

**COUNTY OF SANTA CRUZ
DEPARTMENT OF COMMUNITY
DEVELOPMENT AND INFRASTRUCTURE
DIVISION OF PUBLIC WORKS**

BOOK 2 OF 2

**NOTICE TO BIDDERS AND
SPECIAL PROVISIONS**

FOR CONSTRUCTION OF

**ROBERTSON STREET SIGNALIZATION
PROJECT**

**FOR USE IN CONNECTION WITH STATE OF CALIFORNIA,
DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS
DATED 2025 AND STANDARD PLANS DATED 2025**

BIDS OPEN: JULY 30, 2026

THIS IS A PREVAILING WAGE PROJECT

SPECIAL NOTICES

See Section 5-1.01 for the requirements of using C-MIS Construction Management software

See Section 7-1.02K(3) for the requirements for electronic submittal of certified payroll records using LCPtracker Pro.

PROJECT DIRECTORY/SIGNATURE PAGE

PROJECT: ROBERTSON STREET SIGNALIZATION PROJECT

OWNER: COUNTY OF SANTA CRUZ,
DEPARTMENT OF COMMUNITY DEVELOPMENT AND INFRASTRUCTURE
DIVISION OF PUBLIC WORKS
701 OCEAN STREET, ROOM 410
SANTA CRUZ, CA 95060

CONTACT PERSON: TIM NGUYEN (831) 454-2160

CIVIL ENGINEERING STAFF IN RESPONSIBLE CHARGE: LEOPOLDO TRUJILLO

Signed by:

E46DD0EF89BC4D0...

6/1/2026

Registered Civil Engineer

Date



TABLE OF CONTENTS

NOTICE TO BIDDERS.....	10
ORGANIZATION.....	14
DIVISION I GENERAL PROVISIONS.....	14
1 GENERAL.....	14
2 BIDDING.....	15
3 CONTRACT AWARD AND EXECUTION.....	18
4 SCOPE OF WORK.....	20
5 CONTROL OF WORK.....	21
6 CONTROL OF MATERIALS.....	26
7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC.....	31
8 PROSECUTION AND PROGRESS.....	36
9 PAYMENT.....	39
DIVISION II GENERAL CONSTRUCTION.....	40
10 GENERAL.....	40
12 TEMPORARY TRAFFIC CONTROL.....	41
13 WATER POLLUTION CONTROL.....	45
14 ENVIRONMENTAL STEWARDSHIP.....	45
15 EXISTING FACILITIES.....	45
DIVISION III EARTHWORK AND LANDSCAPE.....	46
17 GENERAL.....	46
18 DUST PALLIATIVES.....	46
19 EARTHWORK.....	46
20 LANDSCAPE.....	46
21 EROSION CONTROL.....	47
22 FINISHING ROADWAY.....	47
DIVISION IV SUBBASES AND BASES.....	47
23 GENERAL.....	47
24 STABILIZED SOILS.....	47
25 AGGREGATE SUBBASES.....	47

26 AGGREGATE BASES.....	47
27 CEMENT TREATED BASES.....	47
28 CONCRETE BASES.....	47
29 TREATED PERMEABLE BASES.....	48
30 RECYCLED PAVEMENT.....	48
31–35 RESERVED.....	48
DIVISION V SURFACINGS AND PAVEMENTS	48
36 GENERAL.....	48
37 SEAL COATS	48
38 RESERVED	48
39 ASPHALT CONCRETE	48
40 CONCRETE PAVEMENT	49
41 EXISTING CONCRETE PAVEMENT.....	49
42 GROOVE AND GRIND CONCRETE	49
43–44 RESERVED.....	49
DIVISION VI STRUCTURES.....	49
45 GENERAL.....	49
46 GROUND ANCHORS AND SOIL NAILS	49
47 EARTH RETAINING SYSTEMS.....	49
48 TEMPORARY STRUCTURES	49
49 PILING	50
50 PRESTRESSING CONCRETE.....	50
51 CONCRETE STRUCTURES.....	50
52 REINFORCEMENT	50
53 SHOTCRETE	50
54 WATERPROOFING	50
55 STEEL STRUCTURES	50
56 OVERHEAD SIGN STRUCTURES, STANDARDS, AND POLES.....	50
57 WOOD AND PLASTIC LUMBER STRUCTURES.....	50
58 SOUND WALLS.....	51
59 STRUCTURAL STEEL COATINGS	51
60 EXISTING STRUCTURES.....	51

DIVISION VII DRAINAGE FACILITIES.....	51
61 GENERAL.....	51
62 STORMWATER TREATMENT	51
63 RESERVED	51
64 PLASTIC PIPE.....	51
65 CONCRETE PIPE.....	51
66 CORRUGATED METAL PIPE	52
67 STRUCTURAL PLATE CULVERTS.....	52
68 SUBSURFACE DRAINS.....	52
69 OVERSIDE DRAINS	52
70 MISCELLANEOUS DRAINAGE FACILITIES.....	52
71 EXISTING DRAINAGE FACILITIES	52
DIVISION VIII MISCELLANEOUS CONSTRUCTION	52
72 SLOPE PROTECTION.....	52
73 CONCRETE CURBS AND SIDEWALKS	52
74 PUMPING EQUIPMENT AND CONTROLS	53
75 MISCELLANEOUS METAL.....	53
76 WELLS.....	53
77 LOCAL INFRASTRUCTURE.....	53
78 INCIDENTAL CONSTRUCTION.....	53
79 RESERVED	54
80 FENCES.....	54
DIVISION IX TRAFFIC CONTROL DEVICES	54
81 MISCELLANEOUS TRAFFIC CONTROL DEVICES.....	54
82 SIGNS AND MARKERS	54
83 RAILINGS AND BARRIERS.....	54
84 MARKINGS.....	54
85 RESERVED	54
DIVISION X ELECTRICAL WORK	54
86 GENERAL.....	54
86 GENERAL.....	55
87 ELECTRICAL SYSTEMS	55

88 RESERVED	84
DIVISION XI MATERIALS	84
89 AGGREGATE	84
90 CONCRETE	84
91 PAINT	84
92 ASPHALT BINDERS	84
93 RESERVED	84
94 ASPHALTIC EMULSIONS	85
95 EPOXY.....	85
96 GEOSYNTHETICS.....	85
97–98 RESERVED.....	85
DIVISION XII BUILDING CONSTRUCTION	85
99 BUILDING CONSTRUCTION	85
COUNTY OF SANTA CRUZ DESIGN CRITERIA	86
CITY OF SANTA CRUZ WATER DEPARTMENT (SCWD).....	87

STANDARD PLANS LIST

The standard plan sheets applicable to this Contract include those listed below. The applicable revised standard plans (RSPs) listed below are included in the Information handout.

ABBREVIATIONS, LINES, SYMBOLS, AND LEGEND

A3A	Abbreviations (Sheet 1 of 3)
A3B	Abbreviations (Sheet 2 of 3)
A3C	Abbreviations (Sheet 3 of 3)
A10A	Legend - Lines and Symbols (Sheet 1 of 5)
A10B	Legend - Lines and Symbols (Sheet 2 of 5)
A10C	Legend - Lines and Symbols (Sheet 3 of 5)
A10D	Legend - Lines and Symbols (Sheet 4 of 5)
A10E	Legend - Lines and Symbols (Sheet 5 of 5)
A20A	Pavement Markers and Traffic Lines - Typical Details
RSP A20B	Pavement Markers and Traffic Lines - Typical Details
RSP A20C	Pavement Markers and Traffic Lines - Typical Details
RSP A20D	Pavement Markers and Traffic Lines - Typical Details
A24A	Pavement Markings - Arrows
A24B	Pavement Markings - Arrows and Symbols
A24C	Pavement Markings - Symbols and Numerals
A24D	Pavement Markings - Words
RSP A24E	Pavement Markings - Words, Limit and Yield Lines
A24F	Pavement Markings – Crosswalks
RSP A24G	Pavement Markings – Yield Lines, Limit Lines, and Wrong Way Details

EXCAVATION AND BACKFILL

A62A	Excavation and Backfill - Miscellaneous Details
A62B	Limits of Payment for Excavation and Backfill - Bridge Surcharge and Wall
A62F	Excavation and Backfill - Metal and Plastic Culverts

OBJECT MARKERS, DELINEATORS, CHANNELIZERS, AND BARRICADES

A73A	ObjectMarkers
RSP A73B	Markers
A73C	Delineators, Channelizers and Barricades

CURBS, DRIVEWAYS, DIKES, CURB RAMPS, AND ACCESSIBLE PARKING

A87A	Curbs and Driveways
A88A	Curb Ramp Details
A88B	Curb Ramp and Island Passageway Details

TEMPORARY TRAFFIC CONTROL SYSTEMS

T9	Traffic Control System Tables for Lane and Ramp Closures
T10	Traffic Control System for Lane Closure on Freeways and Expressways
T11	Traffic Control System for Lane Closure on Multilane Conventional Highways
T11A	Traffic Control System for Changeable Lane Closure on Multilane Conventional Highways and Expressways
RSP T15	Traffic Control System for Moving Lane Closure on Multilane Highways
T16	Traffic Control System for Moving Lane Closure on Multilane Highways

TEMPORARY PEDESTRIAN ACCESS ROUTES

T30	Temporary Pedestrian Access Routes – Typical Sidewalk Closure and Pedestrian Detour
T31	Temporary Pedestrian Access Routes – Typical Sidewalk Diversion Within Roadbed
T32	Temporary Pedestrian Access Routes – Typical Sidewalk/Crosswalk Closure and Pedestrian Detour
T33	Temporary Pedestrian Access Routes – Ramp
T34	Temporary Pedestrian Access Routes – Curb Ramp Options

TEMPORARY WATER POLLUTION CONTROL

T56	Temporary Water Pollution Control Details (Temporary Fiber Roll)
------------	---

ROADSIDE SIGNS

RS1	Roadside Signs - Typical Installation Details No. 1
RS2	Roadside Signs - Wood Post - Typical Installation Details No. 2

ELECTRICAL SYSTEMS - LEGEND AND ABBREVIATIONS

RSP ES-1A	Electrical Systems (Legend) (Sheet 1 of 2)
RSP ES-1B	Electrical Systems (Legend) (Sheet 2 of 2)
RSP ES-1C	Electrical Systems (Legend and Abbreviations)

ELECTRICAL SYSTEMS - SIGNAL HEADS, SIGNAL FACES AND MOUNTINGS

RSP ES-4A	Electrical Systems (Signal Heads and Mountings)
------------------	--

RSP ES-4B Electrical Systems (Pedestrian Signal Heads)
RSP ES-4C Electrical Systems (Signal Heads and Mountings)
RSP ES-4D Electrical Systems (Signal Heads Mountings)
RSP ES-4E Electrical Systems (Signal Heads and Optical Detector Mounting)
ES-5C Electrical Systems (Accessible Pedestrian Signal and Push Button Assemblies)

ELECTRICAL SYSTEMS - LIGHTING STANDARDS

ES-6A Electrical Systems (Lighting Standard, Types 15 and 21)
Electrical Systems (Electrolier Anchorage and Grouting for Type 15 and Type 21, barrier Rail Mounted)
ES-6B

ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARD, TYPE TS, AND PUSH BUTTON ASSEMBLY POST

RSP ES-7A Electrical Systems (Signal and Lighting Standard, Types TS, and Push Button Assembly Post)

ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARD

RSP ES-7B Electrical Systems (Signal and Lighting Standard, Types 1 and Equipment Identification Characters)

ELECTRICAL SYSTEMS - SIGNAL AND LIGHTING STANDARD DETAILS

RSP ES-7M Electrical Systems (Signal and Lighting Standard, Detail No. 1)
RSP ES-7N Electrical Systems (Signal and Lighting Standard, Detail No. 2)
RSP ES-7O Electrical Systems (Signal and Lighting Standard, Detail No. 3)

ELECTRICAL SYSTEMS - PULL BOX

RSP ES-8A Electrical Systems (Non-Traffic Pull Box)
RSP ES-8B Electrical Systems (Traffic Pull Box)
RSP ES-8C Electrical Systems (Splice Vaults)

ELECTRICAL SYSTEMS - FIBER OPTIC DETAILS

ES-11 Electrical Systems (Fiber Optic Marker Details)

**COUNTY OF SANTA CRUZ
DEPARTMENT OF COMMUNITY DEVELOPMENT AND INFRASTRUCTURE
DIVISION OF PUBLIC WORKS**

NOTICE TO BIDDERS

The County of Santa Cruz Department of Community Development and Infrastructure Division of Public Works is accepting electronic Proposal submissions for the

ROBERTSON STREET SIGNALIZATION PROJECT

Bid opening will occur on JULY 30, 2026, no later than 2:00 p.m. and soon thereafter, will be publicly opened and read.

GENERAL WORK DESCRIPTION:

The project location in the County of Santa Cruz is as follows:

Intersection of Soquel Drive and Robertson Street

Work includes construction of a new traffic signal at the intersection of Soquel Drive and Robertson Street. Major work includes, but is not limited to:

Furnishing and installing an Adaptive System for a reduction in traffic congestion resulting in improvements to corridor travel times, furnishing and installation of fiber optic cabling for traffic signals coordination, installation of a Transit Signal Priority system for Santa Cruz METRO bus transit, curb, gutter, and sidewalk improvements, and thermoplastic striping.

The work to be performed under the Contract Documents requires that the Contractor possess a Class "A" license at the time that this contract is awarded. The bidder must be licensed under the provisions of Chapter 9, Division 3, of the Business and Professions Code of the State of California to do the type of work contemplated in the "contract documents" and must be skilled and regularly engaged in the general class or type of work called for under this contract. Contractor and all listed subcontractors must be registered with the Department of Industrial Relations pursuant to Section 1725.5 of the Labor Code.

Complete the work within 70 working days.

The estimated cost of the project is \$788,752

Examine the job site and contract documents. Notify the Department of apparent errors and patent ambiguities in the plans, specifications, and bid item list by submitting an electronic inquiry for clarification via the online procurement portal, OpenGov, a minimum of 5 days before bid opening. Failure to do so may result in rejection of a bid or rescission of an award. The correction of the bid documents during the bidding period will be made by issuing an addendum. Any other interpretation or explanation will not be considered binding.

Prevailing wages are required on this Contract. The Director of the California Department of Industrial Relations determines the general prevailing wage rates. Obtain the wage rates at the DIR Web site, <http://www.dir.ca.gov>, or from the Department's Labor Compliance Office of the district in which the work is located.

If the minimum wage rates as determined by the United States Secretary of Labor differs from the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors must not pay less than the higher wage rate. The County does not accept lower State wage rates not specifically included in the federal minimum wage determinations. This includes helper, or other classifications based on hours of experience, or any other classification not appearing in the federal wage determinations. Where federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors must not pay less than the federal minimum wage rate that most closely approximates the duties of the employees in question.

The Department of Community Development and Infrastructure Division of Public Works hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement will be afforded full opportunity to submit bids and will not be discriminated against on the grounds of race, color, religion, gender, or national origin in consideration for an award.

