on the Plans, as directed by the Project Engineer or as specified in the Special Provisions.

Liquid asphalt shall conform to the provisions in CSS Section 93 "Liquid Asphalts." Sand Cover (SC) #250 shall be used for penetration treatment. The total amount to be applied, and the number of applications to be made will be specified in the special provisions.

36.02 MAINTAINING TRAFFIC

At locations where public traffic is being routed over the Roadbed to be treated, the penetration treatment shall not be applied to more than one-half the width of the Traveled Way at a time, and the remaining width shall be kept free of obstruction and open for use by public traffic until the treatment first applied is ready for use by public traffic.

The Contractor shall provide for the passage of public traffic through the Work area in accordance with the provisions in CSS Section 7.22 "Public Convenience and Public Safety," and, when directed by the Project Engineer, traffic shall be routed through the Work area under one-way control.

36.03 PREPARING ROADBED

Immediately in advance of applying liquid asphalt, the surface to be treated shall conform to the compaction and elevation tolerances specified for the material involved and shall be cleaned of all loose or extraneous material.

36.04 APPLYING LIQUID ASPHALT

Liquid asphalt shall be applied in accordance with the provisions in CSS Section 93 "Liquid Asphalts."

Liquid asphalt shall not be applied when the atmospheric temperature is below 10⁰C (50°F). A second application of liquid asphalt shall not be spread until the first application has thoroughly penetrated.

36.05 SAND COVER

After the final application of liquid asphalt, any excess asphalt, which has failed to penetrate the surface, shall be covered with sand conforming to these provisions.

Sand shall be free from clay or organic material and shall be of such size that 90 to 100 percent will pass a No. 4 sieve and not more than 5 percent will pass a No. 200 sieve.

Sand shall be spread uniformly within the rates specified in the Special Provisions. The exact rate will be determined by the Project Engineer. All loose sand shall be removed from a treated area at the time directed by the Project Engineer.

The treated surface shall be maintained in a smooth and satisfactory condition.

36.06 MEASUREMENT AND PAYMENT

The Contract price per metric tonne or ton (2,000 pounds avoirdupois), as specified in the Contract Documents, of SC #250 shall include sand cover, where required by the Project Engineer, in the field.

Quantities of liquid asphalt to be paid for will be determined in accordance with CSS Section 93 "Liquid Asphalts."

Quantities for penetration treatment will be measured as provided in CSS Section 93 "Liquid Asphalts" and paid for at the contract price per metric tonne or ton (2,000 pounds avoirdupois) as specified in the Contract Documents. Such prices shall include preparation for treatment, furnishing and applying liquid asphalt and sand, and removing excess sand.

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No adjustment in compensation will be made for any increase in the quantity of sand cover required, regardless of the reason for such increase or decrease. The provisions in CSS Section 9.03 "Payment for Increased or Decreased Quantities" shall not apply.

Payment shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in applying the penetration treatment, complete in place, as specified in the Contract Documents.

**SECTION 37
BITUMINOUS SEALS**

Bituminous seals shall conform to the provisions in Section 37 "Bituminous Seals" of the most current edition of the State Standard Specifications and as follows.

37.01 ROCK SEAL

This item shall consist of sterilizing soil, applying a seal coat and a cover of colored screenings on those areas shown on the Plans.

37.01.01 STERILIZING SOIL

Sterilizing soil shall conform to the provisions in CSS Section 7.17 "Pesticides & Hazardous Materials," SSS Section 20-4.026 "Pesticides," and the following:

The soil in areas to be sealed shall be sterilized and shaped to a neat and smooth surface. Where rock seal is to be placed adjacent to curbs, the sub-grade shall be graded so that after the seal is placed, the top of the seal will be flush with the top of the curb.

Prior to sterilizing, the soil shall be scarified to a minimum depth of 150 mm (6 inches) and all rocks, large lumps of earth, weeds, and other debris shall be removed and disposed of outside the highway right-of-way as provided in CSS Section 7.18 "Disposal Of Material Outside The Highway Right-of-Way." The loosened material shall then be brought to as finely divide a condition, as the material will permit.

After scarification, the soil shall be sterilized with a sterilizer approved by the Project Engineer.

The areas shall be rolled, where practicable, with a power roller until thoroughly compacted. Where power rollers cannot be operated, compaction shall be obtained by hand rollers or by a compactor.

Full compensation for sterilizing soil shall be considered as included in other items of work and no additional compensation will be

allowed therefor.

37.01.02 SEAL COAT

Seal coat shall be medium grade and shall consist of asphaltic emulsion.

Medium seal coat will be measured and paid for at the Contract price per metric tonne or ton (2,000 pounds avoir-du-poids), as specified in the Contract Documents, for asphaltic emulsion (rock seal).

37.01.03 SCREENINGS

Screenings will be measured and paid for at the Contract price per metric tonne or ton (2,000 pounds avoir-du-poids), as specified in the Contract Documents. The Contract price paid for screenings shall include furnishing and applying of all water.

**SECTION 39
ASPHALT CONCRETE**

Asphalt concrete shall conform to the provisions in Section 39 “Asphalt Concrete” of the most current edition of the State Standard Specifications and as follows.

39.01 ASPHALT CONCRETE, TYPE

Asphalt concrete shall be Type A or Type B.

39.02 ASPHALT

Paving asphalt shall be of grade AR 8000 or AR 4000, as directed by the Project Engineer.

39.03 AGGREGATE

Unless otherwise specified in the Special Provisions, the aggregate for the surface course shall conform to the grading specified for the 19 mm (3/4 inch) maximum medium grading, or as directed by the Project Engineer.

39.04 ASPHALT CONCRETE DIKE

Asphalt concrete dike shall conform to the provisions of SSS Section 39 “Asphalt Concrete” and the following.

Unless otherwise directed by the Project Engineer, mineral aggregate for asphalt concrete dikes shall conform to the grading specified for 9.5 mm (3/8 inch) maximum in SSS Section 39-2.02 “Aggregate.”

39.05 PRIME COAT (PENETRATION TREATMENT)

Prior to placing the asphalt concrete, a prime coat shall be applied to the surface of untreated base or subbase in accordance with SSS Section 39 “Asphalt Concrete” or as directed by the Project Engineer; provided, however, that when the Roadbed structural section consists of deep-lift asphalt, such prime coat shall not be required.

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39.06 SPREADING AND COMPACTING

A minimum of 2 lifts of asphalt concrete shall be required on all projects where the total thickness is larger than 60 mm (0.20-foot).

The top 2 lifts of AC shall be applied with self-propelled asphalt-paver spreading and finishing equipment.

39.07 SEAL COAT

Fog seal may be applied at the discretion of the Project Engineer and will be paid for on a Force Account basis.

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SECTION 40 PORTLAND CEMENT CONCRETE PAVEMENT

Portland cement concrete pavement shall conform to the provisions in Section 40 “Portland Cement Concrete Pavement” of the most current edition of the State Standard Specifications.

**SECTION 41
PAVEMENT SUBSEALING AND JACKING**

Pavement subsealing and jacking shall conform to the provisions in Section 41 "Pavement Subsealing and Jacking" of the most current edition of the State Standard Specifications.

**SECTION 42
GROOVE AND GRIND PAVEMENT**

Groove and grind pavement shall conform to the provisions in Section 42 “Groove and Grind Pavement” of the most current edition of the State Standard Specifications and as follows.

42.01 GRIND ASPHALT CONCRETE

Unless specified or directed otherwise, grinding of asphalt concrete for pavement conforms may be accomplished by cold planing.

42.02 MEASUREMENT AND PAYMENT

Measurement and payment of pavement grinding and grooving shall be as specified in SSS Sections 42-2.04 “Measurement” and 42-2.05 “Payment” except that conform or wedge grinding which tapers to daylight in 1.5 m (5 feet) shall be paid for at the Contract price per linear meter or linear foot unless specified otherwise in the Contract Documents.

**SECTION 49
PILING**

Piling shall conform to the provisions in Section 49 “Piling” of the most current edition of the State Standard Specifications.

**SECTION 50
PRESTRESSING CONCRETE**

Prestressing concrete shall conform to the provisions in Section 50 “Prestressing Concrete” of the most current edition of the State Standard Specifications and as follows.

50.01 DRAWINGS

The first paragraph in SSS Section 50-1.02 “Drawings” is amended to read as follows:

“The Contractor shall submit to the Santa Clara County Roads & Airports Department, Highway and Bridge Design Division, 101 Skyport Dr., San Jose, Ca 95110-1302 in accordance with the provisions in CSS Section 5.02 “Plans and Working Drawings,” working drawings of the prestressing system proposed for use. For initial review, 3 sets of such drawings shall be submitted for highway bridges and 5 sets shall be submitted for railroad bridges. After review, 6 to 12 sets, as requested by the Engineer, shall be submitted to the Department of Roads & Airports for final approval and for use during construction.”

**SECTION 51
CONCRETE STRUCTURES**

Portland cement concrete structures shall conform to the provisions in Section 51 "Concrete Structures" of the most current edition of the State Standard Specifications and as follows.

51.01 MINOR STRUCTURES

Minor concrete shall conform to the requirements in SSS Section 90 "Portland Cement Concrete."

51.02 MEASUREMENT AND PAYMENT

Drainage inlets including drop inlets will be measured and paid for by the unit. The Contract unit price paid for drainage inlets shall include full compensation for all structure excavation and structure backfill and for furnishing and placing all bar reinforcing steel, metal frames, covers and grates necessary to construct the drainage inlets complete in place.

**SECTION 52
REINFORCEMENT**

Reinforcement shall conform to the provisions in Section 52 “Reinforcement” of the most current edition of the State Standard Specifications.

**SECTION 53
SHOTCRETE**

Shotcrete shall conform to the provisions in Section 53 “Shotcrete” of the most current edition of the State Standard Specifications.

**SECTION 54
WATERPROOFING**

Waterproofing shall conform to the provisions in Section 54 “Waterproofing” of the most current edition of the State Standard Specifications.

**SECTION 55
STEEL STRUCTURES**

Construction of steel structures shall conform to the provisions in Section 55 “Steel Structures” of the most current edition of the State Standard Specifications and as follows.

55.01 DRAWINGS

The first paragraph in SSS Section 55-1.02 is amended to read as follows:

“The Contractor shall submit to the Santa Clara County Roads & Airports Department, Highway and Bridge Design Division, 101 Skyport Dr., San Jose California 95110-1302 for approval in accordance with the provisions in CSS Section 5.02 “Plans and Working Drawings”, working drawings for structural steel. For initial review, 3 sets of such drawings shall be submitted for highway bridges and 7 sets shall be submitted for railroad bridges. After review, 6 to 12 sets, as requested by the Project Engineer, shall be submitted to the Roads & Airports Department for final approval and for use during construction.”

**SECTION 56
SIGNS**

Overhead sign structures and roadside signs shall conform to the provisions in Section 56 “Signs” of the most current edition of the State Standard Specifications and as follows.

56.01 FURNISHING OF MATERIALS

Contractor shall furnish regulatory, warning, guide, and special signs, which are specified in the Contract Documents. Contractor shall also furnish all required temporary construction and traffic control signs as specified in CSS Section 12.01 “Construction Signs.” The furnishing of signs shall include all hardware and posts.

56.02 MEASUREMENT AND PAYMENT

Compensation for furnishing and installing regulatory, warning, guide, and/or special signs shall include labor, material, and equipment required for a complete installation in place. Payment will be made on a lump sum basis at the price bid for furnishing and installing signs, unless specified otherwise in the Special Provisions.

Compensation for furnishing and installing temporary construction signs shall include labor, equipment, and materials required for the complete installation in place and subsequent removal of signs. Payment shall be considered as included in the Contract item for “Traffic Control,” unless specified otherwise in the Special Provisions.

**SECTION 57
TIMBER STRUCTURES**

Timber structures shall conform to the provisions in Section 57 “Timber Structures” of the most current edition of the State Standard Specifications.

**SECTION 58
PRESERVATIVE TREATMENT OF LUMBER,
TIMBER AND PILING**

Preservative treatment of lumber, timber, and piling shall conform to the provisions in Section 58 “Preservative Treatment of Lumber, Timber and Piling” of the most current edition of the State Standard Specifications.

**SECTION 59
PAINTING**

Painting shall conform to the provisions in Section 59 “Painting” of the most current edition of the State Standard Specifications.

**SECTION 61
CULVERT AND DRAINAGE PIPE JOINTS**

Culvert and drainage pipe joints shall conform to Section 61 “Culvert and Drainage Pipe Joints” of the most current edition of the State Standard Specifications and as follows.

61.01 MEASUREMENT AND PAYMENT

Furnishing and installing culvert and pipe joints will not be measured and paid for separately. Compensation for culvert and drainage pipe joints shall be considered as included in the Contract prices paid for the types of culvert or pipe.

**SECTION 62
ALTERNATIVE CULVERTS**

Alternative pipe and pipe arch culverts shall conform to Section 62 “Alternative Culverts” of the most current edition of the State Standard Specifications.

**SECTION 63
CAST-IN-PLACE CONCRETE PIPE**

Cast-in place concrete pipe shall conform to the provisions in Section 63 “Cast-In-Place Concrete Pipe” of the most current edition of the State Standard Specifications.

**SECTION 64
PLASTIC PIPE**

Plastic pipe shall conform in Section 64 “Plastic Pipe” of the most current edition of the State Standard Specifications.

**SECTION 65
REINFORCED CONCRETE PIPE**

Reinforced concrete pipe shall conform to the provisions in Section 65 “Reinforced Concrete Pipe” of the most current edition of the State Standard Specifications and as follows.

65.01 REINFORCED CONCRETE PIPE, CLASS

Reinforced concrete pipe shall be Class 3 unless otherwise indicated in the Contract Documents.

65.02 MANHOLES

Manholes shall conform to the provisions in CSS Section 70.01 “Manholes.”

**SECTION 66
CORRUGATED METAL PIPE**

Corrugated metal pipe shall conform to the provisions to Section 66 “Corrugated Metal Pipe” of the most current edition of the State Standard Specifications and as follows.

66.01 GALVANIZING

Corrugated steel pipe shall be galvanized in accordance with the provisions of SSS Section 75 “Miscellaneous Metal”.

**SECTION 67
STRUCTURAL METAL PLATE PIPE**

Structural metal pipe shall conform to the provisions of Section 67 "Structural Metal Plate Pipe" of the most current edition of the State Standard Specifications and as follows.

67.01 TUNNELING

The approach trench for tunneling operations shall be adequately shored to safeguard the structure and to insure against ground movement in the vicinity of the entrance.

Excess excavation or over-break, outside the required line of excavation, shall be refilled by grouting through holes provided for that purpose to the approval of the Project Engineer. The Contractor shall be responsible for maintaining the required straight alignment and grade, for preventing settlement of the structures or pavement above opening, and for other damage due to tunneling operations.

The approach trench shall be backfilled with no. 20 sand equivalent backfill compacted to 90% or as directed by the Project Engineer

All surplus of excavated material from the tunneling operations shall be hauled away and disposed of by the Contractor at its own expense.

67.02 STRUCTURAL METAL LINER PLATE (MORTAR LINED)

Structural liner plate shall conform to ASTM Designation A 415 or SSS Section 67-1.02 "Materials." The size and gage of the plate shall be as designated on the Plans.

Structural liner plate shall be lined with air-blown mortar to provide a smooth inside surface. Mortar shall be applied in accordance with the requirements of SSS Section 53-1.01 "Description" through Section 53-1.06 "Finishing". No. 20M welded wire fabric of 100 mm x 300 mm (4 in. x 12 in.) tack-welded to the liner plate at about 600 mm (2 feet) on center each way shall be provided to furnish bond.

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The cement proportion shall be increased as necessary to maintain the necessary flow characteristics throughout the grouting operation.

Full payment for furnishing and placing structural liner plates (mortar lined), complete in place, including labor, materials and equipment, excavation, backfill, grout, grouting plugs, pumping equipment, welded wire mesh, mortar lining, and pits shall be made at the Contract price per meter or linear foot, as specified in the Contract Documents, of structural liner plate (mortar lined).

**SECTION 68
SUBSURFACE DRAINS**

Subsurface drains shall conform to the provisions of Section 68 "Subsurface Drains" of the most current edition of the State Standard Specifications and as follows.

68.01 MATERIAL

All subsurface drains shall be installed using perforated pipe or alternate approved by the Project Engineer.

68.02 PERMEABLE MATERIAL

Unless otherwise shown on the Plans or in the Special Provisions, the grading of permeable material shall conform to Class 1, Type A as specified in SSS Section 68-1.025 "Permeable Material."

**SECTION 69
OVERSIDE DRAINS**

Overside drains shall conform to the provisions of Section 69 “Overside Drains” of the most current edition of the State Standard Specifications and as follows.

69.01 MEASUREMENT AND PAYMENT

Overside drains will be measured and paid for at the Contract price per meter or linear foot, as specified in the Contract Documents, of oversight drain. Payment for oversight drains shall be considered as including all fittings, entrance tapers, tapered inlets, reducers, and downdrain slip joints; aluminum entrance tapers, taper inlets, reducers, and downdrain slip joints; anchor assemblies; and all necessary excavation and backfill. No separate payment shall made therefore.

**SECTION 70
MISCELLANEOUS FACILITIES**

Miscellaneous facilities shall conform to the provisions of Section 70 "Miscellaneous Facilities" of the most current edition of the State Standard Specifications and as follows.

70.01 MANHOLES

70.01.01 ADJUSTMENT OF EXISTING MANHOLES TO GRADE

Existing manholes shall be adjusted to grade subsequent to the placing of surfacing. Backfill around manholes for grade adjustment shall be Class 2 concrete (i.e. 350 kg of Portland cement per cubic meter) per SSS Section 90-1.01 "Description" to the bottom of new surfacing. Manhole covers shall be seated in 3 mm x 12 mm (1/8" x 1/2") chromate felt or as directed by the Project Engineer.

70.01.02 NEW MANHOLES

Manholes shall conform to the Plans, except that new manholes are to be constructed to approximately 150 mm (0.5 feet) below sub-grade elevations. Subsequent to paving operations, manholes shall be raised to grade and ring and cover placed. All backfill around manholes for grade adjustment shall be Class 2 concrete to the bottom of new AC paving. Manhole covers shall be seated in 3 mm x 12 mm (1/8" x 1/2") chromate felt or as directed by the Project Engineer.

70.02 CLEANING, FLUSHING, AND TESTING

Upon completion of the Work, the Contractor shall flush the sewer lines with water until all dirt and debris are removed. The dirt and debris shall be removed from the newly constructed lines and shall not be allowed to flow into the sanitary sewer system. All flushing shall be done with a Wayne Sewer Ball or approved equal and the pressure of the water during flushing shall be high enough to provide a minimum cleansing velocity of 1.5 m (5 feet) per second. When a new sewer is connected to

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an existing line at a point between existing manholes, cleaning, and flushing with an approved sewer ball shall be carried out to the first existing manhole downstream from the point of connection.

Pipe structures shall be submitted to a static head test whenever ground-water conditions are encountered in the installation of the pipe, or when required by the Project Engineer. The test shall consist of plugging a downstream manhole and filling the line for a twenty-four (24) hour period. The leakage rate for the line shall be computed from the water level drop (if any) in the upper manhole. The amount of leakage shall not be more than 454 L (120 gallons) per twenty-four (24) hours per 305 m (1,000 feet) of line per 25.4 mm (1 inch) of diameter of pipe.

