INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NOS. 300510 AND 300524

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PLANS FOR THE INSTALLATION OF TRAFFIC SIGNAL ON POMEROY ROAD AT WILLOW ROAD (SITE 1)

PLANS FOR THE INSTALLATION OF TRAFFIC SIGNAL ON THOMPSON AVENUE AT TITAN WAY (SITE 2)

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

NOTICE AND INSTRUCTIONS TO BIDDERS

FOR

INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NOS. 300510 AND 300524

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
NOTICE TO BIDDERS

Sealed proposals will be received at the office of the County Clerk, 1055 Monterey Street, Room D-120, San Luis Obispo, California 93408 until 3:00 P.M. on Thursday, _____, 20__, which bids will then be opened and declared at 3:15 o'clock P.M. on the above mentioned date at a public meeting at 1055 Monterey Street, Room D-120, by the County Clerk, for the following Public Works Project:

INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NOS. 300510 AND 300524

Any bid received at the Office of the Clerk of the Board of Supervisors of the County of San Luis Obispo after 3:00 P.M. on the date specified above shall not be considered, and shall be returned to the bidder unopened.

Bids are required for the entire work described herein.

An official bound copy of a reduced size set of the Project Plans, the Agreement, the Special Provisions, and blank forms suitable for use in bidding on said work may be obtained from the Department of Public Works, Room 207, County Government Center, San Luis Obispo, CA 93408 and may be purchased therefrom for $, (tax included), per bound copy, said purchase cost not to be refunded. Such documents must be purchased from the Department of Public Works in order to be recognized as an official planholder. No bid will be considered which is not on the forms herein provided. A full size set of the Project Plans and cross sections, if available, are charged separately at the department's current rates and will be provided only upon request.

Pursuant to the provisions of Section 1773 of the California Labor Code, the Board of Supervisors of the County of San Luis Obispo has obtained from the Director of the California Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work for the locality in which the work is to be performed for each needed craft, classification, or type of workman. Copies of said prevailing rate of per diem wages are on file in the Office of the Clerk of the Board of Supervisors and available at the California Department of Industrial Relations' web site address at: www.dir.ca.gov/DLSR/PWD.

Bidders are advised that any contractor who is awarded a public works project and intends to use a craft or classification not shown on the general prevailing wage determination may be required to pay the wage rate of that craft or classification most closely related to it as shown in the general determinations effective at the time of the call for bids.

Travel and Subsistence Payments shall be in accordance with Section 1773.1 of the Labor Code. Wage rates for holiday and overtime work shall be in accordance with Section 1773 of the Labor Code. Attention is directed to the provisions in Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning the employment of apprentices by the Contractor or any subcontractor. Attention is directed to the provisions in Section 1776 of the Labor Code concerning payroll records.

Attention is directed to the provisions in Sections 1810 – 1815 of the Labor Code concerning work hours.

Attention is directed to the provisions of Section 2-1.02, "Required Listing of Proposed Subcontractors," of the Special Provisions regarding the requirement that proposed subcontractors be listed in the bidder's proposal. A "DESIGNATION OF SUBCONTRACTORS" form for listing subcontractors, as required, is included in the section titled "Bid Proposal and Forms" of the Contract Documents. This form must be completed and submitted with bidder's bid proposal.

All bonds and endorsements thereto to be submitted pursuant to this contract shall be written by a company authorized to do surety business in the State of California.

Each bid must be accompanied by a form of bidder's security, namely cash, certified check, cashier's check, or bidder's bond, in the amount of ten percent (10%) of the total of the bid.

All addenda issued before the time in which to submit bids expires shall form a part of the Contract Documents which are the subject of the bid. Any such addendum issued before the time in which to submit bids expires shall be e-mailed to each planholder on the County's official planholder list, at the e-mail address provided to the County at the time bid documents were purchased from the Department of Public Works. An informational electronic copy of such addenda will also be posted to the County's website for the Bidder's convenience at the following web address:

http://www.slocounty.ca.gov/PW/Design_Division/Projects_Out_To_Bid.htm

All bidders are required to acknowledge and confirm receipt of each and every addendum in their bid proposal.

Within ten (10) calendar days, not including Saturdays, Sundays, and legal holidays, after receipt of notice that the contract has been awarded, the successful bidder, shall execute a written contract with the County in the form prescribed herein.

At the time of execution of the contract, the successful bidder shall submit the certificates of insurance stipulated in Article 7 of the Agreement, and, in addition thereto, shall furnish a "Performance Bond" in the sum of one hundred percent (100%) of the contract bid to guarantee the performance of the contract, and a "Payment Bond" in the sum of one hundred percent (100%) of the contract bid. The bond forms are included in the section titled "Agreement" of the Contract Documents.

Attention is directed to the provisions of Section 5-1.07, "Measurement and Payment," of the Special Provisions permitting the substitution of equivalent securities for any moneys withheld to ensure performance of this contract. Said Section 5-1.07 is incorporated by reference in this invitation for bid as if fully set forth at length.

Pursuant to Labor Code Section 1771.1, no contractor or subcontractor may be listed on the bid proposal for this public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

Pursuant to Labor Code Section 1771.1, no contractor or subcontractor may be awarded this public works contract unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations, pursuant to Labor Code Section 1771.4.

The Board of Supervisors reserves the right to reject any or all bids, and to waive discrepancies, irregularities, informalities or any other errors in the bids or bidding, if to do so seems to best serve the public interest. The right of Board of Supervisors to waive errors applies even if the Contract Documents state that a discrepancy, irregularity, informality or other error makes a bid nonresponsive, so long as the error does not constitute a material error.

The successful bidder must be licensed to perform the work in accordance with the laws of the State of California. Accordingly, the successful bidder shall possess a Class A general engineering contractor's license at the time this contract is awarded. In the alternative, the successful bidder shall possess a specialty contractor's license that permits the successful bidder to perform with his or her own organization contract work amounting to not less than 30% of the original total contract price and to subcontract the remaining work in accordance with Section 5-1.055, "Subcontracting," of the Amendments to the Standard Specifications. Failure of the bidder to be properly and adequately licensed shall constitute a failure to execute the contract and shall result in the forfeiture of the bidder's security.

Bidder's obligation to carefully examine the plans, specifications, contract, and site of the work are as set forth in Section 2-1.03 of the Standard Specifications of the State of California, Department of Transportation, dated May 2006. Bidder shall not at any time after submission of the bid, assert, or complain that there was any misunderstanding in regard to the nature or amount of work to be done.

By order of the Board of Supervisors County of San Luis Obispo made this _____day of _____, 20____.

County Clerk and Ex-officio Clerk
of the Board of Supervisors

By _____
Deputy Clerk

BID PROTESTS AND OTHER CHALLENGES TO AWARDS OF CONSTRUCTION CONTRACTS

Bid protests and any other challenges to the award of this construction contract must comply with the requirements described in the "Rules Governing Bid Protests and Other Challenges to Awards of Construction Contracts" ("Rules"), a copy of which is attached to this contract. In addition to the requirements described in the Rules, any bid protest must be submitted in writing to the Department of Public Works, Room 207, County Government Center, 976 Osos Street, San Luis Obispo, CA 93408; Attention: Design Engineer.

SPECIAL INSTRUCTIONS TO BIDDERS

All bidder Requests for Information must be submitted no later than 3 days prior to the bid opening date. Requests submitted after said date may not be considered. Bidders should submit Requests for Information to the County during the bid period at the following website:

http://www.slocounty.ca.gov/PW/Design_Division/Projects_Out_To_Bid.htm

Attention is directed to Section 4-1.03, "Contract Submittals," of the Special Provisions regarding the time period to submit the listed items upon receipt of the fully executed contract.

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

BID PROPOSAL AND FORMS

FOR

INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NOS. 300510 AND 300524

BID PROPOSAL

TO: THE BOARD OF SUPERVISORS OF THE COUNTY OF SAN LUIS OBISPO, STATE OF CALIFORNIA:

Pursuant to and in compliance with your Notice to Bidders, the undersigned, as bidder, declares that the only person or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm or corporation; that he/she is 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 he/she will comply with such provisions before commencing the performance of the work of this contract; that he/she has carefully examined the location of the proposed work, the annexed proposed form of contract, and he/she proposes, and agrees if this proposal is accepted, that he/she will contract with the Board of Supervisors of the County of San Luis Obispo in the form of the copy of the contract annexed hereto, to provide all necessary machinery, tools, apparatus and other equipment needed, and to do all of the work and furnish all the materials specified in the contract, in the manner and the time therein prescribed, and according to the requirements of the Department of Public Works and Transportation as therein set forth, and that he/she will take in full payment therefor the following unit prices, to-wit:

SEE NEXT PAGE FOR BID PROPOSAL FORM

INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NO. 300510 & 300524
ENGINEERS ESTIMATE

SITE 1 - TRAFFIC SIGNAL AT POMEROY ROAD AND WILLOW ROAD

ITEM NO.	CODE NO.	DESCRIPTION OF ITEM	APPROX. QUANTITY	UNIT OF MEASURE	UNIT PRICE (IN FIGURES) DOLLARS. CENTS	TOTAL AMOUNT DOLLARS. CENTS
1	120090	CONSTRUCTION AREA SIGNS	1	LS	LUMP SUM	
2	120100	TRAFFIC CONTROL SYSTEM	1	LS	LUMP SUM	
3	150710	REMOVE TRAFFIC STRIPE AND MARKINGS	1	LS	LUMP SUM	
4	150742	REMOVE ROADSIDE SIGN	8	EA		
5	1507XX	REMOVE AND SALVAGE EXISTING LIGHTING	1	LS	LUMP SUM	
6	566011	ROADSIDE SIGN - ONE POST	6	EA		
7	731503	MINOR CONCRETE (CURB RAMP)	4.2	CY		
8	731656	TRUNCCATED DOME MAT	75	SF		
9	833077	PEDESTRIAN BARRICADE	2	EA		
10	840XXX	STRIPING / MARKINGS	1	LS	LUMP SUM	
11	860XXX	FLASHING BEACON (SOLAR)	4	EA		
12	860201	TRAFFIC SIGNAL	1	LS	LUMP SUM	
13		ALLOWANCE FOR SUPPLEMENTAL FLAGGING AND TRAFFIC CONTROL	1	LS	LUMP SUM	$ 4,000.00
		TOTAL SITE 1 - TRAFFIC SIGNAL AT POMEROY ROAD AND WILLOW ROAD				

SITE 2 - TRAFFIC SIGNAL AT THOMPSON AVENUE AND TITAN WAY (CONTRACT NO. 300524)

14	120090	CONSTRUCTION AREA SIGNS	1	LS	LUMP SUM	
15	120100	TRAFFIC CONTROL SYSTEM	1	LS	LUMP SUM	
16	150710	REMOVE TRAFFIC STRIPE AND MARKINGS	1	LS	LUMP SUM	
17	150742	REMOVE ROADSIDE SIGN	2	EA		
18	1507XX	REMOVE AND SALVAGE EXISTING FLASHING BEACON/SOLAR PANEL	1	LS	LUMP SUM	
19	190101	ROADWAY EXCAVATION	30	CY		
20	203031	EROSION CONTROL (HYDROSEED)	1	LS	LUMP SUM	
21	260203	CLASS II AGGREGATE BASE	55	CY		
22	390132	HOT MIX ASPHALT (TYPE A)	31	TON		
23	566011	ROADSIDE SIGN - ONE POST	3	EA		
24	731503	MINOR CONCRETE (CURB RAMP)	2.5	CY		
25	731521	MINOR CONCRETE (SIDEWALK)	13.7	CY		
26	731656	TRUNCCATED DOME MAT	113	SF		
27	833077	PEDESTRIAN BARRICADE	1	EA		
28	833088	TUBULAR HANDRAILING	1	LS	LUMP SUM	
29	840XXX	STRIPING / MARKINGS	1	LS	LUMP SUM	
30	860604	FLASHING BEACON (SOLAR)	2	EA		

31	860201	TRAFFIC SIGNAL	1	LS	LUMP SUM	
32		ALLOWANCE FOR SUPPLEMENTAL FLAGGING AND TRAFFIC CONTROL	1	LS	LUMP SUM	$ 4,000.00
TOTAL SITE 2 - TRAFFIC SIGNAL AT THOMPSON AVENUE AND TITAN WAY						
TOTAL BID AMOUNT						

Bidder's Name: _____

Bidder represents that he/she has hereinabove set forth for each unit basis item of work a unit price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for that purpose. In the case of unit basis items, the amount set forth under the "Total" column is the extension of the unit price bid on the basis of the approximate quantity for the item.

In case of discrepancy between the unit price and the total set forth for a unit basis item, the unit price shall prevail, provided, however, if the amount set forth as a unit price is ambiguous, unintelligible, or uncertain for any cause, or is omitted, or is the same amount as the entry in the "Total" column, then the amount set forth in the "Total" column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price.

Proposals in which the prices are mathematically or materially unbalanced may be rejected. A bid is mathematically unbalanced if the bid is structured on the basis of nominal prices for some work and inflated prices for other work; that is, each element of the bid must carry its proportionate share of the total cost of the work plus profits. A bid is materially unbalanced if there is reasonable doubt that award to the bidder submitting the mathematically unbalanced bid will result in the lowest ultimate cost to the County.

Bidder shall execute and submit with their proposal, each of the following:

- BIDDERS INFORMATION LIST
- DESIGNATION OF SUBCONTRACTORS
- BIDDER'S NON-COLLUSION DECLARATION (STATE FORM)
- BIDDER'S BOND

Bidder declares that he/she has read, and agrees to, the Special Provisions, including, without limitation, the provisions of Sections 1, 2, 3, 4, and 5 thereof.

Bidder shall list the name and address of each subcontractor to whom the bidder proposes to directly subcontract portions of the work as required by the provisions in Section 2-1.02, "Required Listing of Proposed Subcontractors," of these Special Provisions. The list of subcontractors shall also set forth the portion of work that will be done by each subcontractor listed. The "DESIGNATION OF SUBCONTRACTORS" form for listing the subcontractors is included in the section titled "Bid Proposal and Forms" of the Contract Documents.

Accompanying this bid proposal is a bidder's bond, cash, cashier's check, or a certified check, payable to the County of San Luis Obispo, for the sum of _____ _____ Dollars ($_____), said amount being at least ten percent (10%) of the total of the bid. The proceeds thereof shall become the property of the County of San Luis Obispo if the proposal is withdrawn after the time fixed in the Notice to Bidders for the opening of bids, or if, in case this bid is accepted by said Board of Supervisors and such bidder has received notice that the contract has been awarded to him/her, the undersigned shall fail within ten (10) calendar days, not including Saturdays, Sundays, and legal holidays, thereafter to execute a contract with the County and furnish the certificates of insurance and Payment and Performance bonds required by the Contract Documents. Otherwise, said guarantee, except a bidder's bond, will be returned to the undersigned.

This bid proposal may be withdrawn, in writing, prior to the time fixed in the Notice to Bidders for the opening of bids. It is understood and agreed that this bid proposal will not be withdrawn after the time fixed in the Notice to Bidders for the opening of bids. Bidders further agree that the failure of the County to open bids for this project exactly at the time fixed in said Notice shall not extend the time within which bids may be withdrawn.

The undersigned bidder will sign and deliver to the County of San Luis Obispo the written contract, together with the certificates of insurance and bonds described in the Notice to Bidders, within ten (10) calendar days, not including Saturday, Sundays, and legal holidays, after the undersigned has received notice that the contract has been awarded to him/her.

The undersigned, as bidder, declares that he/she is aware of the provisions of Section 3700 of the California 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 will comply with such provisions before commencing the performance of the work of this contract.

The bidder's execution of the signature portion of this bid proposal shall also constitute an endorsement and execution of those certifications, questionnaires, and assurances which are a part of this proposal.

ADDENDA: The undersigned acknowledges and confirms the receipt of the following Addenda**:**

Addenda Number	Date

and agrees that said addenda are covered in the bid proposal and shall form a part of the Contract Documents.

If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a partnership, state true name of firm, also names of all individual co-partners composing firm; if bidder or other interested person is an individual, state first and last names in full.

_____

_____

Bidder warrants and represents that he/she is licensed in accordance with an Act providing for the registration of Contractors, License No. _____, Class _____, License Expiration Date _____. (Note: The successful bidder must possess the license classification specified in the Notice to Bidders upon award of this contract.)

Name of Bidder_____

Signature of Bidder_____

Printed Name and Title_____

Business Address_____

Email Address_____

Telephone Number_____

Date_____

DIR Registration No.*_____

NOTICE. . . . . .If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officer or officers authorized to sign contract in behalf of the corporation; if bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts in behalf of the partnership; and if the bidder is an individual, his or her signature shall be placed above. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the County prior to opening of bids or submitted with the bid; otherwise, the bid will be disregarded as irregular and unauthorized.

* Pursuant to Labor Code Section 1771.1, no contractor or subcontractor may be awarded this public works contract unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

RETURN THIS FORM WITH YOUR BID PROPOSAL

BIDDERS INFORMATION LIST

All bidders/proposers are required to provide the following information for all DBE and non-DBE contractors, who provided a proposal, bid, quote, or were contacted by the proposed prime contractor. This information is required from the proposed prime contractor and shall be submitted with their bid proposal. The Department of Public Works will use this information to maintain and update a "Bidder's List" to assist in the overall annual Disadvantaged Business Enterprise (DBE) availability goal setting process required for Federal-aid projects. This information is also being made available to other local agencies for the same purpose. *To the extent permitted by law, all information submitted will be held in strict confidence and will not be shared without your consent except as noted above.*

Contractor: ☐ Prime Contractor ☐ Subcontractor ☐ Supplier ☐ Other: _____

Firm Name: _____ Phone: _____

Business Address: _____ Fax: _____

_____

License No.
and Classification _____ Years in Business: _____

Contact Person: _____

Is the firm currently certified as a DBE by Caltrans? ☐ No ☐ Yes Cert. Number: _____

Gross Annual Receipts for last year:
☐ less than $1 million ☐ less than $5 million ☐ less than $10 million
☐ less than $15 million ☐ more than $15 million

Type of work/ services/ materials provided for this job:
☐ Contractor ☐ Supplier ☐ Manufacturer ☐ Trucking ☐ Broker
☐ Other (describe): _____

Contractor Specialty for this job:
☐ Roadway Construction (including signing, paving, and concrete) (237310)
☐ Roadway Painting/Striping (237310)
☐ Highway Lighting & Signal Installation (238210)
☐ Bridge Construction (237310)
☐ Tunnel Construction (237990)
☐ Water, Sewer, & Pipeline Construction (237110)
☐ Power & Communication Transmission Line (including conduit construction) (237130)
☐ Landscaping (561730)
☐ Irrigation (237110)
☐ Other Heavy Construction (including parks, reclamation, reservoir, water & sewer treatment facilities) (237990)
☐ Masonry (including retaining walls and foundations) (238140)
☐ Concrete Retaining Walls (238110)
☐ Building Construction (236210/236220)
☐ Other (describe): _____

- Copy sheet as needed
- None of the information requested on this form is material to the County's determination of which Bidder's Bid is the lowest responsive bid.

RETURN THIS FORM WITH YOUR BID PROPOSAL

DESIGNATION OF SUBCONTRACTORS FORM

In compliance with the provisions of Sections 4100-4113 of the Public Contract Code of the State of California, and any amendments thereto, the undersigned bidder sets forth the following:

a. The name and location of the place of business of each subcontractor who will perform work or labor, or render service to the undersigned Prime Contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the Prime Contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of one percent of the undersigned Prime Contractor's total bid or in the case of bids for the construction of streets and highways, including bridges, in excess of one-half of one percent or ten thousand dollars ($10,000), whichever is greater.*

b. The portion of the work which will be done by each such subcontractor. Only one subcontractor shall be listed for each such portion. If the subcontractor is not performing all of the work under the bid item number(s) listed for that subcontractor, the bidder shall set forth the portion of the work relating to said bid item number(s) that will be done by the subcontractor.

Bid Schedule Item No.	Description of Portion of Work (if applicable)	Subcontractor	License No.	DIR Reg. No.**	Address	Percent of Total Bid Price

By:_____

(Bidder's Signature/Printed Name and Title/Company Name)

NOTES: * When there is a failure to list a subcontractor, as required, the law provides that the Contractor agrees to do the work with his or her own forces. In such case, bidder must be authorized to perform said work. Any bid not complying with the provisions hereof may be rejected.

** Pursuant to Labor Code Section 1771.1, no contractor or subcontractor may be listed on the bid proposal for this public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

RETURN THIS FORM WITH YOUR BID PROPOSAL

BIDDER'S NON-COLLUSION DECLARATION (STATE FORM)

Bidder hereby states, under penalty of perjury, that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

_____
(Name of Company)

By: _____

_____
Printed Name

_____
Title

Date: _____

RETURN THIS FORM WITH YOUR BID PROPOSAL

BIDDER'S BOND

KNOW ALL BY THESE PRESENTS:

That we, _____

_____

as Principal, and _____

_____,

as Surety, are held and firmly bound unto the County of San Luis Obispo, State of California (hereinafter called "County") in the penal sum of Ten Percent (10%) of the total aggregate amount of the bid of the Principal above named, submitted by said Principal to the County for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents. In no case shall the liability of the Surety hereunder exceed the sum of _____

_____ ($_____).

THE CONDITION OF THIS OBLIGATION IS SUCH,

That whereas a bid to County for certain construction specifically described as follows, for which bids are to be opened on _____, 20____, has been submitted by Principal to County for:

INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NOS. 300510 AND 300524

NOW, THEREFORE, if the aforesaid Principal shall not withdraw said bid after the time fixed in the Notice to Bidders for the opening of the same, and shall within ten (10) calendar days, not including Saturdays, Sundays, and legal holidays, after receipt of written notice that the contract has been awarded to him/her, enter into a written contract with County, in the prescribed form, in accordance with the bid as accepted, and file with the County the certificates of insurance as stipulated in Article 7 of the Agreement and the two bonds, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by law, then this obligation shall be null and void; otherwise, it shall remain in full force and effect, and the penal sum guaranteed by this bond shall be forfeited to the County.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of said contract or to the work to be performed thereunder or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

In the event suit is brought upon said bond by County and judgment is recovered, the Surety shall pay all costs incurred by County in such suit, including a reasonable attorney's fee to be fixed by the court. Death of the Principal shall not relieve Surety of its obligations hereunder.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this _____ day of_____, 20____.

_____ (Seal)

_____ (Seal)

_____ (Seal)
Principal

_____ (Seal)

_____ (Seal)

_____ (Seal)
Surety

_____

_____
Address

NOTE:

Signatures of those executing for Surety must be properly acknowledged.

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

CONTRACT AGREEMENT

FOR

INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NOS. 300510 AND 300524

COUNTY OF SAN LUIS OBISPO

AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20_____, between the County of San Luis Obispo, a political subdivision and county of the State of California, party of the first part, hereinafter called "County" and _____ _____ the party of the second part, hereinafter called "Contractor".

WITNESSETH, that for and in consideration of the mutual covenants and agreements hereinafter contained, the parties hereto agree as follows:

ARTICLE 1 – WORK

That the Contractor will, at its own proper cost and expense, do all the work and furnish all the equipment and materials necessary to construct and complete in good and workmanlike manner to the satisfaction of the Board of Supervisors of said County, for

INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NOS. 300510 AND 300524

all in strict accordance with the Contract Documents, including without limitation, the Project Plans, the Standard Specifications of the State of California, Department of Transportation, dated May 2006 (hereinafter called, "Standard Specifications"), the Standard Plans of the State of California, Department of Transportation, dated May 2006 (hereinafter called, "Standard Plans"), and the Special Provisions therefor, on file in the Department of Public Works and Transportation and the Office of the Clerk of the Board of Supervisors of the County of San Luis Obispo, State of California.

ARTICLE 2 – CONTRACT

This Agreement, together with the Notice and Instructions to Bidders, Bid Proposal and Forms, Standard Specifications, Standard Plans, the Special Provisions, including without limitation the Project Plans incorporated therein, and all addenda thereto, form the contract, and said documents by this reference become as fully a part of this Agreement as if set forth in full and are herein sometimes referred to as "Contract" or as "Contract Documents". The terms set forth below, when utilized in said documents, shall mean as follows:

PUBLIC WORKS DIRECTOR: Means the Director of Public Works and Transportation (hereinafter, also the Department of Public Works) of the County of San Luis Obispo, State of California, acting either directly or through properly authorized agent(s), acting within the scope of the particular duties delegated to them, including registered engineers employed by the Department of Public Works and Transportation.

COUNTY CLERK: Means the Clerk of the Board of Supervisors of the County of San Luis Obispo, State of California.

ARTICLE 3 – CONTRACT TIMES

The Contractor shall begin work within ten (10) calendar days, not including Saturdays, Sundays, or legal holidays, from the date of receipt of the County's Notice to Contractor to Proceed, and the work to be accomplished under this contract shall be completed within the time limit provided in Section 4, "Prosecution and Progress of the Work", of the Special Provisions. Attention is directed to the provisions of said Section 4, "Prosecution and Progress of the Work", of the Special Provisions for the amount of liquidated damages.

ARTICLE 4 – CONTRACT PRICE

The total Contract price is the amount of the Contractor's bid as set forth in the award of the Contract approved by the County's Board of Supervisors. The Contractor will receive and accept and the County will pay the prices specified in the attached Bid Proposal, which is incorporated herein by reference, as full compensation for furnishing all labor, materials, and equipment for doing all the work contemplated and embraced in this Agreement. To the extent permitted by law, the Contractor assumes during the progress of the work and before its acceptance, any and all loss or damage arising out of the nature of the work aforesaid or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by the County; and assumes any and all expenses incurred by or in consequence of the suspension or discontinuance of work, for well and faithfully completing the work, and the whole thereof, in the manner and to the requirements of the Plans, Special Provisions, Standard Specifications, Standard Plans, and the Public Works Director.

ARTICLE 5 – SUBCONTRACTING

The Contractor's attention is directed to the provisions of Section 2-1.02, "Required Listing of Proposed Subcontractors," of the Special Provisions and the requirements contained therein.

Additionally, the Contractor's attention is directed to the provisions of the "Subletting and Subcontracting Fair Practices Act" set forth in Sections 4100-4114 of the Public Contract Code.

ARTICLE 6

The Contractor agrees that the Public Works Director shall decide as to the meaning of the Standard Specifications, Standard Plans, and Special Provisions for the work, including without limitation the Project Plans incorporated therein, where the same may be found to be obscure or in dispute and the decision shall be final. The Public Works Director shall have the right to correct any errors or omissions therein when such corrections are necessary to the proper fulfillment of the intention of the Special Provisions, Standard Specifications and Standard Plans; the action of such corrections is to take effect from the time said Public Works Director gives notice thereof to the Contractor.

ARTICLE 7 - INSURANCE REQUIREMENTS

Contractor, at its sole cost, shall purchase and maintain the insurance policies set forth below on all of its operations under this Agreement. All of the insurance companies providing insurance for Contractor shall have, and provide evidence of, an A.M. Best & Co. rating of A:VII or above, unless

exception is granted by Risk Manager. Further, all policies shall be maintained for the full term of this Agreement and related warranty period if applicable.

7.01 SCOPE AND LIMITS OF REQUIRED INSURANCE POLICIES

A. COMMERCIAL GENERAL LIABILITY

Policy shall include coverage at least as broad as set forth in Insurance Services Office Commercial General Liability Coverage (CG 00 01) with policy limits of not less than $2 million dollars combined single limit per occurrence. Policy shall be endorsed with the following specific language or contain equivalent language in the policy:

i.) The County of San Luis Obispo, its officers, officials, employees, and volunteers are named as an additional insured for all liability arising out of the operations by or on behalf of the named insured in the performance of this Agreement. General liability coverage can be provided in the form of an endorsement to the Contractor's insurance as least as broad as ISO Form CG 20 10 11 85 or if not available, through the addition of both CG 20 10 and CG 20 37 (if a later edition is used).

ii.) The insurance provided herein shall be considered primary coverage to the County of San Luis Obispo with respect to any insurance or self insured retention maintained by the County. Further, the County's insurance shall be considered excess insurance only and shall not be called upon to contribute to this insurance.

iii.) The policy shall not be cancelled or materially changed without first giving thirty days prior written notice to the County of San Luis Obispo, Department of Public Works.

B. BUSINESS AUTOMOBILE POLICY

Policy shall include coverage at least as broad as set forth in the liability section of Insurance Services Office Business Auto Coverage (CA 00 01) with policy limits of no less than $1 million dollars combined single limit for each occurrence. Said insurance shall include coverage for owned, non-owned, and hired vehicles. Policy shall be endorsed with the following specific language or contain equivalent language in the policy:

i.) The County of San Luis Obispo, its officers, officials, employees, and volunteers are named as an additional insured for all liability arising out of the operations by or on behalf of the named insured in the performance of this Agreement.

ii.) The policy shall not be cancelled or materially changed without first giving thirty days prior written notice to the County of San Luis Obispo, Department of Public Works.

C. WORKERS' COMPENSATION / EMPLOYERS' LIABILITY INSURANCE

i. Workers' Compensation: policy shall provide statutory limits as required by State of California. Policy shall be endorsed with the following specific language or contain equivalent language in the policy:

a. Contractor and its insurer shall waive all rights of subrogation against the County, its officers and employees for workers' compensation losses arising out of this Agreement.

b. The policy shall not be cancelled or materially changed without first giving thirty days prior written notice to the County of San Luis Obispo, Department of Public Works.

ii. Employer's Liability: policy shall provide $1 million dollars per accident for bodily injury or disease.

If the Contractor maintains higher limits than the minimum shown above, the County requires and shall be entitled to coverage for the higher limits maintained by the Contractor.

7.02 DEDUCTIBLES AND SELF-INSURANCE RETENTIONS

All deductibles and/or self-insured retentions which apply to the insurance policies required herein will be declared in writing and approved by the County prior to commencement of this Agreement.

7.03 DOCUMENTATION

Prior to commencement of work and annually thereafter for the term of this Agreement, Contractor will provide to the County of San Luis Obispo, Department of Public Works, Room 207, County Government Center, CA 93408, Attention Design Engineer, Contract No. 300510 and 300524, properly executed certificates of insurance clearly evidencing the coverage, limits, and endorsements specified in this Agreement. Further, at the County's request, the Contractor shall provide certified copies of the insurance policies within thirty days of request.

Failure of the County to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of the County to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

7.04 ABSENCE OF INSURANCE COVERAGE

County may direct Contractor to immediately cease all activities with respect to this Agreement if it determines that Contractor fails to carry, in full force and effect, all insurance policies with coverage levels at or above the limits specified in this Agreement. Any delays or expense caused due to stopping of work and change of insurance shall be considered Contractor's delay and expense.

7.05 SPECIAL RISKS OR CIRCUMSTANCES

The County reserves the right to modify these requirements, including limits, based on the nature of the risk, prior experience, insurer, coverage, or other special circumstances.

ARTICLE 8 – INDEMNIFICATION

8.01 A.1 GENERAL

To the fullest extent permitted by law, the Contractor assumes liability for and agrees, at the Contractor's sole cost and expense, to promptly and fully indemnify, protect, hold harmless and defend (even if the allegations are false, fraudulent, or groundless), the County, its Board and each member thereof, and their respective officials, officers, directors, employees, commission members, representatives, and agents ("Indemnitees"), from and against any and all claims, allegations, actions, suits, arbitrations, administrative proceedings, regulatory proceedings, or other legal proceeds, causes of action, demands, costs, judgments, liens, stop payment notices, penalties, liabilities, damages, losses, anticipated losses of revenues, and expenses (including, but not limited to, any fees of accountants, attorneys, experts, or other professionals, or investigation expenses), or losses of any kind or nature whatsoever, whether actual, threatened, or alleged, arising out of, resulting from, or in any way (either directly or indirectly), related to the Work, the Project or any breach of the Contract by Contractor or any of its officers, agents, employees, Subcontractors, Sub-subcontractors, or any person performing any of the Work, pursuant to a direct or indirect contract with the Contractor ("Indemnity Claims"). Such Indemnity Claims include, but are not limited to, claims for:

1. Any activity on or use of the County's premises or facilities;
2. Any liability incurred due to Contractor acting outside the scope of its authority pursuant to the Contract, whether or not caused in part by an Indemnified Party;
3. The failure of Contractor or the Work to comply with any applicable law, permit, or orders;
4. Any misrepresentation, misstatement or omission with respect to any statement made in the Contract Documents or any document furnished by the Contractor in connection therewith;
5. Any breach of any duty, obligation or requirement under the Contract Documents, including, but not limited to any breach of Contractor's warranties, representations, or agreements set forth in the Contract Documents;
6. Any failure to coordinate the Work with the County's separate contractors;
7. Any failure to provide notice to any party as required under the Contract Documents;
8. Any failure to act in such a manner as to protect the Project from loss, cost, expense, or liability;

9. Bodily or personal injury, emotional injury, sickness or disease, or death at any time to any persons including without limitation employees of Contractor;

10. Damage or injury to real property or personal property, equipment and materials (including, but without limitation, property under the care and custody of the Contractor or the County) sustained by any person or persons (including, but not limited to, companies, corporations, utility company or property owner, Contractor and its employees or agents, and members of the general public);

11. Any liability imposed by applicable law including, but not limited to criminal or civil fines or penalties;

12. Any dangerous, hazardous, unsafe or defective condition of, in or on the site, of any nature whatsoever, which may exist by reason of any act, omission, neglect, or any use or occupation of the site by Contractor, its officers, agents, employees, or Subcontractors;

13. Any operation conducted upon or any use or occupation of the site by Contractor, its officers, agents, employees, or Subcontractors under or pursuant to the provisions of the Contract or otherwise;

14. Any acts, errors, omission or negligence of Contractor, its officers, agents, employees, or Subcontractors;

15. Infringement of any patent rights, licenses, copyrights or intellectual property which may be brought against the Contractor or the County arising out of Contractor's Work, for which the Contractor is responsible; and

16. Any and all claims against the County seeking compensation for labor performed or materials used or furnished to be used in the Work or alleged to have been furnished on the Project, including all incidental or consequential damages resulting to the County from such claims.

A.2 EFFECT OF INDEMNITEES' ACTIVE NEGLIGENCE

Contractor's obligations to indemnify and hold the Indemnitees harmless **exclude** only such portion of any Indemnity Claim which is attributable to the active negligence or willful misconduct of the Indemnitee, provided such active negligence or willful misconduct is determined by agreement of the parties or by findings of a court of competent jurisdiction. In instances where an Indemnitee's active negligence accounts for only a percentage of the liability for the Indemnity Claim involved, the obligation of Contractor will be for that entire percentage of liability for the Indemnity Claim not attributable to the active negligence or willful misconduct of the Indemnitee(s). Such obligation shall not be construed to negate, abridge or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Article 8 A. Subject to the limits set forth herein, the Contractor, at its own expense, shall satisfy any resulting judgment that may be rendered against any Indemnitee resulting from an Indemnity Claim. The Indemnitees shall be consulted with regard to any proposed settlement.

A.3 INDEPENDENT DEFENSE OBLIGATION

The duty of the Contractor to indemnify and hold harmless the Indemnitees includes the separate and independent duty to defend the Indemnitees, which duty arises immediately upon receipt by Contractor of the tender of any Indemnity Claim from an Indemnitee. The Contractor's obligation to defend the Indemnitee(s) shall be at Contractor's sole expense, and not be excused because of the Contractor's inability to evaluate liability or because the Contractor evaluates liability and determines that the Contractor is not liable. This duty to defend shall apply whether or not an Indemnity Claim has merit or is meritless, or which involves claims or allegations that any or all of the Indemnitees were actively, passively, or concurrently negligent, or which otherwise asserts that the Indemnitees are responsible, in whole or in part, for any Indemnity Claim. The Contractor shall respond within thirty (30) calendar days to the tender of any Indemnity Claim for defense and/or indemnity by an Indemnitee, unless the Indemnitee agrees in writing to an extension of this time. The defense provided to the Indemnitees by Contractor shall be by well qualified, adequately insured and experienced legal counsel acceptable to the County.

A.4 INTENT OF PARTIES REGARDING SCOPE OF INDEMNITY

It is the intent of the parties that the Contractor and its Subcontractors of all tiers shall provide the Indemnitees with the broadest defense and indemnity permitted by Applicable Law. In the event that any of the defense, indemnity or hold harmless provisions in the Contract Documents are found to be ambiguous, or in conflict with one another, it is the parties' intent that the broadest and most expansive interpretation in favor of providing defense and/or indemnity to the Indemnitees be given effect.

A.5 WAIVER OF INDEMNITY RIGHT AGAINST INDEMNITEES

With respect to third party claims against the Contractor, to the fullest extent permitted by law, the Contractor waives any and all rights to any type of express or implied indemnity against the Indemnitees.

A.6 SUBCONTRACTOR REQUIREMENTS

In addition to the requirements set forth hereinabove, Contractor shall ensure, by written subcontract agreement, that each of Contractor's Subcontractors of every tier shall protect, defend, indemnify and hold harmless the Indemnitees with respect to Indemnity Claims arising out of, in connection with, or in any way related to each such Subcontractors' Work on the Project in the same manner in which Contractor is required to protect, defend, indemnify and hold the Indemnitees harmless. In the event Contractor fails to obtain such defense and indemnity obligations from others as required herein, Contractor agrees to be fully responsible to the Indemnitees according to the terms of this Article 8 A.

A.7 NO LIMITATION OR WAIVER OF RIGHTS

Contractor's obligations under this Article 8 A are in addition to any other rights or remedies which the Indemnitees may have under the law or under the Contract Documents. Contractor's indemnification and defense obligations set forth in this Article 8 A are separate and independent from the insurance provisions set forth in the Contract Documents, and do not limit, in any way, the applicability, scope, or obligations set forth in such insurance provisions. The purchase of insurance by the Contractor with respect to the obligations required herein shall in no event be construed as fulfillment or discharge of such obligations. In any and all claims against the Indemnitees by any employee of the Contractor, any Subcontractor, any supplier of the Contractor or Subcontractors, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the obligations under this Article 8 A shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor or any supplier of either of them, under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts. Failure of the County to monitor compliance with these requirements imposes no additional obligations on the County and will in no way act as a waiver of any rights hereunder.

A.8 WITHHOLDING TO SECURE OBLIGATION

In the event an Indemnity Claim arises prior to final payment to Contractor, the County may, in its sole discretion, reserve, retain or apply any monies due Contractor for the purpose of resolving such Indemnity Claims; provided, however, the County may release such funds if the Contractor provides the County with reasonable assurances of protection of the Indemnitees' interests. The County shall, in its sole discretion, determine whether such assurances are reasonable.

A.9 SURVIVAL OF INDEMNITY OBLIGATIONS

Contractor's obligations under this Article 8 A are binding on Contractor's and its Subcontractors' successors, heirs and assigns and shall survive the completion of the Work or termination of the Contractor's performance of the Work.

B.01 RESPONSIBILITY TO OTHER ENTITIES

You are responsible for any liability imposed by law and for injuries to or death of any person, including workers and the public, or damage to property. Indemnify and save harmless any county, city or district and its officers and employees connected with the work, within the limits of which county, city, or district the work is being performed, all in the same manner and to the same extent specified for the protection of the State.

ARTICLE 9 – FINAL PAYMENT

It is mutually agreed between the parties hereto, that no certificate given or payments made under this contract, except the final payment, shall be evidence of the performance of this contract, either wholly or in part, against any claim of the Contractor. Final payment for the work performed under this contract shall not be made until the lapse of thirty-five (35) calendar days after the notice of completion of said work has been filed for record and no payment shall be construed to be an acceptance of any defective work or improper materials. The Contractor further agrees that acceptance by the Contractor of the final payment due under this contract, and the adjustment and payment of his/her bill rendered for any work done in accordance with any amendments of this Contract, shall be and shall operate as a release to the County of San Luis Obispo from any and all claims or liabilities on account of work performed under this Contract except claims or liabilities for which written notice of claim or protest has been filed with the Public Works Director. Besides guarantees required elsewhere, the Contractor shall and does hereby guarantee all workmanship and material for a period of one year from and after both the date of acceptance of the work and the recordation of the notice of completion by the County and shall repair or replace any or all work and material, together with any other portions of the work which may be displaced in so doing, that in the opinion of the County is or becomes defective during the period of said guarantee without expense whatsoever to the County.

ARTICLE 10 – CONTRACTOR'S REPRESENTATIONS

The Contractor hereby declares that he/she has read the Contract Documents pertaining to the work to be accomplished hereunder, has carefully examined the plans and detail drawings of the work to be performed and fully understands the intent and meaning of the same.

It is further stipulated and agreed that the Contractor shall keep himself/herself fully informed of all laws, ordinances, and regulations which do or may affect the conduct of the work, the materials used therein or persons engaged or employed thereupon and all such orders of bodies and tribunals having any jurisdiction over the same. If it be found that the Special Provisions or Standard Specifications for the work conflict with any such law, ordinance or regulation the Contractor shall immediately report same to the Public Works Director in writing. The Contractor shall at all times observe and comply with and shall cause all his/her agents, employees, and independent contractors hired by the Contractor to observe and comply with all such existing and future laws, ordinances, regulations, or decrees.

ARTICLE 11 – APPRENTICES

Attention is directed to the provisions in Sections 1777.5, 1777.6, and 1777.7 of the Labor Code concerning the employment of apprentices by the Contractor or any subcontractor.

The Contractor and any subcontractor shall comply with the requirements of Sections 1777.5, 1777.6, and 1777.7 of the Labor Code in the employment of apprentices.

To insure compliance and complete understanding of the law relating to apprentices, and specifically the required ratio thereunder, each contractor or subcontractor should, where some question exists, contact the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco,

California, or one of its branch offices prior to commencement of work on this contract. Responsibility for compliance with said Labor Code Sections lies with the prime contractor.

ARTICLE 12 – PAYROLL RECORDS

Attention is directed to the provisions in Section 1776 of the Labor Code concerning Contractor and subcontractor payroll records.

The Contractor and any subcontractor shall comply with the requirements of Section 1776 of the Labor Code.

ARTICLE 13 – EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this contract, Contractor agrees to comply with all of the Equal Employment Opportunity provisions of Executive Order No. 11246 of September 24, 1965, as amended by Executive Order 11375 of October 13, 1967, and as supplemented in Department of Labor regulations (41 CFR Chapter 60), including the following:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoffs or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Department of Public Works setting forth the provisions of this nondiscrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

3. The Contractor will send to each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Department of Public Works, advising the said labor union or worker's representative of the Contractor's commitments under this Article 14 and shall post copies of the Notice in conspicuous places available to employees and applicants for employment.

4. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations (41 CFR, Part 60) and relevant orders of the Secretary of Labor.

5. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the County of San Luis Obispo and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

6. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations or orders, this contract may be cancelled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.

7. The Contractor will include the provisions of this Article in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Public Works Director or the Secretary of Labor may direct as a means of enforcing such provisions including sanctions for noncompliance: provided, however, that in the event a contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the Secretary of Labor, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

ARTICLE 14 - SAFETY

All work conducted by the Contractor and/or subcontractors in the execution of this contract shall be in accordance with current CAL OSHA requirements. Full compensation for compliance with the provisions of this Article shall be considered as included in the other items of work and no additional compensation will be allowed therefor.

ARTICLE 15 – BONDS

Contractor agrees that the Payment Bond and Performance Bond attached to this Agreement are for reference purposes only, and shall not be considered a part of this Agreement or any other Contract Document. Contractor further agrees that said bonds are separate obligations of the Contractor and its surety, and that any attorney's fee provision contained in any payment bond or performance bond shall not apply to any legal action between Contractor and County to enforce any provision of the Contract Documents.

ARTICLE 16 – ATTORNEYS FEES

No provisions of the Contract Documents provide either the Contractor or the County the right to be awarded any attorney's fees and/or costs under Civil Code section 1717 in any legal action brought by either party to enforce any provision of the Contract Documents against the other party. The parties agree that any references to attorney's fees in language describing indemnification obligations do not constitute a contractual provision that would provide either the Contractor or the County the right to be awarded any attorney's fees and/or costs under Civil Code section 1717 in any legal action brought by either party to enforce any provision of the Contract Documents against the other party. Any other language in the Contract Documents providing for a recovery of attorney's fees shall be strictly construed as not including the recovery of any attorney's fees incurred by either Contractor or County in any legal action brought by either party to enforce any provision of the Contract Documents against the other party.

The parties agree that the Contract Documents contain no provisions that would allow either the Contractor or the County to be awarded attorney's fees and/or costs under Civil Code section 1717. Nothing in this Article affects any right by Contractor or County to recover attorney's fees or costs by operation of any law other than Civil Code section 1717.

In the event of any conflict between language in this Article and any other language in the Contract Documents, the language in this Article shall prevail.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands the year and date first above written, being authorized thereto.

COUNTY OF SAN LUIS OBISPO

By:_____
Chairperson of the Board of Supervisors

Date:_____

ATTEST:
CLERK OF THE BOARD OF SUPERVISORS

By:_____
Deputy Clerk

Date:_____

APPROVAL RECOMMENDED

By:_____
Wade Horton, Director of Public Works

Date: 22 JUN 2015

APPROVED AS TO FORM AND LEGAL EFFECT:

RITA L. NEAL
County Counsel

By:_____

Date: 6/2/15

CONTRACTOR

_____

By:_____

Date:_____

_____
Printed Name and Title
(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign)

By:_____

_____
(Printed Name and Title)

Date:_____

Address for giving notices:

_____

_____

_____

PERFORMANCE BOND

KNOW ALL BY THESE PRESENTS: That

WHEREAS, the Board of Supervisors of the County of San Luis Obispo, State of California, has awarded to _____

_____

(hereinafter designated as "Principal") a contract for _____

_____

_____

_____; and

WHEREAS, said Principal is required under the terms of said contract to furnish a bond for the faithful performance of said contract;

NOW, THEREFORE, we, the Principal and _____

_____, as Surety, are held and firmly bound unto the County of San Luis Obispo, (hereinafter called "County"), in the penal sum of

_____

($_____), lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above bounded Principal, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the said contract and any alteration thereof made as therein provided, on his/her or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and

meaning, and shall indemnify and save harmless County, its officers, agents, and employees, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force virtue and effect.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or additions to the terms of the contract or to the work or to the specifications.

In the event suit is brought upon this bond by County and judgment is recovered, Surety shall pay all costs incurred by County in such suit, including a reasonable attorney's fee to be fixed by the Court.

Death of the Principal shall not relieve Surety of its obligations hereunder.

IN WITNESS WHEREOF, one identical counterpart of this instrument, which shall for all purposes be deemed an original thereof, has been duly executed by Principal and Surety above named, on the _____ day of_____, 20____.

_____ (Seal)

_____ (Seal)

_____ (Seal)
Principal

_____ (Seal)

_____ (Seal)

_____ (Seal)
Surety

_____

_____
Address

NOTE:

Signatures of those executing for Surety must be properly acknowledged.

PAYMENT BOND

KNOW ALL BY THESE PRESENTS:

WHEREAS, the Board of Supervisors of the County of San Luis Obispo, State of California, and _____ _____ (hereinafter designated as "Principal") have entered into an agreement for _____ _____ _____ _____ which said Agreement, and all of the Contract Documents attached to or forming a part of said Agreement, are hereby referred to and made a part hereof; and

WHEREAS, pursuant to law, the Principal is required before entering upon the performance of the Work, to file a good and sufficient bond with the body by whom the contract is awarded, to secure claims to which reference is made in Sections 3247 through 3252, inclusive, of the Civil Code of California, and Sections 3181, 3110, 3111 and 3112 of the Civil Code of California,

NOW, THEREFORE, said Principal and the undersigned _____ _____ as corporate surety, are held and firmly bound unto the County of San Luis Obispo, and unto all laborers, materialmen, and other persons referred to in said statutes in the sum of _____ ($_____), lawful money of the United States for the payment of which sum well and truly made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally by these presents.

The condition of this obligation is such that if the said Principal, his/her or its heirs, executors, administrators, successors or assigns, or subcontractors, shall fail to pay any of the persons named in Civil Code Section 3181, or amounts due under the Unemployment Insurance Code with respect to work or labor performed by any such claimant, or any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Principal and his/her subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, that the surety herein will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall be void. In case suit is brought upon this bond, the said surety will pay a reasonable attorney's fee to be fixed by the court.

This bond shall inure to the benefit of any of the persons named in Civil Code Section 3181 as to give a right of action to such persons or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force, virtue, and effect.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or additions to the terms of the contract or to the work or to the specifications.

Death of the Principal shall not relieve Surety of its obligations hereunder.

IN WITNESS WHEREOF one identical counterpart of this instrument, which shall for all purposes be deemed an original thereof, has been duly executed by the Principal and Surety above named, on the _____ day of_____, 20____.

_____ (Seal)

_____ (Seal)

_____ (Seal)
Principal

_____ (Seal)

_____ (Seal)

_____ (Seal)
Surety

_____

_____
Address

NOTE:
Signatures of those executing for Surety must be properly acknowledged.

COUNTY OF SAN LUIS OBISPO
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

SPECIAL PROVISIONS

FOR

INSTALLATION OF
TRAFFIC SIGNALS
NIPOMO, CA
CONTRACT NOS. 300510 AND 300524

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CONTRACT NO. 300510 and 300524

The Special Provisions contained herein have been prepared by or under the direction of the following registered engineer(s):

PREPARED BY:

PROJECT ENGINEER — DATE 6/19/15

DESIGN ENGINEER — DATE 6/19/15

RECOMMENDED FOR APPROVAL AND ADVERTISING BY:

Dave Flynn
DEPUTY PUBLIC WORKS DIRECTOR — DATE 6/22/15

APPROVED BY:

PUBLIC WORKS DIRECTOR — DATE 22 JUN 2015

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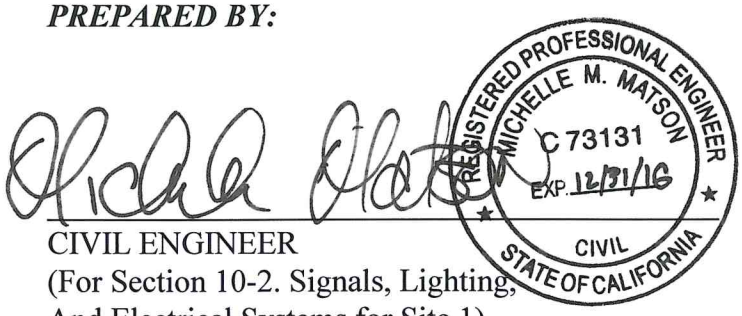
CONTRACT NO. 300510 and 300524

The Special Provisions contained herein have been prepared by or under the direction of the following registered engineer(s):

PREPARED BY:



CIVIL ENGINEER
(For Section 10-2. Signals, Lighting,
And Electrical Systems for Site 1)

June 11th, 2015
DATE

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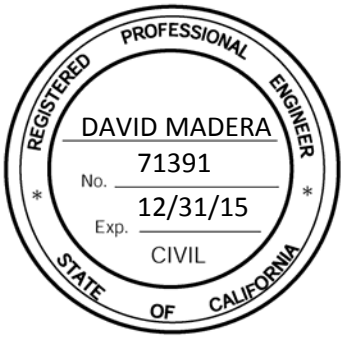
CONTRACT NO. 300510 and 300524

The Special Provisions contained herein have been prepared by or under the direction of the following registered Engineer(s):

PREPARED BY:

_____	6-25-2015
CIVIL ENGINEER (For Section 10-3. Signals, Lighting, And Electrical Systems for Site 2)	DATE



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SECTION 1. SPECIFICATIONS AND PLANS

1-1.01 SPECIFICATIONS AND PLANS

The work embraced herein shall be done in accordance with the Standard Specifications of the State of California, Department of Transportation, dated May 2006 (hereinafter called, "Standard Specifications"), the Standard Plans of the State of California, Department of Transportation, dated May 2006 (hereinafter called, "Standard Plans"), and in accordance with these Contract Documents. Wherever State Agencies, Departments, or Officers are referred to in the above mentioned Standard Specifications and Standard Plans, the comparable County of San Luis Obispo Agency, Department, or Officer having jurisdiction shall be meant thereby for the purpose of these Contract Documents.

The County hereby elects under Public Contract Code § 20396 to have said applicable provisions of the Standard Specifications and Standard Plans referenced above, including those provisions modified by these Special Provisions, governed by the State Contract Act to the extent, and only to the extent, one or both of the following conditions is satisfied: (1) the applicable provisions of the Standard Specifications or Standard Plans expressly refer to the State Contract Act; or (2) the County would lack the authority to implement the applicable provisions of the Standard Specifications or Standard Plans absent the County's election to have the County's implementation of the provisions governed by the State Contract Act.

No amendment by the Department of Transportation to the Standard Specifications shall apply to these Contract Documents unless the amendment is expressly set forth in these Special Provisions.

In case of conflict between the Standard Specifications and the contract Special Provisions herein, the Special Provisions shall take precedence over such conflicting portions.

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SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

2-1.01 PROPOSAL REQUIREMENTS AND CONDITIONS

Attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these Special Provisions for the requirements and conditions which the bidder must observe in preparation and the submission of their bid.

Pursuant to Labor Code Section 1771.1, no contractor or subcontractor may be listed on the bid proposal for this public works project unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

Pursuant to Labor Code Section 1771.1, no contractor or subcontractor may be awarded this public works contract unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

This Project is subject to compliance monitoring and enforcement by the Department of Industrial Relations, pursuant to Labor Code Section 1771.4.

The bidder's bond shall conform to the bond form in the section titled "Bid Proposal and Forms" of the Contract Documents and shall be properly filled out and executed. The bidder's bond form included in the Contract Documents may be used.

The following provisions for Section 2, "Proposal Requirements and Conditions," of the Standard Specifications are hereby modified as set forth hereafter.

Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications is hereby amended by modifying the first sentence of the 5th paragraph to read: "Inspection of such records may be made at the Department of Public Works and Transportation of the County of San Luis Obispo."

Section 2-1.05, "Proposal Forms" of the Standard Specifications, is hereby amended by substituting the words, "General and Special Provisions" for the words, "Proposal and Contract" in the first sentence of the 2nd paragraph and by substituting the words, "Notice to Bidders" for the words, "Notice to Contractors" in the first sentence of the 3rd paragraph. The 4th paragraph is hereby amended to read: "Proposal forms shall be obtained from the Department of Public Works and Transportation, County Government Center, San Luis Obispo, CA. 93408." The 5th paragraph is hereby deleted.

Section 2-1.07, "Proposal Guaranty" of the Standard Specifications, is hereby amended by substituting the words, "made payable to the County of San Luis Obispo" for the words, "made payable to the Director of Transportation" in the first paragraph. The 2nd paragraph is hereby amended by adding the following

sentence, “The provisions of the Public Contract Code § 10181 are applicable to this contract.” The first sentence of the last paragraph is hereby amended by substituting the words, “General and Special Provisions” for the words, “Proposal and Contract”. The last sentence of the last paragraph is hereby deleted.

Section 2-1.08, “Withdrawal of Proposals” of the Standard Specifications, is hereby amended by substituting the words, “Office of the Clerk of the Board of Supervisors of the County of San Luis Obispo” for the words, “Office Engineer, Division of Construction” in the first sentence. The last sentence is hereby amended by modifying it to read: “Any bid received at the Office of the Clerk of the Board of Supervisors of the County of San Luis Obispo after the date and time specified in the Notice to Bidders shall not be considered and shall be returned to the bidder unopened nor may any bid be withdrawn after the time fixed in the public notice for the opening of bids.”

Section 2-1.105, “Previous Disqualification, Removal or Other Prevention of Bidding”, of the Standard Specifications, is hereby amended by deleting the first paragraph.

Section 2-1.108, “Compliance with Orders of the National Labor Relations Board”, of the Standard Specifications, is hereby amended by modifying the last paragraph to read: “The statement required by said Section 10232 is included in the section titled “Bid Proposal and Forms” of the Contract Documents.”

Section 2-1.11, “Ineligibility to Contract”, of the Standard Specifications is hereby amended by modifying the last paragraph to read: “A form for the statement required by Section 10285.1 is included in the section titled “Bid Proposal and Forms” of the Contract Documents.”

2-1.02 REQUIRED LISTING OF PROPOSED SUBCONTRACTORS

The designated subcontractors listed in the bidder's proposal shall list therein the name and address of all subcontractors to whom the bidder proposes to subcontract portions of the work in an amount in excess of 1/2 of one percent of the total bid, or in the case of bids for the construction of streets and highways, including bridges, in excess of 1/2 of the one percent or $10,000, whichever is greater, in accordance with the Subletting and Subcontracting Fair Practices Act commencing with Section 4100 of the Public Contract Code. The bidder’s attention is invited to other provisions of said Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

The “DESIGNATION OF SUBCONTRACTORS” form for the designation of subcontractors, as required herein, is included in the section titled “Bid Proposal and Forms” of the Contract Documents and shall be completely filled out, signed by the bidder, and submitted with the bid proposal.

SECTION 3. AWARD AND EXECUTION OF CONTRACT

3-1.01 AWARD OF CONTRACT

Attention is directed to the provisions of Section 3, "Award and Execution of Contract," of the Standard Specifications and these Special Provisions for the requirements and conditions concerning award and execution of the contract.

The award of contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all of the requirements prescribed. Such award, if made, will be made within 45 calendar days after the opening of proposals.

If the lowest responsible bidder refuses or fails to execute the contract, the Board of Supervisors of the County of San Luis Obispo may award the contract to the second lowest responsible bidder. Such award, if made, will be made within 75 calendar days after the opening of proposals. If the second lowest responsible bidder refuses or fails to execute the contract, the Board of Supervisors of the County of San Luis Obispo may award the contract to the third lowest responsible bidder. Such award, if made, will be made within 105 calendar days after the opening of proposals. The periods of time specified above within which the award of contract may be made shall be subject to extension for such further period as may be agreed upon in writing between the County of San Luis Obispo and the bidder concerned.

3-1.02 CONTRACT BONDS

The successful bidder shall furnish two (2) bonds:

1. The Payment bond to secure the claim payments of laborers, workers, mechanics, or materialmen providing goods, labor, or services under the contract. This bond shall be equal to one hundred percent (100%) of the total contract bid.
2. The Performance bond to guarantee the faithful performance of the contract. This bond shall be equal to one hundred percent (100%) of the total contract bid.

Forms for the two (2) required bonds are included in the section titled "Bid Proposal and Forms" of the Contract Documents.

Surety on said bonds must agree that death of the Contractor shall not relieve the surety of its obligation hereunder. The said surety, for the value received, must stipulate and agree that all alterations, extension of time, extra and additional work, and other changes authorized by these Specifications or any part of the contract may be made without securing consent of the surety on the contract bonds, and such actions shall not in any way affect the obligations of the surety on the bonds.

Attention is directed to the provisions in Section 6-1.075, "Guarantee," of the

Amendments to the Standard Specifications.

3-1.03 EXECUTION OF CONTRACT

The contract shall be signed by the successful bidder and returned, together with the contract bonds, copy of insurance policies, and Certificates of Insurance, with documents to verify any self insurance coverage within ten (10) calendar days, not including Saturdays, Sundays, and legal holidays, after the bidder has received the contract for execution.

The contract shall not be deemed executed by the successful bidder unless all of the above documents are received by the County with the signed contract within said time period. The bidder's security may be forfeited for failure to execute the contract within the time specified.

SECTION 4. PROSECUTION AND PROGRESS OF THE WORK

4-1.01 GENERAL

Attention is directed to the provisions in Section 8, "Prosecution and Progress," of the Standard Specifications and these Special Provisions.

The Contractor shall begin work within fifty (50) working days from the date of receipt of the County's "Notice to Proceed."

This work shall be diligently prosecuted to completion before the expiration of 120 WORKING DAYS from the date of receipt of the County's "Notice to Proceed." The Contractor shall not begin work in advance of receiving the County's "Notice to Proceed."