Award shall be on the basis of the total base bid. Award made to the lowest responsive and responsible bidder. The County of Santa Cruz and its Board of Supervisors reserve the right to waive minor irregularities and/ or reject any or all bids received as the public good may require.

Bid protests must be filed in writing with the Director of Community Development and Infrastructure Division of Public Works of the County of Santa Cruz, 701 Ocean Street, Rm. 410, Santa Cruz, California, 95060, by certified or registered mail, or by hand delivery during normal working hours not later than three (3) days after the bid opening or, if the protest is based on the selection of the apparent lowest responsible bidder, not later than three (3) days after selection of the apparent lowest responsible bidder. The protest shall specify the reasons and facts upon which the protest is based.

CONTRACT DOCUMENTS:

A digital copy of the Contract documents is available free of charge and can be downloaded via the online procurement portal, OpenGov, <https://procurement.opengov.com/portal/santacruzcounty>

A hard copy of the Contract documents will be made available for purchase for \$60.00 at the County of Santa Cruz Department of Community Development and Infrastructure Division of Public Works, Room 410, 701 Ocean Street, Santa Cruz, California. No partial sets will be issued.

PROPOSAL INSTRUCTIONS:

Bidders shall create a free of charge account via the online procurement portal, ProcureNow by signing up at <https://procurement.opengov.com/signup>.

For additional information on account registration, see <https://opengov.my.site.com/support/s/>

Once account registration is completed, browse back to this page, <https://procurement.opengov.com/portal/santacruzcounty>, click on the "Project Name", "Submit Response", and follow the instructions to submit the electronic bid.

Only electronic Proposals will be accepted.

Proposal forms for this work must be uploaded via the online procurement portal, OpenGov. Copies are included in a separate book entitled:

BOOK 1 of 2

BID BOOK

FOR CONSTRUCTION OF

ROBERTSON STREET SIGNALIZATION PROJECT

Cashier's check or certified check, payable to the order of the County of Santa Cruz, of not less ten percent (10%) of the bid submitted, payable to the County of Santa Cruz and signed by the bidder as well as a corporate surety, shall accompany the bid. Bidder's bonds shall be issued by a corporate surety duly admitted and authorized to issue bonds and undertakings by the State of California. Scan and upload a copy of your bid bond/cashier's check via the online procurement portal, OpenGov at time of bid.

No later than 4 p.m. on the 5th business day after bid opening, please mail the original bid bond/cashier's or certified check to the Contract Analyst, Rosa Ortiz-Rocha;

Attn: Rosa Ortiz-Rocha

County of Santa Cruz Department of Community Development and Infrastructure
Division of Public Works

Bid Proposal for (insert Project Name)

701 Ocean Street, Room 410
Santa Cruz, CA 95060

Any questions concerning the bid process, required submittals, evaluation criteria, bid schedule, and selection process should be sent through OpenGov.

BID OPENING:

The County of Santa Cruz Department of Community Development and Infrastructure Division of Public Works will conduct bid openings through the videoconferencing platform, Zoom, in lieu of in person attendance.

Bid results will be posted to OpenGov after the bid opening.

To view the live bid opening please go to:

Topic: **ROBERTSON STREET SIGNALIZATION PROJECT**

Date and Time: **JULY 30, 2026 at 2:00 p.m. Pacific Time**

Zoom Meeting: <https://us05web.zoom.us/j/6307868819>

Meeting ID: **630 786 8819**

Pin: **3bugZJ**

Find your local number: <https://santacruzcounty-us.zoomgov.com/u/a4DdWX746>

DEPARTMENT OF COMMUNITY DEVELOPMENT AND INFRASTRUCTURE
COUNTY OF SANTA CRUZ

Date: _____

Matthew Machado

Deputy CEO/

Director of Community

Development and Infrastructure

Investigations of subsurface conditions are made for the purpose of design, and the County assumes no responsibility whatsoever with respect to the sufficiency or accuracy of borings, the log of test borings, or other preliminary investigations, or of the interpretation, and there is no guaranty, either expressed or implied, that the conditions indicated are representative of those existing throughout the work, or any part of it, or that unanticipated conditions may not occur. When a log of test borings is made available to you or included in the Contract Documents, it is expressly understood and agreed that the log of test borings does not constitute a part of the Contract and is made available or included in the Contract Documents only for the convenience of the bidders. Making such information available to bidders is not to be construed in any way as a waiver of the provisions of section 2-1.07, and bidders must satisfy themselves, through their own investigations, as to conditions to be encountered.

Replace the first paragraph of section 2-1.07 with:

Examine the job site and bid documents. Notify the Department of apparent errors and patent ambiguities in the plans, specifications, and Bid Item List by submitting a written request for clarification a minimum of 5 days before bid opening. Failure to do so may result in rejection of a bid or rescission of an award. The correction of the bid documents during the bidding period will be made by issuing an addendum. Any other interpretation or explanation will not be considered binding.

Replace section 2-1.11 with:

2-1.11 IN-USE OFF-ROAD DIESEL-FUELED VEHICLE LIST

Section 2-1.11 applies to non-informal-bid contracts.

Complete and submit the In-Use Off-Road Diesel-Fueled Vehicle List form under section 2-1.33.

On the In-Use Off-Road Diesel-Fueled Vehicle List form, list each fleet used by you or your subcontractor to perform work and is subject to 13 CCR § 2449 et seq. Submit a copy of a valid Certificate of Reported Compliance (13 CCR § 2449, subdivision (n)) for each fleet listed on the form within 10 days of bid opening. Failure to list a fleet used by you or your subcontractor to perform work on the In-Use Off-Road Diesel-Fueled Vehicle List form may result in a nonresponsive bid. Failure to submit the Certificate of Reported Compliance for a fleet listed on the In-Use Off-Road Diesel-Fueled Vehicle List form may result in a nonresponsive bid.

Replace the first paragraph of section 2-1.33A with:

Complete the forms in Book 1 of 2, Bid Book. Submit forms at time of bid unless Section 2-1.33B specifies a different deadline.

Replace section 2-1.33B(1) with:

2-1.33B Bid Form Submittal Schedules

2-1.33B(1) General

The Book 1 of 2, Bid Book includes forms specific to the Contract. Determine the requirements of the Contract and submit the forms based on the schedule specified in section 2-1.33B(2)(c).

Bid forms and information due after the time of bid may be submitted at the time of bid.

Delete section 2-1.33B(2)(b)

Replace section 2-1.33B(2)(c) with:

2-1.33B(2)(c) Contracts without a DBE Goal

2-1.33B(2)(c)(i) General

Section 2-1.33B(2)(c) applies.

2-1.33B(2)(c)(ii) Bid Form Schedule

Submit the bid forms according to the schedule shown in the following table:

Bid Form Submittal Schedule for a Non-Federal Aid Contract

Form	Submittal deadline
Bid to the Department of Transportation	Time of bid except for the public works contractor registration number
Bidder's List of Subcontractors	Time of bid except for the public works contractor registration number
Bidder's List of Subcontractors as submitted at the time of bid with the public works contractor registration number	10 days after bid opening
Bidders Bond	No later than 4 p.m. on the 5 th day after bid opening ^b
In-Use Off-Road Diesel-Fueled Vehicle List	10 days after bid opening

a. Submit only if you choose the option.

b. If the last day for submitting the bid form falls on a Saturday or holiday, it may be submitted on the next business day with the same effect as if it had been submitted on the day specified.

Replace items 2-4 of the list in the first paragraph of section 2-1.34 with:

2. Cashier's check made payable to the County of Santa Cruz
3. Certified check made payable to the County of Santa Cruz
4. Bidder's bond signed by a surety insurer who is licensed in California made payable to the County of Santa Cruz

Add to section 2-1.34:

The Bidder must pay to the County such sums from said cash, bond, certified check, or cashier's check as necessary to reimburse the County for costs incurred for failure of the successful bidder to complete, sign and return in strict compliance with these Contract Documents, the Contractor's Qualification Questionnaire, or enter into a contract. The amount of said cash, bond, certified check, or cashier's check must not be deemed to constitute a penalty or liquidated damages. The County will not be precluded by such cash, bond, certified check, or cashier's check from recovering from the defaulting bidder damages in excess of the amount of said cash, bond, certified check, or cashier's check incurred as a result of the failure of the successful bidder to complete, sign and return in strict compliance with these Contract Documents, if requested to do so, Contractor's Qualification Questionnaire, or enter into a contract.

Replace section 2-1.43 with:

The Department publicly opens and reads bids at the time and place shown on the Notice to Bidders.

Replace section 2-1.46 with:

The Department's decision on the bid amount is final.

The Department may reject:

1. Any and all bids
2. A nonresponsive bid

companies of such changes will in no way relieve the surety or sureties of their obligations under this Contract.

Replace section 3-1.06 with:

3-1.06 CONTRACTOR LICENSE

For a federal-aid contract, the Contractor must be properly licensed as a contractor from contract award through Contract acceptance (23 CFR 635.110).

Replace the first paragraph of section 3-1.07 with:

Within 8 business days of receiving the Notice of Award the successful bidder must submit:

1. Copy of its commercial general liability policy and its excess policy or binder until such time as a policy is available, including the declarations page, applicable endorsements, riders, and other modifications in effect at the time of contract execution. Standard ISO form no. CG 00 01 or similar exclusions are allowed if not inconsistent with section 7-1.06. The allowance of additional exclusions is at the discretion of the Department.
2. Certificate of insurance showing all other required coverages. Certificates of insurance, as evidence of required insurance for the auto liability and any other required policy, must set forth deductible amounts applicable to each policy and all exclusions that are added by endorsement to each policy. The evidence of insurance must provide that no cancellation, lapse, or reduction of coverage will occur without 30 days prior written notice to the Department.
3. Declaration under the penalty of perjury by a CPA certifying the accountant has applied GAAP guidelines confirming the successful bidder has enough funds and resources to cover any self-insured retentions if the self-insured retention is over \$50,000.
4. All forms found in Book 1 of 2 Bid Book under Contract section.

Replace "RESERVED" in section 3-1.09 with:

3-1.09 FRINGE BENEFIT STATEMENT FORM

Submit the Fringe Benefit Statement form in the Bid Book for all trades to be employed.

Replace the third and fifth paragraphs in section 3-1.18 with:

The Contract form will be provided by the County. The County must receive these documents before the 8th business day after the bidder receives the contract. After signing by the County, one copy will be delivered to the Engineer, and one copy will be returned to the bidder.

If the bidder to whom the award is made fails or refuses to enter into the Contract within eight (8) business days of receiving the Notice of Award, the County may then award the Contract to the next lowest responsible bidder. This will be done after the failure or refusal of the low bidder to enter into the Contract, as is convenient for the County. If the next lowest responsible bidder fails or refuses to enter into the Contract, then the County may then award the Contract to the next lowest responsible bidder.

If any one or more of the provisions contained in the Contract should be invalid, illegal, or unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions contained will not in any way be affected or impaired.

This Contract constitutes the full and complete understanding of the parties, and supersedes any previous agreements or understandings, oral or written, with respect to the subject matter hereof. The Contract may only be modified by a written instrument signed by both parties.

Contractor hereby assigns to County all its first-tier subcontracts now or hereafter entered into by Contractor for performance of any part of the work. The assignment will be effective upon acceptance by County in

writing, and only as to those subcontracts, which County designates in writing. Such assignment is part of the consideration to County for entering into the Contract with Contractor and may not be withdrawn.

AA

4 SCOPE OF WORK

Add to section 4-1.02:

All work and materials must be in accordance with the latest adopted standards and regulations of the State Fire Marshal; the Uniform Building Code; the National Electrical Code; the Uniform Plumbing Code; Americans With Disabilities Act; and all other applicable codes, laws, or regulations. Immediately upon signing of the Contract, diligently review the Contract Documents and determine if any work described or inferred within the Contract Documents is not in conformance with these requirements. If you discover work within the Contract Documents not in conformance with these requirements, immediately notify the Engineer in writing. When the work in the Contract Documents differs from governing codes, Contract Sum is based upon the more costly or expensive standard.

Replace section 4-1.06 with:

4-1.06 CHANGED CONDITIONS

4-1.06A DIFFERING SITE CONDITIONS

1. During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the site is disturbed and before the affected work is performed.
2. Upon written notification, the engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding anticipated profits, will be made and the contract modified in writing accordingly. The engineer will notify the contractor of the determination whether or not an adjustment of the contract is warranted.
3. No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has provided the required written notice.
4. No contract adjustment will be allowed under this clause for any effects caused on unchanged work.

4-1.06B SUSPENSIONS OF WORK ORDERED BY THE ENGINEER

1. If the performance of all or any portion of the work is suspended or delayed by the engineer in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, the contractor shall submit to the engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.
2. Upon receipt, the engineer will evaluate the contractor's request. If the engineer agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. The contractor will be notified of the engineer's determination whether or not an adjustment of the contract is warranted.

Both the address given in the proposal and your office in the vicinity of the work are designated as places to either of which drawings, letters, notices, or other articles or communications to the Contractor may be mailed, transmitted electronically or delivered. The mailing, electronic transmission or delivery at either of these places will be deemed sufficient notice. Nothing in the specification is deemed to preclude the service of any drawing, letter, notice, article, or communication to you or your representative personally. Provide written notice to the Engineer to change the address named in the proposal.

You are responsible for verifying that all information and data contained and set forth in all of your and subcontractor's submittals that are required by the Contract Documents comply in all respects with the Contract Documents.

If any particular type or piece of equipment has been banned, or if the Engineer has condemned for use on the work, any piece or pieces of equipment, promptly remove such equipment from the site of the work. Failure to do so within a reasonable time may be considered a breach of contract.

Make arrangements for a construction staging area and provide the Engineer with the Construction Staging Area Notification Form in the Contract, for the approval of the Engineer of those arrangements. Staging area must be in conformance with all County land use and zoning regulations.

Incorporate best management practices such as surfacing the ingress and egress to the construction staging area with gravel, compacted base rock material or other measures to prevent tracking or deposition of mud, dirt, dust and debris onto the public right of way or outside of the staging area. Submit details of the proposed ingress/egress improvements to the Engineer prior to use of said construction staging area. During the course of the work and prior to the end of each work day, clean all tracked materials from the public right of way to the satisfaction of the Engineer. Should you fail to adequately clean the public travel way within a four hour written notice by the Engineer or by the end of the work day, you shall forfeit \$100 to the County plus the cost of any County expenditures to clean the travel way per occurrence. Forfeited amounts and County expenditures will be deducted from the next progress payment.

Provide the Engineer with two working days prior written notice of any work to be done on a Saturday, with the location and type of work to be done specified; and any work done without such notice and without the supervision of an inspector may be ordered removed and replaced at your expense.

Submit contract administrative items described below electronically using the County contracted construction management internet system C-MIS.