70.03 MEASUREMENT AND PAYMENT

Measurement and payment shall conform to SSS Sections 70-1.04 "Measurement" and 70-1.02 "Payment" except that:

- Concrete cutoff walls to be constructed as part of flared end sections shall be considered as part of the flared end sections and no separate payment will be made therefore.
- Brick and mortar plugs as shown on the Plans shall be considered as included in the Contract price paid for reinforced concrete pipe and no additional allowance will be made therefor.
- The unit price paid for adjusting manholes to grade shall include furnishing, installing and removing temporary manhole covers as necessary, all labor, tools, materials, and equipment.
- The unit price paid per new manhole complete in place shall include furnishing and installing temporary and permanent manhole covers and rings, including the removal of temporary manhole covers, excavation and backfill, all labor, tools, materials and equipment.

**SECTION 72
SLOPE PROTECTION**

Slope protection shall conform to the provisions in Section 72 "Slope Protection" of the most current edition of the State Standard Specifications and as follows.

72.01 SACKED CONCRETE SLOPE PROTECTION

If the Contractor elects to form footings, the space left after removal of the forms shall be compacted to a relative density of not less than 95%.

Portland cement concrete shall conform to the provisions in SSS Section 72-4.03 "Materials."

The use of pit run material shall not be allowed.

72.02 MEASUREMENT AND PAYMENT

The price paid per cubic yard or cubic meter of sacked concrete slope protection shall include all labor, materials, tools and equipment necessary and doing all the work involved herein, including excavation necessary for placing sacks. If there is no item in the Bid Form for sacked concrete slope protection, then all sacked concrete slope protection shown on the Plans shall be considered as paid for in other items of Work.

**SECTION 73
CONCRETE CURBS AND SIDEWALKS**

Sidewalk, island paving, and miscellaneous flatwork shall be constructed of Class 3 concrete (i.e., 300 kg of Portland cement per cubic meter) and shall include all flatwork other than driveway approaches and shall be constructed in accordance with Section 73 “Concrete Curbs & Sidewalks” and Section 90 “Portland Cement Concrete” of the most current edition of the State Standard Specifications and as follows.

73.01 CUSHION

Cushion, when required, shall be Class 3 aggregate base.

73.02 (BLANK)

73.03 CURB AND GUTTER

Curbs and gutters shall be constructed of Class 3 concrete in accordance with SSS Sections 73 “Concrete Curb & Sidewalks” and 90 “Portland Cement Concrete.”

73.04 CURBS

Curbs shall be constructed of Class 3 concrete in accordance with SSS Sections 73 “Concrete Curb & Sidewalks,” and 90 “Portland Cement Concrete.”

73.05 DRIVEWAY APPROACHES

Driveway approaches will be considered as that portion of a driveway extending from the back of the curb to the back of the street sidewalk line and from expansion joint to expansion joint.

Driveway approaches shall conform to the dimensions shown on the plans or as directed by the Engineer in the field and shall be constructed of Class 3 concrete in accordance with SSS Sections 73 “Concrete Curb & Sidewalks,” 90 “Portland Cement Concrete,” and the following.

- Cushion, when required, shall be Class 3 aggregate base.

73.06 SAND BACKFILL (ISLANDS)

Sand used to backfill islands shall be placed as shown in the Plans and shall conform to SSS Section 19 "Earthwork."

All sand used for backfill shall be clean and unwashed sand such that no particle shall be retained on the 6.25-mm (1/4") mesh sieve.

73.07 MEASUREMENT AND PAYMENT

Sidewalk, island paving, and miscellaneous flatwork will be measured and paid for at the Contract price per square meter or square foot as specified in the Contract Documents.

Curb and gutter will be measured and paid for at the Contract price per linear meter or linear foot of curb and gutter installed complete in place, as specified in the Contract Documents. The Contract price paid shall include all labor, materials, tools, water, curing agents, and equipment.

Curbs will be measured and paid for at the Contract price per linear meter or linear foot of curb installed complete in place, as indicated in the Contract Documents. The Contract price paid shall include dowels, reinforcing steel, epoxy when specified.

Driveway approaches will be measured and paid for at the Contract price per square meter or square foot of driveway approach installed complete in place, as specified in the Contract Documents.

Aggregate base will be measured and paid for at the Contract price per metric tonne or ton (2,000 pounds avoirdupois) as specified in the Contract Documents, which shall include all labor, materials, tools, and equipment.

Sand backfill will not be measured and paid for separately and shall be considered as included in the Contract price paid for island paving.

**SECTION 74
PUMPING PLANT EQUIPMENT**

Pumping plant equipment shall conform to the provisions in Section 74 “Pumping Plant Equipment” of the most current edition of the State Standard Specifications and as follows.

74.01 DATA TO BE FURNISHED

Four copies of the proposed parts list and service instruction manual shall be required and delivered to the Project Engineer for review. No equipment shall be furnished and installed until submittals are approved by the Project Engineer.

**SECTION 75
MISCELLANEOUS METAL**

Miscellaneous metal shall conform to the provisions in Section 75 “Miscellaneous Metal” of the most current edition of the State Standard Specifications.

**SECTION 80
FENCES**

Fences shall conform to the provisions in Section 80 “Fences” of the most current edition of the State Standard Specifications.

**SECTION 81
MONUMENTS**

Monuments shall conform to the provisions in Section 81 “Monuments” of the most current edition of the State Standard Specifications and as follows.

81.01 COUNTY STANDARD MONUMENT BOXES

County standard monument boxes shall conform to the details shown on the Project Plans or in the Standard Details Manual.

Existing monument boxes, when affected by surrounding work specified in the Contract Documents and requiring grade adjustment, shall be adjusted to new grade.

Existing survey monuments, whether in a monument box or not, that are in danger of being or will be destroyed by construction activities shall be located and referenced by or under the direction of a licensed Land Surveyor or registered Civil Engineer authorized to practice land surveying. The referencing of the existing monument shall be done prior to the time when streets or highways are to be improved, constructed, reconstructed, or relocated; and a Corner Record or Record of Survey of the references shall be filed with the County Surveyor. The Land Surveyor Act and Streets and Highways Code require that the monument shall be reset in the surface of the new construction, a monument box placed thereon, and a Corner Record or Record of Survey be filed with the County Surveyor prior to the recording of the Certificate of Completion for the Project. The Project Engineer shall notify the Santa Clara County Roads and Airports Survey Section of any monument, on the Project, that is in danger of being destroyed so that it may be referenced out and perpetuated in accordance with the requirements of the Land Surveyors Act and Street and Highways Code. Monument which is potentially impacted by Contractor’s construction activities or operations shall be brought to the attention of the Project Inspector or Engineer for referencing by the County Roads & Airports Survey Section as indicated above.

Contractor shall be responsible for all costs in reestablishing monument which is destroyed or damaged by Contractor’s construction activities or

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operations in the event that Contractor fails to notify the County as specified hereinabove.

81.02 MEASUREMENT AND PAYMENT

The Contract price paid for each monument box shall include furnishing and placement of the sleeve and monument box complete in place.

Compensation for adjusting monument box to grade shall be considered as paid for in other items of work, unless specified otherwise in the Contract Documents.

**SECTION 82
MARKERS AND DELINEATORS**

Markers and delineators shall conform to the provisions in Section 82 “Markers and Delineators” of the most current edition of the State Standard Specifications.

**SECTION 83
RAILINGS AND BARRIERS**

Railings and barriers shall conform to the provisions in Section 83 “Railings and Barriers” of the most current edition of the State Standard Specifications.

SECTION 84
TRAFFIC STRIPES AND PAVEMENT MARKINGS

Traffic stripes and pavement markings shall conform to the provisions of Section 84 “Traffic Stripes and Pavement Markings” of the most current edition of the State Standard Specifications, Chapter 6 “Markings” the State Traffic Manual, and as follows.

84.01 GENERAL

Pavement markings, such as stop bar, crosswalk limit line, arrows, railroad grade crossing symbol, and any others as specified in the Contract Documents, shall be alkyl thermoplastic type conforming to State Specification 8010-19A. Traffic stripes on expressways and arterials shall be alkyl thermoplastic type. Traffic stripes on all other roadway systems shall be two-coat painted. Traffic stripes shall be of details as specified in the Contract Documents.

All alignment layouts shall be approved by the Project Engineer prior to installation of pavement markings and/or striping.

Pavement arrows used on expressway traffic lanes shall be Type V for through lane, Type III(L) for left-turn lane and Type III(R) for right-turn lane per SSP A24A and A24B except that Type IV(R) may be used for shorter right-turn stacking lane. Pavement arrows on expressway lanes shall be set back 7.6 m (approximately 25 ft) from the nearest crosswalk limit line or stop bar line. Pavement arrows on other roadway systems shall be set back 2.5 m (approximately 8 ft) from the nearest crosswalk limit line or stop bar line.

Curb face and top of all island noses shall be painted with white reflective paint.

84.02 MEASUREMENT AND PAYMENT

Measurement and payment shall conform to SSS Sections 84-3.06 “Measurement” and 84-3.07 “Payment” except that:

- Painted curb face will be measured and paid for at the Contract price per linear meter or linear foot as indicated in the Contract

SECTION 84

Documents. Painted curb will be measured at the face of curb. If there is no Contract item for painted curb face, payment shall be considered as included in the Contract price paid for painted traffic stripe and no additional compensation shall be allowed therefor.

**SECTION 85
PAVEMENT MARKERS**

Pavement markers shall conform to the provisions of Section 85 “Pavement Markers” of the most current edition of the State Standard Specifications.

SECTION 86
SIGNALS, LIGHTING, TRAFFIC COMMUNICATION
AND OTHER ELECTRICAL SYSTEMS

86.01 GENERAL

86.01.01 DESCRIPTION

Work on signals, lighting, traffic communication systems, and other electrical systems shall be as specified in the Contract Documents supplemented by other documents as specified in CSS Section 5.19 “Coordination, Interpretation and Order of Precedence of Contract Documents.”

Unless specifically indicated on the Plans or in the Special Provisions, the locations of the signals, lighting, communication or other electrical facilities shown on the Plans are approximate. Exact locations for these facilities shall be established by the Contractor in the field with the approval of the Project Engineer.

All systems shall be completed, successfully pass all tests and in operating condition at the time of acceptance of the work. Unless specified otherwise in the Contract Documents, all materials and equipment furnished shall be new and free of damage. Materials and equipment, which are damaged upon delivery to the site, shall be replaced prior to installation.

86.01.02 DEFINITIONS

Terms for signals, lighting and electrical systems shall be defined in accordance with SSS Section 86-1.015 “Definitions” and the following:

Backup Timing	Preset, standard timing and configuration values used to setup the controller in a known state of operation; also referred to as default timing.
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Concurrent phase	A phase that is allowed to time at the same time as another phase (a phase in a different timing ring).
Conflicting phase	A phase that can not be allowed at the same time as another phase due to potential hazards if displayed.
Demand	The service of a timing phase based on the detection of a vehicle or pedestrian presence, not the result of the preemption sequence.
EEPROM	Electrically erasable, programmable read only memory.
EPROM	Erasable programmable read only memory.
Non-concurrent phase	A phase that is not allowed to time at the same time as another phase. (A phase across the barrier from another phase or a phase which would cause a conflicting movement.)
Non-conflicting phase	A phase that is allowed to time and be displayed at the same time as another phase.
Slack	Conductor or cable slack is the amount of conductor or cable exposed within the pullbox or mastarm tenon after being installed in conduit or mastarm. In general, a minimum of 1-m (3.28 ft.) of slack shall be provided at each end of the installed conductor.

86.01.03 REGULATIONS AND CODES

All electrical equipment and materials shall conform to the requirements as specified in SSS Section 86-1.02 “Regulations and Codes.”

Fiber-optic cable material, installation and testing shall conform to the requirements of the following:

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- CFR 1755.900, RUS Specification for Filler Fiber Optic Cables;
- ANSI, C8.47-1983, American National Standard for Polyolefin-insulated Thermoplastic Jacketed Communication Cables;
- EIA-455-27A, Method of Measuring (Uncoated) Diameter of Optical Waveguide Fibers;
- EIA-455-28B, Method of Measuring Tensile Failure Point of Optical Waveguide Fibers;
- EIA/TIA-455-82A, Water Penetration Test;
- EIA-455-95, Absolute Optical Power Test for Optical Fibers & Cables;
- EIA-455-103, Buffered Fiber Bend Test;
- EIA-359-A-1, Special Colors.

Wherever reference is made to any of the codes, orders, or standards the reference shall be construed to mean the code, order, or standard that was in effect as of the date of these Standard Specifications. Where the date of a referenced specification differs from the current code, order, or standard date, the Engineer shall be consulted to determine the effective code, order, or standard to be used.

86.01.04 SUBMITTALS

86.01.04A GENERAL

Contractor shall furnish to the Project Engineer for review and approval equipment and material submittals in accordance with CSS Section 4.06 "Submittals for Materials and Equipment" and the following.

- (1) All electrical diagrams, plans and drawings shall be prepared using graphic symbols shown in ANSI publication Y32.2, entitled "IEEE Standard and American National Standard Graphic Symbols for Electrical and Electronic Diagrams."
- (2) Any deviation from the requirements of this section must be provided by the Contractor in writing for the Engineer's approval. In the event of non-compliance by the Contractor, all Work shall be suspended in accordance with CSS Section

8.05 "Temporary Suspension of Work."

The following constitute as a minimum, but are not limited to, the required submittals to be furnished by the Contractor to the Project Engineer for review and approval.

86.01.04B EQUIPMENT AND MATERIAL LISTS

A list of equipment and materials proposed for use shall be complete as to name of manufacturer, size, and identifying number of each item. The list shall include, but not be limited, the following, when applicable:

- (1) Traffic signal standards.
- (2) Vehicular signal equipment and mounting hardware.
- (3) Pedestrian signal equipment and mounting hardware.
- (4) Conduit.
- (5) Conductors and/or cables.
- (6) Pull boxes.
- (7) Detector handhole.
- (8) Detector system materials: lead-in cables, loop wires, loop sealant.
- (9) Lubricant.
- (10) Luminaire.
- (11) Photo-electric unit.
- (12) Fused splice connector.
- (13) Conductor identification tags.
- (14) Service cabinet (incl. breakers and controls).
- (15) Concrete mix design for signal and light pole foundations and cabinet pedestal/foundation.
- (16) Fiber-optic cables (incl. resumes and references of qualified people performing splices, logging procedure for splicing).
- (17) Items specified throughout these Standard Specifications or in the Contract Documents.

86.01.04C CONTROLLER CABINET SUBMITTALS

The Contractor shall supply AutoCAD (Version 14 or later) drawing files for all cabinet wiring documentation CAD data shall be delivered on PC compatible 1.4 MB high density diskettes or as specified in the Contract Documents. Computer word processor

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files shall be provided on IBM compatible 1.4-MB high-density diskettes for all maintenance and operations manuals. These files shall be in a Rich Text Format or as approved by the Project Engineer.

All drawings, prints, manuals, and any copies thereof shall be legible with good contrast, sharp image, good definition, and clear layout.

The traffic signal controller cabinet schematic wiring diagrams shall call out and identify all wires connected on each terminal in the cabinet. All such connections shall be fully cross-referenced by callouts at the point specified by the terminal callouts. The complete cabinet diagram shall be contained on no more than three (3) prints of size A1 (841 mm x 594 mm) (22 in. x 34 in.). Each print shall be divided by functions. Callbacks shall reference the sheet containing the destination if different than the current sheet.

- (1) For new installations:
 - (a) Two (2) copies of the schematic wiring diagram for the controller cabinet shall be submitted at least 30 calendar days prior to cabinet wiring being initiated.
 - (b) Two (2) complete sets of cabinet information shall be furnished along with the new traffic controller cabinet(s) to be delivered. Each set of cabinet information shall consist of:
 - Schematic cabinet wiring diagram;
 - Scale drawings of cabinet showing location and spacing of shelves, terminal blocks and equipment, including dimensioning;
 - Schematic wiring diagrams of the controller unit and auxiliary equipment;
 - Maintenance and operational manuals.
 - (c) Upon completion of cabinet testing and installation, five (5) complete sets of as-built or corrected cabinet

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drawings or wiring diagrams shall be supplied prior to the acceptance of the Work.

- (2) For modification to existing controller(s).
 - (a) Two (2) complete sets of cabinet information including plans, procedures, and schedule of work shall be furnished at least 30 calendar days prior to the start of modification to any existing traffic signal controller. Each set of information shall consist of cabinet prints, drawings, wiring diagrams, maintenance and operational manuals related to the modification.
 - (b) Upon completion of the modification, five (5) complete sets of corrected or as-built drawings or diagrams shall be supplied prior to the Acceptance of the Work.

86.01.04D OTHERS

The Contractor shall furnish the following for review and approval by the Engineer:

- (1) Progress Schedule as per CSS Section 8.04 "Progress Schedule."
- (2) Traffic Control/Detour Plan for lane and/or intersection closure or traffic signal shutdown. Submittal shall be provided in accordance with CSS Section 4.06 "Submittals for Materials and Equipment," and in no case shall be less than 30 calendar days prior to the planned closure or shutdown date. Street closure and traffic detour shall conform to CSS Sections 7.22 "Public Convenience and Public Safety," 12 "Construction Area Traffic Control Devices," and Caltrans "Manual of Traffic Controls for Construction and Maintenance Work Zones."
- (3) As-built drawings as specified in CSS Section 4.05 "As-Built Record Construction Plans."

86.01.05 WARRANTIES, GUARANTEES & INSTRUCTION SHEETS

86.01.05A GENERAL

Manufacturers' written warranties and guarantees furnished for equipment and materials used in the Work, instruction sheets, and part lists supplied with equipment and materials shall be delivered by the Contractor to the Project Engineer prior to the Acceptance of the Work.

Warranty certificates shall contain the following minimum information: character of work, name of subcontractors, warranty period and conditions, and any other requirements as specified in the Contract Documents.

86.01.05B GUARANTEE OF WORK

Guarantee of Work shall be in accordance with CSS Section 5.17 "Correction of Work And Guarantee."

Within the warranty period and upon notification by the Owner, the Contractor, its supplier(s)/manufacturer(s) shall take immediate action to correct the failure at no cost to the Owner. In the event which the Contractor, its supplier(s)/manufacturer(s) fail to respond within twelve (12) hours of notification, including weekends and holidays, the Owner will carry out the correction necessary or to hire whomever it deems suitable to do so without abrogation of warranty. All costs incurred by the Owner as a result of the failure to respond by the Contractor, or the Contractor shall reimburse its supplier(s)/ manufacturer(s).

86.01.05C NOTIFICATION OF EQUIPMENT SAFETY FAILURE

The Contractor, its supplier(s)/manufacturer(s) shall immediately notify the Owner of any potential or actual safety problems associated with any equipment or material furnished. It shall be the responsibility of the Contractor, its supplier(s)/manufacturer(s) to take necessary action to correct the safety problems at no cost to the County regardless of the status of the one-year warranty period.

**86.01.05D CONTROLLER-RELATED COMPUTER
ACCESSORIES**

The Contractor, its supplier/manufacturer shall guarantee the maintainability of the accepted system hardware and software for a period of ten (10) years from the date of filing the Notice of Completion by the Owner. Maintainability shall include the County maintenance, expansion, and upgrade of equipment provided hereunder to maintain and/or achieve its designed functions. If the Contractor, its supplier/manufacturer is unable to comply with the above, he/she shall provide, for a period of ten (10) years, at no charge to the County, the latest hardware, and/or software upgrade to the County equipment.