4-1.02 LIQUIDATED DAMAGES

Attention is directed to Section 8-1.07, "Liquidated Damages," of the Standard Specifications and these Special Provisions.

It is agreed by the parties to the contract that in the case all the work called for under the contract in all parts and requirements is not finished or completed within the number of working days as set forth in these Special Provisions, damage will be sustained by the County of San Luis Obispo, and that it is and will be impractical and extremely difficult to ascertain and determine the actual damage which the County will sustain in the event of and by reason of such delay; and it is therefore agreed that the Contractor will pay to the County of San Luis Obispo the sum of TWO THOUSAND DOLLARS ($2,000.00) per day for each and every calendar days delay in finishing the work in excess of the number of working days prescribed above as liquidated and agreed damages; and the Contractor agrees to pay said liquidated damages herein provided for, and further agrees that the County may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.

The language in Sections 10253 through 10260 of the Public Contract Code are incorporated herein by reference as though fully set forth herein (with the word "Director" therein construed to mean the Public Works Director); provided, however, that prequalification of bidders shall not be required, and any references in said sections to prequalification of bidders are hereby deleted.

4-1.03 CONTRACT SUBMITTALS

The Contractor shall submit the following to the Engineer within ten (10) calendar days, not including Saturdays, Sundays, and legal holidays, of the Contractor's receipt of the fully executed contract:

- Storm Water Pollution Prevention Plan or Water Control Plan – 3 copies
- Recycling Plan

- Proposed Progress Schedule

- Identity of Project Safety Officer

The Contractor shall allow ten (10) days, not including Saturdays, Sundays, and legal holidays, for the Engineer's review. The Contractor shall revise and resubmit the submittal within five (5) days, not including Saturdays, Sundays, and legal holidays, of receipt of the Engineer's comments. No claim will be allowed for damages or extensions of time because of delays in work resulting from rejection of the submittals or from revisions and resubmittal of the submittals. The number of working days within which the Contractor must complete the work under this contract shall be reduced by 1 working day for each day the Contractor fails to submit or resubmit the required submittal to the Engineer within the prescribed time allowances.

The Engineer's review and approval shall not waive any contract requirements and shall not relieve the Contractor from complying with Federal, State, and local laws, regulations, and requirements. No claim will be allowed for damages or extensions of time because of delays in work resulting from any documents submitted by Contractor to any federal, state, or local agency that are determined by such agency to be incomplete or not in compliance with any applicable laws, regulations, or requirements.

4-1.04 MANDATORY PRE-CONSTRUCTION CONFERENCE

Prior to the issuance of the "Notice to Proceed" a mandatory pre-construction conference will be held at the office of the Construction Engineer for the purpose of discussing with the Contractor the scope of work, contract drawings, specifications, existing conditions, materials to be ordered, equipment to be used, and all essential matters pertaining to the prosecution and the satisfactory completion of the project as required. The Contractor's representatives at this conference shall include major superintendents and shall include major subcontractors' representatives. So long as the County provides the Contractor at least 5 calendar days advance notice of the date and time of said conference. The number of working days within which the Contractor must complete the work under this contract shall be reduced by 1 working day for each day said conference is delayed by the Contractor's failure to attend the conference with the appropriate representatives.

A written record of attendance and items discussed will be made by the Engineer and a copy of the record kept in the Engineer's files. If for any reason a pre-construction conference is not held the Engineer will notify the Contractor in writing.

SECTION 5. GENERAL AND MISCELLANEOUS

5-1.01 DEFINITIONS AND TERMS

Attention is directed to the provisions in Section 1, "Definitions and Terms," of the Standard Specifications with the modifications as set forth hereafter.

Section 1-1.13, "Department," of the Standard Specifications is hereby amended to read: "The County of San Luis Obispo acting by and through its Department of Public Works and Transportation."

Section 1-1.15, "Director," of the Standard Specifications is hereby amended to read: "The Director of the Department of Public Works and Transportation of the County of San Luis Obispo."

Section 1-1.18, "Engineer," of the Standard Specifications is hereby amended to read: "Any duly authorized representative either employed by or contracting with the Department of Public Works and Transportation acting within the scope of the particular duties delegated to them."

Section 1-1.19, "Engineer's Estimate," of the Standard Specifications is hereby amended to read: "The contract bid form indicating the approximate quantities of work to be performed as contained in the Bid Proposal."

Section 1-1.26, "Liquidated Damages," of the Standard Specifications is hereby amended to read: "The amount prescribed in Section 4, "Prosecution and Progress of the Work," of the Special Provisions pursuant to Government Code Section 53069.85 to be paid to the County, or to be deducted from any payments due, or to become due, the Contractor for each day's delay in completing the whole or any specified portion of work beyond the time allowed in the Contract Documents."

Section 1-1.39, "State," of the Standard Specifications is hereby amended to read: "The State of California and its political subdivision, the County of San Luis Obispo."

Section 1-1.40, "State Contract Act," of the Standard Specifications is hereby amended to read: "Only those sections or provisions of Chapter 1 of Part 2 of Division 2 of the Public Contract Code (Section 10100 et seq.) which are specifically incorporated into this contract are applicable to this contract. All other sections and provisions of Chapter 1 of Part 2 of Division 2 of the Public Contract Code are not applicable to this contract and do not constitute a part hereof."

5-1.02 SCOPE OF WORK

Attention is directed to the provisions in Section 4, "Scope of Work," of the Standard Specifications with the modifications as set forth hereafter.

Section 4-1.03B(1), "Increases of More Than 25 Percent," of the Standard Specifications is amended by adding the following sentence to the last paragraph: "Additionally, such written request by the Contractor shall be accompanied by adequate, detailed data to support actual costs incurred."

Section 4-1.03B(2), "Decreases of More Than 25 Percent, " of the Standard Specifications is hereby amended by modifying the first sentence of the first paragraph to read: "Should the total pay quantity of any item of work required under the contract be less than 75 percent of the Engineer's Estimate therefor, the Engineer may reserve the right to make no adjustment in the corresponding unit price for that item if he/she so elects, except that an adjustment in compensation pursuant to this Section will be made if requested in writing by the Contractor. Additionally, such written request by the Contractor shall be accompanied by adequate, detailed data to support actual costs incurred."

Section 4-1.03D, "Extra Work," of the Standard Specifications is hereby amended by adding the following sentences to the 2nd paragraph: "All extra work shall be reported daily by the Contractor upon forms furnished by the Engineer, signed by both parties at the conclusion of each workday. Said daily extra work reports shall thereafter be considered the true record of the extra work performed and shall become the basis of payment therefor."

5-1.03 CONTROL OF WORK

The Engineer will not have control over, be in charge of, nor be responsible for construction means, methods, techniques, sequences, or procedures, or for the safety precautions and programs in connection with the work, since these are solely Contractor's responsibility, unless otherwise required by the Contract Documents.

Attention is directed to Section 5, "Control of Work," of the Standard Specifications with the modifications as set forth hereafter.

Section 5-1.07, "Lines and Grades," of the Standard Specifications is hereby amended to read: "Stakes or marks will be set by the Engineer as the Engineer determines to be necessary to establish the lines and grades required for the completion of the work specified in these specifications, on the plans, and in the Special Provisions.

When the Contractor requests stakes or marks to be set, the Contractor shall notify the Engineer of the request in writing no less than three (3) working days in advance of starting operations that require their use. The Contractor shall also submit to the Engineer for acceptance, a tentative schedule of all anticipated staking requests for the initial thirty (30) working days of the contract. The Engineer shall determine if the staking request schedule is reasonable before recognizing any requests for stakes or marks to be set. Said schedule shall correlate with any order of work specified in the Contract Special Provisions. If any vegetation needs to be cleared or grubbed, as determined by the Engineer, before stakes or marks can be set, then the Contractor shall clear the obstructing

vegetation for the proper placement of stakes or marks. The Engineer and the Contractor shall agree on the extent of vegetation removal necessary to prepare the work site for the setting of stakes or marks. Vegetation removal for the preparation of the work site for the setting of stakes or marks shall be considered as included in the various items of work involved and no additional compensation will be allowed therefor. The Contractor will not be entitled to any compensation for any perceived delay, nor entitled to an extension of time for any perceived delay without due cause for the period between when the work site is deemed cleared by the Engineer and when the stakes or marks are set for use by the Contractor.

Stakes and marks set by the Engineer shall be carefully preserved by the Contractor. In case the stakes and marks are destroyed or damaged, the stakes and marks will be replaced or restored at the Engineer's earliest convenience. The Contractor will be charged $875.00 for each stake or mark replaced or restored which in the judgment of the Engineer had been carelessly or willfully destroyed or damaged by the Contractor's operations. This charge will be deducted from any moneys due or to become due the Contractor."

Section 5-1.116, "Differing Site Conditions," of the Amendments to the Standard Specifications is hereby amended by including the following language from Section 7104 of the Public Contract Code: "7104. Any public works contract of a local public entity which involves digging trenches or other excavations that extend deeper than four feet below the surface shall contain a clause which provides the following: (a) That the contractor shall promptly, and before the following conditions are disturbed, notify the public entity, in writing, of any: (1) Material that the contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law. (2) Subsurface or latent physical conditions at the site differing from those indicated. (3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract. (b) That the public entity shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the contractor's cost of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in the contract. (c) That, in the event that a dispute arises between the public entity and the contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the contractor's cost of, or time required for, performance of any part of the work, the contractor shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. The contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties."

5-1.04 PREVAILING WAGE

Attention is directed to the provisions in Section 7-1.01A(2), "Prevailing Wage," of the Standard Specifications and these Special Provisions.

Pursuant to the provisions of Section 1773 of the California Labor Code, the Board of Supervisors of the County of San Luis Obispo has obtained from the Director of the California Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work for the locality in which the work is to be performed for each needed craft, classification, or type of workman. Copies of said prevailing rate of per diem wages are on file in the Office of the Clerk of the Board of Supervisors and available at the California Department of Industrial Relations' web site at:

www.dir.ca.gov/DLSR/PWD.

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

Pursuant to Section 1773.2 of the Labor Code, a copy of said general prevailing rates shall be posted by the Contractor in a prominent place at the site of the work.

Additionally, the Director of Industrial Relations has reserved the right to issue corrected wage determinations for certain crafts contained in the prevailing wage determinations applicable to this contract. These corrected prevailing wage rates shall apply to this contract in the same manner as if they had been published in the prevailing wage determinations applicable to this contract. These revisions to the general prevailing wage rates are on file at the Office of the Clerk of the Board of Supervisors and available at the California Department of Industrial Relations' web site at:

www.dir.ca.gov/DLSR/PWD.

Additionally, changes in general prevailing wage determinations which conform to Labor Code Section 1773.6 and Title 8 California Code of Regulations Section 16204 shall apply to the contract when issued by the Director of Industrial Relations at least ten (10) calendar days prior to the date of the Notice to Bidders for the project. Changes, if any, to the general prevailing wage rate will be on file at the Office of the Clerk of the Board of Supervisors and available at the California Department of Industrial Relations' web site at:

www.dir.ca.gov/DLSR/PWD.

5-1.05 PRESERVATION OF PROPERTY

Attention is directed to the provisions in Section 7-1.11, "Preservation of Property," of the Standard Specifications is hereby amended by adding the following to the end of the second paragraph: "Pursuant to Section 8771(b) of the California Business and Professions Code, existing survey monuments that control the location of subdivisions, tracts, boundaries, roads, streets, or highways, or provide survey control that are within or adjacent to the Contractor's operations, shall be located and referenced by or under the direction of a licensed land surveyor or registered civil engineer prior to the time when any streets, highways, other rights-of-way, or easements are improved, constructed, reconstructed, maintained, resurfaced, or relocated. In the event that any existing survey monument is disturbed in any way by the Contractor's operations as determined by a licensed land surveyor or registered civil engineer, they shall be reset accordingly and a corner record shall be filed with the county surveyor prior to the recording of a certificate of completion for the project. Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in locating existing survey monuments by or under the direction of a licensed land surveyor or registered civil engineer, resetting any disturbed survey monument and filing a corner record, shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor."

5-1.06 PROGRESS SCHEDULE

Progress schedules will be required for this contract and shall conform to the provisions in Section 8-1.04, "Progress Schedules," of the Standard Specifications.

The Contractor shall submit to the Engineer a practicable progress schedule in conformance with the provisions in Section 4-1.03, "Contract Submittals," of these Special Provisions, and within 5 working days of the Engineer's written request at any other time.

5-1.07 MEASUREMENT AND PAYMENT

Attention is directed to the provisions in Section 9, "Measurement and Payment," of the Standard Specifications with the modifications as set forth hereafter.

The 13th paragraph of Section 9-1.01, "Measurement of Quantities," of the Standard Specifications shall be amended to read as follows: "Whenever pay quantities of materials are determined by weighing, the scales shall be operated by a weighmaster licensed in accordance with provisions of the California Business and Professions Code, Division 5, Chapter 7. The contractor shall furnish a Public Weighmaster's certificate, or a private Weighmaster's certificate (load slip) with each load and a Daily Record of Platform Scale Weights. The Weighmaster's certificates shall be numbered consecutively to correspond with the Daily Record of Platform Scale Weights. The Daily Record of Platform Scale Weights shall be prepared using a form supplied by the County and shall be delivered to the Engineer at the end of each day. Contractor shall provide the County sufficient advance notice so as to enable a representative of the County to be present to witness the Weighing and check the Daily Record of Platform Scale Weights."

Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications is hereby amended by adding the following: "Additionally, the written notice of potential claim shall be submitted on Caltrans form CEM-6201 and shall be certified with reference to the California False Claims Act, Government Code Sections 12650-12655. The notice shall set forth the reasons for which the Contractor believes additional compensation will or may be due and the nature of the costs involved. Unless the amount of the potential claim has been stated in the written notice, the Contractor shall within 15 working days of submitting said notice, furnish an estimate of the cost of the affected work and impacts, if any, on project completion. Said estimate of costs may be changed or updated by the Contractor when conditions have changed. When the affected work is completed, the Contractor shall submit substantiation of actual costs. Failure to do so shall be sufficient cause for denial of any claim subsequently filed on the basis of said notice of potential claim.

Should the Contractor, in conjunction with or subsequent to the assertion of a potential claim, request inspection and copying of documents or records in the possession of the County that pertain to the potential claim, the Contractor shall make its records of the project, as deemed by the County to be pertinent to the potential claim, available to the County for inspection and copying."

Section 9-1.05, "Stop Notices," of the Standard Specifications is hereby amended by adding the following statement: "Stop notice information may be obtained from the Department of Public Works and Transportation."

Section 9-1.06 "Partial Payments," of the Standard Specifications is hereby amended by deleting the first sentence of the first paragraph and inserting the following at the beginning of the section:

General

Based upon Applications for Payment submitted to the Engineer by the Contractor, the District shall make progress payments to the Contractor as provided below and elsewhere in the Contract Documents. The pay period

covered by each Application for Payment shall be one calendar month ending on the 20th day of the month. The Contractor shall submit each Application for Payment to the Engineer by the last day of each month.

Applications for Payment shall indicate the percentage of completion of each portion of the Work for which a lump sum price is specified as of the end of the period covered by the Application for Payment.

Application for Payment

Contractor shall submit to the Engineer an Application for Payment (on a form provided by the Engineer) for Work completed in accordance with the measurement of quantities. Such application shall be supported by such data substantiating the Contractor's right to payment as the Engineer may require.

Each Application for Payment shall be reviewed by the Engineer as soon as practicable after receipt for the purpose of determining that the Application for Payment is a "proper" payment request, accurately reflecting the value of Work completed. An Application for Payment shall be deemed "proper" only if it is properly completed and submitted on the proper forms. The Engineer shall have the right to adjust any estimate of quantity and to subsequently correct any error made in any Application for Payment.

The District shall make payment to the Contractor not later than thirty (30) calendar days after the Engineer's verification and approval that an Application for Payment is undisputed and properly submitted.

The Contractor may elect to allow an alternative procedure for processing monthly applications for payment whereby the Engineer prepares monthly progress payment estimates. To initiate such alternative procedure, the Contractor shall submit to the Engineer a written request (before the 10th day of the month) which authorizes the Engineer to prepare the monthly progress payment estimates for all remaining payments due under the Contract. Under such alternative procedure, the District, once in each month, shall cause an estimate in writing to be made by the Engineer, and the Contractor's signature approving the progress payment estimate shall be considered to be "receipt of an undisputed and properly submitted payment request" from the Contractor under Section 20104.50 of the California Public Contract Code, and the District shall make payment to the Contractor within thirty (30) calendar days after such receipt.

Applications for Payment shall include the following:

Contractor's Verification: Contractor has carefully prepared this entire document and hereby attests that the quantities and amounts stated herein accurately represent the total work that has been performed in compliance with the Contract Documents. Contractor will pay any released retainage to subcontractor due to accepted complete work of

the Subcontractors portion of the work within 30 days of receipt of payment as required under 49 CFR Part 26 sub section 26.29(b)(3).

Under the alternative procedure described above, progress pay estimates prepared by the Engineer shall include the following:

Contractor's Verification: Contractor has carefully reviewed this entire document and hereby attests that the quantities and amounts stated herein accurately represent the total work that has been performed in compliance with the Contract Documents. Contractor will pay any released retainage to subcontractor due to accepted complete work of the Subcontractors portion of the work within 30 days of receipt of payment as required under 49 CFR Part 26 sub section 26.29(b)(3).

Section 9-1.06, "Partial Payments," of the Standard Specifications is hereby amended by modifying the third paragraph to read: "In accordance with PUBLIC CONTRACT CODE SECTION 7201, the retention proceeds withheld from payment shall not exceed 5 percent of the payment."

Section 9-1.065, "Payment of Withheld Funds," of the Standard Specifications is hereby amended to read: "Attention is directed to Section 9-1.06, "Partial Payments," of the Standard Specifications, to these Special Provisions and in particular to the retention provisions therein.

Upon the Contractor's request, the County will make payment to the Contractor of funds withheld to ensure performance of this contract if the Contractor, in accordance with Public Contract Code Section 22300, deposits in escrow with the County, or with a state or federally chartered bank in California securities equivalent to the amount withheld. Securities eligible for investment under this section shall include bank or savings and loan certificates of deposit, the securities enumerated in Government Code Section 16430, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the County. Upon satisfactory completion of the contract, the securities shall be returned to the Contractor. Alternatively, the Contractor may request that the County make payment of retention earned directly to the escrow agent as provided in subdivision (b) of Section 22300 of the Public Contract Code.

Each of the following conditions shall apply to the deposit of securities into escrow:

(a) The Contractor shall bear the expense of the County and the escrow agent (either the County or the bank) in connection with the escrow deposit made.

(b) Securities or certificates of deposit to be placed in escrow shall be of a value at least equivalent to the amounts of retention to be paid to the Contractor pursuant to this section.

(c) The value of any securities placed in escrow shall be based upon the market value of such securities as of the date the securities are deposited in escrow, and not upon the face value of the securities. Such securities shall be valued by the County, whose decision on valuation of the securities shall be final.

(d) The escrow agreement shall provide that the escrow agent must convert the securities deposited therein for cash, in whole or in part, to meet the defaults by the Contractor upon a unilateral demand for such conversion by the Public Works Director, and further that any amount so demanded shall be paid to the County upon said unilateral demand for payment.

(e) The Contractor shall be the beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon.

(f) The Contractor shall enter into an escrow agreement satisfactory to the County, which agreement shall be substantially similar to the form set forth in Public Contract Code Section 22300. The Contractor shall obtain the written consent of the surety to such agreement. The Public Works Director is authorized to sign such escrow agreements on behalf of the County.

Section 9-1.07B, "Final Payments and Claims," of the Standard Specifications is hereby amended by deleting the introductory phrase "After acceptance by the Director," and inserting in its place the phrase: "After the Engineer makes a formal recommendation to the Director that the Public Works Department initiates the internal procedures that would allow the Board to accept the work at a future Board meeting,"

5-1.08 CLAIMS

5-1.08A GENERAL

5-1.08A(1) Mandatory Procedure and Condition Precedent

(a) Any demand or assertion by the Contractor seeking an adjustment of Contract Price and/or Contract Times, or other relief, for any reason whatsoever, must be in strict compliance with the requirements of this Section 5-1.08. For purposes of this Section 5-1.08, any and all work relating to any such demand or assertion shall be referred to as "Disputed Work", regardless of whether the basis of the demand or assertion arises from an interpretation of the Contract Documents, an action or inaction of the Contractor, the Engineer, or the County, or any other event, issue, or circumstance. The Contractor shall bear all costs incurred in complying with the provisions of this Section 5-1.08.

(b) Compliance with these requirements is a condition precedent to the Contractor's ability to exercise any rights or remedies that may otherwise be available to Contractor under the Contract Documents or any applicable Laws or Regulations relating to the Claim. No action or inaction by the Contractor or the Engineer to try to resolve any Claim(s) through agreement (including Change

Order), mediation, settlement, or any other means shall excuse the Contractor from complying with the requirements of this Section 5-1.08.

(c) For Claims less than or equal to $375,000, Section 5-1.08 shall be interpreted in a manner consistent with Public Contract Code sections 20104 and 20104.2. The substance of Public Contract Code sections 20104 and 20104.2 have been incorporated into Section 5-1.08 in a manner that is consistent with the notice requirements provided herein. For purposes of Public Contract Code 20104 and 20104.2, a Claim shall not be deemed submitted until a Notice of Final Claim is properly submitted.

(d) In the event of any conflict between Section 5-1.08 and any other language in the Contract Documents, the provisions of Section 5-1.08 shall take precedence over any such conflicting language.

5-1.08A(2) Contractor's Continuing Obligations.

(a) At all times during the processing of the Contractor's potential Claim, the Contractor shall diligently proceed with the performance of the Disputed Work and other Work, unless otherwise specified or directed by the Engineer.

(b) The Contractor shall provide the Engineer the opportunity to examine the site of the Disputed Work as soon as reasonably possible, and in no event later than five (5) days from the date of the Initial Notice of Potential Claim. Throughout the processing of the Contractor's potential Claim, the Contractor shall provide the Engineer a reasonable opportunity to examine the site of the Disputed Work within five (5) days of the date of Engineer's written request therefor.

(c) The Contractor shall promptly respond to any requests for further information or documentation regarding the Contractor's potential Claim. If the Contractor fails to provide an adequate written response to the Engineer within fifteen (15) days of the Engineer's written request for such further documentation or information, the Contractor shall be deemed to have waived its Claim. If the further documentation or information requested by the Engineer would, in the opinion of the Engineer, reasonably take the Contractor more than fifteen (15) days to comply with, the written request shall provide the Contractor a specific response deadline that is commensurate to a reasonable response time.

(d) Throughout the performance of the Disputed Work, the Contractor shall maintain records that provide a clear distinction between the incurred direct costs of Disputed Work and other Work. The Contractor shall allow the Engineer access to its Project records deemed necessary by the Engineer to evaluate the potential Claim within fifteen (15) days of the date of the Engineer's written request. The Contractor's failure to comply with the provision of this Section 5-1.08 shall constitute a waiver of the Contractor's Claim.

(e) All Subcontractor's and material supplier's claims of any type shall be brought only through Contractor pursuant to the provisions of this Section 5-1.08. Under no circumstances shall any Subcontractor or material supplier make any direct claim against County.

(f) Except where provided by law, or elsewhere in these Contract Documents, THE COUNTY SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES AND THE CONTRACTOR SHALL NOT INCLUDE THEM IN ITS CLAIMS. Contractor shall be limited in its recovery on any Claim(s) to the adjustments allowed in the Contract Documents.

(g) During each step in the processing of the Contractor's Claim, each notice shall be accompanied by the Contractor's written statement that the adjustment or relief claimed is the entire adjustment or relief to which the claimant believes it is entitled as a result of the event, issue, or circumstance giving rise to the Claim.

(h) The Contractor shall be responsible for providing written evidence of the date any of the notices referenced in Section 5-1.08 above were provided to Engineer, and shall provide Engineer a copy of such written evidence within five (5) days of a request thereof. Such evidence shall be either a written receipt of actual delivery from U.S. Postal Service or other reputable delivery service, or by the recipient's written acknowledgement of receipt.

(i) The rights of the Engineer to request further records, documents, or information from the Contractor regarding a Claim are for the sole benefit of the Engineer, and may be exercised at their sole discretion. Any failure by the Engineer to exercise its rights does not provide the Contractor any excuse for not providing all of the records, documents, and other information it is requested to provide under Section 5-1.08 or any other provision of the Contract Documents.

(j) Contractor's compliance with the provisions of this Section 5-1.08 shall not excuse Contractor's failure to comply with any additional requirements set forth in the Contract Documents, including but not limited to, any provisions relating to Contractor's obligation to provide any notice, information, documentation, inspections, site access, or any other requirements relating to any event, issue, or circumstance relating to the Contract.

(k) Contractor's compliance with the provisions of this Section 5-1.08 shall not excuse Contractor's failure to comply with any additional requirements set forth in the Contract Documents, including but not limited to, any provisions relating to contractor's obligation to provide any notice, information, documentation, inspections, site access, or any requirements relating to any event, issue, or circumstance relating to the Contract.

(l) Under no circumstances may the Contractor submit an Initial Notice of Potential Claim, Supplemental Notice of Potential Claim, or Notice of Final Claim after the date of final payment.

5-1.08A(3) Claim Identification Number

(a) The Contractor shall assign an exclusive identification number for each potential Claim, determined by chronological sequencing, based on the date of the potential Claim. The nature and circumstances involved in the dispute shall remain consistent throughout the processing of the Claim.

(b) The exclusive identification number for each Claim shall be used on the following corresponding documents:

i.. Initial Notice of Potential Claim.

ii. Supplemental Notice of Potential Claim.

iii. Notice of Final Claim.

iv. Contractor's written statement of Claims

5-1.08A(4) Initial Notice of Potential Claim

(a) Promptly upon becoming aware of any event, issue, or circumstance which the Contractor believes provides a basis for an adjustment of Contract Price and/or Contract Times, or other relief, Contractor shall provide a signed written Initial Notice of Potential Claim to the Engineer. The Initial Notice of Potential Claim shall be submitted before commencing any Disputed Work, or within five (5) days of the event, issue, or circumstance from which the Claim arises, whichever is earlier.

(b) The Initial Notice of Potential Claim shall clearly state the Contractor's grounds for seeking an adjustment in Contract Price and/or Contract Times or other relief, the nature and circumstances of the Disputed Work, the relief or adjustment sought by the Contractor for the Disputed Work. The Initial Notice of Potential Claim shall be submitted on a form furnished by the Engineer and shall be certified under penalty of perjury with reference to the California False Claims Act, Government Code Sections 12650-12655.

(c) After reviewing the Initial Notice of Potential Claim, the Engineer may provide a written response thereto or may decide to delay providing a response until the Contractor provides further information regarding the potential Claim pursuant to the provisions of this Section 5-1.08.

5-1.08A(5) Supplemental Notice of Potential Claim

(a) Within fifteen (15) days of submitting the Initial Notice of Potential Claim, the Contractor shall submit a signed Supplemental Notice of Potential Claim to Engineer that provides the following information:

i. The complete nature and circumstances of the dispute which caused the potential Claim.

ii. The contract provisions that provide the basis of the potential Claim.

iii. The requested adjustment of Contract Price, if any, and the estimated cost of the potential Claim, including an itemized breakdown of individual costs and how each estimate was determined.

iv. The requested adjustment of Contract Time, if any, and a time impact analysis of the schedule that illustrates the effect on the scheduled completion date due to schedule changes or disruptions.

(b) The information provided by the Contractor shall provide the Contractor's complete reasoning for additional compensation or adjustments and shall be as complete as reasonably possible.

(c) The Supplemental Notice of Potential Claim shall be submitted on a form furnished by Engineer and shall be certified under penalty of perjury with reference to the California False Claims Act, Government Code Sections 12650-12655. If at any time the estimated cost of the potential Claim or effect on the Progress Schedule changes, Contractor shall update information in items 3 and 4 above as soon as the change is recognized and submit this information to Engineer.

(d) If the Disputed Work is not completed within thirty (30) days, the Contractor shall, every thirty (30) days until the Disputed Work ceases, submit to the Engineer an updated Supplemental Notice of Potential Claim that shall update and quantify all of the information required in the Supplemental Notice of Potential Claim. The Contractor's failure to so quantify costs and schedule impacts every thirty (30) days shall result in a waiver of the Claim for that 30-day period. Any supplemental notice or updated notice that states that the requested adjustment of Contract Price and/or Contract Time will be provided or determined at a later date, or that any damages, costs, schedule impacts, and/or any other analysis will be provided or determined at a later date, shall be deemed to be not in compliance with this Section 5-1.08, and shall result in the Contractor waiving its Claim.

(e) After reviewing the Supplemental Notice of Potential Claim or updated Supplemental Notice of Potential Claim, the Engineer may provide a written response thereto or may decide to delay providing a response until the Contractor provides further information regarding the potential Claim pursuant to the provisions of this Section 5-1.08.

5-1.08A(6) Notice of Final Claim.

As soon as reasonably practical upon completion of the Disputed Work, and no later than thirty (30) days after completion of the Disputed Work, the Contractor shall submit to the Engineer a Notice of Final Claim containing a full and final documentation of the Claim including, but not limited to, the following information:

(a) A detailed factual narration of events fully describing the nature and circumstances that caused the dispute, including, but not limited to, necessary dates, locations, and items of Work affected by the dispute.

(b) The specific provisions of the Contract that support the Claim and a statement of the reasons these provisions support and provide a basis for entitlement of the Claim.

(c) When additional monetary compensation is requested, the exact amount requested calculated in conformance with the Contract Documents and shall

include an itemized breakdown of individual costs. These costs shall be segregated into the following cost categories:

i. Labor – A listing of individuals, classifications, regular hours and overtime hours worked, dates worked, hourly labor rates, and other pertinent information related to the requested reimbursement of labor costs.

ii. Materials – Invoices, purchase orders, location of materials either stored or incorporated into the work, dates materials were transported to the project or incorporated into the work, and other pertinent information related to the requested reimbursement of material costs.

iii. Equipment – Listing of detailed description (make, model, and serial number), hours of use, dates of use, and equipment rates. Equipment rates shall be at the applicable State rental rate as listed in the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rates," in effect when the Disputed Work was performed.

iv. Other categories as specified by Contractor or Engineer.

(d) When an adjustment of Contract Time is requested the following information shall be provided:

i. The chronology of the specific dates for which Contract Time is being requested.

ii. The specific reasons for entitlement to a Contract Time adjustment.

iii. The specific provisions of the Contract that provide the basis for the requested Contract Time adjustment.

iv. A detailed time impact analysis of the schedule. The time impact analysis shall show the effect of changes or disruptions on the scheduled completion date to demonstrate entitlement to a Contract Time adjustment.

(e) The listing, identification, and production of copies of all documents the Contractor believes support its Claim and the date, time, circumstances, details and substance of any oral communications that the Contractor believes support the Claim.

The Notice of Final Claim shall be submitted on a form furnished by the Engineer and shall be certified under penalty of perjury with reference to the California False Claims Act, Government Code Sections 12650-12655.

Information submitted subsequent to the Notice of Final Claim will not be considered.

No Notice of Final Claim will be considered that does not have the same nature and circumstances, and basis of Claim as those specified on the Initial and Supplemental Notices of Potential Claim.

5-1.08A(7) Response to Notice of Final Claim.

(a) Date of Final Decision in Response to Final Claim

In the event a valid written decision is not provided to the Contractor within the time prescribed in this Section 5-1.08, the Claim shall be deemed denied on the last day a written response was due. The date upon which the Claim is approved or denied pursuant to the provisions of this Section 5-1.08, shall constitute the date of the final decision on the Claim under the provisions of this Section 5-1.08. The date of the final decision on a Claim can only be changed by a subsequent writing signed by Engineer and County that expressly states that the date of the final decision on the Claim has been changed to a new specific date."

(b) Public Contract Code Requirements for Claims Less Than or Equal to $375,000.

i. Written Response to Claims of less than $50,000.

For Claims of less than fifty thousand dollars ($50,000), the Engineer shall respond in writing to the Notice of Final Claim within forty-five (45) days of receipt thereof, or may request, in writing, within thirty (30) days of said receipt, any additional documentation relating to the Claim or any defenses to the Claim the County may have against the Contractor. The Contractor shall comply with the request within the reasonable time deadlines provided by the Engineer in the request. If additional information is thereafter required, it shall be requested and provided upon mutual agreement of the County and the Contractor. The written response to the Notice of Final Claim shall be submitted to the Contractor within fifteen (15) days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

ii. Written Response to Claims Over $50,000 and Less Than or Equal to $375,000

For Claims of over fifty thousand dollars ($50,000) and less than or equal to three hundred seventy-five thousand dollars ($375,000), the Engineer shall respond in writing to the Notice of Final Claim within sixty (60) days of receipt thereof, or may request, in writing, within thirty (30) days of said receipt, any additional documentation relating to the Claim or any defenses to the Claim the County may have against the Contractor. The Contractor shall comply with the request within the reasonable time deadlines provided by Engineer in the request. If additional information is thereafter required, it shall be requested and provided upon mutual agreement of the County and the Contractor. The written response to the Notice of Final Claim shall be submitted to the Contractor within thirty (30) days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

iii. Right to Meet and Confer For Claims Less Than or Equal to $375,000

For Claims less than or equal to $375,000, if the Contractor disputes the written response to the Claim, or if a written response is not submitted within the time prescribed above, the Contractor may so notify the Engineer and County, in writing, either within fifteen (15) days of receipt of the written response or within fifteen (15) days of the Engineer's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon such a timely demand by the Contractor, the Engineer shall schedule a meet and confer conference within thirty (30) days for settlement of the dispute. Within thirty (30) days after such conference, a final written response to the Claim shall be issued which will serve as the new final decision on the Claim. Pursuant to Public Contract Code section 20104.6, the County shall not fail to pay money as to any portion of a Claim which is undisputed, except as otherwise provided in the Contract Documents.

(c) For Claims Greater Than $375,000

For Claims over three hundred seventy-five thousand dollars ($375,000), the Engineer shall respond in writing to the Notice of Final Claim within sixty (60) days of receipt thereof Claim, or may request, in writing, within forty-five (45) days of said receipt, any additional information or documentation relating to the Claim or any defenses to the Claim the County may have against the Contractor. The Contractor shall comply with the request within the reasonable time deadline provided by the Engineer in the request. If any additional information is thereafter requested by the Engineer, it shall likewise be provided by the Contractor within the reasonable time deadline provided by the Engineer in such follow-up request. The written response to the Notice of Final Claim shall be submitted to the Contractor within thirty (30) days after receipt of such further information and documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or documentation, whichever is greater. The Contractor may request an informal conference to meet and confer for settlement of the issues in dispute, but the Contractor shall have no right to demand such a conference. Neither the requesting of any such conference by the Contractor or the Engineer, nor the holding of such conference shall affect the date of the final decision on the Claim. No written communications of the Engineer and/or the County sent to the Contractor after any such conference will change the date of the final decision on the Claim unless the writing expressly states that the date of the final decision is being changed to a new specific date.

5-1.08A(8) Exclusive Remedy

The administration of a Claim as provided in this Section 5-1.08, including the Contractor's performance of its duties and obligations specified in this Section 5-1.08 is the Contractor's sole and exclusive remedy for disputes of all types pertaining to the payment of money, extension of time, the adjustment or interpretation of the Contract Documents terms or other contractual or tort relief arising from the Contract Documents. This exclusive remedy and the limitation of liability (expressed herein and elsewhere throughout the Contract Documents)

apply notwithstanding the completion, termination, suspension, cancellation, breach, or rescission of the Work or the Contract Documents, the negligence or strict liability of the County, its representatives, consultants, or agents, or the transfer of Work or the Project to the County for any reason whatsoever.

The Contractor waives and covenants not to raise any claims of waiver, estoppel, release, bar, or any other type of excuse for non-compliance with these Section 5-1.08 requirements. Compliance with the procedures described in this Section 5-1.08 is a condition precedent to the right to file a Government Code Claim, commence litigation, or commence any other legal action. Claim(s) or issue(s) not raised in a timely Claim submitted under this Section 5-1.08 may not be asserted in any subsequent Government Code Claim, litigation, or legal action. The County shall not be deemed to waive any provision under this Section 5-1.08, if at the County's sole discretion, a claim is administered in a manner not in accordance with this Section 5-1.08.

5-1.08B OTHER REQUIREMENTS RELATING TO CLAIMS

5-1.08B(1) Government Code Claim Requirements

For all Claims not resolved as a result of the Section 5-1.08A procedures, the Contractor must submit each Claim in a Government Code Section 910 form of claim for final investigation and consideration of its settlement prior to initiation of any litigation on any such Claim, as required by Government Code Section 945.4. Pursuant to Government Code Section 930.2, the one-year period in Government Code Section 911.2 is hereby reduced to 150 days. This time deadline is measured from the accrual date of each separate cause of action.

5-1.08B(2) Tolling

For each unresolved Claim properly processed by the Contractor in accordance with Section 5-1.08A, the running of the period of time within which a Government Code claim must be submitted shall be tolled during the time the Contractor is processing the Claim in compliance with Section 5-1.08A. Under no circumstances shall the time for submitting a Government Code Claim be extended beyond 150 days of the date of the final decision on the Claim under Section 5-1.08A. The Contractor waives the right to pursue or submit any Claims not processed in accordance with Section 5-1.08A.

Other than as expressly provided above, the time deadline for filing a Government Code claim shall not be tolled by any action or inaction by the Contractor, the Engineer, or the County, including but not limited to any action or inaction to try to resolve the Claim through negotiation, mediation, settlement, agreement (including Change Order), or by any other means, other than by a separate written tolling agreement expressly approved as to form (on the face of the agreement) by the County.

5-1.09 AUDIT OF RECORDS

The Contractor shall maintain and make available for examination and audit by the State Auditor General and/or duly authorized representatives of the State, County, or Federal Governments, all books, papers, accounting records, and other documents pertaining to the cost and performance of this contract.

The Contractor shall retain said books, papers, accounting records, and other documents for a period of three years after the date of final payment under this contract (Government Code Section 8546.7).

5-1.10 CONTRACTOR'S REPORTS

The Contractor shall complete a daily report indicating location worked, total manpower per construction trade for each task, major equipment on site, each subcontractor's manpower and equipment, weather conditions, and other related information involved in the performance of the work. The daily report shall be completed on forms furnished by the Engineer and shall be submitted to the Engineer at the conclusion of each workday. The report shall comment on the daily progress and status of the work within each major component of the work.

5-1.11 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay in conformance with the provisions in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.12 SUBCONTRACTING

No subcontract releases the Contractor from the contract or relieves the Contractor of their responsibility for a subcontractor's work.

If the Contractor violates Public Contract Code §4100 et seq., the County may exercise the remedies provided under Public Contract Code §4100. The County

may refer the violation to the Contractors State License Board as provided under Public Contract Code §4111.

The Contractor shall perform work equaling at least 30 percent of the value of the original total bid with the Contractor's own employees and equipment, owned or rented, with or without operators.

Each subcontract shall comply with the contract.

Each subcontractor shall have an active and valid State contractor's license with a classification appropriate for the work to be performed (Business and Professions Code, §7000 et seq.).

The Contractor shall submit copies of subcontracts upon request by the Engineer.

The Contractor shall submit a Subcontracting Request form prior to commencement of that portion of the work.

The Contractor shall not use a debarred subcontractor. Pursuant to the provisions in Section 1777.1 of the Labor Code, the Labor Commissioner publishes and distributes a list of contractors ineligible to perform work as a subcontractor on a public works project. This list of debarred contractors is available from the Department of Industrial Relations web site at:

http://www.dir.ca.gov/DLSE/Debar.html.

Upon request by the Engineer, the Contractor shall immediately remove and not again use a subcontractor who fails to prosecute the work satisfactorily.

5-1.13 CONSTRUCTION SUBMITTALS

Construction project submittals, including shop drawings and manufacturer's product specifications, shall be supplied for all material, equipment items, and for other items of work required by its contract documents. The Contractor shall supply 5 copies of manufacturer's scaled, dimensioned shop drawings complete with all information required to describe the item and demonstrate compliance with contract drawings and these specifications. Submittals will only be accepted from the Contractor (not sub-contractor or material supplier). Neither fabrication nor onsite preparation shall be started before receipt of written review from the County.

Each submittal shall be sequentially numbered, dated, and appropriately titled with the specification number and description.

The Contractor's responsibility for errors, omissions, and deviations from the requirements of the contract documents in submittals is not relieved by the County's review. The Contractor shall be responsible for confirming and correlating all quantities and dimensions, the compatibility of different components, selecting fabrication processes and techniques of construction, coordinating its work with that of other trades or other contractors at the site, and

performing its work in a safe and satisfactory manner. The County will require 10 working days for submittal review. No claim will be allowed for damages or extensions of time because of delays in work resulting from rejection of material or from revisions and resubmittal of shop drawings, project data, or samples.

Resubmittals will be reviewed and returned in the same review period as the original submittals. It is considered reasonable that the Contractor shall make a complete and acceptable submittal by the second submission. The Engineer reserves that right to withhold monies due to the Contractor to cover additional costs of any review beyond the second submittal. Full compensation for preparing submittals and shop drawings, as required, shall be considered as included in the contract items of work involved and no additional compensation will be allowed therefor.

5-1.14 LEGAL ADDRESS OF THE CONTRACTOR

Both the address given in the proposal and the Contractor's office in the vicinity of the work are hereby 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 shall be deemed sufficient notice thereof upon the Contractor.

Nothing herein contained shall be deemed to preclude the service of any drawing, letter, notice, article, or communication to, or upon, the Contractor or Contractor's representative personally. The address named in the proposal may be changed at any time by written notice from the Contractor to the Engineer.

5-1.15 WEEKLY PROGRESS MEETINGS

Weekly meetings shall be held at the project site to review the progress of the work and to discuss any problems which may have occurred. Meeting shall include the Engineer, inspectors, and the Contractor's foreman. The Contractor shall provide an updated schedule at the weekly meeting.

Full compensation for preparing updated schedules and attending the progress meetings, as required, shall be considered as included in the contract items of work involved and no additional compensation will be allowed therefor.

5-1.16 GOVERNMENT CODE CLAIM REQUIREMENTS

Nothing in these Contract Documents shall excuse a Contractor from fully complying with the requirements of Part 3 of division 3.6 of Title 1 of the Government Code (commencing with section 900). Said requirements must be complied with before filing any claim in any court of law, and are in addition to the other claims procedures set forth in the Contract Documents shall be considered a substitute or alternative procedure for complying with the requirements of Part 3 of Division 3.6 of Title 1 of the Government Code (commencing with section 900.)

5-1.17 SURFACE MINING AND RECLAMATION ACT

Imported borrow or aggregate material must come from a surface mine permitted under the Surface Mining and Reclamation Act of 1975 (SMARA), Pub Res Code § 2710, et seq., or from an exempt site.

The Department of Conservation, Office of Mine Reclamation maintains a list of permitted mine sites. For the list of permitted sites, go to:

http://www.conservation.ca.gov/omr/ab_3098_list

If Contractor obtains import borrow or aggregate material from a surface mine not on this list, Contractor shall submit written proof the mine is exempt from SMARA to the Engineer.

5-1.18 SUPPLEMENTAL WORK PAYMENTS

Certain extra work to be performed on this project has been designated in the bid proposal as a contract item of work. For bidding purposes, the Contractor shall deem the amount set forth in the "Total Amount" column for the designated item as the maximum amount allotted for said item of extra work.

The County reserves the right to increase, decrease or entirely eliminate any supplemental work item in this contract without penalty. Notwithstanding any other provision to the contrary (including but not limited to section 4-1.03B(3) of the Standard Specifications), the Contractor has no right to receive any payment(s) for Supplemental Work that is decreased or entirely eliminated by the County.

5-1.19 SOLID WASTE MANAGEMENT

The Contractor shall recycle at least 50% of the construction and demolition waste generated by the project.

The following is a list of IWMA-Certified Recycling Facilities:

C&D Recycling Facility at Cold Canyon Landfill	805-549-8332
C&D Recycling Facility at Chicago Grade Landfill	805-466-2985
North SLO County Recycling	805-434-0043
API (roll-off/debris box company)	805-928-8689
R&R (a roll-off/debris box company)	805-929-8000
Recycling Facility at the Paso Robles Landfill	805-238-2028
Santa Maria Transfer Station	805-922-9255
Bedford Enterprises/SMART	805-922-4977

The Contractor shall complete and sign the "RECYCLING PLAN" form in conformance with the provisions in Section 4-1.03, "Contract Submittals," of these Special Provisions. This form must be submitted and approved prior to receiving the Notice to Proceed.

This form must show how at least 50% of the project construction and demolition waste will be recycled.

The Contractor shall maintain receipts or other documentation for any facility or site that received waste from the project.

The Contractor shall submit a complete and accurate "DISPOSAL REPORT" form with original receipts and supporting documentation. This form must be submitted and approved prior to receiving the Notice of Completion.

If the Contractor fails to submit the required information showing the 50% recycling goal was met, the County could impose a penalty equal to 2 percent of the total contract amount.

Full compensation for complying with these requirements shall be considered as included in the prices paid for the various items of work generating such construction and demolition waste and no additional compensation will be allowed therefor.

The following are copies of the "RECYCLING PLAN" and "DISPOSAL REPORT" forms:

RECYCLING PLAN FOR COUNTY PROJECTS

SECTION 1. PROJECT INFORMATION					
Contract Title	Contractor Name				
	Contractor Phone		Contractor Fax		
Contract Number	Street Address				
Total Contract Amount	City, State, Zip				
Print Name and Title	Signature			Date	

SECTION 2. RECYCLING PLAN					
	Before Construction (estimated tons)				
	Landfill	Recycling Facility		Reuse	
Materials	(Tons)	(Tons)	Location	(Tons)	Location
Cleared Vegetation					
Asphalt Concrete					
Concrete					
Metals (including spent equipment)					
Lumber					
Drywall					
Mixed Recyclables					
Trash					
Totals					
% Diversion					

Official Use Only		
Recycling Plan Approved ☐	Recycling Plan Denied ☐	
Information Required:		
Print Name and Title	Signature	Date

DISPOSAL REPORT FOR COUNTY PROJECTS

SECTION 1. PROJECT INFORMATION

Contract Title	Contractor Name	
	Contractor Phone	Contractor Fax
Contract Number	Street Address	
Total Contract Amount	City, State, Zip	

Contractor Certification: I certify under penalty of perjury that the information provided in this form is complete and accurate.

Print Name and Title	Signature	Date

SECTION 2. DISPOSAL REPORT

	After Construction (actual tons)				
	Landfill	Recycling Facility		Reuse	
Materials	(Tons)	(Tons)	Location	(Tons)	Location
Cleared Vegetation					
Asphalt Concrete					
Concrete					
Metals (including spent equipment)					
Lumber					
Drywall					
Mixed Recyclables					
Trash					
Totals					
% Diversion					

I have reviewed and approved the information submitted in this report for completeness

Resident Engineer's Name:	Signature:	Date:

Official Use Only

Disposal Report Approved ☐	Disposal Report Denied ☐
Information Required	

Print Name and Title	Signature	Date

SECTION 6. (*BLANK*)

SECTION 7. (*BLANK*)

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SECTION 8. MATERIALS

8-1.01 QUALIFIED PRODUCTS LIST

The assemblies listed below have been tested by the California Department of Transportation Laboratory and found to be compliant to the Transportation Electrical Equipment Specifications (TEES), dated March 12, 2009 and TEES 2009 Errata 1 dated January 21, 2010, and December 5, 2014.

For those categories of materials included on the Qualified Products List, only those products shown within the listing may be used in the work. Other categories of products, not included on the Qualified Products List, may be used in the work provided they conform to the requirements of the Standard Specifications and approved by the Engineer.

A manufacturer's listing on the QPL does not waive any of the requirements of the specifications or relieve the manufacturer/vendor of any obligation there under. Defective work, materials and equipment will be rejected.

In short, all equipment submitted must comply with current specifications.

Model 170E Controller Unit

Automatic/Eagle Signal	Model: AAZ11516P001
Dynamic Traffic Systems (Dynatrol)	Model: 170E
Topping Electronics, LTD	Model: 170E
McCain, Inc. Traffic Supply	Model: M11347, ATC Coldfire
Phillips/Sisson Industries, Inc. (PSI)	Model: 170E-0000
Safetran Traffic Systems Incorporated	Model: 289447A170

Model 200 Switch Packs

General Devices, Incorporated (GDI)	Model: 200, Rev. A
Power Distribution & Control Ltd (PDC)	Model: 200, SSS-88
Traffic Sensor Corporation (TSC)	Model: 200, 83A059A (C/N SP4200)

Model 204 Flashers

General Devices, Incorporated (GDI)	Model: 204, Rev. A
Power Distribution & Control Ltd (PDC)	Model: 204, SSF-88
Traffic Sensor Corporation (TSC)	Model: 204, C/N FU 4204

Model 206L Power Supply Module

Eberle Design Incorporate (EDI)	Model: 206L
Jasper Electronics	Model: 206L
ETA-USA	Model: 206L

Model 206LS Power Supply Module

Jasper Electronics	Model: 206LS

Model PDA2LS Power Supply Module

Jasper Electronics	Model: PDA2LS

Model 208 Monitor Unit

McCain Inc.	Model: 208
Safetran Brand by Econolite	Model: 208

Model 210 Monitor Unit

Eberle Design Incorporate (EDI)	Model: 210
Phillips / Sisson Industries, Inc. (PSI)	Model: 210
Solid State Devices	Model: 210

Model 222 Two-Channel Loop Detectors

Detector Systems Incorporated	Model: 222
Eberle Design Incorporated (EDI)	Model: 222
Northstar Controls, LLC	Model: 222
Reno A & E	Model: 222

Model 242L Two-Channel DC Isolators

General Devices, Incorporated (GDI)	Model: 242L
Eberle Design Incorporate (EDI)	Model: 242L

Model 252 Two-Channel AC Isolators

General Devices, Incorporated (GDI)	Model: 252
Power Distribution & Control Ltd (PDC)	Model: 252

Model 332L Cabinets

McCain, Inc.	Model: 332L
Safetran Brand by Econolite	Model:332L
Brown Traffic (Eagle)	Model:332L
Temple, Inc.	Model:332L

Model 420, Auxiliary Output File

Safetran Brand by Econolite	Model: 420
McCain Inc.	Model:420

Model 412 Program Module

Automatic / Eagle Signal	Model: 412C
Dynamic Traffic Systems (Dynatrol)	Model: 412C
McCain, Inc.	Model: 412C
Phillips / Sisson Industries, Inc. (PSI)	Model: 412C
Safetran Brand by Econolite	Model: 412C
Topping Electronics, Incorporated	Model: 412C

C2 Serial Harness

Rose Supply Company	Model: C2PS
General Devices Incorporated (GDI)	Model: C2PS
McCain	Model: C2PS

C11 Harness

Safetran Brand by Econolite	Model: C11 Harness
McCain Inc.	Model: C11 Harness
Brown Traffic (Eagle)	Model: C11 Harness
Temple, Inc.	Model: C11 Harness

Battery Back-up System (BBS)

Alpha Technologies, LTD.	Model: FXM-1100
Sensata Technologies Inc.	Model: 24M-11WBE
Myers Power Products	Model MP-2000E
Marathon Power	Model : TRTC-2002-N1

External BBS Cabinet

Alpha Technologies	Model E-BBS
Tesco	Model E-BBS
Myers Power	Model E-BBS
McCain Traffic	Model E-BBS
Econolite	Model E-BBS

8-1.02 PREQUALIFIED AND TESTED LED TRAFFIC SIGNAL MODULES

The Department uses the following list of Prequalified and Tested LED Traffic Signal Modules, created by Caltrans. The Engineer shall not be precluded from sampling and testing products on the list of Prequalified and Tested LED Traffic Signal Modules.

The manufacturer of products on the list of Prequalified and Tested LED Traffic Signal Modules shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of LED product supplied.

For those categories of materials included in the list of Prequalified and Tested LED Traffic Signal Modules, only those products shown within the listing may be used in the work. Other categories of products, not included in the list of Prequalified and Tested LED Traffic Signal Modules, may be used in the work provided they conform to the requirements of the Standard Specifications and are approved by the Engineer.

8-1.03 PREQUALIFIED AND TESTED LED LUMINAIRES

The Department uses the following list of Prequalified and Tested LED Luminaires, created by Caltrans. The Engineer shall not be precluded from sampling and testing products on the list of Prequalified and Tested LED Luminaires.

The manufacturer of products on the list of Prequalified and Tested LED Luminaires shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of LED product supplied.

For those categories of materials included in the list of Prequalified and Tested LED Luminaires, only those products shown within the listing may be used in the work. Other categories of products, not included in the list of Prequalified and Tested LED Luminaires, may be used in the work provided they conform to the requirements of the Standard Specifications and are approved by the Engineer.

8-1.04 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department uses the following list of Prequalified and Tested Signing and Delineation Materials, created by Caltrans. The Engineer shall not be precluded from sampling and testing products on the list of Prequalified and Tested Signing and Delineation Materials.

The manufacturer of products on the list of Prequalified and Tested Signing and Delineation Materials shall furnish the Engineer a Certificate of Compliance in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each type of traffic product supplied.

For those categories of materials included on the list of Prequalified and Tested Signing and Delineation Materials, only those products shown within the listing may be used in the work. Other categories of products, not included on the list of Prequalified and Tested Signing and Delineation Materials, may be used in the work provided they conform to the requirements of the Standard Specifications and approved by the Engineer.

PAVEMENT MARKERS, PERMANENT TYPE

Retroreflective With Abrasion Resistant Surface (ARS)
(traffic direction x marker width)

1. Apex, Model 921AR (4" x 4") and 828AR (3.1x4.5)
2. Ennis-Flint, Model 911 (4" x 4") and C80FH (3.1" x 4.5")
3. Ray-O-Lite, Models "AA" ARC II (4" x 4") and ARC Round Shoulder (4" x 4")
4. 3M Series 290 (3.5" x 4")
5. 3M Series 290 PSA
6. Glowlite, Inc Model 988AR (4" x 4")

Retroreflective With Abrasion Resistant Surface (ARS)
(for recessed applications only)

1. Ray-O-Lite, Model 2002 (2" x 4.6")
2. Ray-O-Lite, Model 2004 (2" x 4")*

*For use only in 4.5 inch wide (older) recessed slots

Non-Reflective, 4-inch Round

1. Apex Universal (Ceramic)
2. Apex Universal, Models 929 (ABS) and 929PP (Polypropylene)
3. Glowlite, Inc. (Ceramic) and PP (Polypropylene)
4. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
5. Interstate Sales, "Diamond Back" (Polypropylene)
6. Novabrite Models Cdot (White) Cdot-y (Yellow), Ceramic
7. Novabrite Models Pdot-w (White) Pdot-y (Yellow), Polypropylene
8. Three D Traffic Works TD10000 (ABS), TD10500 (Polypropylene)

9. Ray-O-Lite, Ray-O-Dot (Polypropylene)

PAVEMENT MARKERS, TEMPORARY TYPE

Temporary Markers For Long Term Day/Night Use (180 days or less)
1. Vega Molded Products "Temporary Road Marker" (3" x 4")
2. Pexco LLC, Halftrack model 25, 26 and 35

Temporary Markers For Short Term Day/Night Use (14 days or less)
(For seal coat or chip seal applications, clear protective covers are required)
1. Apex Universal, Model 932
2. Pexco LLC, Models T.O.M., T.R.P.M., and "HH" (High Heat)
3. Hi-Way Safety, Inc., Model 1280/1281
4. Glowlite, Inc., Model 932

STRIPING AND PAVEMENT MARKING MATERIAL

Permanent Traffic Striping and Pavement Marking Tape
1. Advanced Traffic Marking, Series 300 and 400
2. Brite-Line, Series 1000
3. Brite-Line, "DeltaLine XRP"
4. Swarco Industries, "Director 35" (For transverse application only)
5. Swarco Industries, "Director 60"
6. 3M, "Stamark" Series 380 and 270 ES

Temporary (Removable) Striping and Pavement Marking Tape (180 days or less)
1. Advanced Traffic Marking, Series 200
2. Brite-Line, "Series 100", "Deltaline TWR"
3. Garlock Rubber Technologies, Series 2000
4. Tape 4, Aztec, Grade 102
5. Swarco Industries, "Director-2", "Director 2-Wet Reflective"
6. Trelleborg Industries, R140 Series
7. 3M Series 710
8. Advanced Traffic Marking Black "Hide-A-Line" (Black Tape: for use only on Hot mix asphalt surfaces)
9. Brite-Line "BTR" Black Removable Tape
(Black Tape: for use only on Hot mix asphalt surfaces)
10. Trelleborg Industries, RB-140
(Black Tape: for use only on Hot mix asphalt surfaces)

Preformed Thermoplastic (Heated in place)
1. Ennis-Flint "Hot Tape"
2. Ennis-Flint "Premark Plus"
3. Ennis-Flint, "Flametape"
4. Alta Traffic Solutions, “Alta All-Season”, Series 100 (White Only)
5. Swarco Preformed Thermoplastic, (White Only)

Ceramic Surfacing Laminate, 6" x 6"
1. Highway Ceramics, Inc.

CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 66-inch
1. Pexco LLC, "Flexi-Guide Models 400 and 566"
2. Carsonite, Curve-Flex CFRM-400
3. Carsonite, Roadmarker CRM-375
4. FlexStake, Model 654 TM
5. GreenLine Model CGD1-66

Special Use Type, 66-inch
1. Pexco LLC, Model FG 560 (with U-Channel base), FG 300 UR (with 2-inch square anchor)
2. Carsonite, "Survivor" (with 18-inch U-Channel base)
3. Carsonite, Roadmarker CRM-375 (with 18-inch U-Channel base)
4. FlexStake, Model 604
5. GreenLine Model CGD (with 18-inch U-Channel base)
6. Impact Recovery Model D36, with #105 Driveable Base
7. Safe-Hit with 8-inch pavement anchor (SH248-GP1)
8. Safe-Hit with 15-inch soil anchor (SH248-GP2) and with 18-inch soil anchor
(SH248-GP3)
9. Safe-Hit RT 360 Post with Soil Mount Anchor (GPS)
10. Shur-Tite Products, Shur-Flex Drivable
11. Three D Traffic Works, Earthflex TD5500

Surface Mount Type, 48-inch
1. Bent Manufacturing Company, Masterflex Model MFEX 180-48
2. Carsonite, "Channelizer"
3. FlexStake, Models 704, 754 TM, and EB4
4. Impact Recovery Model D48, with #101 Fixed (Surface-Mount) Base
5. Three D Traffic Works "Channelflex" ID No. 522248W
6. Flexible Marker Support, Flexistiff Model C-9484
7. Safe-Hit, SH 248 SMR
8. New Direction Manufacturing, Model FTSM
9. Hi-way Safety, Inc, Model CFUR48
10. Shur-Tite Products, Shur-Flex

CHANNELIZERS

Surface Mount Type, 36-inch
1. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) MF-180-36 (Flat) and MFEX 180—36
2. Pexco LLC, Flexi-Guide Models FG300PE, FG300UR, and FG300EFX
3. Carsonite, "Super Duck" (Round SDR-336)
4. Carsonite, Model SDCF03601MB "Channelizer"

5. FlexStake, Models 703, 753 TM, and EB3
6. GreenLine, Model SMD-36
7. Hi-way Safety, Inc. "Channel Guide Channelizer" Model CGC36, CFUR36
8. Impact Recovery Model D36, with #101 Fixed (Surface-Mount) Base
9. Safe-Hit, Guide Post, Model SH236SMA and Dura-Post, Model SHL36SMA
10. Three D Traffic Works "Boomerang" 5200 Series
11. Flexible Marker Support, Flexistiff Model C-9484-36
12. Shur-Tite Products, Shur-Flex

Lane Separation System

1. Pexco LLC, "Flexi-Guide (FG) 300 Curb System"
2. Qwick Kurb, "Klemmfix Guide System"
3. Dura-Curb System
4. Tuff Curb
5. FG 300 Turnpike Curb
6. Shur-Tite Products, SHUR-Curb , Model No. SF0200

CONICAL DELINEATORS, 42-inch

(For 28-inch Traffic Cones, see Standard Specifications)

1. Bent Manufacturing Company "T-Top", TDSC Series
2. Plastic Safety Systems "Navigator-42"
3. TrafFix Devices "Grabber"
4. Three D Traffic Works "Ringtop" TD7000, ID No. 742143
5. Three D Traffic Works, TD7500
6. Work Area Protection Corp. C-42
7. Custom-Pak 4600 (Part No. 93005-0001)
8. Plasticade, Navicade, 650 RI

OBJECT MARKERS

Type "K", 18-inch

1. Pexco LLC, Model FG318PE
2. Carsonite, Model SMD 615
3. FlexStake, Model 701 KM
4. Safe-Hit, Model SH718SMA
5. Impact Recovery Systems, Model 282-K
6. Hi-way Safety, Inc, Model CFURK
7. Shur-Tite Products, Shur-Flex Driveable

Type "Q" Object Markers, 24-inch

1. Bent Manufacturing "Masterflex" Model MF-360-24
2. Pexco LLC, Model FG324PE
3. Carsonite, "Channelizer"
4. FlexStake, Model 701KM
5. Safe-Hit, Models SH824SMA_WA and SH824GP3_WA
6. Three D Traffic Works ID No. 531702W and TD 5200

7. Three D Traffic Works ID No. 520896W
8. Safe-Hit, Dura-Post SHLQ-24"
9. Flexible Marker Support, IMC 9484-24
10. Impact Recovery Systems, Model 282 –Q
11. Hi-way Safety, Inc, Model CFURQ

CONCRETE BARRIER MARKERS AND TEMPORARY RAILING (TYPE K) REFLECTORS

Impactable Type
1. ARTUK, "FB"
2. Pexco LLC, Models PCBM-12 and PCBM-T12, PCBM 912
3. Duraflex Corp., "Flexx 2020" and "Electriflexx"
4. Hi-Way Safety, Inc., Model GMKRM100
5. Plastic Safety Systems "BAM" Models OM-BARR and OM-BWAR
6. Three D Traffic Works "Roadguide" Model TD 9300
7. K-Cone Industries, Inc

Non-Impactable Type
1. ARTUK, JD Series
2. Plastic Safety Systems "BAM" Models OM-BITARW and OM-BITARA
3. Vega Molded Products, Models GBM and JD
4. Plastic Vacuum Forming, "Cap-It C400"
5. Irwin Hodson Co., Barrier Traffic Reflector, 5 inch

METAL BEAM GUARD RAIL POST MARKERS

(For use to the left of traffic)
1. Pexco LLC, "Mini" (3" x 10"), I-Flex
2. Creative Building Products, "Dura-Bull, Model 11201"
3. Duraflex Corp., "Railrider"
4. Plastic Vacuum Forming, "Cap-It C300"
5. Irwin Hodson Co., Barrier Traffic Reflector

CONCRETE BARRIER DELINEATORS, 16-inch

(For use to the right of traffic)
1. Pexco LLC, Model PCBM T-16
2. Safe-Hit, Model SH216RBM
3. Three D Traffic Works "Roadguide" Model 9400

CONCRETE BARRIER-MOUNTED MINI-DRUM (10" x 14" x 22")

1. Stinson Equipment Company "SaddleMarker"

GUARD RAILING DELINEATOR
(Place top of reflective element at 48 inches above plane of roadway)

Wood Post Type, 27-inch
1. Pexco LLC, FG 427 and FG 527
2. Carsonite, Model 427
3. FlexStake, Model 102 GR
4. GreenLine GRD 27
5. Safe-Hit, Model SH227GRD
6. Three D Traffic Works "Guardflex" TD9100
7. New Directions Mfg, NDM27
8. Shur-Tite Products, Shur-Tite Flat Mount
9. Glasforms, Hiway-Flex, GR-27-00
10. Impact Recovery Systems, 200-GRP

Barrier, Guardrail Visibility Enhancement
1. UltraGuard Safety System, Potters Industries, Inc.
2. Worldwide Safety and Irwin Hodson, Monarch Butterfly Reflective Device (MBG only)
3. 3M, Linear Delineation System, Series 340

Steel Post Type
1. Carsonite, Model CFGR-327

RETROREFLECTIVE SHEETING

Channelizers, Barrier Markers, and Delineators
1. Avery Dennison T-6500 Series, (For rigid substrate devices only)
2. Avery Dennison WR-7100 Series and WR-6100 Series
3. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
4. Orafol, PC-1000 Metalized Polycarbonate
5. Orafol, AC-1000 Acrylic
6. Orafol, AP-1000 Metalized Polyester
7. Orafol, Conformalight, AR-1000 Abrasion Resistant Coating
8. 3M, High Intensity and Series 3310

Traffic Cones, 4-inch and 6-inch Sleeves
1. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
2. Orafol, Vinyl, "TR" (Semi-transparent) or "Conformalight", C85
3. 3M Series 3840, Series 3340
4. Avery Dennison S-9000C

Drums
1. Avery Dennison WR-6100 series
2. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
3. Orafol, "Conformalight", "Super High Intensity" or "High Impact Drum Sheeting"
4. 3M Series 3810 and Series 3310

Barricade Sheeting: ASTM D 4956
Type I

1. Nippon Carbide Industries, CN8117
2. Avery Dennison, W 1100 series
3. 3M Series CW 44

Type II

4. Avery Dennison, W-2100 Series

Type III

5. Aura Optical Systems, Aura 150

Type IV

6. 3M Series 3334/3336

Vertical Clearance Signs: Structure Mounted

1. 3M Model 4061, Diamond Grade DG3, Fluorescent Yellow

Signs: Type II, Medium-High-Intensity (Typically Enclosed Lens, Glass-Bead Element)

1. Avery Dennison, T-2500 Series
2. Nippon Carbide Industries, Nikkalite 18000

Signs: Type III, High-Intensity (Typically Encapsulated Glass-Bead Element)

1. Avery Dennison, T-5500A and T-6500 Series
2. Nippon Carbide Industries, Nikkalite Brand Ultralite Grade II
3. 3M 3870 and 3930 Series
4. Changzhou Hua R Sheng, Series TM 1200
5. Oracal, Oralite Series 5800

Signs: Type IV, High-Intensity (Typically Unmetallized Microprismatic Element)

1. Avery Dennison, T-6500 Series
2. Nippon Carbide Industries, Crystal Grade, 94000 Series
3. Nippon Carbide Industries, Model No. 94847 Fluorescent Orange
4. 3M Series 3930 and Series 3924S
5. Orafol, Oralite Series 5900 and Series 5930 Fluorescent Orange

Signs: Type VI, Elastomeric (Roll-Up) High-Intensity, without Adhesive

1. Avery Dennison, WU-6014
2. Novabrite LLC, "Econobrite"
3. Orafol "Vinyl"
4. Orafol "SuperBright"
5. Orafol "Marathon"
6. 3M Series RS20

Signs: Type VIII, Super-High-Intensity (Typically Unmetallized Microprismatic Element)

1. Avery Dennison, T-7500 Series
2. Avery Dennison, T-7511 Fluorescent Yellow
3. Avery Dennison, T-7513 Fluorescent Yellow Green
4. Avery Dennison, W-7514 Fluorescent Orange

5. Nippon Carbide Industries, Nikkalite Crystal Grade Series 92800
6. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92847 Fluorescent Orange
7. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92844 Fluorescent Yellow/Green

Signs: Type IX, Very-High-Intensity (Typically Unmetallized Microprismatic Element)

1. 3M VIP Series 3981 Diamond Grade Fluorescent Yellow
2. 3M VIP Series 3983 Diamond Grade Fluorescent Yellow/Green
3. 3M VIP Series 3990 Diamond Grade
4. Avery Dennison T-9500 Series
5. Avery Dennison, T9513, Fluorescent Yellow Green
6. Avery Dennison, W9514, Fluorescent Orange
7. Avery Dennison, T-9511 Fluorescent Yellow

Signs: Type XI, Very High Intensity (Typically Unmetallized Microprismatic Element)

1 3M Diamond Grade, DG3, Series 4000
2. 3M Diamond Grade, DG3, Series 4081, Fluorescent Yellow
3. 3M Diamond Grade, DG3, Series 4083, Fluorescent Yellow/Green
4. 3M Diamond Grade, DG3, Series 4084, Fluorescent Orange
5. Avery Dennison, OmniCube, T-11500 Series
6. Avery Dennison, OmniCube, T-11511, Fluorescent Yellow
7. Avery Dennison, OmniCube, T-11513, Fluorescent Yellow Green
8. Avery Dennison, OmniCube, W-11514 Fluorescent Orange

SPECIALTY SIGNS

1. Orafol "Endurance" Work Zone Sign (with Semi-Rigid Plastic Substrate)

ALTERNATIVE SIGN SUBSTRATES

Fiberglass Reinforced Plastic (FRP) and Expanded Foam PVC

1. Fiber-Brite (FRP)
2. Sequentia, "Polyplate" (FRP)
3. Inteplast Group "InteCel" (0.5 inch for Post-Mounted CZ Signs, 48-inch or less)(PVC)

Aluminum Composite, Temporary Construction Signs and Permanent Signs up to 4 foot, 7 Inches

1. Alcan Composites "Dibond Material, 80 mils"
2. Mitsubishi Chemical America, Alpolic 350
3. Bone Safety Signs, Bone Light ACM (temporary construction signs only)
4. Kommerling, USA, KomAlu 3 mm

8-1.05 PREQUALIFIED AND TESTED FLASHING BEACON

Advance Warning Beacon

Flashing Signal
Flashing Beacon
Control Box
Reflective Sign
Sign Light
Pole

Overview

McCain's Advance Warning Beacon attracts attention to important roadside signs or information and is ideal for a range of traffic applications. Road safety is heavily reliant on a driver's compliance with roadside signs, including speed limits, merging traffic, stoplights, etc. By using a solid state flashing beacon to draw attention to hidden, changing, or approaching road conditions such as an intersection not yet in view, McCain's Beacon increases driver awareness and thereby enhances overall roadside safety.

Benefits

- Increases roadside safety by warning drivers of hidden or approaching hazards
- Rugged high-quality signal housing
- Reliable solid-state flasher control
- Multiple configurations for mounting framework

Product Description

The McCain Advance Warning Beacon is ideal for a wide range of traffic applications. Either in a single or dual configuration, the flashing beacon(s) draws the motorist's attention to a warning sign alerting them to an approaching hazard.

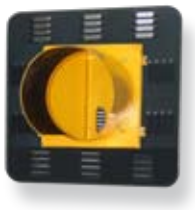
The signal housing is the same high-quality, rugged product found in all McCain signal heads. It is available in eight and 12-inch sizes, fabricated from aluminum or polycarbonate, with or without visors and backplates, and accepts a number of standard light modules.

A powder coated, aluminum Flashing Beacon Control Box (FBCA), featuring solid state electronics to control the flashing of the signal head, is mounted on the back of the pole.

The signs are highly reflective, uniform traffic signs available in standard sizes and messages. Additionally, the signs can be lit with a lamp, and the type 1 poles are available in several materials.

Advance Warning Beacon

Signal Housing



FBCA

Uniform Signs (examples)

W1-2 W2-1 W3-1

Sign Light

Pole

Standard Features

Beacon

- Aluminum or polycarbonate
- Aluminum powder coated, polycarbonate colored resins
- Federal yellow, signal green, black, or custom colors
- 72-tooth serrated boss and reinforcing ribs, top and bottom
- 2.0" hole top and bottom fits 1.5" NPT fittings
- Brass threaded inserts for visor attachment (4)
- Terminal block installed
- Stainless steel door roll pins and eye bolt/wing nut assemblies
- Weathertight E.P.D.M. rubber door gasket

Controller

- NEMA 3R aluminum or galvanized, hinged-door, powder coated (sea foam green), weathertight enclosure
- 15 AMP circuit breaker protection
- Plug-in solid state flasher (Model 204)
- Plug-in flash transfer dimming relay
- Sign light auto/test switch

Pole

- Type 1 Pole
- Aluminum, galvanized steel, or fiberglass
- 10' H

Uniform Sign Panels

- MUTCD and Caltrans
- Various sizes

Incandescent Sign Light

- Reflector
- Socket, standard E26 Edison screw base

Mounting Framework

- Available in aluminum or bronze
- Multiple configurations to match your requirements

Options

- 365 day solid state programmable time clock
- Time clock module without dimming relay
- Various signal modules including LED
- Two flashing beacons
- Photocell

To learn more about McCain's Integrated Traffic Solutions, please contact ***info@mccain-inc.com*** *or call* ***(760) 727-8100***

McCain®

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SECTION 9. DESCRIPTION OF WORK

This project will construction and upgrade handicap accessibility; install traffic signal standards, poles, luminaries, and controller cabinets; all appurtenant hardware, signal heads accessible pedestrian signals and signs shall be mounted; the system shall be tested; and other such items or detail work not mentioned herein that are required by the Plans, the Standard Specifications, Standard Plans, or these Special Provisions.

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SECTION 10. CONSTRUCTION DETAILS

10-1.01 ORDER OF WORK:

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

The Contractor's attention is directed to the lead time required for ordering and delivery of materials required for project construction. The Contractor's schedule shall reflect these lead times and the Contractor shall be solely responsible to ensure that all work is completed within the contract working days. The first order of work shall be to place the order for the signal components. These components shall be ordered within five (5) days of receipt of the Notice to Proceed and approved by the Engineer. The Engineer shall be furnished a statement from the vendor/s that the order for the traffic signal equipment has been received and accepted by the vendor/s.

The work shall conform to the inherent stages of construction described in the Contractor's Progress Schedule as accepted by the Engineer. Work may proceed that is not in conflict with work in preceding stages, provided satisfactory progress is maintained in said preceding stages of construction. The Progress Schedule shall identify the dates for work on each road.

After having received the written Notice to Proceed, the Contractor shall install the required construction area signs in accordance with these Special Provisions. No other work will be allowed until the placement of the construction area signs has been completed.

Staging and parking areas not on existing roadway surfaces must be reviewed and approved by the Environmental Programs Division prior to use.

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

After having received the written Notice to Proceed, the Contractor shall place and activate the changeable message boards for advance warning to motorists in accordance with these Special Provisions. No traffic closures will be allowed until the message boards have been in operation for 7 calendar days.

The Contractor's attention is directed to the provisions of "Water Pollution Control" of these Special Provisions, requiring acceptance of the WPCP and installation of specified BMPs before any work is performed.

The Contractor's attention is directed to the provisions of "Maintaining Traffic" of these Special Provisions, requiring public notification and placement of temporary "No Parking" signs before performing work in any location, and

temporary pavement delineation before opening the traveled ways to public traffic.

Lane closures are prohibited on Thompson Avenue and Titan Way from 0630 to 0830 and from 1430 to 1800 on weekdays. Lane closures not permitted on Friday afternoons preceding three-day weekend of a Federal holiday.

No work will be permitted on all other roads before 0800 and after 1700.

10-1.02 WATER POLLUTION CONTROL:

10-1.02.A GENERAL:

Summary

Water pollution control work applies to project where work activities result in less than 1 acre of soil disturbance. Manage work activities to reduce the discharge of pollutants to surface waters, groundwater, or municipal separate storm sewer systems including contract work item for Prepare Water Pollution Control Program. Water Pollution Control Program (WPCP) preparation includes obtaining WPCP acceptance, amending the WPCP, and installation, maintenance, monitoring, and inspecting water pollution control practices at the job site.

Do not begin work until the WPCP is accepted.

Definitions and Abbreviations

active and inactive areas: (1) Active areas have soil disturbing work activities occurring at least once within 14 days, and (2) Inactive areas are areas that have not been disturbed for at least 15 days.

BMPs: Best Management Practices are water pollution control practices.

construction phase: Construction phases are (1) Highway Construction including work activities for building roads and structures, (2) Plant Establishment including maintenance on vegetation installed for final stabilization, and (3) Suspension where work activities are suspended and areas are inactive.

Preparation Manual: The Department's "Storm Water Pollution Prevention Plan and Water Pollution Control Program Preparation Manual."

NPDES: National Pollutant Discharge Elimination System

RWQCB: Regional Water Quality Control Board

SWPPP: Storm Water Pollution Prevention Plan

SWRCB: State Water Resources Control Board

Water Pollution Control Manager: The Water Pollution Control Manager implements water pollution control work described in the WPCP and oversees revisions and amendments to the WPCP.

WPCP: Water Pollution Control Program

Submittals

Within 10 calendar days, not including Saturdays, Sundays, and legal holidays, of receipt of the executed contract, start the following process for WPCP acceptance:

1. Submit 2 copies of the WPCP and allow 5 days for the Engineer's review. If revisions are required, the Engineer provides comments and specifies the date that the review stopped.

2. Change and resubmit the WPCP within 5 days of receipt of the Engineer's comments. The Engineer's review resumes when the complete WPCP is resubmitted.

3. When the Engineer accepts the WPCP, submit an electronic and 3 printed copies of the accepted WPCP.

Submit:

1. Stormwater training records including training dates and subject for employees and subcontractors. Include dates and subject for ongoing training, including tailgate meetings.

2. Employee training records:

    2.1. Within 5 days of WPCP acceptance for existing employees

    2.2. Within 5 days of training for new employees

    2.3. At least 5 days before subcontractors start work for subcontractor's employees

Submit as required:

1. BMP Status Report

2. Inspection Reports

At least 5 days before operating any construction support facility:

1. Submit a plan showing the location and quantity of water pollution control practices associated with the construction support facility

2. If you will be operating a batch plant or a crushing plant under the General Industrial Permit, submit a copy of the NOI approved by the RWQCB and the WPCP approved by the RWQCB.

Quality Control and Assurance:

Training

Provide storm water training for:

1. Project managers

2. Supervisory personnel

3. Employees involved with water pollution control work

Train all employees, including subcontractor's employees, in the following subjects:

1. Water pollution control rules and regulations

2. Implementation and maintenance for:

    2.1. Temporary Soil Stabilization

    2.2. Temporary Sediment Control

    2.3. Tracking Control

    2.4. Wind Erosion Control

    2.5. Material pollution prevention and control

    2.6. Waste management

    2.7. Non-storm water management

    2.8. Identifying and handling hazardous substances

    2.9. Potential dangers to humans and the environment from spills and leaks or exposure to toxic or hazardous substances

Employees must receive initial water pollution control training before working on the job.

Conduct weekly training meetings covering:

1. Water pollution control BMPs deficiencies and corrective actions

2. BMPs that are required for work activities during the week

3. Spill prevention and control

4. Material delivery, storage, use, and disposal

5. Waste management

6. Non-storm water management procedures

You may obtain copies of the Preparation Manual from the Publication Distribution Unit. The mailing address for the Publication Distribution Unit is:

State of California

Department of Transportation

Publication Distribution Unit

1900 Royal Oaks Drive

Sacramento, California 95815

Telephone: (916) 445-3520

For the Preparation Manual and other water pollution control references, go to the Department's "Construction Storm Water and Water Pollution Control" web site at:

http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm

If you operate construction support facilities, protect storm water systems or receiving waters from the discharge of potential pollutants by using water pollution control practices.

Construction support facilities include:

1. Staging areas

2. Storage yards for equipment and materials

3. Mobile operations

4. Batch plants for PCC and HMA

5. Crushing plants for rock and aggregate

6. Other facilities installed for your convenience such as haul roads

If you operate a batch plant to manufacture PCC, HMA, or other material; or a crushing plant to produce rock or aggregate; obtain coverage under the General Industrial Permit. You must be covered under the General Industrial Permit for batch plants and crushing plants located:

1. Outside of the job site

2. Within the job site that serve one or more contracts

Discharges from manufacturing facilities such as batch plants must comply with the general waste discharge requirements for Order No. 97-03-DWQ, NPDES General Permit No. CAS000001, issued by the SWRCB for "Discharge of Stormwater Associated with Industrial Activities Excluding Construction Activities." The General Industrial Permit is available at:

http://www.waterboards.ca.gov/

Water Pollution Control Manager

The Contractor shall designate in writing a Water Pollution Control Manager (WPCM). The Contractor shall submit a statement of qualifications describing the training, work history, and expertise of the proposed WPCM. The WPCM must have at least one of the following qualifications:

1. Certified Erosion, Sediment and Storm Water Inspector (CESSWI)™ registered through Enviro Cert International, Inc.

2. Certified Inspector of Sediment and Erosion Control (CISEC) registered through CISEC, Inc.

3. Qualifications described in the Permit (Order No. 2009-009-DWQ, NPDES No. CAS000002) for a QSD.

4. Department approved storm water management training described in the Department's "Construction Storm Water and Water Pollution Control" web site

At the job site, the Water Pollution Control Manager must:

1. Be responsible for water pollution control work

2. Be the primary contact for water pollution control work

3. Oversee the maintenance of water pollution control practices

4. Oversee and enforce hazardous waste management practices

5. Have the authority to mobilize crews to make immediate repairs to water pollution control practices

6. Ensure that all employees have current water pollution control training

7. Implement the accepted WPCP and amend the WPCP when required

Water Pollution Control Manager must oversee:

1. Inspections of water pollution control practices identified in the WPCP

2. Inspections for visual monitoring

You may designate one manager to prepare the WPCP and a different manager to implement the plan. The WPCP preparer shall meet the training requirements for the WPCM.

10-1.02.B WATER POLLUTION CONTROL PROGRAM:

The work includes preparing a WPCP, obtaining WPCP acceptance, amending the WPCP, and reporting on water pollution control practices at the job site. The WPCP must comply with the Preparation Manual. The WPCP is required by the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, and these Special Provisions.

You may request, or the Engineer may order, changes to the water pollution control work. Changes may include addition of new water pollution control practices. Additional water pollution control work is change order work.

The WPCP must include water pollution control practices:

1. For storm water and non-stormwater from areas outside of the job site related to project work activities such as:

   1.1. Staging areas

   1.2. Storage yards

   1.3. Access roads

2. For activities or mobile operations related to contractor obtained NPDES permits

3. Construction support facilities

The WPCP must include a copy of permits obtained by the County such as Fish & Game permits, US Army Corps of Engineers permits, RWQCB 401 Certifications, and RWQCB Waste Discharge Requirements for Aerially Deposited Lead Reuse.

WPCP Amendments

You must amend the WPCP when:

1. Changes in work activities could affect the discharge of pollutants

2. Water pollution control practices are added by change order work

3. Water pollution control practices are added by your discretion

If you amend the WPCP, follow the same process specified for WPCP acceptance.

Retain a printed copy of the accepted WPCP at the job site.

WPCP Schedule

The WPCP schedule must:

1. Describe when work activities will be performed that could cause the discharge of pollutants in storm water

2. Describe water pollution control practices associated with each construction phase

3. Identify soil stabilization and sediment control practices for disturbed soil areas

10-1.02.C IMPLEMENTATION REQUIREMENTS:

Monitor the National Weather Service Forecast Office on a daily basis. For forecasts, go to:

http://www.srh.noaa.gov/forecast

Whenever you or the Engineer identifies a deficiency in the implementation of the accepted WPCP:

1. Correct the deficiency immediately, unless the Engineer authorizes an agreed date for correction

2. Correct the deficiency before precipitation occurs

If you fail to correct the deficiency by the agreed date or before the onset of precipitation, the County may correct the deficiency and deduct the cost of correcting the deficiency from payment.

If you fail to comply with "Water Pollution Control" of these Special Provisions, the Engineer will order a suspension of work until the project complies with the requirements of "Water Pollution Control" of these Special Provisions.

The Contractor's responsibility for WPCP implementation shall continue throughout any temporary suspension of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications.

Install water pollution control practices within 15 days or before predicted precipitation, whichever occurs first except as required sooner as required elsewhere by these Special Provisions.

If actions for the Contractor's convenience disturb one or more acres, the Contractor must pay all costs and be responsible for all delays associated with complying with Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002) issued by the SWRCB for "Storm Water Discharges Associated with Construction and Land Disturbance Activities." The General Permit is available at:

http://www.waterboards.ca.gov/

Inspection

The Water Pollution Control Manager must oversee inspections for water pollution control practices identified in the WPCP:

1. Before a forecasted storm

2. After precipitation that causes site runoff

3. At 24-hour intervals during extended precipitation

4. On a predetermined schedule, a minimum of once a week

The Water Pollution Control Manager must oversee daily inspections of:

1. Storage areas for hazardous materials and wastes

2. Hazardous waste disposal and transporting activities

3. Hazardous material delivery and storage activities

4. Water pollution control practices specified under "Construction Site Management" of these Special Provisions

The Water Pollution Control Manager must use the Storm Water Site Inspection Report provided in the Preparation Manual.

The Water Pollution Control Manager must prepare BMP status reports that include the following:

1. Location and quantity of installed water pollution control practices

2. Location and quantity of disturbed soil for the active or inactive areas

Within 24 hours of finishing the weekly inspection, the Water Pollution Control Manager must submit:

1. Copy of the completed site inspection report

2. Copy of the BMP status report

Reporting Requirements

If the following occur, notify the Engineer within 6 hours:

1. You identify discharges into receiving waters or drainage systems causing or potentially causing pollution

2. The job receives a written notice or order from a regulatory agency

No later than 48 hours after the conclusion of a storm event resulting in a discharge, a non-stormwater discharge, or receiving the notice or order, submit:

1. Date, time, location, and nature of the activity, type of discharge and quantity, and the cause of the notice or order

2. Water pollution control practices used before the discharge, or before receiving the notice or order

3. Description of water pollution control practices and corrective actions taken to manage the discharge or cause of the notice.

10-1.02.D PAYMENT:

If you fail to comply with "Water Pollution Control" of these Special Provisions or fail to implement water pollution control practices during each estimate period, the County withholds 25 percent from progress payment.

Withholds for failure to perform water pollution control work are in addition to all other withholds provided for in the contract. The County returns performance-failure withholds in the progress payment following the correction for noncompliance.

Full compensation for preparing and implementing a water pollution control program, including furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in preparing, obtaining acceptance of, and amending the WPCP and inspecting water pollution control practices as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer, shall be considered as included in the contract price paid for the various items of work involved and no separate payment will be made therefor.

The County does not pay for implementation of water pollution control practices in areas outside the right of way not specifically provided for in the drawings or in the Special Provisions.

The County does not pay for water pollution control practices installed at construction support facilities.

10-1.03 CONSTRUCTION SITE MANAGEMENT

10-1.03.A GENERAL

Summary

This work includes controlling potential sources of water pollution before they come in contact with storm water systems or watercourses.

Control material pollution and manage waste and non-stormwater at the job site by implementing effective handling, storage, use, and disposal practices.

For information on documents specified in these Special Provisions, refer to the Department's Preparation Manual, Dewatering Guide, and BMP Manual.

Preparation Manual, Dewatering Guide, and BMP Manual are available from the Department's Construction Storm Water and Water Pollution Control web site at:

http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm

Definitions and Abbreviations

active and inactive areas: (1) Active areas have soil disturbing work activities occurring at least once within 14 days, and (2) Inactive areas are areas that have not been disturbed for at least 15 days.

BMP Manual: The Department's Construction Site Best Management Practices (BMP) Manual.

CDPH: California Department of Public Health

Dewatering Guide: The Department's Field Guide to Construction Site Dewatering.

ELAP: Environmental Laboratory Accreditation Program

Minor spills: Small quantities of oil, gasoline, paint, or other material that are small enough to be controlled by a first responder upon discovery of the spill.

MSDS: Material Safety Data Sheet

Preparation Manual: The Department's Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual.

Semi-significant spills: Spills that can be controlled by a first responder with help from other personnel.

Significant or hazardous spills: Spills that cannot be controlled by construction personnel.

WPC: Water Pollution Control

WPC Manager: Water Pollution Control Manager as defined under "Water Pollution Control" of these Special Provisions.

Submittals

Submit the following:

1. MSDS at least 5 days before material is used or stored

2. Monthly inventory records for material used or stored

3. Copy of written approval to discharge into a sanitary sewer system at least 5 days before beginning discharge activities

10-1.03.B CONSTRUCTION

Spill Prevention and Control

Implement spill and leak prevention procedures for chemicals and hazardous substances stored at the job site. If you spill or leak chemicals or hazardous substances at the job site, you are responsible for all associated cleanup costs and related liability.

As soon as it is safe, contain and clean up spills of petroleum products, sanitary and septic waste substances listed under CFR Title 40, Parts 110, 117, and 302.

Minor Spills

Clean up minor spills using the following procedures:

1. Contain the spread of the spill

2. Recover the spilled material by absorption

3. Clean the contaminated area

4. Dispose of the contaminated material promptly and properly

Semi-significant Spills

Clean up semi-significant spills immediately by the following procedures:

1. Contain the spread of the spill

2. Recover the spilled material using absorption whenever a spill occurs on a paved surface or an impermeable surface

3. Contain the spill with an earthen dike and dig up the contaminated soil for disposal whenever a spill occurs on soil

4. If the spill occurs during precipitation, cover the spill with plastic or other material to prevent contaminated runoff

5. Dispose of the contaminated material promptly and properly

Significant or Hazardous Spills

Immediately notify qualified personnel of significant or hazardous spills. Do not let construction personnel attempt to clean up the spill until qualified staff have arrived. Do the following:

1. Notify the Engineer and follow up with a written report

2. Obtain the services of a spills contractor or hazardous material team immediately

3. Notify the local emergency response team by dialing 911 and county officials at the emergency phone numbers kept at the job site

4. Notify the Governor's Office of Emergency Services Warning Center at (805) 852-7550

5. Notify the National Response Center at (800) 424-8802 regarding spills of Federal reportable quantities under CFR Title 40, Parts 110, 119, and 302

6. Notify other agencies as appropriate, including:

    6.1. Fire Department

    6.2. Public Works Department

    6.3. Coast Guard

    6.4. Highway Patrol

    6.5. County Sheriff Department

    6.6. Department of Toxic Substances

    6.7. California Division of Oil and Gas

    6.8. Cal OSHA

    6.9. Regional Water Resources Control Board

Report minor, semi-significant, and significant spills to the WPC Manager. The WPC Manager must notify the Engineer immediately. The WPC Manager must oversee and enforce proper spill prevention and control measures.

Prevent spills from entering storm water runoff before and during cleanup. Do not bury spills or wash spills with water.

Keep material or waste storage areas clean, well organized, and equipped with enough cleanup supplies for the material being stored.

10-1.03.C MATERIAL MANAGEMENT

General

Material must be delivered, used, and stored for this job in a way that minimizes or eliminates discharge of material into the air, storm drain systems, and watercourses.

Implement the practices described under "Material Management" of these Special Provisions while taking delivery of, using, or storing any of the following materials:

1. Hazardous chemicals including acids, lime, glues, adhesives, paints, solvents, and curing compounds
2. Soil stabilizers and binders
3. Fertilizers
4. Detergents
5. Plaster
6. Petroleum materials including fuel, oil, and grease
7. Asphalt components and concrete components
8. Pesticides and herbicides

Employees trained in emergency spill cleanup procedures must be present during the unloading of hazardous materials or chemicals.

If practicable, use less hazardous materials.

Material Storage

Use the following material storage procedures:

1. Store liquids, petroleum materials, and substances listed in CFR Title 40, Parts 110, 117, and 302 as specified by the Department, and place them in secondary containment facilities.
2. Secondary containment facilities must be impervious to the materials stored there for a minimum contact time of 72 hours.
3. Cover secondary containment facilities during non-working days and when precipitation is predicted. Secondary containment facilities must be adequately ventilated.

4. Keep secondary containment facility free of accumulated rainwater or spills. After precipitation, or in the event of spills or leaks, collect accumulated liquid and place into drums within 24 hours. Handle these liquids as hazardous waste under "Hazardous Waste" of these Special Provisions unless testing determines them to be nonhazardous.

5. Do not store incompatible materials, such as chlorine and ammonia, in the same secondary containment facility.

6. Store materials in the original containers with the original material labels maintained in legible condition. Replace damaged or illegible labels immediately.

7. Secondary containment facilities must have the capacity to contain precipitation from a 24-hour-long, 25-year storm, and 10 percent of the aggregate volume of all containers, or entire volume of the largest container within the facility, whichever is greater.

8. Store bagged or boxed material on pallets. Protect bagged or boxed material from wind and rain during non-working days and while precipitation is predicted.

9. Provide sufficient separation between stored containers to allow for spill cleanup or emergency response access. Storage areas must be kept clean, well organized, and equipped with cleanup supplies appropriate for the materials being stored.

10. Repair or replace perimeter controls, containment structures, covers, and liners as necessary. Inspect storage areas before and after precipitation, and at least weekly during other times.

Stockpile Management

Use the following stockpile management procedures:

1. Reduce or eliminate potential water pollution from stockpiled material including soil, paving material, and pressure treated wood.

2. Locate stockpiles:

   2.1. If within the floodplain, at least 100 feet from concentrated flows of storm water, drainage courses, and inlets unless approved

   2.2. If outside the floodplain, at least 50 feet from concentrated flows of storm water, drainage courses, and inlets unless approved

Install WPC practices within 15 days or before predicted precipitation, whichever occurs first.

Active and inactive soil stockpiles must be:

1. Covered with soil stabilization measures, plastic sheeting, or geosynthetic fabric

2. Surrounded with a linear sediment barrier

Portland cement concrete rubble, AC, HMA, AC and HMA rubble, aggregate base or aggregate sub-base stockpiles must be:

1. Covered with plastic sheeting, or geosynthetic fabric

2. Surrounded with a linear sediment barrier

Pressure treated wood stockpiles must be:

1. Placed on pallets

2. Covered with impermeable material

Cold mix asphalt concrete stockpiles must be:

1. Placed on impervious surface

2. Covered with impermeable material

3. Protected from run-on and runoff

Control wind erosion year round under Section 10, "Dust Control" of the Standard Specifications.

Repair or replace linear sediment barriers and covers as needed to keep them functioning properly. If sediment accumulates to 1/3 of the linear sediment barrier height, remove the sediment.

10-1.03.D WASTE MANAGEMENT

Solid Waste

Do not allow litter or debris to accumulate anywhere at the job site, including storm drain grates, trash racks, and ditch lines. Pick up and remove trash and debris from the job site at least once a week. The WPC Manager must monitor solid waste storage and disposal procedures at the job site.

If practicable, recycle nonhazardous job site waste and excess material. If recycling is not practicable, disposal must comply with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way" of the Standard Specifications.

Furnish enough closed-lid dumpsters of sufficient size to contain any solid waste generated by work activities. When the refuse reaches the fill line, empty the dumpsters. Dumpsters must be watertight. Do not wash out dumpsters at the job

site. Furnish additional containers and pick up dumpsters more frequent during the demolition phase of construction.

Solid waste includes:

1. Brick
2. Mortar
3. Timber
4. Metal scraps
5. Sawdust
6. Pipe
7. Electrical cuttings
8. Non-hazardous equipment parts
9. Styrofoam and other packaging materials
10. Vegetative material and plant containers from highway planting
11. Litter and smoking material, including litter generated randomly by the public
12. Other trash and debris

Furnish and use trash receptacles at the job site yard, field trailers, and locations where workers gather for lunch and breaks.

Hazardous Waste

Use hazardous waste management practices if waste is generated at the job site from the following substances:

1. Petroleum products
2. Asphalt products
3. Concrete curing compound
4. Pesticides
5. Acids
6. Paints
7. Stains

8. Solvents

9. Wood preservatives and treated posts

10. Roofing tar

11. Road flares

12. Lime

13. Glues and adhesives

14. Materials classified as hazardous by California Code of Regulations, Title 22, Division 4.5; or listed in CFR Title 40, Parts 110, 117, 261, or 302

The WPC Manager must oversee and enforce hazardous waste management practices. Minimize the production of hazardous materials and hazardous waste at the job site. If damaged, repair or replace perimeter controls, containment structures, and covers.

If hazardous material levels are unknown, use a laboratory certified by ELAP under CDPH to sample and test waste to determine safe methods for storage and disposal.

Separate potentially hazardous waste from nonhazardous waste at the job site. Hazardous waste must be handled, stored, and disposed of under California Code of Regulations, Title 22, Division 4.5, Section 66262.34; and in CFR Title 49, Parts 261, 262, and 263.

Store hazardous waste in sealed containers constructed and labeled with the contents and date accumulated under California Code of Regulations, Title 22, Division 4.5; and in CFR Title 49, Parts 172, 173, 178, and 179. Keep hazardous waste containers in temporary containment facilities under "Material Storage" of these Special Provisions.

Furnish containers with adequate storage volume at convenient locations for hazardous waste collection. Do not overfill hazardous waste containers. Do not mix hazardous wastes. Do not allow potentially hazardous waste to accumulate on the ground. Store containers of dry waste that are not watertight on pallets. Store hazardous waste away from storm drains, watercourses, moving vehicles, and equipment.

Clean water based or oil based paint from brushes or equipment within a contained area and in a way that does not contaminate soil, watercourses, and storm drain systems. Handle and dispose of the following as hazardous waste: paints, thinners, solvents, residues, and sludges that cannot be recycled or reused. When thoroughly dry, dispose of the following as solid waste: dry, latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths.

Dispose of hazardous waste within 90 days of being generated. Use a licensed hazardous waste transporter to take hazardous waste to a Class I Disposal Site. Submit a copy of uniform hazardous waste manifest forms within 24 hours of transporting hazardous waste.

The WPC Manager must inspect the following daily:

1. Storage areas for hazardous materials and wastes

2. Hazardous waste disposal and transporting activities

3. Hazardous material delivery and storage activities

Contaminated Soil

Identify contaminated soil from spills or leaks by noticing discoloration, odors, or differences in soil properties. Soil with evidence of contamination must be sampled and tested by a laboratory certified by ELAP.

If levels of contamination are found to be hazardous, handle and dispose of the soil as hazardous waste.

Prevent the flow of water, including ground water, from mixing with contaminated soil by using one or a combination of the following measures:

1. Berms

2. Cofferdams

3. Grout curtains

4. Freeze walls

5. Concrete seal course

If water mixes with contaminated soil and becomes contaminated, sample and test the water using a laboratory certified by ELAP. If levels of contamination are found to be hazardous, handle and dispose of the water as hazardous waste.

Concrete Waste

Use practices that will prevent the discharge of portland cement concrete, AC, or HMA waste into storm drain systems or watercourses.

Collect and dispose of portland cement concrete, AC, or HMA waste at locations where:

1. Concrete material, including grout, is used

2. Concrete dust and debris result from demolition

3. Sawcutting, coring, grinding, grooving, or hydro-concrete demolition of portland cement concrete, AC, or HMA creates a residue or slurry

4. Concrete truck or other concrete-coated equipment is cleaned at the job site

Sanitary and Septic Waste

Do not bury or discharge wastewater from sanitary or septic systems within County right-of-way. The WPC Manager must inspect sanitary or septic waste storage and monitor disposal procedures at least weekly. Sanitary facilities that discharge to the sanitary sewer system must be properly connected and free from leaks. Place sanitary facilities at least 50 feet away from storm drains, watercourses, and flow lines.

Obtain written approval from the local health agency, city, county, and sewer district before discharging from a sanitary or septic system directly into a sanitary sewer system, and submit a copy to the Engineer. Comply with local health agency provisions while using an on-site disposal system.

Liquid Waste

Use practices that will prevent job site liquid waste from entering storm drain systems or watercourses. Liquid wastes include the following:

1. Drilling slurries or fluids

2. Grease-free or oil-free wastewater or rinse water

3. Dredgings, including liquid waste from drainage system cleaning

4. Liquid waste running off a surface including wash or rinse water

5. Other non-stormwater liquids not covered by separate permits

Hold liquid waste in structurally sound, leak proof containers such as:

1. Roll-off bins

2. Portable tanks

Liquid waste containers must be of sufficient quantity and volume to prevent overflow, spills and leaks.

Store containers:

1. At least 50 feet from moving vehicles and equipment

2. If within the floodplain, at least 100 feet from concentrated flows of storm water, drainage courses, watercourses, and storm drain inlets unless approved

3. If outside the floodplain, at least 50 feet from concentrated flows of storm water, drainage courses, watercourses, and storm drain inlets unless approved

Remove and dispose of deposited solids from sediment traps under "Solid Waste" of these Special Provisions unless the Engineer approves another method.

Liquid waste may require testing to determine hazardous material content before disposal.

Drilling fluids and residue must be disposed of outside the highway right-of-way.

If an approved location is available within the job site, fluids and residue exempt under California Code of Regulations, Title 23, Section 2511(g) may be dried by evaporation in a leak proof container. Dispose of remaining solid waste under "Solid Waste" of these Special Provisions.

10-1.03.E NON-STORM WATER MANAGEMENT

Water Control and Conservation

Manage water used for work activities to prevent erosion or discharge of pollutants into storm drain systems or watercourses. Obtain approval before washing anything at the job site with water that could discharge into a storm drain system or watercourse. Report discharges immediately.

If water is used at the job site, implement water conservation practices. Inspect irrigation areas. Adjust watering schedules to prevent erosion, excess watering, or runoff. Shut off water source to broken lines, sprinklers, or valves, and repair breaks within 24 hours. If possible, reuse water from waterline flushing for landscape irrigation. Sweep and vacuum paved areas; do not wash them with water.

Direct job site water runoff, including water from water line repair, to areas where it can infiltrate into the ground and not enter storm drain systems or watercourses. Do not allow spilled water to escape water truck filling areas. If possible, direct water from off-site sources around the job site. Minimize the contact of off-site water with job site water.

Illegal Connection and Discharge Detection and Reporting

Inspect the job site and the site perimeter before starting work for evidence of illegal connections, discharges, or dumping. After starting work, inspect the job site and perimeter on a daily schedule.

Whenever illegal connections, discharges, or dumping are discovered, notify the Engineer immediately. Take no further action unless ordered by the Engineer. Assume unlabeled or unidentifiable material is hazardous.

Look for the following evidence of illegal connections, discharges, or dumping:

1. Debris or trash piles

2. Staining or discoloration on pavement or soils

3. Pungent odors coming from drainage systems

4. Discoloration or oily sheen on water

5. Stains or residue in ditches, channels or drain boxes

6. Abnormal water flow during dry weather

7. Excessive sediment deposits

8. Nonstandard drainage junction structures

9. Broken concrete or other disturbances near junction structures

Vehicle and Equipment Cleaning

Limit vehicle and equipment cleaning or washing at the job site except what is necessary to control vehicle tracking or hazardous waste. Notify the Engineer before cleaning vehicles and equipment at the job site with soap, solvents, or steam. Contain and recycle or dispose of resulting waste under "Liquid Waste" or "Hazardous Waste" of these Special Provisions, whichever is applicable. Do not use diesel to clean vehicles or equipment, and minimize the use of solvents.

Clean or wash vehicles and equipment in a structure equipped with disposal facilities. If using a structure is not possible, clean or wash vehicles and equipment in an outside area. The outside area must be:

1. Paved with AC, HMA, or concrete paving

2. Surrounded by a containment berm

3. Equipped with a sump to collect and dispose of wash water

4. If within the floodplain, located at least 100 feet from concentrated flows of storm water, drainage courses, watercourses, and storm drain inlets unless approved

5. If outside the floodplain, located at least 50 feet from concentrated flows of storm water, drainage courses, watercourses, and storm drain inlets unless approved

When washing vehicles or equipment with water, use as little water as possible. Hoses must be equipped with a positive shutoff valve.

Discharge liquid from wash racks to a recycle system or to another approved system. Remove liquids and sediment as necessary.

The WPC Manager must inspect vehicle and equipment cleaning facilities:

1. Daily if vehicle and equipment cleaning occurs daily

2. Weekly if vehicle and equipment cleaning does not occur daily

Vehicle and Equipment Fueling and Maintenance

If practicable, perform maintenance on vehicles and equipment off the job site.

If fueling or maintenance must be done at the job site, designate a site, or sites, and obtain approval before using. Minimize mobile fueling or maintenance.

If vehicle and equipment fueling and maintenance must be done at the job site, areas for the following activities must be:

1. On level ground

2. Protected from storm water run-on

3. If within the floodplain, located at least 100 feet from concentrated flows of storm water, drainage courses, watercourses, and storm drain inlets unless approved

4. If outside the floodplain, located at least 50 feet from concentrated flows of storm water, drainage courses, watercourses, and storm drain inlets unless approved

Use containment berms or dikes around the fueling and maintenance area. Keep adequate quantities of absorbent spill cleanup material and spill kits in the fueling and maintenance area and on fueling trucks. Dispose of spill cleanup material and kits immediately after use. Use drip pans or absorbent pads during fueling or maintenance.

Fueling or maintenance activities must not be left unattended. Fueling nozzles must be equipped with an automatic shutoff control. Vapor recovery fueling nozzles must be used where required by the Air Quality Management District. When not in use, nozzles must be secured upright. Do not top-off fuel tanks.

Recycle or properly dispose of used batteries and tires.

The WPC Manager must inspect vehicle and equipment maintenance and fueling areas:

1. Daily when vehicle and equipment maintenance and fueling occurs daily

2. Weekly when vehicle and equipment maintenance and fueling does not occur daily

The WPC Manager must inspect vehicles and equipment at the job site for leaks and spills on a daily schedule. Operators must inspect vehicles and equipment each day of use.

If leaks cannot be repaired immediately, remove the vehicle or equipment from the job site.

Material and Equipment Used Over Water

Place drip pans and absorbent pads under vehicles or equipment used over water. Keep an adequate supply of spill cleanup material with the vehicle or equipment. If the vehicle or equipment will be idle for more than one hour, place drip pans or plastic sheeting under the vehicle or equipment on docks, barges, or other surfaces over water.

Furnish watertight curbs or toe boards on barges, platforms, docks, or other surfaces over water to contain material, debris, and tools. Secure material to prevent spills or discharge into water due to wind.

Structure Removal Over or Adjacent to Water

Do not allow demolished material to enter storm water systems or watercourses. Use approved covers and platforms to collect debris. Use attachments on equipment to catch debris on small demolition activities. Empty debris catching devices daily and handle debris under "Waste Management" of these Special Provisions.

The WPC Manager must inspect demolition sites within 50 feet of storm water systems or watercourses daily.

Paving, Sealing, Sawcutting, Grooving, and Grinding Activities

Prevent the following materials from entering storm drain systems or water courses:

1. Cementitious material
2. Asphaltic material
3. Aggregate or screenings
4. Grinding grooving, or sawcutting residue
5. Pavement chunks
6. Shoulder backing
7. Methacrylate

Cover drainage inlets and use linear sediment barriers to protect downhill watercourses until paving, sealing, sawcutting, grooving, or grinding activities are completed and excess material has been removed. Cover drainage inlets and manholes during the application of seal coat, tack coat, slurry seal, or fog seal.

If precipitation is predicted, limit paving, sawcutting, and grinding to places where runoff can be captured.

Do not start seal coat, tack coat, slurry seal, or fog seal activities if precipitation is predicted during the application or curing period. Do not excavate material from existing roadways during precipitation.

Use a vacuum to remove slurry immediately after slurry is produced. Do not allow slurry to run onto lanes open to traffic or off the pavement.

Collect residue from portland cement concrete grinding and grooving activities with a vacuum attachment on the grinding machine. Do not leave any residue on the pavement or allow the residue to flow across the pavement.

If approved, material excavated from existing roadways may be stockpiled under "Stockpile Management" of these Special Provisions.

Do not coat asphalt trucks and equipment with substances that contain soap, foaming agents, or toxic chemicals.

When paving equipment is not in use, park over drip pans or plastic sheeting with absorbent material to catch drips.

Thermoplastic Striping and Pavement Markers

Thermoplastic striping and preheating equipment shutoff valves must work properly at all times. Do not preheat, transfer, or load thermoplastic within 50 feet of drainage inlets or watercourses. Do not fill a preheating container above a level that is 6 inches below the top. Truck beds must be cleaned daily of scraps or melted thermoplastic.

Do not unload, transfer, or load bituminous material for pavement markers within 50 feet of drainage inlets or watercourses. Release all pressure from a melting tank before removing the lid to fill or service. Do not fill a melting tank above a level that is 6 inches below the top.

Collect bituminous material from the roadway after marker removal.

Pile Driving

Keep spill kits and cleanup material at pile driving locations. Pile driving equipment must be parked over drip pans, absorbent pads, or plastic sheeting with absorbent material. If precipitation is predicted, protect pile driving equipment by parking on plywood and covering with plastic.

Store pile driving equipment when not in use. Stored pile driving equipment must be:

1. Kept on level ground

2. Protected from storm water run-on

3. If within the floodplain, at least 100 feet from concentrated flows of storm water, drainage courses, watercourses, and storm drain inlets unless approved

4. If outside the floodplain, at least 50 feet from concentrated flows of storm water, drainage courses, watercourses, and storm drain inlets unless approved

If practicable, use vegetable oil instead of hydraulic fluid.

The WPC Manager must inspect the pile driving area for leaks and spills:

1. Daily when pile driving occurs daily

2. Weekly when pile driving does not occur daily

Concrete Curing

Do not overspray chemical curing compound. Minimize the drift by spraying as close to the concrete as possible. Cover drainage inlets before applying the curing compound.

Minimize the use and discharge of water by using wet blankets or similar methods to maintain moisture while curing concrete.

Concrete Finishing

Collect and dispose of water and solid waste from high-pressure water blasting. Cover drainage inlets within 50 feet before sandblasting. Minimize drift of dust and blast material by keeping the nozzle close to the surface of the concrete. The blast residue may contain hazardous material.

Inspect concrete finishing containment structures for damage before each day of use and before predicted precipitation. Remove liquid and solid waste from containment structures after each work shift.

Sweeping

Sweeping must be done using hand or mechanical methods such as vacuuming.

Monitor paved areas and roadways within the job site for sediment and debris generating activities such as:

1. Clearing and grubbing

2. Earthwork

3. Trenching

4. Roadway structural section work

5. Vehicles entering and leaving the job site

6. Soil disturbing work

7. Work that causes offsite tracking of material

If sediment or debris is observed, perform sweeping:

1. Within:

    1.1. 8 hours of predicted rain

    1.2. 24 hours unless the Engineer approves a longer period

2. On paved roads at job site entrances and exit locations

3. On paved areas within the job site that flow to storm drains or receiving waters

You may stockpile collected material at the job site. Remove collected material including sediment from paved shoulders, drain inlets, curbs and dikes, and other drainage areas. If stockpiled, dispose of collected material at least once per week.

You may dispose of sediment within the job site that you collected during sweeping activities. Protect disposal areas against erosion.

Remove and dispose of trash collected during sweeping under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way" of the Standard Specifications.

Dewatering

Dewatering consists of discharging accumulated storm water, ground water, or surface water from excavations or temporary containment facilities.

If dewatering and discharging activities are specified under a work item such as "Temporary Active Treatment System" or "Dewatering and Discharge," perform dewatering work as specified in the section involved.

If dewatering and discharging activities are not specified under a work item and you will be performing dewatering activities, you must:

1. Submit a Dewatering and Discharge Plan under Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications and "Water Pollution Control" of these Special Provisions at least 10 days before starting dewatering activities. The Dewatering and Discharge Plan must include:

1.1. Title sheet and table of contents

1.2. Description of dewatering and discharge activities detailing locations, quantity of water, equipment, and discharge points

1.3. Estimated schedule for dewatering and discharge (start and end dates, intermittent or continuous)

1.4. Discharge alternatives such as dust control or percolation

1.5. Visual monitoring procedures with inspection log

2. Conduct dewatering activities under the Department's "Field Guide for Construction Dewatering."

3. Ensure that any dewatering discharge does not cause erosion, scour, or sedimentary deposits that could impact natural bedding materials.

4. Discharge the water within the project limits. Dispose of the water in the same way as specified for material in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specification if it cannot be discharged within project limits due to site constraints.

5. Do not discharge storm water or non-stormwater that has an odor, discoloration other than sediment, an oily sheen, or foam on the surface. Notify the Engineer immediately upon discovering any such condition.

The WPC manager must inspect dewatering activities:

1. Daily when dewatering work occurs daily

2. Weekly when dewatering work does not occur daily

10-1.03.F PAYMENT:

Full compensation for construction site management, including furnishing all labor, materials, tools, equipment, and incidentals and for fully complying with the provisions in this section and for doing all the work involved in spill prevention and control, material management, waste management, non-storm water management, and dewatering and identifying, sampling, testing, handling, and disposing of hazardous waste resulting from contractor activities, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer, shall be considered as included in the contract price paid for the various items of work involved and no separate payment will be made therefor.

10-1.04 OBSTRUCTIONS:

Attention is directed to Section 8-1.10, “Utility and Non-Highway Facilities,” and Section 15, “Existing Highway Facilities,” of the Standard Specifications and these Special Provisions.

The Contractor shall notify the Engineer and the Underground Service Alert ("USA") at (800) 277-2600 at least 2 business days, but not more than 14 days, prior to performing any excavation work (including erecting stationary mounted construction area signs) close to any underground, pipeline, conduit, duct, wire, or other structure. Contractor shall provide the USA ticket to the Engineer.

The Contractor shall pothole each and every underground utility line and buried roadway facility within the proximity of the roadway excavation, structure excavation, and conduit trenching to confirm their placement.

The Contractor's attention is directed to the presence of Department of Water Resources (DWR) pipeline and communication facilities at Site 2 (intersection of Thompson Avenue and Titan Way). Central Coast Water Authority (CCWA)/DWR will be constructing concrete encasement around their facilities in advance of construction at this location.

The Contractor shall coordinate work activities with the related utility work necessary during construction of the project that must occur during the progress of the Contractor's work. The contract time specified in Section 4, "PROSECUTION AND PROGRESS OF WORK" of the contract Special Provisions includes an allowance of five (5) non-consecutive working days for the utility companies to perform their respective work. During this time, the Contractor may only work on those portions of the project that do not interfere with the utility companies' work.

Compensation for delay to permit rearrangement of utilities shall be considered included in the contract items of work involved and the Contractor will not be entitled to any compensation for such delay, nor entitled to an extension of time for such delay, nor entitled to an extension of time for such delay, without due cause.

The Contractor shall notify the Engineer in writing at least five (5) working days prior to the date upon which the utility companies may begin their rearrangement work. In the event that the work area is not satisfactorily prepared, as determined by the Engineer, the Contractor shall supply the engineer with another (5) working days notice, in writing, upon which the utility companies may begin their rearrangement work.

The following utility companies are known to have existing facilities and/or services within the Project limits:

Pomeroy Road and Willow Road:

Company Name	Contact	Phone Number
AT&T Local	Steve Plemons	805-237-8131
The Gas Company	Eric Neblett	805-681-7917
PG&E	Mike Orban	805-346-2225

Nipomo CSD	Peter Sevick	805-929-1133
Charter Communications	Tim Lindsay	805-431-3047

Thompson Avenue and Titan Way:

Company Name	Contact	Phone Number
Central Coast Water Authority	Drew Dudley	805-680-2056
AT&T Local	Steve Plemons	805-237-8131
PG&E	Mike Orban	805-346-2225
The Gas Company	Eric Neblett	805-681-7917

Full compensation for complying with the work of this section, including potholing, shall be considered as included in the items of work involved and no additional compensation will be allowed therefor.

10-1.05 DUST CONTROL:

Dust control shall conform to the provisions in Section 10, "Dust Control," of the Standard Specifications and these Special Provisions including Section 14-9.02, "Dust Control," of the Amendments to the Standard Specifciations.

The Contractor shall prevent airborne dust from leaving the work site to the fullest extent possible. Any and all stockpiles shall have measures to control dust during construction. All exposed ground areas resulting from the construction shall be planted with erosion control panting as soon as practical. All trucks hauling dirt, sand, soil or other loose materials to and from the work site are to be covered to control dust. Any tracked soil onto adjacent paved roads as a result of the construction shall be cleaned off the Contractor at the end of each workday.

Full compensation for compliance with the provisions of this section shall be considered as included in the various contract items of work involved and no additional compensation will be allowed therefor.

10-1.06 MAINTAINING TRAFFIC

10-1.06.A GENERAL:

Attention is directed to the provisions of Section 7-1.08, "Public Convenience," Section 7-1.09, "Public Safety," and Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these Special Provisions. Nothing in these Special Provisions shall be construed as relieving the Contractor from the responsibilities specified in these sections.

During the times when men or equipment are actually working, a minimum of one 12-foot wide lane with flagging shall be provided for public traffic. At all other

times, a minimum of two 10-foot wide lanes which are reasonably smooth and satisfactory for public two-way traffic shall be provided and maintained by the Contractor irrespective of the state of construction. Adequate sight distance for vehicles exiting driveways shall be maintained.

All flaggers shall hold current certifications in accordance with Cal OSHA Construction Safety Order Section 1599. All workers in the roadway shall wear Type 2 Cal OSHA high-visibility vests.

The Contractor shall conduct operations in such a manner that access of abutting residences and businesses along the road is not obstructed. Care shall be taken by the Contractor so that materials or equipment placed or parked within the County road right of way will not block driveways or other access means used by the adjacent property owners.

Unless otherwise permitted, the full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays, designated legal holidays, and when construction operations are not actively in progress.

The Contractor shall provide access to emergency vehicles through site at all times.

The Contractor will not be permitted to work on two sides of any road at a time without a temporary road closure confirming to Section 10-1.04C, “Temporary Road Closures,” of these Special Provisions. All work on one side of the road shall be completed as required prior to the beginning of construction operations on the other side of the road.

The Contractor, pursuant to Section 22651-M of the California Vehicle Code, shall be responsible for notifying and making arrangements with owners of vehicles required to be removed from the work area.

Streets and roads shall be posted by the Contractor with temporary “NO PARKING” signs on Type II barricades. Temporary “NO PARKING” signs shall be 12” x 18”, and shall display the message “TEMPORARY NO PARKING TOW AWAY” in 2” red letters. Signs shall be posted with the appropriate dates listed, a minimum of 48 hours in advance of doing the work. In the event that a change in sign posting is required due to a change in the Contractor’s work schedule, the Contractor shall repost the locations affected at the Contractor’s own expense.

Portable delineators, traffic cones, barricades, telescoping flag tree with flags, signs, and all traffic control devices specified in these Special Provisions shall conform to the requirements of Section 12, “Construction Area Traffic Control Devices,” of the Standard Specifications.

The Contractor’s jobsite vehicles and equipment shall be equipped with amber, flashing lights, visible to jobsite labor public traffic, and pedestrians.

The provisions in this section may be modified if, in the opinion of the Engineer, public traffic will be better served and work expedited. Any proposed modifications shall be approved in writing by the Engineer.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various items of work involved and no additional compensation will be allowed therefore.

Flagging costs will be paid for as provided in Section 12-2.02, "Flagging Costs," of the Standard Specifications.

The contract lump sum price paid for “TRAFFIC CONTROL SYSTEM” shall include full compensation for furnishing all labor (except for flagging costs), materials including signs, tools, equipment, and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of the traffic control system and for furnishing and operating the pilot car (including driver, radios, other equipment, and labor required), as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer, and no additional compensation will be allowed therefor.

Costs for flagging in accordance with Section 7-1.09, “Public Safety,” and supplemental traffic control ordered by the Engineer in accordance with Section 7-1.08, “Public Convenience,” of the Standard Specifications will be paid for under “ALLOWANCE FOR SUPPLEMENTAL FLAGGING AND TRAFFIC CONTROL”.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications shall not apply to the item of traffic control system, or the supplemental work item for flagging and supplemental traffic control. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. The adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the supplemental work item for flagging and supplemental traffic control.