1. Requests for Information
2. Submittals
3. Potential Change Orders
4. Extra Work Bills
5. Potential Claim Records
6. SWPPP Inspection Reports
7. Surveying Request
8. Weekly Lane Closure Requests
9. General Correspondence/Notifications required by the contract
10. Notice of Materials to Be Used

Replace the second paragraph of section 5-1.12 with:

Do not assign the right to receive Contract payments to a third party. The Department does not accept the assignment. This does not pertain to escrow accounts established for the sole purpose of depositing retained earnings in accordance with Section 10263 of the Public Contract Code.

Add to section 5-1.13A:

For federal-aid contracts insert form FHWA-1273 in all subcontractor contracts and all lower tier subcontracts.

Replace section 5-1.13E with:

5-1.13E Prompt Payment

Section 5-1.13E applies to a federal-aid contract.

FROM THE AGENCY TO THE CONTRACTORS The Local Agency shall make all project progress payment within 30 days after receipt of an undisputed and properly submitted payment request from the Contractor on a construction contract. If the Local Agency fails to pay promptly, the Local Agency shall pay interest to the Contractor, which accrues at the rate of 10 percent per annum on the principal amount of a money judgment remaining unsatisfied and pro-rated as necessary. Upon receipt of the payment request, the Local Agency shall act in accordance with both of the following:

1. The Local Agency shall review each payment request as soon as feasible after receipt to verify it is a proper payment request.
2. The Local Agency must return any payment request deemed improper by the Local Agency to the Contractor as soon as feasible, but not later than seven (7) days, after receipt. A request returned pursuant to this paragraph shall include documentation setting forth in writing the reasons why it is an improper payment request.

In accordance with California Business and Professions Code section 7108.5, the prime contractor or subcontractor shall pay to any subcontractor, not later than seven days after receipt of each progress payment, unless otherwise agreed to in writing, the respective amounts allowed the contractor on account of the work performed by the subcontractors, to the extent of each subcontractor's interest therein.

In the event that there is a good faith dispute over all or any portion of the amount due on a progress payment from the prime contractor or subcontractor to a subcontractor, the prime contractor or subcontractor may withhold no more than 150 percent of the disputed amount. Any violation of this requirement shall constitute a cause for disciplinary action and shall subject the licensee to a penalty, payable to the subcontractor, of 2 percent of the amount due per month for every month that payment is not made.

Provide a written withhold notification to the subcontractor or other entity and the Engineer no later than 7 days after receipt of the corresponding progress payment that includes the following:

1. Value of the disputed work
2. Amount of the withhold being taken
3. Bid item numbers or change order numbers associated with the disputed work
4. Explanation of the deficiencies of the disputed work and how the corresponding value was calculated
5. Corrective actions to be taken for release of withheld amount

The Department may request additional documentation from you to evaluate whether you applied the withhold in good faith.

In any action for the collection of funds wrongfully withheld, the prevailing party shall be entitled to his or her attorney's fees and costs. The sanctions authorized under this requirement shall be separate from, and in addition to, all other remedies, either civil, administrative, or criminal.

The Contractor must submit Exhibit 9-P to the Local Agency administering the contract by the 15th of the month following the month of any payment(s). If the Contractor does not make any payments to subcontractors, supplier(s) and/or manufacturers they must report "no payments were made to subs this month" and write this visibly and legibly on Exhibit 9-P.

The Department may request additional documentation to verify the information provided on the Prompt Payment Certification form is complete.

Add to section 5-1.16:

Your representative must be available to respond to the job site within 1-2 hours at all times, including non-work hours, weekends and holidays.

Add new Section 5-1.20A(1):

Contractor shall coordinate with Pacific Gas and Electric (PG&E) company for traffic signal and street lighting service disconnect, reconnect, and new service activation. Contractor shall invite PG&E representative to the project pre-construction meeting and any relevant meetings where PG&E coordination is required.

Contractor shall contact PG&E at least 72 hours prior to any major service changes. The PG&E representative is:

Mike Jarvis
New Business Rep (PG&E)
(831) 682-7686
maja@pge.com

Add to section 5-1.23A:

Each submittal must be dated and appropriately titled with the bid item number and project name.

Replace section 5-1.26 with:

5-1.26 CONSTRUCTION SURVEYS

5-1.26A Summary

Section 5-1.26 includes specifications for furnishing and setting construction stakes and marks.

Conform to Chapter 12, Construction Surveys, of the Department's publication entitled, "Surveys Manual," except as amended below.

5-1.26B Action Submittals

Submit for approval proposed construction staking plan prior to placement of any survey points on the project.

Before starting any survey work, submit for Engineer's approval the proposed procedures, methods, equipment, and typical stake markings to be used.

Upon completion of the construction staking and prior to acceptance of the contract, submit all computations, survey notes, and other data used to accomplish the work.

5-1.26C Materials

Stakes must be wooden hubs with sufficient length to assure solid embedment in the grounds. Use nails only when setting points on existing pavement.

5-1.26D Construction

Furnish and set construction stakes and marks required for the completion of the work. Set stakes with accuracy adequate to assure that the completed work conforms to the lines, grades, and sections shown on the plans. Remove construction stakes when no longer needed.

Set hubs using GPS or total stationing. Horizontal tolerances must be within the tolerances specified in the Department's Survey Manual.

Set grade stakes at even 50-foot stations and at vertical and horizontal transition points.

Only use a level to establish the elevations of all hubs and points used for setting grades. Contractor shall submit the required cut-sheets to the Engineer prior to starting any work for approval.

Vertical Control Benchmark has been set by the County and is shown on the plans. If you destroy any of the survey control points, replace the control points at your cost. Notify the Engineer before replacing the control points. The Engineer will verify your work.

You may request the Engineer to replace the control points. Allow ten (10) days for replacement of control points by the Engineer. The cost of verification and replacement, if performed by the Engineer, will be deducted from your payment. You will be allowed an adjustment in contract time for such verification or replacement of survey control points by the Engineer.

Add to section 5-1.31:

Construct and maintain the necessary sanitary conveniences for the use of the workers on the project, properly obscured from public observance.

If you fail or refuse to fulfill these obligations to the County's satisfaction, County may, at its option, undertake these obligations, and withhold the cost of performing these obligations, plus an additional fee of twenty-five percent (25%) for administrative costs, from payments to you.

Add between the 2nd and 3rd paragraphs of section 5-1.36C(3):

During the progress of the work under this Contract, the utility owner will relocate a utility shown in the following table within the corresponding number of working days shown. Notify the Engineer when the site is ready for utility work. After verifying the site is ready for utility work, the Engineer notifies the utility owner. The working days to relocate start on the notification date to the utility owner.

Utility Relocation and Department-Arranged Time for the Relocation

City of Santa Cruz Water Department Water Meter	North side of intersection within existing sidewalk	TBD
--	--	-----

Installation of the utilities shown in the following table requires coordination with your activities. Make the necessary arrangements with the utility company through the Engineer and submit a schedule:

1. Verified by a representative of the utility company

jurisdiction, submit a local material plan for each material at least 60 days before placing the material. The local material plan must include:

1. Certification signed by you and an engineer who is registered as a civil engineer in the State or a professional geologist licensed as a professional geologist by the State stating:

I am aware local material from a noncommercial source or a source not regulated under CA jurisdiction must be sampled and analyzed for pH and lead and may require sampling and analysis under section 6-1.03B(3) for other constituents of concern based on the land use history. I am aware that local material sources must not contain ADL at concentrations greater than 80 mg/kg total lead or equal to or greater than 5 mg/L soluble lead as determined by the Waste Extraction Test (WET) Procedures, 22 CA Code of Regs § 66261.24(a)(2) App II. I am aware that a maximum quantity of material may be excavated at the site based on the minimum number of samples taken before excavating at the site under section 6-1.03B(3).

2. Land use history of the local material location and surrounding property
3. Sampling protocol
4. Number of samples per volume of local material
5. QA and QC requirements and procedures
6. Qualifications of sampling personnel
7. Stockpile history
8. Name and address of the analytical laboratory that will perform the chemical analyses
9. Analyses that will be performed for lead and pH
10. Other analyses that will be performed for possible hazardous constituents based on:
 - 10.1. Source property history
 - 10.2. Land use adjacent to source property
 - 10.3. Constituents of concern in the ground water basin where the job site is located

The plan must be sealed and signed by an engineer who is registered as a civil engineer in the State or a professional geologist licensed as a professional geologist by the State.

If the plan requires revisions, the Engineer provides comments. Submit a revised plan within 7 days of receiving comments. Allow 7 days for the review.

6-1.03B(3) Analytical Test Results

At least 15 days before placing local material, submit analytical test results for each local material obtained from a noncommercial source or a source not regulated under CA jurisdiction. The analytical test results must include:

1. Certification signed by an engineer who is registered as a civil engineer in the State or a professional geologist licensed as a professional geologist by the State stating:

The analytical testing described in the local material plan has been performed. I performed a statistical analysis of the test results using the US EPA's ProUCL software with the applicable 95 percent upper confidence limit. I certify that the material from the local material source is suitable for unrestricted use at the job site, it has a pH above 5.0, does not contain soluble lead in concentrations equal to or greater than 5mg/l as determined by the Waste Extraction Test (WET) Procedures, 22 CA Code of Regs § 66261.24(a)(2) App II, does not contain lead in concentrations above 80 mg/kg total lead, is free from all other contaminants identified in the local material plan, and will comply with the job site's basin plan and water quality objectives of the RWQCB.

2. Chain of custody of samples
3. Analytical results no older than 1 year

4. Statistical analysis of the data using US EPA's ProUCL software with a 95 percent upper confidence limit
5. Comparison of sample results to hazardous waste concentration thresholds and the RWQCB's basin plan requirements and water quality objectives for the job site location

6-1.03B(4) Sample and Analysis

Sample and analyze local material from a (1) noncommercial source or (2) a source not regulated under CA jurisdiction:

1. Before bringing the local material to the job site
2. As described in the local material plan
3. Under US EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)

The sample collection must be designed to generate a data set representative of the entire volume of proposed local material.

Before excavating at the (1) noncommercial material source or (2) a source not regulated under CA jurisdiction, collect the minimum number of samples and perform the minimum number of analytical tests for the corresponding maximum volume of local material as shown in the following table:

Minimum Number of Samples and Analytical Tests for Local Material

Maximum volume of imported borrow (cu yd)	Minimum number of samples and analytical tests
< 5,000	8
5,000–10,000	12 for the first 5,000 cu yd plus 1 for each additional 1,000 cu yd or portion thereof
10,000–20,000	17 for the first 10,000 cu yd plus 1 for each additional 2,500 cu yd or portion thereof
20,000–40,000	21 for the first 20,000 cu yd plus 1 for each additional 5,000 cu yd or portion thereof
40,000–80,000	25 for the first 40,000 cu yd plus 1 for each additional 10,000 cu yd or portion thereof
> 80,000	29 for the first 80,000 cu yd plus 1 for each additional 20,000 cu yd or portion thereof

Do not collect composite samples or mix individual samples to form a composite sample.

Analyze the samples using the US EPA's ProUCL software with a 95 percent upper confidence limit. All chemical analysis must be performed by a laboratory certified by the SWRCB's Environmental Laboratory Accreditation Program (ELAP).

The analytical test results must demonstrate that the local material:

1. Is not a hazardous waste
2. Has a pH above 5.0
3. Has an average total lead concentration, based upon the 95 percent upper confidence limit, at or below 80 mg/kg
4. Is free of possible contaminants identified in the local material plan
5. Complies with the RWQCB's basin plan for the job site location
6. Complies with the RWQCB's water quality objectives for the job site location

6-1.03B(4) Sample and Analysis

Sample and analyze local material from a (1) noncommercial source or (2) a source not regulated under CA jurisdiction:

1. Before bringing the local material to the job site
2. As described in the local material plan
3. Under US EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)

The sample collection must be designed to generate a data set representative of the entire volume of proposed local material.

Before excavating at (1) a noncommercial material source or (2) a source not regulated under CA jurisdiction, collect the minimum number of samples, and perform the minimum number of analytical tests for the corresponding maximum volume of local material as shown in the following table:

Minimum Number of Samples and Analytical Tests for Local Material

Maximum volume of imported borrow (cu yd)	Minimum number of samples and analytical tests
< 5,000	8
5,000–10,000	12 for the first 5,000 cu yd plus 1 for each additional 1,000 cu yd or portion thereof
10,000–20,000	17 for the first 10,000 cu yd plus 1 for each additional 2,500 cu yd or portion thereof
20,000–40,000	21 for the first 20,000 cu yd plus 1 for each additional 5,000 cu yd or portion thereof
40,000–80,000	25 for the first 40,000 cu yd plus 1 for each additional 10,000 cu yd or portion thereof
> 80,000	29 for the first 80,000 cu yd plus 1 for each additional 20,000 cu yd or portion thereof

Do not collect composite samples or mix individual samples to form a composite sample.

Statistically analyze the samples' laboratory results using the US EPA's ProUCL software to define 95 percent upper confidence limit for the various contaminants of concern. All chemical analysis must be performed by a laboratory certified by the SWRCB's Environmental Laboratory Accreditation Program (ELAP).

The analytical test results must demonstrate that the local material:

1. Is not a hazardous waste
2. Has a pH above 5.0
3. Has an average total lead concentration, based upon the 95 percent upper confidence limit, at or below 80 mg/kg
4. Is not contaminated with local material plan-identified constituents of concern at average concentrations (95 percent upper confidence limits) in excess of their respective commercial/industrial San Francisco Bay RWQCB environmental screening levels ESLs, except for arsenic.
5. Does not contain any of the following compounds, chemicals, or elements at an estimated average concentration (95 percent upper confidence limit) above the maximum allowed concentration defined in the following table:

Compound/Chemical	Maximum allowed concentration (mg/kg)
Arsenic	11
Barium	1500
Benzene	1
Beryllium	10
Cadmium	10
Chromium (total)	1000
Cobalt	100
Diesel	150
Ethylbenzene	10
Gasoline	500
Mercury	10
Motor oil	500
Nickel	150
Selenium	10
Toluene	10
Trichloroethene	1
Vanadium	200
Xylenes	10
Zinc	600

6-1.03C Local Material Management

Do not place local material until authorized.

If the Engineer determines the appearance, odor, or texture of any delivered local material suggests possible contamination, sample and analyze the material. The sampling and analysis is change order work unless (1) hazardous waste is discovered or (2) the analytical test results indicate the material does not comply with section 6-1.03B(3).

Dispose of noncompliant local material at an appropriately permitted CA Class I, CA Class II or CA Class III facility. You are the generator of noncompliant local materials.

Replace 5th paragraph section 6-2.01A:

The Department uses a Quality Assurance Program (QAP) to ensure a material is produced to comply with the Contract. The Local Agency may examine the records and reports of tests the prime contractor performs if they are available at the job site. Schedule work to allow time for QAP. For a copy of the manual, contact the Department.

Add to section 6-2.03A:

The Department may use multiple acceptance methods for a material.

Specifications in sections titled "Department Acceptance" do not include all requirements on which the Department makes its acceptance.