**86.01.06 MAINTAINING EXISTING AND/OR
TEMPORARY ELECTRICAL SYSTEMS AND
TRAFFIC COMMUNICATION SYSTEMS**

Unless specified otherwise in the Special Provisions, existing and/or temporary electrical systems and communication systems within the Project limits shall be kept in effective operation for the benefit and safety of the general public during the progress of the Contractor's Work, except when shutdown is permitted to allow for final connection and/or removal of the said systems.

Maintenance responsibilities of the existing and/or temporary electrical systems and communication systems shall be as defined in SSS Section 86-1.05 "Maintaining Existing and Temporary Systems" for the duration of the Work and until the Acceptance of the Work, and the following:

- (1) The Contractor shall be responsible for the cost of any necessary maintenance and/or repair of the electrical systems and communication systems if damaged by the Contractor.
- (2) Any work involving traffic detector loop, traffic coordination facilities, and communication facilities shall be expedited. Replacement of traffic detector loop, communication fiber-optic or interconnect cabling systems damaged by the Contractor's operations shall be performed immediately upon notification by the Owner to bring the system(s) back into operation to the original condition. Temporary repair by the

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Contractor to restore the system to full operation may be permitted provided that the Contractor will complete replacement of the damaged facility(ies) within 48 hours. Repair or replacement shall be made in accordance with these specifications and shall include all the required tests for quality assurance. If the Contractor fails to repair or replace the damaged facility(ies) within the period indicated, the Owner will, at the Owner's option, implement the provisions in Section 8.05 "Temporary Suspension of Work" and/or perform the necessary repair. Costs for the repair performed by the Owner will be invoiced to the Contractor for payment or deducted from moneys due or become due the Contractor. Contractor shall immediately notify the Project Engineer any damage to these facilities or call the Traffic Operations Center at (408)-299-3604.

86.01.07 SCHEDULING OF WORK

Work shall be scheduled as specified in SSS Section 86-1.06 "Scheduling of Work" and as follows:

- (1) The order of Work may be modified if, in the opinion of the Project Engineer, Work can be expedited. Any proposed modification shall require the approval of the Project Engineer.
- (2) Work shall conform to the approved progress schedule as per CSS Section 86.01.04 "Submittals." The progress schedule may be modified if, in the opinion of the Project Engineer, Work can be expedited. Any proposed modification shall require the approval of the Project Engineer.
- (3) Lane and/or intersection closures shall conform to CSS Section 7.22.03 "Intersection or Lane Closure."
- (4) The Contractor shall notify the Project Engineer prior to any modification to the existing system.
- (5) Installation of foundations for traffic signal standards shall begin only after receipt of all materials required for the complete installation of the signal standards as specified on the Contract Plans.

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- (6) Traffic signal heads to be activated or deactivated shall be installed in a coordinated manner such that they are not displayed in the inactive state for more than seven (7) days. Masking of deactivated signal heads shall be installed and maintained during the inactive period.

Any exception or modification to these requirements will be specified in the Special Provisions or shall require prior approval of the Project Engineer.

86.02 MATERIALS AND INSTALLATION

86.02.01 MOBILITY – IMPAIRED ACCESS PROVISIONS

- (1) All electrical facilities such as traffic signal and lighting standards, traffic signal controller and service equipment cabinets, which might interfere with the pedestrian direct pathway shall be located off the sidewalk or walkway area or, if located within these areas, a minimum of 1.5 m (5 ft) wide unobstructed passageway shall be provided. At locations with restricted right of way, these facilities may be located within the sidewalk or walkway area provided that a minimum of 915 mm (3 ft) wide unobstructed passageway and a 1.5 m x 1.5 m (5 ft x 5 ft) passing spaces at 61 m (200 ft.) max. interval are provided.

Controller and service cabinets shall be located conforming to the above clearance requirements based upon the open-door condition.

- (2) Push button shall be located in accordance with CSD E/6A.
- (3) Pullboxes shall be located in accordance with CSD E/8.

86.02.02 EXCAVATING AND BACKFILLING

All work pertaining to excavating and backfilling shall conform to the provisions in SSS Sections 86-2.01 "Excavating and Backfilling" and as follows:

- (1) Trench excavation safety shall conform to CSS Sections 5.02.01 "Trench Excavation Safety Plans," 7.04 "Trench

Safety," and CAL-OSHA requirements.

- (2) All backfill shall be compacted to a relative compaction of not less than 95 percent unless specified otherwise in the Contract Documents.

86.02.03 REMOVING AND REPLACING EXISTING IMPROVEMENTS

The removal and/or replacement of existing improvements or facilities shall conform to the provisions in SSS Section 86-2.02 "Removing and Replacing Improvements."

The Contractor at no cost to the Owner shall perform the removal and replacement of existing improvements, which are damaged by the Contractor.

86.02.04 FOUNDATIONS

Foundations shall conform to CSS Sections 86.01.07 "Scheduling of Work" and 86.02.10 "Bonding and Grounding" and SSS Section 86-2.03 "Foundations" and the following:

- (1) Controller cabinet foundation shall be for Type P controller cabinet. Foundation and bonding details shall conform to CSD E/4 and E/47, respectively.
- (2) Service cabinet foundation shall be for Type III-AF service cabinet. Foundation and bonding details shall conform to CSD E/2D and E/48, respectively.
- (3) Electrolier foundations for Type 15 and Type 15B standards shall conform to CSD E/6B. Foundation bonding details shall conform to CSD E/47.
- (4) Foundations for traffic signal standards with mastarm lengths of 16.8 m (55 ft) or 19.8 m (65 ft) shall conform to CSD E/43. Foundations for standards with other mastarm lengths shall conform to the applicable details in the State Standard Plans. Foundation bonding details shall conform to CSD E/47.
- (5) Foundation for Type 1-B signal standard shall conform to the

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details in the State Standard Plans.

- (6) A mortar pad shall be provided under the base plate of each standard, post, or pedestal, which does not rest directly on top of the foundation. Mortar mix shall be as specified in SSS Section 86-2.03 "Foundations" and installed after the standard, post, or pedestal is in proper position and/or alignment. The exposed portion of the mortar shall be formed to present a neat appearance.

Post, poles, standards, pedestals, and cabinets shall not be erected or installed until the foundation has set at least 7 days, and shall be plumbed or raked as directed by the Project Inspector.

Compensation for the work under this section will be made at the Contract unit prices for the appropriate foundations installed complete in place and per the specified details.

86.02.05 STANDARDS, STEEL PEDESTALS AND POSTS

Standards, steel pedestals, and posts shall conform to SSS Section 86-2.04 "Standards, Steel Pedestals and Posts" and the following:

- (1) All standards except Type 1 and all signal mastarms shall be permanently identified as to type with embossed or stamped metal tags permanently attached near the base of the shaft and near the mounting flange of the mastarms.
- (2) Unless specified otherwise in the Contract Documents, signal and lighting standards with mastarm lengths other than specified below shall conform to the details in the State Standard Plans. Standards with signal mastarm lengths of 16.8 m (55 ft) or 19.8 m (65 ft) shall conform to CSD E/40 and E/41.
- (3) Signal or lighting standard without mastarm shall be Type 1-B as shown on the State Standard Plans unless specified otherwise in the Contract Documents
- (4) Lighting standard shall be Type 15 or 15B per CSD E/6B.
- (5) Unused mastarm tenons shall be securely capped with bolt-on

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galvanized steel caps.

- (6) Galvanized surfaces of standards, steel pedestals and posts which are damaged or affected by modification shall be repaired in accordance with CSS Section 86.02.14 "Galvanizing." The Contractor shall be responsible for the repair of work damaged by the Contractor at no cost to the Owner.
- (7) Unused bolt holes on standards shall be patched by welding and re-galvanizing in accordance with CSS Section 86.02.14 "Galvanizing" or other method approved by the Project Engineer. Care shall be taken to avoid damage to wiring during the repair. Insulation tests shall be performed both before and after the patching of the standard. The Contractor shall provide a written report of the insulation tests to the Project Engineer.

Compensation for the Work specified in this Section shall be made at the Contract unit prices for the appropriate standards furnished and installed complete in place and per the specified details. Patching of unused bolt holes on county-furnished standards will be paid for as Extra Work.

86.02.06 CONDUIT

Material, application and installation of conduits for the containment of electrical conductors or wires shall conform to SSS Section 86-2.05 "Conduit" and the following.

86.02.06A MATERIAL

When specified, rigid non-metallic conduit shall be Schedule 80 Polyvinyl Chloride (PVC) or approved equivalent conforming to the requirements of Article 347 "Rigid Non-Metallic Conduit" of the National Electrical Code. Conduit bonding shall be as specified in Section 86.02.10 (1) below. Non-metallic conduit installed by the directional boring method shall be colored red impregnated throughout the thickness of the conduit wall.

86.02.06B APPLICATION

The minimum conduit diameter shall be Size 53 (2 in.) except as follows:

- (1) Conduit between pedestrian push button post and adjacent pull box shall be Size 41 (1-1/2 in.).
- (2) Conduit between electrolier and adjacent pull box shall be Size 41 (1-1/2 in.).
- (3) Controller cabinet foundation conduits shall be of sizes as specified in Detail C of CSD E/4.

86.02.06C INSTALLATION

- (1) Bending of all conduits, other than factory bends, shall be performed with standard bending tools approved by the Project Engineer. Conduit bending without the proper tool shall not be permitted and shall be cause for rejection of the Work.
- (2) Conduit bends, except factory bends, shall have radius of the greater of 457 mm (18 in.) or twelve (12) times the inside conduit diameter for runs over 3 m (approximately 10 ft.).
- (2) Conduit bends shall not exceed the following angles as measured from the extended horizontal plane:
 - (a) 45 degrees max. for rise of elbows into pullbox;
 - (b) 90 degrees max. for other locations.
- (4) The total accumulative bending angle based upon the conduit running length shall not exceed the following:
 - (a) 180 degrees for a maximum of 3 m (10 ft) run;
 - (b) 150 degrees for a maximum of 15 m (50 ft) run;
 - (c) 135 degrees for a maximum of 30 m (100 ft) run;
 - (d) 90 degrees for a maximum of 60 m (200 ft) run.
- (5) Conduit shall enter the pullbox from the bottom of the pullbox at a vertical angle as specified above. Conduit shall terminate

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approximately 50 mm (2 in.) above the grouted bottom and nearest to the wall, under which the conduit emerges.

- (6) Conduit shall be installed at depths as specified in SSS Section 86-2.05C "Installation" except that conduit installed within the paved or unpaved median shall be at a minimum depth of 760 mm (30 in.) below finished grades. Placement of conduit on top of roadway pavement within the paved median island shall not be permitted.
- (7) Rigid non-metallic conduits shall be used for all underground installation including under roadway pavement and LRT tracks except that the rigid metal type shall be used at the following locations:
 - (a) In concrete structures, including pole and cabinet foundations;
 - (b) Adjacent to gasoline service stations or installations of underground gasoline or diesel storage, piping, or pumps, for conduit which lead to a controller cabinet, circuit breaker panel, service or any enclosure where an arc may occur during normal operations. Such conduit shall be sealed if located within the limits specified in the National Electrical Code for Class 1, Division 1, Hazardous Locations.

Under roadway pavement or LRT tracks, conduit shall be installed by jacking or drilling method or by an approved method. Open cut of the pavement or trackway shall not be permitted. Hole for non-metallic conduit runs shall be pre-drilled larger than the conduit and conduit shall be installed by hand.
- (8) Conduit may be installed by the trenching method in non-vehicular traffic areas, such as at back of roadway side curbs and in median islands. The installation shall conform to CSD E/45.
- (9) Conduit alignments shown on Plans are schematic. Conduit runs shall be installed in straight line to the maximum possible extent. Where underground obstructions are encountered and with prior approval of the Project Engineer, location of

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conduit may be changed or alignment is curved according to the conduit bending requirements specified in this section.

- (10) All conduit exposed ends shall be temporarily and securely capped during construction and until conductor installation by an approved method. The Contractor shall be responsible for the removal of any foreign material inside conduits with no cost to the Owner.
- (11) Conduit installed for future conductors shall be provided with pull rope and bonding wire as specified in Section 86.02.10 "Bonding and Grounding." A minimum of 2-m (6.5 ft.) of slack shall be provided in pull box at each end of the pull rope.
- (12) Existing and new underground conduits to be incorporated into a new system shall be cleaned with a mandrel or cylindrical wire brush and blown out with compressed air. Results shall be furnished to the Project Engineer for approval prior to the wire installation.

86.02.06D MODIFICATION OF EXISTING CONDUIT

Existing conduit, including conduit stub-ups, terminating in pullboxes, which require adjustment or replacement by the Contract Documents shall be modified as, specified in the above Section 86.02.06C "Installation."

86.02.06E MEASUREMENT AND PAYMENT

Conduit will be measured by the linear meter or linear foot, as indicated in the Contract Documents, and paid for at the Contract price for furnishing and installation of conduit, complete in place. Compensation shall include all required termination, bends, and stub-ups inside pullboxes, cabinets, foundations, and bases.

Modification of existing conduit and its stub-ups as specified in CSS Section 86.02.06D "Modification of Existing Conduit" will not be measured and paid for separately and compensation shall be considered as included in the Contract price for the work item "pullbox adjustment" or "pullbox replacement" as applicable.

86.02.07 PULLBOXES

Material, cover markings, application and installation of pullboxes, covers, and extensions shall conform to SSS Section 86-2.06 “Pull Boxes” and State Standard Plan ES-8 except the following.

86.02.07A MATERIAL

Pullboxes and extensions shall be precast of steel reinforced Portland cement concrete (PCC) material. Pullbox covers shall be constructed of polymer concrete.

Polymer concrete shall be an aggregate consisting of sand and gravel bound together with a polyester resin. Inside and outside surfaces shall be reinforced with a continuous layer of inter woven fiberglass strands and coated with polyester resin. It shall be concrete gray and have the following mechanical properties:

- Compressive strength: 80 MPa (11,000 psi)
- Tensile strength: 15 MPa (1,700 psi)
- Flexural strength: 55 MPa (7,500 psi)
- Static design load: 36 KN (8,000 lb.)
- Static test load: 54 KN (12,000 lb.)

When specified in the Contract Documents, traffic rated pullboxes shall conform to the following:

- (1) All component parts of the metal lid shall have continuous welds. The lid shall be 13-mm (1/2-in.) minimum thickness and bolted at two points to the cast-in-place metal rim. Bolt holes shall be threaded to accept the anchor bolts. The pullbox lid shall fit snugly into the metal rim.
- (2) The pullbox rim shall be cast into the concrete box and securely attached to the reinforcing steel of the box.
- (3) The concrete box shall be cast in place with 150 mm (6 in.) thick side walls and bottom using high strength concrete approved by the Engineer and shall be reinforced with Size 10 (1/2 in.) steel rebar placed at 76 mm (3 in.) center-to-center, horizontally and vertically.

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- (4) All exposed steel in the pull box and lid shall be galvanized steel.

86.02.07B COVER MARKING

Marking of pullbox covers shall conform to SSS Section 86-2.06B "Cover Marking" and, unless specified otherwise in the Contract Documents, the identification "COUNTY TEO" shall be engraved, welded or casted on the top face of all covers and followed by one of the following applicable markings:

- (1) "IRRIGATION" (for pullboxes containing irrigation controller circuits of 120 volts or more).
- (2) "COMMUNICATIONS" (for pullboxes in telephone service runs from utility service termination).
- (3) "SERVICE" (for pullboxes in service runs and where utilities company conduits terminate).
- (4) "SPRINKLER-CONTROL" (for pullboxes containing sprinkler control circuits of 50 volts or less).
- (5) "STREET LIGHTING" (for pullboxes containing lighting circuits of 600 volts or less).
- (6) "TRAFFIC SIGNAL" (for pullboxes containing traffic signal circuits with or without street lighting circuits).
- (7) "TRAFFIC COMMUNICATIONS" (for pullboxes containing fiber-optic cabling system).

86.02.07C APPLICATION

Pullboxes shall be No. 5 with the following exceptions:

- (1) No. 6 pullbox shall be used when five (5) or more conduits entering the pullbox.
- (2) No. 3 1/2 pullbox may be used if it is solely used for lighting purpose.

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- (3) Pullbox for fiber-optic cabling system shall have the following minimum inside dimensions, unless specified otherwise in the Contract Documents: 1.225 m (48 in.) long by 0.762 m (30 in.) wide by 0.355 m (14 in.) high. It shall be provided with a locking lid. Pullbox extension shall be in 355 mm (14 in.) high increment.

86.02.07D INSTALLATION

The installation of pullboxes shall conform to SSS Section 86-2.06C "Installation and Use," CSD E/8 and the following:

- (1) Where the roadway median or side is not separated from the travel lanes by curb, pullboxes shall be located a minimum of 3 m (10 ft.) from the shoulder stripe or edge of pavement in the case of no shoulder.
- (2) Pullboxes located in sidewalk or paved areas shall be installed with top of pullboxes flush with surrounding grade. Electrolier pullbox location shall conform to CSD E/46; other pullbox locations shall conform to CSD E/47.
- (3) Pullboxes, including existing ones requiring adjustment, shall have base prepared according to CSD E/8.
- (4) No more than one (1) extension shall be added to a pullbox unless specified otherwise in the Contract Documents.

86.02.07E MEASUREMENT AND PAYMENT

Unless specified otherwise, marker post and pull box shall each be measured and paid for separately per the unit's contract price. Prices shall include all costs for furnishing and installation complete in place.

Pullbox adjustment or replacement will be measured as a unit adjusted or furnished and installed, respectively, complete in place and paid for at the Contract price for Pullbox Adjustment or Furnish & Install. Prices shall include the removal and disposal, when applicable, of existing unit, furnishing of new unit, and installation of new or existing unit, modification of existing conduit and conduit

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stub-ups, and any incidental works, all to the specified requirements.

86.02.08 CONDUCTORS AND CABLES

Conductor material, size, identification, and application shall conform to SSS Section 86-2.08 "Conductors" and the following.

86.02.08A CONDUCTOR IDENTIFICATION

Conductor identification shall conform to SSS Section 86-2.08A "Conductor Identification" and as follows:

- Identification stripe color shall be permanently impregnated the conductor insulating jacket.

86.02.08B TRAFFIC SIGNAL CONDUCTORS

No. 10 or smaller traffic signal conductors shall be solid copper with either:

- Type USE insulation with a minimum thickness of 1 mm (40 mils), or
- Type THW insulation with a minimum thickness of 1 mm (40 mils).

86.02.08C SIGNAL CABLES

At the option of the Project Engineer and where shown on the Project Plans, signal cable shall be installed in lieu of individual conductors. Signal cable shall conform to SSS Section 86-2.08D "Signal Cable," the requirements as specified in the special provisions and the following:

- An amorphous interior moisture penetration barrier of non-hygroscopic polyethylene or polypropylen fillers shall be provided to protect against water entering the cable.

86.02.08D TELEMETRY OR SIGNAL INTERCONNECT CABLE

Telemetry cable shall have twelve (12) No. 20 AWG minimum, stranded tinned copper conductors. Conductors shall be in twisted pairs, color-coded and conform to the requirements of SSS Section 86-2.08E "Signal Interconnect Cable." In addition, the cable jacket shall be rated for flooded burial application and an amorphous interior moisture penetration barrier of non-hygroscopic polyethylene or polypropylene fillers shall be provided to protect against water entering the cable. Color-coding shall be provided for each conductor in each pair and shall require the Project Engineer's approval.