10-1.06.B TRAFFIC CONTROL SYSTEM FOR LANE CLOSURES:

A traffic control system shall consist of closing traffic lanes in conformance with the details shown on the Plans, the provisions of Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions of "Maintaining Traffic" and "Construction Area Signs" of these Special Provisions, and these Special Provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide additional devices or take measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

If components in the traffic control system are damaged, displaced, or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

When lane closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations designated by the Engineer within the limits of the highway right of way.

One-way traffic shall be controlled through the project in conformance with the plan entitled "Traffic Control System for Lane Closure on Two Lane Conventional Highways" and these Special Provisions.

Utilizing a pilot car will be at the option of the Contractor. If the Contractor elects to use a pilot car, the cones shown along the centerline of the plan need not be placed. The pilot car shall have radio contact with personnel in the work area and the maximum speed of the pilot car through the traffic control zone shall be 25 miles-per-hour.

10-1.06.C TEMPORARY PAVEMENT DELINEATION:

When the work causes obliteration or removal of pavement delineation, temporary or permanent pavement delineation shall be in place before opening the traveled way to public traffic. Centerline pavement delineation shall be provided for traveled ways open to public traffic.

Temporary pavement delineation shall be furnished, placed, maintained and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as reducing the minimum standards specified in the California MUTCD or as relieving the Contractor from the responsibilities specified in Section 7-1.09, "Public Safety," of the Standard Specifications.

After removing pavement delineation and before applying binder that would obliterate existing traffic stripes, temporary raised pavement markers shall be placed on the existing traffic stripes (except right edgelines) at intervals of not more than 24 feet. On double traffic stripes 2 markers shall be placed side by side, one on each stripe, at longitudinal intervals of not more than 24 feet. Prior to opening the lanes to uncontrolled traffic, the covers shall be removed from the temporary raised pavement markers.

Temporary raised pavement markers shall be, at the option of the Contractor, one of the temporary pavement markers listed for short term day/night use (14 days or less) for seal coats in "Prequalified and Tested Signing and Delineation Materials" of these special provisions.

The markers shall be placed in conformance with the manufacturer's installation procedure instructions.

Where "no passing" centerline pavement delineation is obliterated, the following "no passing" zone signing shall be installed prior to opening the lanes to public traffic. W20-1 (ROAD WORK AHEAD) signs shall be installed from 1,000 feet to 2,000 feet in advance of "no passing" zones. R4-1 (DO NOT PASS) signs shall be installed at the beginning and at every 2,000-foot interval within "no passing" zones. For continuous zones longer than 2 miles, W7-3a or W71(CA) (NEXT _____ MILES) signs shall be installed beneath the W20-1 signs installed in advance of "no passing" zones. R4-2 (PASS WITH CARE) signs shall be installed at the end of "no passing" zones. The exact location of "no passing" zone signing will be as determined by the Engineer and shall be maintained in place until permanent "no passing" centerline pavement delineation has been applied. The signing for "no passing" zones shall be removed when no longer required for the direction of public traffic. The signing for "no passing" zones shall conform to the provisions in "Construction Area Signs" of these special provisions, except for payment.

Where stop bars or crosswalks are obliterated, temporary pavement markers shall be placed at the direction of the Engineer.

Temporary pavement delineation shall be maintained until replaced with permanent pavement delineation. Temporary pavement delineation shall be removed when, as determined by the Engineer, the temporary pavement delineation conflicts with the permanent pavement delineation.

Full compensation for furnishing, placing and maintaining temporary pavement delineation and the construction area signing specified for "no passing" zones and for removing and disposing of these signs and conflicting temporary raised pavement markers, when no longer required, shall be considered as included in the contract prices paid for the seal coat work and no separate payment will be made therefor.

10-1.06.D CONSTRUCTION AREA SIGNS:

Construction area signs for temporary traffic control shall be furnished, installed, maintained, and removed when no longer required in conformance with the provisions in Section 12, “Construction Area Traffic Control Devices,” of the Standard Specifications and these Special Provisions.

Standard W20-1 (ROAD WORK AHEAD) and G20-2 (END ROAD WORK) signs shall be placed in advance of the work at each site and left onsite during non-working hours until the work at each site is complete. The W20-1 and G20-2

signs shall be stationary mounted sign supports as specified in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications.

Encroachment permits for placement of construction area signs placed within the jurisdiction of adjacent agencies are the responsibility of the Contractor.

Attention is directed to the provisions in Section 8-1.01, "Prequalified and Tested Signing and Delineation Materials," of these Special Provisions. Type II retroreflective sheeting shall not be used on construction area sign panels. Type III, IV, VII, VIII, or IX retroreflective sheeting shall be used for stationary mounted construction area sign panels.

Unless otherwise shown on the Plans or specified in these Special Provisions, the color of construction area warning and guide signs shall have black legend and border on orange background.

The base material of construction area signs shall not be plywood. Used sign panels, in good repair as determined by the Engineer, may be furnished. If determined by the Engineer, signs damaged by any cause shall be replaced by the Contractor at the Contractor’s own expense. Repair to construction area sign panels will not be allowed, except when approved by the Engineer. At nighttime under vehicular headlight illumination, sign panels that exhibit irregular luminance, shadowing, or dark blotches shall be immediately replaced at the Contractor's expense.

The Contractor shall notify the appropriate regional notification center (USA North, 1-800-227-2600) for operators of subsurface installations at least 2 business days, but not more than 14 days, prior to commencing excavation for construction area sign posts.

Excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes. The post hole diameter, if backfilled with portland cement concrete, shall be at least 4 inches greater than the longer dimension of the post cross section.

The Contractor shall maintain accurate information on construction area signs. Signs that are no longer required shall be immediately covered or removed. Signs that convey inaccurate information shall be immediately replaced or the information shall be corrected. Covers shall be replaced when they no longer cover the signs properly. The Contractor shall immediately restore to the original position and location any sign that is displaced or overturned, from any cause, during the progress of work.

Signs damaged by any cause shall be repaired, or, if determined by the Engineer to be irreparable, replaced by the Contractor at the Contractor’s expense.

"CONSTRUCTION AREA SIGNS" will be paid for on a lump sum basis in the manner specified in Section 12-4.01 of the Standard Specifications.

10-1.07 EXISTING HIGHWAY FACILITIES:

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these Special Provisions.

10-1.07.A REMOVE TRAFFIC STRIPE AND MARKINGS:

Remove Traffic Stripe shall consist of the removal of all painted and thermoplastic striping and pavement markers including underlying adhesive within rumble strip limits, in conformance with the plans, the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications, the provisions under "Traffic Control System" of these Special Provisions, and these Special Provisions.

Attention is directed to "Construction Site Management" of these Special Provisions.

Before obliterating any pavement delineation (traffic stripes, pavement markers) that is to be replaced on the same alignment and location, as determined by the Engineer, the pavement delineation shall be referenced by the Contractor, with a sufficient number of control points to reestablish the alignment and location of the new pavement delineation. The references shall include the limits or changes in striping pattern, including one- and 2-way barrier lines, limit lines, and other pavement markings or markers.

Waste from removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking contains lead chromate in average concentrations greater than or equal to 5 mg/L Soluble Lead or 1,000 mg/kg Total Lead. Residue produced from the removal of yellow thermoplastic and yellow paint contains heavy metals in concentrations that exceed thresholds established by the California Health and Safety Code and Title 22 of the California Code of Regulations. The Contractor shall assume that the residue is not regulated under the Federal Resource Conservation and Recovery Act (RCRA). Yellow thermoplastic and yellow paint may produce toxic fumes when heated.

The removed yellow thermoplastic and yellow paint shall be disposed of at a Class 1 disposal facility in conformance with the requirements of the disposal facility operator within 10 days after accumulating 220 pounds of residue and dust. The Contractor shall make necessary arrangements to test the yellow thermoplastic and yellow paint residue as required by the disposal facility and these Special Provisions. Testing shall include, at a minimum, (1) Total Lead by EPA Method 6010B and Chromium by EPA Method 7000 series, (2) Soluble Lead and Chromium by California Waste Extraction Test, and (3) Soluble Lead and Chromium by Toxicity Characteristic Leaching Procedure. From the first 222 gallons of waste, or portion thereof if less than 222 gallons of waste are produced,

a minimum of four randomly selected samples shall be taken and analyzed individually. Samples shall not be composited. From each additional 888 gallons of waste, or portion thereof if less than 888 gallons are produced, a minimum of one additional random sample shall be taken and analyzed. Each sample shall be homogenized prior to analysis by the laboratory performing the analyses. A sample aliquot sufficient to cover the amount necessary for the total and the soluble analyses shall then be taken. This aliquot shall be homogenized a second time and the total and soluble (if necessary) run on this aliquot. The homogenization process shall not include grinding of the samples. The Contractor shall submit the name and location of the disposal facility and analytical laboratory along with the testing requirements to the Engineer not less than 5 days prior to the start of removal of yellow thermoplastic and yellow painted traffic stripe and pavement marking. The analytical laboratory shall be certified by the Department of Health Services Environmental Laboratory Accreditation Program for all analyses to be performed. Test results shall be provided to the Engineer for review prior to signing a waste profile as requested by the disposal facility, prior to issuing an EPA identification number, and prior to allowing removal of the waste from the site.

The Contractor shall prepare a project specific Lead Compliance Plan to prevent or minimize worker exposure to lead while handling removed yellow thermoplastic and yellow paint residue. Attention is directed to Title 8, California Code of Regulations, Section 1532.1, "Lead," for specific Cal-OSHA requirements when working with lead.

The Lead Compliance Plan shall contain the elements listed in Title 8, California Code of Regulations, Section 1532.1(e)(2)(B). Before submission to the Engineer, the Lead Compliance Plan shall be approved by an Industrial Hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene. The Plan shall be submitted to the Engineer at least 7 days prior to beginning removal of yellow thermoplastic and yellow paint.

Prior to removing yellow thermoplastic and yellow painted traffic stripe and pavement marking, personnel who have no prior training, including County personnel, shall complete a safety training program provided by the Contractor that meets the requirements of Title 8, California Code of Regulations, Section 1532.1, "Lead," and the Contractor's Lead Compliance Program.

Personal protective equipment, training, and washing facilities required by the Contractor's Lead Compliance Plan shall be supplied to County personnel by the Contractor. The number of County personnel will be 3.

Where grinding or other methods approved by the Engineer are used to remove yellow thermoplastic and yellow painted traffic stripe and pavement marking, the removed residue, including dust, shall be contained and collected immediately. Collection shall be by a high efficiency particulate air (HEPA) filter equipped vacuum attachment operated concurrently with the removal operations or other equally effective methods approved by the Engineer. The Contractor shall submit a written work plan for the removal, storage, and disposal of yellow thermoplastic

and yellow painted traffic stripe and pavement marking to the Engineer for approval not less than 7 days prior to the start of the removal operations. Removal operations shall not be started until the Engineer has approved the work plan.

The removed yellow thermoplastic and yellow painted traffic stripe and pavement marking residue shall be stored and labeled in covered containers. Labels shall conform to the provisions of Title 22, California Code of Regulations, Sections 66262.31 and 66262.32. Labels shall be marked with date when the waste is generated, the words "Hazardous Waste," composition and physical state of the waste (for example, asphalt grindings with thermoplastic or paint), the word "Toxic," the name and address of the Engineer, the Engineer's telephone number, contract number, and Contractor or subcontractor. The containers shall be a type approved by the United States Department of Transportation for the transportation and temporary storage of the removed residue. The containers shall be handled so that no spillage will occur. The containers shall be stored in a secured fenced enclosure at a location within the project limits until disposal, as approved by the Engineer.

If the yellow thermoplastic and yellow painted traffic stripe and pavement marking residue is transported to a Class 1 disposal facility as a hazardous waste, a manifest shall be used, and the transporter shall be registered with the California Department of Toxic Substance Control. The Engineer will obtain the United States Environmental Protection Agency Identification Number and sign all manifests as the generator within 2 working days of receiving sample test results and approving the test methods.

Nothing in these Special Provisions shall relieve the Contractor of the Contractor's responsibilities as specified in Section 7-1.09, "Public Safety," of the Standard Specifications.

The contract lump sum price paid for “REMOVE TRAFFIC STRIPE AND MARKINGS” shall include full compensation for full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in removing, cleaning residue, and disposing of removed material for each phase of construction an shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.07.B REMOVE ROADSIDE SIGN

Existing roadside signs at those locations shown on the Plans to be removed and disposed of.

Sign panels shown on the Plans shall be salvaged or disposed of as directed by the Engineer.

The contract price paid per each for “REMOVE ROADSIDE SIGN”, shall include full compensation for furnishing all labor, materials, tools, equipment and

incidentals, and for doing all the work involved in removing and disposing of the roadside signs, as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.07.C REMOVE AND SALVAGE EXISTING LIGHTING

Contractor shall safely remove and salvage existing lighting equipment. Contact Ron Wallravin at 805-781-4475, 10 days prior to starting work. Contractor shall deliver existing lighting equipment to County facilities determined by Ron Wallravin. Work shall be coordinated to minimize disturbance to the public.

Poles and support wiring shall be disposed of outside of the right of way in conformance with Section 7-1.03, "Disposal of Material Outside the Right of Way", of the Standard Specifications. Excavations and ground voids shall be backfilled and compacted to a minimum 90% relative compaction and shall match surrounding grade.

The contract lump sum price paid for "REMOVE AND SALVAGE EXISTING LIGHTING", shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in removing and salvaging the existing lighting, as shown on the Plans, as specified in the Standards Specifications and these Special Provisions, and as directed by the Engineer.

10-1.07.D REMOVE AND SALVAGE FLASHING BEACON/SOLAR PANEL

Contractor shall safely remove and salvage existing flashing beacon equipment, including solar panel and appurtenances. Contact Ron Wallravin at 805-781-4475, 10 days prior to starting work. Contractor shall deliver existing flashing beacon/solar panel to County facilities determined by Ron Wallravin. Work shall be coordinated to minimize disturbance to the public.

Poles and support wiring shall be disposed of outside of the right of way in conformance with Section 7-1.03, "Disposal of Material Outside the Right of Way", of the Standard Specifications. Excavations and ground voids shall be backfilled and compacted to a minimum 90% relative compaction and shall match surrounding grade.

The contract lump sum price paid for "REMOVE AND SALVAGE EXISTING FLASHING BEACON/SOLAR PANEL", shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in removing and salvaging the existing flashing beacon/solar panel, as shown on the Plans, as specified in the Standards Specifications and these Special Provisions, and as directed by the Engineer.

10-1.08 PROTECTION OF SURVEY MONUMENTS

The Contractor shall preserve existing survey monuments in place in accordance with Section 5-1.05 "Preservation of Property" of these Special Provisions.

Full compensation for protection of existing monuments shall be considered as included in the various contract items of work involved and no additional compensation will be made therefore.

10-1.09 DEMOLITION

Removal and Demolition of AC Paving and other items indicated on the Plans shall conform to Section 15, "Existing Highway Facilities" of the Standard Specifications and Section 7-1.13, "Disposal of Material Outside the Highway Right of Way" of the Standard Specifications.

Sawcutting of asphalt concrete pavement shall be done with a power-driven saw and shall extend the full depth of the asphalt pavement. Pavement shall be cut vertical in a neat straight line.

Full compensation for removal and disposal of asphalt pavement shall be considered as included in the various contract items of work involved and no additional compensation will be allowed therefor.

10-1.10 EARTHWORK

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these Special Provisions.

Excess soil, if any, shall be used to flatten slopes and fill low spots. Existing drainage patterns shall be maintained with the final grading configuration. At Site 2, Thompson Avenue and Titan Way, positive drainage shall be maintained away from private property and directed to the existing drainage culvert crossing Thompson Avenue.

The contract item price paid per cubic yard for "ROADWAY EXCAVATION", shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in roadway excavation and embankment construction for the bus turnout at Site 2 (Thompson Ave. and Titan Way), complete in place, as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Compensation for all grading and subgrade preparation required for other project construction shall be considered as included in the items of work involved and no additional compensation will be allowed therefor.

10-1.11 EROSION CONROL (HYDROSEED)

GENERAL

Summary

This work includes removing and disposing of weeds and applying erosion control materials including seed, fiber, commercial fertilizer, organic fertilizer,

straw, tackifier to erosion control (hydroseed) areas shown on the plans, and as directed by the Engineer.

Comply with Section 20-3, "Erosion Control," of the Standard Specifications.

If notified by the Engineer that an area is ready to receive erosion control materials, start erosion control (hydroseed) work within 5 business days of the Engineer's notification to perform the work.

The Engineer will designate the ground location of all erosion control (hydroseed) areas in increments of one acre or smaller by directing the placing of stakes or other suitable markers. Furnish all tools, labor, materials, and transportation required to adequately mark the various erosion control (hydroseed) locations.

MATERIALS

The erosion control materials shall be mixed and applied in the following approximate proportions:

Material	**Per Acre (slope measurement)**
Seed	36 pounds
Fiber	1,500 pounds
Commercial Fertilizer	400 pounds
Water	As needed for application
Stabilizing emulsion	As recommended by the manufacturer

Seed

Seed not required to be labeled under the California Food and Agricultural Code must be tested for purity and germination by a seed laboratory certified by the Association of Official Seed Analysts or by a seed technologist certified by the Society of Commercial Seed Technologists. Measure and mix individual seed species in the presence of the Engineer.

Seed must contain at most 1.0 percent total weed seed by weight.

Deliver seed to the job site in unopened separate containers with the seed tag attached. Containers without a seed tag attached are not accepted. The Engineer take a sample of approximately one ounce or 0.25 cup of seed for seed lot greater than 2 pounds.

Seed must comply with the following:

Botanical Name	Common Name	Rate (lbs/acre)
Bromus carinatus	Cucamonga Brome	20
Triflium tridentatum	Tomcat clover	4
Vulpia microstachys	Small fescue	8

Fiber must be:

1. Free from lead pint, printing ink, varnish, petroleum products, seed germination inhibitors, or chlorine bleach
2. Free from synthetic or plastic materials
3. At least 7 percent ash

Wood fiber must be:

1. Long strand, whole wood fibers, thermos-mechanically processed from clean, whole wood chips
2. Not made from sawdust, cardboard, paper, or paper byproducts
3. At least 25 percent of fibers 3/8 inch long
4. At least 40 percent held on a No. 25 sieve

Cellulose fiber must be made from natural or recycled pulp fiber, such as wood chips, sawdust, newsprint, clipboard, corrugated cardboard, or a combination of these materials.

Alternate fiver must be:

1. Long strand, whole natural fibers made from clean straw, cotton, corn, or other natural feed stock
2. At least 25 percent of fibers 3/8 inch long
3. At least 40 percent held on a No. 25 sieve

Commercial Fertilizer

Commercial fertilizer must have a guaranteed chemical analysis within 10 percent of __percent nitrogen, ___percent phosphoric acid and ___percent water soluble potash.

Tackifier

Tackifier must be one of the following:

1. Guar (plant based)
2. Psyllium (plant based)
3. Starch (plant based)
4. Polymeric emulsion blend

Tackifier must comply with the following:

1. Nonflammable
2. Nontoxic to aquatic organisms
3. Free from growth or germination inhibiting factors
4. Either a plant-based product or a polymeric-emulsion blend

Tackifier classified as a plant-based product must be:

1. Natural high molecular weight polysasc charide
2. High viscosity hydrocolloid that is miscible in water
3. Functional for at least 180 days
4. Labeled as either guar, psyllium, or starch

Guar must be:

1. Gum-based product derived from the ground endosperm of the guar plant, cyanmopsis tetragonolobus
2. Treated with dispersant agent for easy mixing
3. Able to be diluted at the rate of 1 to 5 pounds per 100 gallons of water

Psyllium must be:

1. Made of the finely ground muciloid coating of plantago ovata or plantago ispaghula seeds
2. Able to dry and form a firm but rewettable membrane

Starch must be nonionic, water-soluble granular material derived from corn, potato, or other plant-based source.

Tackifier classified as polymeric emulsion blend must be:

1. Liquid or dry powder formulation
2. Anionic with a residual monomer content that is at most 0.05 percent by weight
3. Functional for at least 180 days
4. Prepackaged product labeled as containing one the following as the primary active ingredient of the polymeric emulsion blend:
    a. Acrylic copolymers and polymers
    b. Polymers of methacrylates and acrylates
    c. Copolymers of sodium acrylates and acrylamides
    d. Polyacrylamide (PAM) and copolymer of acrylamide
    e. Hydrocolloid polymers

PAYMENT

The contract lump sum price paid for “EROSION CONTROL (HYDROSEED)”, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in hydroseeding all disturbed areas, excavations, and embankments, complete in place as shown on

the Plans, as specified in the Standards Specifications and these Special Provisions, and as directed by the Engineer.

10-1.12 CLASS II AGGREGATE BASE

"CLASS 2 AGGREGATE BASE" shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these special provisions.

Preparing Sub-grade shall be included in the compensation for construction of Class 2 Aggregate Base, and shall conform to Section 19, "Earthwork," of the Standard Specifications and these Special Provisions and consist of excavating, scarifying, grading and compacting, the existing aggregate base at the locations shown on the Plans for reconstruction of the pavement structural section, and import and incorporation of additional aggregate base as required to construct the sidewalks, curb and gutters, ramps, and pavement structural sections to the specified grades shown on the plans including construction of detours. Watering, spreading and compaction shall conform to the provisions of Section 26, "Aggregate Bases", of the Standard Specifications

"CLASS 2 AGGREGATE BASE" will be measured and paid for by the cubic yard in place in the manner specified for aggregate base in Section 26, "Aggregate Bases", of the Standard Specifications. The contract item price paid per cubic yard for "CLASS 2 AGGREGATE BASE", shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Class 2 Aggregate Base construction for the bus turnout, including pedestrian landing and concrete sidewalk, at Site 2 (Thompson Ave. and Titan Way), complete in place, as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Compensation for all Class 2 Aggregate Base used for other project construction shall be considered as included in the items of work involved and no additional compensation will be allowed therefor.

10-1.13 HOT MIX ASPHALT (TYPE A)

The work of this section includes producing hot mix asphalt (HMA) at a central mixing plant and placing it as specified.

Bus turnout shall conform to County of San Luis Obispo Standard Drawing A-6c.1, as attached in the Appendix of the Contract Documents.

1. Do not submit a job mix formula.

2. Choose the 3/8-inch or 1/2-inch HMA Type A or Type B aggregate gradation under Section 39-1.02E, "Aggregate," of the Standard Specifications.

3. Minimum asphalt binder content must be 6.8 percent for 3/8-inch aggregate gradation and 6.0 percent for 1/2-inch aggregate gradation.

4. Choose asphalt binder Grade PG 64-10, PG 64-16, or PG 70-10 under Section 92, "Asphalts," of the Standard Specifications.

If you request and the Engineer authorizes, you may reduce the minimum asphalt binder content.

Tack coat must comply with Section 39, "Hot Mix Asphalt," of the Standard Specifications.

Spread and compact HMA by methods that produce an HMA surfacing:

1. Textured uniformly

2. Compacted firmly

3. Without depressions, humps, and irregularities

Using a self-propelled spreader, spread HMA ready for compacting without further shaping.

Compact HMA with a vibratory roller providing a minimum of 7,000 pounds centrifugal force. With the vibrator on, compact at least 3 complete coverages over each layer, overlapping to prevent displacement. The speed of the vibratory roller in miles per hour must not exceed the vibrations per minute divided by 1,000. If the HMA layer thickness is less than 0.08 foot, turn the vibrator off. Complete the first coverage before the mixture's temperature drops below 250 °F.

1. Textured uniformly

2. Compacted firmly

3. Without depressions, humps, and irregularities

4. Compliant with the 12-foot straightedge specifications in Section 39-1.12, "Smoothness," of the Standard Specifications

The contract item price paid per ton for “HOT MIX ASPHALT (TYPE A)”, shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in minor hot mix asphalt construction for the bus turnout at Site 2 (Thompson Ave. and Titan Way), complete in place, as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

Compensation for all Hot Mix Asphalt used for other project construction shall be considered as included in the items of work involved and no additional compensation will be allowed therefor.

10-1.14 BAR REINFORCING STEEL

Reinforcement for “Minor Concrete (Curb Ramp)” and “Minor Concrete (Sidewalk)” shall conform to the provisions in Section 52, “Reinforcement,” of the Standard Specifications and these Special Provisions.

The provisions in “Welding Quality Control” of these Special Provision do not apply to resistance butt welding.

Full compensation for bar reinforcing steel shall be considered as included in the items of work involved and no additional compensation will be allowed therefor.

10-1.15 ROADSIDE SIGN – ONE POST

Roadside signs shall be furnished and installed at the locations shown on the plans or where designated by the Engineer and in conformance with the provisions in Section 56-2, "Roadside Signs," of the Standard Specifications and these special provisions.

The Contractor shall furnish roadside sign panels in conformance with the provisions in "Furnish Sign" of these special provisions.

Wood posts shall be pressure treated after fabrication in conformance with the provisions in Section 58, "Preservative Treatment of Lumber, Timber and Piling," of the Standard Specifications and AWPA Use Category System: UC4A, Commodity Specification A or B.Type N (CA), Type P (CA), and Type R (CA) marker panels mounted on a post with a roadside sign shall be considered to be sign panels and will not be paid for as markers.

The contract price paid per each for “ROADSIDE SIGN – ONE POST”, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved for furnishing, placing, and installing the roadside signs, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.16 MINOR CONCRETE

Concrete curbs, gutters, sidewalks, driveways, and curb ramps shall conform to the provisions in Section 73, “Concrete Curbs and Sidewalks,” of the Standard Specifications, SLO County Public Improvement Standards and these Special Provisions.

The contract price paid per cubic yard for “MINOR CONCRETE (CURB RAMP)” at the intersection of Willow Road and Pomeroy Road (Site 1) shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in constructing the curb ramps, complete in place, including sawcut, removal and disposal of existing AC dike and paving, subgrade preparation, Class 2 Aggregate Base, reinforcing steel, dowels, placement of HMA paving and AC dike conforms as required, and all appurtenant work and materials, as shown on the plans, as specified in the

Standard Specifications and these Special Provisions, and as directed by the Engineer.

The contract price paid per cubic yard for "MINOR CONCRETE (CURB RAMP)" at the intersection of Thompson Avenue and Titan Way (Site 2), shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in constructing the 5.5' wide pedestrian landing and retaining wall/footing at the intersection of Thompson Ave. and Titan Way (Site 2), as shown on the Civil Sheet and Detail Sheet (Sheets 3 & 4 of 7 of the Site 2 plans) complete in place, including sawcut, removal and disposal of existing AC paving, subgrade preparation, structure backfill, reinforcing steel, dowels, and all appurtenant work and materials, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer. Provision and placement of Class 2 Aggregate Base and Hot Mix Asphalt widening and conforms required for construction of the pedestrian landing and retaining wall/footing at Site 2 shall be paid for as "CLASS 2 AGGREGATE BASE" and "HOT MIX ASPHALT (TYPE A)," respectively.

The contract price paid per cubic yard for "MINOR CONCRETE (SIDEWALK)" at the intersection of Thompson Avenue and Titan Way (Site 2), shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all the work involved in constructing the 5' wide concrete sidewalk at the intersection of Thompson Ave. and Titan Way (Site 2), as shown on the Civil Sheet and Detail Sheet (Sheets 3 & 4 of 7 of the Site 2 plans) complete in place, including sawcut, removal and disposal of existing AC paving, subgrade preparation, structure backfill, reinforcing steel, dowels, and all appurtenant work and materials, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer. Provision and placement of Class 2 Aggregate Base and Hot Mix Asphalt widening and conforms required for construction of the 5' wide concrete sidewalk Site 2 shall be paid for as "CLASS 2 AGGREGATE BASE" and "HOT MIX ASPHALT (TYPE A)," respectively.

10-1.17 TRUNCATED DOME MAT

Truncated Dome Mats shall be placed in accordance with the 2006 Caltrans Standard PlanA88A and these special provisions. Truncated Dome Mats shall be placed as a surface mounted mat with the following dimensions:

Length: 4 feet min.

Width: 36 inches min.

Depth: 0.1875 (3/16"), (+/-) 5% max.

Face Thickness: 0.1875 (3/16"), (+/-) 5% max.

Warpage of Edge: 0.5% max.

Truncated Dome Mats shall be yellow and conform to Federal Color No. 33538. Color shall be homogeneous throughout the tile. Before placement the surface that the Truncated Dome Mat will be attached to shall be cleaned of loose material and dirt. Prior to placing the Truncated Dome Mat care should be taken to make sure that the lip of the ramp meets the Caltrans Standard Plan A88A and is flush with the adjacent gutter, grinding may be necessary as determined by the Engineer.

The Contractor is responsible for the repair of the surface that truncated domes are being applied to. Placement of truncated domes on a Portland Concrete surface shall be achieved with a two stage epoxy. The mat edges shall be flush with the concrete surface and firmly cemented in place. Mat shall be cut and applied to utility box and valve covers for utility access and provide continuity of dome pattern. The manufacturer shall provide a written 5-year warranty for prefabricated detectable warning surfaces, guaranteeing replacement when there is defect in the dome shape, color fastness, sound-on-cane acoustic quality, resilience, or attachment. The warranty period shall begin upon acceptance of the contract. When applying truncated domes to an asphalt concrete surface, the truncated dome mat shall be made from a non-skid thermoplastic material and shall be melted onto the ramp.

The contract price paid per square foot for "TRUNCATED DOME MAT" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing truncated dome mat, complete in place, including, but not limited to, cleaning and repairing surfaces that truncated domes are applied to, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.18 PEDESTRIAN BARRICADE

The Contractor shall install pedestrian barricade at the locations shown on the Plans per the State Standard Plan ES-7P.

The contract price paid per each for "PEDESTRIAN BARRICADE", shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing the pedestrian barricade, complete in place, as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.19 TUBULAR HANDRAILING

The Contractor shall install handrailing per "Greenbook" Standard 606-3 of the American Public Works Association (APWA) and the project plans.

The contract lump sum price paid for "TUBULAR HANDRAILING", shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in constructing the handrail,

complete in place as shown on the Plans, as specified in the "Greenbook" and these Special Provisions, and as directed by the Engineer.

10-1.20 STRIPING / MARKINGS

Painted traffic stripes (traffic lines) shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

Traffic stripe paint shall conform to the requirements in State Specification No. PTWB 01.

The color of the painted traffic stripes and pavement markings shall conform to the requirements in ASTM Designation: D6628 01. Retroreflectivity of the painted traffic stripes shall conform to the requirements in ASTM Designation: D6359 99. White painted traffic stripes shall have a minimum initial retroreflectivity of 250 mcd m 2 lx 1.

The contract lump sum price paid for "STRIPING/MARKINGS", shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in applying traffic striping and markings, complete in place as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.21 FLASHING BEACON (SOLAR)

The Contractor shall provide and install solar powered advance flashing beacons as identified on the plans. Advance flashing beacon shall be Type 1-A (10'), 1-section signal face with 12" yellow, per Caltrans 2010 Standard Plan ES-7J, with W3-3. Flashing beacon units shall have Contractor furnished LED lamps in conformance with the provisions in "Materials" of these Special Provisions. Product shall be solar powered and conform to 86-4.05 through 86-4.05A(5) of the 2010 Standard Specifications.

The Contractor shall furnish a photovoltaic system to energize each advance flashing beacon, consisting of solar module arrays, batteries, a voltage controller, and associated components. The photovoltaic system shall be designed to provide each advance flashing beacon with 24-hour operation per day and shall be capable of operating for eight (8) days in low light conditions. The solar module mounting angle setting shall be in accordance with the manufacturer's recommendation, and the total system shall be designed to withstand winds of 80 mph. The solar panel shall be high-efficiency. The battery shall be replaceable, sealed and maintenance-free. The photovoltaic system shall be fully self-contained, and shall be weather, corrosion and vandal-resistant with premium-grade UV-resistant head.

The contract price paid per each for "FLASHING BEACON (SOLAR)", shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing, installing and

testing the solar flashing beacons, complete in place, as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

10-1.22 RELOCATE EXISTING BUS STOP APPURTENANCES

The Contractor shall remove and relocate the existing bus stop appurtenances at the intersection of Thompson Avenue and Titan Way (Site 2). The appurtenances include signage, bench and trash receptacle. The Contractor shall be responsible to store the appurtenances and reconstruct in-kind in the location shown on the plans, as directed by the Engineer. If, in the opinion of the Engineer, any appurtenances are damaged by the Contractor's operations, the Contractor shall repair or replace in-kind, to the satisfaction of the Engineer.

Full compensation for removing, storing and reinstallation in-kind of the existing bus stop appurtenances at Site 2 shall be considered as included in the items of work involved for construction of the bus stop pavement widening and no additional compensation will be allowed therefor.

SECTION 10-2. SIGNALS, LIGHTING, AND ELECTRICAL SYSTEMS FOR SITE 1 (POMEROY ROAD AND WILLOW ROAD)

10-2.01 Description: All work material and equipment shall conform to the provisions in Section 86, “Electrical Systems,” of the Standard Specifications and these Special Provisions. The signal shall conform to the provisions in the Transportation and Electrical Equipment Specifications (TEES).

Traffic signal work shall be performed at Pomeroy Road and Willow Road in Nipomo, CA.

All signal components shall be contractor furnished.

10-2.02 Cost Break-Down: Cost break-downs shall conform to the provisions in Section 86-1.03, "Cost Break-Down," of the Standard Specifications and these Special Provisions.

The Engineer shall be furnished a cost break-down for each contract lump sum item of work described in this Section 10-3. The cost break-down shall be submitted to the Engineer for approval within 10 calendar days, not including Saturdays, Sundays, and legal holidays, after receipt of the fully executed contract. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

The cost break-down shall include the items listed in the Standard Specifications:

A. Foundation
B. Signal and lighting standards
C. Conduits
D. Pull boxes
E. Conductors, cable and wiring
F. Bonding and grounding
G. Service
H. Model 170 controller assemblies
I. Controller cabinets
J. Intersection Control Software
K. Battery backup system
L. Vehicle signal faces and signal heads
M. Pedestrian signal faces and signal heads
N. Pedestrian push button
O. Loop detectors
P. Video detection system
Q. Emergency vehicle detector system
R. Luminaires
S. Photoelectric control
T. Pedestrian barricade

U. Signs and Striping

10-2.03 Equipment List and Drawings: The controller cabinet schematic wiring diagram and intersection sketch shall be combined into one drawing, so that, when the cabinet door is fully open, the drawing is oriented with the intersection.

A maintenance manual shall be furnished for all controller units, auxiliary equipment, and vehicle detector sensor units, control units, and amplifiers. The maintenance manual and operation manual may be combined into one manual. The maintenance manual or combined maintenance and operation manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, prior to purchase. The maintenance manual shall include, but need not be limited to, the following items:

A. Specifications
B. Design characteristics
C. General operation theory
D. Function of all controls
E. Trouble shooting procedure (diagnostic routine)
F. Block circuit diagram
G. Geographical layout of components
H. Schematic diagrams
I. List of replaceable component parts with stock numbers

10-2.04 Foundations: Foundations shall conform to the provisions in Section 86-2.03, "Foundations," of the Standard Specifications, "Electrical Systems" sheets of the Standard Plans and these Special Provisions.

The drilling of foundation hole and placement of cast-in-place concrete shall conform to Section 49-4, "Cast-In-Place Concrete Piles," of the Standard Specifications. Concrete shall be vibrated from the bottom of the reinforcement cage to the top of the pile. Conduit in foundation to the nearest pull box shall be Type 1.

When potential conflict with underground utilities is anticipated, and with the approval of the Engineer, exploratory holes shall be dug. This work will be measured and paid for as part of the "Traffic Signal" lump sum item.

10-2.05 Signal and Lighting Standards: Traffic signal and safety lighting standards shall conform to the provisions in Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, "Electrical Systems" sheets of the Standard Plans and these Special Provisions.

Contractor shall submit shop drawings for all signal and lighting standards and the Steel Certified Test Reports (e.g. Mill Test) for review by the Engineer. County will not accept any signal standard not meeting the requirements of this provision.

All standards shall be painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications

10-2.06 Conduit: Conduit shall conform to the provisions in Section 86-2.05, “Conduit,” of the Standard Specifications and these Special Provisions.

Conduit to be installed underground shall be Type 3 unless otherwise specified. Detector termination conduits shall be Type 3. The conduit in a foundation and between a foundation and the nearest pull box shall be Type 1.

After conductors have been installed, the ends of conduits terminating in pull boxes, service equipment enclosures, and controller cabinets shall be sealed with a sealing compound approved by the Engineer.

Conduit shall be placed under existing pavement and Portland Cement Concrete by boring. Pavement shall not be disturbed without permission from the Engineer. At those locations where conduit is required to be installed under pavement and existing underground facilities require special precautions in conformance with the provisions in "Obstructions" of these Special Provisions, conduit shall be placed by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications.

10-2.07 Pull Boxes: Pull Boxes shall conform to the provisions in Section 86-2.06, “Pull Boxes,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

Grout shall not be placed in the bottom of pull boxes. All pull boxes shall be No. 6, unless otherwise noted on the plans. Pull boxes shall not be located in or within 1 foot of any curb access ramp or driveway. All pull boxes and covers shall be concrete, unless noted on the plans, and shall be marked “Traffic Signal”.

10-2.08 Conductors, Cable and Wiring: Signal conductors and signal cable shall conform to Section 86-2.08, “Conductors,” of the Standard Specifications. Wiring shall conform to Section 86-2.09, “Wiring,” in the Standard Specifications. Conductors, cables and wiring shall also conform to the “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

The Conduit Schedule is furnished as an installation guideline only. It shall be the Contractor’s responsibility to provide the appropriate number of conductors required for the intended operation.

Each cable and conductor shall be permanently identified. Identification shall be by direct labeling, tags or bands permanently fastened to the cables/conductors. The identification shall be placed on each cable, conductor or group of conductors in each pull box and near the end of each where terminated.

Testing

The Contractor shall perform a high-voltage series lighting test consisting of the open circuit voltage of the connected constant current transformer between conductors and ground.

The high-voltage test shall not be performed on existing circuits or equipment. Non-testing of existing circuits and equipment shall not relieve the Contractor from the responsibility for malfunctioning of existing lighting circuits due to the Contractor making splices in or connecting to the circuits and such malfunctions shall be corrected at the Contractor's expense.

10-2.09 Bonding and Grounding: Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding," of the Standard Specifications and these Special Provisions.

10-2.10 Service: Electrical service shall conform to the provisions in Section 86-2.11, “Service,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

Type III-AF service equipment is existing.
Service equipment enclosure shall be painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

10-2.11 Model 170 Controller Assemblies: Model 170E Controller Assemblies shall conform to the provisions in Section 86-3, "Controller Assemblies," of the Standard Specifications and these Special Provisions. Model 170E Controller Assemblies shall be furnished and installed by the contractor from an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

Assemblies shall have a menu driven LCD front panel.

The Contractor shall arrange to have a signal technician, qualified to work on the controller unit and employed by the controller unit manufacturer, or the manufacturer's representative, present at the time the equipment is turned on.

10-2.12 Controller Cabinets: Controller Cabinet shall conform to the provisions in Section 86-3, "Controller Assemblies," of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions. Model 332L Controller Cabinet shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

Prior to shipping to the project site, each cabinet shall be submitted to the Transportation Laboratory for acceptance testing. The costs of transportation to and from the Laboratory shall be at the Contractor's expense.

Cabinets shall be Type 1 and shall consist of a Type 1 housing (A or B), a mounting cage 1, and the following listed equipment.

A. Service panel No. 1
B. Power distribution assembly

The following equipment shall be provided with each power distribution assembly:

A. Two each of Duplex NEMA Type 5-20R controller receptacle
B. One each of 30 A, 1-pole, 120 V (ac) Main circuit breaker
C. One each of 15 A, 1- pole, 120 V (ac) circuit breaker
D. Two each of 20 A, 1- pole, 120 V (ac) circuit breaker

Six steel supporting angles extending from the front to the back rails shall be supplied to support the shelves. The shelf shall be attached to the top of 2 supporting angles with 4 screws. The front of the shelf shall abut the front member of the mounting cage. The angles shall be designed to support a minimum of 50 pounds each. The horizontal side of each angle shall be a minimum of 3 inches. The angles shall be vertically adjustable.

Three terminal blocks shall be conform to the requirements in Chapter 6, Section 5, Subsection 6.5.3, "Terminal Blocks," Paragraph 5.3.1 of the TSCES, except that the screw size shall be 8-32.

Controller cabinets shall be painted with a powder coated County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

Cabinet door hinge shall be on the right.

10-2.13 Intersection Control Software: Intersection control software shall be compatible with Model 170E controllers. At a minimum the software shall include the follow capabilities: eight (8) vehicle phases, pedestrian phases and overlaps, exclusive pedestrian phase operation, Split ring operation, system detection, transit priority, vehicle preemption, railroad preemption, multiple phase timing banks, time of day/day of week operations, signal coordination and traffic responsive plans. Vendor shall be approved by Engineer prior to ordering video detection system components.

10-2.14 Battery Backup System: The Battery Backup System (BBS) shall consist of, but not limited to, cabinet, inverter/charger, power transfer relay, bypass switch and all necessary hardware and interconnect wiring. BBS cabinets

shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

The BBS unit shall be capable of operating an intersection with all LED traffic signal heads for not less than 240 minutes of full run time operation. BBS not to go below 20V.

BBS cabinet shall be painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

10-2.15 Vehicle Signal Faces and Signal Heads: Vehicle signal faces and signal heads shall conform to the provisions in Section 86-4, “Traffic Signal Faces and Fittings,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

The signal head shall have 12-inch sections and shall use light emitting diode (LED) signal modules as the light source; attention is called to Section 86-4.02, “Light Emitting Diode Signal Module,” of the Standard Specifications. LED signal modules shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

The signal housing, backplates and visors shall be metal and black.

10-2.16 Pedestrian Signal Faces and Signal Heads: Pedestrian signal faces and signal heads shall conform to the provisions in Section 86-4, “Traffic Signal Faces and Fittings,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

The pedestrian signal head shall be combo type and shall use light emitting diode (LED) signal modules as the light source. The pedestrian signal housing shall be metal. Pedestrian signal faces shall be countdown type.
The LED Pedestrian Traffic Signal Head Combo shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

The signal housing shall be metal and black.

10-2.17 Pedestrian Push Button: Pedestrian push button unit shall conform to the provisions in Section 86-5.02, “Pedestrian Push Button Assemblies,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

Pedestrian push buttons shall be Type B and conform to Standard Plan ES-5C. Pedestrian push button shall be installed at a mounting height of approximately 3.5 feet, but no more than 4 feet, above the sidewalk with textured tape on the pole per California Title 24 1117B.5.10.

Pedestrian push button shall be ADA compliant and be equipped with an LED that lights when the button is actuated and remains lit until next walk phase. LED shall be sunlight visible and ultra bright red.

PPB housing shall be metal and painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

10-2.18 Loop Detectors: Loop detectors shall conform to the provisions in Section 86-5.01A, “Inductive Loop Detectors,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions. Loop detectors shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

Loop wire shall be Type 1 or Type 2. Loop detector lead-in cable shall be Type B.

After conductors are installed in the slots cut in the pavement, paint binder (tack coat) shall be applied to the vertical surfaces of slots in conformance with the provisions in Section 39-04.02, "Prime Coat and Paint Binder (Tack Coat)," of the Standard Specifications.

Slots in asphalt concrete pavement shall be filled with Hot-Melt Rubberized Asphalt Sealant. The minimum conductor coverage shall be one inch. Excess sealant remaining after rolling shall not be reused. On completion of rolling, traffic will be permitted to travel over the sealant.

10-2.19 Video Detection System: The video detection system shall consist of, but not limited to, video cameras, processor module, extension module, surge suppressors, video monitor and all necessary hardware and wiring. Vendor shall be approved by Engineer prior to ordering video detection system components.

Video Camera

The video image sensor (camera) shall produce a useable video image under all roadway lighting conditions, regardless of time of day.

Cameras shall be mounted on the luminaire arm with a standard bracket approximately 1’ from the luminaire head.

Processor Module

Processor and extension module shall be bundled into sealed enclosure (s), compatible with Caltrans Model 170E controller input file, associated cables and software. Processor shall need only a mouse to configure. Processor shall be capable of up to 24 detection zones per input.

Video Monitor

The monitor shall fit inside the controller cabinet without the need to modify, replace, or rearrange the controller cabinet sub-assemblies. A minimum 17" LCD monitor shall be housed in rack mounted drawer.

10-2.20 Emergency Vehicle Detector System: Each traffic signal shall have an emergency vehicle detector system which shall conform to the details shown on the plans and these Special Provisions.

General

Each emergency vehicle detector system shall consist of an optical emitter assembly or assemblies located on the appropriate vehicle and an optical detector/discriminator assembly or assemblies located at the traffic signal.

Emitter assemblies are not required for this project except units for testing purposes to demonstrate that the systems perform as specified. Tests shall be conducted in the presence of the Engineer as described below under "System Operation" during the signal test period. The Engineer shall be given a minimum of 2 working days' notice prior to performing the tests.

Each system shall permit detection of 2 classes of authorized vehicles. Class I (mass transit) vehicles shall be detected at ranges of up to 1,000 feet from the optical detector. Class II (emergency) vehicles shall be detected at ranges up to 1,800 feet from the optical detector.

Class I signals (those emitted by Class I vehicles) shall be distinguished from Class II signals (those emitted by Class II vehicles) on the basis of the modulation frequency of the light from the respective emitter. The modulation frequency for Class I signal emitters shall be 9.639 Hz ± 0.110 Hz. The modulation frequency for Class II signal emitters shall be 14.035 Hz ± 0.250 Hz.

A system shall establish a priority of Class II vehicle signals over Class I vehicle signals and shall conform to the requirements in Section 25352 of the California Vehicle Code.

EMITTER ASSEMBLY

Each emitter assembly, provided for testing purposes, shall consist of an emitter unit, an emitter control unit, and connecting cables.

General

Each emitter assembly, including lamp, shall operate over an ambient temperature range of -34°C to 60°C at both modulation frequencies and operate continuously at the higher frequency for a minimum of 3,000 hours at 25°C ambient before failure of the lamp or other components.

Each emitter unit shall be controlled by a single, maintained-contact switch on the respective emitter control unit. The switch shall be located to be readily accessible to the vehicle driver. The control unit shall contain a pilot light to

indicate that the emitter power circuit is energized and shall generate only one modulating code, either that for Class I vehicles or that for Class II vehicles.

Functional
Each emitter unit shall transmit optical energy in one direction only.

The signal from each Class I signal emitter unit shall be detectable at a distance of 1,000 feet when used with a standard optical detection/discriminator assembly and filter to eliminate visible light. Visible light shall be considered eliminated when the output of the emitter unit with the filter is less than an average of 0.0003-candela per energy pulse in the wavelength range of 380 nm to 750 nm when measured at a distance of 10 feet. A Certificate of Compliance, conforming to the requirements in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be submitted to the Engineer with each Class I emitter unit.

The signal from each Class II signal emitter unit shall be detectable at a distance of 1,800 feet when used with a standard optical detection/discriminator assembly.

The standard optical detection/discriminator assembly to be used in making the range tests shall be available from the manufacturer of the system. A certified performance report shall be furnished with each assembly.

Electrical
Each emitter assembly shall provide full light output with input voltages of between 12.5 V (dc) and 17.5 V (dc). An emitter assembly shall not be damaged by input voltages up to 7.5 V (dc) above supply voltage. The emitter assembly shall not generate voltage transients, on the input supply, which exceed the supply voltage by more than 4 volts.

Each emitter assembly shall consume not more than 100 W at 17.5 V (dc) and shall have a power input circuit breaker rated at 10 A to 12 A, 12 V (dc).

The design and circuitry of each emitter shall permit its use on vehicles with either negative or positive ground without disassembling or rewiring of the unit.

Mechanical
Each emitter unit shall be housed in a weatherproof corrosion-resistant housing. The housing shall be provided with facilities to permit mounting on various types of vehicles and shall have provision for aligning the emitter unit properly and for locking the emitter unit into this alignment.

Each emitter control unit shall be provided with hardware to permit the unit to be mounted in or on an emergency vehicle or mass transit vehicle. Where

required for certain emergency vehicles, the emitter control unit and exposed controls shall be weatherproof.

Optical Detection/Discriminator Assembly

General
Each optical detection/discriminator assembly shall consist of one or more optical detectors, connecting cable, and a discriminator module.

Each assembly, when used with standard emitters, shall have a range of at least 1,000 feet for Class I signals and 1,800 feet for Class II signals. Standard emitters for both classes of signals shall be available from the manufacturer of the system. Range measurements shall be taken with all range adjustments on the discriminator module set to "maximum".

Optical Detector
Each optical detector shall be a waterproof unit capable of receiving optical energy from two separately aimable directions. The horizontal angle between the 2 directions shall be variable from 180 degrees to 5 degrees.

The reception angle for each photocell assembly shall be a maximum of 8 degrees in all directions about the aiming axis of the assembly. Measurements of reception angle will be taken at a range of 1,000 feet for a Type I emitter and at a range of 1,800 feet for a Type II emitter.

Internal circuitry shall be solid state and electrical power shall be provided by the associated discriminator module.

Each optical detector shall be contained in a housing, which shall include 2 rotatable photocell assemblies, an electronic assembly and a base. The base shall have an opening to permit mounting on a mast arm or a vertical pipe nipple, or suspension from a span wire. The mounting opening shall have female threads for 3/4 inch conduit. A cable entrance shall be provided which shall have male threads and gasketing to permit a waterproof cable connection. Each detector shall have mass of less than 2.5 pounds and shall present a maximum wind load area of 36 square inches. The housing shall be provided with weep holes to permit drainage of condensed moisture.

Each optical detector shall be installed, wired and aimed as specified by the manufacturer.

Cable
Optical detector cable (EV-C) shall meet the requirements of IPCEA-S-61-402/NEMA WC 5, Section 7.4, 600-V (ac) control cable, 75°C, Type B, and the following:

A. The cable shall contain 3 conductors, each of which shall be No. 20 (7 x 28) stranded, tinned copper with low-density polyethylene insulation.

Minimum average insulation thickness shall be 25 mils. Insulation of individual conductors shall be color coded: 1-yellow, 1-blue, 1-orange.

B. The shield shall be either tinned copper braid or aluminized polyester film with a nominal 20 percent overlap. Where film is used, a No. 20 (7 x 28) stranded, tinned, bare drain wire shall be placed between the insulated conductors and the shield and in contact with the conductive surface of the shield.
C. The jacket shall be black polyvinyl chloride with minimum ratings of 600 V (ac) and 80°C and a minimum average thickness of 43 mils. The jacket shall be marked as required by IPCEA/NEMA.
D. The finished outside diameter of the cable shall not exceed 0.35-inch.
E. The capacitance, as measured between any conductor and the other conductors and the shield, shall not exceed 48 pf per foot at 1000 Hz.
F. The cable run between each detector and the controller cabinet shall be continuous without splices or shall be spliced only as directed by the detector manufacturer.

Discriminator Module

The Contractor will furnish discriminator modules (phase selectors) unless otherwise indicated. Each discriminator, if required, module shall be designed to be compatible and usable with a NEMA detector rack, and shall conform to the requirements of Chapter I of the State of California, Department of Transportation, “Traffic Signal Control Equipment Specifications,” dated April, 1978, and to all addenda thereto current at the time of project advertising.

Each discriminator module shall be capable of operating two channels, each of which shall provide an independent output for each separate input.

Each discriminator module, when used with its associated detectors, shall perform the following:

A. Receive Class I signals at a range of up to 1,000 feet and Class II signals at a range of up to 1,800 feet.
B. Decode the signals, on the basis of frequency, at 9.639 Hz ± 0.119 Hz for Class I signals and 14.035 Hz ± 0.255 Hz for Class II signals.
C. Establish the validity of received signals on the basis of frequency and length of time received. A signal shall be considered valid only when received for more than 0.50–second. No combination of Class I signals shall be recognized as a Class II signal regardless of the number of signals being received, up to a maximum of 10 signals. Once a valid signal has been recognized, the effect shall be held by the module in the event of temporary loss of the signal for a period adjustable from 4.5 seconds to 11 seconds in at least 2 steps at 5 seconds ± 0.5 second and 10 seconds ± 0.5 second.
D. Provide an output for each channel that will result in a "low" or grounded condition of the appropriate input of a NEMA controller unit. For Class I signals the output shall be a 6.25 Hz ± 0.1 percent, rectangular waveform

with a 50 percent duty cycle. For Class II signals the output shall be steady.

Each discriminator module shall receive electric power from the controller cabinet at either 24 V (dc) or 120 V (ac).

Each channel together with the channel's associated detectors shall draw not more than 100 mA at 24 V (dc) or more than 100 mA at 120 V (ac). Electric power, one detector input for each channel and one output for each channel shall terminate at the printed circuit board edge connector pins listed below:

BOARD EDGE CONNECTOR PIN ASSIGNMENT

A	DC ground		
B	+24 V (dc)	P	(NC)
C	(NC)		
D	Detector input, Channel A	R	(NC)
E	+24V (dc) to detectors	S	(NC)
F	Channel A output (C)	T	(NC)
		U	(NC)
H	Channel A output (E)	V	(NC)
J	Detector input, Channel B	W	Channel B Output (C)
K	DC Ground to detectors	X	Channel B Output (E)
L	Chassis ground	Y	(NC)
M	AC-	Z	(NC)
N	AC+		

(C) Collector, Slotted for Keying
(E) Emitter, Slotted for Keying
(NC) Not connected, cannot be used by manufacturer for any purpose.

Two auxiliary inputs for each channel shall enter each module through the front panel connector. Pin assignment for the connector shall be as follows:

A. Auxiliary detector 1 input, Channel A
B. Auxiliary detector 2 input, Channel A
C. Auxiliary detector 1 input, Channel B
D. Auxiliary detector 2 input, Channel B

Each channel output shall be an optically isolated NPN open collector transistor capable of sinking 50 mA at 30 V (ac) and shall be compatible with the Model 170E controller unit inputs.

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

Each discriminator module shall have a single connector board and shall occupy one slot width of the input file. The front panel of each module shall

have a handle to facilitate withdrawal and the following controls and indicators for each channel:

A. Three separate range adjustments each for both Class I and Class II signals.
B. A 3-position, center-off, momentary contact switch, one position (down) labeled for test operation of Class I signals, and one position (up) labeled for test operation of Class II signals.
C. A "signal" indication and a "call" indication each for Class I and for Class II signals. The "signal" indication denotes that a signal above the threshold level has been received. A "call" indication denotes that a steady, validly coded signal has been received. These 2 indications may be accomplished with a single indication lamp; "signal" being denoted by a flashing indication and "call" with a steady indication.

In addition, the front panel shall be provided with a single circular, bayonet-captured, multi-pin connector for 2 auxiliary detector inputs for each channel. Connector shall be a mechanical configuration conforming to the requirements in Military Specification MIL-C-26482 with 10-4 insert arrangement, such as Burndy Trim Trio Bantamate Series, consisting of the following:

A. Wall mounting receptacle, G0B10-4PNE with SM20M-1S6 gold plated pins.
B. Plug, G6L10-4SNE with SC20M-1S6 gold plated sockets, cable clamp and strain relief that shall provide for a right angle turn within 2 1/2 inches maximum from the front panel surface of the discriminator module.

System Operation

The Contractor shall demonstrate that 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:

A. Each system to be used for testing shall consist of an optical emitter assembly, an optical detector, an optical detector cable and a discriminator module.
B. The discriminator modules shall be installed in the proper input file slot of the Model 170 controller assembly.
C. Two tests shall be conducted; one using a Class I signal emitter and a distance of 1,000 feet between the emitter and the detector, the other using a Class II signal emitter and a distance of 1,800 feet between the emitter and the detector. Range adjustments on the module shall be set to "Maximum" for each test.
D. Each 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 the emitter signal shall cause the proper response from the controller unit

during each "on" interval and there shall be no improper operation of either the controller unit or the monitor during each "off" interval.

10-2.21 Luminaires: LED Luminaires shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

General Requirements

Each luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array, and electronic driver (power supply). Each luminaire shall be rated for a minimum operational life of 63,000 hours. Each luminaire will operate at an average operating time of 11.5 hours per night. Each luminaire is expected to have a minimum operational life of 180 months (15 years).

Each luminaire shall be designed to operate at an average nighttime operating temperature of 70°F. The operating temperature range shall be -40°F to +130°F. Each luminaire is expected to operate above 100°F, but not expected to comply with photometric requirements. Some parameters and tests (such as LM -79 and LM-80) shall be conducted at different ambient temperatures. Each luminaire shall meet all parameter of this specification throughout the minimum operational life when operated at the average nighttime operating temperature.

The individual LEDs shall be connected such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire. Each luminaire shall be listed with Underwriters Laboratory, Inc. under UL 1598 for luminaires in wet locations, or an equivalent standard from a recognized testing laboratory.

Technical Requirements

Electrical

Maximum power consumption allowed for the luminaire shall be 165 Max Wattage.

The luminaire shall operate from a 60 HZ ±3 HZ AC power source. The fluctuations of line voltage shall have no visible effect on the luminous output. The operating voltage may range from 120 VAC to 480 VAC. The luminaire may operate over the entire voltage range or the voltage range may be selected from the two following options. The luminaire shall operate over a minimum voltage range of 95 VAC to 277 VAC. The typical operating voltages for this option are 120 VAC, 240 VAC. The luminaire shall operate over a minimum voltage range of 347 VAC to 480 VAC. The typical operating voltage for this option is 480 VAC.

The luminaire shall have a power factor of 0.90 or greater.

Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 20 percent.

The luminaire on-board circuitry shall include surge protection devices (SPD) to withstand high repetition noise transients as a result of utility line switching, nearby lightning strikes, and other interference. The SPD shall protect the luminaire from damage and failure for transient voltages and currents as defined in ANSI/IEEE C64.41.2 (Tables 1 and 4) for Location Category C-High. SPD shall conform to UL 1449, or UL 1283, depending of the components used in the design. SPD performance shall be tested per the procedures in ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for Location Category C-High.

The LED circuitry shall prevent perceptible flicker to the unaided eye over the voltage range specified above.

The luminaire shall be operationally compatible with currently used lighting control systems and photoelectric controls as detail in Standard Specification 86-6.07 (2006 Version).

The luminaires and associated on-board circuitry shall meet Class A emission limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.

Photometric Requirements

The minimum maintained illuminance shall be .15 fc. The L70 of the luminaire shall be at least the minimum number of hours as specified in Section 2.2 or greater. The measurements shall be calibrated to standard photopic calibrations. The luminaire shall have a correlated color temperature (CCT) range of 3,500K to 6,500K. The color rendition index (CRI) shall be 65 or greater. The luminaire shall not allow more than 10 percent of the rated lumens to project above 80 degrees from vertical. The luminaire shall not allow more than 2.5 percent of the rated lumens to project above 90 degrees from vertical.

Thermal Management

The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the minimum operational life. The LED manufacturer’s maximum junction temperature for the minimum operational life shall not be exceeded. The designed maximum junction temperature shall not exceed 221°F (105°C). The junction-to-ambient thermal resistance shall be 58°F/Watt or less.

Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed. The heat sink material shall be aluminum or other material of equal or lower thermal resistance.

The luminaire may contain circuitry that will automatically reduce the power to the LEDs to a level that will insure that the maximum junction temperature is not exceeded, when the ambient, outside air temperature is 100°F or greater.

Physical and Mechanical Requirements
The luminaire shall be a single, self-contained device, not requiring on-site assembly for installation. The power supply for the luminaire shall be integral to the unit. The maximum weight of the luminaire shall be 35 lbs. The maximum effective projected area (when viewed from either side or either end) shall be 1.4 sq ft. The housing shall be a light to medium gray color within the Federal Standard 595B ranges of 26250 to 26500 for semi-gloss sheen, or 36250 to 36500 for flat sheen.