The Department may inspect, sample, and test materials for compliance with the Contract at any time.

Allow the Department to record, including photograph and video, to ensure a material is produced to comply with the Contract.

You may examine the records and reports of tests the Department performs if they are available at the job site.

Schedule work to allow time for the Department's QAP (inspection, sampling, testing, etc.)

The Department deducts testing costs for work that does not comply with the Contract.

The Department may retest material previously tested and authorized for use. If the Department notifies you of a retest, furnish resources for retesting.

Remove from the site all rejected materials brought to, or incorporated in, the work. Do not propose to use the rejected materials again. All work that has been rejected must be remedied, or removed and replaced, in an acceptable manner at your expense. If you fail to comply within 48 hours or to make satisfactory progress in so doing, the County may remove rejected materials, or rejected work and deduct and retain the costs from any payments due or to become due.

AA

7 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

Replace section 7-1.02J with:

COUNTY EQUAL OPPORTUNITY EMPLOYMENT CONTRACT COMPLIANCE DEFINITIONS AND PROVISIONS.

The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, national origin, ancestry, physical or mental disability, medical condition (cancer related), marital status, pregnancy, gender, sexual orientation, age (over 18), veteran status or any other non-merit factor unrelated to job duties. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection of training including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notices setting forth the provisions of this non-discrimination clause.

In the event of the Contractor's non-compliance with the non-discrimination clauses of this Contract or with any of the said rules, regulations or orders, this Contractor may be declared ineligible for further contracts with the County.

For all contracts in excess of \$50,000.00 where the Contractor employs at least 15 employees, the Department will require the inclusion of the following equal opportunity clauses as a condition of the Contract:

1. The Contractor shall state that it is an equal opportunity employer in all solicitations or advertisements for employees placed by or on behalf of the Contractor, and ensure that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, ancestry, physical or mental disability, medical condition (cancer related), pregnancy, marital status, gender, sexual orientation, age (over 18), veteran status or any other non-merit factor unrelated to job duties.
2. All County contracts must comply with the non-discrimination requirements of both the State and Federal governments. Certain specific projects conducted under State and/or Federal oversight may have additional definitions and requirements.
3. If applicable according to the contract-funding source, the Contractor will comply with all of the rules, regulations and orders of the Secretary of Labor, which include furnishing required information and report.

Replace the second paragraph of section 7-1.02K(2) with:

The general prevailing wage rates and any applicable changes to these wage rates are available from the Department of Industrial Relations' website.

Add to section 7-1.02K(2):

Pay travel and subsistence payments to each worker needed to execute the work, as such travel and subsistence are defined in the applicable collective bargaining agreements. (Labor Code § 1773.8)

Add to section 7-1.02K(3):

Submit electronic certified payroll records required under California Labor Code Section 1776 to the Labor Commissioner pursuant to California Code of Regulations Chapter 8, Section 16404.

Replace the 12th paragraph in section 7-1.03 with:

The Engineer may order or consent to your request to open a completed or partially completed portion of work for public use. You will not be compensated for any delay to your construction activities caused by the public. This does not relieve you from any other contractual responsibility. Opening the work to traffic does not automatically deem it complete and acceptable per the contract documents.

Add to section 7-1.03:

Normal working hours are 7:30 AM to 5:00 PM Monday through Friday. All work involving heavy equipment or traffic control must be done between 8:30 AM and 4:30 PM unless otherwise specified.

Replace section 7-1.06 with:

7-1.06 INSURANCE

7-1.06A General

Nothing in the Contract is intended to establish a standard of care owed to any member of the public or to extend to the public the status of a third-party beneficiary for any of these insurance specifications.

7-1.06B Casualty Insurance

Obtain and maintain insurance on all of your operations with companies acceptable to the County as follows:

1. Keep all insurance in full force and effect from the start of the work through Contract acceptance.
2. Maintain completed operations coverage with a carrier acceptable to the County through the expiration of the patent deficiency in construction statute of repose set forth in Civ Pro Code § 337.1.
3. All insurance must be with an insurance company with a rating from A.M. Best Financial Strength Rating of A- or better and a Financial Size Category of VII or better.

If you utilize one or more subcontractors in the performance of this Contract, obtain and maintain Independent Contractor's Insurance for each subcontractor or provide evidence of insurance coverage for each subcontractor equivalent to that required.

7-1.06C Workers' Compensation and Employer's Liability Insurance

Under Labor Code § 1860, secure the payment of worker's compensation under Labor Code § 3700.

Submit to the Department the following certification before performing the work (Labor Code § 1861):

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

Contract signing constitutes your submittal of this certification.

Provide Employer's Liability Insurance in amounts not less than:

1. \$1,000,000 for each accident for bodily injury by accident
2. \$1,000,000 policy limit for bodily injury by disease
3. \$1,000,000 for each employee for bodily injury by disease

coverage shall contain a waiver of subrogation in favor of the County, including its officers, directors, agents, and employees.

If there is an exposure of injury to your employees under the US Longshoremen's and Harbor Workers' Compensation Act, the Jones Act, or under laws, regulations, or statutes applicable to maritime employees, coverage must be included for such injuries or claims.

7-1.06D Liability Insurance 7-1.06D(1) General

Evidence General Liability and Umbrella or Excess Liability Insurance covering all operations by or on behalf of you providing insurance for bodily injury liability, property damage liability, and personal and advertising injury for the limits outlined in 7-1.06D(2). Coverage must extend to premises, operations and mobile equipment, personal and advertising injury, products and completed operations, and contractual liability. Coverage shall not contain a cross-suits exclusion barring coverage for a suit brought by or between County and another Insured in the policy. Coverage shall also not contain an exclusion for explosion, collapse and underground hazards. Such policies must contain an annual reinstatement of limits during construction operations.

7-1.06D(2) Liability Limits/Additional Insureds

The County of Santa Cruz requires Contractors to provide a copy of their insurance certificate with the information and limits outlined below:

1. Include Contractor/vendor name and current address.
2. General Liability (Comprehensive or Commercial Liability) Coverage
 - 2.1 \$2,000,000 combined single limit required
 - 2.2 \$2,000,000 Products – Comp./Op. Agg. required
 - 2.3 Damage to Rented Premises – required coverage
 - 2.4 Medical Expenses (bodily injury) – required coverage
 - 2.5 Personal & Adv. Injury – required coverage
 - 2.6 General Aggregate – required coverage
 - 2.7 The box for 'Occur' should be checked
3. Automobile Liability Coverage
 - 3.1 Required unless the Contractor does not drive a vehicle in conjunction with any part of the performance of the contract and certifies to this fact
 - 3.2 \$1,000,000 combined single limit (minimum requirement)
 - 3.3 'Any Auto' selection preferred
4. Workers Compensation (see section 7-1.06C)
5. Additional Insurances
 - 5.1 Professional Liability (required for professional services; recommended coverage for other services) \$1,000,000 combined single limit (minimum requirement when required)
6. Umbrella Liability
7. All policies of Comprehensive or Commercial General Liability shall be endorsed to contain the following clause:

“*County, its officials, employees, agents and volunteers as additional insureds with respect to liability arising out of the work or operations and activities performed by or on behalf of 'CONTRACTOR', including materials, parts or equipment furnished in connection with such work or operations.”

Endorsements shall be at least as broad as ISO Form CG 20 10 11 85, or both CG 20 10 10 01 and CG 20 37 10 01, covering both ongoing operations and products and completed operations.

8. All required insurance policies shall be endorsed to contain the following clause:

“This insurance shall not be canceled until after thirty (30) days’ prior written notice (10 days for nonpayment of premium) has been given to *County.”

9. County must be named as certificate holder. Correct address must also be entered, along with room number.

The limits of liability must be at least the values shown in the following table:

Total bid	For Each Occurrence ^a	Aggregate for products/completed operation	General aggregate ^b	Umbrella or excess liability ^c
< \$1,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$5,000,000
> \$1,000,000 <\$10,000,000	\$2,000,000	\$2,000,000	\$2,000,000	\$10,000,000
> \$10,000,000 < \$25,000,000	\$2,000,000	\$2,000,000	\$4,000,000	\$15,000,000
> \$25,000,000	\$2,000,000	\$2,000,000	\$4,000,000	\$25,000,000

^a combined single limit for bodily injury and property damage. This limit must apply separately to your work under this Contract.

^b This limit must apply separately to your work under this Contract.

^c The umbrella or excess policy must contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted. The required umbrella liability limits are separate from and in addition to the required general liability limits. The umbrella or excess policies shall not contain exclusions barring follow-form coverage for required coverages in this specification.

7-1.06D(3) Contractor's Insurance -Waiver of Subrogation

The policy must stipulate that coverage contains a waiver of subrogation in favor of the State, including its officers, directors, agents (excluding agents who are design professionals), and employees.

7-1.0D(4) Contractor's Insurance - Separation of Insureds

The policy must stipulate that coverage shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

7-1.0E Automobile Liability Insurance

Coverage shall be provided per section 7-1.06D(2).

7-1.0F Policy Forms, Endorsements, and Certificates

Coverage shall be provided per section 7-1.06D(2).

7-1.0G Deductibles

Pay all deductibles and self-insured retentions (SIR) within 5 working days.

7-1.0H Enforcement

The Department may assure your compliance with your insurance obligations. Ten days before an insurance policy lapses, expires, or is canceled during the Contract period you must submit to the Department evidence of renewal through a binder or specimen copies of such policies or complete replacement of the policy.

If you fail to maintain any required insurance coverage, the Department may maintain this coverage and withhold or charge the expense to you or terminate your control of the work.

Any failure to comply with the reporting provisions of your policy shall not affect coverage provided to the County, including its officers, directors, agents (excluding agents who are design professionals), and employees.

You are not relieved of your duties and responsibilities to indemnify, defend, and hold harmless the County, its officers, agents, and employees by the Department's acceptance of insurance policies and certificates.

The minimum insurance coverage amounts do not relieve you for liability in excess of such coverage, nor do they preclude the County from taking other actions available to it, including the withholding of funds under this Contract.

7-1.01 Self-Insurance

Self-insurance programs and self-insured retentions in insurance policies are subject to separate annual review and approval by the County.

If you use a self-insurance program or self-insured retention, you must provide the County with the same protection from liability and defense of suits as would be afforded by first-dollar insurance. Execution of the Contract is your acknowledgment that you will be bound by all laws as if you were an insurer as defined under Ins Code § 23 and that the self-insurance program or self-insured retention shall operate as insurance as defined under Ins Code § 22.

AA

8 PROSECUTION AND PROGRESS

Add to section 8-1.03:

In addition, be prepared to discuss the scope of work, contract drawings, specifications, existing conditions, materials to be ordered and all essential matters pertaining to the prosecution and satisfactory completion of the project.

Replace Reserved section 8-1.04A with:

The Contractor shall begin work per section 8-1.04, Start of Job Site Activities within 15 calendar days after receiving Notice of Contract Execution.

This work shall be diligently prosecuted to completion before the expiration of working days beginning on the fifteenth calendar day after the date shown on the Notice of Contract Execution.

Add to section 8-1.04B:

Submittals Required for Approval Prior to Start of Work
Level 1 Critical Path Method Schedule
Construction Staging Area Notification Form
Traffic Control Plan
Temporary Water Pollution Control Plan (CT submits 7 days after contract approval, see 13-2.01C)
Adaptive traffic signal system hardware
Transit Signal Priority (TSP) hardware
Camera mounting hardware
Category 6 cable
Electrical service conductors
Ethernet access device

Add to section 8-1.06:

During unfavorable weather and other unfavorable conditions, the Contractor shall pursue only such portions of the work as will not be damaged thereby. No portions of the work the satisfactory quality or efficiency of which will be affected by any unfavorable conditions shall be constructed while these

conditions remain, unless, by special means or precautions approved by the Engineer, the Contractor shall be able to overcome these conditions.

Replace section 8-1.10 with:

The Contractor shall begin work within 15 calendar days after the issuance of the Contract Execution.

This work shall be diligently prosecuted to completion before the expiration of working days beginning on the fifteenth calendar day after the date shown on the Contract Execution.

The Department specifies liquidated damages (Pub Cont Code § 10226). Liquidated damages, if any, accrue starting on the 1st day after the expiration of the working days through the day of Contract acceptance except as specified in sections 8-1.10B and 8-1.10C.

The Contractor shall pay to the County liquidated damages in the sum of **\$1,500 per day**, for each and every calendar days' delay in finishing the work in excess of the number of working days prescribed above.

The Department may withhold liquidated damages before the accrual date if the anticipated liquidated damages may exceed the value of the remaining work.

If all work except plant establishment or permanent erosion control establishment is complete and the total number of working days have expired, liquidated damages are \$950 per day.

Replace the 4th paragraph of section 8-1.13 with:

The Department gives notice to you and your surety at least 5 business days before terminating control. The notice describes the failures and the time allowed to remedy the failures. If failures are not remedied within the time provided, the Department will take control of the work or require your surety to complete it.

If the Contractor should be adjudged bankrupt, or make an assignment for the benefit of Contractor's creditors, or if a receiver should be appointed on account of Contractor's insolvency, the County may declare the Contractor's control over the work terminated, and so notify the Contractor and Contractor's sureties.

Upon such termination, the County may take possession, and use all or any part, of the Contractor's materials, tools, equipment, and appliances upon the premises to complete the work; the County assuming responsibility for the final relinquishment of such equipment at the conclusion of the work, or sooner, at its option, in as good condition as when it was taken over, reasonable wear and tear excepted; and the County agrees to pay for such materials and the use of said equipment at a reasonable compensation.

Upon such termination or the County's declaration that the Contractor is in default, the County may direct the Surety to complete, or cause to be completed, the Contract work, or the County may direct that all or any part of the work be completed by day labor, or by employment of other contractors on informal contracts, or both. If the County directs the Surety to complete or cause to be completed, the Contract work, Contractor's performance bond surety agrees to immediately undertake to complete or cause to be completed, all Contract work.

If your control over the work is terminated and the County takes control of the work, you are not entitled to receive any portion of the amount to be paid under the Contract until it is fully completed. After completion, if the unpaid balance exceeds the sum of the amount expended by the County in finishing the work, plus all damages sustained, or to be sustained, by the County, plus any unpaid claims on account of labor, materials, tools, equipment, or supplies contracted for by the Contractor for the work herein contemplated, the excess not otherwise required by these Contract Documents to be retained will be paid you. If the sum so expended exceeds the unpaid balance, you and your surety are liable to the County for the amount of such excess.

If the County directs the Surety to complete or cause to be completed, the Contract work, your performance bond surety agrees to immediately undertake to complete or cause to be completed, all Contract work. The surety will be subrogated to money due under the Contract, and to money which will become due in the course of completion by the surety. However, you and Surety agree that any subrogation rights of surety are subordinate to and inferior to the rights of the County.

Replace item 3 on the list in the 1st paragraph of section 8-1.14E with:

3. Allowance for profit not to exceed 4 percent of the cost of the work performed to the date of termination plus demobilization.