86.02.08E SERVICE CONDUCTORS

Service conductors shall be three (3) no. 2 AWG stranded copper wires or larger sized for a minimum 100 amp. service between the utility service point and the service equipment enclosure or service cabinet. Two (2) no. 6 AWG conductors or larger sized for a minimum 60 amp. breaker shall extend from the service equipment enclosure or service cabinet to the controller cabinet. Two (2) no. 8 AWG minimum conductors shall extend from the service equipment enclosure or service cabinet to the luminaire pullboxes.

86.02.08F FIBER-OPTIC CABLE

(1) General Fiber Characteristics

The Contractor shall provide manufacturer's certification that the furnished cable shall comply with the Rural Utilities Service (RUS) Specification 1755.900 as currently amended and with the requirements set forth in the Contract Documents. Any deviations from these Specifications shall be conspicuously noted in the Contractor's submittal.

Each fiber optic cable, unless otherwise indicated, shall be dielectric central membrane, gel filled (or tape water blocked), duct type, loose tube, and contain strands of single mode fibers (SM) as indicated and shall conform to these Specifications.

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The optical fibers shall be contained within loose buffer tubes. The loose buffer tubes shall be stranded around an all dielectric central member in a Reverse Oscillation Lay with aramid yarn as the primary strength member and a polyethylene sheath for overall protection. The cable shall have six (6) fibers per tube when less than thirty six (36) fibers total and twelve (12) fibers per tube when greater than or equal to thirty six (36) fibers.

The glass used shall be manufactured by Corning or approved equivalent.

The cable shall be BellCore certified GR-20-CORE for single-mode or approved equal or as specified in the Contract Documents.

Each optical fiber shall be glass and consist of a doped silica core surrounded by concentric silica cladding. All fibers in the buffer tube shall be factory tested and usable fibers, and shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of these Specifications.

Fiber coating shall be layered, UV cured acrylate. The coating shall be mechanically or chemically strippable without damaging the fiber.

The required fiber grade shall reflect the maximum individual fiber attenuation to guarantee the required performance of each and every fiber in the cable.

Cable shall comply with the optical and mechanical requirements over an operating temperature range of -40 degrees C to +70 degrees C.

The Contractor shall provide a cable with at least the fiber counts shown on the Project Plans. The Contractor at its option and expense may provide cables with additional fibers.

Single mode fibers within the finished cable shall meet the requirements:

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Type	Step Index
Core Diameter	8.3 μm (nominal)
Cladding Non-circulatory	125 $\mu\text{m} \pm 1.75 \mu\text{m}$
Core to Cladding Offset	$\leq 0.8 \mu\text{m}$
Coating Diameter	250 $\mu\text{m} \pm 15 \mu\text{m}$
Cladding Non-Circularity Defined as: $[1 - (\text{min. cladding dia.} / \text{max. cladding dia.})] \times 100$	$\leq 1.0\%$
Proof/Tensile Test	3,500 kg/square mm min.
Attenuation @ 1,300 nm (MM)/1310 nm (SM) @ 1,550 nm	$\leq 0.4 \text{ dB/km}$ $\leq 0.3 \text{ dB/km}$
Attenuation at the Water Peak	$\leq 2.1 \text{ dB/km @ } 1,383 + 3 \text{ nm}$
Chromatic Dispersion Zero Dispersion Wavelength Zero Dispersion Slope	1,301 to 1,321.5 nm $\leq 0.092 \text{ ps}/(\text{nm}^2 \cdot \text{km})$
Maximum Dispersion	3.3 ps/(nm*km) for 1,285–1,330 nm < 18 ps/(nm*km) for 1,550 nm
Cut-Off Wavelength	< 1,260 nm
Mode Field Diameter (Peterman II)	9.3 $\pm 0.5 \mu\text{m}$ at 1,300 nm 10.5 $\pm 1.0 \mu\text{m}$ at 1,550 nm

(a) Color Coding

In buffer tubes containing multiple fibers, each fiber shall be distinguishable from others in the same tube by means of color coding. The colors shall be targeted in accordance with the Munsell color shades and shall meet EIA/TIA-598 “Color Coding of Fiber Optic Cables.”

The color formulation shall be compatible with the fiber coating and the buffer tube filling compound and be heat stable. It shall not fade or smear or be susceptible to migration and it shall not affect the transmission characteristics of the optical fibers and shall not cause fibers to stick together.

(2) Cable Construction**(a) Buffer Tubes**

The loose buffer tubes shall provide clearance between the fibers and the inside of the tube to allow for thermal expansion without restraining the fiber. The fibers shall be loose or suspended within the tubes. The fibers shall not adhere to the inside of the buffer tube.

The loose buffer tubes shall be extruded from material having a coefficient of friction sufficiently low to allow the fiber free movement. Buffer tubes shall be made of tough abrasion resistant material to provide mechanical and environmental protection of the fibers, yet designed to permit safe intentional “scoring” and breakout entry without jeopardizing the internal fibers.

Buffer tube filling compound shall be homogenous hydrocarbon-based gel (with anti-oxidant additives) USRD to prevent water intrusion and migration. The filling compound shall be non-toxic and dermatologically safe to exposed skin. It shall be chemically and mechanically compatible with all cable components, non-nutritive to fungus, non-hygroscopic and electrically non-conductive. The filling compound shall be free from dirt and foreign matter and shall be readily removable with conventional non toxic solvents.

Buffer tubes shall be stranded around a central member by the reverse oscillation stranding process.

Each buffer tube shall be distinguishable from other buffer tubes in the cable by means of color coding.

(b) Central Member

The central member which functions as an anti-buckling element shall be a glass reinforced plastic rod with similar expansion and contraction characteristics as the optical fibers. A linear overcoat of Low Density Polyethylene shall be applied to the central member of

the main trunk fiber cable to achieve the optimum diameter to provide the proper spacing between buffer tubes during stranding.

(c) Filler Rods

Fillers may be included in the cable to lend symmetry to the cable cross-section where needed. Filler rods shall be solid medium or high density polyethylene. The diameter of filler rods shall be the same as the outer diameter of the buffer tubes.

(d) Stranding

Completed buffer tubes shall be stranded around the over-coated central member using stranding methods, lay lengths and positioning such that the cable shall meet mechanical, environmental and performance specifications. A polyester binding shall be applied over the stranded buffer tubes to hold them in place. Binders shall be applied with sufficient tension to secure the buffer tubes to the central member without crushing the buffer tubes. The binders shall be non-hygrosopic, non-wicking (or rendered so by the flooding compound), and dialectic with low shrinkage.

(e) Core and Cable Flooding

The cable core interstices shall be filled with a polyolefin based compound to prevent water ingress and migration. The flooding compound shall be homogenous, free from dirt and other foreign matter, non-hygrosopic, electrically non-conductive, non-nutritive to fungus and readily removable. The compound shall also be non-toxic, dermatologically safe and compatible with all other cable components. The compound shall be free from dirt and foreign matter and shall be readily removable with conventional non-toxic solvents. A water blocking tape can be substituted for a filling compound.

(f) Tensile Strength Member

Tensile strength shall be provided by high tensile strength aramid yarns and fiberglass which shall be helically stranded evenly around the cable core.

(g) Outer jacket

The outer jacket material shall be a Medium Density Polyethylene (MDPE) conforming to ASTM D1248, Type II, Class C, Category 4 or 5, Grade J4. The light absorption coefficient, when measured in accordance with ASTM D3349, shall be a minimum of 400 at a wavelength of 375 nm. The jacket shall be free from holes, splits, and blisters with a total minimum jacket thickness of $1\text{ mm} \pm 0.1\text{ mm}$ (40 ± 5 mils). Jacketing material shall be applied directly over the tensile strength members and flooding compound and shall not adhere to the armored strength material. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus.

The outer jacket or sheath shall be marked with the manufacturer's name, the words "Fiber Optic Cable", date of manufacture, and sequential meter markers. The markings shall be repeated every meter. The actual length of the cable shall be within 0 ± 1 percent of the length marking. The marking shall be in a contrasting color to the cable jacket. The height of the marking shall be approximately 3 mm (1/8 in.).

The cable shall contain at least one ripcord under the inner sheath for easy sheath removal.

The finished cable shall be capable of withstanding a pulling tension of 2,700 N (12,015 lbf) minimum.

(h) Indoor Fiber-optic Cable

Indoor fiber optic cable shall be plenum rated in accordance with UL910/CSA OFNP/FT6 listings. The cable shall otherwise be similar to the outdoor cable

specified in these Specifications. Cable shall meet BellCore TR-409-CORE specifications.

(3) Cable Performance**(a) General**

The fiber-optic cable shall withstand water penetration when tested with one (1) meter static head or equivalent continuous pressure applied at one end of a one meter length of filled cable for one hour. No water shall leak through the open cable end. Testing shall be done in accordance with EIA-455-82B "Fluid Penetration Test for Filled Fiber Optic Cable."

The cable shall exhibit no flow (drip or leak) at 80 degrees C (176 degrees F). The weight of any compound that drips from the sample shall be less than 0.05 grams (0.002 ounce). A representative sample of cable shall be tested in accordance with EIA-455-81A "Compound Flow (Drip) Test for Filled Fiber Optic Cable." The test sample shall be prepared in accordance with Method A.

Crush resistance of the finished fiber-optic cables shall be 220 N/cm (25,000 lbf/inch) applied uniformly over the length of the cable without showing evidence of cracking or splitting when tested in accordance with EIA-455-25A "Repeated Impact Testing of Fiber Cables and Cable Assemblies." The average increase in attenuation for the fibers shall be <0.10 dB at 1,550 nm (single-mode) for a cable subjected to this load. The cable shall not exhibit any measurable increase in attenuation after removal of load. Testing shall be in accordance with EIA-455-41A "Compressive Loading Resistance of Fiber Optic Cable" except that load shall be applied at the rate of 3 mm to 20 mm per minute and maintained for 10 minutes.

The cable shall withstand 25 cycles of mechanical flexing at a rate of 30 ± 1 cycles/minute. The average increase in attenuation for the fibers shall be <0.10 dB at 1,550 nm (single-mode) at the completion of the

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test. Outer cable jacket cracking or splitting observed under 10x magnification shall constitute failure. The test shall be conducted in accordance with EIA-455-104A "Fiber Optic Cable Cyclic Flexing Test," except that the sheave diameter shall be a maximum diameter of 20 times the cable outside diameter. The cable shall be tested in accordance with Test Conditions I and III of the EIA-455.

The cable shall withstand a tensile load of 2,700 N (12,015 lbf) without exhibiting an average increase in attenuation of greater than 0.10 dB (single-mode). The test shall be conducted in accordance with EIA-455-33 "Fiber Optic Cable Tensile Loading and Bending Test," using a maximum mandrel and sheath diameter of 560 mm. The load shall be applied for one hour in Test Condition II of the EIA-455 procedure.

(b) Quality Assurance

All optical fibers shall be proof-tested by the fiber-optic cable manufacturer at a minimum load of 3,500 kg/square mm (2,500 tons/square inch). Documentation of factory results shall be provided to the Project Engineer prior to shipping.

All optical fibers shall be attenuation tested by the manufacturer. The attenuation of each fiber shall be provided with each cable reel.

Attention is directed to the testing requirements specified in CSS Section 86.02.13 "Testing."

(c) Packaging and Shipping

Unless specified otherwise in the Contract Documents, the completed cable shall be packaged for shipment on lagged wooden reels. The cable and reel shall be wrapped in water resistant covering.

Each end of the cable shall be securely fastened to the reel to prevent the cable from coming loose during

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transport. Two meters of cable length on each end of the cable shall be accessible for testing. Both ends of the cable shall be sealed to prevent the ingress of moisture.

Each cable reel shall have a durable weatherproof label or tag showing the manufacturer's name, the cable type, the actual length of cable on the reel, the Contractor's name, the contract number, and the reel number. A shipping record shall be included in an attached weatherproof envelope showing the above information and shall include the date of manufacture, cable characteristics (size, attenuation, bandwidth, etc...), cable information number and any other pertinent information.

The diameter of the reel shall be at least thirty times the diameter of the cable. The fiber-optic cable shall be in one continuous length per reel with no factory splices in the fiber. Each reel shall be marked to indicate the direction the reel should be rolled to prevent loosening of the cable.

86.02.08G MEASUREMENT AND PAYMENT

The furnishing of conductors, telemetry or signal interconnect cable, and fiber-optic cable will not be measured and paid for separately. Compensation shall be as specified in the following CSS Section 86.02.09H "Measurement And Payment."

86.02.09 WIRING

Any wiring within the traffic controller cabinet shall be performed by a qualified manufacturer's representative, approved by the Project Engineer, and with the presence of the County's Lighting and Signal Systems Center inspector. Work performed by personnel other than the manufacturer's authorized representative or without the presence of the County's LSSC personnel shall result in work stoppage.

Wiring of conductors shall conform to SSS Section 86-2.09 "Wiring" and the following.

86.02.09A CIRCUITRY

In addition to the requirements in SSS Section 86-2.09A "Circuitry," the following shall apply:

- (1) Each mastarm signal head and unused tenon shall be provided with its own set of 4 conductors (#14 color coded red, yellow, green and white) and one (1) additional spare conductor (#14 color coded black), all running continuously and directly from the signal head and unused tenon to the pullbox. Each conductor shall be provided with slack as specified in the following section and conductors in unused mastarm tenon shall be securely fastened to the inside of the tenon.
- (2) Unused signal ports on non-tenon type mastarms shall not have spare conductors installed.

89.02.09B INSTALLATION AND TAGGING OF CONDUCTORS AND CABLES (OTHER THAN FIBER-OPTIC CABLE)

The installation and tagging of conductors and cables shall be as specified in SSS Section 86-2.09B "Installation" modified and/or supplemented by the followings:

- (1) Conductors shall be protected during installation. No conductors, new or existing, shall be left exposed where they might be damaged. Conductors shall be placed in pullboxes or be protected by other means when not actively being installed. Exposed conductors left unattended will be subject to rejection by the Project Engineer and the Contractor shall be responsible for the costs of the rejected material.
- (2) Unless specified otherwise, all installed conductors including spare conductors shall each be provided with 1 m (3 feet) of slack at each end. At the pull box end, slack shall be neatly grouped together without tangles or crossovers, taped to form a neat coil and then placed inside the pullbox. At the opposite end other than pullbox end, such as in the unused tenons, the conductor slack shall be left inside the mastarm and the conductor ends shall be securely fastened to a convenient location inside the tenon.

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- (3) Telemetry cables shall run continuously without splices between controller cabinets.
- (4) Vehicular and pedestrian traffic signal light conductors shall not run to a terminal block on a standard unless they are to be connected to the signal heads mounted thereon. Conductors for additional mastarm indications on the same standard shall run continuously from the signal heads to the pullbox. Conductors for signal heads from any standard that are to be connected to signal head conductors on another standard shall be connected only in the pullbox or at the controller cabinet terminals. No entry or connection in the terminal block compartment shall be permitted.
- (5) In addition to the conductor identification requirements specified in SSS Section 86-2.08A "Conductor Identification," all conductors inside the cabinet or pullbox shall be labeled or tagged in accordance with CSD E/44 for all new wiring installation or modification. When required by the Project Engineer, conductors, which have missing or incorrect labels, shall be re-tagged and labeled. Work will be paid for as Extra Work.

86.02.09C INSTALLATION OF FIBER-OPTIC CABLE

(1) General

Installation procedures and technical support information shall be furnished at the time of material submittal. Installation procedures shall be in conformance with the procedures specified by the cable manufacturer for the specific cable being installed.

The tension on the cable during installation shall not exceed 2,700 N (12,015 lbf).

During cable installation, the bend radius shall be maintained at a minimum of twenty times the outside diameter of the cable. After installation, the bend radius shall be maintained at a minimum of ten times the outside diameter of the cable.

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Fiber-optic cable shall be installed without splices except where specifically indicated on the Project Plans. Cable, which is damaged, shall be removed extending to the existing nearest splice on either side of the location where damage occurs and replaced with cable conforming to the specifications of the cable being replaced. New splices shall be provided at locations of the initially installed splices. No additional splice shall be permitted.

The cable shall be clearly marked with a permanent plastic orange tag in each pull box which it passes through.

During installation the Contractor shall maintain a log showing the meter (foot) marking on the cable at every pull box. This will help determine the exact location of problems along the cable run during the Optical Time Domain Reflectometer (OTDR) testing.

Testing of the fiber-optic cable shall conform to the requirements in CSS Section 86.02.13D "Fiber-optic Cable Testing."

(2) Aerial Installation of Temporary System

Where specified in the Contract Documents, temporary aerial installation of the fiber-optic cable shall conform to the general installation specifications above, the recommended installation of the cable manufacturer and the following.

The Contractor shall provide the Project Engineer with the following information as part of the material submittal for approval prior to installation:

- Detailed instructions on the proposed cable installation method;
- All hardware that will be used during the installation; and,
- The fiber-optic manufacturer recommended installation techniques.

A galvanized rigid steel conduit, size 53C (2 in.), shall be

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installed up each temporary utility pole for the fiber-optic cable run. The conduit shall enter the pullbox at the termination point. During and after installation, care shall be taken not to bend the cable below the minimum bend radius noted above.

A messenger wire shall be installed between the two utility poles for attachment of the fiber optic cable. The tension in the messenger wire after installation shall be set at the manufacturer recommended level for fiber installation. Eye bolts, clamps, etc. that are used for aerial fiber-optic cable installation shall be as recommended by the messenger wire manufacturer. The messenger wire shall be grounded in accordance with the National Electrical Code or local requirements, whichever are more stringent.

The pulling grip recommended by the fiber-optic cable manufacturer for aerial installations shall be used.

A drip loop in the fiber cable shall be placed at each pole. The sag in the cable at each drip loop shall be no more than 75 mm (3 inches).

A lasher shall be used to attach the fiber optic cable to the messenger wire. The lasher shall wrap a continuous lashing wire around both the fiber cable and the messenger wire in a spiral fashion. The lashing wire shall be made of steel or contain dielectric material such as aramid yarn. The Contractor shall consult the lasher manufacturer on the ideal lashing wire material. The fiber-optic cable shall be installed without loose lashing, twisting, weaving along the messenger wire. Ripples or kinks in the fiber-optic cable shall be avoided due to potential damage to the fiber-optic cable. The lasher shall be installed with at least one complete wrap of lashing wire for every 300 mm (1 foot) of cable.

A “shotgun” arm (cable block pusher) shall be used between the lasher and the cable guide chute.

The lashing wire shall be terminated at each pole with a lashing clamp.

86.02.09D CONNECTORS AND TERMINALS

(1) Conductors

- (a) All connectors and terminals installed to the conductors, including those for detector circuits, shall be pressure connector crimp type and shall be soldered after being applied with the applicable tool recommended by the connector manufacturer.
- (b) All spade terminals used to attach field conductors to terminals inside controller cabinet shall be replaced upon controller cabinet replacement, relocation, or modification. Contractor shall not be paid separately for this Work.
- (c) No. 10 or smaller conductors which are to be installed on a terminal block either in the cabinet, at any other location, or in signal heads other than mastarm-mounted signal heads, shall be fitted with medium length spring spade type connectors (Hollingsworth # SS 20818B or SS 20830B, or approved equal). Connector shall be crimped and then soldered to the conductor. Open flame soldering will not be permitted. The crimping tool recommended by the manufacturer shall be used for the application of all connectors and shall have prior approval of the Project Engineer.
- (d) No. 10 or smaller conductors which are to be installed onto a terminal block in a mastarm-mounted signal head shall not be fitted with a spade-type connector but shall have a loop formed in the non-insulated portion of the conductor's end for a secured attachment to the terminal block screw.