Each housing shall be provided with a slip-fitter capable of mounting on a 2 inch pipe tenon. This slip-fitter shall fit on mast-arms from 1-5/8 to 2-3/8 in (O.D.) The slip-fitter shall be capable of being adjusted a minimum of ±5 degrees from the axis of the tenon in a minimum of five steps (+5, +2.5, 0, -2.5, -5). The clamping brackets of the slip-fitter shall not bottom out on the housing bosses when adjusted within the designed angular range. No part of the slip-fitter mounting brackets on the luminaires shall develop a permanent set in excess of 1/32 in. when the two or four 3/8 in. diameter cap screws used for mounting are tightened to 10 ft-lb. Two sets of cap screws may be supplied to allow for the slip-fitter to be mounted on any pipe tenon in the acceptable range without the cap screws bottoming out in the threaded holes. The cap screws and the clamping bracket(s) shall be made of corrosion resistant materials and be compatible with the luminaire housing and the mast-arm, or treated to prevent galvanic reactions.

The assembly and manufacturing process for the LED luminaire shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Luminaires to be mounted on horizontal mast arms, when tested in conformance with California Test 611 (as modified below), shall be capable of withstanding cyclic loading in (G = Acceleration of Gravity): a vertical plane at a minimum peak acceleration level of 3.0 G peak-to-peak sinusoidal loading (same as 1.5 G peak) with the power supply installed, for a minimum of 2 million cycles without failure of any luminaire parts, and a horizontal plane perpendicular to the direction of the mast arm at a minimum peak acceleration level of 1.5 G peak-to-peak sinusoidal loading (same as 0.75-G peak) with the power supply installed, for a minimum of 2 million cycles without failure of any luminaire parts.

The housing shall be designed to prevent the buildup of water on the top of the housing. Exposed heat sink fins shall be oriented so that water can freely run off the luminaire, and carry dust and other accumulated debris away from the unit.

The optical assembly of the luminaire shall be protected against dust and moisture intrusion per the requirements of IP-66 (minimum). The electronics/power supply enclosure shall be protected per the requirements of IP-43 (minimum).

Each luminaire shall be furnished with an ANSI C136.10 compliant, locking type, photo control receptacle. A rain tight shorting cap must be provided and installed. The receptacle must conform to the requirements of Standard Specification 86-6.07B(1). When available, an ANSI C136.41 compliant, locking type photo control receptacle with dimming connections shall be furnished in place of the ANSI C136.10 compliant receptacle.

When the components are mounted on a down opening door, the door shall be hinged and secured to the luminaire housing separately from the refractor or lens frame. The door shall be secured to the housing in a manner to prevent its accidental opening. A safety cable shall mechanically connect the door to the housing. Field wires connected to the luminaire shall terminate on a barrier type terminal block secured to the housing. The terminal screws shall be captive and equipped with wire grips for conductors up to No. 6. Each terminal position shall be clearly identified.

The power supply shall be contained inside the luminaire. The power supply shall be rated for outdoor operation. The power supply must have a minimum IP rating of IP65. The power supply shall be rated for a minimum life expectancy equal to or greater than the minimum operation life (Section 2.2) of the luminaire. The power supply case temperature shall have a self rise of 45° F or less above ambient temperature in free air with no additional heat sinks. The power supply shall have two leads to accept standard 0-10V Dimming control. (compatible with IEC 60929 Annex E) If the control leads are open or the analog control signal is lost, the driver will default to 100% power.

Materials

Housings shall be fabricated from materials that are designed to withstand a 3000-hour salt spray test as specified in ASTM Designation: B117. Each refractor or lens shall be made from UV inhibited high impact plastic (such as acrylic or polycarbonate) or heat and impact resistant glass, and be resistant to scratching. All aluminum used in housings and brackets shall be a marine grade alloy with less than 0.2% copper. All exposed aluminum shall be anodized. Polymeric materials (if used) of enclosures containing either the power supply or electronic components of the luminaire shall be made of UL94VO flame retardant materials. The len(s) of the luminaire are excluded from this requirement.

Luminaires shall be painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

Luminaire Identification
Each luminaire shall have the manufacturer's name, trademark, model number, serial number, date of manufacture (month-year), and lot number as identification permanently marked inside the each unit and the outside of each packaging box. The following operating characteristics shall be permanently marked inside each unit: rated voltage and rated power in Watts and Volt-Ampere.

Quality Assurance
The luminaires shall be manufactured in accordance with a manufacturer quality assurance (QA) program. The QA program shall include two types of quality assurance: (1) design quality assurance and (2) production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of the modules built to meet this specification, and a documented process of how problems are to be resolved.

QA process and test results documentation shall be kept on file for a minimum period of seven years. LED luminaire designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or soldas conforming to this specification.

Design Qualification Testing
Design Qualification Testing shall be performed by the manufacturer or an independent testing lab hired by the manufacturer on new luminaire designs, and when a major design change has been implemented on an existing design. A major design change is defined as a design change (electrical or physical) which changes any of the performance characteristics of the luminaire, results in a different circuit configuration for the power supply, or changes the layout of the individual LED's in the module.

Warranty
The manufacturer shall provide a warranty against loss of performance and defects in materials and workmanship for the luminaires for a period of 84 months after acceptance of the luminaires. Replacement luminaires shall be provided promptly after receipt of luminaires that have failed at no cost to the State. All warranty documentation shall be given to the Translab prior to random sample testing.

10-2.22 Photoelectric Control: Photoelectric controls shall conform to the provisions in Section 86-6.07, "Photoelectric Controls," of the Standard Specifications and these Special Provisions.

Photoelectric control shall be Type V and mounted on the north side of the service cabinet.

10-2.23 Pedestrian Barricade: Pedestrian barricade shall conform to ES-7P "Electrical System (Pedestrian Barricades)" of the Standard Plans and these Special Provisions.

Pedestrian barricade shall be Type I.

10-2.24 Signs and Striping: Roadside signs shall confirm to the provisions in Section 56-2, "Roadside Signs," of the Standard Plans and these Special Provisions. Striping shall confirm to the provisions in Section 84, "Traffic Stripes and Pavement Markings" of the Standard Plans and these Special Provisions.

10-2.25 Payment: The contract lump sum price paid for "TRAFFIC SIGNAL" shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in the installation, complete and functional in place, of the new traffic signal at Site 1, Willow Road and Pomeroy Road as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and no additional compensation will be allowed therefor.

The contract lump sum price paid for "TRAFFIC SIGNAL", shall include, but not limited to, foundations, signal and lighting standards, conduits, pull boxes, conductors and wiring, bonding and grounding, service, Model 170 controller assemblies, controller cabinets, intersection control software, battery backup system, vehicle signal faces and signal heads, pedestrian signal faces and signal heads, pedestrian push button, loop detectors, video detection system, emergency vehicle detector system, luminaires and photoelectric control.

Full compensation for testing and start up of traffic signal is included in the price paid for the various items of work and no additional compensation will be allowed therefor.

Full compensation for loading and transporting the salvaged equipment to the stockpile location is included in the price paid for the various items of work and no additional compensation will be allowed therefor.

Full compensation for hauling and stockpiling electrical materials shall be considered as included in the contract price paid for the item requiring the material to be salvaged and no additional compensation will be allowed therefor.

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SECTION 10-3. SIGNALS, LIGHTING, AND ELECTRICAL SYSTEMS FOR SITE 2 (THOMPSON AVENUE AND TITAN WAY)

10-3.01 Description: All work material and equipment shall conform to the provisions in Section 86, “Electrical Systems,” of the Standard Specifications and these Special Provisions. The signal shall conform to the provisions in the Transportation and Electrical Equipment Specifications (TEES).

Traffic signal work shall be performed at Thompson Avenue and Titan Way in Nipomo, CA.

All signal components shall be contractor furnished.

10-3.02 Cost Break-Down: Cost break-downs shall conform to the provisions in Section 86-1.03, "Cost Break-Down," of the Standard Specifications and these Special Provisions.

The Engineer shall be furnished a cost break-down for each contract lump sum item of work described in this Section 10-3. The cost break-down shall be submitted to the Engineer for approval within 10 calendar days, not including Saturdays, Sundays, and legal holidays, after receipt of the fully executed contract. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

The cost break-down shall include the items listed in the Standard Specifications:

A. Foundation
B. Signal and lighting standards
C. Conduits
D. Pull boxes
E. Conductors, cable and wiring
F. Bonding and grounding
G. Service
H. Model 170 controller assemblies
I. Controller cabinets
J. Intersection Control Software
K. Battery backup system
L. Vehicle signal faces and signal heads
M. Pedestrian signal faces and signal heads
N. Pedestrian push button
O. Loop detectors
P. Video detection system
Q. Emergency vehicle detector system
R. Luminaires
S. Photoelectric control
T. Pedestrian barricade

U. Signs and Striping

10-3.03 Equipment List and Drawings: The controller cabinet schematic wiring diagram and intersection sketch shall be combined into one drawing, so that, when the cabinet door is fully open, the drawing is oriented with the intersection.

A maintenance manual shall be furnished for all controller units, auxiliary equipment, and vehicle detector sensor units, control units, and amplifiers. The maintenance manual and operation manual may be combined into one manual. The maintenance manual or combined maintenance and operation manual shall be submitted at the time the controllers are delivered for testing or, if ordered by the Engineer, prior to purchase. The maintenance manual shall include, but need not be limited to, the following items:

A. Specifications
B. Design characteristics
C. General operation theory
D. Function of all controls
E. Trouble shooting procedure (diagnostic routine)
F. Block circuit diagram
G. Geographical layout of components
H. Schematic diagrams
I. List of replaceable component parts with stock numbers

10-3.04 Foundations: Foundations shall conform to the provisions in Section 86-2.03, "Foundations," of the Standard Specifications, "Electrical Systems" sheets of the Standard Plans and these Special Provisions.

The drilling of foundation hole and placement of cast-in-place concrete shall conform to Section 49-4, "Cast-In-Place Concrete Piles," of the Standard Specifications. Concrete shall be vibrated from the bottom of the reinforcement cage to the top of the pile. Conduit in foundation to the nearest pull box shall be Type 1.

When potential conflict with underground utilities is anticipated, and with the approval of the Engineer, exploratory holes shall be dug. This work will be measured and paid for as part of the "Traffic Signal" lump sum item.

10-3.05 Signal and Lighting Standards: Traffic signal and safety lighting standards shall conform to the provisions in Section 86-2.04, "Standards, Steel Pedestals and Posts," of the Standard Specifications, "Electrical Systems" sheets of the Standard Plans and these Special Provisions.

Contractor shall submit shop drawings for all signal and lighting standards and the Steel Certified Test Reports (e.g. Mill Test) for review by the Engineer. County will not accept any signal standard not meeting the requirements of this provision.

All standards shall be painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications

10-3.06 Conduit: Conduit shall conform to the provisions in Section 86-2.05, “Conduit,” of the Standard Specifications and these Special Provisions.

Conduit to be installed underground shall be Type 3 unless otherwise specified. Detector termination conduits shall be Type 3. The conduit in a foundation and between a foundation and the nearest pull box shall be Type 1.

After conductors have been installed, the ends of conduits terminating in pull boxes, service equipment enclosures, and controller cabinets shall be sealed with a sealing compound approved by the Engineer.

Conduit shall be placed under existing pavement and Portland Cement Concrete by boring. Pavement shall not be disturbed without permission from the Engineer. At those locations where conduit is required to be installed under pavement and existing underground facilities require special precautions in conformance with the provisions in "Obstructions", Section 10-1.02 of these Special Provisions, conduit shall be placed by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications.

10-3.07 Pull Boxes: Pull Boxes shall conform to the provisions in Section 86-2.06, “Pull Boxes,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

Grout shall not be placed in the bottom of pull boxes. All pull boxes shall be No. 6, unless otherwise noted on the plans. Pull boxes shall not be located in or within 1 foot of any curb access ramp or driveway. All pull boxes and covers shall be concrete, unless noted on the plans, and shall be marked “Traffic Signal”.

10-3.08 Conductors, Cable and Wiring: Signal conductors and signal cable shall conform to Section 86-2.08, “Conductors,” of the Standard Specifications. Wiring shall conform to Section 86-2.09, “Wiring,” in the Standard Specifications. Conductors, cables and wiring shall also conform to the “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

The Conduit Schedule is furnished as an installation guideline only. It shall be the Contractor’s responsibility to provide the appropriate number of conductors required for the intended operation.

Each cable and conductor shall be permanently identified. Identification shall be by direct labeling, tags or bands permanently fastened to the cables/conductors. The identification shall be placed on each cable, conductor or group of conductors in each pull box and near the end of each where terminated.

Testing

The Contractor shall perform a high-voltage series lighting test consisting of the open circuit voltage of the connected constant current transformer between conductors and ground.

The high-voltage test shall not be performed on existing circuits or equipment. Non-testing of existing circuits and equipment shall not relieve the Contractor from the responsibility for malfunctioning of existing lighting circuits due to the Contractor making splices in or connecting to the circuits and such malfunctions shall be corrected at the Contractor's expense.

10-3.09 Bonding and Grounding: Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding," of the Standard Specifications and these Special Provisions.

10-3.10 Service: Electrical service shall conform to the provisions in Section 86-2.11, “Service,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

Type III-BF service equipment enclosures shall be the aluminum type. Continuous welding of exterior seams in service equipment enclosures is not required.

Circuit breakers shall be the cable-in/cable-out type, mounted on non-energized clips. All circuit breakers shall be mounted vertically with the up position of the handle being the "ON" position.

Each service shall be provided with up to 2 main circuit breakers which shall disconnect ungrounded service entrance conductors. Where the "Main" circuit breaker consists of 2 circuit breakers as shown on the plans or required in these Special Provisions, each of the circuit breakers shall have a minimum interrupting capacity of 10 000 A, rms.

Service equipment enclosure shall be painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

10-3.11 Model 170 Controller Assemblies: Model 170E Controller Assemblies shall conform to the provisions in Section 86-3, "Controller Assemblies," of the Standard Specifications and these Special Provisions. Model 170E Controller Assemblies shall be furnished and installed by the contractor from an

approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

Assemblies shall have a menu driven LCD front panel.

The Contractor shall arrange to have a signal technician, qualified to work on the controller unit and employed by the controller unit manufacturer, or the manufacturer's representative, present at the time the equipment is turned on.

10-3.12 Controller Cabinets: Controller Cabinet shall conform to the provisions in Section 86-3, "Controller Assemblies," of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions. Model 332L Controller Cabinet shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

Prior to shipping to the project site, each cabinet shall be submitted to the Transportation Laboratory for acceptance testing. The costs of transportation to and from the Laboratory shall be at the Contractor's expense.

Cabinets shall be Type 1 and shall consist of a Type 1 housing (A or B), a mounting cage 1, and the following listed equipment.

A. Service panel No. 1
B. Power distribution assembly

The following equipment shall be provided with each power distribution assembly:

A. Two each of Duplex NEMA Type 5-20R controller receptacle
B. One each of 30 A, 1-pole, 120 V (ac) Main circuit breaker
C. One each of 15 A, 1- pole, 120 V (ac) circuit breaker
D. Two each of 20 A, 1- pole, 120 V (ac) circuit breaker

Six steel supporting angles extending from the front to the back rails shall be supplied to support the shelves. The shelf shall be attached to the top of 2 supporting angles with 4 screws. The front of the shelf shall abut the front member of the mounting cage. The angles shall be designed to support a minimum of 50 pounds each. The horizontal side of each angle shall be a minimum of 3 inches. The angles shall be vertically adjustable.

Three terminal blocks shall be conform to the requirements in Chapter 6, Section 5, Subsection 6.5.3, "Terminal Blocks," Paragraph 5.3.1 of the TEES, except that the screw size shall be 8-32.

Controller cabinets shall be painted with a powder coated County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

Cabinet door hinge shall be on the left.

10-3.13 Intersection Control Software: Intersection control software shall be compatible with Model 170E controllers. At a minimum the software shall include the follow capabilities: eight (8) vehicle phases, pedestrian phases and overlaps, exclusive pedestrian phase operation, Split ring operation, system detection, transit priority, vehicle preemption, railroad preemption, multiple phase timing banks, time of day/day of week operations, signal coordination and traffic responsive plans. Vendor shall be approved by Engineer prior to ordering video detection system components.

10-3.14 Battery Backup System: The Battery Backup System (BBS) shall consist of, but not limited to, cabinet, inverter/charger, power transfer relay, bypass switch and all necessary hardware and interconnect wiring. BBS cabinets shall be an approved vendor in conformance with Section 8, "Materials," of these Special Provisions.

The BBS unit shall be capable of operating an intersection with all LED traffic signal heads for not less than 240 minutes of full run time operation. BBS not to go below 20V.

BBS cabinet shall be painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, "Painting," of the Standard Specifications.

10-3.15 Vehicle Signal Faces and Signal Heads: Vehicle signal faces and signal heads shall conform to the provisions in Section 86-4, "Traffic Signal Faces and Fittings," of the Standard Specifications, "Electrical Systems" sheets of the Standard Plans and these Special Provisions.

The signal head shall have 12-inch sections and shall use light emitting diode (LED) signal modules as the light source; attention is called to Section 86-4.02, "Light Emitting Diode Signal Module," of the Standard Specifications. LED signal modules shall be an approved vendor in conformance with Section 8, "Materials," of these Special Provisions.

The signal housing, backplates and visors shall be metal and black.

10-3.16 Pedestrian Signal Faces and Signal Heads: Pedestrian signal faces and signal heads shall conform to the provisions in Section 86-4, "Traffic Signal Faces and Fittings," of the Standard Specifications, "Electrical Systems" sheets of the Standard Plans and these Special Provisions.

The pedestrian signal head shall be combo type and shall use light emitting diode (LED) signal modules as the light source. The pedestrian signal housing shall be metal. Pedestrian signal faces shall be countdown type.
The LED Pedestrian Traffic Signal Head Combo shall be an approved vendor in conformance with Section 8, "Materials," of these Special Provisions.

The signal housing shall be metal and black.

10-3.17 Pedestrian Push Button: Pedestrian push button unit shall conform to the provisions in Section 86-5.02, “Pedestrian Push Button Assemblies,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions.

Pedestrian push buttons shall be Type B and conform to Standard Plan ES-5C. Pedestrian push button shall be installed at a mounting height of approximately 3.5 feet, but no more than 4 feet, above the sidewalk with textured tape on the pole per California Title 24 1117B.5.10.

Pedestrian push button shall be ADA compliant and be equipped with an LED that lights when the button is actuated and remains lit until next walk phase. LED shall be sunlight visible and ultra bright red.

PPB housing shall be metal and painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

10-3.18 Loop Detectors: Loop detectors shall conform to the provisions in Section 86-5.01A, “Inductive Loop Detectors,” of the Standard Specifications, “Electrical Systems” sheets of the Standard Plans and these Special Provisions. Loop detectors shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

Loop wire shall be Type 1 or Type 2. Loop detector lead-in cable shall be Type B.

After conductors are installed in the slots cut in the pavement, paint binder (tack coat) shall be applied to the vertical surfaces of slots in conformance with the provisions in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," of the Standard Specifications.

Slots in asphalt concrete pavement shall be filled with Hot-Melt Rubberized Asphalt Sealant. The minimum conductor coverage shall be one inch. Excess sealant remaining after rolling shall not be reused. On completion of rolling, traffic will be permitted to travel over the sealant.

10-3.19 Video Detection System: The video detection system shall consist of, but not limited to, video cameras, processor module, extension module, surge suppressors, video monitor and all necessary hardware and wiring. Vendor shall be approved by Engineer prior to ordering video detection system components.

Video Camera

The video image sensor (camera) shall produce a useable video image under all roadway lighting conditions, regardless of time of day.

POLE D and F - Cameras shall be mounted on the luminaire arm with a standard bracket approximately 1’ from the luminaire head.

POLE E – Camera shall be mounted on the mast arm with a 5’ extension bracket centered over the approach travel way.

Processor Module

Processor and extension module shall be bundled into sealed enclosure (s), compatible with Caltrans Model 170E controller input file, associated cables and software. Processor shall need only a mouse to configure. Processor shall be capable of up to 24 detection zones per input.

Video Monitor

The monitor shall fit inside the controller cabinet without the need to modify, replace, or rearrange the controller cabinet sub-assemblies. A minimum 17” LCD monitor shall be housed in rack mounted drawer.

10-3.20 Emergency Vehicle Detector System: Each traffic signal shall have an emergency vehicle detector system which shall conform to the details shown on the plans and these Special Provisions.

General

Each emergency vehicle detector system shall consist of an optical emitter assembly or assemblies located on the appropriate vehicle and an optical detector/discriminator assembly or assemblies located at the traffic signal.

Emitter assemblies are not required for this project except units for testing purposes to demonstrate that the systems perform as specified. Tests shall be conducted in the presence of the Engineer as described below under "System Operation" during the signal test period. The Engineer shall be given a minimum of 2 working days’ notice prior to performing the tests.

Each system shall permit detection of 2 classes of authorized vehicles. Class I (mass transit) vehicles shall be detected at ranges of up to 1,000 feet from the optical detector. Class II (emergency) vehicles shall be detected at ranges up to 1,800 feet from the optical detector.

Class I signals (those emitted by Class I vehicles) shall be distinguished from Class II signals (those emitted by Class II vehicles) on the basis of the modulation frequency of the light from the respective emitter. The modulation frequency for Class I signal emitters shall be 9.639 Hz ± 0.110 Hz. The modulation frequency for Class II signal emitters shall be 14.035 Hz ± 0.250 Hz.

A system shall establish a priority of Class II vehicle signals over Class I vehicle signals and shall conform to the requirements in Section 25352 of the California Vehicle Code.

EMITTER ASSEMBLY

Each emitter assembly, provided for testing purposes, shall consist of an emitter unit, an emitter control unit, and connecting cables.

General

Each emitter assembly, including lamp, shall operate over an ambient temperature range of -34°C to 60°C at both modulation frequencies and operate continuously at the higher frequency for a minimum of 3,000 hours at 25°C ambient before failure of the lamp or other components.

Each emitter unit shall be controlled by a single, maintained-contact switch on the respective emitter control unit. The switch shall be located to be readily accessible to the vehicle driver. The control unit shall contain a pilot light to indicate that the emitter power circuit is energized and shall generate only one modulating code, either that for Class I vehicles or that for Class II vehicles.

Functional

Each emitter unit shall transmit optical energy in one direction only.

The signal from each Class I signal emitter unit shall be detectable at a distance of 1,000 feet when used with a standard optical detection/discriminator assembly and filter to eliminate visible light. Visible light shall be considered eliminated when the output of the emitter unit with the filter is less than an average of 0.0003-candela per energy pulse in the wavelength range of 380 nm to 750 nm when measured at a distance of 10 feet. A Certificate of Compliance, conforming to the requirements in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications shall be submitted to the Engineer with each Class I emitter unit.

The signal from each Class II signal emitter unit shall be detectable at a distance of 1,800 feet when used with a standard optical detection/discriminator assembly.

The standard optical detection/discriminator assembly to be used in making the range tests shall be available from the manufacturer of the system. A certified performance report shall be furnished with each assembly.

Electrical

Each emitter assembly shall provide full light output with input voltages of between 12.5 V (dc) and 17.5 V (dc). An emitter assembly shall not be damaged by input voltages up to 7.5 V (dc) above supply voltage. The emitter assembly shall not generate voltage transients, on the input supply, which exceed the supply voltage by more than 4 volts.

Each emitter assembly shall consume not more than 100 W at 17.5 V (dc) and shall have a power input circuit breaker rated at 10 A to 12 A, 12 V (dc).

The design and circuitry of each emitter shall permit its use on vehicles with either negative or positive ground without disassembling or rewiring of the unit.

Mechanical
Each emitter unit shall be housed in a weatherproof corrosion-resistant housing. The housing shall be provided with facilities to permit mounting on various types of vehicles and shall have provision for aligning the emitter unit properly and for locking the emitter unit into this alignment.

Each emitter control unit shall be provided with hardware to permit the unit to be mounted in or on an emergency vehicle or mass transit vehicle. Where required for certain emergency vehicles, the emitter control unit and exposed controls shall be weatherproof.

Optical Detection/Discriminator Assembly

General
Each optical detection/discriminator assembly shall consist of one or more optical detectors, connecting cable, and a discriminator module.

Each assembly, when used with standard emitters, shall have a range of at least 1,000 feet for Class I signals and 1,800 feet for Class II signals. Standard emitters for both classes of signals shall be available from the manufacturer of the system. Range measurements shall be taken with all range adjustments on the discriminator module set to "maximum".

Optical Detector
Each optical detector shall be a waterproof unit capable of receiving optical energy from two separately aimable directions. The horizontal angle between the 2 directions shall be variable from 180 degrees to 5 degrees.

The reception angle for each photocell assembly shall be a maximum of 8 degrees in all directions about the aiming axis of the assembly. Measurements of reception angle will be taken at a range of 1,000 feet for a Type I emitter and at a range of 1,800 feet for a Type II emitter.

Internal circuitry shall be solid state and electrical power shall be provided by the associated discriminator module.

Each optical detector shall be contained in a housing, which shall include 2 rotatable photocell assemblies, an electronic assembly and a base. The base shall have an opening to permit mounting on a mast arm or a vertical pipe nipple, or suspension from a span wire. The mounting opening shall have

female threads for 3/4 inch conduit. A cable entrance shall be provided which shall have male threads and gasketing to permit a waterproof cable connection. Each detector shall have mass of less than 2.5 pounds and shall present a maximum wind load area of 36 square inches. The housing shall be provided with weep holes to permit drainage of condensed moisture.

Each optical detector shall be installed, wired and aimed as specified by the manufacturer.

Cable

Optical detector cable (EV-C) shall meet the requirements of IPCEA-S-61-402/NEMA WC 5, Section 7.4, 600-V (ac) control cable, 75°C, Type B, and the following:

A. The cable shall contain 3 conductors, each of which shall be No. 20 (7 x 28) stranded, tinned copper with low-density polyethylene insulation. Minimum average insulation thickness shall be 25 mils. Insulation of individual conductors shall be color coded: 1-yellow, 1-blue, 1-orange.
B. The shield shall be either tinned copper braid or aluminized polyester film with a nominal 20 percent overlap. Where film is used, a No. 20 (7 x 28) stranded, tinned, bare drain wire shall be placed between the insulated conductors and the shield and in contact with the conductive surface of the shield.
C. The jacket shall be black polyvinyl chloride with minimum ratings of 600 V (ac) and 80°C and a minimum average thickness of 43 mils. The jacket shall be marked as required by IPCEA/NEMA.
D. The finished outside diameter of the cable shall not exceed 0.35-inch.
E. The capacitance, as measured between any conductor and the other conductors and the shield, shall not exceed 48 pf per foot at 1000 Hz.
F. The cable run between each detector and the controller cabinet shall be continuous without splices or shall be spliced only as directed by the detector manufacturer.

Discriminator Module

The Contractor will furnish discriminator modules (phase selectors) unless otherwise indicated. Each discriminator, if required, module shall be designed to be compatible and usable with a NEMA detector rack, and shall conform to the requirements of Chapter I of the State of California, Department of Transportation, “Traffic Signal Control Equipment Specifications,” dated April, 1978, and to all addenda thereto current at the time of project advertising.

Each discriminator module shall be capable of operating two channels, each of which shall provide an independent output for each separate input.

Each discriminator module, when used with its associated detectors, shall perform the following:

A. Receive Class I signals at a range of up to 1,000 feet and Class II signals at a range of up to 1,800 feet.
B. Decode the signals, on the basis of frequency, at 9.639 Hz ± 0.119 Hz for Class I signals and 14.035 Hz ± 0.255 Hz for Class II signals.
C. Establish the validity of received signals on the basis of frequency and length of time received. A signal shall be considered valid only when received for more than 0.50–second. No combination of Class I signals shall be recognized as a Class II signal regardless of the number of signals being received, up to a maximum of 10 signals. Once a valid signal has been recognized, the effect shall be held by the module in the event of temporary loss of the signal for a period adjustable from 4.5 seconds to 11 seconds in at least 2 steps at 5 seconds ± 0.5 second and 10 seconds ± 0.5 second.
D. Provide an output for each channel that will result in a "low" or grounded condition of the appropriate input of a NEMA controller unit. For Class I signals the output shall be a 6.25 Hz ± 0.1 percent, rectangular waveform with a 50 percent duty cycle. For Class II signals the output shall be steady.

Each discriminator module shall receive electric power from the controller cabinet at either 24 V (dc) or 120 V (ac).

Each channel together with the channel's associated detectors shall draw not more than 100 mA at 24 V (dc) or more than 100 mA at 120 V (ac). Electric power, one detector input for each channel and one output for each channel shall terminate at the printed circuit board edge connector pins listed below:

BOARD EDGE CONNECTOR PIN ASSIGNMENT

A	DC ground		
B	+24 V (dc)	P	(NC)
C	(NC)		
D	Detector input, Channel A	R	(NC)
E	+24V (dc) to detectors	S	(NC)
F	Channel A output (C)	T	(NC)
		U	(NC)
H	Channel A output (E)	V	(NC)
J	Detector input, Channel B	W	Channel B Output (C)
K	DC Ground to detectors	X	Channel B Output (E)
L	Chassis ground	Y	(NC)
M	AC-	Z	(NC)
N	AC+		

(C) Collector, Slotted for Keying
(E) Emitter, Slotted for Keying
(NC) Not connected, cannot be used by manufacturer for any purpose.

Two auxiliary inputs for each channel shall enter each module through the front panel connector. Pin assignment for the connector shall be as follows:

A. Auxiliary detector 1 input, Channel A
B. Auxiliary detector 2 input, Channel A
C. Auxiliary detector 1 input, Channel B
D. Auxiliary detector 2 input, Channel B

Each channel output shall be an optically isolated NPN open collector transistor capable of sinking 50 mA at 30 V (ac) and shall be compatible with the Model 170E controller unit inputs.

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

Each discriminator module shall have a single connector board and shall occupy one slot width of the input file. The front panel of each module shall have a handle to facilitate withdrawal and the following controls and indicators for each channel:

A. Three separate range adjustments each for both Class I and Class II signals.
B. A 3-position, center-off, momentary contact switch, one position (down) labeled for test operation of Class I signals, and one position (up) labeled for test operation of Class II signals.
C. A "signal" indication and a "call" indication each for Class I and for Class II signals. The "signal" indication denotes that a signal above the threshold level has been received. A "call" indication denotes that a steady, validly coded signal has been received. These 2 indications may be accomplished with a single indication lamp; "signal" being denoted by a flashing indication and "call" with a steady indication.

In addition, the front panel shall be provided with a single circular, bayonet-captured, multi-pin connector for 2 auxiliary detector inputs for each channel. Connector shall be a mechanical configuration conforming to the requirements in Military Specification MIL-C-26482 with 10-4 insert arrangement, such as Burndy Trim Trio Bantamate Series, consisting of the following:

A. Wall mounting receptacle, G0B10-4PNE with SM20M-1S6 gold plated pins.
B. Plug, G6L10-4SNE with SC20M-1S6 gold plated sockets, cable clamp and strain relief that shall provide for a right angle turn within 2 1/2 inches maximum from the front panel surface of the discriminator module.

<u>System Operation</u>
The Contractor shall demonstrate that 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:

A. Each system to be used for testing shall consist of an optical emitter assembly, an optical detector, an optical detector cable and a discriminator module.
B. The discriminator modules shall be installed in the proper input file slot of the Model 170E controller assembly.
C. Two tests shall be conducted; one using a Class I signal emitter and a distance of 1,000 feet between the emitter and the detector, the other using a Class II signal emitter and a distance of 1,800 feet between the emitter and the detector. Range adjustments on the module shall be set to "Maximum" for each test.
D. Each 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 the emitter signal shall cause the proper response from the controller unit during each "on" interval and there shall be no improper operation of either the controller unit or the monitor during each "off" interval.

10-3.21 Luminaires: LED Luminaires shall be an approved vendor in conformance with Section 8, “Materials,” of these Special Provisions.

General Requirements

Each luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array, and electronic driver (power supply). Each luminaire shall be rated for a minimum operational life of 63,000 hours. Each luminaire will operate at an average operating time of 11.5 hours per night. Each luminaire is expected to have a minimum operational life of 180 months (15 years).

Each luminaire shall be designed to operate at an average nighttime operating temperature of 70°F. The operating temperature range shall be -40°F to +130°F. Each luminaire is expected to operate above 100°F, but not expected to comply with photometric requirements. Some parameters and tests (such as LM -79 and LM-80) shall be conducted at different ambient temperatures. Each luminaire shall meet all parameter of this specification throughout the minimum operational life when operated at the average nighttime operating temperature.

The individual LEDs shall be connected such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire. Each luminaire shall be listed with Underwriters Laboratory, Inc. under UL 1598 for luminaires in wet locations, or an equivalent standard from a recognized testing laboratory.

Electrical

Maximum power consumption allowed for the luminaire shall be 165 Max Wattage.

The luminaire shall operate from a 60 HZ ±3 HZ AC power source. The fluctuations of line voltage shall have no visible effect on the luminous output. The operating voltage may range from 120 VAC to 480 VAC. The luminaire may operate over the entire voltage range or the voltage range may be selected from the two following options. The luminaire shall operate over a minimum voltage range of 95 VAC to 277 VAC. The typical operating voltages for this option are 120 VAC, 240 VAC. The luminaire shall operate over a minimum voltage range of 347 VAC to 480 VAC. The typical operating voltage for this option is 480 VAC.

The luminaire shall have a power factor of 0.90 or greater.

Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 20 percent.

The luminaire on-board circuitry shall include surge protection devices (SPD) to withstand high repetition noise transients as a result of utility line switching, nearby lightning strikes, and other interference. The SPD shall protect the luminaire from damage and failure for transient voltages and currents as defined in ANSI/IEEE C64.41.2 (Tables 1 and 4) for Location Category C-High. SPD shall conform to UL 1449, or UL 1283, depending of the components used in the design. SPD performance shall be tested per the procedures in ANSI/IEEE C62.45 based on ANSI/IEEE C62.41.2 definitions for standard and optional waveforms for Location Category C-High.

The LED circuitry shall prevent perceptible flicker to the unaided eye over the voltage range specified above.

The luminaire shall be operationally compatible with currently used lighting control systems and photoelectric controls as detail in Standard Specification 86-6.07 (2006 Version).

The luminaires and associated on-board circuitry shall meet Class A emission limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 regulations concerning the emission of electronic noise.

Photometric Requirements

The minimum maintained illuminance shall be .15 fc. The L70 of the luminaire shall be at least the minimum number of hours as specified in Section 2.2 or greater. The measurements shall be calibrated to standard photopic calibrations. The luminaire shall have a correlated color temperature (CCT) range of 3,500K to 6,500K. The color rendition index (CRI) shall be 65 or greater. The luminaire shall not allow more than 10 percent of the rated lumens to project above 80 degrees from vertical. The luminaire shall not allow more than 2.5 percent of the rated lumens to project above 90 degrees from vertical.

Thermal Management

The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the minimum operational life. The LED manufacturer's maximum junction temperature for the minimum operational life shall not be exceeded. The designed maximum junction temperature shall not exceed 221°F (105°C). The junction-to-ambient thermal resistance shall be 58°F/Watt or less.

Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed. The heat sink material shall be aluminum or other material of equal or lower thermal resistance.

The luminaire may contain circuitry that will automatically reduce the power to the LEDs to a level that will insure that the maximum junction temperature is not exceeded, when the ambient, outside air temperature is 100°F or greater.

Physical and Mechanical Requirements

The luminaire shall be a single, self-contained device, not requiring on-site assembly for installation. The power supply for the luminaire shall be integral to the unit. The maximum weight of the luminaire shall be 35 lbs. The maximum effective projected area (when viewed from either side or either end) shall be 1.4 sq ft. The housing shall be a light to medium gray color within the Federal Standard 595B ranges of 26250 to 26500 for semi-gloss sheen, or 36250 to 36500 for flat sheen.

Each housing shall be provided with a slip-fitter capable of mounting on a 2 inch pipe tenon. This slip-fitter shall fit on mast-arms from 1-5/8 to 2-3/8 in (O.D.) The slip-fitter shall be capable of being adjusted a minimum of ±5 degrees from the axis of the tenon in a minimum of five steps (+5, +2.5, 0, -2.5, -5). The clamping brackets of the slip-fitter shall not bottom out on the housing bosses when adjusted within the designed angular range. No part of the slip-fitter mounting brackets on the luminaires shall develop a permanent set in excess of 1/32 in. when the two or four 3/8 in. diameter cap screws used for mounting are tightened to 10 ft-lb. Two sets of cap screws may be supplied to allow for the slip-fitter to be mounted on any pipe tenon in the acceptable range without the cap screws bottoming out in the threaded holes. The cap screws and the clamping bracket(s) shall be made of corrosion resistant materials and be compatible with the luminaire housing and the mast-arm, or treated to prevent galvanic reactions.

The assembly and manufacturing process for the LED luminaire shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Luminaires to be mounted on horizontal mast arms, when tested in conformance with California Test 611 (as modified below), shall be capable of withstanding cyclic loading in (G = Acceleration of Gravity): a vertical plane at a minimum peak acceleration level of 3.0 G peak-to-peak sinusoidal loading

(same as 1.5 G peak) with the power supply installed, for a minimum of 2 million cycles without failure of any luminaire parts, and a horizontal plane perpendicular to the direction of the mast arm at a minimum peak acceleration level of 1.5 G peak-to-peak sinusoidal loading (same as 0.75-G peak) with the power supply installed, for a minimum of 2 million cycles without failure of any luminaire parts.

The housing shall be designed to prevent the buildup of water on the top of the housing. Exposed heat sink fins shall be oriented so that water can freely run off the luminaire, and carry dust and other accumulated debris away from the unit.

The optical assembly of the luminaire shall be protected against dust and moisture intrusion per the requirements of IP-66 (minimum). The electronics/power supply enclosure shall be protected per the requirements of IP-43 (minimum).

Each luminaire shall be furnished with an ANSI C136.10 compliant, locking type, photo control receptacle. A rain tight shorting cap must be provided and installed. The receptacle must conform to the requirements of Standard Specification 86-6.07B(1). When available, an ANSI C136.41 compliant, locking type photo control receptacle with dimming connections shall be furnished in place of the ANSI C136.10 compliant receptacle.

When the components are mounted on a down opening door, the door shall be hinged and secured to the luminaire housing separately from the refractor or lens frame. The door shall be secured to the housing in a manner to prevent its accidental opening. A safety cable shall mechanically connect the door to the housing. Field wires connected to the luminaire shall terminate on a barrier type terminal block secured to the housing. The terminal screws shall be captive and equipped with wire grips for conductors up to No. 6. Each terminal position shall be clearly identified.

The power supply shall be contained inside the luminaire. The power supply shall be rated for outdoor operation. The power supply must have a minimum IP rating of IP65. The power supply shall be rated for a minimum life expectancy equal to or greater than the minimum operation life (Section 2.2) of the luminaire. The power supply case temperature shall have a self rise of 45° F or less above ambient temperature in free air with no additional heat sinks. The power supply shall have two leads to accept standard 0-10V Dimming control. (compatible with IEC 60929 Annex E) If the control leads are open or the analog control signal is lost, the driver will default to 100% power.

Materials

Housings shall be fabricated from materials that are designed to withstand a 3000-hour salt spray test as specified in ASTM Designation: B117. Each refractor or lens shall be made from UV inhibited high impact plastic (such as

acrylic or polycarbonate) or heat and impact resistant glass, and be resistant to scratching. All aluminum used in housings and brackets shall be a marine grade alloy with less than 0.2% copper. All exposed aluminum shall be anodized. Polymeric materials (if used) of enclosures containing either the power supply or electronic components of the luminaire shall be made of UL94VO flame retardant materials. The len(s) of the luminaire are excluded from this requirement.

Luminaires shall be painted with a powder coated finish County approved Forest Green color FS14079. Painting shall conform to Section 86-2.16, “Painting,” of the Standard Specifications.

Luminaire Identification

Each luminaire shall have the manufacturer's name, trademark, model number, serial number, date of manufacture (month-year), and lot number as identification permanently marked inside the each unit and the outside of each packaging box. The following operating characteristics shall be permanently marked inside each unit: rated voltage and rated power in Watts and Volt-Ampere.

Quality Assurance

The luminaires shall be manufactured in accordance with a manufacturer quality assurance (QA) program. The QA program shall include two types of quality assurance: (1) design quality assurance and (2) production quality assurance. The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of the modules built to meet this specification, and a documented process of how problems are to be resolved.

QA process and test results documentation shall be kept on file for a minimum period of seven years. LED luminaire designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

Design Qualification Testing

Design Qualification Testing shall be performed by the manufacturer or an independent testing lab hired by the manufacturer on new luminaire designs, and when a major design change has been implemented on an existing design. A major design change is defined as a design change (electrical or physical) which changes any of the performance characteristics of the luminaire, results in a different circuit configuration for the power supply, or changes the layout of the individual LED's in the module.

Warranty

The manufacturer shall provide a warranty against loss of performance and defects in materials and workmanship for the luminaires for a period of 84 months after acceptance of the luminaires. Replacement luminaires shall be

provided promptly after receipt of luminaires that have failed at no cost to the State. All warranty documentation shall be given to the Translab prior to random sample testing.

10-3.22 Photoelectric Control: Photoelectric controls shall conform to the provisions in Section 86-6.07, "Photoelectric Controls," of the Standard Specifications and these Special Provisions.

Photoelectric control shall be Type V and mounted on the north side of the service cabinet.

10-3.23 Pedestrian Barricade: Pedestrian barricade shall conform to ES-7P “Electrical System (Pedestrian Barricades)” of the Standard Plans and these Special Provisions.

Pedestrian barricade shall be Type I.

10-3.24 Signs and Striping: Roadside signs shall confirm to the provisions in Section 56-2, “Roadside Signs,” of the Standard Plans and these Special Provisions. Striping shall confirm to the provisions in Section 84, “Traffic Stripes and PavementMarkings” of the Standard Plans and these Special Provisions.

10-3.25 Payment: The contract lump sum price paid for “TRAFFIC SIGNAL” shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in the installation, complete and functional in place, of the new traffic signal at Site 2, Thompson Avenue and Titan Way as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and no additional compensation will be allowed therefor.

The contract lump sum price paid for “TRAFFIC SIGNAL”, shall include, but not limited to, foundations, signal and lighting standards, conduits, pull boxes, conductors and wiring, bonding and grounding, service, Model 170E controller assemblies, controller cabinets, intersection control software, battery backup system, vehicle signal faces and signal heads, pedestrian signal faces and signal heads, pedestrian push button, loop detectors, video detection system, emergency vehicle detector system, luminaires and photoelectric control.

Full compensation for testing and start up of traffic signal is included in the price paid for the various items of work and no additional compensation will be allowed therefor.

Full compensation for loading and transporting the salvaged equipment to the stockpile location is included in the price paid for the various items of work and no additional compensation will be allowed therefor.

Full compensation for hauling and stockpiling electrical materials shall be considered as included in the contract price paid for the item requiring the material to be salvaged and no additional compensation will be allowed therefor.

SECTION 11. AMENDMENTS TO STANDARD SPECIFICATIONS

SECTION 5 CONTROL OF WORK
(Issued 06-10-10)

Add:

5-1.055 SUBCONTRACTING

5-1.055A General

No subcontract releases you from the contract or relieves you of your responsibility for a subcontractor's work.

If you violate Pub Cont Code § 4100 et seq., the Department may exercise the remedies provided under Pub Cont Code § 4110. The Department may refer the violation to the Contractors State License Board as provided under Pub Cont Code § 4111.

Except for a building-construction non-federal-aid contract, perform work equaling at least 30 percent of the value of the original total bid with your employees and with equipment owned or rented by you, with or without operators.

Each subcontract must comply with the contract.

The Department encourages you to include a dispute resolution process in each subcontract.

Each subcontractor must have an active and valid State contractor's license with a classification appropriate for the work to be performed (Bus & Prof Code, § 7000 et seq.).

Submit copies of subcontracts upon request.

Before subcontracted work starts, submit a Subcontracting Request form.

Do not use a debarred contractor; a current list of debarred contractors is available at the Department of Industrial Relations' Web site.

Upon request, immediately remove and not again use a subcontractor who fails to prosecute the work satisfactorily.

5-1.116 DIFFERING SITE CONDITIONS (23 CFR 635.109)

5-1.116A Contractor's Notification

Promptly notify the Engineer if you find either of the following:

1. Physical conditions differing materially from either of the following:

    1.1. Contract documents
    1.2. Job site examination

2. 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

Include details explaining the information you relied on and the material differences you discovered.

If you fail to notify the Engineer promptly, you waive the differing site condition claim for the period between your discovery of the differing site condition and your notification to the Engineer.

If you disturb the site after discovery and before the Engineer's investigation, you waive the differing site condition claim.

5-1.116B Engineer's Investigation and Decision

Upon your notification, the Engineer investigates job site conditions and:

1. Notifies you whether to resume affected work
2. Decides whether the condition differs materially and is cause for an adjustment of time, payment, or both

You may protest the Engineer's decision.

SECTION 6 CONTROL OF MATERIALS
(Issued 05-01-09)

Replace Section 6-1.05 with:

6-1.05 SPECIFIC BRAND OR TRADE NAME AND SUBSTITUTION

A reference to a specific brand or trade name establishes a quality standard and is not intended to limit competition. You may use a product that is equal to or better than the specified brand or trade name if approved.

Submit a substitution request within a time period that:

1. Follows Contract award
2. Allows 30 days for review
3. Causes no delay

Include substantiating data with the substitution request that proves the substitution:

1. Is of equal or better quality and suitability
2. Causes no delay in product delivery and installation

6-1.075 GUARANTEE

Guarantee the work remains free from substantial defects for 1 year after contract acceptance except for work parts for which you were relieved of maintenance and protection. Guarantee each of these relieved work parts for 1 year after the relief date.

The guarantee excludes damage or displacement caused by an event outside your control including:

1. Normal wear and tear
2. Improper operation
3. Insufficient maintenance
4. Abuse
5. Unauthorized change
6. Act of God

During the guarantee period, repair or replace each work portion having a substantial defect.

The Department does not pay for corrective work.

During corrective work activities, provide insurance coverage specified for coverage before contract acceptance.

The contract bonds must be in full force and effect until the later of:

1. Expiration of guarantee period
2. Completion of corrective work

If a warranty specification conflicts with Section 6-1.075, "Guarantee," comply with the warranty specification.

During the guarantee period, the Engineer monitors the completed work. If the Engineer finds work having a substantial defect, the Engineer lists work parts and furnishes you the list.

Within 10 days of receipt of the list, submit for authorization a detailed plan for correcting the work. Include a schedule that includes:

1. Start and completion dates
2. List of labor, equipment, materials, and any special services you plan to use
3. Work related to the corrective work, including traffic control and temporary and permanent pavement markings

The Engineer notifies you when the plan is authorized. Start corrective work and related work within 15 days of notice.

If the Engineer determines corrective work is urgently required to prevent injury or property damage:

1. The Engineer furnishes you a request to start emergency repair work and a list of parts requiring corrective work
2. Mobilize within 24 hours and start work
3. Submit a corrective work plan within 5 days of starting emergency repair work

If you fail to perform work as specified, the Department may perform the work and bill you.

SECTION 9 MEASUREMENT AND PAYMENT
(Issued 03-11-10)

In Section 9-1.03A replace the 2nd paragraph with:

To the total of the direct costs computed as provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," there will be added a markup of 35 percent to the cost of labor, 15 percent to the cost of materials, and 15 percent to the cost of equipment rental.

In Section 9-1.03A replace the 4th paragraph with:

If a subcontractor performs work at force account, accept an additional 10 percent markup to the total cost of that work paid at force account, including markups specified in Section 9-1.03, "Force Account Payment," as reimbursement for additional administrative costs.

Replace Section 9-1.03B with:

The Contractor, and all subcontractors obtained before or after contract execution, shall itemize the labor, material, and equipment rental costs, and shall not be deemed specialists unless the selected Contractor or available subcontractors on site are not capable of performing the specialty work and it is not the special service industry's established practice to provide cost itemization. In addition, the Engineer may approve work required to be performed at an off-site manufacturing plant or machine shop to be paid as a non-itemized specialist billing. To obtain approval as a specialist, the Contractor shall submit on behalf of the subcontractor a request to the Engineer prior to the start of the proposed specialist work.

If approval is granted, the Engineer will accept the non-itemized invoices for specialty work performed, provided the invoices are at current market rates. Markup percentages of Section 9-1.03A, "Work Performed by Contractor," will not apply. A markup of 10 percent will be added to the total cost of the extra work. The 10 percent markup shall reimburse the Contractor for additional administrative costs, and no other payment will be made by reason of performance of the extra work by a specialist.

If approval is not granted prior to the start of the proposed specialty work, the Contractor or subcontractor shall itemize labor, material, and equipment rental costs and apply percentage markups as required by Section 9-1.03A, "Work Performed by Contractor."

In Section 9-1.03C delete the 6th paragraph.

SECTION 12 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES
(Issued 11-07-08)

In Section 12-1.01 in the 2nd paragraph, replace the 1st sentence with:

Attention is directed to Part 6 of the California MUTCD.

Replace Section 12-2.01 with:

12-2.01 FLAGGERS

Flaggers while on duty and assigned to traffic control or to give warning to the public that the highway is under construction and of any dangerous conditions to be encountered as a result thereof, shall perform their duties and shall be provided with the necessary equipment in conformance with Part 6 of the California MUTCD. The equipment shall be furnished and kept clean and in good repair by the Contractor at the Contractor's expense.

All flaggers shall wear safety apparel meeting the requirements of ANSI/ISEA 107-2004 for Class 2 or 3 garment and complying with 71 Fed Reg 67792.

In Section 12-3.01 replace the 1st paragraph with:

In addition to the requirements in Part 6 of the California MUTCD, all devices used by the Contractor in the performance of the work shall conform to the provisions in this Section 12-3.

In Section 12-3.06 in the 1st paragraph, replace the 2nd sentence with:

Construction area signs are shown in or referred to in Part 6 of the California MUTCD.

In Section 12-3.06 in the 4th paragraph, replace the 1st sentence with:

All construction area signs shall conform to the dimensions, color and legend requirements of the plans, Part 6 of the California MUTCD and these specifications.

In Section 12-3.06 in the 8th paragraph, replace the 1st sentence with:

Used signs with the specified sheeting material will be considered satisfactory if they conform to the requirements for visibility and legibility and the colors conform to the requirements in Part 6 of the California MUTCD.

SECTION 14 (BLANK)
(Issued 06-05-09)

Replace Section 14 with:

SECTION 14 ENVIRONMENTAL STEWARDSHIP

14-1 GENERAL

14-1.01 GENERAL

Environmental stewardship includes both environmental compliance and environmental resource management.

If an ESA is shown on the plans:

1. The boundaries shown are approximate; the Department marks the exact boundaries on the ground
2. Do not enter the ESA unless authorized
3. If the ESA is breached, immediately:
   3.1. Secure the area and stop all operations within 60 feet of the ESA boundary
   3.2. Notify the Engineer
4. If the ESA is damaged, the Department determines what efforts are necessary to remedy the damage and who performs the remedy; you are responsible for remedies and charges.

14-2 CULTURAL RESOURCES

14-2.01 GENERAL

Reserved

14-2.02 ARCHAEOLOGICAL RESOURCES

If archaeological resources are discovered at the job site, do not disturb the resources and immediately:

1. Stop all work within a 60-foot radius of the discovery
2. Protect the discovery area
3. Notify the Engineer

The Department investigates. Do not take archaeological resources from the job site. Do not resume work within the discovery area until authorized.

If, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of an archaeological find, or investigation or recovery of archeological materials, you will be compensated for resulting losses, and an extension of time will be granted, in the same manner as provided for in Section 8-1.09, "Right of Way Delays."

If ordered, furnish resources to assist in the investigation or recovery of archaeological resources. This work will be paid for as extra work as specified in Section 4-1.03D, "Extra Work."

14-2.03 ARCHAEOLOGICAL MONITORING AREA

Section 14-2.03 applies if an AMA is described in the Contract.

The Department assigns an archaeological monitor to monitor job site activities within the AMA. Do not work within the AMA unless the archeological monitor is present.

The Engineer and the Department archaeological monitor conduct an AMA location field review with you at least 5 business days before start of work. The Department marks the exact boundaries of the AMA on the ground.

If temporary fence (Type ESA) for an AMA is described in the Contract, install temporary fence (Type ESA) to define the boundaries of the AMA during the AMA location field review.

At least 5 business days before starting work within an AMA, submit a schedule of days and hours to be worked for the Engineer's approval. If you require changes in the schedule, submit an update for the Engineer's approval at least 5 business days before any changed work day.

If archaeological resources are discovered within an AMA, comply with Section 14-2.02, "Archaeological Resources."

14-2.04 HISTORIC STRUCTURES

Reserved

14-3 COMMUNITY IMPACTS AND ENVIRONMENTAL JUSTICE

Reserved

14-4 NATIVE AMERICAN CONCERNS

Reserved

14-5 AESTHETICS

Reserved

14-6 BIOLOGICAL RESOURCES

14-6.01 GENERAL

Reserved

14-6.02 BIRD PROTECTION

Protect migratory and nongame birds, their occupied nests, and their eggs.

The Department anticipates nesting or attempted nesting from February 15 to September 1.

The federal Migratory Bird Treaty Act, 16 USC § 703–711, and 50 CFR Pt 10 and Fish & Game Code §§ 3503, 3513, and 3800 protect migratory and nongame birds, their occupied nests, and their eggs.

The federal Endangered Species Act of 1973, 16 USC §§ 1531 and 1543, and the California Endangered Species Act, Fish & Game Code §§ 2050–2115.5, prohibit the take of listed species and protect occupied and unoccupied nests of threatened and endangered bird species.

The Bald and Golden Eagle Protection Act, 16 USC § 668, prohibits the destruction of bald and golden eagles and their occupied and unoccupied nests.

If migratory or nongame bird nests are discovered that may be adversely affected by construction activities or an injured or killed bird is found, immediately:

1. Stop all work within a 100-foot radius of the discovery.
2. Notify the Engineer.

The Department investigates. Do not resume work within the specified radius of the discovery until authorized.

When ordered, use exclusion devices, take nesting prevention measures, remove and dispose of partially constructed and unoccupied nests of migratory or nongame birds on a regular basis to prevent their occupation, or perform any combination of these. This work will be paid for as extra work as specified in Section 4-1.03D, "Extra Work."

Prevent nest materials from falling into waterways.

Bird protection that causes a delay to the controlling activity is a condition unfavorable to the suitable prosecution of work as specified in Section 8-1.05, "Temporary Suspension of Work."

14-7 PALEONTOLOGICAL RESOURCES

If paleontological resources are discovered at the job site, do not disturb the material and immediately:

1. Stop all work within a 60-foot radius of the discovery
2. Protect the area
3. Notify the Engineer

The Department investigates and modifies the dimensions of the protected area if necessary. Do not take paleontological resources from the job site. Do not resume work within the specified radius of the discovery until authorized.

14-8 NOISE AND VIBRATION

14-8.01 GENERAL

Reserved

14-8.02 NOISE CONTROL

Do not exceed 86 dBa at 50 feet from the job site activities from 9 p.m. to 6 a.m.

Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

14-9 AIR QUALITY

14-9.01 AIR POLLUTION CONTROL

Comply with air pollution control rules, regulations, ordinances, and statutes that apply to work performed under the Contract, including air pollution control rules, regulations, ordinances, and statutes provided in Govt Code § 11017 (Pub Cont Code § 10231).

Do not burn material to be disposed of.

14-9.02 DUST CONTROL

Prevent and alleviate dust by applying water, dust palliative, or both under Section 14-9.01.

Apply water under Section 17, "Watering."

Apply dust palliative under Section 18,"Dust Palliative."

If ordered, apply water, dust palliative, or both to control dust caused by public traffic. This work will be paid for as extra work as specified in Section 4-1.03D, "Extra Work."

14-10 SOLID WASTE DISPOSAL AND RECYCLING

14-10.01 SOLID WASTE DISPOSAL AND RECYCLING

Submit an annual Solid Waste Disposal and Recycling Report between January 1 and 15 for each year work is performed under the Contract at any time during the previous calendar year. Show the types and amounts of project-generated solid waste taken to or diverted from landfills or reused on the project from January 1 through December 31 of the previous calendar year.

Submit a final annual Solid Waste Disposal and Recycling Report within 5 business days after Contract acceptance. Show the types and amounts of project-generated solid waste taken to or diverted from landfills or reused on the project from January 1 to Contract acceptance.

For each failure to submit a completed form, the Department withholds $10,000.

14-11 HAZARDOUS WASTE AND CONTAMINATION

14-11.01 GENERAL

Reserved

14-11.02 ASBESTOS AND HAZARDOUS SUBSTANCES

Upon discovery, immediately stop working in and notify the Engineer of areas where asbestos or a hazardous substance is present if the:

1. Contractor reasonably believes the substance is asbestos as defined in Labor Code § 6501.7 or a hazardous substance as defined in Health & Safety Code §§ 25316 and 25317
2. Presence is not described in the Contract
3. Substance has not been made harmless

14-12 OTHER INTERAGENCY RELATIONS

Reserved

14-13 PAYMENT

Payment for work specified in Section 14 is included in the payment for the bid items involved unless:

1. Bid item for the work is shown in the verified Bid Item List
2. Work is specified as paid for as extra work

ast 2,500 vibrations per minute and must be equipped with amplitude and frequency controls.

The roller's gross static weight must be at least 7.5 tons.

SECTION 19 EARTHWORK

(Issued 09-16-11)

Replace Section 19-1.02 with:

19-1.02 (BLANK)

Replace Section 19-1.03 with:

19-1.03 GRADE TOLERANCE

Immediately prior to placing subsequent layers of material thereon, the grading plane shall conform to one of the following:

A. When hot mix asphalt is to be placed on the grading plane, the grading plane at any point shall not vary more than 0.05 foot above or below the grade established by the Engineer.
B. When subbase or base material to be placed on the grading plane is to be paid for by the ton, the grading plane at any point shall not vary more than 0.10 foot above or below the grade established by the Engineer.
C. When the material to be placed on the grading plane is to be paid for by the cubic yard, the grading plane at any point shall be not more than 0.05 foot above the grade established by the Engineer.

In Section 19-3.025C replace the 1st paragraph with:

Cementitious material used in soil cement bedding shall conform to the provisions in Section 90-2.01, "Cementitious Materials." Supplementary cementitious material will not be required.

In Section 19-3.025C replace the 4th paragraph with:

The aggregate, cementitious material, and water shall be proportioned either by weight or by volume. Soil cement bedding shall contain not less than 282 pounds of cementitious material per cubic yard. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed.

In Section 19-3.06 replace the 9th paragraph with:

Unless otherwise shown on the plans or specified in these specifications or the special provisions, material for structure backfill to be compacted to a relative compaction of not less than 90 percent, except material to be placed behind retaining walls, shall consist of material free of rocks, broken concrete, other solid material exceeding 3 inches in greatest dimension, or organic or other unsatisfactory material.

In Section 19-3.062 replace the 1st paragraph with:

Slurry cement backfill shall consist of a fluid, workable mixture of aggregate, cementitious material, and water.

In Section 19-3.062 replace the 5th paragraph with:

Cementitious material shall conform to the provisions in Section 90-2.01, "Cementitious Materials." Supplementary cementitious material will not be required.

In Section 19-3.062 replace the 8th paragraph with:

The aggregate, cementitious material, and water shall be proportioned either by weight or by volume. Slurry cement backfill shall contain not less than 188 pounds of cementitious material per cubic yard. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed.