AA

9 PAYMENT

Add to section 9-1.03:

If you fail to include a unit price for a particulate item the unit price will be calculated dividing the bid amount by the quantity for that item and rounding to the nearest penny. Rounding may affect the bid item total.

Replace section 9-1.07 with:

Reserved

Add to section 9-1.16A with:

9-1.16A(1) PROMPT PAYMENT

FROM THE AGENCY TO THE CONTRACTORS

Contractor invoices do not control payment- payment is based on the Engineer's progress estimate. For purposes of prompt payment requirements outlined in Public Contract Code Section 20104.50, the approved Engineer monthly progress estimate shall constitute the payment request. The Engineer-prepared progress estimate shall be signed by the Engineer within 7 days of the close of the payment period, which will be the last day of each month. The Agency shall pay each undisputed portion of the progress payment within thirty (30) days after a monthly progress payment is signed by the Engineer. Disputes must be submitted by a Request For Information within 5 days of receipt of the signed progress payment.

Replace section 9-1.16F with:

Retention will be 5% and conform to PCC 7201.

The agency shall hold retainage from the prime contractor and shall make prompt and regular incremental acceptances of portions, as determined by the agency of the contract work and pay retainage to the prime contractor based on these acceptances. The prime contractor or subcontractor shall return all monies withheld in retention from all subcontractors within seven (7) days for construction contracts and fifteen (15) days for consultant contracts after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract work by the agency. Any delay or postponement of payment may take place only for good cause and with the agency's prior written approval. Any violation of these provisions shall subject the violating prime contractor or subcontractor to the penalties, sanctions, and other remedies specified in Section 7108.5 of the California Business and Professions Code and Section 10262 of the California Public Contract Code for construction contracts, and Section 3321 of the California Civil Code for consultant contracts. This requirement shall not be construed to limit or impair any contractual, administrative or judicial remedies otherwise available to the contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the contractor; deficient subcontractor performance and/or noncompliance by a subcontractor. This clause applies to both DBE and non-DBE subcontractors.

Replace the 1st paragraph of section 9-1.17D(1):

If you accept the proposed final estimate or do not submit a claim statement within 30 days of receiving the estimate, the Engineer provides you the final estimate. A minimum of 60 days from proposed final estimate acceptance is required for recordation of Notice of Completion and Board of Supervisors

12-3.11D PAYMENT

Replace *Not Used* in section 12-3.11D with:

Construction area signs are included in the payment for Traffic Control System, including signs required per section 5-1.20B(3), section 12-3.11, Project Notification Signs, No Parking Signs, doorknob hangers, and any additional signs detailed in the plans or specs.

Add to the end of section 12-4.02C(1):

Keep the full width of the traveled way open to traffic when no active construction activities are occurring in the traveled way or within 2 feet of the traveled way and on:

1. Friday after 3:00 p.m.
2. Saturday
3. Sunday
4. Designated holidays
5. Special days

Keep the full width of the traveled way open to traffic when no active construction activities are occurring in the traveled way or within 2 feet of the traveled way.

Add to the end of section 12-4.02C(8)(a):

If shoulders are closed, use one of the following advance warning signs:

1. W20-1 (Road Work Ahead)
2. W21-5b (Right/Left Shoulder Closed Ahead)
3. C24(CA) (Shoulder Work Ahead)

Add between the 1st and 2nd paragraphs of section 12-4.04C:

A pedestrian facility closure on the same side of the highway is limited to no more than 1 block. When working on one side of the highway, the pedestrian facility on opposite side of the highway within the same block must be open.

Concurrent pedestrian facility closures on the same side of the highway must be spaced at least 2 blocks apart.

For an intersection with 4 quadrants, close the side serving the 2 quadrants in the same direction of travel.

At the locations listed below, schedule operations such that pedestrian facility closure does not exceed the number of working days shown:

Location	Pedestrian Facility	Working Days
Various Isolated Curb Ramps/ Driveways	Sidewalk/ curb ramp/ Driveway with less than 200' of additional sidewalk past the curb return	6
Various curb/ gutter/ sidewalk	Contiguous lengths of 200' to 700'	10
Various curb/ gutter/ sidewalk	Contiguous lengths of greater than 700'	14

Add to Section 12-3.32A(1):

Traffic Control shall include the use of changeable message signs. The Contractor shall place changeable message signs beginning at least 4 working days prior to and throughout any construction that causes delays or lane closure. At least three (3) changeable message signs shall be provided to improve the awareness of motorists.

Replace the table in the definition of *designated holidays* in section 12-4.02A(2) with:

Designated Holidays

Holiday	Date observed
New Year's Day	January 1st
Martin Luther King Jr. Day	3rd Monday in January
Lincoln's Birthday	2nd Monday in February
George Washington's Birthday	3rd Monday in February
Farmworkers Day	March 31st
Memorial Day	Last Monday in May
Independence Day	July 4th
Labor Day	1st Monday in September
Indigenous People's Day	2nd Monday in October
Veterans Day	November 11th
Thanksgiving	4th Thursday and Friday in November
Christmas Day	December 25th

Replace section 12-4.02A(3)(b) with:

Every Monday by noon, submit to the Engineer the lane closure schedule, in accordance with previously approved traffic control plans, for closures planned for the next week. The next week is defined as Sunday at noon through the following Sunday at noon. Lane closure requests are an informational submittal which must utilize form "Weekly Traffic Control Schedule". Late submittals or revisions will only be authorized at the discretion of the Engineer.

The Engineer notifies you of submitted closures which are not authorized and closures that require coordination with other parties as a condition for authorization

Cancel closure requests by notifying the Engineer at least 48 hours before the start time of the closure.

Replace section 12-4.02C(2) with:

See section 12-4.02A(3)(b) for lane closure requests.

Replace section 12-4.02C(3)(f) with:

Lane Closure Restrictions For Designated Holidays And Special Days											
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun	Mon
x	H xx	xx	xx								
	SD xx										
x	xx	H xx	xx								
		SD xx									
	x	xx	H xx	xx							
			SD xx								
	x	xx	xx	H xx	xxx						
	x	xx	xx	SD xx	xxx						
				x	H xx						
				x	SD xx						
					x	H xx					
						SD xx					
						x	H xx	xx	xx	xx	
							SD xx				
Legend:											
x	The full width of the traveled way must be open for use by traffic after 1400.										
xx	The full width of the traveled way must be open for use by traffic.										
xxx	The full width of the traveled way must be open for use by traffic until 1000.										
H	Designated holiday										
SD	Special day										

AA

Add to the end of section 87-1.03B(1) of the RSS for section 87:

Where 4 or more 2 & 3-inch conduit enter a No. 6 pull box, the conduit must enter at an angle not greater than 45 degrees from the horizontal.

Add to the beginning of section 87-1.03B(3)(a):

Use Type 3 conduit for underground installation.

Add to the beginning of section 87-1.03B(5):

Prior to performing jacking or drilling, the Contractor shall:

- Perform a pre- and post- test (by camera), of all city sewers and storm drains within the bore path.
- Contractor shall notify USA, and shall not perform any conduit installation until all utilities have been marked and or cleared by the USA department.
 - Provide USA tickets to the County for all utility responses, with utility contact information.
- Verify marked utilities by potholing and visual inspection to confirm depth and locations of utilities.
- A bore path profile shall be developed and submitted to the County Engineer for review and approval. The bore path profile shall include the utility location information gathered from the steps listed above.

Replace the 3rd paragraph of section 87-1.03C(1) with:

Install a pull box on a bed of crushed rock.

Add to the end of section 87-1.03C(3):

Where a traffic pull box is adjacent to a post or standard, place the box within 5 feet upstream from traffic if practical.

Replace the 1st paragraph of section 87-1.03F(2)(c)(ii) with:

Install a Type B loop detector lead-in cable in conduit.

Replace the 1st paragraph of the RSS for section 87-1.03F(3)(c)(ii) with:

Use a Type 2 loop wire.

Replace the 2nd paragraph of section 87-1.03H(2) with:

Use Method B to insulate a splice.

Add between the 1st and 2nd paragraphs of section 87-1.03J:

Use coupling nuts (Sleeve nuts) on Type 1-B Standard.

Add to the end of section 87-1.03L(2)(a):

Run the neutral conductor from the service equipment enclosure to the controller cabinet without splicing to any other neutral conductor.

Add to the end of section 87-1.03Q(1):

Install a DIN-rail mounting bracket in the controller cabinet.

Add to the end of section 87-1.03T:

A manufacturer's representative must program the **Accessible Pedestrian Signals (APS)** at the following **signalized intersections**:

1. Intersection of Soquel Avenue and 7th Street

When the extended pushbutton press is used, program the signals with messages for each street as follows:

1. During the pedestrian clearance interval, the message heard must be *Wait to Cross Soquel Avenue. Wait.*

A manufacturer's representative must program the **Accessible Pedestrian Signals (APS)** at the following **unsignalized pedestrian crossings**:

1. Intersection of Soquel Drive and Robertson Street

Add new section 87-4.05:

87-4.05 COMMUNICATIONS NETWORK EQUIPMENT

87-4.05A Summary

Section 87-4.05 includes general specifications for the ethernet-over-fiber device and cellular modem.

87-4.05B Ethernet-over-Fiber Device

The Contractor shall furnish and install an Etherwan Ex78900E series hardened switch (or approved equivalent).

The Fiber Optic Network Switch shall include the following items:

- 10/100/1000 Mbps Single Mode Rugged LC SFP (2 fibers per port)
- Field-hardened power transformer

The Contractor shall submit documentation on the proposed Fiber Ethernet device to the Engineer for review and approval prior to procurement.

87-4.05B(1) Materials

The Ethernet device shall operate with other Ethernet devices over single mode fiber optic cabling (SMFO) to extend or bridge field Ethernet networks for Intelligent Transportation Systems (ITS) and traffic signal systems. The Ethernet device shall be interoperable with industry standard Ethernet network capable equipment and rated for use in outdoor enclosures without the use of mechanical cooling. Operations of the Ethernet device shall be transparent to end users and other industry standard Ethernet network capable equipment.

The Contractor shall provide all necessary mounting hardware, power supplies, cables, and connectors required for installation of the Ethernet device to a din rail in type 332 & 342 cabinets, and on the shelf of Type Nema P cabinet.

The Ethernet device shall be rated for outdoor enclosure installation. All wiring and cabling shall be done per Caltrans Transportation Electrical Equipment Specifications (TEES) Section 1.3.13, "Wiring/Cabling/Harnesses".

The switch shall be a managed, environmentally hardened and intended for industrial applications and shall meet or exceed the NEMA TS2 - 2003 environmental requirements. The switch shall meet, at a minimum, the following requirements:

- A minimum of four (4) 10/100/1000 SFP ports (transmit and receive) capable of transmitting Ethernet data at up to 1000 Mb/s over single-mode fiber, full duplex (SFP ports)
- Minimum of Twelve (12) 10/100/1000 Base-T copper port to accept RJ-45 connectors capable of transmitting Ethernet data at 10, 100, or 1000 Mb/s, full duplex.
- Switch shall be capable of operating using an input voltage of 120VAC at 60Hz with a maximum power consumption of 240 watts, or shall come equipped with power supplies capable of doing so.
- Switch ports shall comply with the following standards:
 - IEEE 802.3 10BASE-T
 - IEEE 802.3u 100BASE-TX/100BASE-FX
 - IEEE 802.3ab 1000BASE-T
 - IEEE 802.3ad link aggregation control
 - IEEE 802.3z 1000BASE-SX/1000BASE-LX
 - IEEE 802.3x full duplex and flow control
 - IEEE 802.1D STP
 - IEEE 802.1p QoS
 - IEEE 802.1Q Tag VLANs
 - IEEE 802.1s MSTP
 - IEEE 802.1w RSTP
 - IEEE 802.1x PNAC
 - IEEE 802.1ab LLDP
- Wire speed switching on all ports simultaneously, non-blocking
- IEEE 802.1Q VLAN Tagging 4 port trunking groups with up to 2~4 ports per group with support for 256 VLANS

- Operating temperature = -40 to +75 degrees Celsius
- Relative humidity = 5% - 95%, non-condensing
- Packet Filtering and Port Security Destination MAC
- MAC address learning with a minimum of 1028 MAC addresses and ≥ 1028 static MAC addresses
- IEEE 802.1p QoS Classification based on: Port based priority VLAN Priority field in VLAN tagged frame DS/TOS field in IP packet UDP/TCP logical ports
- IEEE 802.1w Rapid Spanning Tree Algorithm
- IP Multicast Filtering through IGMP Snooping
- Support Telnet, SNMP v1 & v2, RMON, Web Browser, Port Mirroring (RFC 1757, TFTP, FTP and CLI management tools
- MIB statistics counters for all ports
- Management and configuration shall be able to be performed through an integrated web interface
- Support remote reset and remote management

87-4.05B(2) Programming

The contractor shall configure, adjust settings, and perform any setup routine necessary for the operation of the switch. Contractor shall coordinate with the County of Santa Cruz Information and Technology Department for the IP address available to each switch.

87-4.05B(3) Final Acceptance Testing

After the post installation testing has been approved by the Engineer and after the splicing and connectorizing of the fiber cable per the contract plans is completed, as well as all network switches are installed, Contractor shall perform an Acceptance Test of The System.

Contractor will provide certification of NTCIP-compliance as part of the contractors's submittal documentation. This certification shall be in the form of a comprehensive test plan and completed test report as performed by either the contractor or a third-party testing agency. The testing shall have been completed using industry accepted test tools such as the NTCIP Exerciser or other NTCIP compliant test tools. Data capture files from the test tool software during the performance of the above testing shall be furnished to the engineer and County.

The Acceptance Test shall comply with NTCIP report 9012 v01, "Center-to-field (C2F) Communications" and at a minimum consist of the following:

- Establishing communication between County building and each field switch
- Testing upload and download capabilities, bandwidth, and latency
- Establishing communication between County building and each IP accessible device in the controller cabinet at each traffic signal on the project.

87-4.05C Small Form-Factor Pluggables (SFPs)

The Contractor shall furnish and install SFP) module for each fiber termination to the fiber optic switch as shown on the plans. The SFP module shall allow for optical interface between the

LC/SC connector of the fiber optic patch cable to the managed/unmanaged fiber optic switch or media converter.

The SFP module shall adhere to the following functional requirements:

- Transparent to data encoding/compatible with major data protocols
- Interchangeable SFP for fiber type, distance, and connector.
- No in-field optical adjustment required
- IEEE 802.3 compliant
- Can withstand -40° C to +75° C operating temperature
- Lifetime warranty

The SFP module shall adhere to the following technical specifications:

1) Data Transfer Rate:	at least 1000 Mbps
2) Transmission Medium:	Single Mode
3) Transmission Wavelength:	1310 nm
4) Receive Wavelength:	1310 nm
5) Maximum Path Length:	15 km
6) TX Power (dBm):	-8
7) RX Sensitivity (dBm):	≤ -24
8) Optical Loss Budget (dBm):	16
9) Number of Fibers:	2
10) Receptacle Type:	LC

Add new section 87-4.06:

87-4.06 BATTERY BACKUP SYSTEM

87-4.06A Summary

Section 87-4.05 includes general specifications for the **Battery Backup System (BBS)** for use in both 33X and NEMA Type P traffic signal cabinets to be installed at the locations listed below.