(1) Fiber-optic Connectors

All optical fibers shown on the plans to be connectorized shall be terminated with a FCIPC Ultra Polish type nickel plated zinc bayonet, zircona ceramic tip, keyed connector. All cables shall use the same connectors. The connector shall not require a mechanical splice to a factory polished tip.

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The surface of the fiber end installed in a connector shall be free of scratches, pits and chips.

No index-matching fluids, gels or anti-reflection coatings shall be applied to the end of the fiber.

Connectors shall conform to the following:

- Attenuation: 0.25 dB typical, 0.5 dB maximum,
- Reflectance: Less than -50 dB,
- Optical Fiber Nominal Outside Diameter: 125 micrometers,
- Tensile Strength: Less than a 0.2 dB change, based upon a 10 kg. load without adhesive,
- Temperature Cycling: Less than a 0.2 dB change based upon -40 degrees C. to +80 degrees C., 100 cycles,
- Humidity: Less than 0.2 dB change, 60 degrees C. at 95% relative humidity for 500 hours,
- Durability: Less than 0.2 dB change per 1000 insertions, cleaned every 25th insertion.

Connectorized fibers shall be clearly labeled using a labeling convention approved by the Project Engineer.

Testing shall be as specified in CSS Section 86.02.13D "Fiber-optic Cable Testing."

86.02.09E SPLICING AND SPLICING INSULATION

(1) Conductors

Splicing of conductors and method of insulating splices shall meet the requirements of SSS Sections 86-2.09D "Splicing" and 86-2.09E "Splice Insulation" and the following:

- (a) All connectors and terminals installed to the conductors, including those for detector circuits, shall be pressure connector crimp type and shall be soldered after being applied with the applicable tool recommended by the manufacturer of the connector.

- (b) Heat shrinkable insulating tubing shall be applied after completion of the splicing procedure. Insulation over the connector shall consist of a heat shrinkable, mastic lined, 1 mm (40 mils) minimum polyolefin cable sleeve, or cover, to which heat shall be applied at a temperature greater than 120 degrees C. with an electric hot air gun until the sleeve or cover shrinks and covers the connector and the mastic material has flowed completely around and between the conductor(s) to form a waterproof insulation. The conductor insulation shall not be damaged due to application of the heat shrinkable insulation sleeve.

(2) Fiber-optic Cable

Splices shall be performed by qualified personnel approved by the Project Engineer. Personnel performing the splices shall have successfully completed of no less than 2,000 fusion splices.

Fiber-optic splices and terminations shall only be provided at locations shown on the Project Plans. Fiber-optic splices shall not be less than 1,000 meters (3,300 ft) apart. Approval from the Project Engineer shall be obtained before performing any splices that are not indicated on the Project Plans.

Splices shall be the fusion type and shall not exceed 0.05 dB loss per splice. Splice losses shall be measured and recorded with the splicing equipment. This measurement shall not be used in lieu of Optical Time Domain Reflectometer testing of the fiber.

Splices shall be housed in a splice tray in a splice enclosure and in fiber termination units. All splices shall be protected with a thermal shrink sleeve.

Contractor shall coil a minimum of 5 meters (16 ft) of each cable entering an underground splice enclosure and sufficient additional length to allow the splice to be performed above ground in a vehicle specifically equipped for such work. Such coiled cable shall be located adjacent to the splice enclosure.

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A segment of cable routed between two splice enclosures shall have a minimum of 5 meters (16 ft) of cable coiled at each end, for a total of 10 meters (32 ft). Cable routed through a splice chamber or fiber-optic pull box without being spliced shall have 10 meters (32 ft) of cable left coiled within that pull box to accommodate future splicing. Two meters (6 ft) of cable shall be coiled in cabinets. Different lengths of coiled cable shall be provided where shown on the Project Plans.

In non-fiber optic pull boxes, the cable shall be routed as needed to avoid exceeding the minimum bending radius.

Only those fibers that are to be spliced shall be removed from the cable and buffer tubes. All other fibers shall remain in their tubes and shall be suitably protected. The Contractor shall seal all cables where the cable jacket is removed. The cable shall be sealed per the cable manufacturer's recommendation with an approved blocking material.

The Contractor shall maintain and furnish to the Project Engineer accurate detailed records of each splice. These records shall include the following:

- Date each splice was made, the name of the person performing the splice, splice location, splice loss, fiber and tube color codes, splice tray number and position of the fiber within the tray.
- For each splice enclosure, a chart indicating the source and destination of every fiber spliced in that enclosure, and the tray and position within each tray. This also applies to fibers terminated in patch panels.

86.02.09F FUSED SPLICE CONNECTORS

Fused splice connectors for luminaire circuits shall be provided per the requirements in SSS Section 86-2.095 "Fused Splice Connectors."

86.02.09G FIBER-OPTIC CABLE SPLICE ENCLOSURE

(1) Material

Splices outside of buildings and cabinets shall be enclosed in a splice closure, which shall be waterproof, rodent proof, and re-entenable, and shall accommodate all the fibers to be spliced at a splice location, including any branch cables.

Splice closures shall be complete with splice organizer trays, brackets, plugs, clips, cable ties, seals, and sealant. The splice closure shall be suitable for use in an underground fiber optic pull box as specified on the Project Plans. The splice closure shall provide the capability to accommodate only certain spliced fibers in the cable while the other fibers remain continuous through the closure.

(2) Installation

The optical fiber shall not be bent less than a 50 mm (2 inches) radius during installation or after final assembly in the splice tray. Each bare fiber shall be individually restrained in the splice tray. The placement and attachment of optical fibers in the splice tray shall be such that there is no discernible tensile force on the optical fiber. The raw fiber coming from the field cable shall have two complete wraps in the splice tray.

Location of the splice enclosures shall be as shown on the Project Plans or as specified in these Specifications or as directed by the Project Engineer. Splice enclosures shall be provided in buildings as shown on the Project Plans for transitioning from outdoor to indoor rated cable inside the building.

86.02.09H MEASUREMENT AND PAYMENT

Work specified in this section, except as specified below, will be paid for at the Contract lump sum price for wiring, including the furnishing and installation of conductors and bonding/grounding as specified in CSS Sections 86.02.08 "Conductors and Cables" and 86.02.10 "Bonding & Grounding."

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Telemetry or signal interconnect cable will be measured by the linear meter or linear foot, as specified in the Contract Documents, and paid for at the Contract price for furnishing and installing telemetry or signal interconnect cable completed in place.

Fiber-optic cable will be measured by the linear meter or linear foot, as specified in the Contract Documents, and will be paid for at the Contract price for furnishing and installing fiber-optic cable completed in place. Compensation shall include the furnishing and installation of fiber-optic connector and the required Optical Time Domain Reflectometer tests on the fiber-optic cable at different phases of the cable installation. The quantity of fiber-optic cable supplied and installed, for payment purposes, shall be measured horizontally between pull boxes or between a pull box and a cabinet. The length of cable coiled in splice chambers, fiber-optic pull boxes and cabinets shall be paid for according to the length of coiled cable in those facilities, respectively, when specified in the Contract Documents. The length of cable rising on utility pole in an aerial installation shall be paid for according to the vertical rise from the base of the utility pole to the point of attachment of the messenger wire on the utility pole. No separate measurement or payment shall be made for other sections or lengths of cable such as underground cable's vertical rise into pull boxes, cable rising into or routed within a cabinet (other than the specified amount to be coiled therein), or cable following a locally curved conduit path.

Fiber-optic splice, when provided as a Bid item in the Contract Documents, will be measured and paid for as each unit installed completed in place, including the furnishing and installation of splice enclosure, and successfully passes all test requirements. Otherwise, it shall be considered as included in the Contract item for furnishing and installing fiber-optic cable.

86.02.10 BONDING AND GROUNDING

Bonding and grounding shall conform to SSS Section 86-2.10 "Bonding and Grounding," CSD E/8, CSD E/47, and CSD E/48 and the following:

- (1) All non-metallic conduits (such as PVC) containing conductors shall each be provided with a continuously run no. 8 AWG THW stranded copper bonding wire. The wire-insulating

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jacket shall be color-coded green and shall have a minimum thickness of 1.3 mm (54 mils). Exception to this requirement shall be as follows:

- (a) Equipment bonding and grounding wires shall not be required in non-metallic conduit containing only existing loop lead-in cable or signal interconnect cable or both.
- (2) Metal pullbox lids shall be bonded using copper braiding of the same cross sectional area as a No. 8 conductor. A 1 m (approximately 3 ft) slack shall be provided.
- (3) Standard foundations shall have copper wire or copper braid of the same cross sectional area as a No. 8 conductor bonded to all anchor bolts by clamps and run to the conduit or bonding wire in the adjacent pullbox. Grounding jumper and clamps shall be installed within the monolithic cast of the foundation and prior to the installation of the final mortar pad.

86.02.11 SERVICE

Electrical service installation and materials shall conform to SSS Section 86-2.11 "Service," and the following.

86.02.11A SERVICE CABINET

All service cabinets shall be Type III-AF per CSD E/2D and shall be painted in accordance with the requirements in CSS Section 86.02.15 "Painting." Service cabinet shall be fabricated with galvanized sheet steel. Fabrication of service cabinet shall conform to the requirements in CSS Section 86.03.15A "Cabinet Construction."

86.02.11B SERVICE CONTROLS

The following type of breakers shall be provided for:

- Main circuit 1 each 100 Amp. 120/240 volt, split bus, 3-pole.
- Signal circuit 1 each 60 Amp. 120 volt, metered, 1-pole.

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- Lighting control circuit 1 each 15 Amp. 120 volt, unmeteread, 1-pole.
- Lighting circuit 1 each 40 Amp., 240 volt, unmeteread, 2-pole.
- Auxiliary circuits 3 each 15 Amp. 120 volt, meteread, 1-pole.

86.02.11C MEASUREMENT AND PAYMENT

Compensation for this work will be made at the Contract price per unit and shall include furnishing and installing the service equipment, complete in place and per the specified details. Unless indicated otherwise in the Contract Documents, service connection fee will be paid for by Owner to the appropriate utility company.

86.02.12 SIGN ILLUMINATION CONTROL

The control of sign illumination shall conform to SSS Section 86-2.13 "Sign Control."

86.02.13 TESTING

Testing shall conform to SSS Section 86-2.14 "Testing" and the following.

86.02.13A MATERIALS AND EQUIPMENT TESTING

(1) General

- (a) The Contractor shall notify the Project Engineer a minimum of fourteen (14) calendar days prior to the date of delivery of the materials or equipment to be tested.
- (b) Equipment shop and/or environmental tests will be performed by the County or, at the County's option, by a designated testing agency for an uninterrupted twenty-one (21) consecutive days at the County designated site. Any malfunctions or failures of the equipment shall cause the testing to be ceased and will be reported to the Contractor. The Contractor shall remove the equipment within five (5) calendar days after the notification. In the event that the equipment is not removed within said

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period, it may be shipped to the Contractor at the expense of the Contractor.

The Contractor shall allow 21 full days for re-testing of the corrected equipment upon equipment delivery at the test site.

- (c) When an equipment prototype is being specified for fabrication and testing, the Contractor shall limit the work to the prototype. Mass production of the equipment shall not proceed until after the County's acceptance of the prototype, which shall serve as a standard for production of all other units.

(2) Traffic Signal Controller Assembly Testing

- (a) Shop tests shall be initiated only after all equipment has been received at the County Lighting and Signal Systems Center that is necessary for functional tests to be conducted, and the initiation training per CSS Section 86.08 "Equipment Operational and Maintenance Training" has been completed.
- (b) Each controller cabinet and its associated equipment shall pass an approved environmental test before delivery for the twenty-one day test. The test shall be for a minimum 24-hour period. During the test period, the controller and associated equipment shall be exercised with typical input activities. Typical loads shall be placed on all outputs. Temperature, pressure, and other environmental factors simulating the local annual conditions shall be used in the test to assure proper operation of the equipment.
- (c) Other requirements shall conform to CSS Section 86.02.13A(1) "General" above.

(3) Equipment and Material Testing

The County has retained the California Department of Transportation Testing Laboratory to provide testing services for signal standards conforming to Caltrans' specifications.

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The Contractor shall make arrangement with the testing agency for the inspection of the materials/ equipment. Upon testing, accepted materials/ equipment shall be tagged. No installation of materials/equipment shall be permitted without the proper tag affixed by the testing agency. Untagged materials/equipment shall be rejected by the Owner and shall be the responsibility of the Contractor at no additional cost to the Owner.

Unless specified otherwise in the Contract Documents, testing services will be paid by the Owner.

86.02.13B FIELD TESTING

Field-testing shall comply with the requirements in SSS Section 86-2.14B "Field testing" and the following:

- (1) The Contractor shall notify the Project Engineer a minimum of 2 working days prior to the test date.
- (2) Field-testing shall be performed in the presence of the County Lighting and Signal Systems Center Inspector. A written record of the results of the field tests shall be provided to the Project Engineer by the Contractor.
- (3) All repaired work resulted from the field testing must be completed and successfully re-tested prior to the commencement of the functional testing.

86.02.13C FUNCTIONAL TESTING

Functional testing shall comply with the requirements in SSS Section 86-2.14C "Functional Testing" and the following:

- (1) The Contractor shall have a manufacturer's representative present during the system turn-on and the functional testing period. The Project Engineer will have the authority to deny the test to proceed due to the absence of the manufacturer's representative, weather conditions, or other field conditions.

86.02.13D FIBER-OPTIC CABLE TESTING

The fiber optic cable plant shall consist of fiber optic cables, fiber patch cords and pigtails. The Contractor shall perform fiber continuity and attenuation testing and fiber backscatter measurements after the complete optical link is installed with the other components of the fiber optic system in place.

The Contractor shall perform all Optical Time Domain Reflectometer (OTDR) testing in the presence of the Project Engineer. The Project Engineer shall sign off all test documentation made by the Contractor at the time of the test. Testing performed by the Contractor and not witnessed by the Project Engineer shall not be accepted and re-testing shall be required.

OTDR testing shall be done at the following points in the system construction:

- At cable delivery,
- Following cable installation prior to termination and splicing, and
- End to end following installation of all pigtails, connectors and termination devices.

All fibers shall be tested end to end with an OTDR. The end to end total attenuation shall not exceed the sum of the maximum allowable attenuation for the component cable segments, splices and typical loss for connectors. If the fibers in the cable exceed the allowable loss, the Contractor shall take corrective measures to bring the cable's total attenuation below the allowable limit, including replacement of the cable at the Contractor's expense.

The Contractor shall verify that the attenuation and optical continuity of each active and spare optical fiber in the cable plant satisfy the specified requirements.

Attenuation and continuity shall be measured at the operational wavelength of the equipment being used on the link.

Attenuation shall be calculated by the insertion method. Calibration between the light source and the power meter shall be performed at the beginning of each day of testing.

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The Contractor shall record the attenuation of each optical link. Optical links shall be identified in the test results by identifying the label identifier on each drop cable and by identifying the field cabinet at which light was launched and at which it was received.

The OTDR shall be used to measure the backscattered light profile of the designated optical links. The OTDR shall include all necessary hardware to couple it to either a connectorized or non-connectorized fiber. While performing backscatter measurements, the end of the fiber link that is not connected to the OTDR shall be capped to prevent the ingress of infrared radiation. The OTDR used shall be provided with certification of its most recent calibration and shall not be more than 12 months old.

A 1,000 meter (3,300 ft) pigtail to overcome the dead zone of the OTDR shall be inserted between the OTDR and the optical link.

The OTDR testing shall be done at a scale of at most 1 dB per division on the vertical scale. It shall have a dynamic range of at least 30dB at 131 Ohms and distance measurement accuracy of $\pm 0.01\%$.

The Contractor shall record each optical link measured for attenuation by means of an electronic data file of the OTDR trace. The Contractor shall supply a licensed software package (installed on the Network Management Computer) to read, store, compare, and analyze the electronic data files created by the OTDR instrument. A hard copy printout of each trace shall also be provided. The OTDR traces shall be compared with this software following each testing stage of the installation.

Documentation of this comparison shall be provided to the Project Engineer. Optical links shall be designated in the test results by indicating the label identifier on each drop cable and by identifying the field cabinet at which light was launched.

The OTDR traces shall be marked noting the physical location of each splice or connector. The notation shall be clear and understandable.

The OTDR shall be of a manufacturer recommended by the fiber-

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optic cable supplier. The OTDR operator shall hold a current operator's certificate for the equipment used. This certificate shall represent not less than 16 hours of training from the equipment manufacturer. This certificate shall be presented to the Project Engineer at the start of testing.

The test results shall include the following measurements:

- Total measured length of the optical link,
- Total attenuation in decibel of the optical link,
- Mean attenuation in decibel of each splice in the optical link under test, and
- Wavelength of the measurement.

86.02.14 GALVANIZING

Galvanizing of equipment shall conform to SSS Section 86-2.15 "Galvanizing" and the following:

- (1) Galvanized surface, which is abraded or damaged, shall be hot-dipped or mechanically galvanized. Field application of zinc-rich paint or "cold-galvanizing" shall not be performed.

86.02.15 PAINTING

Painting shall conform to SSS Section 86-2.16 "Painting" except the following:

- (1) Galvanized steel poles or standards or galvanized metal guard posts adjacent to the poles or standards shall not be painted.
- (2) Traffic signal controller and service cabinets shall be painted with a final coat of the County-approved anti-graffiti silver baked-on enamel paint.

86.03 CONTROLLER ASSEMBLIES

Controller assembly shall be Type 90 conforming to SSS Section 86-3.06 "Type 90 Controller Assembly", N.E.M.A. Standards for Traffic Control Systems (Publication No. TS-1) Sections 13 and 14, and the following.

86.03.01 GENERAL REQUIREMENTS

- (1) All equipment shall operate over an input voltage range of 100-133 volts.
- (2) During a power interruption not exceeding 0.5 second duration, the controller assembly shall continue in cyclic operation and shall retain all actuations registered prior to the interruption.
- (3) Following a power interruption exceeding 1.0 second duration, the controller preprogrammed initialization and start-up sequence shall begin and vehicle and pedestrian calls shall be placed on all active phases.
- (4) Following a power interruption between 0.5 and 1.0 second duration, the controller assembly shall continue in cyclic operation or the pre-programmed initialization and start-up sequence shall begin and vehicle and pedestrian calls shall be placed on all active phases.
- (5) All timing shall be synchronized to the time base of the 60-HZ power line frequency.
- (6) All of the input and output terminations specified in Sections 13 and 14 of the NEMA Standards Publication TS-1, shall be brought to an external terminal via the regular controller connector and wiring harness. The pin used for each function shall be the pin used for the same function on all controllers with similar model and of the same manufacturer.
- (7) All indicator lights shall be L.E.D.'s (light emitting diodes) and/or L.C.D.'s (liquid crystal displays). All displays shall be plainly visible in all normally occurring light levels. No false nor ambiguous indications shall be displayed.
- (8) All software necessary to operate, monitor, and maintain the system shall be compatible with the system currently operated by the County.
- (9) Controller assembly shall be tested as specified in CSS Section 86.02.13 "Testing."

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- (10)Warranty shall conform to CSS Section 86.01.05 “Warranties, Guarantees and Instruction Sheets.”