SECTION 26 AGGREGATE BASES
(Issued 02-16-07)

In Section 26-1.02A replace the 1st paragraph with:

Aggregate must be clean and free from organic matter and other deleterious substances. Aggregate must consist of any combination of:

1. Broken stone
2. Crushed gravel
3. Natural rough surfaced gravel
4. Sand
5. Up to 100 percent of any combination of processed:

    5.1. Asphalt concrete
    5.2. Portland cement concrete
    5.3. Lean concrete base
    5.4. Cement treated base

In Section 26-1.02B replace the 1st paragraph with:

Aggregate must be clean and free from organic matter and other deleterious substances. Aggregate must consist of any combination of:

1. Broken stone
2. Crushed gravel
3. Natural rough surfaced gravel
4. Sand
5. Up to 100 percent of any combination of processed:

    5.1. Asphalt concrete
    5.2. Portland cement concrete
    5.3. Lean concrete base
    5.4. Cement treated base

SECTION 73 CONCRETE CURBS AND SIDEWALKS
(Issued 06-05-09)

In Section 73-1.01 in the 2nd paragraph, replace item 2 with:

2. Minor concrete shall contain not less than 463 pounds of cementitious material per cubic yard except that when extruded or slip-formed curbs are constructed using 3/8-inch maximum size aggregate, minor concrete shall contain not less than 505 pounds of cementitious material per cubic yard.

In Section 73-1.06 replace the 15th paragraph with:

Where hot mix asphalt or portland cement concrete pavements are to be placed around or adjacent to manholes, pipe inlets or other miscellaneous structures in sidewalk, gutter depression, island paving, curb ramps or driveway areas, the structures shall not be constructed to final grade until after the pavements have been constructed for a reasonable distance on each side of the structures.

SECTION 86 SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS (Issued 01-20-12)

Replace Section 86 with:

SECTION 86 ELECTRICAL SYSTEMS

86-1 GENERAL

86-1.01 DESCRIPTION

Section 86 includes specifications for installing, modifying, and removing:

1. Traffic signal
2. Flashing beacon system
3. Lighting system

Comply with Part 4 of the California MUTCD. Nothing in this Section 86 is to be construed as to reduce the minimum standards in this manual.

The locations of electrical system elements are approximate; the Engineer will approve final location.

86-1.015 DEFINITIONS

Definitions pertain only to Section 86, "Electrical Systems."

actuation: As defined in the California MUTCD.

channel: Discrete information path.

controller assembly: Controller unit and auxiliary equipment housed in a rainproof cabinet to control a system's operations.

controller unit: Part of the controller assembly performing the basic timing and logic functions.

detector: As defined in the California MUTCD.

electrolier: Complete assembly of lighting standard and luminaire.

flasher: Device to open and close signal circuits at a repetitive rate.

flashing beacon control assembly: Switches, circuit breakers, terminal blocks, flasher, wiring, and necessary electrical components all housed in a single enclosure to properly operate a beacon.

inductive loop detector: Detector capable of being actuated by inductance change caused by vehicle passing or standing over the loop.

lighting standard: Pole and mast arm supporting the luminaire.

luminaire: Assembly that houses the light source and controls the light emitted from the light source.

magnetic detector: Detector capable of being actuated by induced voltage caused by vehicle passing through the earth's magnetic field.

powder coating: A coating applied electrostatically using UV-stable polymer exterior grade powder.

pre-timed controller assembly: Operates traffic signals under a predetermined cycle length.

signal face: As defined in the California MUTCD.

signal head: As defined in the California MUTCD.

signal indication: As defined in the California MUTCD.

signal section: As defined in the California MUTCD.

signal standard: Pole and mast arm supporting one or more signal faces with or without a luminaire mast arm.

traffic-actuated controller assembly: Operates traffic signals under the varying demands of traffic as registered by detector actuation.

traffic phase: Signal phase as defined in the California MUTCD.

vehicle: As defined in the California Vehicle Code.

86-1.02 REGULATIONS AND CODE Electrical equipment must comply with one or more of the following:

1. ANSI
2. ASTM
3. 8 CA Code of Regs § 2299 et seq.
4. EIA
5. NEMA
6. NETA
7. UL

Materials and workmanship must comply with:

1. FCC
2. ITE
3. NEC
4. NRTL
5. Public Utilities Commission, General Order No. 95, "Rules for Overhead Electrical Line Construction"
6. Public Utilities Commission, General Order No. 128, "Rules for Construction of Underground Electric Supply and Communication Systems"

86-1.03 COST BREAK-DOWN

Determine quantities required to complete work. Submit the quantities as part of the cost breakdown.

The sum of the amounts for the units of work listed in the cost breakdown must equal the contract lump sum price bid for the work. Include overhead and profit for each unit of work

listed in the cost breakdown. If mobilization is a bid item, include bond premium, temporary construction facilities, and material plants into the mobilization bid item, otherwise, include in each unit of work listed in the cost breakdown. Do not include costs for traffic control system in the cost breakdown.

The cost breakdown may be used to determine partial payment and to calculate payment adjustments for additional costs incurred due to a change order. If a change order increases or decreases the quantities, payment adjustment may be determined under Section 4-1.03B, "Increased or Decreased Quantities."

The cost breakdown must include type, size, and installation method for:

1. Foundations
2. Standards and poles
3. Conduit
4. Pull boxes
5. Conductors and cables
6. Service equipment enclosures
7. Telephone demarcation cabinet
8. Signal heads and hardware
9. Pedestrian signal heads and hardware
10. Pedestrian push buttons
11. Loop detectors
12. Luminaires and lighting fixtures

86-1.04 EQUIPMENT LIST AND DRAWINGS

Within 15 days of contract approval, submit for review a list of equipment and materials that you propose to install. Comply with Section 5-1.02, "Plans and Working Drawings." The list must include:

1. Name of manufacturer
2. Dimension
3. Item identification number
4. List of components

The list must be supplemented by other data as required, including:

1. Schematic wiring diagrams
2. Scale drawings of cabinets showing location and spacing of shelves, terminal blocks, and equipment, including dimensioning
3. Operation manual

Submit 2 copies of the above data. The Engineer will review within 15 days.

Electrical equipment that is manufactured as detailed on the plans will not require detailed drawings and diagrams.

Furnish 3 sets of computer-generated cabinet schematic wiring diagrams.

The cabinet schematic wiring diagram must be placed in a heavy duty plastic envelope and attached to the inside of the door of each cabinet.

Prepare diagrams, plans, and drawings using graphic symbols in IEEE 315, "Graphic Symbols for Electrical and Electronic Diagrams."

86-1.05 CERTIFICATE OF COMPLIANCE

Submit a Certificate of Compliance for all electrical material and equipment to the Engineer under Section 6-1.07, "Certificates of Compliance."

86-1.06 MAINTAINING EXISTING AND TEMPORARY ELECTRICAL SYSTEMS

Keep existing electrical system or approved temporary replacement in working order during the progress of the work. Shutdown is allowed for alteration or removal of the system. Traffic signal shutdown must be limited to normal working hours. Lighting system shutdown must not interfere with the regular lighting schedule.

Notify the Engineer before performing work on the existing system.

Notify the local traffic enforcement agency before traffic signal shutdown.

If existing or temporary system must be modified, work not shown on the plans or specified in the special provisions, but required to keep the system in working order will be paid for as extra work as specified in Section 4-1.03D, "Extra Work."

The State or local agency will:

1. Continue the operation and maintenance of existing electrical facilities
2. Continue to provide electrical energy to operate existing electrical facilities
3. Repair or replace existing facilities damaged by public traffic
4. Pay for electrical energy to operate existing or new facilities undergoing the functional tests described in Section 86-2.14C, "Functional Testing"

Verify location and depth of existing detectors, conduits, pull boxes, and other electrical facilities before using tools or equipment that may damage those facilities or interfere with an electrical system.

Notify the Engineer immediately if existing facility is damaged by your activities. Repair or replace damaged facility promptly. If you fail to complete the repair or replacement, promptly, the State will repair or replace and deduct the costs.

Damaged detectors must be replaced within 24 hours at your expense. If you fail to complete the repair within 24 hours, the State will repair and deduct the repair costs.

If roadway remains open to traffic while an existing lighting system is modified:

1. Keep existing system in working order
2. Make final connection so the modified circuit is in operation by nightfall

Keep temporary electrical installations in working order until no longer required. Remove temporary installations as specified in Section 86-7, "Removing, Reinstalling or Salvaging Electrical Equipment."

These provisions do not void your responsibilities as specified in Section 7-1.12, "Indemnification and Insurance," and Section 7-1.16, "Contractor's Responsibility for the Work and Materials."

During traffic signal system shutdown, place W3-1a, "STOP AHEAD," and R1-1, "STOP," signs in each direction to direct traffic through the intersection. For 2-lane approaches, place 2 R1-1 signs.

W3-1a and R1-1 signs must comply with Section 12-3.06, "Construction Area Signs." Use a minimum size of 30 inches for the R1-1 sign.

Cover signal faces when the system is shut down overnight. Cover temporary W3-1a and R1-1 signs when the system is turned on.

86-1.07 SCHEDULING OF WORK

Except service installation and service equipment enclosure, do not work above ground until all materials are on hand to complete electrical work at each location. Schedule work to allow each system to be completed and ready for operation before opening the corresponding section of the roadway to traffic.

If street lighting exists or is installed in conjunction with traffic signals, do not turn on the signals until the street lighting is energized.

Traffic signals will not be placed in operation until the roadways to be controlled are open to public traffic.

Lighting and traffic signals, including flashing operation, will not be placed in operation before starting the functional test period specified in Section 86-2.14, "Testing."

Do not pull conductors into conduit until:

1. Pull boxes are set to grade
2. Metallic conduit is bonded

The initial traffic signal turn-on must be made between 9:00 a.m. and 2:00 p.m. Before the initial turn-on, all equipment, including pedestrian signals, pedestrian push buttons, vehicle detectors, lighting, signs, and pavement delineation must be installed and in working order. Direct louvers, visors, and signal faces to maximize visibility.

Start functional tests on any working day except Friday or the day before a legal holiday. You must notify the Engineer 48 hours before the start of functional test.

86-1.08 (BLANK)

86-2 MATERIALS AND INSTALLATION

86-2.01 EXCAVATING AND BACKFILLING

Dispose of surplus excavated material under Section 7-1.13, "Disposal of Materials Outside the Highway Right of Way."

Backfill as specified in Section 19-3, "Structure Excavation and Backfill." Compact backfill in conduit trenches outside the hinge point of slopes and not under pavement to a minimum relative compaction of 90 percent. Compact backfill within hinge points and in areas where pavement is to be constructed to a minimum relative compaction of 95 percent.

Backfill trenches and restore sidewalk, pavement, and landscaping at one intersection before starting excavation at another intersection.

If excavating on a street or highway, restrict closure to 1 lane at a time.

86-2.02 REMOVING AND REPLACING IMPROVEMENTS

Replace or reconstruct sidewalk, curb, gutter, concrete pavement, asphalt concrete pavement, underlying material, lawn, plant, and other facilities damaged by your activities. Replacement material must be of equal or better quality than the material replaced. Work must be in a serviceable condition.

If a part of a square or slab of concrete sidewalk, curb, gutter, or driveway is broken or damaged, the entire square or slab must be removed and reconstructed.

Cut outline of PCC sidewalk or driveway to be removed:

1. Using a power-driven saw

2. On a neat line
3. To a 0.17-foot minimum depth

86-2.03 FOUNDATIONS

Except for concrete for cast-in-drilled-hole concrete pile foundation, PCC must comply with Section 90-10, "Minor Concrete."

Construct concrete foundation on firm ground.

After each post, standard, and pedestal is properly positioned, place mortar under the base plate. Finish exposed portion to present a neat appearance. Mortar must comply with Section 51-1.135, "Mortar," except mortar must have:

1. 1 part by volume of cementitious material
2. 3 parts by volume of clean sand

Reinforced cast-in-drilled-hole concrete pile foundation must comply with Section 49, "Piling," except:

1. Material resulting from drilling holes must be disposed of as specified in Section 86-2.01, "Excavating and Backfilling"
2. Concrete for cast-in-drilled-hole concrete pile will not be considered as designated by compressive strength

Form exposed portion of the foundation to present a neat appearance and true to line and grade. The top of a foundation for post and standard must be finished to curb or sidewalk grade. Forms must be rigid and securely braced in place. Conduit ends and anchor bolts must be placed at proper height and position. Anchor bolts must be installed a maximum of 1:40 from vertical and held in place by rigid top and bottom templates. Use a steel bottom template at least 1/2 inch thick that provides proper spacing and alignment of anchor bolts near the embedded bottom end. Install bottom template before placing footing concrete.

Provide new foundation and anchor bolts of the proper type and size for relocated standards.

Steel parts must be galvanized as specified in Section 75-1.05, "Galvanizing."

Provide 2 nuts and washers for the upper threaded part of each anchor bolt. Provide 3 nuts and washers for each anchor bar or stud.

Do not weld high-strength steel used for anchor bolt, anchor bar, or stud.

Before placing concrete, moisten forms and ground. Keep forms in place until the concrete sets for at least 24 hours and is strong enough to prevent damage to surface.

Except if located on a structure, construct foundation for post, standard, and pedestal monolithically.

Apply ordinary surface finish as specified in Section 51-1.18A, "Ordinary Surface Finish."

If a foundation must be extended for additional depth, the extension work will be paid for as extra work as specified in Section 4-1.03D, "Extra Work."

Do not erect post, pole, standard, pedestal, or cabinet until the foundation is set for a minimum of 7 days.

The Engineer will choose the plumbing or raking technique for posts, standards, and pedestals. Plumb or rake by adjusting the leveling nuts before tightening nuts. Do not use shims or similar devices. After final adjustments of both top nuts and leveling nuts on anchorage assemblies have been made, and each post, standard, and pedestal on structure is properly positioned, tighten nuts as follows:

1. Tighten leveling nuts and top nuts, following a crisscross pattern, until bearing surfaces of all nuts, washers, and base plates are in firm contact.
2. Use an indelible marker to mark the top nuts and base plate with lines showing relative alignment of the nut to the base plate.
3. Tighten top nuts, following a crisscross pattern, an additional 1/6th of a turn.

In unpaved areas, construct a raised PCC pad in front of each controller cabinet.

Completely remove foundations not to be reused or abandoned.

If abandoning a foundation, remove the top of foundation, anchor bolts, and conduits to a minimum depth of 0.5 foot below sidewalk surface or original ground. Backfill the resulting hole with material equivalent to the surrounding material.

86-2.04 STANDARDS, STEEL PEDESTALS AND POSTS

Bolts, including anchor bolts, nuts, and washers for signal and lighting support structures must comply with Section 55-2, "Materials." Except for bearing-type connection or slip-base, high-strength bolted connection must comply with Section 55-3.14, "Bolted Connections." Welding, nondestructive testing of welds, and acceptance and repair criteria for steel member nondestructive testing must comply with American Welding Society (AWS) D1.1.

Using stainless steel rivets, attach rectangular corrosion-resistant metal identification tag on all standards and poles, except Type 1:

1. Above the hand hole, near the base of standards and poles
2. On the underside of mast arms near the arm plate

The lettering on each identification tag must be depressed or raised, 1/4 inch tall, legible, and include the following information:

1. Name of the manufacturer
2. Date of manufacture
3. Identification number
4. Contract number
5. Unique identification code that is:

    5.1. Assigned by the manufacturer
    5.2. Traceable to a particular contract and the welds on that component
    5.3. Readable after the support structure is coated and installed

Type 1 standard and steel pedestal for controller cabinet must be manufactured of one of the following:

1. 0.12-inch or thicker galvanized steel
2. 4-inch standard weight galvanized steel pipe as specified in ASTM A 53
3. 4-inch Type 1 conduit with the top designed for post-top slip-fitter

Ferrous metal parts of a standard that has a shaft length of 15 feet or longer must comply with the provisions in Section 55-2, "Materials," and the following:

1. Standard must be manufactured from sheet steel of weldable grade having a minimum yield strength of 40,000 psi after manufacturing.

2. Certified test report verifying compliance with minimum yield strength requirements must be submitted. Test report may be the mill test report for the as-received steel or if the as-received steel has a lower yield strength than required you must provide test data assuring that your method of cold forming will consistently increase the tensile properties of the steel to meet the specified minimum yield strength. Test data must include tensile properties of the steel after cold forming for specific heats and thicknesses.
3. If a single-ply 5/16-inch thick pole is specified, a 2-ply pole with equivalent section modulus may be substituted.
4. Standard may be manufactured of full-length sheets or shorter sections. Each section must be manufactured from 1 or 2 pieces of sheet steel. If 2 pieces are used, the longitudinal welded seams must be directly opposite from one another. If the sections are butt-welded together, the longitudinal welded seams of adjacent sections must be placed to form continuous straight seams from base to top of standard.
5. Butt-welded circumferential joints of tubular sections requiring CJP groove welds must be made using a metal sleeve backing ring inside each joint. The sleeve must be 1/8 inch nominal thickness, or thicker, and manufactured from steel having the same chemical composition as the steel in the tubular sections to be joined. If the sections to be joined have different specified minimum yield strengths, the steel in the sleeve must have the same chemical composition as the tubular section having the higher minimum yield strength. The width of the metal sleeve must be consistent with the type of nondestructive testing selected and must be a minimum width of 1 inch. At fitting time, the sleeve must be centered at the joint and in contact with the tubular section at the point of the weld.
6. Welds must be continuous.
7. Weld metal at the transverse joint must extend to the sleeve, making the sleeve an integral part of the joint.
8. During manufacturing, longitudinal seams on vertical tubular members of cantilevered support structures must be centered on and along the side of the pole that the pole plate is located. Longitudinal seams on horizontal tubular members, including signal and luminaire arms, must be within ±45 degrees of the bottom of the arm.
9. Longitudinal seam weld in steel tubular section may be made by the electric resistance welding process.
10. Longitudinal seam weld must have 60 percent minimum penetration, except:

    10.1. Within 6 inches of circumferential weld, longitudinal seam weld must be CJP groove weld.
    10.2. Longitudinal seam weld on lighting support structure having telescopic pole segment splice must be CJP groove weld on the female end for a length on each end equal to the designated slip-fit splice length plus 6 inches.

11. Exposed circumferential weld, except fillet and fatigue-resistant weld, must be ground flush with the base metal before galvanizing or painting. Ground flush is specified as -0, +0.08-inch.
12. Circumferential weld and base plate-to-pole weld may be repaired only one time.
13. Exposed edges of the plates that make up the base assembly must be finished smooth and exposed corners of the plates must be broken. Provide shafts with slip-fitter shaft caps.
14. Surface flatness requirements of ASTM A 6 apply to plates:

    14.1. In contact with concrete, grout, or washers and leveling nuts

14.2. In high-strength bolted connections
14.3. In joints, where cap screws are used to secure luminaire and signal arms
14.4. Used for breakaway slip-base assemblies

15. Standard must be straight with a maximum variation of:

15.1. 1 inch measured at the midpoint of a 30-foot to 35-foot standard
15.2. 3/4 inch measured at the midpoint of a 17-foot to 20-foot standard
15.3. 1 inch measured 15 feet above the base plate for Type 35 and Type 36 standards

16. Zinc-coated nuts used on fastener assemblies having a specified preload obtained by specifying a prescribed tension, torque value, or degree of turn must be provided with a colored lubricant, clean and dry to the touch. The lubricant color must contrast the zinc coating color on the nut so the presence of the lubricant is visually obvious. Lubricant must be insoluble in water or the fastener components must be shipped to the job site in a sealed container.
17. Do not make additional holes in structural members.
18. Standard with an outside diameter of 12 inches or less must be round. Standard with an outside diameter greater than 12 inches must be round or multisided. Multisided standard must be convex with a minimum of 12 sides and have a minimum bend radius of 4 inches.
19. Manufacture mast arm from material specified for standard.
20. Manufacture cast steel option for slip base from material of Grade 70-40, as specified in ASTM A 27/A 27M. Other comparable material may be used if approved by the Engineer. The casting tolerances must comply with the Steel Founders' Society of America's recommendations for green sand molding.
21. One casting from each lot of a maximum of 50 castings must be radiographed as specified in ASTM E 94. Casting must comply with the acceptance criteria for severity level 3 or better for the types and categories of discontinuities in ASTM E 186 and E 446. If the casting fails the inspection, 2 additional castings must be radiographed. If the 2 additional castings fail the inspection, the entire lot will be rejected.
22. Material certification, consisting of physical and chemical properties, and radiographic film of the casting must be filed at the manufacturer's office. Certification and film must be available for inspection.
23. High-strength bolts, nuts, and flat washers used to connect slip-base plate must comply with ASTM A 325 or A 325M and be galvanized as specified in Section 75-1.05, "Galvanizing."
24. Plate washers must be manufactured by saw cutting and drilling steel plate. Steel plate must comply with AISI 1018 and be galvanized as specified in Section 75-1.05, "Galvanizing." Before galvanizing, remove burrs and sharp edges and chamfer both sides of holes to allow the bolt head to make full contact with the washer without tension.
25. High-strength cap screws for attaching arms to standards must comply with ASTM A 325, A 325M, or A 449, and the mechanical requirements in ASTM A 325 or A 325M after galvanizing. Cap screws must be galvanized as specified in Section 75-1.05, "Galvanizing." Coat threads of cap screws with a colored lubricant, clean and dry to the touch. Lubricant color must contrast the zinc-coating color on the cap screw so the presence of the lubricant is visually obvious. Lubricant must be insoluble in water or the fastener components must be shipped to the job site in a sealed container.

26. Bolted connection attaching signal or luminaire arm to pole must be considered slip critical. Galvanized faying surfaces of plates on luminaire, signal arm, and pole must be roughened by hand using a wire brush before assembly and must comply with requirements for Class C surface conditions for slip-critical connections in "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts," a specification approved by the Research Council on Structural Connections (RCSC). Paint for faying surfaces must be as specified in the RCSC specification for Class B coating.
27. The Engineer will randomly take samples of fastener components from each production lot and submit to the Transportation Laboratory with test reports as specified in ASTM fastener specifications for QA testing and evaluation. The Engineer will determine sample sizes for each fastener component.

Change in mast arm configuration is allowed as long as the mounting height and stability are maintained.

Before manufacturing, details must be adjusted to ensure that cap screw heads can be turned using conventional installation tools. During manufacturing process, to avoid interference with the cap screw heads, the position of the luminaire arm on the arm plate must be properly located.

Configure mast arm as a smooth curving arm.

Push button post, pedestrian barricade, and guard post must comply with ASTM A 53.

Assemble and tighten slip base when pole is on the ground. Threads of heavy hex nuts for each slip-base bolt must be coated with additional lubricant that is clean and dry to the touch. Tighten high strength slip-base bolts to within ±10 foot-pounds of the following:

Slip-Base Bolt-Tightening Requirements

Standard Type	Torque (foot-pounds)
15-SB	150
30	150
31	200
36-20A	165

Hole in shaft of existing standard, due to removal of equipment or mast arms, must be sealed by fastening a galvanized steel disk to cover the hole. Fasten using a single central galvanized steel fastener. Seal edges of disk and hole with polysulfide or polyurethane sealing compound of Type S, Grade NS, Class 25, and Use O, as specified in ASTM C 920.

If existing standard is ordered to be relocated or reused, remove large dents, straighten shafts, and replace parts that are in poor condition. You must furnish anchor bolts or bars and nuts required for relocating or reusing standard. Repair and replacement work will be paid for as extra work as specified in Section 4-1.03D, "Extra Work."

New nuts, bolts, cap screws, and washers must be provided if:

1. Standard or mast arm is relocated
2. Used standard or mast arm is State furnished

If the standard has a slip base, a new keeper plate must be provided.

86-2.05 CONDUIT

Run conductors in conduit except for overhead and where conductors are run inside poles.

You may use a larger size conduit than specified as long as you use it for the entire length between outlets. Do not use reducing coupling.

New conduit must not pass through existing foundations for standards.

86-2.05A Material

Conduit and conduit fitting must be UL or NRTL listed and comply with the following:

Conduit and Conduit Fitting Requirements

Type 1	Hot-dip galvanized rigid steel conduit and conduit couplings must comply with UL 6 and ANSI C80.1. Zinc coating testing must comply with copper sulfate test requirements in UL 6. Conduit couplings for rigid steel conduit must be electrogalvanized.
Type 2	Hot-dip galvanized rigid steel conduit must comply with requirements for Type 1conduit and be coated with polyvinyl chloride (PVC) or polyethylene. Exterior thermoplastic coating must have a minimum thickness of 35 mils. Internal coating must have a minimum thickness of 2 mils. Coated conduit must comply with UL 6; NEMA RN 1; or NRTL PVC-001.
Type 3	Rigid nonmetallic PVC conduit must comply with UL 651. Type A extruded rigid PVC conduit and extruded rigid HDPE conduit must comply with UL 651A. Coilable, smooth-wall, continuous length HDPE conduits must comply with UL 651B. Install at underground locations only.
Type 4	Waterproof flexible metal conduit must consist of conduit with a waterproof non-metallic sunlight-resistant jacket over an inner flexible metal core. Type4 conduit must be UL listed for use as the grounding conductor.
Type 5	Intermediate steel conduit and conduit couplings must comply with UL 1242 and ANSI C80.6. Zinc coating testing must comply with copper sulfate test requirements in UL 1242. Conduit couplings for intermediate rigid steel conduit must be electrogalvanized. Type 5 conduit must only be used if specified.

Bonding bushings to be installed on metal conduit must be insulated and either galvanized or zinc alloy type.

Fittings for steel conduit and for watertight flexible metal conduit must be UL listed at UL 514B.

86-2.05B Use

Install Type 1 conduit on all exposed surfaces and at the following locations:

1. In concrete structures
2. Between a structure and nearest pull box

Exposed conduit installed on painted structure must be painted the same color as the structure.

Change or extend existing conduit runs using the same material. Install pull box if an underground conduit changes from the metallic type to Type 3.

Minimum trade size of conduit must be:

1. 1-1/2 inches from electrolier to adjacent pull box
2. 1 inch from pedestrian push button post to adjacent pull box
3. 2 inches from signal standard to adjacent pull box
4. 3 inches from controller cabinet to adjacent pull box
5. 2 inches from overhead sign to adjacent pull box
6. 2 inches from service equipment enclosure to adjacent pull box
7. 1-1/2 inches if unspecified

Two conduits must be installed between controller cabinet and adjacent pull box.

86-2.05C Installation

Whether shop or field cut, ream ends of conduit to remove burrs and rough edges. Make cuts square and true. Slip joints and running threads are not allowed for coupling conduit. If a standard coupling cannot be used for coupling metal type conduit, use a threaded union coupling that is UL or NRTL listed. Tighten couplings for metal conduit to maintain a good electrical connection through conduit run.

Cut Type 3 conduit with tools that will not deform the conduit. Use solvent weld for connections.

Cut Type 2 conduit with pipe cutters; do not use hacksaws. Coated conduit must be threaded with standard conduit-threading dies. Tighten conduit into couplings or fittings using strap wrenches or approved groove-joint pliers.

Protect shop-cut threads from corrosion as follows:

Shop-Cut Thread Protection

Steel conduit and conduit couplings	ANSI C80.1
Electrical intermediate metal conduit and conduit couplings	ANSI C80.6

Paint conduits as specified in Section 91, "Paint." Apply 2 coats of approved unthinned zinc-rich primer of organic vehicle type. Do not use aerosol cans. Paint the following parts of conduits:

1. All exposed threads
2. Field-cut threads before installing conduit couplings to steel conduit
3. Damaged surfaces on metal conduit

Do not remove shop-installed conduit couplings.

Damaged Type 2 conduit or conduit coupling must be wrapped with at least 1 layer of 2 inch wide, 20 mil minimum thickness PVC tape, as specified in ASTM D 1000, with a minimum tape overlap of 1/2 inch. Before applying the tape, conduit or fitting must be cleaned and painted with 1 coat of rubber-resin based adhesive as recommended by the tape manufacturer. You may

repair damaged spots in the thermoplastic coating by painting over with a brushing type compound supplied by the conduit manufacturer instead of the tape wrap.

The ends of Types 1, 2, or 5 conduit must be threaded and capped with standard pipe caps until wiring is started. The ends of Types 3 and 4 conduit must be capped until wiring is started. If caps are removed, replace with conduit bushings. Fit insulated bonding bushings on the end of metal conduit ending in pull box or foundation. Bell or end bushings for Type 3 conduit must be non-metallic type.

Conduit bends, except factory bends, must have a radius of not less than 6 times the inside diameter of the conduit. If factory bends are not used, bend the conduit without crimping or flattening using the longest radius practicable. Bend conduits as follows:

Conduit-Bending Requirements

Type 1	By methods recommended by the conduit manufacturer and with equipment approved for the purpose.
Type 2	Use standard bending tool designed for use on thermoplastic coated conduit. Conduit must be free of burrs and pits.
Type 3	By methods recommended by the conduit manufacturer and with equipment approved for the purpose. Do not expose conduit to direct flame.
Type 4	--
Type 5	By methods recommended by the conduit manufacturer and with equipment approved for the purpose.

Install pull tape in conduit that is to receive future conductors. The pull tape must be a flat woven lubricated soft-fiber polyester tape with a minimum tensile strength of 1,800 pounds and have printed sequential measurement markings every 3 feet. At least 2 feet of pull tape must be doubled back into the conduit at each end.

Existing underground conduit to be incorporated into a new system must be cleaned with a mandrel or cylindrical wire brush and blown out with compressed air.

Install conduit to a depth of not less than 30 inches below finished grade, except in sidewalk and curbed paved median areas, where it must be at least 18 inches below grade. You may lay conduit on existing pavement within new curbed median.

Conduit coupling must be a minimum of 6 inches from face of foundation.

Place a minimum of 2 inches of sand bedding in the trench before installing Type 2 or Type 3 conduit. Place a minimum of 4 inches of same material over conduit before placing additional backfill material.

Obtain approval from the Engineer before disturbing pavement. If obstruction is encountered, obtain approval from Engineer to cut small holes in the pavement to locate or remove obstruction If jacking or drilling method is used, keep jacking or drilling pit 2 feet away from edge of pavement. Pavement must not be weakened or subgrade softened from excess water use.

Conduit used for drilling or jacking must be removed; install new conduit for completed work. If a hole larger than the conduit is pre-drilled and you install conduit by hand or by method recommended by the conduit manufacturer with equipment approved for purpose, you may install Type 2 or Type 3 conduit under pavement.

If trenching in pavement method is specified, conduit installation under pavement that is not a freeway lane or freeway to freeway connector ramp, must comply with the following:

1. Use Type 3 conduit. Place conduit under pavement in a trench approximately 2 inches wider than the outside diameter of conduit, but not exceeding 6 inches in width. Trench depth must not exceed the greater of 12 inches or conduit trade size plus 10 inches, except that at pull boxes the trench may be hand dug to required depth. The top of the installed conduit must be a minimum of 9 inches below finished grade.
2. Trenching installation must be completed before placing final pavement layer.
3. Cut pavement to be removed with a rock cutting excavator. Minimize shatter outside the removal area.
4. Place conduit in bottom of trench and backfill with minor concrete as specified in Section 90-10, "Minor Concrete.". Minor concrete must contain a minimum of 590 pounds of cementitious material per cubic yard. If the trench is in asphalt concrete pavement and pavement overlay is not placed, backfill the top 0.10 foot of trench with minor HMA.
5. Before spreading HMA, apply tack coat as specified in Section 39, "Hot Mix Asphalt."
6. Backfill trenches, except for the top 0.10 foot, by the end of each day. The top 0.10 foot must be filled within 3 days after trenching.

Conduit installed beneath railroad tracks must be:

1. Type 1 or 2
2. 1-1/2-inch minimum diameter
3. Placed a minimum depth of 42 inches below bottom of the rail

If jacking or drilling method is used, construct jacking pit to a minimum of 13 feet from the centerline of track at the near side of jacking pit. Cover jacking pit with substantial planking if left overnight.

Conduit ending in standard or pedestal must not extend more than 3 inches vertically above the foundation and must be sloped toward the handhole opening. Conduit entering through the side of non-metallic pull box must end inside the box within 2 inches of the wall and 2 inches above the bottom and be sloped toward the top of box to facilitate pulling of conductors. Conduit entering through the bottom of a pull box must end 2 inches above the bottom and be located near the end walls to leave the major portion of the box clear. At outlet, conduit must enter from the direction of the run.

Underground conduit runs, including under sidewalks, that are adjacent to gasoline service stations or other underground gasoline or diesel storage, piping, or pumps and that lead to a controller cabinet, circuit breaker panel, service, or enclosure where an arc may occur during normal operations must be sealed if the conduit is within the limits specified in the NEC for Class 1, Division 1. Use Type 1 or Type 2 conduit for these runs.

Conduit for future use in structures must be threaded and capped. Conduit leading to soffit, wall, or other lights or fixtures below pull box grade must be sealed and made watertight, except where conduit ends in a No. 9 or No. 9A pull box.

Support for conduit in or on wall or bridge superstructure must comply with the following:

1. Steel hangers, steel brackets, and other fittings must comply with Section 75-1.03, "Miscellaneous Bridge Metal."
2. Construct precast concrete conduit cradles using minor concrete and commercial quality welded wire fabric. Minor concrete must comply with Section 90-10, "Minor Concrete," and contain a minimum of 590 pounds of cementitious material per cubic yard.. The cradles must be moist cured for a minimum of 3 days. Bond precast concrete cradles to structure with epoxy adhesives specified in one of the following:

2.1. Section 95-2.03, "Epoxy Resin Adhesive for Bonding New Concrete to Old Concrete"
2.2. Section 95-2.04, "Rapid Set Epoxy Adhesive for Pavement Markers"
2.3. Section 95-2.05, "Standard Set Epoxy Adhesive for Pavement Markers"

3. Use pipe sleeve or form opening for conduit through bridge superstructure concrete. Sleeve or opening through either prestressed member or conventionally reinforced precast member must be:

   3.1. Transverse to the member
   3.2. Through the web
   3.3. Not more than 3 inches maximum gross opening in concrete

4. Where conduits pass through the abutment concrete, wrap conduit with 2 layers of asphalt-felt building paper securely taped or wired in place. Fill space around conduit that runs through bridge abutment wall with mortar as specified in Section 51-1.135, "Mortar," except the proportion of cementitious material to sand must be 1 to 3. Fill the space around conduits that run through abutments after prestressing is completed.
5. Run surface-mounted conduit straight and true, horizontal or vertical on the wall, and parallel to wall on ceiling or other similar surfaces. Support conduit at a maximum of 5-foot intervals or closer where necessary to prevent vibration or unsightly deflection. The supports must include galvanized malleable iron conduit clamps and clamp backs secured with expansion anchorage devices as specified for concrete anchorage devices in Section 75-1.03, "Miscellaneous Bridge Metal." Threaded studs must be galvanized and be of the largest diameter that will pass through the mounting hole in conduit clamp.
6. Where pull boxes are placed in conduit runs, conduit must be fitted with threaded bushings and bonded.
7. Mark location of conduit end in structure, curb, or wall with a "Y" that is a minimum of 3 inches tall, directly above conduit.

86-2.05D Expansion Fittings

Install expansion fitting where the conduit crosses an expansion joint in structure. Each expansion fitting for metal conduit must include a copper bonding jumper having the ampacity specified in NEC.

Each expansion-deflection fitting for expansion joints of 1-1/2-inch movement rating must be watertight and include a molded neoprene sleeve, a bonding jumper, and 2 silicon bronze or zinc-plated iron hubs. Each fitting must allow a minimum of 3/4-inch expansion, contraction, and lateral deflection.

86-2.06 PULL BOXES

86-2.06A (Blank)

86-2.06B Cover Marking

Marking must be clearly defined, uniform in depth, and parallel to either the long or short sides of cover.

Marking letters must be 1 inch to 3 inches high.

Before galvanizing steel or cast iron cover, apply marking by one of the following methods:

1. Use cast iron strip at least 1/4 inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover with 1/4 inch flathead stainless steel machine bolts and nuts. Peen bolts after tightening.
2. Use sheet steel strip at least 0.027-inch thick with letters raised a minimum of 1/16 inch. Fasten strip to cover by spot welding, tack welding, or brazing, with 1/4 inch stainless steel rivets or 1/4 inch roundhead stainless steel machine bolts and nuts. Peen bolts after tightening.
3. Bead weld the letters on cover so that letters are raised a minimum of 3/32 inch.

86-2.06C Installation and Use

Space pull boxes no more than 200 feet apart. You may install additional pull boxes to facilitate the work.

You may use a larger standard size pull box than that shown on the plans or specified.

A pull box in ground or sidewalk area must be installed as follows:

1. Embed bottom of pull box in crushed rock.
2. Place a layer of roofing paper on the crushed rock.
3. Place mortar over the layer of roofing paper. Mortar must be 0.50 inch to 1 inch thick and sloped toward the drain hole.
4. Make a 1-inch drain hole in center of pull box through mortar and roofing paper.
5. Place mortar between pull box and pull box extension, and around conduits.

The top of the pull box must be flush with the surrounding grade or the top of an adjacent curb, except in unpaved areas where the pull box is not immediately adjacent to and protected by a concrete foundation, pole, or other protective construction. Place the pull box 1-1/4 inches above the surrounding grade. Where practical, place a pull box shown in the vicinity of curbs or adjacent to a standard on the side of the foundation facing away from traffic, unless otherwise directed. If a pull box is installed in a sidewalk area, adjust the depth of the pull box so that the top of the pull box is flush with the sidewalk.

Reconstruct the sump of an existing pull box if it is disturbed by your operations. Remove old grout and replace with new if the sump was grouted.

86-2.07 TRAFFIC PULL BOXES

Comply with Sections 86-2.06B, "Cover Marking," and 86-2.06C, "Installation and Use."

Traffic pull box and cover must comply with ASTM C857, "Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures," for HS20-44 loading. You must be able to place the load anywhere on box and cover for 1 minute without causing cracks or permanent deformations.

Frame must be anchored to the box with 1/4" x 2-1/4" concrete anchors. Four concrete anchors must be included for No. 3-1/2(T) pull box; one placed in each corner. Six concrete anchors for must be included for No. 5(T) and No. 6(T) pull boxes; one placed in each corner and one near the middle of each of the longer sides.

Nuts must be zinc plated carbon steel, vibration resistant, and have a wedge ramp at the root of the thread.

After installation of traffic pull box, install steel cover and keep bolted down when your activities are not in progress at the pull box. When steel cover is placed for final time, cover and Z bar frame must be cleaned of debris and tightened securely.

Steel cover must be countersunk approximately 1/4 inch to accommodate bolt head. When tightened, bolt head must not exceed more than 1/8 inch above the top of cover.

Concrete placed around and under traffic pull box must be minor concrete as specified in Section 90-10, "Minor Concrete."

86-2.08 CONDUCTORS AND CABLES

Conductor must be copper wire that complies with ASTM B 3 and B 8.

Wire size must comply with the following:

Wire Size Requirements

Conductor usage	Requirement
In loop detector lead-in cable	ASTM B 286
Everywhere except in loop detector lead-in cable	American Wire Gage (AWG)[a]

[a]Except conductor diameter must not be less than 98 percent of specified AWG diameter.

Single conductor and cable, except detector lead-in cable, must have clear, distinctive, and permanent markings on the outer surface throughout its length. The markings must include the manufacturer's name or trademark, insulation type letter designation, conductor size, voltage, and temperature rating, and for cables, it must also include number of conductors.

86-2.08A Conductor Identification

Conductor insulation must be a solid color with a permanent stripe as specified below. The solid color must be homogeneous through the full depth of insulation. Identification stripe must be continuous throughout the length of conductor. For conductor sizes No. 2 and larger, the insulation may be black and the ends of the conductors must be taped for a minimum length of 20 inches with electrical insulating tape of the required color.

Conductor Identification

Circuit	Signal Phase or Function	Identification			Size
		Insulation Color[i]		Band Symbols[f]	
		Base	Stripe[a]		
Vehicle Signals[a,b,d]	2,6	Red, Yel, Brn	Blk	2,6	14
	4,8	Red, Yel, Brn	Ora	4,8	14
	1,5	Red, Yel, Brn	None	1,5	14
	3,7	Red, Yel, Brn	Pur	3,7	14
	Ramp Meter 1	Red, Yel, Brn	None	NBR	14
	Ramp Meter 2	Red, Yel, Brn	Blk	NBR	14
Pedestrian Signals[d]	2p,6p	Red, Brn	Blk	2p,6p	14
	4p,8p	Red, Brn	Ora	4p,8p	14

	1p,5p	Red, Brn	None	1p,5p	14
	3p,7p	Red, Brn	Pur	3p,7p	14
Pedestrian Push Buttons[d]	2p,6p	Blu	Blk	P-2,P-6	14
	4p,8p	Blu	Ora	P-4,P-8	14
	1p,5p	Blu	None	P-1,P-5	14
	3p,7p	Blu	Pur	P-3,P-7	14
Traffic Signal Controller Cabinet	Ungrounded Circuit Conductor	Blk	None	CON-1	6
	Grounded Circuit Conductor	Wht	None	CON-2	6
Highway Lighting Pull Box to Luminaire	Ungrounded-Line 1	Blk	None	NBR	14
	Ungrounded-Line 2	Red	None	NBR	14
	Grounded	Wht	None	NBR	14
Multiple Highway Lighting	Ungrounded-Line 1	Blk	None	ML1	10
	Ungrounded-Line 2	Red	None	ML2	10
Lighting Control	Ungrounded to PEU	Blk	None	C1	14
	Switching leg from PEU unit or SM transformer	Red	None	C2	14

Service	Ungrounded-Line 1 (Signals)	Blk	None	NBR[e]	6
	Ungrounded-Line 2 (Lighting)	Red[h]	None	NBR[e]	8
Sign Lighting	Ungrounded-Line 1	Blk	None	SL-1	10
	Ungrounded-Line 2	Red	None	SL-2	10
Flashing Beacons[g]	Ungrounded between Flasher and Beacons	Red or Yel	None	F-Loc.[c]	14
Grounded and Common	Pedestrian Push Buttons	Wht	Blk	NBR	14
	Signals and Multiple Lighting	Wht	None	NBR	10
	Flashing Beacons and Sign Lighting	Wht	None	NBR	12
	Lighting Control	Wht	None	C-3	14
	Multiple Service	Wht	None	NBR	14

Railroad Preemption		Blk	None	R	14
Spares		Blk	None	NBR	14

NBR = No Band Required PEU=Photoelectric unit

[a]On overlaps, insulation is striped for 1st phase in designation. e.g., phase (2+3) conductor is striped as for phase 2.

[b]Band for overlap and special phases as required.

[c]Flashing beacons having separate service do not require banding.

[d]These requirements do not apply to signal cable.

[e]"S" if circuit is switched on line side of service equipment by utility.

[f]Band conductors in each pull box and near ends of termination points. On signal light circuits, a single band may be placed around 2 or 3 ungrounded conductors comprising a phase.

[g]Ungrounded conductors between service switch and flasher mechanism must be black and banded.

[h]Black acceptable for size No. 2 and larger. Tape ends for 20 inches with indicated color.

[i]Color Code: Yel-Yellow, Brn-Brown, Blu-Blue, Blk-Black, Wht-White, Ora-Orange, Pur-Purple.

86-2.08B Multiple Circuit Conductors

Conductor for multiple circuit must be UL or NRTL listed and rated for 600 V(ac) operation. Insulation for No. 14 to No. 4 conductors must be one of the following:

1. Type TW PVC as specified in ASTM D 2219
2. Type THW PVC
3. Type USE, RHH, or RHW cross-linked polyethylene

Minimum insulation thickness must comply with the following:

Insulation Thickness

Insulation Type	Conductor Size	Insulation Thickness (mils)
USE, RHH, or RHW	No. 14 to No. 10	39
	No. 8 to No. 2	51
THW or TW	No. 14 to No. 10	27
	No. 8	40
	No. 6 to No. 2	54

Insulation for No. 2 and larger conductor must be one of the types listed above or Type THWN.

Conductor for wiring wall and soffit luminaire must be stranded copper with insulation rated for use at temperatures up to 125 °C.

86-2.08C Signal Cable

Signal cable, except for the 28-conductor type, must:

1. Not be spliced
2. Be marked in each pull box with the signal standard information it is connecting to

Signal cable must comply with the following:

1. Cable jacket must be:

    1.1. Black polyethylene with an inner polyester binder sheath
    1.2. Rated for 600 V(ac) and 75 °C

2. Filler material, if used, must be polyethylene material.
3. Conductor must be solid copper with Type THWN insulation as specified in Section 86-2.08, "Conductors and Cables," and ASTM B 286. The minimum thickness of Type THWN insulation must be 12 mils for conductor sizes No. 14 to No. 12 and 16 mils for conductor size No. 10. The minimum thickness of nylon jacket must be 4 mils.

Conductor Signal Cable Requirements

Cable Type[a]	Conductor Quantity and Type	Cable Jacket Thickness (mils)		Maximum Nominal Outside Diameter (inch)	Conductor Color Code	Remarks
		Average	Minimum			

3CSC	3 - No. 14	44	36	0.40	blue/black, blue/orange, white/black stripe	Use for pedestrian push buttons and spare
5CSC	5 - No. 14	44	36	0.50	red, yellow, brown, black, white	
9CSC	8 - No. 14 1 - No. 12	60	48	0.65	No. 12 - white No. 14 - red, yellow, brown, black, and red/black, yellow/black, brown/black, white/black stripe	
12CSC	11 - No. 14 1 - No. 12	60	48	0.80	No. 12 - white No. 14 - see "12CSC Color Code and Functional Connection" table	Use for vehicle signals, pedestrian signals, spares, and signal common
28CSC	27 - No. 14 1 - No. 10	80	64	0.90	No. 10 - white No. 14 - see "28CSC Color Code and Functional Connection" table	Keep signal commons in each cable separate except at the signal controller. Label each cable as "C1" or "C2" in pull box. Use "C1" for signal phases 1, 2, 3, and 4. Use "C2" for phases 5, 6, 7, and 8.

[a]Conductor signal cable description starts with the number of conductors, followed by "CSC". (e.g., a signal cable with 3 conductors is labeled "3CSC.")

12CSC Color Code and Functional Connection

Color Code	Termination	Phase
Red	Vehicle signal red	2, 4, 6, or 8
Yellow	Vehicle signal yellow	2, 4, 6, or 8
Brown	Vehicle signal green	2, 4, 6, or 8
Red/black stripe	Vehicle signal red	1, 3, 5, or 7
Yellow/black stripe	Vehicle signal yellow	1, 3, 5, or 7
Brown/black stripe	Vehicle signal green	1, 3, 5, or 7
Black/red stripe	Spare, or use as required for red or DONT WALK	
Black/white stripe	Spare, or use as required for yellow	
Black	Spare, or use as required for green or WALK	
Red/white stripe	Ped signal DONT WALK	
Brown/white stripe	Ped signal WALK	

28CSC Color Code and Functional Connection

Color Code	Termination	Phase
Red/black stripe	Vehicle signal red	2 or 6
Yellow/black stripe	Vehicle signal yellow	2 or 6
Brown/black stripe	Vehicle signal green	2 or 6
Red/orange stripe	Vehicle signal red	4 or 8
Yellow/orange stripe	Vehicle signal yellow	4 or 8
Brown/orange stripe	Vehicle signal green	4 or 8
Red/silver stripe	Vehicle signal red	1 or 5
Yellow/silver stripe	Vehicle signal yellow	1 or 5
Brown/silver stripe	Vehicle signal green	1 or 5
Red/purple stripe	Vehicle signal red	3 or 7
Yellow/purple stripe	Vehicle signal yellow	3 or 7
Brown/purple stripe	Vehicle signal green	3 or 7
Red/2 black stripes	Ped signal DONT WALK	2 or 6
Brown/2 black stripes	Ped signal WALK	2 or 6
Red/2 orange stripes	Ped signal DONT WALK	4 or 8
Brown/2 orange stripes	Ped signal WALK	4 or 8
Red/2 silver stripes	Overlap A, C red	OLA, OLC
Brown/2 silver stripes	Overlap A, C green	OLA, OLC
Red/2 purple stripes	Overlap B, D red	OLB, OLD
Brown/2 purple stripes	Overlap B, D green	OLB, OLD
Blue/black stripe	Ped push button	2 or 6
Blue/orange stripe	Ped push button	4 or 8
Blue/silver stripe	Overlap A, C yellow	OLA(y), OLC(y)
Blue/purple stripe	Overlap B, D yellow	OLB(y), OLD(y)
White/black stripe	Ped push button common	
Black/red stripe	Railroad preemption	
Black	Spare	

86-2.09 WIRING

Run conductors in conduit, except for overhead and temporary installations and where conductors are run inside poles.

Solder by hot iron, pouring, or dipping method, connectors and terminal lugs for conductor sizes No. 8 and smaller. Do not perform open-flame soldering.

86-2.09A Circuitry

Do not run traffic signal indication conductors to a terminal block on a standard unless connected to a mounted signal head.

Use only 1 conductor to connect to each terminal of a pedestrian push button.

The common for pedestrian push button circuit must be separate from traffic signal circuit grounded conductor.

86-2.09B Installation

Use a UL- or NRTL-listed inert lubricant for placing conductors in conduit.

Pull conductors into conduit by hand using pull tape specified in Section 86-2.05C, "Installation." Do not use winches or other power-actuated pulling equipment.

If adding new conductors or removing existing conductors, remove all conductors, clean conduit as specified in Section 86-2.05C, "Installation," and pull all conductors in conduit as 1 unit.

If traffic signal conductors are run in lighting standard containing street lighting conductors from a different service point, you must encase the traffic signal conductors or the lighting conductors with a flexible or rigid metal conduit for a length until the 2 types of conductors are no longer in the same raceway.

If less than 10 feet above grade, enclose temporary conductors in flexible or rigid metal conduit.

Leave slack for each conductor as follows:

Conductor Slack Requirements

Location	Slack (feet)
Signal standard	1
Lighting standard	1
Signal and lighting standard	1
Pull box	3
Splice	3
Standards with slip base	0

After conductors are installed, seal ends of conduits with an approved sealing compound.

To form a watertight seal, tape ends of spare conductors and conductors ending in pull boxes.

Conductors and cables inside fixture or cabinet must be neatly arranged and tied together by function with self-clinching nylon cable ties or enclosed in plastic tubing or raceway.

Identify conductors for signal overlap phase as specified for vehicle signals in the table titled "Conductor Identification."

Permanently identify conductors by function. Place identification on each conductor, or each group of conductors forming a signal phase, at each pull box and near the end of conductors.

Label, tag, or band conductors by mechanical methods. Identification must not move along the conductors.

86-2.09C Connectors and Terminals

Connectors and terminals must be UL- or NRTL-listed crimp type. Use manufacturer-recommended tool for connectors and terminals to join conductors. Comply with MIL-T-7928.

Terminate stranded conductors smaller than No. 14 in crimp style terminal lugs.

86-2.09D Splicing and Terminations

Splices are allowed for:

1. Grounded conductors in pull box.
2. Pedestrian push button conductors in pull box.
3. Conductors in pull box adjacent to each electrolier or luminaire.
4. Ungrounded traffic signal conductors in pull box, if traffic signals are modified.
5. Ungrounded traffic signal conductors to a terminal compartment or signal head on a standard with conductors of the same phase in the pull box adjacent to the standard.
6. Ungrounded lighting circuit conductors in pull box, if lighting circuits are modified.

86-2.09E Splice Insulation

Splice must function under continuous submersion in water.

Multi-conductor cable must be spliced and insulated to form a watertight joint and to prevent moisture absorption by the cable.

Low-voltage tape must be:

1. UL or NRTL listed
2. Self-fusing, oil and flame-resistant, synthetic rubber
3. PVC, pressure-sensitive adhesive of 6 mils minimum thickness

Insulating pad must be a combination of an 80-mils thick electrical grade PVC laminate and a 120-mils thick butyl splicing compound with removable liner.

Heat-shrink tubing must comply with the following:

1. Be medium or heavy wall thickness, irradiated polyolefin tubing with an adhesive mastic inner wall.
2. Before contraction, minimum wall thickness must be 40 mils.
3. Heating must be as recommended by the manufacturer. Do not perform open-flame heating.
4. When heated, the inner wall must melt and fill crevices and interstices of the covered object and the outer wall must shrink to form a waterproof insulation.
5. After contraction, each end of the heat-shrink tubing or the open end of end cap of heat-shrink tubing must overlap the conductor insulation at least 1-1/2 inches. Coat ends and seams with electrical insulation coating.
6. Comply with requirements for extruded insulated tubing at 600 V(ac) in UL Standard 468D and ANSI C119.1, and the following requirements:

Heat-Shrink Tubing Requirements

Shrinkage Ratio	33 percent, maximum, of supplied diameter when heated to 125 °C and allowed to cool to 25 °C
Dielectric Strength	350 kV per inch, minimum
Resistivity	25^{13} Ω per inch, minimum
Tensile Strength	2,000 psi, minimum
Operating Temperature	-40 °C to 90 °C (135 °C in emergency)
Water Absorption	0.5 percent, maximum

7. If 3 or more conductors are to be enclosed in 1 splice, place mastic around each conductor before placing inside tubing. Use mastic type recommended by heat-shrink tubing manufacturer.

You may use "Method B" as an alternative method for splice insulation. Use at least 2 thicknesses of electrical insulating pad. Apply pad to splice as recommended by manufacturer.

86-2.095 FUSED SPLICE CONNECTORS

Install a fused disconnect splice connector in each ungrounded conductor, between the line and the ballast, in the pull box adjacent to each luminaire. Connector must be accessible in the pull box.

For 240 and 480 V(ac) circuits, each connector must simultaneously disconnect both ungrounded conductors. Connector must not have exposed metal parts, except for the head of stainless steel assembly screw. Recess head of stainless steel assembly screw a minimum of 1/32 inch below top of plastic boss that surrounds the head.

Splice connector must protect fuse from water or weather damage. Contact between fuse and fuseholder must be spring loaded. Splice connector terminals must be:

1. Rigidly crimped, using a tool recommended by manufacturer of fused splice connector, onto ungrounded conductors
2. Insulated
3. Watertight

Fuses must be standard midget ferrule type, with "Non-Time-Delay" feature, and 13/32" x 1-1/2".

86-2.10 BONDING AND GROUNDING

Secure all metallic components, mechanically and electrically, to form a continuous system that is effectively grounded.

Bonding jumper must be copper wire or copper braid of the same cross sectional area as a No. 8 or larger to match the load. Equipment grounding conductors must be color coded as specified in NEC or be bare.

Attach bonding jumper to standard as follows:

Bonding Jumper Attachment

Standard type	Requirements
Standard with handhole and traffic pull box lid cover	Use UL-listed lug and 3/16-inch diameter or larger brass or bronze bolt. Run jumper to conduit or bonding wire in adjacent pull box. Grounding jumper must be visible after the standard is installed and mortar pad is placed on foundation.
Standard without handhole	Use UL-listed ground clamp on each anchor bolt.
Slip-base standard	Use UL-listed ground clamp on each anchor bolt or attach UL-listed lug to bottom slip-base plate with 3/16-inch diameter or larger brass or bronze bolt.

Ground one side of secondary circuit of step-down transformer.

Ground metal conduit, service equipment, and grounded conductor at service point as specified by NEC and service utility, except grounding electrode conductor must be No. 6 or larger.

Equipment bonding and grounding conductors are required in conduit. Run a No. 8 minimum bare copper wire continuously in conduit system. The bonding wire must be sized as specified in the NEC.

Ground electrode must be:

1. 1 piece
2. 10-foot minimum length of one of the following:

    2.1. Galvanized steel rod or pipe not less than 3/4 inch in diameter
    2.2. Copper clad steel rod not less than 5/8 inch in diameter

3. Installed as specified in NEC
4. Bonded to service equipment using one of the following:

    4.1. Ground clamp
    4.2. Exothermic weld
    4.3. No. 6 or larger copper conductor

On wood pole, metallic equipment mounted less than 8 feet above ground surface must be grounded.

Bond metallic conduit in non-metallic pull box using bonding bushing or bonding jumper.

Bond metallic conduit in metal pull box using bonding bushings and bonding jumpers connected to bonding wire running in the conduit system.

86-2.11 SERVICE

Electrical service installation and materials must comply with service utility requirements.

If service equipment is to be installed on utility-owned pole, you must furnish and install conduit, conductors, and other necessary material to complete service installation. Service utility will decide riser and equipment position.

Install service equipment early on to allow service utility to schedule its work before project completion.

Furnish each service with a circuit breaker that simultaneously disconnects all ungrounded service entrance conductors.

Circuit breakers must:

1. Be quick-break on either automatic or manual operation.
2. Have operating mechanism that is enclosed and trip-free from operating handle on overload.
3. Be trip indicating.
4. Have frame size plainly marked.
5. Have trip rating clearly marked on operating handle.
6. Have overload tripping of breakers not influenced by ambient temperature range of -18 °C to 50 °C.
7. Be internal trip type.
8. Be UL or NRTL listed and comply with UL 489 or equal.
9. Have minimum interrupting capacity of 10,000 A, rms, if used as service disconnect.

Service equipment enclosure must be a NEMA 3R enclosure with dead-front panel and a hasp with a 7/16-inch hole for a padlock. Enclosure must be field marked as specified in the NEC to warn qualified persons of potential electric arc flash hazards.

Service equipment enclosure, except Types II and III, must be galvanized or have a factory-applied rust-resistant prime coat and finish coat.

Types II and III service equipment enclosures must be manufactured from one of the following:

1. Galvanized sheet steel
2. Sheet steel plated with zinc or cadmium after manufacturing
3. Aluminum

Manufacture service equipment enclosure as specified in Section 86-3.04A, "Cabinet Construction." Overlapping exterior seams and doors must comply with requirements for NEMA 3R enclosures in the NEMA Enclosure Standards.

If an alternative design is proposed for Type II or III service equipment enclosure, submit plans and shop drawings to the Engineer for approval before manufacturing.

Except for falsework lighting and power for your activities, when you submit a written request, the Engineer will arrange:

1. With the service utility to complete service connections for permanent installations and the Department will pay all costs and fees required by the service utility. Submit request at least 15 days before service connections are required.
2. For furnishing electrical energy. Energy used before contract completion will be charged to you, except cost of energy used for public benefit as ordered by the Engineer will be paid by the Department or local authorities.

Full compensation for furnishing and installing State-owned or permanent service poles, service equipment, conduit, conductors, and pull boxes, including equipment, conduit, and conductors placed on utility-owned poles, is included in the contract item of electrical work involved and no additional compensation will be allowed therefor.

If the service point is indeterminate and is shown on the plans as "approximate location" or "service point not yet established," the labor and materials required for making the connection

between the service point, when established, and the nearest pull box shown on the plans will be paid for as extra work as specified in Section 4-1.03D, "Extra Work."

86-2.13 LIGHTING AND SIGN ILLUMINATION CONTROL

Enclosure for the circuit breaker for lighting and sign illumination control must:

1. Be NEMA 3R
2. Be galvanized, cadmium plated, or powder-coated
3. Include dead front panel and a hasp with a 7/16 inch diameter hole for padlock

86-2.14 TESTING

86-2.14A Materials Testing

Deliver material and equipment to be tested to either the Transportation Laboratory or a testing location ordered by the Engineer.

Allow 30 days for acceptance testing from the time material or equipment is delivered to test site. You must pay for all shipping, handling, and related transportation costs associated with testing. If equipment is rejected, you must allow 30 days for retesting. Retesting period starts when corrected equipment is delivered to test site. You must pay for all retesting costs. Delays resulting from submittal of non-compliant materials do not relieve you from executing the contract within the allotted time.