- Soquel Avenue and Robertson Street

87-4.06B Materials

The Contractor shall furnish and install **one (1)** battery backup system consisting of the materials list below or approved alternative.

- **Tesco Model 22-2000VA or approved equal**

The battery back-up system (BBS) shall include, but not be limited to the following: Control Unit, Battery, Inverter, externally mounted cabinet, and all necessary Cables. The BBS shall provide reliable emergency power to a traffic signal in the event of a power failure or interruption. The BBS shall be Tesco Model 22-2000VA and shall include six (6) 24V batteries.

The BBS shall be designed for outdoor application, in accordance with the Caltrans Transportation Electrical Equipment Specifications (TEES), dated November 2020.

Add new section 87-4.07:

87-4.07 TRAFFIC SIGNAL CONTROLLER

The Contractor shall furnish and install an **Econolite Cobalt controller** and **EOS controller software** as shown on the plans and specified herein.

- 332 and 342 cabinet locations shall have installed the rackmount versions of the Cobalt controller with connections to interface with 33X cabinets
- Type P cabinet locations shall have the Econolite Cobalt Type 2-2 controller.

The controller assembly shall conform to Sections 86-1.02Q and 87-1.03Q of the Standard Specifications and the “Transportation Equipment Specifications” (TEES)

Prior to delivering controller and installing in the field at each intersection, Contractor shall ensure that existing traffic signal timing has been programmed in to new controller and tested, and is corresponding to the timing at each intersection where this controller is being installed at.

Replace 10th paragraph in section 87-19.02B of the RSS with the following:

The Access cover must:

1. Be a two-piece polymer lid with locking mechanism
2. Have inset lifting pull slots.
3. Have markings *COUNTY FIBER OPTIC*.

Replace text in Section 87-19.02D with:

87-19.02D(1) GENERAL

There are two types of underground splice closures that will be used on this project. A small closure will be used everywhere, where a #6E box is installed next to traffic signal cabinet. A large splice closure will be used everywhere where an N48E box is installed next to a traffic signal cabinet.

All underground fiber splice closures must be butt-end style, corrosion resistant, watertight, and meet the latest requirements of GR-771-CORE. Underground splice closures must seal, bond,

anchor, and provide efficient routing, storage, organization, and protection for the fiber optic cables and splices that are installed within the closure.

Splice closures shall have a reliable dual seal design with both the cable jackets and core tubes sealed, without the use of water-blocking material. The splice closures must be capable of being opened and completely resealed without loss of performance.

The fiber splice closures shall be equipped with splice trays that are designed specifically for housing single-mode fusion splices protected by heat-shrink sleeves, are easy to install and remove, and have provisions for a minimum number of fusion splices accommodated by the splice closure.

87-19.02D(2) SMALL SPLICE CLOSURE

The Small Splice closures shall adhere to the following specifications:

- Accommodate a minimum of three (3) ports, with each port having the capacity to accept up to 0.5 in OD cable
- Have a splice capacity up to 48 fusion splices
- Not exceed the following dimensions: 16in length and 7 in in diameter

87-19.02D(3) LARGE SPLICE CLOSURE

The Large Splice closures shall adhere to the following specifications:

- Accommodate a minimum of eight (8) ports, with each port having the capacity to accept up to 1 in OD cable
- Have a splice capacity up to 288 fusion splices
- Not exceed the following dimensions: 22in length and 7 in in diameter

Add to section 87-19.02E

87-19.02E FIBER OPTIC DISTRIBUTION UNIT

Contractor to splice fiber optic branch cable to fiber distribution unit and connect using contractor furnished fiber patch cables to fiber switch as indicated in the project plans. The fiber distribution unit shall adhere to the specs listed below.

87-19.02E(1) MATERIALS

1. 332/342 Traffic Signal Cabinets
 - Corning Model number CCS-01U or County approved equal.
 - Model M67-048 Splice Trays, CCH-CS Splice Cassette or County approved equal.

- Corning Closet Connector Housing, LC adapters, Duplex, UPC, 12F, Single-mode (OS2) [CCH-CP12-A9]
2. NEMA Type P Traffic Signal Cabinets
- Corning Lanscape housing or County approved equal.
 - Corning Closet Connector Housing, LC adapters, Duplex, UPC, 12F, Single-mode (OS2) [CCH-CP12-A9]

Add new section 87-19.02J

87-19.02J FABRIC INNERDUCT

Work under this section shall include the installation of fabric innerduct as indicated on the project plans.

fabrInnerduct

Innerduct must be installed as indicated on the plans. Innerduct consists of flexible fabric chambers that is installed inside conduit, and which in turn the fiber optic cable is installed. Innerduct within a conduit run must be continuous without splices or joints. Innerduct for this project must have a minimum of **3 cells** as specified in the Project Plans.

Innerduct cells must include 1250lb minimum flat woven pull tape for installation. Innerduct shall be protected and installed per manufacturer specifications.

The innerduct must be shipped on reels marked with the manufacturer, the contract number, and the size and length of the innerduct. The material on reels must be covered with aluminized material to protect colors from UV deterioration during shipment and storage. Each innerduct must be one continuous unit within a conduit run. Each innerduct must comply with Caltrans Standard Specifications section 86-1.02, "Materials", of the State Standard Specifications.

Tracer Wire

Tracer wire shall be installed within innerduct or conduit as shown on Project plans. Tracer wire shall be #12 AWG stranded copper conductor with orange THWN insulation, unless otherwise noted.

Replace Section 87-19.03A of the RSS with the following:

87-19.03A(1) FIBER OPTIC TESTING

This section includes performance of fiber optic testing of the communication system as specified in the Project Plans.

87-19.03A(2) TECHNICAL AND FUNCTIONAL REQUIREMENTS

The Contractor acknowledges that contractor-performed testing is a vital component of the work and required for acceptance of the fiber optic cables and all related assemblies.

The fiber optic testing shall be conducted at the following stages:

- Upon Cable Delivery Before Installation – Cable Reel Tests
- After Installation and Before Splicing – Post Installation/Pre-Splicing Tests
- After Splicing and Connectorizing – End-to-End/Post-Splicing Tests

Contractor shall submit a sample of the OTDR and power meter/light source data printouts to the Engineer for review and approval prior to conducting any testing.

All testing shall be performed in a manner that provides the time, space, set up, tools, and equipment for the Engineer or his designee to inspect and verify that all test setups and tests, including review of fiber connections, test equipment, device displays, and all related documentation. The tests shall quantitatively demonstrate that the fiber optic cable meets or exceeds the minimum requirements and specifications provided in these special provisions and the contract plans.

All technicians testing cable shall be certified as an Advanced Fiber Optics Technician or Certified Fiber Optics Specialist by the Fiber Optic Association (FOA). Contractor shall submit to the Engineer for approval proof of FOA certification for each of the technicians performing testing.

Vehicles used for fiber testing shall have their engine turned off during testing.

The Contractor shall use clean, well maintained testing equipment. The testing equipment shall have been calibrated within one (1) year prior to conducting the tests.

A 1,000-meter launch cable, or launch box tuned to the attenuation of a 1,000-meter launch cable, shall be used to overcome the dead zone of the OTDR inserted between the OTDR and the optical link.

The OTDR testing shall be done at a scale of at least 1 dB per division on the vertical scale.

All test measurements shall be measured at the wavelengths for the proposed equipment to use the fiber optic cable.

Contractor shall perform tests to verify that ports and fibers installed by others have end points indicated in the contract plans.

Short Fiber Cable Segments

A short fiber cable segment is defined as a cable measuring 1000 feet or less including all coiling and slack.

It is acknowledged that test results from short segments of fiber cable may require re-testing, and that there may be an issue where the OTDR results may appear inconsistent and do not meet the maximum attenuation limits required in these special provisions even after the re-tests. In these cases, the Contractor shall prepare link attenuation calculations and perform power meter/light source tests on the subject fiber cable and submit to the Engineer for review. Should the power meter tests show that the actual loss is less than the theoretical maximum loss for the fiber cable (all strands), the power meter/light source test results will be used accepted instead of the OTDR tests.

There shall be no additional cost for the additional calculations and testing for short fiber cable testing including the power meter/light source tests and link attenuation calculations. The contractor shall bear the entire cost of the re-tests and calculations, and no additional compensation shall be allowed therefor.

Test Plan

The Contractor shall prepare and submit a Test Plan to the Engineer for review and approval that provides a detailed description of the tests that will be conducted, the steps required to conduct the testing, and the specific locations where the tests will be conducted.

The Test Plan shall cover all stages of the fiber testing and shall include the following at a minimum:

1. Stage of Test (i.e., Cable Reel, Post Installation or End-to-End)
2. Contractor staff who will be conducting the tests
3. Test equipment to be used
4. The setup for the testing including all of the equipment connections
5. The detailed process for the testing including, but not limited to:
 - a) recording/capturing of the test data;
 - b) file format and organization of the test data that will be submitted;
 - c) direction of the test (OTDR and power meter/light source); and
 - d) test data that will be collected and reported
6. Sample test printouts including all graphic and tables
7. A tabular and narrative summary of all of the fiber optic segments that will be tested which shall include all start and end points noted by intersection name, facility name, stationing, or other means for the Engineer to be able to verify the location

Contractor shall submit a sample of the OTDR and power meter/light source data printouts to the Engineer for review and approval as part of the Test Plan.

If the Engineer rejects the submitted Test Plan, the Contractor shall submit a revised Test Plan within five (5) working days for review and approval by the Engineer. No testing shall be performed until Contractor's test plan has been approved by the Engineer.

Submittal of the test equipment user's manual does not constitute any part of the Test Plan, and should the Test Plan contain such documentation, it shall be rejected in its entirety.

The Contractor shall notify the Engineer of his intent to proceed with testing forty-eight (48) hours prior to commencement of each test. It is noted that regardless of the advance notification, there shall be no testing until the Test Plan is approved by the Engineer. In addition, the Contractor shall be able to commence testing a minimum of 48 hours after the Test Plan has been approved.

The approval of the formats for the test printouts shall be attained prior to conducting any testing. Any tests that are conducted prior to the Engineer's approval of the Test Plan and the test document format shall be considered as not acceptable and the Contractor shall re-test all fibers as a result.

Link Attenuation Calculations

The Contractor shall prepare Link Attenuation Calculations for each fiber segment. The calculations shall be shown in a table clearly indicating the following:

- Fiber cable segment – note the two end points
- Length of the segment tested
- Direction – note which direction the calculation is being conducted for
- Splices – note the number and locations of the splices
- Connectors – note the number and locations of the connectors.

The results of the calculations will provide the theoretical attenuation limits for each segment. This will be used to compare the results of the power meter and light source testing.

The Contractor shall submit the Link Attenuation Calculations to the Engineer for review and approval prior to conducting any power meter/light source tests.

The approval of the Link Attenuation Calculations shall be attained prior to conducting any power meter/light source testing.

Any power meter/light source tests that are conducted prior to the Engineer's approval of the Link Attenuation Calculations shall be considered as not acceptable and the Contractor shall re-test all fibers as a result.

Cable Reel Test

After delivery of the fiber optic cable to the project site prior to field installation (Cable Reel Acceptance Test). This test is intended to verify that the fiber received from the supplier is in sound condition and without manufacturing defects.

The Cable Reel Test shall be performed within ten (10) working days from the delivery of the fiber optic cable to the project site, or when the cable is received by the Contractor from the supplier, whichever is sooner.

The Contractor shall notify the Engineer of his intent to proceed with the cable reel testing forty-eight (48) hours prior to commencement of the test. However, no tests shall commence until the Engineer has approved the Test Plan that shall be submitted to the Engineer (refer to the "Test Plan" section elsewhere in these special provisions).

The fiber cable shall be tested with an Optical Time Domain Reflectometer (OTDR), and only one direction needs to be tested.

Any fiber optic cable that does not meet the requirements described in the section "Fiber Cable Characteristics" and any applicable and relevant section in these special provisions shall be replaced at shall be at the sole cost of the Contractor, and no additional compensation shall be allowed therefor.

At the time of testing, the Contractor shall inspect the fiber optic cable and record any visible signs of defects.

The Contractor shall compare the test results to the manufacturer's specifications and note any discrepancies.

If the attenuation level measured from the tests conducted by the Contractor is 5% or more higher than the attenuation reported from the manufacturer's factory tests, or 5% or more higher than the maximum attenuation values allowed as shown in Table 1, the fiber cable reel will be considered as unacceptable at this stage regardless of the number of fibers that deviate from the manufacturer's test results.

The Contractor shall replace the unsatisfactory reels of cables at no additional expense to the project, and no additional compensation shall be allowed therefor.

The Contractor shall install heat shrink or other protective covering to the fiber optic cable end to prevent the entry of moisture or other contaminants.

Installation of new fiber optic cable shall only occur once the fiber optic cable reel acceptance test has been reviewed and approved by the Engineer.

The Cable Reel Test results including the manufacturer's factory test results shall be summarized and submitted to the Engineer for review and approval. The test results shall be documented and submitted to the Engineer based on the requirements contained in section "Test Documentation" contained herein these special provisions.

Post Installation/Pre-Splicing Testing

The installation of new fiber optic cable shall only occur once the fiber optic cable reel acceptance test has been reviewed and approved by the Engineer.

At the time of testing, the Contractor shall inspect the fiber optic cable and record any visible signs of damage.

The Post Installation/Pre-Splicing Test shall be performed within ten (10) workings from the time the fiber optic cable is installed, and before any splices are conducted or connectors installed on the fiber cable segment.

The fiber cable shall be tested with an OTDR, and shall be conducted in both directions along each fiber cable segment.

Any fiber optic cable that does not meet the requirements described in the section "Fiber Cable Characteristics" and any applicable and relevant section in these special provisions shall be replaced at shall be at the sole cost of the Contractor, and no additional compensation shall be allowed therefor.

If the attenuation level for a fiber strand measured from the tests conducted by the Contractor is 5% or more higher than the attenuation reported from the cable reel tests, or 5% or more higher than the maximum attenuation values allowed as shown in Table 1, the fiber strand shall be considered as an unacceptable fiber having failed the test.

The Contractor will be allowed one re-test to mitigate any failed test(s).

Should the results from any re-tests continue to yield test failures, the entire fiber cable shall be considered as unacceptable and shall be replaced by the Contractor, regardless of the number of fibers that have failed the test.

The Contractor shall replace the unacceptable fiber cables at no additional cost, and no additional compensation shall be allowed therefor.

Test results shall be summarized and submitted to the Engineer. If the cable installation test results are found unsatisfactory by the Engineer, the fiber optic cable segment will be judged as unacceptable. The Contractor shall replace the unsatisfactory segment of cable with new fiber, without additional splices, at no expense to the City. Conduct cable installation acceptance test for the new segment of cable to demonstrate proper installation.