86.03.02 LOCAL CONTROLLER

- (1) Error checking shall be provided as part of the controller unit which shall protect against operator and remote programming errors, loss of programmed data integrity, and any and all cycling or safety related problem(s) with the controller operations. Minimally, the controller shall monitor the minimum clearance, minimum green, stop or unusual cycling. Error identification shall be provided to assist in identifying the cause of errors. Invalid data shall not be accepted by the controller.
- (2) “Stop Timing” as described in Section 14 of the NEMA Standards Publication TS-1 shall hold the interval at the value that existed when stop time was applied. The controller shall cause the interrupted interval to time the complete programmed interval upon release of the “Stop Time” input.
- (3) The controller shall provide:
 - (a) Copying functions for program entry capable of selectable phase to phase and phase to multiple phase copying, all with selected intervals.
 - (b) A simultaneous gap-out feature for each timing ring.
 - (c) Calling/passage detection and stop bar detection for each phase.
- (4) The controller shall provide individual bicycle functions for each phase as follows:
 - (a) It shall provide a means of individual and separate bicycle actuation to the controller.
 - (b) It shall provide an individual and separate bicycle extension interval (0-40 second).
 - (c) Actuation of the bicycle actuation input shall cause a locked call to be placed on the associated phase until served.

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- (d) The bicycle extension interval shall begin at the beginning of the associated phase minimum green interval and shall time concurrently. The bicycle extension interval shall reset during application of a bicycle actuation input. Extension of the associated phase shall function identical to the NEMA defined functions of the vehicle extension interval. Extension shall be limited by the phase maximum interval.
- (5) Similar time reference shall be utilized at both local and master controllers such that identically programmed events shall occur at identical times.
- (6) Each local controller shall be microprocessor based, eight (8) phase's, four (4) overlaps phases, density and pedestrian functions for each phase, modular construction, full traffic actuated, solid-state, utilizing digital timing and integrated circuits.
- (7) Program memory shall be EEPROM.
- (8) Controller function and timing programming shall be accomplished by keyboard entry from the face of the controller, by telemetry data link from/via the master controller and via dial up modem (solo, no master).
- (9) Status and operation shall be indicated by LCD indicators and alphanumeric display on the face of the controller.
- (10) It shall be provided with a detector rack failure input which shall be reported through telemetry as programmed. The detector rack failure input shall, programmably, cause the controller to place a constant vehicle call on all phases when active.
- (11) Permanent memory shall be provided for backup or default in conformance with the following:
 - (a) Local programmable functions consisting of, but not limited to, any and all controller timing intervals, detector memory, controller phase usage, and startup configuration data.

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- (b) Permanent memory shall not be changeable or overridden by the master controller or the signal monitor at the Central Computer Center.
- (c) Data in permanent memory shall be easily transferred to the controller active database upon user initiated command and shall be automatically transferred due to the manufacturer's design for normal program failure or data integrity loss detection.
- (d) The permanent memory shall be EEPROM conforming with the following:
 - Approved security means must be provided such that inadvertent keyboard entry or random program activity shall not modify data.
 - Data contained in permanent memory shall be programmable by the County. Contractor shall furnish the necessary software to facilitate programming.
 - Batteries or other power storage devices shall not be required for maintenance of permanent memory data.

86.03.03 ACCESS SECURITY CONTROL SYSTEM

- (1) It shall be secure and it shall not be possible to gain access to the systems without a valid password.
- (2) A time-out of security access privileges shall be provided. The time-out period shall expire and cause reduction of access privileges to the lowest level of access if there is no keyboard activity within a programmable period. The period shall be programmable only during the highest level of access.
- (3) At least four (4) levels of access shall be provided:
 - (a) Administrative, password control, and all the following functions.
 - (b) Read/write PC timing and operational data, upload controller

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timing and operational data, and all the following functions.

- (c) Download controller timing and operational data, and all the following functions.
 - (d) Monitor controller activity.
- (4) At least 64 access codes shall be provided.
- (5) The programmably selected capability of dial-back to programmed phone numbers based on entry of a valid access code shall be provided.
- (a) The dial-back requirements may be programmably defeated for the lowest level of access.
 - (b) The dial-back phone number shall be received with the access code or shall be selected by the controller assembly based on access code received upon initial contact.
 - (c) The number of dial-back attempts and the telephone area codes allowing access shall be programmable.
 - (d) A caller ID feature as provided by the serving telephone company shall be provided. The caller ID shall be logged and if, authorized for access and a valid access code were received, access shall begin without the requirement of the dial-back as specified above.
- (6) Logging of all access activities shall be maintained.
- (a) It shall log phone number, caller ID, date and time for each access or attempted access.
 - (b) The log shall be re-settable only from the signal monitor under the highest level of access.
- (7) Software tools shall be provided within the signal monitor system to facilitate update and change of all passwords in all connected systems. Upon access at the highest level, passwords may be selectably updated, using the tool. The tool shall only require entry of the new passwords and selection of the locations

to be updated.

86.03.04 CONDITIONAL SERVICE AND RESERVICE

86.03.04A CONDITIONAL SERVICE

Conditional service is the feature which allows reservice of NEMA odd phase after normal service to that phase. It shall be programmably enabled for each phase or phase pair.

Conditions for conditional service shall be as follows:

- (1) The master phase is the lagging phase in an odd/even phase pair in the opposite ring from the phase exercising conditional service or reservice. The non-master phase is the lagging phase in an odd/even phase pair whose leading phase exercised conditional service. In a normal sequence of phases, the odd phases are the leading phases and the even phases are the lagging phases.
- (2) A call exists on any phase across the barrier from the master phase.
- (3) A call exists on the NEMA leading phase while the NEMA lagging phase is timing.
- (4) A NEMA lagging phase in the same cycle gaps out or maxes out.
- (5) It shall allow reservice of leading phases provided that sufficient time remains in the concurrent lagging phase (master phase) to service the minimum timing intervals of the phase to be reserved.
- (6) The vehicle clearance time of the gapped/maxed out phase, plus the conditional service minimum green time is less than or equal to the timing remaining on the maximum timer of the lagging (master) phase.

86.03.04B CONDITIONAL RESERVICE

Conditional reservice is the feature which allows the controller in

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conditional service to serve the non-master phase which was terminated as part of a leading phase conditional service cycle, prior to crossing the barrier.

Conditions for conditional reservice shall be as follows:

- (1) There is sufficient time remaining in the concurrent master phase to service the minimum timing intervals of the phase to be served again.
- (2) The phase to be served again has not been served twice during the existing service of the controlling master phase.
- (3) The controller unit shall not reactivate the re-serviced phase maximum timer.
- (4) The detectors assigned to the re-serviced phase shall be programmably switched to the controlling master phase.
- (5) Re-service shall not preclude an active pedestrian movement.
- (6) Re-service shall not occur if the time necessary to fully service the phase is greater than the time remaining in the controlling master phase.

86.03.05 PLATOON PROGRESSION

Platoon progression shall be provided to synchronize closely spaced intersections. Platoon progression shall be accomplished through the internal logic of the controller. The logic shall provide for four (4) directions of transmitting (T) and receiving (R).

86.03.05A TRANSMITTER OPERATION (EACH CHANNEL)

- (1) Definition: "T-phase" = Transmit phase(s), the phase(s) that are related to the pulse generation.
- (2) It shall generate an individual output pulse through the inter-cabinet communications system to downstream cabinets at the beginning of the programmed events.

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- (3) It shall have an individually programmable delay before output (0-255 sec.).
- (4) It shall be individually programmable for phase(s) which shall originate the pulse.
 - (a) Pulse shall originate at beginning of phase next for programmed phase(s).
 - (b) Pulse shall be inhibited on transition from one programmed phase to another programmed phase.
- (5) The controller outputs assigned by NEMA as pedestrian clearance outputs may be programmably assigned as the individual transmitter outputs.

86.03.05B RECEIVER OPERATION (EACH CHANNEL; MAY BE COMMON TO THE LOW PRIORITY PRE-EMPTION SEQUENCE)

- (1) Definition: "R-phase" = Receive phase(s), the phase(s) to be held.
- (2) Pulses may be received by either the inter-cabinet communications system or by discreet controller inputs (as selected by the user).
- (3) It shall have an individually programmable delay after receipt of pulse before activating the coordination sequence.
- (4) It shall have an individually programmable inhibit which shall inhibit response to received pulses (by time-of-day control, by manual control, by coordination plan, or by higher level pre-emption).
- (5) Upon receipt of the pulse, after the delay period has expired and if the programmed R-phase(s) are not green:
 - (a) The controller, if enabled by user program, shall force off any individually selected phase except of timing pedestrian or minimum intervals.

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- (b) The programmed R-phase(s) shall be held if green. At the beginning of the hold period, the programmed phase maximum interval shall be reset. The maximum interval shall be reset only once per cycle. A programmable option shall be provided to allow clearing the lockout if demand did not exist on any opposing phase upon expiration of the delay. The hold period shall be adjustable from 0-100 seconds.

86.03.06 SYSTEM DETECTORS

A minimum of eight system detectors shall be provided. Each system detector shall be capable of being programmed for coordination sampling by volume and/or occupancy, traffic counting, or vehicle speed; and the information shall be available to the master controller and system monitor.

86.03.07 TELEMETRY AND INTERCONNECT

The telecommunications system shall be an integral unit and provided with every controller. The telemetry system functions shall conform with the following.

- (1) Each local controller shall be capable of operating within a telemetry system of interconnect operation, and under the control of a central master controller or arterial master controller.
- (2) Each local controller shall have the capability to monitor status of intersection parameters and its performance; capability to diagnose malfunctions or no activity on various system functions, such as detectors, telemetry communication, intersection operations, and other available special functions. All diagnostic data and information generated shall be capable of being recorded and logged in by the remotely located Central Computer Center. All diagnostic data and information shall be available for CRT display and on printed report at the Central Computer Center. Diagnostics shall be programmably selectable for report only or defined for action on failure.
- (3) The following functions, as a minimum, shall be programmably capable of continuous input to the system monitor.

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- (a) Each Phase Green.
- (b) Each Phase Yellow.
- (c) Each Phase Red.
- (d) Each Phase Vehicle Call.
- (e) Each Phase Walk.
- (f) Each Phase Don't Walk.
- (g) Each Phase Pedestrian Call.
- (h) Each System Sampler detector.
- (i) Each Local Coordination Counter.
- (j) System Samplers volume and occupancy.
- (k) System Sampler speed data.
- (l) All programmed reportable events.

All data returned via telemetry from each system monitor shall be available to external software in real time. It shall be possible to control the operating mode of the system monitor from external software.

The following events shall be reported, programmably on request, at specified time, or on occurrence to the system monitor. Inputs shall be provided as necessary:

Detector failure (i.e. open shorted or intermittent loop).

- (a) Conflict monitor flash status change.
 - (b) Police/Maintenance panel flash status change.
 - (c) Signal lamp failure, (load change +/- 0.5 amp).
 - (d) Street lighting lamp failure (load change +/- 0.5 amp).
 - (e) Street lighting on/off.
 - (f) Cabinet door opened/closed.
 - (g) All preempt calls.
 - (h) Coordination status change (dial, offset, split, and if traffic responsive or time of day mode).
 - (i) Controller access (keyboard and modem).
 - (j) Power interruption (as defined in these Specifications).
 - (k) Loss of communications between local and master controllers.
- (4) Event log shall be able to store a minimum of last ten of events (event log shall be programmably resettable).
- (5) The maximum delay in the occurrence of a reportable event and the receipt of the report by the signal monitor system

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shall be no greater than three (3) minutes. The maximum delay in the update of information during real-time monitoring mode shall be no greater than one second for a system with six or fewer controllers connected to the master one.

- (6) Each master controller and local controller shall provide an effective means of preventing misdirected data transfers. This may be accomplished by cabinet hardware addresses (each address bit shall be brought to a terminal strip) for each master or local controller, by use of controller identification system which is part of the backup configuration data such as controller serial number, or by other effective means as approved by the Engineer.
- (7) Upload and download capabilities shall be provided as follows:
 - (a) All data downloaded shall be verified for accuracy: error identification and correction of the error.
 - (b) All programmable features of the controller shall be downloaded except as approved by the Engineer. Any feature that would cause an unsafe condition may be deleted from downloaded data. Any data not included in the download will be identified both at the controller and at the signal monitor. Any data that is downloaded as above shall remain in the uploaded data. Uploaded data shall be verified against the database stored in the signal monitor and any differences shall be identified.

86.03.08 DATA LOGGING

The controller shall have programmable data collection capabilities separate from the timebase program requirements, as follows:

- (1) It shall provide traffic volume data at one (1) second resolution for programmably selected periods of 5, 10, 15, 30, 60 minutes.
- (2) It shall record data for the previous 24 hour (for 15 minute periods) before overwriting stored data (oldest data may then be overwritten). An effective means of reporting data to the Central Computer Center signal monitor shall be provided which shall

enable continuous recording of data.

- (3) Any of the minimum sixteen (16) system detectors shall be programmable for traffic counting, or vehicle speed sampling and the information shall be stored in a log.
- (4) Logs of vehicle counts and average vehicle speed data shall have programmable sample periods (minimum 5, 10, 15, 30, 60 minute intervals).
- (5) The controller shall upload the data to the signal monitor and shall initiate a request to transfer data to the signal monitor in advance of any data loss.

86.03.09 COORDINATION SYSTEM

- (1) The coordination system shall have upload/download capability to change all settings. Additionally, it shall be capable of calculating all force-off points for phase termination, vehicle and pedestrian permissive periods and local split selection from intersection demand.
- (2) The coordination system shall provide offset correction, permissive period operation, remote MUTCD flash, manual override, coordinated phase actuated extension capability, and conditional service and reservice.
- (3) The coordination system shall programmably provide both conditional service and reservice as part of each coordination plan. Conditional service and reservice shall operate similar to free mode conditional service and reservice specified elsewhere in this specification, except that the conditional service may cross the barrier and may service more than one non-coordinated phase. The controller may programmably yield a second time within the same cycle when there is no conflicting coordinated phase detector call present. If a second yield occurs, it shall meet the coordination permissive and split requirements such that the guaranteed beginning of the coordinated phase is not altered and the coordinated phase actuated extension capability is maintained.

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- (4) Coordination Plan Switches.
- (a) Each controller shall be capable of operating five (5) unique cycle plans (dials) and three (3) unique splits. These dial/split combinations shall be termed "Coordination Plans," and the combination of dial/splits shall develop a minimum of 15 unique coordination plans.
- (b) Each controller shall provide for smooth transition for cycle length, offset, or split changes. (Shall not go free as part of transition).
- Correction shall be evenly distributed over all phases.
 - Amount of correction shall be individually programmable for each cycle. Programmable "shrink" and "expand" intervals shall be provided.
 - Phase sequence shall transition directly to the next programmed sequence without going free or other unusual sequencing.
 - If phase sequence is identical in next programmed sequence, then the sequence shall not change during the transition to the next coordination plan.
 - If phase sequence is not identical in the next programmed sequence, the new sequence shall take effect after serving any phase(s) across the barrier from the coordinated phase(s) and then returning to the same side of the barrier as the coordinated phase(s).
- (c) Each coordination plan shall allow the selection by phase of:
- NOT USED (Phase not active.)
 - COORDINATED PHASE (1 per ring only.)
 - MINIMUM RECALL (Any phase.)
 - MAXIMUM RECALL (Any phase.)

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- PEDESTRIAN RECALL (Any phase.)
- PEDESTRIAN II TIMES (Any phase.)
- FIXED PHASE (Release of a "FIXED PHASE" occurs at a fixed point in the coordinated cycle.)
- ACTUATED PHASE (Any phase not assigned another function switch.)

(5) Selection of these coordinated plan switches shall be by internal software and shall not require external hardware interfaces. These coordinated plan switches shall be alterable by software download from the Central Computer Center.

86.03.10 LOCAL COORDINATOR

The local coordinator shall be capable of:

- (1) Buffering downloaded data such that keyboard or down loaded data does not cause changes in current timing intervals but becomes effective on the next cycle.
- (2) Responding to programmed changes in current coordination plan with buffering as above.
- (3) Providing alternate sequencing capability:
 - (a) It shall be individually enabled as coordination plan options.
 - (b) It shall be individually selectable by time of day.
 - (c) It shall provide coordination of special phasing sequences without special or unusual programming considerations.
 - (d) It shall provide for implementation of non-concurrent left turn phases on coordinated streets.
- (4) Providing for display of master cycle position during free mode.
- (5) Providing coordination status bit outputs to indicate the current coordination plan in effect, and providing a synchronization output pulse.

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- (6) Allowing free operation at any individual intersection in a coordination system control.

86.03.11 PREEMPTOR SYSTEM

- (1) The preemptor system function shall be an integral unit of and provided with every controller. The Preemptor System function shall conform with the following:
 - (a) The priority of preemption shall be as follows: starting with the highest priority, Train, then High Priority, then Low Priority. If the controller is serving a lower level priority and receives a call for a higher level preemption, the controller shall serve the higher priority preempt call.
 - (b) A cable for any train preemptor function shall be interlocked such that, if the cable is not connected to the preemptor, the intersection shall remain in the flash mode.
 - (c) Each preemption sequence (Train or any of the separate High Priority and Low Priority preemption sequences) shall have separate timing intervals.
 - (d) A decoded input to the Controller shall be provided to discriminate the priority of preemption for each of the four separate High Priority and Low Priority preemption sequences. The decoding shall be compatible with the existing equipment currently in use by the County with a steady state low level input indicating a high level input and a pulsing low level input indicating a low level input.
 - (e) Preemption sequences shall be programmable for each associated phase.
- (2) Each controller shall have a minimum total of nine (9) distinct preemption sequences to provide timing and logic for Train, High Priority, and low Priority preemptions. One (1) sequence is for the Train preemption, four (4) sequences are for the High Priority preemption and the other four (4) sequences are for the Low Priority preemption.
- (3) A priority status shall be assignable to each preemption sequence

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so that a Train preemption sequence can interrupt an in-process High Priority sequence which in turn can interrupt an in-process Low Priority sequence. This priority shall be assignable on a “first-come-first-serve” basis or in a specified order within the type of preemption.

- (4) High Priority Preemption (Emergency)
- (a) Upon acceptance of a High Priority call when the desired traffic signal display is being indicated, the controller shall hold the desired traffic signal display while terminating all conflicting pedestrian walk displays and then shall time appropriate pedestrian clearance intervals. The controller shall have the programmable capability to allow concurrent non-conflicting pedestrian movement to time normally, advance to the solid “DON'T WALK” display, or time pedestrian clearance interval.
 - (b) Upon acceptance of a High Priority call requiring the controller to advance to the desired traffic signal display, the controller shall sequentially:
 - Terminate all conflicting pedestrian “WALK” displays (both concurrent and non-concurrent) and have a programmable capability to terminate concurrent non-conflicting pedestrian “WALK” displays.
 - Service all vehicle and pedestrian clearance intervals for the priority phase(s) and have a programmable capability to terminate pedestrian clearance interval for the non-priority phase. Upon advancing to the priority phase, the controller shall have the programmable capability to allow concurrent non-conflicting pedestrian movement to time normally, advance to solid "DON'T WALK", or time pedestrian clearance interval.
 - Skip all intervening phases to obtain the desired traffic signal display.
 - (c) Upon termination of a High Priority call, the controller shall inhibit further Low Priority call(s). The inhibit

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shall be removed at the beginning of green for the designated High Priority phase(s) after having completed full service of all non-designated High Priority phase(s) because of normal demand and then returning to the High Priority phase(s).