If equipment submitted for testing does not comply with specifications, remove the equipment within 5 business days after notification that the equipment is rejected. If equipment is not removed within that period, it may be shipped to you at your expense.

When testing is complete, you will be notified. You must pick up the equipment at the test site and deliver it to the job site.

Testing and quality control procedures for all other traffic signal controller assemblies must comply with NEMA TS Standards for Traffic Control Systems.

86-2.14B Field Testing

Before starting functional testing, perform the following tests in the presence of the Engineer:

86-2.14B(1) Continuity

Test each circuit for continuity.

86-2.14B(2) Ground

Test each circuit for grounds.

86-2.14B(3) Insulation Resistance

Perform insulation resistance test at 500 V(dc) on each circuit between the circuit and a ground. Insulation resistance must be 10 MΩ minimum on all circuits, except for inductive loop detector circuits that must have an insulation resistance value at least 100 MΩ.

86-2.14C Functional Testing

Test periods must comply with Section 86-1.07, "Scheduling of Work."

Acceptance of new or modified traffic signal will be made only after all traffic signal circuits have been thoroughly tested.

Perform functional test to show that each part of the system functions as specified.

Functional test for each new or modified system must include at least 5 business days of continuous, satisfactory operation. If unsatisfactory performance of the system occurs, the condition must be corrected and the system retested until the 5 business days of continuous, satisfactory operation is obtained.

Except for new or modified parts of existing lighting circuit and sign illumination system, the State or local agency will maintain the system during test period and pay the electrical energy cost. Except for electrical energy, you must pay the cost of necessary maintenance performed by the State or local agency on new circuits or on the portions of existing circuits modified under the contract.

Shutdown of electrical system caused by traffic from a power interruption or from unsatisfactory performance of State-furnished materials does not constitute discontinuity of the functional test.

86-2.15 GALVANIZING

Galvanize as specified in Section 75-1.05, "Galvanizing." Cabinet material may be galvanized before manufacturing as specified in ASTM A 653/653M, Coating Designation G 90.

Steel pipe standard and pipe mast arm must be hot-dip galvanized after manufacturing and must comply with Section 75-1.05, "Galvanizing." . Remove spikes from galvanized surfaces.

A minimum of 10 inches of upper end of anchor bolts, anchor bars or studs, and nuts and washers must be galvanized as specified in Section 75-1.05, "Galvanizing."

After galvanizing, bolt threads must accept galvanized standard nuts without requiring tools or causing removal of protective coatings.

Galvanizing existing materials in an electrical installation will not be required.

86-2.16 PAINTING

Paint electrical equipment and material as specified in Section 59, "Painting," and the following:

1. Use paint material specified in Section 91, "Paint."
2. Factory or shop cleaning methods for metals are acceptable if equal to the methods specified.
3. Instead of temperature and seasonal restrictions for painting as specified in Section 59, "Painting," paint may be applied to equipment and materials for electrical installations if ordered by the Engineer.
4. Ungalvanized ferrous surface to be painted must be cleaned before applying prime coat. Blast cleaning is not required.
5. If an approved prime coat is applied by manufacturer, and in good condition, the 1st primer application is not required.
6. Existing equipment to be painted in the field, including State-furnished equipment, must be washed with a stiff bristle brush using a solution of water containing 2 tablespoons of heavy duty detergent powder per gallon. After rinsing, surface must be wire-brushed with a coarse, cup-shaped, power-driven brush to remove badly bonded paint, rust, scale, corrosion, grease, or dirt. Dust or residue remaining after wire brushing must be removed before priming.
7. Do not paint galvanized metal guard post, galvanized equipment, State-furnished controller cabinet, and wood poles for traffic signal or flashing beacon.

8. New galvanized metal surface to be painted in the field must be cleaned as specified for existing equipment before applying the prime coat. Do not wire brush new galvanized surface.
9. After erection, examine exterior surface for damaged primer, clean, and spot coat with primer.
10. Paint Types II and III steel service equipment enclosures with a polymeric or an enamel coating system matching Color No. 14672, light green, of Federal Standard 595B. Coating must be commercially smooth and free of flow lines, paint washout, streaks, blisters, and other defects that would impair serviceability or detract from general appearance. Coating must comply with the following:

    10.1. Coating hardness - Finish must have pencil lead hardness of HB, minimum, using an Eagle Turquoise pencil.
    10.2. Salt spray resistance - Undercutting coating system's film must not exceed 1/8-inch average, from lines scored diagonally and deep enough to expose the base metal, after 336 hours of exposure in a salt spray cabinet complying with ASTM B 117.
    10.3. Adherence - Must not have coating loss when tested as specified in California Test 645. Perform testing by applying coating to 4" x 8" x 0.024" test specimens of the same material as the cabinet, using the same application method.

11. Finish interior of metal signal visor, louver, and front face of back plates with 2 applications of lusterless black exterior grade latex paint formulated for application to properly prepared metal surface. Good condition factory finish will be acceptable.
12. Finish metal signal section, signal head mounting, brackets and fittings, outside of visor, pedestrian push button housing, pedestrian signal section and visor, and back face of back plate with 2 applications of lusterless black or dark olive green exterior grade latex paint formulated for application to properly prepared metal surface. Match dark olive green color to Color Chip No. 68 filed at the Transportation Laboratory.
13. Prepare and finish conduit and conduit fitting above ground the same as adjacent standard or post.
14. Relocated, reset or modified equipment previously finished as specified in this section, except for previously-finished galvanized standard with traffic signal yellow enamel, must be given a spot finishing application on newly primed areas and 1 finishing application over the entire surface. If signal face or mounting brackets are required to be painted under this section, all signal faces and mounting brackets on the same mounting must be repainted.
15. Small rusted or repaired areas of relocated or reset galvanized equipment must be cleaned and painted as specified in Section 75-1.05, "Galvanizing," for repairing damaged galvanized surfaces.
16. Stencil equipment number neatly on the standard or adjacent structure. Obtain number from the Engineer.
17. Perform painting neatly. The Engineer reserves the right to require use of brushes if the work performed by paint spraying machine is unsatisfactory.

86-3 CONTROLLER ASSEMBLIES

86-3.01 CONTROLLER ASSEMBLIES

A controller assembly houses a complete mechanism for controlling the operation of traffic signals or other systems.

Model 170 and Model 2070, specified as a Model 170/2070 controller assembly, includes a Model 170, 170E or 2070 controller unit, a wired cabinet, and all auxiliary equipment required to control the system.

86-3.02 (BLANK)

86-3.03 (BLANK)

86-3.04 CONTROLLER CABINETS

Controller cabinets for controller assemblies other than Model 170/2070 must comply with the following:

86-3.04A Cabinet Construction

Cabinet must be rainproof and the top crowned 1/2 inch or slanted toward the back to prevent standing water.

Cabinet and door must be manufactured from one of the following:

1. 0.073-inch minimum thickness cold-rolled steel with continuously-welded exterior seams
2. 0.073-inch minimum thickness stainless steel with overlapping exterior seams complying with Type 4 enclosures of the NEMA Enclosure Standards
3. 0.125-inch minimum thickness aluminum with continuously-welded exterior seams

Exterior welds must be ground smooth and edges filed to a radius of at least 0.03 inch.

Cabinet manufactured from cold-rolled steel must comply with Section 86-2.16, "Painting," and the following:

1. Cabinet manufactured from cold-rolled steel must be finished with a polymeric or an enamel coating system conforming to Color No. 14672 of Federal Standard 595B.
2. Cabinet must not have coating loss when 2 test specimens, 4" x 8", of the same material and coating as the cabinet are tested. Two 9-inch-diagonal scratches exposing bare metal will be made on a specimen. Soak specimen in demineralized water for 192 hours. Tightly affix a 1-inch wide strip of masking tape to the surface and remove with one quick motion. Specimen showing evidence of blistering, softening, or peeling of paint or coating from the base metal will be rejected. Testing must comply with California Test 645, except passing 180 Degree Bend Test is not required.
3. Metal must be prepared by the 3-step, iron phosphate conversion coating bonderizing technique.
4. Inside walls, doors, and ceiling of the housing must be the same as the outside finish.

Cabinet manufactured from stainless steel must comply with the following:

1. Use annealed or quarter-hard stainless steel that complies with ASTM A 666 for Type 304, Grades A or B.
2. Use gas tungsten arc welding (GTAW) process with bare stainless steel welding electrodes. Electrodes must comply with AWS A5.9 for ER308 chromium-nickel bare arc welding electrodes.
3. Procedures, welder, and welding operator must comply with requirements and practices recommended in AWS C5.5.

4. Ground or brush exposed, exterior surfaces of stainless steel cabinet to a 25 to 50-microinch finish using iron-free abrasives or stainless steel brushes.
5. After grinding or brushing, cabinet must not show rust discoloration when:

    5.1. Exposed for 48 hours in a salt spray cabinet as specified in ASTM B 117
    5.2. Exposed 24 hours in a tap water spray cabinet with the water temperature between 38 °C and 45 °C

6. After the test, cabinet showing rust discoloration anywhere on its surface will be rejected. Rejected cabinets may be cleaned, passivated, and resubmitted for testing.

Cabinet manufactured from aluminum sheet must comply with ASTM B 209 or B 209M for 5052-H32 aluminum sheet, and the following:

1. Use gas metal arc welding (GMAW) process with bare aluminum welding electrodes. Electrodes must comply with AWS A5.10 for ER5356 aluminum alloy bare welding electrodes.
2. Procedures, welder, and welding operator for welding must comply with requirements in AWS B3.0, "Welding Procedure and Performance Qualification," and to practices recommended in AWS C5.6.
3. Surface finish of each aluminum cabinet must comply with MIL-A-8625 for a Type II, Class I coating, except anodic coating must have a minimum thickness of 0.0007 inch and a minimum coating weight of 0.001 ounce per square inch. The anodic coating must be sealed in a 5 percent aqueous solution of nickel acetate, pH 5.0 to 6.5, for 15 minutes at 97 °C. Before applying anodic coating, clean and etch cabinets using the steps below:

    3.1. Clean by immersing into inhibited alkaline cleaner, Oakite 61A, Diversey 909, or equal, 6 to 8 ounces per gallon at 71 °C for 5 minutes.
    3.2. Rinse in cold water.
    3.3. Etch in solution of 1-1/2 ounce of sodium fluoride and 4 to 6 ounces of sodium hydroxide per gallon of distilled water at 60 °C to 65 °C for 5 minutes.
    3.4. Rinse in cold water.
    3.5. Immerse in 50 percent by volume nitric acid solution at room temperature for 2 minutes.
    3.6. Rinse in cold water.

Cabinet must have:

1. Single front door with:

    1.1. 44-inch maximum door width.
    1.2. Lock, when closed and latched, that is locked.
    1.3. Police panel mounted on door, equipped with a keyed lock and 2 police keys. Each police key must have a shaft at least 1-3/4 inch in length.

2. Dust-tight gasketing on all door openings, permanently bonded to the metal. Mating surface of the gasketing must be covered with silicone lubricant to prevent sticking.
3. Handle that:

3.1. Allows padlocking in closed position
3.2. Has a minimum length of 7 inches
3.3. Has a 5/8-inch, minimum, steel shank
3.4. Is manufactured of cast aluminum, or zinc-plated or cadmium-plated steel

4. Cabinet door frame with:

4.1. Latching mechanism that:

4.1.1. Holds tension on and forms a firm seal between door gasketing and frame.
4.1.2. Is a 3-point cabinet latch with nylon rollers that have a minimum diameter of 3/4 inch and equipped with ball bearings.
4.1.3. Has a center catch and a pushrod made of zinc-plated or cadmium-plated steel. Pushrod must be at least 1/4" x 3/4" and turned edgewise at outer supports. Cadmium plating must comply with MIL-QQ-416. Zinc plating must comply with MIL-QQ-325.

4.2. Hinging that:

4.2.1. Has 3-bolt butt hinges, each having a stainless steel fixed pin. Hinges must be stainless steel or may be aluminum for aluminum cabinet.
4.2.2. Is bolted or welded to the cabinet. Hinge pins and bolts must not be accessible when door is closed.
4.2.3. Has a catch to hold the door open at 90 degrees and 180 degrees, ± 10 degrees, if a door is larger than 22 inches in width or 6 square feet in area. Catch must be at least 3/8-inch diameter, stainless steel plated rod capable of holding door open at 90 degrees in a 60 mph wind at an angle perpendicular to the plane of the door.

5. Lock that:

5.1. Is solid brass, 6-pin tumbler, rim type
5.2. Has rectangular, spring-loaded bolts
5.3. Is left hand and rigidly mounted with stainless steel machine screws approximately 2 inches apart
5.4. Extends 1/8 to 3/8 inch beyond the outside surface of door

6. 2 keys that are removable in the locked and unlocked positions.

Submit alternative design details for review and approval before manufacturing cabinet.
Use metal shelves or brackets that will support controller unit and auxiliary equipment.
Machine screws and bolts must not protrude outside the cabinet wall.

86-3.04B Cabinet Ventilation

Each controller cabinet must have:

1. 8 screened, 1/2-inch diameter or larger, raintight vent holes, in lower side or bottom of cabinet. You may use louvered vents with a permanent metal mesh or 4-ply woven polypropylene air filter held firmly in place, instead.

2. Electric fan with ball or roller bearings and capacity of at least 100 cubic feet per minute. Fan must be thermostatically controlled and manually adjustable to turn on between 32 °C and 65 °C with a differential of not more than 6 °C between automatic turn on and turn off. Fan circuit must be fused at 125 percent of ampacity of installed fan motor.

Fan and cabinet vent holes must be positioned to direct bulk of airflow over controller unit or through ventilating holes of controller unit.

86-3.04C Cabinet Wiring

Conductors used in controller cabinet wiring must:

1. Be neatly arranged and laced, or enclosed in plastic tubing or raceway.
2. End with properly sized captive or spring-spade terminal or be soldered to a through-panel solder lug on the back side of the terminal block. Apply crimp-style connector with proper tool to prevent opening of handle until crimp is completed.

Controller cabinet must have an equipment grounding conductor bus that is grounded to the cabinet and connected to metal conduit system or other approved ground with a No. 8, or larger, grounding conductor.

With all cabinet equipment in place and connected, resistance between grounded conductor terminal bus and equipment grounding conductor bus must be 50 MΩ, minimum, when measured with an applied voltage of 150 V(dc).

If direct current is to be grounded, connect to equipment ground only.

Use two or more terminal blocks for field connection. Install field terminal within 22 inches from front of cabinet and orient for screwdriver operation. Terminal must be a minimum of 5 inches above foundation.

No more than 3 conductors per terminal are allowed. Two flat metal jumpers, straight or U shaped, may be placed under terminal screw. At least 2 full threads of terminal screws must be fully engaged when screw is tightened. Live parts must not extend beyond the barrier.

86-3.05 CABINET ACCESSORIES

86-3.05A Labels

Include permanently printed, engraved, or silk-screened label for equipment and removable items of equipment.

Labeling must match cabinet wiring diagram. Label for shelf-mounted equipment must be on shelf face below item. Label for wall-mounted equipment must be below item.

86-3.05B Convenience Receptacle

Mount convenience receptacle in a readily accessible location inside the cabinet.

Convenience receptacle must be a duplex, 3-prong, NEMA 5-15R grounding type outlet that complies with UL Standard 943.

86-3.05C Surge Arrestor

Surge arrestor must reduce effects of power line voltage transients and have ratings as follows:

Surge Arrestor Requirements

Recurrent peak voltage	184 V(ac)
Energy rating, maximum	20 J
Power dissipation, average	0.85 W
Peak current for pulses less than 7 μs	1,250 A

Standby current must be 1 mA or less for 120 V(ac), 60 Hz sinusoidal input.

86-3.05D Terminal Blocks

Terminal block must be rated 600 V(ac), minimum, and have nickel-, silver-, or cadmium-plated brass binder head screw terminal.

Heavy duty terminal block must be rated at 20 A and have 12 position with No. 10 x 5/16-inch nickel-plated brass binder head screws and nickel-plated brass inserts. Each position must have 2 screw-type terminals. Terminal block must be barrier type with shorting bars in each of the 12 positions, and must have integral type marking strips.

Light duty terminal block must be rated at 5 A and have 12 positions with No. 6 x 1/8 inch binder head screws. Each position must have 1 screw-type terminal.

86-3.06 COMPONENTS

86-3.06A Toggle Switches

Toggle switch must:

1. Have poles as required
2. Be rated at 200 percent of circuit current for circuits of 10 A or less and 125 percent of circuit current for circuits over 10 A

86-3.06B Cartridge Fuses

Install cartridge fuse in panel-mounted fuseholder. Fuse type and rating must be as recommended by the fuse manufacturer for protecting the load.

86-3.06C Circuit Breakers

Circuit breaker must comply with Section 86-2.11, "Service," except breaker must have a minimum interrupting capacity of 5,000 A, rms.

86-3.06D Connectors

Use connector designed to interconnect various parts of circuit together and constructed for the application involved. Design connector for positive connection of circuit and easy insertion and removal of mating contacts. Connector must be permanently keyed to prevent improper connection of circuit.

Connector, or device plugging into connector, must have positive connection to prevent a circuit from breaking due to vibration, a pull on connecting cable, or similar disruptive force.

86-4 TRAFFIC SIGNAL FACES AND FITTINGS

86-4.01 VEHICLE SIGNAL FACES

Each vehicle signal face must:

1. Be adjustable and allow for 360-degree rotation about vertical axis
2. Comply with ITE publication ST-017B, "Vehicle Traffic Control Signal Heads"
3. Comply with California Test 604, except for arrow and "X" faces
4. Have 3 sections arranged vertically: red at top, yellow at center, and green at bottom
5. Be of the same manufacturer and material, if more than 1 is installed at an intersection, except for programmed visibility type
6. Be sealed with neoprene gasket at top opening
7. Be LED modules

86-4.01A Signal Sections

Each signal section must comply with the following:

1. Maximum height must be 10-1/4 inches for an 8-inch section and 14-3/4 inches for a 12-inch section.
2. Housing must:

    2.1. Be either die-cast or permanent mold-cast aluminum, or if specified, be structural plastic.
    2.2. Comply with ITE publication ST-017B if die-cast or permanent mold-cast aluminum is used.
    2.3. Have a 1-piece, hinged, square-shaped door designed to allow access for relamping without the use of tools. Door must be secured to hold the door closed during loading tests. Module or lens must be watertight and mounted in the door.

3. Hinge pins, door latching devices, and other exposed hardware must be Type 304 or 305 stainless steel. Interior screws and fittings must be stainless steel, or steel with a corrosion resistant plating or coating.
4. Opening must be placed on top and bottom to receive 1-1/2-inch pipe. The 8-inch and 12-inch sections of an individual manufacturer must be capable of joining to form a signal face in any combination. This interchangeability is not required between metal and plastic sections.
5. Gaskets must be made of a material that is not affected if installed in a section with metal or plastic housing that is continuously operated for 336 hours.

Structural failure is described as follows:

Signal Section Structural Failure

Signal Section Type	Requirements	Description of Structural Failure
Metal	California Test 666	Fracture within housing assembly or deflection of more than half the lens diameter of signal section during wind load test
Plastic	California Test 605	Fracture within housing assembly or deflection of more than 10 degrees in either the vertical or horizontal plane after wind load has been removed from front of signal face, or deflection of more than 6 degrees in either the vertical or horizontal plane after wind load has been removed from back of signal face

86-4.01A(1) Metal Signal Sections

Each metal signal section must have a metal visor. Metal signal faces requiring backplates must have metal backplates.

86-4.01A(2) Plastic Signal Sections

Housing must be molded in 1 piece, or fabricated from 2 or more pieces and joined into a single piece. Plastic must have ultraviolet stability, be unaffected by lamp heat, and be self-extinguishing. Housing and door must be colored throughout and be black, matching Color No. 17038, 27038, or 37038 of Federal Standard 595B.

Each face section must be joined to adjacent section by one of the following:

1. Minimum of 3 machine screws for 8-inch sections and 4 machine screws for 12-inch sections, installed through holes near front and back of housing. Each screw must be a No. 10 and have a nut, flat washer, and lock washer.
2. Two machine screws, each with a nut, flat washer, and lock washer, installed through holes near the front of the housing, and a fastening through the 1-1/2-inch pipe opening. Fastening must have 2 large flat washers to distribute the load around the pipe opening and 3 carriage bolts, each with a nut and lock washer. Minimum screw size must be No. 10. Minimum carriage bolt size must be 1/4 inch.

Supporting section of each signal face supported only at top or bottom must have reinforcement.

Reinforcement plate must be either sheet aluminum, galvanized steel, or cast aluminum. Each plate must be a minimum of 0.11-inch thick and have a hole concentric with 1-1/2-inch pipe-mounting hole in the housing. Place reinforcement plate as follows:

Reinforcement Plate Placement

Type of Reinforcement Plate	Placement
Sheet aluminum	Inside and outside of housing
Galvanized steel	Inside of housing
Cast aluminum	Outside of housing

Reinforcement plates placed outside of the housing must be finished to match signal housing color and be designed to allow proper serrated coupling between signal face and mounting hardware. Minimum of 3 No. 10 machine screws must be installed through holes in each plate and matching holes in the housing. Each screw must have a round or binder head, a nut, and lock washer.

If signal face is supported by a Type MAS side attachment slip-fitter inserted between 2 sections, place spacers between the 2 sections. Vertical dimension of spacers must allow proper seating of serrations between the slip-fitter and the 2 sections. In addition to the fastening through the large openings in housing, the 2 sections must join with at least 2 machine screws through holes near the front of housing and the spacers, and through matching holes in a reinforcing plate installed in housing. Machine screws must be No. 10 minimum size. Spacers must be made of same material as signal housing.

If reinforcing webs are used to connect back of housing to top, bottom, and sides, reinforcing plates are not required.

Holes for machine screws must be either cast or drilled during signal section manufacturing. Surround each hole with a 1/8-inch minimum width boss to allow contact between signal sections about axis of hole.

Each plastic signal section must have a plastic or metal visor. Plastic signal faces requiring backplates must have plastic backplates.

Serrated nylon washer must be inserted between each plastic signal section and metal mounting assembly. Each washer must be between 3/16- and 1/4-inch thick. Serrations must match those on signal section and mounting assembly.

86-4.01B Electrical Components

Conductors must be connected to a terminal block mounted inside, at the back of housing. Terminal block must have enough screw type terminals or NEMA type tab connectors to end all field and module or lamp conductors independently. Permanently identify terminal with field conductors attached or color code conductors to facilitate field wiring.

86-4.01C Visors

Include removable visor with each signal section. Comply with ITE publication ST-017B. Visors are classified by lens enclosure as full circle, tunnel or cap. Bottom opens for tunnel type and both, bottom and lower sides open for cap type. Visors must be tunnel type.

Visor must have a downward tilt between 3 and 7 degrees with a length of:

1. 9-1/2-inch minimum for nominal 12-inch round lenses
2. 7 inch for nominal 8-inch round lenses

Metal visor must be formed from 0.050-inch, minimum thickness, aluminum alloy sheet.

Plastic visor must be either formed from sheet plastic or assembled from one or more injection, rotational, or blow-molded plastic sections. Material must be of a black homogeneous color with lusterless finish. Sections must be joined using thermal, chemical, or ultrasonic bonding, or with aluminum rivets and washers permanently colored to match visor.

Secure each visor to its door and prevent removal or permanent deformation when wind load specified in California Test 605 for plastic visors or 666 for metal visors is applied to its side for 24 hours.

If directional louvers are used, fit louvers snuggly into full-circular signal visors. Outside cylinder must be constructed of 0.030-inch nominal thickness, or thicker, sheet steel and vanes

must be constructed of 0.016-inch nominal thickness, or thicker, sheet steel, or the cylinder and vanes must be constructed of 5052-H32 aluminum alloy of equal thickness.

86-4.02 (BLANK)

86-4.03 (BLANK)

86-4.04 BACKPLATES

Background light must not be visible between backplate and signal face or between sections.

Plastic backplates must be either formed from sheet plastic or assembled from extruded, molded, or cast sections. Sections must be factory joined using one of the following:

1. Appropriate solvent cement
2. Aluminum rivets and washers painted or permanently colored to match backplate
3. No. 10 machine screws with washers, lock washers, and nuts, painted to match backplate

Backplate material must be of black homogeneous color with a lusterless finish. Secure each plastic backplate to the plastic signal face in a manner that prevents its removal or permanent deformation when the wind-load test is applied to either the front or back of signal face. Permanent deformation of any portion of backplate must not exceed 5 degrees forward or backward after wind loading is applied for 24 hours.

If plastic backplate requires field assembly, join with at least 4 No. 10 machine screws at each field-assembled joint. Each machine screw must have an integral or captive flat washer, a hexagonal head slotted for a standard screwdriver, and either a locking nut or a nut and lockwasher. Machine screws, nuts, and washers must be stainless steel or steel with a zinc or black-oxide finish.

If a metal backplate has 2 or more sections, fasten sections with rivets or aluminum bolts peened after assembly to avoid loosening.

Instead of the screws shown on the plans, you may use self-threading No. 10 steel screws to fasten plastic backplates to plastic signal face. Each screw must have an integral or captive flat washer, a hexagonal head slotted for a standard screwdriver, and is stainless steel or steel with a zinc or black-oxide finish.

86-4.06 PEDESTRIAN SIGNAL FACES

Message symbols for pedestrian signal faces must be white "WALKING PERSON" and Portland orange "UPRAISED HAND." Comply with ITE Standards: "Pedestrian Traffic Control Signal Indications" and California MUTCD. Each symbol's height must be at least 10 inches and width must be at least 6-1/2 inches.

Luminance of "UPRAISED HAND" symbol must be 1,100 foot-lamberts, minimum, and luminance of "WALKING PERSON" symbol must be 1,550 foot-lamberts, minimum, when tested as specified in California Test 606.

Uniformity ratio of an illuminated symbol must not exceed 4 to 1 between the highest luminance area and the lowest luminance area.

Luminance difference between a nonilluminated symbol and the background around the symbol must be less than 30 percent when viewed with the visor and front screen in place and at a low sun angle.

Each housing, including front screen, must have maximum overall dimensions of 18-1/2-inch width, 19-inch height, and 11-1/2-inch depth.

All new pedestrian signal faces installed at an intersection must be the same make and type.

86-4.06A Type A

Each Type A pedestrian signal face must include a housing, 1 LED pedestrian signal combo module and a front screen.

86-4.06B Front Screen

Front screen installation for each Type A signal must comply with one of the following:

1. Install, tilting downward, at an angle of 15±2 degrees out from the top, an aluminum honeycomb screen with 0.2-inch cells, 3/8-inch thick, or a plastic screen of 3/8-inch squares, 1/2-inch thick with wall thickness of 1/16-inch. Completely cover message plate. Include a clear front cover of 1/8-inch minimum thickness acrylic plastic sheet or 1/16-inch minimum thickness polycarbonate plastic. Hold screen and cover firmly in place with stainless steel or aluminum clips or stainless steel metal screws.
2. Install a 1-1/2-inch deep eggcrate or Z crate type screen of 1/32-inch nominal thickness polycarbonate. Mount screening in a frame constructed of 0.040-inch minimum thickness aluminum alloy or polycarbonate. Install screen parallel to face of message plate and hold in place with stainless steel screws.

The Department will test screens in a horizontal position with its edges supported. When a 3-inch diameter, 4-pound steel ball is dropped on the screen from a height of 4 feet above, the front screen must not fracture, separate at the welds, or compress more than 1/8-inch. When pedestrian housing is used to support front screen during test, remove message plate from pedestrian signal housing, so there is no back support for the screen.

Screen and frame must be one of the following:

1. Manufactured from aluminum anodized flat black
2. Finished with lusterless black exterior grade latex paint formulated for application to properly prepared metal surfaces
3. Manufactured from flat black plastic

86-4.06C Housing

Pedestrian signal housing must comply with Section 86-4.01A, "Signal Sections."

86-4.06D Finish

Paint exterior of each housing as specified in Section 86-2.16, "Painting."

86-4.06E Control

Pedestrian signals must be controllable by solid-state switching devices specified for traffic signal controller assemblies.

86-4.06F Terminal Blocks

Include light duty terminal block, as specified in Section 86-4.01B, "Electrical Components," with each pedestrian signal face.

86-4.07 (BLANK)

86-4.08 SIGNAL MOUNTING ASSEMBLIES

Signal mounting assembly must include:

1. 1-1/2-inch standard steel pipe or galvanized conduit
2. Pipe fitting made of ductile iron, galvanized steel, aluminum alloy Type AC-84B No. 380, or bronze
3. Mast arm and post top slip-fitters, and terminal compartments made of cast bronze or hot-dip galvanized ductile iron

After installation, clean and paint exposed threads of galvanized conduit brackets and bracket areas damaged by wrench or vise jaws. Use wire brush to clean and apply 2 coats of approved unthinned zinc-rich primer, organic vehicle type, as specified in Section 91, "Paint." Do not use aerosol can.

Fit each terminal compartment with a terminal block having a minimum of 12 positions, each with 2 screw-type terminals. Each terminal must accommodate at least five No. 14 conductors. Include a cover on compartment for ready access to terminal block. Terminal compartment used to bracket mount signals must be bolted securely to pole or standard.

Horizontal dimension of mounting assembly members between vertical centerline of terminal compartment or slip-fitter, and the vertical centerline of each signal face must not exceed 11 inches, except where required for proper signal face alignment or to allow programming of programmed visibility signal faces.

Mounting assembly members must be plumb or level, symmetrically arranged, and securely assembled.

Mounting assembly must be watertight, and free of sharp edges or protrusions that might damage conductor insulation. Include positive locking serrated fittings that, if mated with similar fittings on signal faces, will prevent faces from rotating.

Orient each mounting assembly to allow maximum horizontal clearance to adjacent roadway.

Use slip-fitter for post-top mounting of signals. Fit slip-fitter over a 4-1/2-inch outside diameter pipe or tapered standard end. Include cadmium-plated steel set screws. Include an integral terminal compartment for each slip-fitter used to post-top mount signals with brackets.

Do not install signal faces at an intersection until all other signal equipment, including complete controller assembly, is in place and ready for operation. You may mount signal faces if covered or not directed toward traffic.

86-4.09 FLASHING BEACONS

Flashing beacon must include:

1. Single section traffic signal face with yellow or red LED module indications
2. Backplate
3. Tunnel visor
4. Flashing beacon control assembly

Beacon flasher unit must be independent of intersection flasher unit.

86-4.09A Flashing Beacon Control Assembly

86-4.09A(1) Enclosure

Enclosure must be:

1. NEMA 3R with a dead front panel and a hasp with a 7/16-inch hole for a padlock
2. Powder coated, hot-dip galvanized, or factory-applied rust resistant prime coat and finish coat

86-4.09A(2) Circuit Breakers and Switches

Circuit breakers must comply with Section 86-2.11, "Service."

Switch for manually operating sign lighting circuit must be a single-hole-mounting toggle type with a single pole and throw and rated at 12 A, 120 V(ac). Furnish switch with an indicating nameplate reading "Auto-Test."

86-4.09A(3) Flasher

Comply with Section 8, "Solid-State Flashers," of NEMA Standards publication No. TS 1.

Flasher must be a solid-state device with no contact points or moving parts.

Include 2 output circuits to allow alternate flashing of signal faces. Flasher must be able to carry a minimum of 10 A per circuit at 120 V(ac).

86-4.09A(4) Wiring

Conductors and wiring in the enclosure must comply with Section 86-2.09B(1), "Cabinet and Enclosure Installation."

86-4.09A(5) Terminal Blocks

Terminal blocks must be:

1. Rated 25 A, 600 V(ac)
2. Molded phenolic or nylon material
3. Barrier type with plated brass screw terminals and integral marking strips

86-5 DETECTORS

86-5.01 VEHICLE DETECTORS

Sensor unit and isolator must comply with TEES.

86-5.01A Inductive Loop Detectors

86-5.01A(1) General

Inductive loop detector includes a completely installed loop or group of loops, in the roadway, lead-in cable, and a sensor unit, with power supply installed in a controller cabinet.

86-5.01A(2) (Blank)

86-5.01A(3) Construction Materials

Conductor for each inductive loop detector must be continuous, unspliced, and one of the following:

Conductor Options for Inductive Loop Detector

Option	Specifications
Type 1 loop wire	Type RHW-USE neoprene-jacketed or Type USE cross-linked polyethylene insulated, No. 12, stranded copper wire with a 40 mils minimum thickness at any point.
Type 2 loop wire	Type THWN or Type XHHW, No. 14, stranded copper wire in a plastic tubing. Plastic tubing must be polyethylene or vinyl, rated for use at 105 °C, and resistant to oil and gasoline. Outside diameter of tubing must be 0.27 inch maximum with a wall thickness of 0.028 inch minimum.

Conductor for loop detector lead-in cable must be two No. 16, 19 x 29, stranded, tinned copper wires, comply with the calculated cross sectional area of ASTM B 286, Table 1, and be one of the following:

Conductor Options for Loop Detector Lead-In Cable

Option	Specifications
Type B lead-in cable	Insulated with 20 mils of high-density polyethylene. Conductors must be twisted together with at least 2 turns per foot and the twisted pair must be protected with a copper or aluminum polyester shield. A No. 20, minimum, copper drain wire must be connected to equipment ground within cabinet. Cable must have a high-density polyethylene or high-density polypropylene outer jacket with a nominal thickness of 32 mils. Include an amorphous interior moisture penetration barrier of nonhydroscopic polyethylene or polypropylene fillers.
Type C lead-in cable	Comply with International Municipal Signal Association (IMSA) Specification No. 50-2. A No. 20, minimum, copper drain wire must be connected to equipment ground within cabinet.

86-5.01A(4) Installation Details

Install loop conductors without splices and end in nearest pull box. Seal open end of cable jacket or tubing similar to splicing requirements to prevent water from entering. Do not make final splices between loops and lead-in cable until loop operations under actual traffic conditions is approved.

Splice all loop conductors for each direction of travel for same phase of a traffic signal system, in same pull box, to a detector lead-in cable that runs from pull box adjacent to loop detector to a sensor unit mounted in controller cabinet.

End all loop conductors in a pull box or terminal strip in the cabinet.

Identify and band conductors for inductive loop installations. Band, in pairs, by lane, in the pull box adjacent to the loops and near the end of conductors in the cabinet. Bands must comply with Section 86-2.09, "Wiring."

If HMA surfacing is to be placed, install loop conductors before placing uppermost layer of HMA. Install conductors in compacted layer of HMA immediately below the uppermost layer. Install conductors as shown on the plans, except fill slot with sealant flush to the surface.

When cutting loops:

1. Residue from slot cutting activities must not be allowed to flow across shoulders or lanes occupied by public traffic and must be removed from the pavement surface before residue flows off. Dispose of residue from slot cutting activities under Section 7-1.13, "Disposal of Materials Outside the Highway Right of Way."
2. Surplus sealant must be removed from adjacent road surface without using solvents before setting.

Sealant for filling slots must comply with one of the following:

Elastomeric Sealant

Polyurethane material that will, within stated shelf life, cure only in the presence of moisture. Sealant must be suitable for use in both HMA and PCC.

The cured sealant must have the following performance characteristics:

Performance Characteristics of Cured Sealant

Specification	ASTM	Requirement
Hardness (indentation) at 25 °C and 50% relative humidity. (Type A, Model 1700 only)	D 2240 Rex.	65-85
Tensile Strength: Pulled at 508 mm per minute	D 412 Die C	3.45 MPa, min.
Elongation: Pulled at 508 mm per minute	D 412 Die C	400%, min.
Flex at -40 °C: 0.6-mm free film bend (180°) over 13-mm mandrel	--	No cracks
Weathering Resistance: Weatherometer 350 h, cured 7 days at 25 °C @ 50% relative humidity	D 822	Slight chalking
Salt Spray Resistance: 28 days at 38 °C with 5% NaCl, Die C & pulled at 508 mm per minute	B 117	3.45 MPa, min. tensile 400%, min. elongation
Dielectric Constant over a temperature range of -30 °C to 50 °C	D 150	Less than 25% change

Asphaltic Emulsion Sealant

Comply with State Specification 8040-41A-15. Use for filling slots in HMA pavement that are a maximum of 5/8 inch in width. Do not use where the slope causes the material to run from the slot. Material must not be thinned beyond manufacturer's recommendations. Place material when air temperature is at least 7 °C.

Hot-Melt Rubberized Asphalt Sealant

Hot-melt rubberized asphalt must be:

1. In solid form at room temperature and fluid at application temperature of 190 °C to 205 °C. Fumes must be non-toxic.
2. Suitable for use in both HMA and PCC.
3. Melted in a jacketed, double-boiler type melting unit. Temperature of heat transfer medium must not exceed 245 °C.

4. Applied with a pressure feed applicator or pour pot, when the pavement surface temperature is greater than 4 °C.
5. Packaged in containers clearly marked "Detector Loop Sealant" and specifying manufacturer's batch and lot number.

The cured sealant must have the following performance characteristics:

Performance Characteristics of Cured Sealant

Specification	ASTM	Requirement
Cone Penetration, 25 °C, 150 g, 5 s	D 5329, Sec. 6	3.5 mm, max
Flow, 60 °C	D 5329, Sec. 8	5 mm, max
Resilience, 25 °C	D 5329, Sec. 12	25%, min
Softening Point	D 36	82 °C, min
Ductility, 25 °C, 50 mm/min	D 113	300 mm, min
Flash Point, COC, °C	D 92	288 °C, min
Viscosity, Brookfield Thermosel, No. 27 Spindle, 20 rpm, 190 °C	D 150	Less than 25% change

86-5.02 PEDESTRIAN PUSH BUTTON ASSEMBLIES

Housing must be either die-cast or permanent mold-cast aluminum, or ultraviolet stabilized, self-extinguishing structural plastic, if specified. Plastic housing must be black matching Color No. 17038, 27038 or 37038 of Federal Standard 595B, and colored throughout. Assembly must be rainproof and shockproof in any weather condition.

Switch must be a single-pole, double-throw, switching unit, with screw type terminals, rated 15 A at 125 V(ac), and must have:

1. Plunger actuator and a U frame to allow recessed mounting in push button housing
2. Operating force of 3.5 pounds
3. 1/64-inch maximum pretravel
4. 7/32-inch minimum overtravel
5. 0.0004- to 0.002-inch differential travel
6. 2-inch minimum diameter actuator

Where pedestrian push button is attached to a pole, shape housing to fit the pole curvature and secure. Include saddles to make a neat fit if needed.

Where a pedestrian push button is mounted on top of a 2-1/2-inch diameter post, fit housing with a slip-fitter and use screws for securing rigidly to post.

Pedestrian push button signs must be porcelain enameled metal or structural plastic.

Install push button and sign on crosswalk side of pole.

Point arrows on push button signs in the same direction as the corresponding crosswalk.

Attach sign on Type B push button assembly.

For Type C pedestrian push button assembly, mount instruction sign on the same standard as the push button assembly, using 2 straps and saddle brackets. Straps and saddle brackets must be corrosion-resisting chromium nickel steel and comply with ASTM A 167, Type 302B. Theft-proof bolts must be stainless steel with a chromium content of at least 17 percent and a nickel content of at least 8 percent.

86-6.08 PHOTOELECTRIC CONTROLS

Photoelectric controls must be capable of directly switching multiple lighting systems.

86-6.08A Types

Photoelectric control type must comply with the following:

Photoelectric Control Types

Type I	Includes a remote photoelectric unit and a test switch housed in an enclosure.
Type II	Includes a remote photoelectric unit, a separate contactor located in a service equipment enclosure, and a test switch located in service equipment enclosure.
Type III	Includes a remote photoelectric unit, a separate contactor, and a test switch housed in an enclosure.
Type IV	Includes a photoelectric unit that plugs into an EEI-NEMA twist-lock receptacle integral with the luminaire.
Type V	Includes a photoelectric unit, contactor, and test switch located in service equipment enclosure.

A switch to allow manual operation of lighting circuit must be included for each Type I, Type II, Type III, and Type V photoelectric control. Switches must be single-hole mounting toggle type, single-pole, single-throw, rated at 12 A with a voltage rating that matches the circuit. Switches must have an indicating nameplate reading "Auto-Test" and be connected in parallel with the load contacts of the photoelectric unit. Test switches must not have an "OFF" position.

Photoelectric unit for Types I, II, and III photoelectric controls, must be pole-top mounted.

86-6.08B Equipment Details

86-6.08B(1) Photoelectric Unit

Photoelectric unit must:

1. Have an output in response to changing light levels. Response level must remain stable throughout life of control unit.
2. Have a "turn-on" between 1 and 5 footcandles, and a "turn-off" between 1.5 and 5 times "turn-on." Measurements must be made by procedures in EEI-NEMA standards for physical and electrical interchangeability of light-sensitive control devices used in the control of roadway lighting.

3. Have a EEI-NEMA type receptacle. Mounting brackets must be used where pole-top mounting is not possible. Photoelectric controls must be installed at locations show on the plans and oriented.
4. Be screened to prevent artificial light from causing cycling.
5. Have a supply voltage rating of 60 Hz, 105-130 V(ac), 210-240 V(ac), or 105-240 V(ac), as specified.
6. Have a load rating of 800 W minimum, incandescent, high intensity discharge, or fluorescent.
7. Operate at a temperature range of -20 °C to 55 °C.
8. Have a power consumption less than 10 W.
9. Be housed in a weatherproof enclosure.
10. Have a base with a 3-prong, EEI-NEMA standard, twist-lock plug mounting.
11. Have a "fail-on" feature.

Unit components must not require periodic replacement.

Photoelectric controls, except Type IV and Type V, must include a 4-inch minimum inside diameter, pole-top mounting adaptor containing a terminal block, and cable supports or clamps to support pole wires.

For switching 480 V(ac), 60 Hz circuits, a 100 VA, minimum, 480/120 V(ac) transformer must be installed in the contactor enclosure to allow 120 V(ac) for the photoelectric control unit. If more than 1 photoelectric unit is to be installed at a location, a single transformer with a volt-ampere rating capable of handling the total controlled load, may be used.

86-6.08B(2) Contactor

Contactor must:

1. Have contacts rated to switch the specified lighting load
2. Be normally open
3. Be the mechanical armature type with contacts of fine silver, silver alloy, or superior alternative material

86-6.08B(3) Enclosure

Enclosure for Type I and Type III photoelectric controls must be NEMA 3R. Enclosure must be supplied with a factory-applied rust-resistant prime coat and finish coat. Two applications of paint to match the color of the standard must be applied as specified in Section 86-2.16, "Painting." Enclosure may be hot-dip galvanized instead of painting. A minimum of 2-1/2 inches must be provided between contactor terminals and end of enclosure for wiring connections. Enclosure must be mounted on the same standard as the photoelectric unit at a height of about 6 feet above finished grade.

86-6.08B(4) Terminal Blocks

Terminal blocks must be rated at 25 A, 600 V(ac), molded from phenolic or nylon material, and of the barrier type with plated-brass screw terminals and integral-type marking strips.

86-6.10 (BLANK)

86-7 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT

86-7.01 REMOVING ELECTRICAL EQUIPMENT

Existing electrical equipment, pull boxes, and conduits, to be removed and not reused or salvaged, become your property and you must dispose of it under Section 7-1.13, "Disposal of Materials Outside the Highway Right of Way." Unused underground conduit may be abandoned in place after all conductors have been removed, except that conduit terminations from conduit to be abandoned must be removed from pull boxes to remain.

Exercise care in salvaging equipment so that it will not be damaged or destroyed. Mast arms must be removed from standards. Luminaires, signal heads, and signal mounting assemblies must be removed from standards and mast arms.

Holes resulting from removing pull boxes must be filled with material equivalent to the surrounding material.

86-7.02 REINSTALLING REMOVED ELECTRICAL EQUIPMENT

If removed electrical equipment is to be reinstalled, you must supply all necessary materials and equipment, including signal mounting assemblies, anchor bolts, nuts, washers, and concrete as required to complete the new installation.

Luminaires to be reinstalled must be cleaned and relamped.

Existing materials required to be reused and found to be unsatisfactory by the Engineer must be replaced with new material and the replacement cost will be paid for as extra work as specified in Section 4-1.03D, "Extra Work."

86-8 PAYMENT

86-8.01 PAYMENT

The contract lump sum price or prices paid for signal, , flashing beacon, lighting , or combinations thereof; for modifying or removing those systems; for temporary systems; or the lump sum or unit prices paid for various units of those systems; or the lump sum or per foot price paid for conduit of the various sizes, types, and installation methods listed in the Engineer's Estimate include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in furnishing and installing, modifying, or removing the systems, combinations or units thereof, including any necessary pull boxes (except if the type required is shown as a separate contract item); excavation and backfill; concrete foundations (except if shown as a separate contract item); pedestrian barricades;; installing sign panels on pedestrian barricades, on flashing beacon standards, and on traffic signal mast arms; restoring sidewalk, pavement and appurtenances damaged or destroyed during construction; salvaging existing materials; and making all required tests, as shown on the plans, as specified in these specifications and the special provisions, and as directed by the Engineer.

If poles for electrical systems are manufactured from a source located more than 300 air-line miles from Sacramento and Los Angeles, the Department will deduct $5,000 for inspection costs for each inspection site. If poles for electrical systems are manufactured from a source located more than 3,000 air-line miles from Sacramento and Los Angeles, the Department will deduct $8,000 for inspection costs for each inspection site.

Full compensation for all additional materials and labor, not shown on the plans or specified, that are necessary to complete the installation of the various systems, is included in the prices paid for the systems, or units thereof, except as provided in Section 86-1.06, "Maintaining

Existing and Temporary Electrical Systems," and no additional compensation will be allowed therefor.

If shown as a contract item, the contract price paid per foot for cast-in-drilled-hole concrete pile (signal foundation) includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing reinforced concrete pile foundations of the size shown on the Engineer's Estimate, including drilling holes, disposing of the material resulting from drilling holes, furnishing and placing anchor bolt assemblies and reinforcing steel, complete in place, as shown on the plans, and as specified in these specifications and the special provisions, and as directed by the Engineer.

If shown as a contract item, non-reinforced PCC foundations will be measured and paid for by the cubic yard for foundation concrete in the same manner as specified for minor concrete (minor structure) in Section 51, "Concrete Structures."

If shown as a separate contract item by the lump sum or per foot, interconnection conduit and cable includes all interconnection conductors, and conduit and pull boxes containing interconnection cable and no other conductors. The quantity of interconnection conduit and cable to be paid for by the foot is the length of that conduit. Compensation for conduit containing interconnection cable and other conductors is included in the contract price paid for the item requiring the other conductors.

Full compensation for furnishing, installing, maintaining, and removing falsework lighting equipment is included in the contract prices paid for the items of work involved in the structure that requires the falsework lighting and no additional compensation will be allowed therefor.

Replace Section 90-10 with:

90-10 MINOR CONCRETE

90-10.01 GENERAL

Concrete for minor structures, slope paving, curbs, sidewalks and other concrete work, when designated as minor concrete on the plans, in the specifications, or in the contract item, shall conform to the provisions specified herein.

The Engineer, at the Engineer's discretion, will inspect and test the facilities, materials and methods for producing the concrete to ensure that minor concrete of the quality suitable for use in the work is obtained.

Before using minor concrete or in advance of revising the mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design. When required by the following table, the Contractor shall include compressive strength test results verifying the minimum specified compressive strength:

SCM	Test Submittal Required
Fly Ash used alone	When portland cement content<350 lbs/cy
GGBFS used alone	When portland cement content <250 lbs/cy
Natural Pozzolan used alone	When portland cement content <350 lbs/cy
More than 1 SCM	Always

Tests shall be performed by an ACI certified technician.

90-10.02 MATERIALS

Minor concrete shall conform to the following requirements:

90-10.02A Cementitious Material

Cementitious material shall conform to the provisions in Section 90-1.01, "Description," and 90-2, "Materials."

90-10.02B Aggregate

Aggregate shall be clean and free from deleterious coatings, clay balls, roots, and other extraneous materials.

Use of crushed concrete or reclaimed aggregate is acceptable only if the aggregate satisfies all aggregate requirements.

The Contractor shall submit to the Engineer for approval, a grading of the combined aggregate proposed for use in the minor concrete. After acceptance of the grading, aggregate furnished for minor concrete shall conform to that grading, unless a change is authorized in writing by the Engineer.

The Engineer may require the Contractor to furnish periodic test reports of the aggregate grading furnished. The maximum size of aggregate used shall be at the option of the Contractor, but in no case shall the maximum size be larger than 1-1/2-inch or smaller than 3/4 inch.

The Engineer may waive, in writing, the gradation requirements in this Section 90-10.02B, if, in the Engineer's opinion, the furnishing of the gradation is not necessary for the type or amount of concrete work to be constructed.

90-10.02C Water

Water used for washing, mixing, and curing shall be free from oil, salts, and other impurities that would discolor or etch the surface or have an adverse affect on the quality of the concrete.

90-10.02D Admixtures

The use of admixtures shall conform to the provisions in Section 90-4, "Admixtures."

90-10.03 PRODUCTION

Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice that will result in concrete that is thoroughly and uniformly mixed, that is suitable for the use intended, and that conforms to requirements specified herein. Recognized standards of good practice are outlined in various industry publications such as are issued by American Concrete Institute, AASHTO, or the Department.

The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."

The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless allowed by the Engineer.

Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more

than 90 °F will be considered conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.

The required mixing time in stationary mixers shall be not less than 50 seconds or more than 5 minutes.

The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.

When a high range water-reducing admixture is added to the concrete at the job site, the total number of revolutions shall not exceed 300.

Each load of ready-mixed concrete shall be accompanied by a weighmaster certificate that shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The weighmaster certificate shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets contract requirements, including minimum cementitious material content specified.

90-10.04 CURING MINOR CONCRETE

Curing minor concrete shall conform to the provisions in Section 90-7, "Curing Concrete."

90-10.05 PROTECTING MINOR CONCRETE

Protecting minor concrete shall conform to the provisions in Section 90-8, "Protecting Concrete," except the concrete shall be maintained at a temperature of not less than 40 °F for 72 hours after placing.

90-10.06 MEASUREMENT AND PAYMENT

Minor concrete will be measured and paid for in conformance with the provisions specified in the various sections of these specifications covering concrete construction when minor concrete is specified in the specifications, shown on the plans, or indicated by contract item in the Engineer's Estimate.

SECTION 12. ENVIRONMENTAL PERMIT SUMMARY FORM

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SAN LUIS OBISPO COUNTY
DEPARTMENT OF PUBLIC WORKS

County Government Center, Room 206 • San Luis Obispo CA 93408 • (805) 781-5252
Fax (805) 781-1229 email address: pwd@co.slo.ca.us

ENVIRONMENTAL PERMIT SUMMARY FORM

Date: November 17, 2014

To: Genaro Diaz, Project Manager

From: John Farhar, Environmental Programs Division

Subject: **Environmental Review & Permit Status for the** Pomeroy Road at Willow Road traffic signals ED14-097 (245R12B617)

The environmental review and regulatory permit processes for the above referenced project are complete. The following is a summary of the environmental requirements for the project:

Permit	Status	Attachments
CEQA Review	CE Class 1(c) filed 11/17/2014	Y
NEPA Review	n/a	
Coastal Permit	n/a	
CZMA	n/a	
CDFW	n/a	
USACOE 404	n/a	
NMFS ESA	n/a	
USFWS ESA	n/a	
RWQCB 401	n/a	
NPDES	n/a	

Summary Project Timeframe
Based on the below work windows, the basic work window for this project is from: **no window identified.**

******* A COPY OF THIS PERMIT SUMMARY FORM AND ALL OF ITS ATTACHMENTS MUST BE ON THE WORK SITE WHEN ANY WORK IS UNDERWAY**

Measure #	**Special Environmental Conditions**	**Responsibility: Contractor, County or Both**
Pre-Construction		
1	Please notify the Environmental Programs Manager if the project description changes.	County
During Construction		
Post-Construction		

******* A COPY OF THIS PERMIT SUMMARY FORM AND ALL OF ITS ATTACHMENTS MUST BE ON THE WORK SITE WHEN ANY WORK IS UNDERWAY**

NOTICE OF EXEMPTION

SAN LUIS OBISPO COUNTY DEPARTMENT OF PLANNING AND BUILDING
976 OSOS STREET • ROOM 200 • SAN LUIS OBISPO • CALIFORNIA 93408 • (805) 781-5600

Promoting the Wise Use of Land • Helping to Build Great Communities

Pomeroy Road at Willow Road Traffic Signal Safety Improvement Project
Project Title

(ENDORSED)
FILED
NOV 17 2014
JULIE L. RODEWALD COUNTY CLERK
Rhonda Parashis
DEPUTY CLERK

Pomeroy Road at the Willow Road intersection, Nipomo
Project Location - Specific

San Luis Obispo
Project Location – County

Installation of new four way traffic signals and sensor loops within the existing roadway.
Description of Nature, Purpose and Beneficiaries of Project

County of San Luis Obispo (see address above)
Name of Public Agency Approving Project

County of San Luis Obispo Department of Public Works
Name of Person or Agency Carrying Out Project

Exempt Status: (Check One)

☐	Ministerial	{Sec. 21080(b)(1); 15268}
☐	Declared Emergency	{Sec. 21080(b)(3); 15269(a)}
☐	Emergency Project	{Sec. 21080(b)(4); 15269(b)(c)}
☒	Categorical Exemption.	{Sec. 15301; Class: 1(c) }
☐	Statutory Exemption	{Sec.____}

Reasons why project is exempt: The project consists of a minor alteration of an existing facility involving negligible or no expansion of capacity.

John Farhar 805-781-5252
Lead Agency Contact Person **Telephone**

If filed by applicant:
1. Attach certified document of exemption finding
2. Has a notice of exemption been filed by the public agency approving the project?
   Yes ☐ No ☐

Signature Ellen Carroll Date 11·5·2014

Name (Print) Ellen Carroll Title Env. Coordinator

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: _____

SAN LUIS OBISPO COUNTY
DEPARTMENT OF PUBLIC WORKS
Wade Horton, Director

County Government Center, Room 206 • San Luis Obispo CA 93408 • (805) 781-5252
Fax (805) 781-1229 email address: pwd@co.slo.ca.us

ENVIRONMENTAL PERMIT SUMMARY FORM

Date: April 21, 2015

To: Genaro Diaz, Project Manager

From: John Farhar, Environmental Programs Division

Subject: **Environmental Review & Permit Status for the** Traffic signal for Thompson Ave. at Titan Way (WBS 300524) ED14-197

The environmental review and regulatory permit processes for the above referenced project are complete. The following is a summary of the environmental requirements for the project:

Permit	Status	Attachments
CEQA Review	Approved Class f under Section 15301	Y
NEPA Review	n/a	N
Coastal Permit	n/a	N
CZMA	n/a	N
CDFW	n/a	N
USACOE 404	n/a	N
NMFS ESA	n/a	N
USFWS ESA	n/a	N
RWQCB 401	n/a	N
NPDES	n/a	N

******* A COPY OF THIS PERMIT SUMMARY FORM AND ALL OF ITS ATTACHMENTS MUST BE ON THE WORK SITE WHEN ANY WORK IS UNDERWAY**

NOTICE OF EXEMPTION

SAN LUIS OBISPO COUNTY DEPARTMENT OF PLANNING AND BUILDING
976 OSOS STREET • ROOM 200 • SAN LUIS OBISPO • CALIFORNIA 93408 • (805)781-5600

Project Title and No.: Public Works - Traffic Signals for Thompson Ave. at Titan Way in Nipomo; 300524 (ED14-197)

Project Location(Specific address): At the intersection of Thompson and Titan Way	**Project Applicant & Phone No.:** Department of Public Works/(805) 781-5252
Project Location(County): San Luis Obispo	**Applicant Address (specific):** County Gov't. Ctr. Rm. 206, SLO, CA 93408

Description of Nature, Purpose and Beneficiaries of Project

Traffic Signals for Thompson Ave. at Titan Way (Nipomo High School) in the community of Nipomo

Name of Public Agency Approving Project: County of San Luis Obispo

Exempt Status: (Check One)

☐	Ministerial	{Sec. 21080(b)(1); 15268}
☐	Declared Emergency	{Sec. 21080(b)(3); 15269(a)}
☐	Emergency Project	{Sec. 21080(b)(4); 15269(b)(c)}
☒	Categorical Exemption.	{Sec. 15301; Class: f }
☐	Statutory Exemption	{Sec.___}

Reasons why project is exempt: Addition of safety protection devices in conjunction with existing facilities will not impact environmental resources

Eric Wier, Environmental Resource Specialist (805) 788-2766
Lead Agency Contact Person **Telephone**

If filed by applicant:
1. Attach certified document of exemption finding
2. Has a notice of exemption been filed by the public agency approving the project?
   Yes ☐ No ☐

Signature Ellen Carroll Date 3-26-2015

Name (Print) Ellen Carroll Title Environmental Coordinator

(ENDORSED)
FILED

APR 21 2015

TOMMY GONG, COUNTY CLERK
CM Christensen
DEPUTY CLERK

Storage, Licence, and Re-Striping Areas

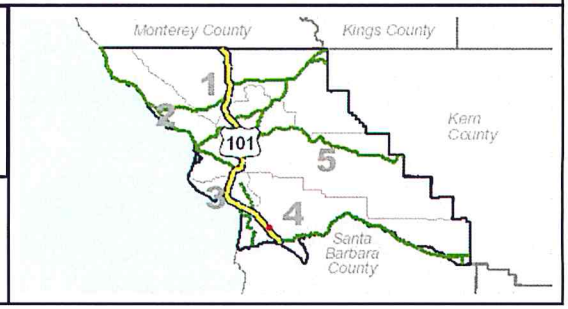
300524 - Thompson Ave & Titan Way Signal Project

COUNTY OF SAN LUIS OBISPO PUBLIC WORKS & TRANSPORTATION DEPARTMENT

NOT TO SCALE

Created by: G. Diaz

Printed: 3/13/2015



SECTION 13. RULES GOVERNING BID PROTESTS AND OTHER CHALLENGES TO AWARDS OF CONSTRUCTION CONTRACTS

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COUNTY OF SAN LUIS OBISPO

Rules Governing Bid Protests And Other Challenges to Awards of Construction Contracts

The requirements set forth in these "Rules Governing Bid Protests And Other Challenges to Awards of Construction Contracts" ("Rules") are mandatory and are a Bidder's sole and exclusive remedy in the event a Bidder desires to challenge, protest or contest the award of any Construction Contract. A Bidder's failure to comply with these requirements shall constitute a waiver of any right to challenge, protest or contest the award of a Construction Contract in any subsequent proceeding, including but not limited to, the filing of a court action.

A Bidder may not rely upon another Bidder's compliance with the requirements of these Rules. Any Bidder that does not independently comply with the requirements set forth herein shall be deemed to have waived any right to challenge, protest or contest the award of a Construction Contract.

Nothing in these Rules affects the right of the County to reject all bids at any time prior to the award of a Construction Contract.

1.1 Definitions

1.1.1 Bidder - The contractor submitting a bid in response to a County solicitation for bids on a Construction Contract.

1.1.2 Protestor - A Bidder who files a Protest in accordance with the provisions of these Rules.

1.1.3 Board – Board of Supervisors of the County of San Luis Obispo (hereinafter, also "County")

1.1.4 Construction Contract - Any Construction Contract which is formally or informally advertised for bids in which the County of San Luis Obispo is, or will be, a party.

1.1.5 Protest – Any challenge, objection, or protest to the award of a Construction Contract to any Bidder.

1.1.6 Response – Any response to a Protest that is filed by an Interested Party in accordance with the provisions of these Rules.

1.1.7 Responsible Department - The County department, agency, or office responsible for the preparation of the bid documents for the Construction Contract and the administration of the Construction Contract.

1.1.8 Department Head - The person designated by the Board to be the head of the Responsible Department, or that person designated by the Department

Head to assume the powers, duties, and responsibilities conferred upon the Department Head under these Rules.