Any and all connectorizing that is necessary to conduct the post-installation testing shall be considered as part of the fiber optic testing costs, and no additional compensation shall be provided therefor.

The test results shall be documented and submitted to the Engineer based on the requirements stated in section "Test Documentation" contained herein these special provisions.

End-to-End/Post-Splicing Testing

After the post installation testing has been approved by the Engineer and after the splicing and connectorizing of the fiber cable per the contract plans is completed, the Contractor shall conduct the End-to-End/Post Splicing Testing.

This test stage is intended to verify that the end-to-end fiber optic paths have been completed per the contract plans, and that all of the splices and connectors have been performed to the highest standard of care that meets all of the requirements in these special provisions.

The End-to-End/Post Splicing Test shall be performed within ten (10) working days from the completion of all the splices and connectorizations.

The Contractor shall notify the Engineer of his intent to proceed with the end-to-end testing forty-eight (48) hours prior to commencement of the test. However, no tests shall commence until the Engineer has approved the Test Plan that shall be submitted to the Engineer (refer to the "Test Plan" section elsewhere in these special provisions).

The end-to end/post-splice tests shall consist of performing OTDR and power meter/light source testing.

Both the OTDR and power meter/light source tests shall be conducted in both directions along each fiber segment.

All fusion splices shall be tested in both directions and the average of the loss measured shall be used to determine the splice loss.

All mated connector pairs shall be tested in both directions and the average of the loss measured shall be used to determine the connector loss.

The tests shall document total end-to-end loss, splice and connector loss and backreflection, and overall reflectance levels.

Should the power meter tests show that the actual fiber loss is less than the theoretical maximum fiber loss for the fiber cable (for all strands), the fiber cable will be considered as acceptable. Refer to the “Test Documentation” section elsewhere in these special provisions.

If the attenuation level for a fiber strand measured from the tests conducted by the Contractor is 5% or more higher than the maximum attenuation values allowed as shown in Table 1, or the theoretical maximum as calculated from the Link Attenuation Calculations, the fiber strand shall be considered as an unacceptable fiber having failed the test.

The Contractor will be allowed one re-test to mitigate any failed test(s).

Should the results from any re-tests continue to yield test failures, the entire fiber cable shall be considered as unacceptable and shall be replaced by the Contractor, regardless of the number of fibers that have failed the test.

The Contractor shall replace the unacceptable fiber cables at no additional cost, and no additional compensation shall be allowed therefor.

Any and all connectorizing that is necessary to conduct the end-to-end testing shall be considered as part of the fiber optic testing costs, and no additional compensation shall be provided therefor.

Test Documentation

All tests shall be saved on Compact Disc (CD) or portable media stick (USB flash drive) and shall be submitted to the Engineer for review and approval. All electronic copies of the test results shall be submitted in portable document format (pdf).

A three-ring binder with hardcopies of the test results shall also be provided. All test result printouts (OTDR and Power Meter/Light Source) shall contain the following:

- Maximum specified loss at specified wavelengths
- Test location (e.g., intersection name or facility name)
- Date and Time of test
- Test crew (names)
- Test Equipment manufacturer and model
- Direction of the test
- Length of fiber segment tested
- Buffer tube and fiber color
- Attenuation result (in dB or dB/km)

OTDR Test Results

The OTDR test result printouts shall provide a graphical representation of the test of each fiber strand that clearly shows the following information at a minimum:

- The launch cable length
- The cable length
- Cable ID
- Fiber strand number or color
- Start location (where the OTDR is located)

- End or Far location
- Total End to End Loss (dB)
- Start point and end point for each OTDR trace
- Indications where losses or other events occur along the fiber

The start point and end point shall be used to determine the direction of the test. The graphical representation shall provide enough information for the Engineer to determine where splice and connector losses are located along the fiber segment. If this information is not readily apparent on the graphical representation, it will be rejected.

In addition to the test result printouts and graphical representations, the Contractor shall provide a summary table that documents the test results of each fiber strand that is tested on each fiber cable segment. The table shall indicate the fiber number or color, buffer tube (color), wavelength (in nm), and attenuation (in dB/km).

All printouts shall bear the signature or initials of the Contractor's representative who has reviewed the tests.

The Contractor shall place a check mark on all traces that satisfy the requirements identified herein.

The Contractor shall highlight any discrepancies that may exist in the test results. If more than 20% of the tests have any discrepancies, abnormalities or failures, the tests will be rejected and the Contractor shall be required to conduct a complete re-test and re-submit the documentation for the Engineer's review and approval.

Any subsequent re-testing, re-splicing, or revision of the test documentation shall be at the sole cost to the Contractor and no additional cost shall be allowed therefor.

Power Meter and Light Source Test Results

The Power Meter/Light Source test results shall be submitted with the following at a minimum:

- Contractor staff tester (name)
- Cable ID
- Start point (intersection or facility name)
- End point (intersection or facility name)
- Fiber number and color
- Fiber buffer tube
- Direction of test
- Length of cable tested (feet)
- Splice locations (name)
- Connector locations (name)
- Wavelength (nm)
- Theoretical loss limit (from Attenuation Calculations)
- Measured loss
- Headroom loss (theoretical loss minus actual loss)

The optical testing using a light source and power meter shall meet the following minimum requirements:

Optical fiber light source

- Single mode fiber
- Provide dual laser light sources with central wavelengths of 1310 nm (± 20 nm) and 1550 nm (± 20 nm).
- Output power of -10 dBm minimum.

Power Meter

- Provide 850 nm, 1300nm, 1310 nm, and 1550 nm wavelength test capability.
- Power measurement uncertainty of ± 0.25 dB.

Single-mode OTDR

- 1. Wavelengths of 1310 nm (± 20 nm) and 1550 nm (± 20 nm).
- 2. Event deadzones of 2 m maximum at 1310 nm and 2 m maximum at 1550 nm.
- 3. Attenuation deadzones of 15 m maximum at 1310 nm and 15 m maximum at 1550 nm.
- 4. Distance range not less than 10,000 m.
- 5. Dynamic range at least 10 dB at 1310 nm and 1550 nm

The OTDR used for testing shall be provided with certification of its most recent calibration which shall be within twelve (12) months from the date of the testing.

The OTDR operator shall hold a current operators certificate for the equipment used. This certificate shall be provided to the Engineer prior to any use of the OTDR for testing, and shall represent not less than sixteen (16) hours of training from the equipment manufacturer.

The OTDR shall have a distance measurement accuracy of $\pm 0.01\%$.

Add to the list in the 2nd paragraph of section 87-21.03B(2):

9. Traffic signal system

Add to the end of section 87-21.03C:

Modifying a signal and lighting system includes removing, adjusting, or adding:

1. Foundations
2. Pull boxes
3. Conduit
4. Conductors
5. Cables
6. Standards
7. Vignal heads
8. Video Detection

9. Traffic controller assembly
10. Battery backup system
11. Detectors
12. Signal interconnect cable
13. Accessible pedestrian signals
14. Push button assemblies
15. Pedestrian signal heads
16. Luminaires
17. Photoelectric control
18. Fuse splice connectors

Add new section 87-22:

87-22 ADAPTIVE TRAFFIC SIGNAL SYSTEM

87-22.01 GENERAL

For items identified as part of **Rhythm Engineering’s In|Sync Adaptive System** in the plans and these specifications, contact Rhythm Engineering:

Contact Information

**14019 W 95th St
Lenexa, KS 66215
Phone: 913-227-0603**

<https://rhythmtraffic.com/insync/>

Cameras purchased from Rhythm Engineering will be installed at the following locations:

Location	No. of fixed IP cameras
Soquel Drive and Robertson Street	4

87-22.02 MATERIALS

For items identified as part of Rhythm Engineering’s InSync Adaptive System in the plans and these specifications, contact the following Rhythm Engineering representative:

The following components are included as part of the adaptive system equipment. The Contractor shall purchase these components from the adaptive system vendor, Rhythm Engineering:

- Fixed IP Camera/Camera enclosure – IP addressable Samsung SNZ-5200 digital IP camera with lens (or approved equal) and die-cast aluminum enclosure with ABS sunshield. These items shall be purchased from adaptive system vendor, installed by the Contractor, and configured by the adaptive system vendor.
- 360° IP Camera/Camera enclosure - IP addressable Samsung SNB-5000 digital IP camera with ImmerVision panomorph lens (or approved equal) in a sealed weatherproof enclosure. These items shall be purchased from adaptive system vendor, installed by the Contractor, and configured by the adaptive system vendor.
- Equipment panel – panel which includes 8-port switch, lightning arrestors for camera cables, termination points for camera power and communication, 24V AC transformer, and power supply from the cabinet. These items shall be purchased from adaptive system vendor, installed by the Contractor, and configured by the adaptive system vendor.
- Adaptive system processor – adaptive system processors shall be purchased from adaptive system vendor, installed by the Contractor, and configured by the adaptive system vendor.
- DIN relay – the DIN relay switch shall be purchased from the adaptive system vendor, installed by the Contractor, and configured by the adaptive system vendor.
- Intercept module – intercept module shall be purchased from the adaptive system vendor, installed by the Contractor, and configured by the adaptive system vendor. Intercept modules shall only be installed at City of Stockton intersections.
- Cables – Contractor shall purchase ABC Y-cables and C1 Y-cables from adaptive system vendor, and install all cables necessary for a fully functional adaptive system.

87-22.02A IP CAMERA COMPONENTS

The IP cameras shall be installed on existing traffic signal and luminaire mast arms as shown on the plans. The IP cameras shall be connected to the adaptive system equipment panel via a Contractor-furnished Category 6 cable and 3 Contractor-furnished #14 AWG conductors. The camera communications and power cables shall be terminated at the equipment panel. The power and communication cables shall be pulled from the traffic signal controller cabinet to the specified camera location. The Contractor shall provide 10 feet of slack at the cabinet and 5 feet of slack at each camera. The following color-coding scheme shall be used to distinguish camera cables:

- Northbound, blue
- Southbound, red
- Eastbound, yellow
- Westbound, orange

Each IP camera shall have a designated IP address which identifies its position (NB, SB, EB, WB), and be labeled accordingly.

The camera enclosure shall be made from die-cast aluminum and include an ABS sunshield, internal heater near the front, three cable glands at the bottom, and be waterproof when closed. The cable glands shall be sealed with silicone gel sealant on the inside of the enclosure after

mounting. Silicone gel sealant shall be applied around the wire at the cable gland once power and Category 6 terminations are made inside the enclosure.

87-22.02B CAMERA MOUNTING HARDWARE

87-22.02B(1) GENERAL

The Contractor shall furnish and install all camera mounting hardware for mounting the adaptive signal system cameras on existing traffic signal and luminaire mast arms.

87-22.02B(2) MATERIAL

1. Mast arm applications
 - Pelco Astro-brac clamp, part no. AB-3009 (or approved equivalent)
 - Pelco Astro-brac poles, part no. AB-2003 (or approved equivalent)
 - Pelco camera bracket, part no. SH-0514 (or approved equivalent)

2. Luminaire arm applications
 - Pelco luminaires mounting bracket, part no. SH-0509 (or approved equivalent)
 - Pelco camera bracket, part no. SH-0514 (or approved equivalent)
 - Pelco Type 201 stainless steel banding, part no. US-8122-06 (or approved equivalent)
 - Pelco Type 201 stainless steel buckles, part no. US-8122-56 (or approved equivalent)
 - Pelco band tool, part no. US-8120-01 (or approved equivalent)

87-22.02C CONTROLLER CABINET COMPONENTS

The Contractor shall furnish and install the adaptive system equipment panel, adaptive system processor, adaptive system intercept module, and adaptive system DIN relay switch, securely inside each traffic signal controller cabinet.

Contractor shall purchase **one (1)** pre-configured adaptive system processors with pedestrian optimization feature from the adaptive system vendor, and install the processors at the following intersections:

- **Soquel Drive and Robertson Street**

Add new section 87-24:

87-24 TRANSIT SIGNAL PRIORITY (TSP) SYSTEM

87-24.01 GENERAL

The TSP system shall enable communications between transit vehicles operated by **Santa Cruz Metro Transit District (METRO)**, requesting transit signal priority as they approach signalized intersections and the agencies' intersection traffic signal controllers where priority may be granted to approaching transit vehicles.

The work under this item shall consist of furnishing, installing, and testing a **Transit Signal Priority (TSP)** system at the locations indicated in the plans. The work also includes furnishing, installing, and testing other elements of the transit signal priority system, including upgraded traffic controller hardware and firmware, in-cabinet equipment, and equipment to be installed on traffic signal standards, as indicated on the plans or as needed for proper and reliable operation.

The TSP System shall include all equipment (in cabinet), cabling, hardware, software, licenses, servers, operating manuals/system documentation, training, testing and system integration for a complete and fully functioning TSP System.

The entire TSP System shall be supplied by a single manufacturer.

Contractor shall purchase and install **one (1) GPS Radio Unit**, cables, mounting equipment and Phase selector TSP card for use at the following locations:

- **Soquel Drive and Robertson Street**

87-24.02 MATERIALS AND EQUIPMENT

87-24.02A TRANSIT SIGNAL PRIORITY (TSP) SYSTEM

A. Transit Signal Priority (TSP) System

The Contractor shall furnish and install, where shown on the Plans, a fully functional TSP system.

The TSP system shall be GPS based and detection equipment furnished by the Contractor shall be fully functional and interoperable with the existing on-board emergency vehicle equipment that is currently compatible with the existing EVP equipment deployed at traffic signals along the project corridor.

The TSP intersection equipment furnished by this project shall provide transit signal priority to transit vehicles and preemption to emergency vehicles by sending a priority/preemption request to the traffic signal controller. The TSP System equipment shall be installed at project intersections, as shown on plans, and shall trigger signal preemption and transit signal priority

requests using the same detectors, cabinet equipment and cables. To ensure priority control system integrity, operation, and compatibility, all installed components shall be from the same manufacturer.

The Contractor is required to supply the necessary TSP assemblies and units required for testing purposes to demonstrate that the TSP system performs as specified.

The Contractor shall conduct testing in the presence of the Engineer, or Engineer designated representative, as described below under “System Operation” during the signal test period. The Contractor shall give the Engineer a minimum of two working days’ notice prior to performing the tests.

The system shall establish a priority of Class II vehicle (Emergency Vehicle) signals over Class I vehicle (Transit Vehicle) signals, and shall conform to the requirements in Section 25352, of the California Vehicle Code.