Calls shall not be placed on any non-priority phase as part of the preemption sequence except by normal demand or by user individually programmable option. Detector response during preemption shall be normal.

(5) Low Priority Preemption.

- (a) Inputs and controls shall be provided to inhibit each individual Low Priority preemption sequence by internal time clock and by external input.
- (b) No Low Priority calls shall be processed while the controller is servicing:
 - A conflicting pedestrian interval.
 - Another Low Priority preemption sequence.
 - A High Priority preemption sequence.
 - A Train preemption sequence.
 - Low Priority call is inhibited by latching as defined in these Specifications.
 - Low Priority call is inhibited by individual external input.
- (c) Upon acceptance of a Low Priority call when the desired traffic signal display is being indicated, the controller shall hold the desired traffic signal display until that the Low Priority call is terminated and the Low Priority minimum interval or Low Priority maximum interval has elapsed or a higher level preemption call is received.
- (d) Upon acceptance of a low priority call requiring the controller to advance to the desired traffic signal display, the controller shall sequentially:
 - Time out the remaining balance of the conflicting

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phase's minimum green time setting.

- Time out all conflicting non-concurrent pedestrian "WALK" displays.
 - Service all vehicle clearance and conflicting non-concurrent pedestrian clearance intervals for the active non priority phase(s).
 - Skip all intervening phase(s) to obtain the desired traffic signal display.
 - Non-conflicting phases shall not be forced off nor skipped. The concurrent non-conflicting phase(s) shall be allowed to time normally after the desired traffic signal has been displayed. The concurrent non-conflicting phase(s) shall be served by demand and shall not be held or served by the preemption sequence.
 - If the low priority call should cease before the desired traffic signal display is obtained, the controller shall advance to and hold the desired traffic signal display for a programmable minimum interval adjustable from 0 to 25 seconds.
- (e) Upon termination of a Low Priority sequence the controller shall inhibit further Low Priority preemption call(s).

The Low Priority preemption inhibit shall be removed at the beginning of green for the designated Low Priority phase(s) after having completed full service of all non-designated Low Priority phase(s) and then returning to the Low Priority phase(s) because of normal demand.

Calls shall not be placed on any non-priority phase as part of the preemption sequence except by normal demand or by user individually programmable option. Detector response during preemption shall be normal.

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- (f) Preemption operation and status indicators for each preemption sequence shall be provided on the face of the controller including non-conflicting concurrent phase(s). The display shall indicate the complete status of the preemption sequence including all timing intervals. Controller display shall reflect field display.

86.03.12 TIME-OF-DAY-CLOCK

The Time-of-Day Clock function shall be an integral unit and provided with every Controller. The Time-of-Day Clock function shall conform with the following:

- (1) Daylight savings time adjustment shall be provided. Date of adjustment shall be programmable for twice-a-year change of date.
- (2) Automatic leap-year adjustment shall be provided.
- (3) A minimum of 150 programmable events shall be provided. Events shall be programmable for year, date, hour, and minute and shall have a minimum repeatable accuracy of one second. Events shall have a minimum programmability for repetition as one time, weekdays, weekend, everyday, or selected days.
- (4) Eight (8) special function outputs shall be provided and be programmable for any intended use. Each output shall conform with the same requirements as NEMA specified outputs.
- (5) Manual control of all special function outputs shall be provided via keyboard entry which shall override program control of the outputs.
- (6) The Time-of-Day Clock function shall override system functions but shall not override manual functions.
- (7) The Status of the special function outputs shall be capable of being displayed by the controller.
- (8) The following functions, minimally, shall be programmable internally by the time of day control: any coordination mode, MUTCD Flash, any phase Minimum recall, any phase

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Maximum recall, any phase soft recall, any alternate time periods (Max 2, Max 3, Ped. 2), any phase conditional reserve, Dual entry, Red rest, Low priority inhibits, Dimming enable, Detector fail table parameters.

- (9) HOV (High Occupancy Vehicle) Signal Control shall conform with the following:
 - (a) Six (6) of the Special Function outputs shall be used.
 - (b) Two (2) standard loadswitches shall be used to provide six (6) outputs for remote activation of sign controls. These loadswitches shall be sources from an individual circuit breaker, shall not be wired to the flash bus and shall be individually fused.
- (10) Each controller shall be capable of operating in a non-interconnected (time based) coordination mode controlled by Time of Day Clock. The digital clock shall use the 60Hz power line frequency as a time base and shall be provided with a lithium battery or other effective means for backup power capable of maintaining the operation of the clock for 1 year of continuous operation and with a battery life of eight years before required replacement.

86.03.13 MASTER CONTROLLER

Master controller shall meet NEMA Specifications. Each master controller function shall be an integral unit and provided, when specified, with the controller. The master controller function shall conform with the following:

- (1) It shall be capable of commanding and monitoring as many as twenty four (24) local controllers with interconnect coordination by means of telemetry data link.
- (2) Each master controller shall be microprocessor-based, modular, solid-state utilizing digital timing and integrated circuits.
- (3) A modem shall be provided for communicating between the Master Controller and the System Monitor computer. This

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modem shall be compatible with existing modems of the County signal systems and shall be capable of communications at 1200/2400/4800/9600 baud. The modem shall meet the same environmental requirements as the controllers.

- (4) Permanent Memory
- (a) Permanent memory shall be provided for backup or default in conformance with the following:
 - Local programmable functions shall consist of, but not limited to, any and all master controller database programming, input and output assignments, and startup configuration data.
 - (b) Permanent memory shall not be changeable or overridden by the master controller or the signal monitor at the Central Computer Center.
 - (c) The permanent memory shall be easily transferred to the master controller unit active database upon user initiated command.
 - (d) Data in the permanent memory shall be easily transferred to the controller active database upon user initiated command and shall be automatically transferred due to the manufacturer's design for normal program failure or data integrity loss detection.
 - (e) The permanent memory shall be EEPROM conforming with the following.
 - Approved security means must be provided such that inadvertent keyboard entry or random program activity shall not modify data.
 - Data contained in permanent memory shall be programmable by the County. Contractor shall furnish the necessary software to facilitate programming.

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- Batteries shall not be required for maintenance of permanent memory data.
- (5) Master controller function and timing programming shall be accomplished by keyboard entry from the face of the master controller and by telephone company data link from the Central Computer Center. Status and operation shall be indicated by LED/LCD indicators and alphanumeric display on the face of the master controller.
 - (6) Master controller shall have the capability to change local intersection controller and coordination setting by means of telemetry data link or master controller keyboard entry. It shall provide for complete system detector logging, MOE (measure of effectiveness) and system performance diagnostics. Error checking shall conform to CSS Section 86.03.02 "Local Controller", Paragraph (1). It shall be capable of traffic responsive programming and Time-of-Day/Day-of-Week programming with backup time-base coordination equivalent to that specified for the local controller.
 - (7) Master controller shall be provided with the following:
 - (a) Versatile sampling programming.
 - (b) Adjustable sampling period (minimum 1-10 minutes).
 - (c) Sample averaging period with programmable averaging period (minimum 1-10 minutes).
 - (d) Selection of sampling detection data based on data validity checks. Detector diagnostics indicating undercount, overcount, or count differing from the norm may be used for validity check. Any means used must effectively reflect the condition of the data.
 - (8) The master controller shall voluntarily (i.e. not as a response to query) dial up the Central Computer Center in the event of a reportable occurrence (i.e. power failure, faulty detection, etc.) This dial up shall result in an audio and visual alarm link to the printer at the Central Computer Center. All functions specified

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in these Specifications under Local Controller shall be available for reporting.

86.03.14 COMMUNICATIONS

- (1) Equipment communications between the master and local controllers shall:
 - (a) Be via no more than two (2) pairs of existing twisted shielded conductors.
 - (b) Use standard dial business telephone service.
 - (c) Provide for proper suppression of noise and sufficient signal strength and clarity such that communications is easy under high background noise conditions.
- (2) Voice communications shall:
 - (a) Be via a single twisted pair of conductors.
 - (b) Use standard dial business telephone service.
 - (c) Include an intercom feature.
 - (d) Have a ringer disabled when cabinet door is closed.
 - (e) Provide for proper suppression of noise and sufficient signal strength and clarity such that communications is easy under high background noise conditions.
- (3) Telephone service in each master controller cabinet shall:
 - (a) Be via telephone service cable.
 - (b) Enter through the bottom of the enclosure.
 - (c) Be routed through a rigid steel conduit terminating in a pullbox adjacent to the cabinet enclosure as per CSD E/4.
 - (d) Terminate in a telephone service enclosure mounted on the outside of the controller cabinet.

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- (4) Telephone service enclosure shall:
- (a) Be lockable with single padlock.
 - (b) Be a weather-tight steel NEMA 4R enclosure.
 - (c) Provide a minimum enclosure size of 300 mm wide x 300 mm high x 150 mm deep (12 in. x 12 in. x 6 in.).
 - (d) Have a 19 mm (3/4 in.) thick plywood painted backboard.
 - (e) Be provided with a #12 ground wire terminated at a grounding terminal with an appropriate terminating block.
 - (f) Be equipped with a 25 mm (1 in.) diameter chase nipple entering the controller cabinet.
 - (g) Be equipped with two RJ11 jacks as termination of telephone service.
 - (h) Be equipped with two cables, each terminating with a RJ1 plug:
 - One cable shall be for data communications terminating at the modem.
 - One cable shall be for voice communications terminating within the controller cabinet at the voice communications tie point.
 - All telephone line isolation and protection shall be provided as required by the telephone service company and shall be mounted on the backboard terminating in RJ11 jacks within the enclosure.

86.03.15 CONTROLLER CABINET

86.03.15A CABINET CONSTRUCTION

Controller cabinet shall be County standard Type P conforming to the requirements in SSS Section 86-3.07A "Cabinet Construction," and 86-3.07B "Cabinet Ventilation," State Standard Plan No. ES-4A, except the following:

- (1) Cabinet and doors shall be fabricated of 1.8 mm (0.073-in.) minimum thickness cold rolled steel.
- (2) Cabinet shelves shall provide spaces with minimum dimensions of 300 mm high by 480 mm wide by 300 mm deep (12 in. x 19 in. x 12 in.).
- (3) Painting of cabinet shall be as specified in CSS Section 86.02.15 "Painting."
- (4) All equipment and modules shall be secured when properly installed. Vibration and minor shaking of the cabinet shall not cause any equipment or module to become dislodged from its proper position nor its operation to fail.
- (5) When Caltrans standard steel cabinets are specified, they shall conform with the following:
 - (a) The controller assembly design shall be submitted as specified in CSS Section 86.01.04C "Controller cabinet Submittals."
 - (b) All functions of the County standard controller assembly shall be maintained. All equipment shall operate in the County closed loop system and with the existing County signal monitor system.
 - (c) All equipment shall be interchangeable with the equipment specified for the County standard controller assembly.
 - (d) Adapter cables and/or connectors shall be provided and attached in the cabinet to convert from the County

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standard controller and conflict monitor to the basic functions of the Caltrans 170 controller and conflict monitor. Any other functions requiring adaptation to convert the supplied cabinet to Caltrans standard control equipment shall be provided. The functions of the County Standard controller assembly shall not require adaptors.

86.03.15B CABINET WIRING

Wiring shall conform to the requirements in CSS Sections 86.01.04C "Controller Cabinet Submittals," and 86.02.09 "Wiring," SSS Section 86-3.07C "Cabinet Wiring," and the following.

- (1) All of the input-output terminations specified in Sections 13 and 14 of the NEMA Standards Publication TS-1 shall be brought to an external terminal via the regular controller connector and wiring harness. The pin used for each function shall be the pin used for the same function on all similar model controllers of the same manufacturer.
- (2) All wires terminating on a terminal strip shall be neatly dressed with adequate service loop.
- (3) All solid conductors installed in the cabinet (such as component pigtails), when a crimp connector is applied, shall be soldered.
- (4) All equipment connecting cables shall have full length conductors on each connector pin. All unused or spare conductors that are not required by these Standard Specifications or to be terminated, shall be identified with the connector origin and appropriate pin number or letter. All equipment cables shall be protected by sleeves. Nylon wire ties shall not be used to lace cables.
- (5) All cabinet conductors that are terminated shall be identified with a label within 25 mm (1 inch) of its attachment to the terminal. The label shall identify the point of origin of the conductor and shall be referenced to the cabinet print callouts.
- (6) No more than one wire shall be attached to the rear of each

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terminal of a feed-through type terminal block, and it shall be possible to alter or interrupt any and all equipment and terminal interconnections at the front of aforementioned terminal block(s). Jumpers shall be allowed on the rear of terminals in order to bus logic power, logic grounds, and other signals for multiple distribution to front mounted terminations.

86.03.15C CABINET ACCESSORIES

The following accessories or features shall be provided as part of each of the controller assemblies:

- (1) A two position "Stop Time Auto-Manual" switch shall be provided stop time of the controller unit when the police panel "Flash-Auto" switch is placed into the "Flash" position. When placed in the "Manual" position, the controller unit will be stop timed. The "Stop Time Auto-Manual" switch shall not have an off position. A separate "Stop Time Disable" momentary pushbutton switch shall be provided near the "Stop Time Auto-Manual" switch to interrupt all stop timing input to the controller unit.
- (2) An "Equipment Power On-Off" switch shall be provided on the control panel to disconnect power to all equipment in the cabinet except the vehicle flasher circuit, which shall remain operable.
- (3) A "Controller Unit On-Off" switch shall be provided on the maintenance panel. It shall remove power from both the controller unit and the conflict monitor.
- (4) The cabinet lighting fixture shall conform to SSS Section 86-3.09K and the "On-Off" switch for the lighting fixture shall be a toggle switch mounted on the inside control panel.
- (5) A transparent, easily removable cover over the face, top and sides of the cabinet power panel and the street lighting contactor panel to prevent accidental contact with energized electrical parts shall be provided. Access to the street lighting "Test-Auto" switch and Photoelectric Unit (PEU) fuse shall not be inhibited by the cover. The cover shall be at least 3 mm (0.125 inch) thickness material. Access holes of approximately

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13 mm (1/2in.) diameter shall be provided in the cover to allow access to the terminal lugs of the signal contactor, lighting contactor, and the circuit breakers.

- (6) Guards shall conform to the following:
 - (a) Guards shall be provided over all circuit breakers to prevent accidental manual tripping of the breaker. The guard shall not interfere with the normal operation of the breakers, and shall not inhibit visual confirmation of any ratings, markings, or the operational status of the breakers.
 - (b) Guards shall be provided to protect against damage to all rear and side mounted equipment by shelf mounted equipment.
 - (c) Guards shall be provided to protect the door mounted maintenance panel switches from accidental actuation.

86.03.15D AUXILIARY EQUIPMENT

The following auxiliary equipment shall be provided.

- (1) The loadbay shall be fastened with hinges near the bottom rear of its point of attachment to the cabinet. It shall be possible, by removing no more than two (2) fasteners at the top of the rack, to swing the rack downward and gain access to the rear of the rack and its wiring. The lowest portion of the loadbay or any part thereof, including any field conductor terminal blocks attached to it, shall be at least 150 mm (6 in.) from the cabinet bottom when in the down position and nor more than 300mm (12 in.) from the cabinet bottom when in the upright position.
- (2) Loadswitches shall be securely supported by a well braced metal bar or shelf located underneath the loadswitches. The support shall not interfere with loadswitch convection cooling or with full utilization of the loadswitch handle to facilitate the insertion and removal. The front portion of the support shall contain the phase/function label(s) for the loadswitches. The labels shall be visible while either standing or kneeling in front

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of the cabinet. All loadswitches shall be of solid state design and shall be provided with LED indicators of the input and output status.

- (3) Conflict monitors shall conform to NEMA Standards for Traffic Control Systems (Publication No. TS 1), Section 6 “Conflict Monitors,” SSS Section 86-3.08C “Monitoring Devices,” and the following.
 - (a) Type 12 monitor with twelve (12) fully programmable input channels shall be used.
 - (b) The monitor shall have the capability to detect the absence of phase color, switch failure, no lamp load conditions and more than one color (R, Y, or G) being on at the same time for each channel. It shall also be capable to detect short clearance intervals for each phase. The minimum interval shall be fixed at 2.5 seconds or shall be adjustable between 2.5 seconds and 2.8 seconds.
 - (c) Conflict monitors are required to monitor voltage levels per NEMA standards regardless of sensed voltage phase shift with respect to cabinet voltage. This shall include 180 degree out of phase shift with respect to cabinet voltage.
 - (d) Conflict monitors shall not latch upon the failure of the Controller Voltage Monitor (NEMA CVM) output; however, conflict monitors shall latch upon failure of either 24 volt monitor circuit.
 - (e) The conflict monitor shall monitor both the controller 24 VDC power supply and the auxiliary power supply. The 24 volt monitor shall operate as follows:
 - If the monitoring device places the signals into flashing operation because of activation of either +24 VDC monitoring circuit, the flashing operation shall lock-in and shall release only upon operation of a reset switch and restoration of the proper +24 VDC levels. If a complete power failure to the controller assembly occurs after the monitoring device has

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placed the signals into flashing operation because of activation of either +24 VDC monitoring circuit, the flashing operation may release if proper +24 VDC levels exist when power is restored.

- Circuitry to provide this feature shall be fully contained within the conflict monitor unit.
 - In no case shall a complete power failure to the controller assembly, which was functioning properly and in normal or “automatic” mode prior to the power failure, cause the signals to be in flashing operation, due to false or erratic operations of the aforementioned circuitry, after restoration of power.
 - All conflict monitor wiring for channel assignments to field indications shall be connected only to the field terminal block(s), not to the rear of loadswitch sockets.
 - The conflict monitor logic power shall be furnished by the controller power switch. The power to the conflict monitor relay shall be furnished from the unswitched main power.
- (4) An auxiliary, series-regulating type power supply shall be installed to provide power to loadswitches, detectors, indicators, relays, external logic and other required equipment. The auxiliary power supply shall conform to the following:
- (a) It shall be shelf-mounted, plug removable and provide positive 24 (± 0.5) volts DC output with one (1) percent regulation or better over an AC line voltage variation from 95 to 135 volts and from no-load to full-load. Current capability shall be from four (4) to five (5) amperes continuous, and with less than 0.5 volts peak-to-peak ripple.
 - (b) The fuse shall be provided and located on the power supply. Fuse shall be accessible for checking and/or replacing without removing the case.

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- (c) It shall be contained in a protective housing. The connector on the power supply shall be a MS 3102A-18-1P, keyed standard, and the pin callout shall be as follows:

<u>PIN</u>	<u>FUNCTION</u>
A	120 VAC Neutral
B	-24 VDC Negative (DC-)
C	120 VAC (Hot)
G	+24 VDC Output
H	Chassis Ground

- (5) A convenience outlet shall be provided in each cabinet, conforming to the requirements in SSS Section 86-3.08K "Convenience Receptacle" and the following:
 - (a) It shall be located on the right inside cabinet wall approximately 18 inches to 40 inches from the base of the cabinet. Devices plugged into the convenience outlet shall not be damaged or interfered by the cabinet door movement.
 - (b) It shall be equipped with ground fault circuit interrupter (GFCI) protection.
- (6) An auxiliary convenience outlet shall be provided in each master cabinet for the modem equipment. It shall conform to the following:
 - (a) It shall be fused at 5 amp. minimum and shall be a single receptacle without GFCI protection.
 - (b) It shall be labeled "For Modem Only."
- (7) All isolators, interfaces, cables, and related equipment for pedestrian circuitry, telemetry, and preemption systems shall be provided regardless of whether those systems will be provided. The optical discrimination module shall only be provided when specified.
- (8) When HOV sign controls are specified in the special

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provisions, the controller cabinet shall contain two (2) 15 amp. circuit breakers and two (2) load switches contained in the loadbay to power and control the two (2) separate and remote NEMA Type F cabinets.

Wiring for HOV sign control in controller cabinet and Type F cabinet shall conform to the Contract Documents.

86.04 TRAFFIC SIGNAL FACES AND FITTINGS

Traffic signal faces and fittings shall conform to the requirements in SSS Section 86-4 "Traffic Signal Faces and Fittings" and the following.

Compensation for work specified in CSS Section 86.04 "Traffic Signal Faces & Fittings" will be made as follows:

- (1) Traffic signal heads will be paid for at the contract unit price for each unit furnished and installed complete in place, including all required framework, appurtenances, and as specified.
- (2) Pedestrian signal heads will be paid for at the Contract unit price for each unit furnished and installed complete in place, including all required framework, appurtenances, and as specified. Pedestrian push-button/sign assembly will be paid for at the Contract units price for each unit furnished and installed complete in place and as specified.

86.04.01 VEHICLE SIGNAL FACES

Vehicle signal faces shall have metal signal sections and visors conforming to the requirements in SSS Section 86-4.01 "Vehicle Signal Faces." Plastic signal faces and visors shall not be used.

Vehicle signal face reflectors shall be made of specular aluminum conforming to the requirements in SSS Section 86-4.01A "Optical Units."

86.04.02 BACKPLATES

Backplates shall be furnished and installed on all signal faces. Backplate shall be made of aluminum and installable from the front of the signal head and conform to the requirements in SSS Section

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86-4.03 “Backplates” and State Standard Plan ES-3C. Louvers shall not be used unless specified in the Contract Documents.

The use of plastic backplates will not be accepted.

86.04.03 SIGNAL MOUNTING ASSEMBLIES

Signal mounting assemblies shall conform to CSD E/3A and the requirements in SSS Section 86-4.06 “Signal Mounting Assemblies” except that terminal compartments, post top adapters, and plain side pole mounts shall be cast bronze. “Clam Shell” mounts shall not be used.

86.04.04 PEDESTRIAN SIGNAL ASSEMBLIES

86.04.04A PEDESTRIAN SIGNAL FACES

Pedestrian signal faces shall be Type A with 4.7 mm (3/16 in.) tempered glass message plate and z-crate type screen conforming to the requirements in SSS Section 86-4.05 “Pedestrian Signal Faces” and State Standard Plan ES-3B.

86.04.04B PEDESTRIAN PUSH BUTTONS

Pedestrian push buttons shall conform to the requirements in SSS Section 86-5.02 “Pedestrian Push Buttons,” CSD E/5C, and the following:

- (1) Pedestrian push button switch cap and housing shall be metal. No structural plastic cap and housing shall be used.
- (2) Push button installation shall conform to CSS Section 86.02.01 “Mobility-Impaired Access Requirements” as amended and the following:
 - (a) Multiple push buttons on the same standard shall be mounted at the same height with a maximum vertical offset of plus or minus 50 mm (2 in.) between push buttons.
 - (b) Pedestrian push button shall be located within 5 feet of the crosswalk centerline or entrance to the designated

crosswalk.

**86.04.04C PEDESTRIAN PUSH BUTTON
INSTRUCTIONAL SIGNS**

Signs shall conform to the requirements in SSS Section 86-5.02 “Pedestrian Push Buttons” and CSD E/5C.

86.04.05 SIGNAL LAMPS

Unless indicated otherwise in the Contract Documents, traffic signal lamps in amber and green colors shall be incandescent type, 150 watts for 304.8 mm (12 in.) diameter head and 69 watts for 203.2 mm (8 in.) diameter head. All lamps shall conform to ITE standards.

Traffic signal sections with red ball indication, red arrow indication, and pedestrian signal with “Hand” symbol indication shall be light emitting diode (LED) type conforming to the requirements of the Contract Documents.

At locations where existing signal standards equipped with LED signal heads require relocation or replacement, Contractor shall furnish and install in kind new LED signal heads, unless specified otherwise in the Contract Documents.

86.04.06 SIGNAL HEAD SIZE

On arterials with posted speed of 70 km/h (45 MPH) or higher, traffic signal heads shall be 304.8 mm (12 in.) in diameter. On local and minor roads, traffic signal heads mounted on mastarms shall be 304.8 mm (12 in.) diameter, and pole side mounted and post top mounted heads supplementing the mastarm mounted signal heads shall be 203.2 mm (8 in.) in diameter unless specified otherwise in the Contract Documents.

86.05 DETECTORS

86.05.01 DETECTOR UNITS

Detector units shall conform to the requirements in Section 15 “Inductive Loop Detectors” of the NEMA Standards for Traffic Control Systems (Publication No. TS-1) and the following:

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- (1) Twelve (12) detector modules shall be provided with each cabinet.
- (2) Detectors shall be two (2) channel units, dual output per channel, with a maximum width of 28.4 mm (1-1/8 in.) in width.
- (3) Each detector channel shall have both a standard selectable pulse/presence output with delay and extension capabilities and a secondary output with a selectable count (one pulse for each car exiting the County standard three loop array)/pulse output. Individual delay and extension timers (minimum of 0-31 seconds delay and 0-15 seconds extension).
- (4) Each detector module shall provide a loop fail diagnostic output. This output shall become true upon detection of an open loop, shorted loop, or sudden unusual change in loop inductance.
- (5) Transformer isolation of the loops shall be provided.
- (6) Detector unit shall be digital in design, using digital timing.
- (7) A minimum of nine (9) selectable sensitivity levels shall be provided.
- (8) A minimum of three (3) selectable operating frequency ranges shall be provided.
- (9) An indication shall be provided on the front panel of the operating status, (active output, delay timing, extension timing, loop failed).
- (10) All controls for frequency (crosswalk control), mode (pulse or presence), and sensitivity shall be located on the front of the detector unit.
- (11) Detector shall be self-tuning.
- (12) Detector performance characteristics shall conform to the following:

- (a) Sensor units shall provide an output true condition for each vehicle passing through the response area of the loop at speeds up to 120 km/h (75 mph) and shall also provide an output true condition of at least three (3) minutes duration when a vehicle is occupying the response area of the loop.
- (13) Detector card edge pins 1, 2, 3, and 10 shall be isolated from all other pins and circuitry on the detector card.
- (14) Counting function shall be provided. It shall be capable of providing an output pulse for each vehicle as it exits the loop field by analysis of the changes caused by the vehicle profile.

86.05.02 DETECTOR RACK

86.05.02A USE OPTIONS

The detector rack shall have the capability of special vehicle and dual mode output detection. It shall conform to the following:

- (1) Two-channel detector modules.
- (2) Timing detectors (extension/delay).
- (3) Dual output per channel detector (pulse/presence) for use as vehicle detector for controller and sampler or counting functions.
- (4) Dual output per channel detector (normal/special) for special vehicle recognition. Program card shall be of similar design to the program card specified and shall conform to the following:
 - (a) It shall have selectable output modes for primary output of presence and pulse.
 - (b) It shall have selectable output modes for the secondary output of presence, pulse, and count (count output shall output a single pulse for each vehicle leaving the county standard three-loop array).

- (5) Three program cards shall be provided as follows:
- (a) Phase Detector Program card (primary detector output routing card):
 - 8 each controller vehicle detector inputs.
 - 8 each controller bicycle detector inputs.
 - 8 each controller system detector inputs.
 - 30 each primary vehicle detector outputs.
 - (b) System Detector Program card (secondary output routing card):
 - 8 each controller system detector inputs.
 - 30 each primary vehicle detector outputs.
 - 16 each outputs to data logger connector.
 - (c) Green-Enable Program card:
 - 8 each controller phase green outputs.
 - 30 each green-enable inputs to detector modules.
 - Hardware address selection.

86.05.02B DETECTOR OUTPUT PROGRAM CARDS

Detector output program cards shall conform to the following:

- (1) They shall be of durable design, clearly marked as to function; with easy to understand program pin layout with each program point clearly identified on the card.
- (2) Each program card shall be interchangeable with existing program cards used in the County standard cabinet.
- (3) Each card shall provide an LED indicator to indicate that the card is properly seated and located. The LED on primary output cards, secondary output cards, and green enable cards shall be on only when installed in the correct position of the rack.

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- (4) A spare system detector program card shall be provided with each cabinet.
- (5) Power to the rack shall be supplied from the cabinet auxiliary power supply. Power shall be routed to the rack through a separate connector. Absence of power to the rack shall activate the detector fault buss.
- (6) All inputs and outputs to and from the rack other than power shall be routed through latching connectors on the rack. The cable routing shall not interfere with the insertion or removal of detector modules or with the visibility of detector module front panels.
- (7) Each card shall provide for sampling detector routing from special vehicle and dual mode output detectors.
- (8) Provisions shall be available for routing of signals from the detector modules to the controller vehicle detector inputs and from the controller greens to the detector condition inputs.
- (9) Controller programmable assignment may be used in place of the above program card or in combination with the program card.
- (10) Using either of the above options, it shall be possible to assign any detector output to any controller input as needed.

86.05.02C OTHERS

- (1) The detector rack shall not have any polarizing keys installed in the detector module connectors.
- (2) The detector rack shall be securely fastened to the back wall or shelf of the controller cabinet, and it shall be made possible to gain access to the wiring on the rear of the rack by removing no more than four (4) fasteners.

86.05.03 DETECTOR LOOP MATERIALS

Inductive loop detector materials shall conform to the requirements in SSS Section 86-5.01A(4) "Construction Materials" and the following:

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- (1) Loop conductor shall be Type 2 loop wire. The conductor shall be identified throughout its length per NEC Article 310-11 "Marking."
- (2) Lead-in cable shall be Type B.

Compensation for detector loop materials shall be as follows:

Loop conductors will be not measured and paid for separately and compensation shall be considered as included in the contract price for the installation of detector loop.

Lead-in cable will be measured per the linear meter furnished and installed complete in place and paid for at the contract price for furnishing and installing, complete in place, detector lead-in cable.

86.05.04 DETECTOR LOOP INSTALLATION

The installation of inductive loop detectors shall conform to the requirements in SSS Section 86-5.01A(5) "Installation Details," on CSD E/5A and the following:

- (1) Detector loops homeruns shall not cross more than one (1) traffic lane before entering the handhole.
- (2) Detector lead-in cables between pullbox (immediately adjacent to the detector handhole) and controller cabinet shall run continuously and shall be unspliced throughout the length of the conductors.
- (3) Detector loops shall have diamond or circular configuration conforming to CSD E/5A.
- (4) The sealant for filling slots shall be asphaltic emulsion sealant for asphaltic concrete pavement application and hot-melt rubberized asphalt sealant for Portland cement concrete pavement; both as specified in the State Standard Specifications.

Work will be paid for at the Contract unit price for each detector loop installed complete in place as specified including pavement sawcut.

86.06 LIGHTING

Lighting shall conform to the requirements in SSS Section 86-6 “Lighting” and the following.

86.06.01 LUMINAIRES

Unless specified otherwise, luminaires shall be 250-watt, high-pressure sodium, Type III cutoff lamp conforming to the requirements in SSS Section 86-6.01 “High Pressure Sodium Luminaires.” Ballasts for luminaires shall be of autotransformer or reactor type multitap (120/208/240/277 volt) integral ballasts.

Luminaire circuit splicing shall conform to CSS Section 86.02.09F “Fused Splicing Connectors.”

Luminaire will be paid for at the Contract unit price for each unit furnished and installed complete in place.

86.06.02 PHOTOELECTRIC CONTROLS

Photoelectric control shall be Type II consisting of a remote photoelectric unit, a separate contactor and a test switch meeting the requirements in SSS Section 86-6.07 “Photoelectric Controls” and the following:

- (1) The photoelectric unit shall be pole-top mounted. In the absence of the Type III cabinet, the contactor and test switch shall be located in the controller cabinet containing the equivalent lighting control circuitry. The “auto-test” switch shall not have an “off” position.
- (2) The contactor shall be mercury displacement type. Each pole shall consist of a complete single pole contactor with coil and mounting provisions. The mercury tube shall be metal. The operating coil shall be rated at 120 volts, 60 Hertz and shall be plastic resin encapsulated. Screw terminals shall be provided for wiring to operating coil and contacts. The mercury contactor shall have a minimum rating of 60 amperes.

Photoelectric control assembly will be paid for at the contract unit price for each unit furnished and installed complete in place.

86.07 REMOVING, REINSTALLING OR SALVAGING SIGNAL/ELECTRICAL EQUIPMENT & FACILITIES

The work specified in this section shall conform to SSS Section 86-7 “Removing, Reinstalling or Salvaging Electrical Equipment” and the following.

The removal and salvage of signal/electrical equipment and facilities specified in this Section 86.07 will be compensated at the Contract lump sum price for removal and salvage of electrical equipment as indicated in the Contract Documents. Unless indicated otherwise in the Contract Documents, the reinstallation of existing equipment shall be considered as incidental and its compensation will not be made separately and shall be considered as included in the Contract price for the appropriate item of work.

86.07.01 ABANDONED FOUNDATIONS

Signal and luminaire standard foundations to be abandoned shall be removed to a depth of not less than 500 mm (1.5 ft.) below the finished grade of the adjacent roadway pavement regardless of the foundation location. Cabinet foundations shall be removed completely. Holes resulted from the removed foundation shall be treated as follows:

- (1) At locations where no pavement structural section exists, structural sand, as specified in SSS Section 19-3.025B “Sand Bedding”, shall be used in backfilling and top finished section shall match in kind and conform to adjoining finished grade. Placement of backfill material shall conform to the requirements in SSS Section 19-3.06 “Structure Backfill.”
- (2) At locations with an existing pavement structural section, a 500 mm (1.5 feet) full depth asphalt concrete, as specified in SSS Section 39 “Asphalt Concrete,” shall be installed to match with existing grade of surrounding pavement section. Top finished section such as in traffic islands shall match in kind and conform to adjoining finished grade.

86.07.02 REMOVAL & STORAGE OF SALVAGED EQUIPMENT

Unless specified otherwise, the County shall deliver materials and equipment identified in the contract documents to be salvaged to the following addresses prior to the final acceptance of the project.

- (1) Signal and lighting standards (pole and mastarm only):
Santa Clara County South Yard
13600 Murphy Ave
San Martin, CA 95046

- (2) All other materials and equipment:
Santa Clara County East Yard
1505 Schallenberger Road
San Jose, CA 95131

Signal heads shall be disassembled from their frameworks. Visors and backplates shall be disassembled from signal heads. Frameworks, and pedestrian push buttons, signs, and bands shall be removed from signal standards. Care shall be taken to insure that equipment is returned in an undamaged condition. All wiring removed shall be neatly coiled and tagged.

The contractor shall be responsible for the damage, loss, and interim storage of all salvaged materials and equipment until delivered and accepted by the Engineer at the specified site. Salvaged materials and equipment shall remain the property of the County.

86.08 EQUIPMENT OPERATIONAL AND MAINTENANCE TRAINING

When specified in the Special Provisions, the equipment manufacturer shall provide to the County with training sessions on the operation and maintenance of the equipment furnished. The duration of training will be specified in the special provisions. The County reserves the right to record any and all training sessions provided under this section for future use. The County will furnish the site for the training sessions.

A minimum of 30 calendar days prior to the commencement of the training period, the Contractor shall furnish to the Engineer for review detailed course outlines, the instructor's qualifications and experience,

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and a schedule of classes. Instruction shall consist of in-class presentation and “hands-on” training on the operation, maintenance, and field implementation of all equipment/systems supplied. Sessions on the orientation to the design and operation of the equipment shall be scheduled so that they are completed prior to the commencement of the equipment 21-day testing period as specified in CSS Section 86.02.13 “Testing.” The remainder of the training may be scheduled during and/or after the 21-day testing period.

The instructor(s) shall be knowledgeable in the system design and in the implementation of actual coordination systems. The County reserves the rights to reject any instructors whose qualifications are deemed unacceptable to the County.

86.09 COUNTY-FURNISHED MATERIALS & EQUIPMENT

Materials or equipment furnished by the County for installation by the Contractor shall be transferred to and received by the Contractor at the County yard indicated in the Contract Documents with a 48-hour advance notice. The Contractor shall be required to sign a material transfer list to be furnished by the County, which shall note any material or equipment irregularities or deficiencies and shall be made part of the contract documents. Upon transfer of the county furnished materials or equipment, the Contractor shall be responsible for the condition of the materials during the duration of the Project. Any damage to the materials or equipment shall be repaired or replaced at the Contractor’s expenses.

Materials or equipment, which are furnished by the County for a temporary installation, shall be removed and returned to the County at the designated storage yard upon completion of the Project.

Compensation for requirements under this Section will not be measured and paid for separately. It shall be considered as included in the Contract prices for the applicable work items.

86.10 MEASUREMENT AND PAYMENT

Measurement and payment shall be as per CSS Section 9 “Measurement and Payment” and SSS Section 86-8 “Payment” and as follows.

Unless specified otherwise in this CSS Section 86 or in the Contract Documents, the Work specified will not be measured and paid for

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separately. Compensation shall be considered as included in the Contract prices for the appropriate items of Work provided in the Contract Bid Schedule.

When the terms “furnishing and installing, complete in place” are specified in the measurement and payment for an item, it shall mean that compensation made shall include all required labor, materials, and equipment to perform and complete such item of work as specified, including all incidentals required to complete the item of work according to the applicable standards, codes or regulations. No additional compensation shall be made unless indicated otherwise.

**SECTION 88
ENGINEERING FABRICS**

Engineering fabrics shall conform to the provisions in Section 88 “Engineering Fabrics” of the most current edition of the State Standard Specifications.

**SECTION 90
PORTLAND CEMENT CONCRETE**

Portland cement concrete shall conform to the provisions in Section 90 “Portland Cement Concrete” of the most current edition of the State Standard Specifications and as follows.

90.01 AMOUNT OF WATER AND PENETRATION

This section shall conform to the requirements of SSS Section 90-6.06 “Amount of Water and Penetration” and the following:

The amount of free water used in concrete for roadway deck slabs of highway bridges shall not exceed 195 kg/m^3 (325 lbs/cubic yard), plus 20 kg (20 lbs) for each required 100 kg (100 lbs) of cement in excess of 400 kg/m^3 (658 lbs/cubic yard).

SECTION 91

**SECTION 91
PAINT**

Paint shall conform to the provisions in Section 91 “Paint” of the most current edition of the State Standard Specifications.

**SECTION 92
ASPHALTS**

Asphalts shall conform to the provisions in Section 92 “Asphalts” of the most current edition of the State Standard Specifications.

**SECTION 93
LIQUID ASPHALTS**

Liquid asphalts shall conform to the provisions in Section 93 “Liquid Asphalts” of the most current edition of the State Standard Specifications.

**SECTION 94
ASPHALTIC EMULSIONS**

Asphaltic emulsions shall conform to the provisions in Section 94 “Asphaltic Emulsions” of the most current edition of the State Standard Specifications.

**SECTION 95
EPOXY**

Epoxy shall conform to the provisions in Section 95 “Epoxy” of the most current edition of the State Standard Specifications.

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