The system shall provide the following functionalities:

1. The TSP System shall work with existing or new Low and High Priority Systems installed on traffic signal standards.
2. The TSP System shall be provide both Schedule Adherence and Headway Adherence functions and features. Headway is defined as the actual time between two buses traveling in the same direction at a fixed point along the bus route.
3. The TSP System shall be able to request low priority (transit signal priority) based on user defined headways (actual time between buses) and schedules (actual time compared against timetables/timepoints).
4. The TSP system shall issue a call for low priority if the bus is behind a user-defined headway and/or schedule value to provide transit signal priority for the designated bus, independent of vehicle direction.
5. The headway and schedule parameters shall be user settable, by day of week and time of day. A time of day and day of week look up table shall be provided.
6. All of the parameters to collect, calculate and evaluate the headway values and schedule adherence values for each bus in each direction shall be contained in the TSP equipment that is installed inside the traffic signal controller cabinet (not on board), including, but not limited to the Bus ID, headway values, direction, intersection ID, date, time of day, etc.
7. The TSP shall grant priority based on a user defined schedule system. The schedule parameters shall be user settable, by day of week and time of day. A time of day and day of week look up table shall be provided.
8. The TSP shall provide an early green or extension of green based on traffic signal timing parameters provided by the Engineer. The phase duration for all subsequent phases, after the early-green or extension of green, shall be reduced equally after the priority call. There

shall be no back-to-back TSP activations.

9. The TSP shall be non-locking, i.e. if a bus has departed the intersection, the priority request will be dropped.
10. The TSP shall not truncate pedestrian walk or don't walk durations if activated. If the intersection is equipped with countdown timers, the countdown timers shall be blank in the absence of a pedestrian call.
11. The system shall meet all applicable MUTCD requirements.
12. The system shall be capable of maintaining a log of all TSP requests and activations, including the fields listed below, to allow the County of Santa Cruz to monitor the performance of TSP operations. This information shall include the following fields (at a minimum) and be stored at each controller for a minimum of four weeks. At a minimum, this information will include the following fields:
 - a. Bus ID and code
 - b. Bus Travel Direction
 - c. Controller or Intersection ID
 - d. Event Start Date-Time (i.e., when bus detected)
 - e. Event End Date-Time (i.e., when bus call has dropped off)

Location of bus at Event End Date-Time

At a minimum, the following components shall be included as part of the GPS radio System:

1. GPS Radio System
 - Opticom Model 3100 GPS Radio Unit
 - Opticom Model 1070 FPS Installation Cable
 - 764 Phase Selector
 - 755 Daughterboard
2. Mounting Equipment
 - Astro Mounting Bracket
 - Contractor Furnished 1.5" diameter stainless steel pipe

87-24.02B TSP DETECTION ASSEMBLY

Each GPS based detection assembly shall consist of one intersection GPS and radio module and connecting cable.

The radio shall have a maximum transmit power of not more than 1 watt (unlicensed spectrum). The radio shall have an unobstructed range of at least 2,500 feet (762 m) and shall meet FCC Part 15 rules. The radio antenna shall be integrated within the radio module and shall also be integrated with the GPS module.

The TSP module (GPS and radio unit) shall be housed in an impact resistant polycarbonate housing. All wire entry points shall be water resistant and shall contain a water resistant access cover to facilitate cable termination.

The TSP module (GPS and radio unit) shall be mounted on signal poles and mast arms as shown in project plans. Mounting hardware shall be per the TSP module manufacturer's recommendations.

The TSP module (GPS and radio unit) shall communicate to the TSP unit inside the controller cabinet via a manufacturer supplied cable up to a maximum of 250 feet (76 m) in length. Longer cable lengths shall be approved by the Engineer.

87-24.02C TSP CABLE

The TSP cable shall carry the data received from the intersection TSP module (GPS and radio unit) to the TSP unit inside the controller cabinet. It shall also carry the power for the TSP unit. The same cable shall be used to carry the data between the on board TSP module (GPS and radio unit) and the vehicle control unit. The cable used to connect the TSP module (GPS and radio) installed on the signal poles and mast arms to the TSP unit in the cabinet shall be a shielded data cable. The use of coax cable is not permitted. The TSP cable shall be approved by the TSP manufacturer if it is not supplied by the TSP manufacturer.

The outside diameter of the cable shall not exceed 0.4 inches (10.16 mm).

The insulation rating of the cable will be 300 volts minimum.

The temperature rating of the detector cable will be -40°F (-40°C) to +194°F (+90°C).

The conductors shall be AWG #20 stranded and individually tinned. The cable will be shielded and have a drain wire to provide signal integrity and transient protection.

The TSP module cable shall utilize twisted pair conductors, AWG #20, stranded and individually tinned copper.

87-24.02D CABINET TSP UNIT

The TSP unit that is installed within the traffic controller cabinets shall recognize inputs from both infrared and radio activation methods at the intersection and supply coordinated inputs to the controller.

All of the parameters to collect, calculate and evaluate the headway value for each bus shall be contained in the TSP equipment inside the traffic signal controller cabinet, including, but not limited to the vehicle ID, headway values, direction, intersection ID, etc.

Each unit shall be a plug-in, four channel, multiple-priority, multi-modal device intended to be installed directly into a card rack located within the controller cabinet. The unit shall be capable of using existing infrared or Radio/GPS system card racks

The cabinet TSP unit shall support front-panel RS-232, USB and Ethernet interfaces to allow management by on-site interface software and central software. An RS-232 port shall be provided on the rear card edge of the unit.

Each channel output shall be an optically isolated NPN open collector transistor capable of sinking 50 mA at 30 V and shall be compatible with the Econolite Cobalt controller unit inputs.

Each discriminator module shall be provided with means of preventing transients received by the detector from affecting the Econolite Cobalt controller assembly.

The discriminator module shall support three types of logging for green signal indications:

- a. Preemption impact logging which measures and records the impact of an individual signal preemption upon a measured green cycle time.
- b. TSP impact logging which measures and records whether a TSP advantage was gained during a request and the amount of early or extended green applied.
- c. Green cycle logging records changes in the average green cycle time. When the average time is measured to have changed, a new log entry is made

All evaluation of the data and decisions to pass TSP calls to the traffic controller shall be made by the Cabinet TSP Unit.

The Cabinet TSP Unit shall recognize inputs from both infrared and GPS and radio signals from an emergency vehicle (infrared) and a bus (radio) and supply coordinated input signals to the traffic controller.

Each Cabinet TSP Unit shall be compatible and usable with the following controllers and firmware:

- **Econolite Cobalt controller unit running EOS software**

87-24.02E AUXILIARY PANEL

The auxiliary panel shall provide additional preemption outputs if needed. It shall also provide a connection point for the TSP unit to monitor the status of traffic signal phase green light indications, and shall provide an additional EIA/TIA-232 communications port. The auxiliary panel shall contain outputs to drive confirmation lights and time sync output.

87-24.02E INTERFACE SOFTWARE

Interface software shall be provided to manage the TSP units through a field computer while on-site at the intersection.

The interface software shall be provided on USB storage device or via download from the vendor's website.

The interface software shall be supported on Windows 11 operating systems.

The vendor shall provide minimum hardware configuration information for computer(s) running the interface software.

The interface software shall allow the user to:

- f. View and update all programmable configuration parameters of the TSP unit.
- g. Provide intersection name and approach names for each of the four channels and store these as part of the TSP unit configuration.
- h. View and update valid and blocked vehicle codes for the TSP unit.
- i. Create preemption zones directly on a GIS map. Provided the map data is complete, it shall not be necessary to drive a vehicle to create the preemption zones. In areas where map data is incomplete or incorrect, it shall be possible to record points to be used as a reference to create the preemption zones.
- j. Save the configuration from the TSP unit to a file.
- k. Restore the configuration for a TSP unit from a saved configuration file.
- l. Print the TSP unit configuration.
- m. View the activity log from the TSP unit.
- n. To save the activity log to a file.
- o. Print the activity log.
- p. Update firmware for all upgradable modules of the TSP unit.
- q. The interface software shall display current status of all vehicles within range of the multimode phase selector, both in table format and displayed on a GIS map (GPS Vehicles only). The following details shall be tracked (Fields will vary by vehicle type):
 - r. The approach channel
 - s. Vehicle code
 - t. Priority level
 - u. Preempt / priority status
 - v. No preempt cause
 - w. Turn signal status
 - x. Signal strength
 - y. Unit ID
 - z. Radio channel
 - aa. ETA, distance, heading and velocity of vehicles in approach corridor
 - bb. Source of the call: vehicle or intersection
 - cc. Green phase monitoring with information on the current greens
 - dd. Active preemption / priority output
 - ee. Noise levels
 - ff. Intensity
 - gg. Primary or Auxiliary detector

The interface software shall display current status of all other intersections within radio range of the TSP unit in the cabinet. The following details shall be tracked:

- a. Name
- b. Radio channel

- c. Signal strength
- d. Number of vehicle tracked
- e. Number of satellites heard
- f. Fix type
- g. Horizontal and position dilution
- h. Unit ID
- i. The interface software shall display current status of visible GPS satellites. The following details shall be tracked:
- j. Intersection latitude and longitude
- k. Fix type
- l. Horizontal and position dilution
- m. Satellite number, elevation, and azimuth

87-24.03 INSTALLATION

87-24.03A INSPECTION OF EQUIPMENT BY AGENCY

Santa Cruz Metro reserves the right to inspect and/or factory test any completed assemblies prior to delivery of the material to the project site. Any deviations from these specifications that are identified during such testing shall be corrected prior to shipment of the assembly to the project site.

87-24.03B TRANSIT SIGNAL PRIORITY SYSTEM INSTALLATION

The Contractor shall install the detector unit(s), mounting hardware, cabling, TSP unit(s), system chassis, auxiliary panel, card rack(s), and shall coordinate with the equipment vendor representative for programming and calibration of the detector and TSP units. The Contractor shall follow step-by-step instructions provided by the equipment manufacturer and supplier to provide a fully functional installation

The Contractor shall program all TSP equipment and units installed in the traffic controller cabinets at each of the project signalized intersections.

The Contractor shall demonstrate that all of the components of each system are compatible and will perform satisfactorily as a system. Satisfactory performance shall be determined using the following test procedure during the functional test period.

Each system to be used for testing shall consist of a GPS emitter assembly, a GPS detector, detector cable and a TSP cabinet unit.

The TSP units shall be installed in the proper input file slot of the 332 controller and Type P cabinet assembly.

Two tests shall be conducted for each GPS detector assemblies; one using a Class I signal emitter and a distance of 1000' (300 m) between the emitter and the detector, the other using a Class II

signal emitter and a distance of 1800' (550 m) between the emitter and the detector. All range adjustments on the module shall be set to "Maximum" for each test.

Each above test shall be conducted for a period of one hour, during which the emitter shall be operated for 30 cycles, each consisting of a one minute "on" interval and a one minute "off" interval. During the total test period (1) the emitter signal shall cause the proper response from the Econolite Cobalt controller unit during each "on" interval and (2) there shall be no improper operation of either the Econolite Cobalt controller unit or the monitor during each "off" interval.

The Contractor shall calibrate the detectors to allow recognition of the transit priority call within 400 feet (minimum) of the stop bar or as directed by City (near-side stops will be case by case). The TSP recognition shall end 50' prior to the stop bar or as directed by the Engineer.

87-24.03C OPERATIONAL AND ACCEPTANCE TESTING

87-24.03C(1) ACCEPTANCE TEST PLAN

The Contractor shall provide an Acceptance Test Plan to FAX for review at least sixty (60) days prior to commencement of the system installation work. The acceptance Test Plan shall include the following:

- a. Installation Checklists
- b. Operational Test
- c. System Acceptance Test

87-24.03C(2) INSTALLATION CHECKLISTS

The Contractor shall prepare installation checklists for each intersection to ensure that the intersection GPS equipment has been installed according to installation plans and in a uniform manner. The checklists will be employed to record conformance with installation plans and uniformity of installation for each type of intersection.

The Contractor shall prepare and submit the Installation Checklists Data for Agency review.

87-24.03C(3) OPERATIONAL TEST

- a. The Contractor shall conduct an Operational Test for the GPS communications equipment installed under this Contract. The Operational Test shall be conducted to verify that each component or subsystem of the GPS functions in accordance with the Specifications and as required for a fully operational communications system to support the Transit Signal Priority applications.
- b. The Operational Test shall be performed for the GPS/TSP equipment installed at each intersection. The Operational Test shall verify that each Access Point Radio is fully operational, associates properly with adjacent Access Point Radios and GPS Terminal Servers

at adjacent client-equipped intersections, and can achieve the required throughput and bandwidth when communicating with adjacent Access Point Radios and Terminal Servers as indicated on the Plans. At a minimum, the Operational Test shall consist of:

- i. Ping tests from mobile client to network devices for each segment. Ping response times from client radio to any device on the network shall not exceed 100ms.
- ii. Link tests including throughput for each network link. Measured throughput shall not be less than 24 Mbps, at least 98 percent of the time, for each wireless link.
- iii. Using a mobile client simulator running on a laptop computer and using a roof-mounted antenna, verify that the desired serial messages are being received by the intersection terminal servers. For each route segment, the simulated serial messages shall be received at least 99 percent of the time.
- iv. The contractor shall prepare and submit the Operational Test Results Data for Agency review.

87-24.03D TRAINING

- 1. The Contractor shall conduct training and provide technical support as needed for the turnover of operations and maintenance for the transit signal priority applications.
- 2. The Contractor shall prepare a System Training Plan. The training shall be provided through practical demonstrations, seminars, and other appropriate technical procedures. Training shall include training on all systems, software, and hardware procured off-the-shelf, modified or partially or wholly developed by the Contractor.
- 3. The Contractor shall provide operations training to personnel designated by County of Santa Cruz and Santa Cruz METRO. The minimum number of personnel to be trained shall be as follows:

<u>Santa Cruz Metro:</u>	
Information Technology	2
Planning and Service Development	2
Operations	2

<u>County of Santa Cruz:</u>	
Traffic Engineering	2
Traffic Signals Maintenance	2
Information Technology	2
Facilities Maintenance	2

- 4. The training shall include, but not necessarily be limited to:
 - a. Hands-on operation for each type of equipment
 - b. Explanation of system commands, their function, and usage

COUNTY OF SANTA CRUZ DESIGN CRITERIA (JUNE 2024 EDITION)

County Applicable Details

<https://cdi.santacruzcountyca.gov/Portals/35/CDI/PublicWorks/Transportation/2024DesignCriteria.pdf>

ST-1a	Geometric Cross Sections
ST-1b	Standard Public Street Widths
ST-4a	Curb, Gutter, Sidewalk, and Dike Details
ST-6a	Typical Driveway Depression
ST-6b	Driveway Curb Depression, Standard Separated Sidewalk and Rolled (Type B Curb)
ST-12	Sidewalk Transition At Obstruction
W-8	Water Meter Box Installation
DW-1	Requirement for Driveways with Type A Curb and Gutter
DW-3	Requirement for Driveways with Type B Curb and Gutter
EP-1	Longitudinal Trench Detail
EP-2	Cross Trench Detail
EP-6	Temporary Steel Plates

CITY OF SANTA CRUZ WATER DEPARTMENT (SCWD)

Water System Standard Specifications and Standard Details (December 2009 Revision)

<https://www.cityofsantacruz.com/home/showpublisheddocument/50991/635919082759830000>