1.1.9 Initial Determination – A written notice by the Department Head that notifies a Bidder of the reasons why the Department Head believes that a bid is nonresponsive, or that a Bidder is not a responsible Bidder.

1.1.10 Interested Parties - For the purpose of these Rules, Interested Parties are defined as:

1.1.10.1 The Responsible Department and/or its Department Head.

1.1.10.2 Any Bidder that filed a Protest or whose bid is the subject of an Initial Determination.

1.1.10.3 Any Bidder whose eligibility for having the Construction Contract awarded to it as a responsible Bidder with the lowest responsive bid would be affected by the outcome of a Protest or Initial Determination.

1.2 Department Head's Independent Authority to Determine Bid Responsiveness and Bidder Responsibility.

1.2.1 Regardless of whether a Protest is submitted under these Rules, the Department Head is authorized to determine whether any bid is a responsive bid and whether any Bidder is a responsible Bidder. In the event the Department Head issues an Initial Determination, the Department Head shall provide the Interested Parties with written notice of the Initial Determination at least five (5) business days before the Department Head renders a final decision addressing the grounds stated in the Initial Determination A final decision of the Department Head under this section 1.2 shall be the final decision of the County with no provision for reconsideration or appeal to the Board.

1.2.2 The Department Head need not issue an Initial Determination in order to make a final decision on whether a bid is a responsive bid or a Bidder is a responsible Bidder. A final decision can also be issued by the Department Head through the processing of a Protest pursuant to the procedures set forth in these Rules.

1.2.3 The Department Head reserves the right to amend or withdraw an Initial Determination at any time before the Department Head renders a final decision addressing the grounds stated in the Initial Determination. When an Initial Determination is withdrawn, it shall have the same effect as if the Initial Determination had never been made.

1.3 Basis for Protest

1.3.1 Grounds for Protest – The grounds for a Protest may include any grounds a Protestor may have for contesting or challenging the award of a Construction Contract to any Bidder, including but not limited to the following grounds:

1.3.1.1 A Protestor objects to a Construction Contract being awarded to another Bidder on the grounds that the other Bidder's bid is nonresponsive.

1.3.1.2 A Protestor objects to a Construction Contract being awarded to another Bidder on the grounds that the other Bidder is not a responsible Bidder.

1.3.1.3 A Protestor objects to a Construction Contract being awarded to the Protestor on the grounds that the Protestor made a mistake in its bid that entitles the Protestor to be relieved of its bid under Public Contract Code Sections 5100 et seq

1.3.1.4 A Protestor objects to a Department Head's Initial Determination issued under section 1.2.1 above.

1.3.2 Required Form of Protest - All Protests shall be made in writing, containing the information listed below, and shall be filed with the Department Head . Protests shall contain the following information:

1.3.2.1 The name, address, telephone, facsimile numbers, and email address of the Protestor.

1.3.2.2 The signature of the Protestor or its representative.

1.3.2.3 The bid, solicitation and/or contract number.

1.3.2.4 The Protest must contain a complete statement of all grounds for the Protest, and must refer to the specific portion of the bid documents that are the basis of the Protest. The Protest must set forth all supporting facts and documentation. If Protester believes there are some facts relevant to its Protest that Protester cannot adequately present in writing, Protester must describe such facts in its Protest under the heading "Facts Requiring Oral Presentation", and state therein the reasons why the Bid Protester believes it cannot adequately present those facts through documentation.

1.3.2.5 All information establishing that the Protestor is a Bidder for the purpose of filing a Protest.

1.3.2.6 The form of relief requested.

1.4 Protest Requirements and Procedure

1.4.1 Standing to Protest - Protests shall be filed only by a Bidder.

1.4.2 Time for Filing a Protest

1.4.2.1 Except as provided in sections 1.4.2.2 and 1.4.2.3 below, all Protests must be submitted in writing to the Department Head before 5 p.m. PST of the fifth (5) business day following the date upon which the bids on the Construction Contract were opened.

1.4.2.2 When a Protestor objects to a Construction Contract being awarded to the Protester on the grounds that the Protestor made a mistake in its bid that entitles the Protestor to be relieved of its bid under Public Contract Code Sections 5100 et seq, the Protest must be submitted in writing to the Department Head before 5 p.m. PST of the fifth (5) business day following the date upon

which the bids on the Construction Contract were opened pursuant to Public Contract Code Section 5103.

1.4.2.3 When the Protestor objects to an Initial Determination made by the Department Head under section 1.2.1 above, the Protest must be submitted in writing to the Department Head before 5 p.m. PST of the fifth (5) business day following the date upon which the Initial Determination was first delivered to Protestor (either electronically or otherwise).

1.4.3 Written Responses of Interested Parties - If any Interested Party desires to respond to the Protest, the Response must be submitted in writing to the Department Head within five (5) business days of the date the Protest was first delivered to the Interested Party (either electronically or otherwise). If an Interested Party believes there are some facts relevant to its Response that the Interested Party cannot adequately present in writing, the Interested Party must describe such facts in its Response under the heading “Facts Requiring Oral Presentation”, and state therein the reasons why the Interested Party believes it cannot adequately present those facts through documentation.

1.4.4 Proof of Transmittal - All Protests, Responses, and Replies shall include documentation evidencing that all Interested Parties were concurrently sent a complete copy of the respective Protest, Response or Reply in a manner that would provide all Interested Parties with a complete copy of the respective Protest, Response or Reply no later than one (1) business day after it was sent to the Department Head. The means of transmission chosen must also provide the sending party a means of verifying the date and time the copy was received by each Interested Party. Transmission by email may be an acceptable means of transmittal.

1.4.5 No Ex Parte or Unilateral Communications on the Merits of a Protest - No Bidder shall have any written communications regarding the merits of a Protest with the Responsible Department or its Department Head that are not concurrently sent to all of the other Interested Parties. No Bidder shall have any oral communications regarding the merits of a Protest with the Responsible Department or its Department Head other than during an oral presentation properly noticed by the Department Head under these Rules.

1.4.6 Suspension of Process for Proposed Rejection of all Bids - At any time during the processing of a Protest, the Department Head may elect to indefinitely suspend any further processing of the Protest by providing written notice to all Interested Parties that the Department Head intends to recommend to the Board that all bids be rejected. All time deadlines provided in these Rules shall be tolled during any such suspension period. If the Board decides to not reject all bids, or if the Department Head otherwise decides to lift the suspension, the requirements of these Rules shall be reactivated upon the Department Head providing all Interested Parties with written notice thereof.

1.5 Summary Dismissal of Protest

The Department Head may summarily dismiss a protest, or specific protest allegations, at any time that the Department Head determines that the Protest is untimely, frivolous, or without merit; is not submitted in the required form of Protest, as set forth above in section 1.3.2., "Required Form of Protest;" or is submitted by a non-Bidder. In such cases, a notice of summary dismissal will be furnished to the Interested Parties. Such a summary dismissal shall be the final decision of the County with no provision for reconsideration or appeal to the Board.

1.6 Decision by the Department Head Based on Written Submissions Only

In reaching a decision on the merits of a Protest, the Department Head may consider relevant documentation submitted by the Protestor and any other Interested Party. If the Department Head wishes to have additional information submitted that was not included in the Protest or in any documentation from other Interested Parties, the Department Head may make a request specifying the information sought and time for submittal. Submissions of additional information that have not been specifically requested by the Department Head may not be considered at the Department Head's sole discretion. If the Department Head does not provide an opportunity for an oral presentation under section 1.7 below, the Department Head will issue a written decision without any oral presentation. . The Department Head's decision shall be the final decision of the County with no provision for reconsideration or appeal to the Board.

1.7 Decision by the Department Head Following Oral Presentation

1.7.1 The Department Head may, at his or her discretion, elect to provide an opportunity for the Protestor and other Interested Parties to make an oral presentation to the Department Head regarding the Protest. In such event. oral presentations shall be conducted in accordance with the following procedure:

1.7.1.1 Notice of Oral Presentation - The Department Head will set a date, time, and place for an oral presentation. Written notice will be sent to Interested Parties not less than five (5) business days in advance of the oral presentation unless it is agreeable to all parties that an earlier date be established. Continuances may be granted by the Department Head for good cause.

1.7.1.2 Guidelines for Oral Presentation - Oral presentations are informal in nature and shall be made by the Protestor or its authorized representative. Technical rules of evidence shall not apply. The Department Head will determine how the oral presentations will be conducted and may set time limits for the presentation. The Department Head may question Interested Parties or provide an opportunity for Interested Parties to make an oral presentation. The Department Head may request additional documentation or information prior to, during or after the oral presentation. Unless

requested by the Department Head, additional documentation or information may not be accepted.

1.7.1.3 Record of Oral Presentation - Any Interested Party may request, and in the Department Head's sole discretion, the Department Head may allow recording of the presentation. If the Department Head allows the presentation to be recorded, the Interested Party requesting that the presentation be recorded must pay the cost of recording, including the costs to make and distribute copies of the recording to the Department Head and other Interested Parties. There shall be no cost to the County.

1.7.1.4 Decisions - The Department Head will issue a written decision within 30 calendar days of the oral presentation; however, the time for issuing the written decision may be extended by the Department Head. A copy of the decision will be furnished to the Interested Parties. The decision shall be the final decision of the County with no provision for reconsideration or appeal to the Board.

1.8 Effect on Contracts

The failure of a County employee or department to comply with the provisions stated in these Rules shall in no way affect the validity of any Construction Contract entered into by the County.

1.9 Department Head Decisions on Protests Seeking Relief from a Bidder's Mistake under Public Contract Code Section 5103.

When a Protestor objects to a Construction Contract being awarded to the Bid Protester on the grounds that the Protestor made a mistake in its bid that entitles the Protestor to be relieved of its bid under Public Contract Code Sections 5100 et seq, a final decision of the Department Head that relieves the Protestor of its bid on the grounds of mistake must be approved by the Board before it can become a final decision of the County. Any other final decision of the Department Head regarding a Protestor's request to be relieved of its bid on the grounds of mistake under Public Contract Code Sections 5100 et seq, shall be the final decision of the County with no provision for reconsideration or appeal to the Board.

STANDARD PLANS

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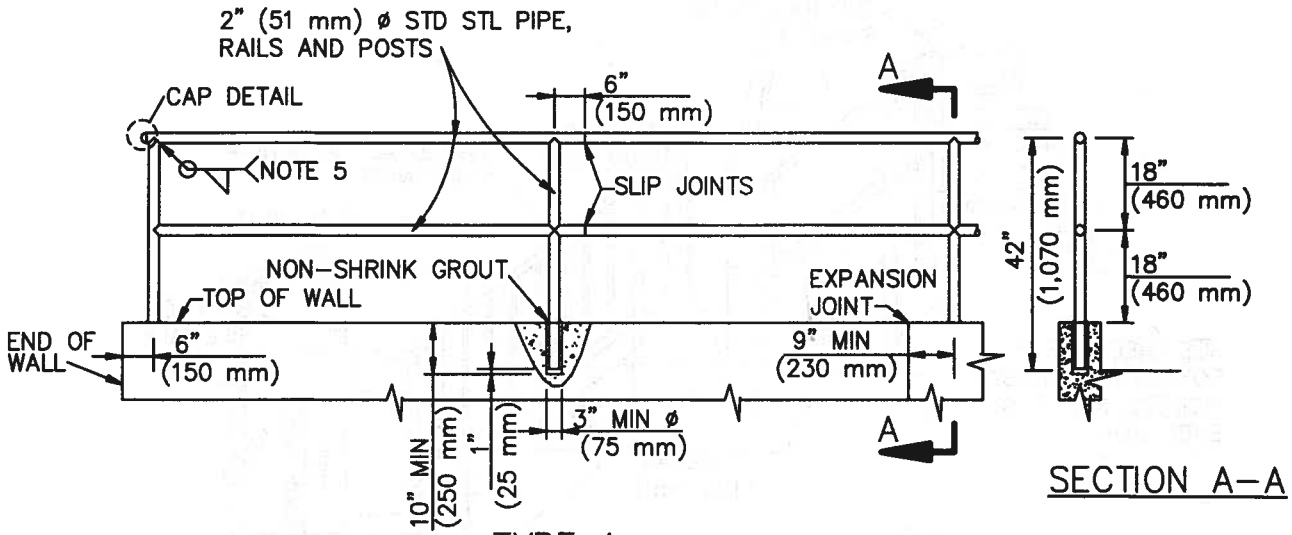
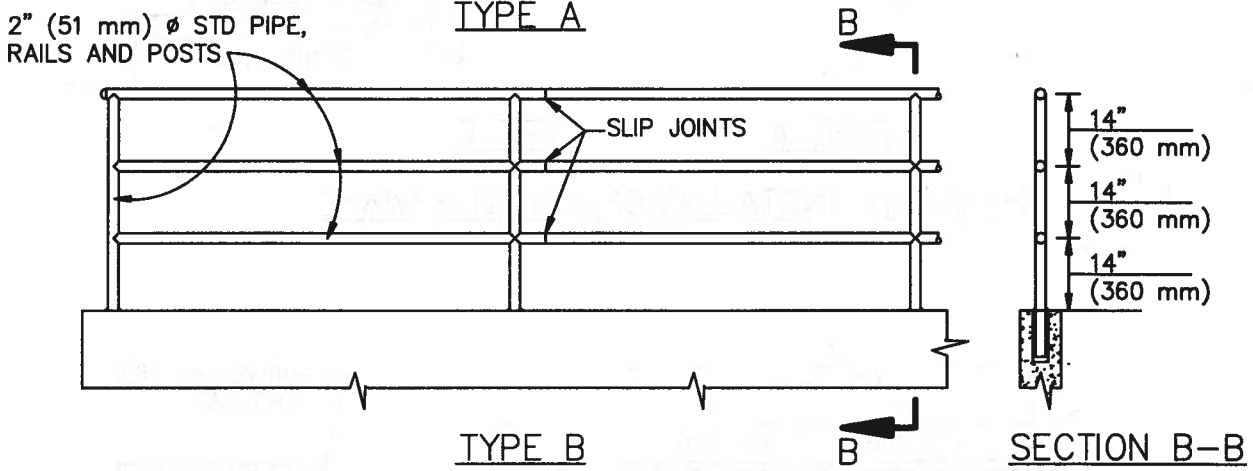


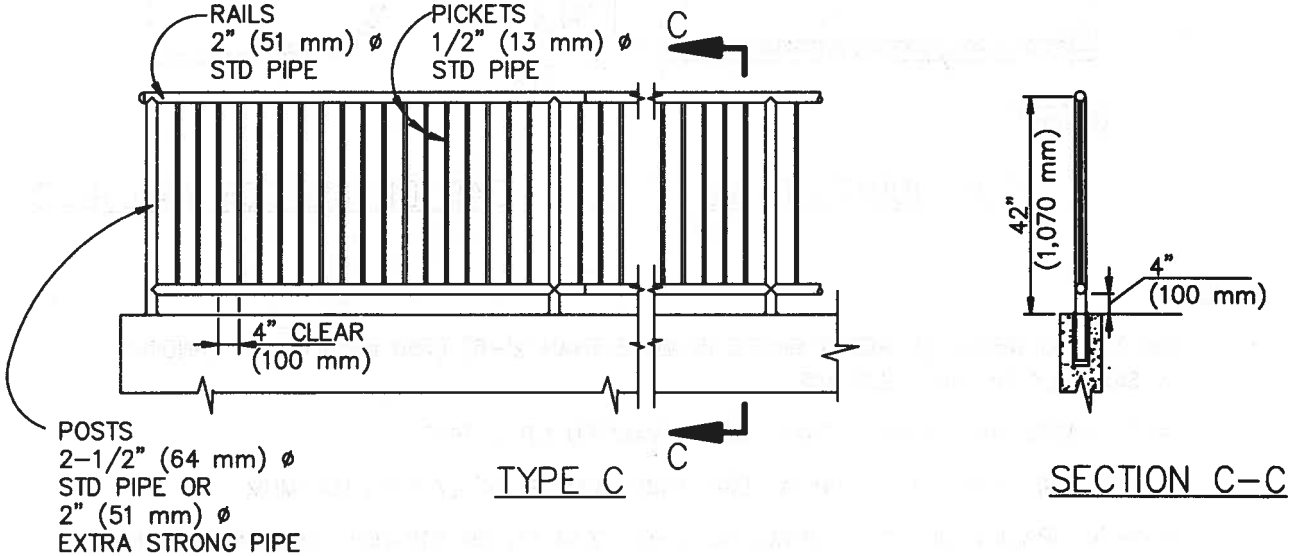
TYPE A

SECTION A–A



TYPE B

SECTION B–B



TYPE C

SECTION C–C

ELEVATION

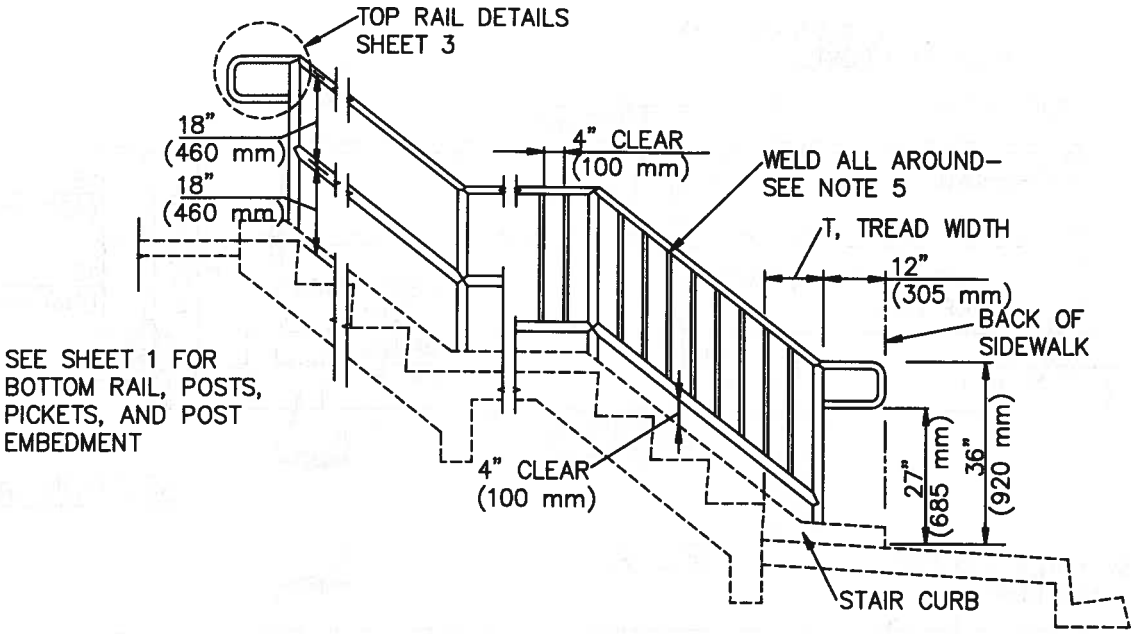
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE
PUBLIC WORKS STANDARDS INC.
GREENBOOK COMMITTEE
1993
REV. 1996, 2005, 2009

METAL HAND RAILINGS

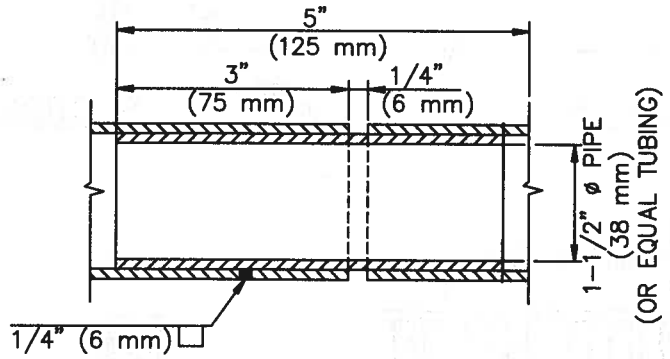
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN
606–3
SHEET 1 OF 3

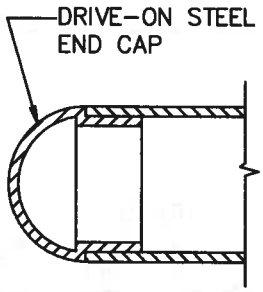


TYPE A TYPE C

HANDRAIL INSTALLATION ON STAIRWAYS



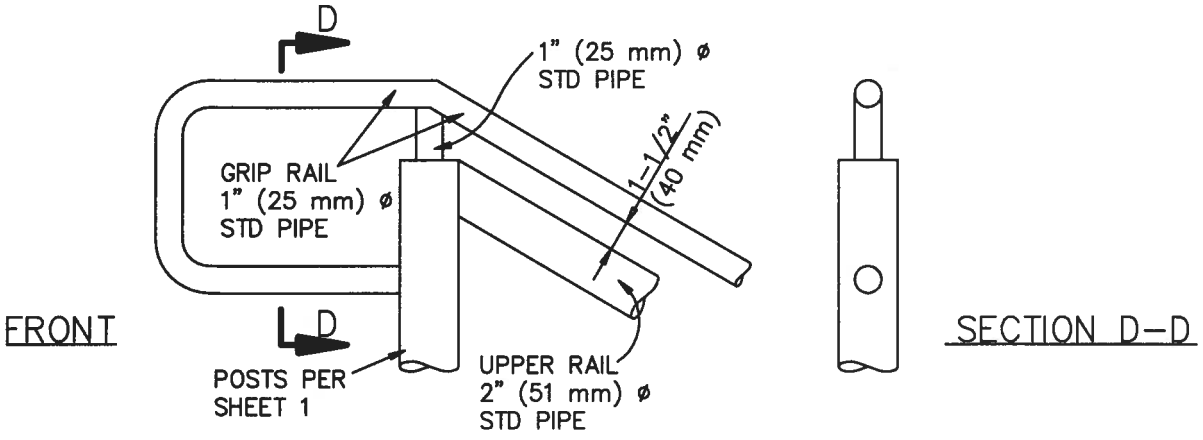
SLIP JOINT DETAIL



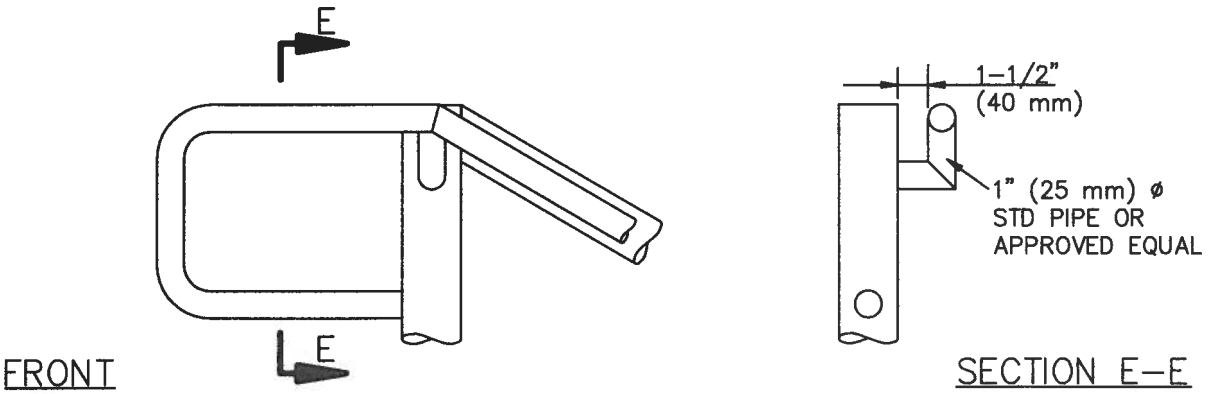
CAP DETAIL FOR RAIL END

NOTES:

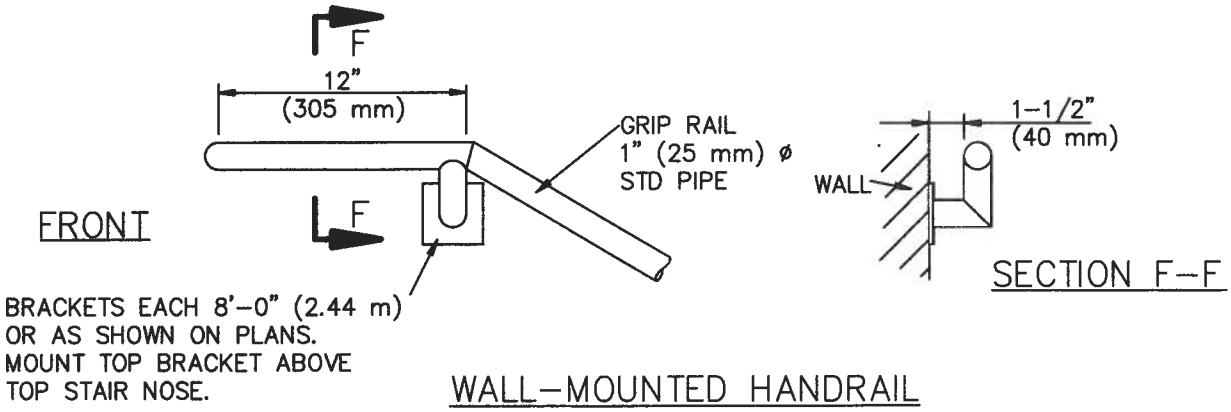
1. USE TYPE C WHERE ADJACENT GRADE IS MORE THAN 2'–6" (760 mm) BELOW LANDING OR SIDEWALK FINISHED SURFACE.
2. RAILS, POSTS, AND PICKETS SHALL BE GALVANIZED STEEL PIPE.
3. PROVIDE SLIP JOINTS AT STAIRWAY EXPANSION JOINTS, 24' (7.3 m) MAXIMUM.
4. MAXIMUM SPACING OF POSTS SHALL BE 8'–0" (2.44 m) ON STRAIGHT ALIGNMENTS, AND 6'–0" (1.83 m) ON CURVED ALIGNMENTS WITH LESS THAN 30' (9.1 m) RADIUS. MAKE SPACING UNIFORM BETWEEN CHANGES IN ALIGNMENT.
5. WELDS SHALL BE SLOT OR FILLET WELDS EQUAL TO THICKNESS OF PIPE. WELD ALL JOINTS ALL AROUND.



TOP RAIL TYPE 1



TOP RAIL TYPE 2



WALL-MOUNTED HANDRAIL

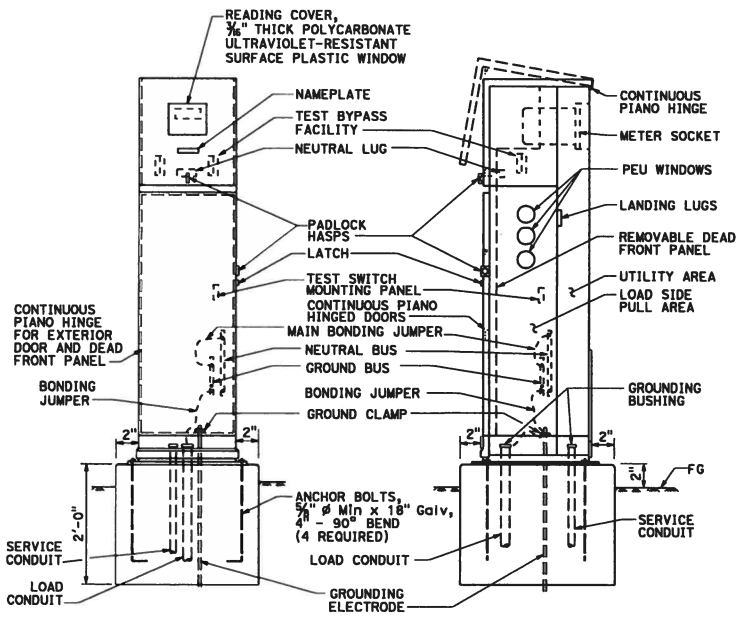
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION	STANDARD PLAN
METAL HAND RAILINGS	**606-3**
	SHEET 3 OF 3

2010 STANDARD PLANS LIST

The Standard Plan sheets applicable to this Contract include, but are not limited to those indicated below. Applicable Revised Standard Plans (RSP) indicated below are included in the project plans as Standard Plans.

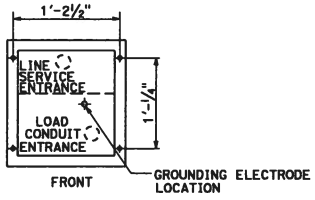
ELECTRICAL SYSTEMS – SERVICE EQUIPMENT AND WIRING DIAGRAMS

ES-2E	**Electrical Systems (Service Equipment Enclosure and Typical Wiring Diagram, Type III-B Series)**
ES-3C	**Electrical Systems (Controller Cabinet Foundation Details)**
RSP ES-5C	**Electrical Systems (Accessible Pedestrian Signal, Push Button Assemblies and Magnetic Vehicle Detector)**
RSP ES-7A	**Electrical Systems (Signal and Lighting Standard, Type TS, and Pedestrian Push Button Post)**
ES-7B	**Electrical Systems (Signal and Lighting Standard, Type 1 and Equipment Numbering)**
RSP ES-7F	**Electrical Systems (Signal and Lighting Standard, Case 4 Signal Mast Arm Loading, Wind Velocity=100 MPH and Signal Mast Arm Lengths 25' to 45')**
ES-7G	**Electrical Systems (Signal and Lighting Standard, Case 5 Signal Mast Arm Loading, Wind Velocity=100 MPH and Signal Mast Arm Lengths 50' to 55')**
ES-7H	**Electrical Systems (Signal and Lighting Standard, Case 5 Signal Mast Arm Loading, Wind Velocity=100 MPH and Signal Mast Arm Lengths 60' to 65')**
ES-7M	**Electrical Systems (Signal and Lighting Standard, Detail No. 1)**
ES-7N	**Electrical Systems (Signal and Lighting Standard, Detail No. 2)**
ES-7O	**Electrical Systems (Signal and Lighting Standard, Detail No. 3)**
RSP ES-7R	**Electrical Systems (Signal and Lighting, Miscellaneous Attachment)**
ES-8A	**Electrical Systems (Non-Traffic Pull Box)**
ES-8B	**Electrical Systems (Traffic Pull Box)**
ES-10A	**Electrical Systems (Isofootcandle Diagrams)**



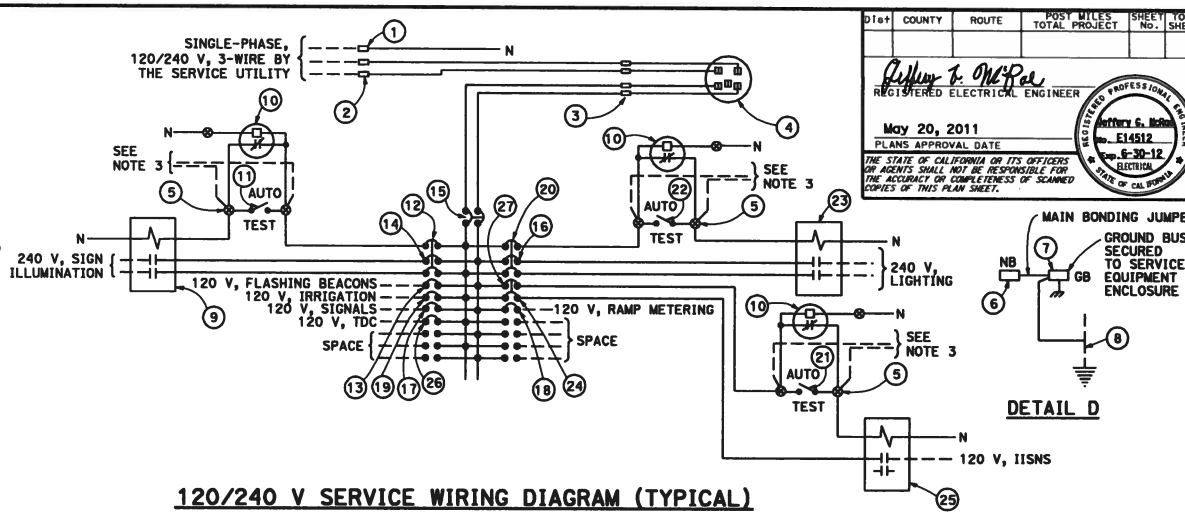
TYPE III-BF SERVICE EQUIPMENT ENCLOSURE (TYPICAL)

DETAIL A



BASE FOR TYPE III-B SERVICE EQUIPMENT ENCLOSURE

DETAIL B



120/240 V SERVICE WIRING DIAGRAM (TYPICAL)

DETAIL C

DETAIL D

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER

May 20, 2011
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER — Jeffrey G. McRae — No. E14512 — Exp. 6-30-12 — ELECTRICAL — STATE OF CALIFORNIA

TYPE III-B SERVICE EQUIPMENT ENCLOSURE LEGEND (120/240 V)

ITEM	COMPONENT	NAMEPLATE DESCRIPTION	ITEM	COMPONENT	NAMEPLATE DESCRIPTION
(1)	NEUTRAL LUG		(14)	30 A, 240 V, 2P, CB	SIGN ILLUMINATION
(2)	LANDING LUG (NOTE 6)		(15)	100 A, 240 V, 2P, CB	MAIN BREAKER
(3)	TEST BYPASS FACILITY		(16)	30 A, 240 V, 2P, CB	LIGHTING
(4)	METER SOCKET AND SUPPORT		(17)	50 A, 120 V, 1P, CB	SIGNALS
(5)	TERMINAL BLOCKS		(18)	30 A, 120 V, 1P, CB	RAMP METERING
(6)	NEUTRAL BUS		(19)	20 A, 120 V, 1P, CB	IRRIGATION
(7)	GROUND BUS		(20)	15 A, 120 V, 1P, CB	LIGHTING CONTROL
(8)	GROUNDING ELECTRODE		(21)	15 A, 1P, TEST SWITCH	IISNS TEST SWITCH
(9)	30 A, 2P, NO CONTACTOR	SIGN ILLUMINATION	(22)	15 A, 1P, TEST SWITCH	LIGHTING TEST SWITCH
(10)	PHOTOELECTRIC UNIT (NOTE 7)	PEU	(23)	60 A, 2P, NO CONTACTOR	LIGHTING
(11)	15 A, 1P, TEST SWITCH	SIGN ILLUMINATION TEST SWITCH	(24)	15 A, 120 V, 1P, CB	IISNS
(12)	15 A, 120 V, 1P, CB	SIGN ILLUMINATION CONTROL	(25)	30 A, 2P, NO CONTACTOR	IISNS
(13)	15 A, 120 V, 1P, CB	FLASHING BEACON	(26)	20 A, 120 V, IP, CB	TELEPHONE DEMARCATION CABINET
			(27)	15 A, 120 V, 1P, CB	IISNS CONTROL

NOTES:

1. Voltage ratings of service equipment shall conform to the service voltages indicated on the plans.
2. Unless otherwise indicated on the plans, service equipment items shall be provided for each service equipment enclosure as shown.
3. Connect to remote test switch mounted on lighting standards, sign post or structure when required.
4. Items (1) and (6) shall be isolated from the service equipment enclosure.
5. Meter sockets shall be 5 clip type.
6. The landing lug shall be suitable for multiple conductors.
7. Type V photoelectric control shall be used unless otherwise indicated on the plans.
8. Item (12), (20) and (27) shall be ganged operated CB.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SERVICE EQUIPMENT ENCLOSURE AND TYPICAL WIRING DIAGRAM, TYPE III-B SERIES)

NO SCALE

ES-2E

3-29-10

Return to Table of Contents

DIst	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED ELECTRICAL ENGINEER

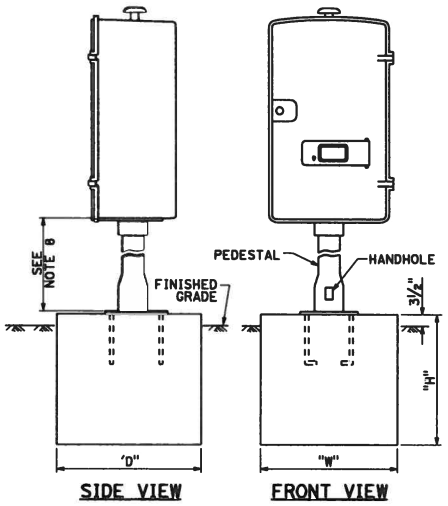
May 20, 2011
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER — Jeffrey G. McRae — No. E14512 — Exp. 6-30-12 — ELECTRICAL — STATE OF CALIFORNIA

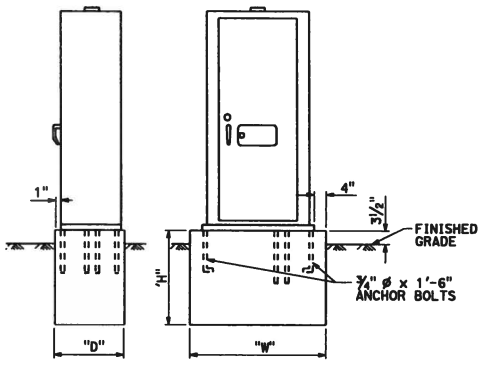
NOTES:

1. Cabinet dimensions are nominal.
2. Foundation shall be located to provide 2'-0" minimum clearance between face of curb and any portion of cabinet.
3. Type G, M, P, R, S and Model 336L cabinets shall be installed with the back toward the nearest lane of traffic.
4. The controller cabinet ground bus shall be bonded to the controller equipment enclosure.
5. In unpaved areas, a raised portland cement concrete pad shall be constructed in front of each controller cabinet. The pad shall be 3'-0" x 3'-0" x 4" for a Type G cabinet and shall be 3'-0" x 4" thick x width of foundation for Type M, P, R, S and Model 336L cabinets.
6. In unpaved areas, the top of foundation for Type G, P, R and S cabinets shall be 6" above surrounding grade. Top of foundation for Type M or Model 336L cabinet shall be 1'-6" above surrounding grade.
7. In sidewalks and other paved areas, top of foundation for Type G cabinet shall be level with surrounding grade. Top of foundation for Type P, R and S cabinets shall be 3½" above surrounding grade.
8. The steel pedestal, base plate, bolt circle and foundation for Type G cabinet shall be the same as that shown for a Type 1-C Standard (see ES-7B). Pedestal shall be 2'-1" to 2'-6" in length. Anchor bolts shall be ¾" ø x 1'-6" with a 2" - 90° bend. Four bolts required per cabinet.
9. Type G cabinet shall be provided with a slipfitter to permit mounting on 4½" outside diameter pedestal. Slipfitter shall be bolted to bottom of the cabinet.
10. Type G cabinet shall be provided with 8 screened, rain tight holes, ½" diameter or larger, in the bottom of the cabinet.
11. A 1" drain shall be provided through the foundation of a Type M or Model 336L cabinet. Drain pipe shall be screened.
12. See Table for cabinet and foundation dimensions; "D" = Depth, "H" = Height and "W" = Width.
13. Cabinet shelves shall be adjustable for vertical spacing and shall be removable. Type M, P, R and S cabinets shall be provided with a minimum of two shelves.
14. Anchor bolts for Type M, P, R, S and Model 336L cabinets shall be ¾" ø x 1'-6" with a 2" - 90° bend.
15. An approved mastic or caulking compound shall be placed on the foundation prior to placing the cabinet to seal openings between bottom of cabinet and foundation.
16. Controller units, plug-mounted equipment, shelf-mounted equipment and wall-mounted equipment shall be located to permit safe and easy removal or replacement without removing any other piece of equipment.
17. Cabinet fan may be installed at an alternate location near the top of the cabinet when approved by the Engineer.
18. Where telephone interconnect is required, a minimum of 5" clear vertical space shall be provided inside the cabinet for the equipment.
19. Telephone interconnect conductors shall be enclosed in a ¾"C or larger conduit through the foundation. Type 4 conduit shall be used to separate telephone and power conductors in cabinets and pedestals.
20. For Model 332L, 334L, 334LC and 336L cabinets details, see "Traffic signal controller equipment specifications".
21. For Model 332L, 334L and 334LC without a battery backup system.



SIDE VIEW FRONT VIEW

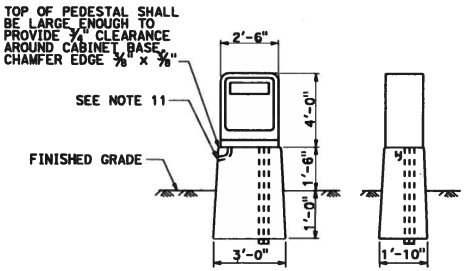
FOUNDATION FOR TYPE G CABINET
DETAIL A



SIDE VIEW FRONT VIEW

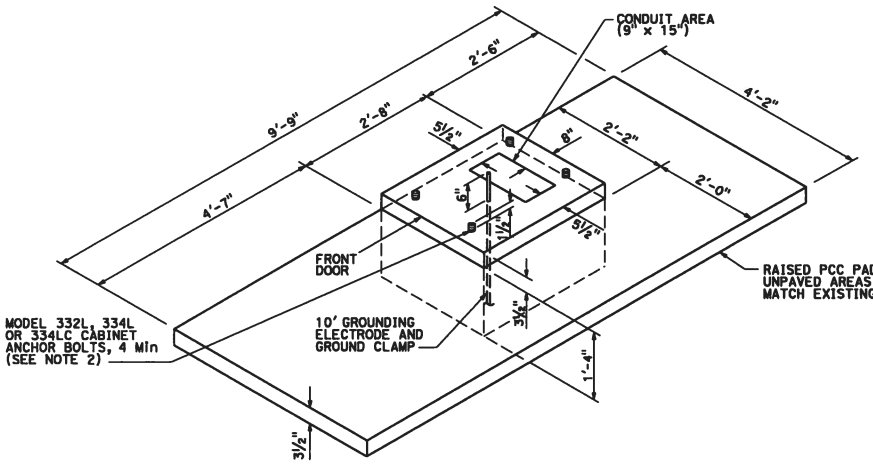
FOUNDATION FOR TYPE P, R AND S CABINETS
DETAIL B

CABINET TYPE	FOUNDATION		
	"W"	"H"	"D"
G	2'-0"	3'-6"	2'-0"
M	3'-2"	2'-6"	1'-6"
P	4'-4½"	1'-6"	2'-4"
R	4'-2"	1'-6"	2'-4"
S	5'-11½"	1'-6"	2'-4"



FRONT VIEW SIDE VIEW

PEDESTAL FOUNDATION FOR TYPE M OR MODEL 336L CABINET
DETAIL C



FOUNDATION DETAIL
See Note 21
DETAIL D

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (CONTROLLER CABINET FOUNDATION DETAILS)

NO SCALE

ES-3C

9-12-10

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Theresa Gabriel
REGISTERED ELECTRICAL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Theresa Aziz Gabriel
No. E15129
Exp. 6-30-14
ELECTRICAL
STATE OF CALIFORNIA

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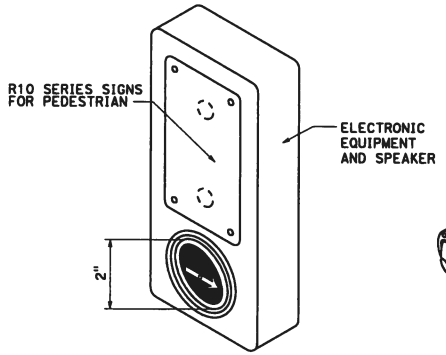
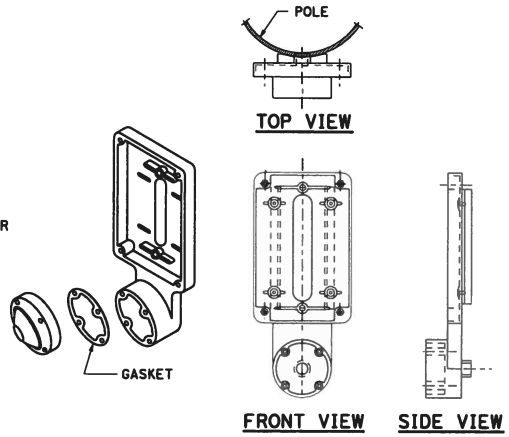
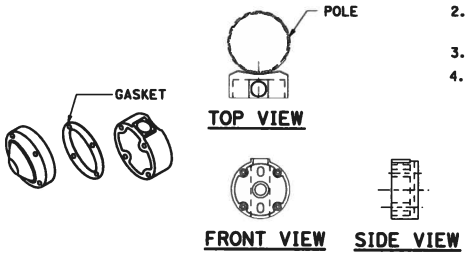
TO ACCOMPANY PLANS DATED _____



ACCESSIBLE PEDESTRIAN SIGNAL
DETAIL A
(See note 1 to 4)



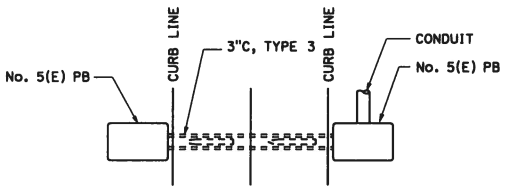
TYPE B PUSH BUTTON ASSEMBLY
DETAIL B
(See note 1 to 4)



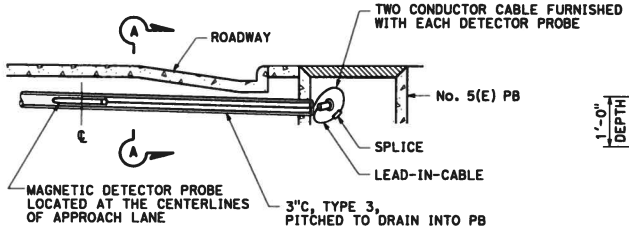
TYPE C PUSH BUTTON ASSEMBLY
DETAIL C
(See note 1 to 4)

NOTES:

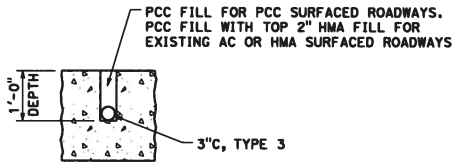
1. Back casting shape to fit curvature of pole.
2. Provide cover fitting for top of post, when PBA is mounted on push button assembly post.
3. Install push button on crosswalk side of standard.
4. Use R10 series regulatory signs and plaques for pedestrian and bicycle facilities.



PLAN



ELEVATION



SECTION A-A

MAGNETIC VEHICLE DETECTOR INSTALLATION DETAILS
DETAIL D

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (ACCESSIBLE PEDESTRIAN SIGNAL, PUSH BUTTON ASSEMBLIES AND MAGNETIC VEHICLE DETECTOR)

NO SCALE

RSP ES-5C DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-5C DATED MAY 20, 2011 - PAGE 450 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP ES-5C

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Stanley P. Johnson — No. C61763 — Exp. 3-31-14 — CIVIL — STATE OF CALIFORNIA

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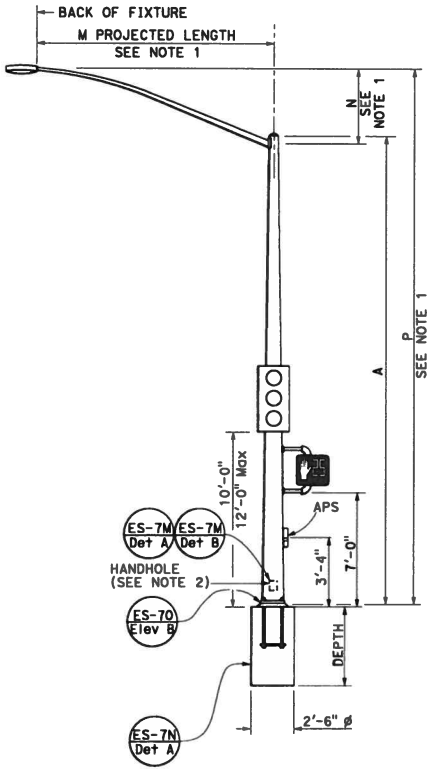
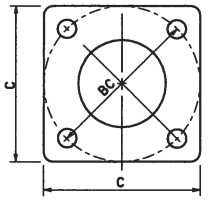
TO ACCOMPANY PLANS DATED _____

NOTES:

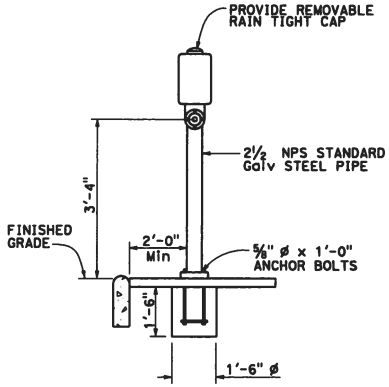
1. For additional notes, details and data for Type 15TS and Type 21TS Standards, see Standard Plan ES-6A.
2. Handhole shall be located on the downstream side of traffic.



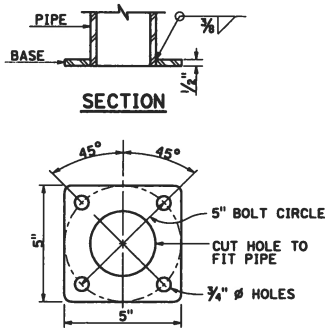
TYPE 15TS AND 21TS STANDARD
ELEVATION A
(See Note 1)



BASE PLATE
TYPE 15TS AND 21TS
DETAIL A

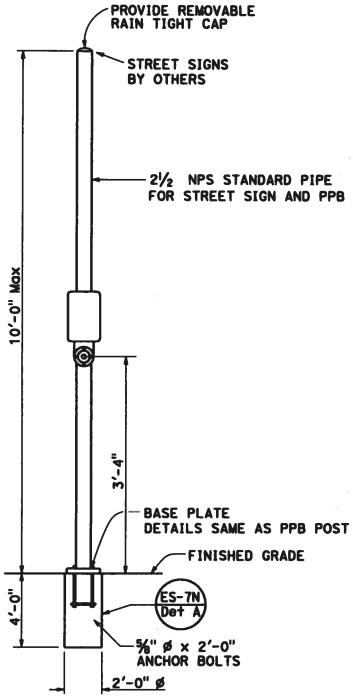


ELEVATION



BASE PLATE
PBA POST

PUSH BUTTON ASSEMBLY POST
DETAIL B



COMBINED STREET SIGN
PUSH BUTTON ASSEMBLY POST
DETAIL C

POLE TYPE	POLE DATA				BASE PLATE DATA				CIDH
	A HEIGHT	Min OD BASE	Min OD TOP	WALL THICKNESS	C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	DEPTH
15TS	30'-0"	8"	3⅛"	0.1793"	1'-1½"	1'-0"	2"	1½" ø x 42"	7'-6"
21TS	35'-0"	9⅜"	3⅜"		1'-3"	1'-2"			8'-6"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

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

NO SCALE

RSP ES-7A DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-7A DATED MAY 20, 2011 - PAGE 462 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP ES-7A

6-18

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 20, 2011
PLANS APPROVAL DATE

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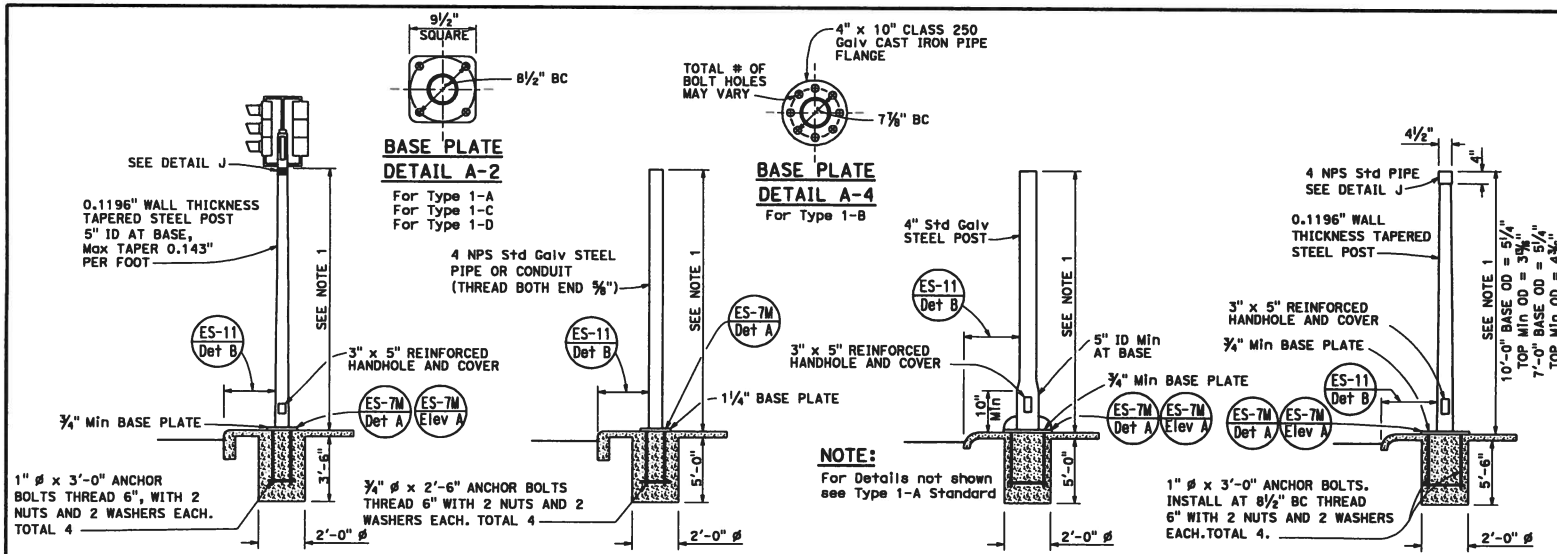
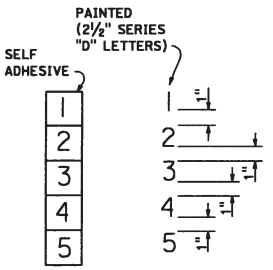
REGISTERED PROFESSIONAL ENGINEER — Stanley P. Johnson — No. C57793 — 3-31-12 — CIVIL — STATE OF CALIFORNIA



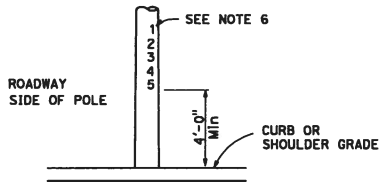
TYPE 1 SIGNAL STANDARDS
DETAIL A

NOTES:

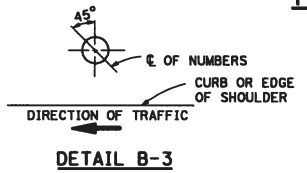
1. Standards shall be 10'-0" ± 2" for vehicle signals and 7'-0" ± 2" for pedestrian signals unless shorter pole is noted on project plans.
2. Top of standards shall be 4½" OD.
3. Conduits shall extend 2" maximum above finished surface of foundation and for Types 1-A, 1-C and 1-D shall be sloped toward handhole.
4. Anchor bolts shall be bonded to conduit or grounding conductor.
5. Conduit between standard and adjacent pull box shall be 2" minimum.
6. Paint numbers on roadway side facing traffic.
7. For additional notes and details, see Standard Plans ES-7M and ES-7N.
8. Pour foundation concrete against undisturbed soil.
9. For standards with handhole, locate in the downstream side of traffic.
10. Coupling nuts to be used only when shown or specified on project plans.



NUMBER DETAIL
DETAIL B-1

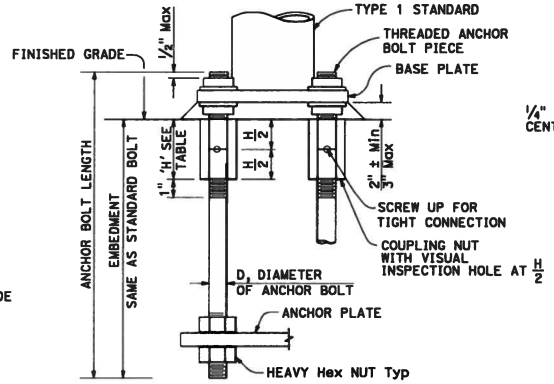


TYPICAL NUMBER FORMAT
DETAIL B-2

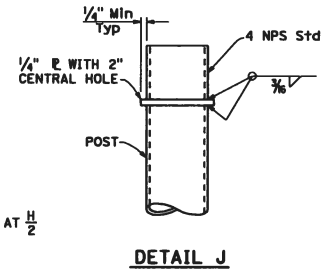


DETAIL B-3

LOCATION OF EQUIPMENT NUMBERS ON STANDARDS AND POSTS
DETAIL B



ANCHOR BOLTS WITH SLEEVE NUTS
DETAIL C
(See Note 10)



DETAIL J

COUPLING NUT TABLE	
BOLT DIAMETER	NUT TABLE THICKNESS 'H'
¾"	2¼"
1"	3"

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, TYPE 1 AND EQUIPMENT NUMBERING)

NO SCALE

ES-7B

7-13-10

Return to Table of Contents

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

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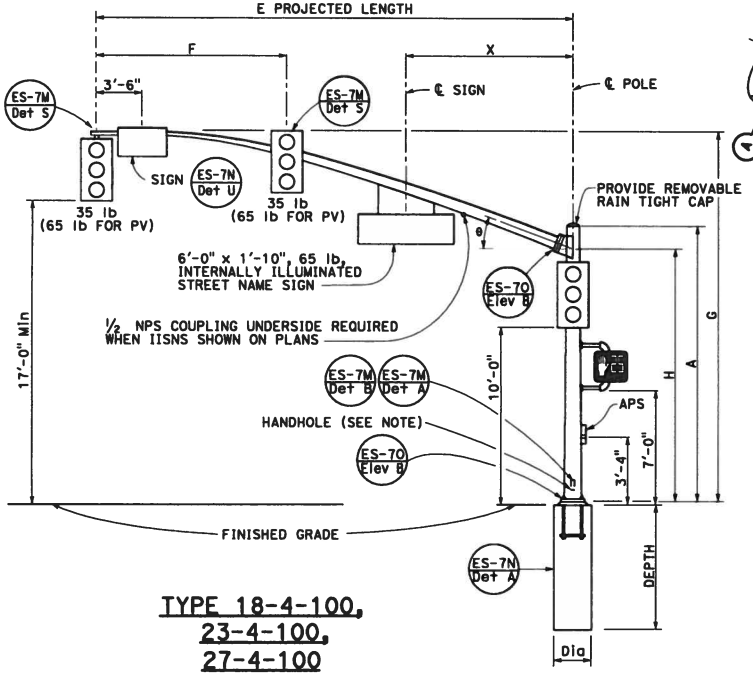
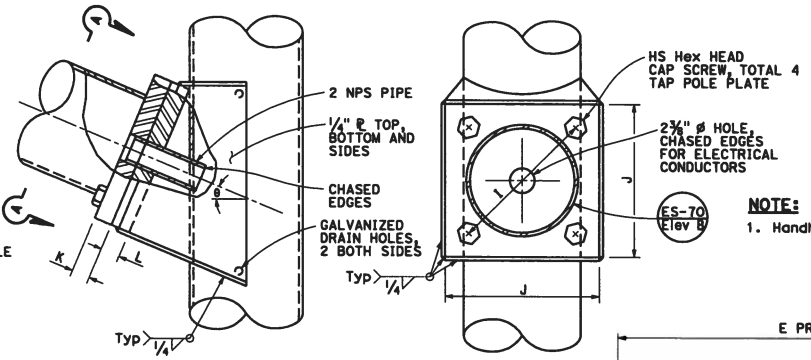
REGISTERED PROFESSIONAL ENGINEER — Stanley P. Johnson — No. C57793 — Exp. 3-31-14 — CIVIL — STATE OF CALIFORNIA

TO ACCOMPANY PLANS DATED _____

NOTE:
1. Handhole shall be located on the downstream side of traffic.

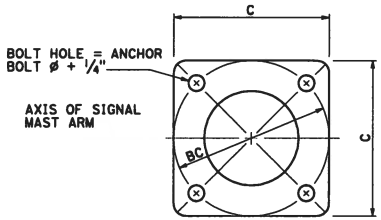


TYPE 18-4-100, 23-4-100, 27-4-100
ELEVATION A

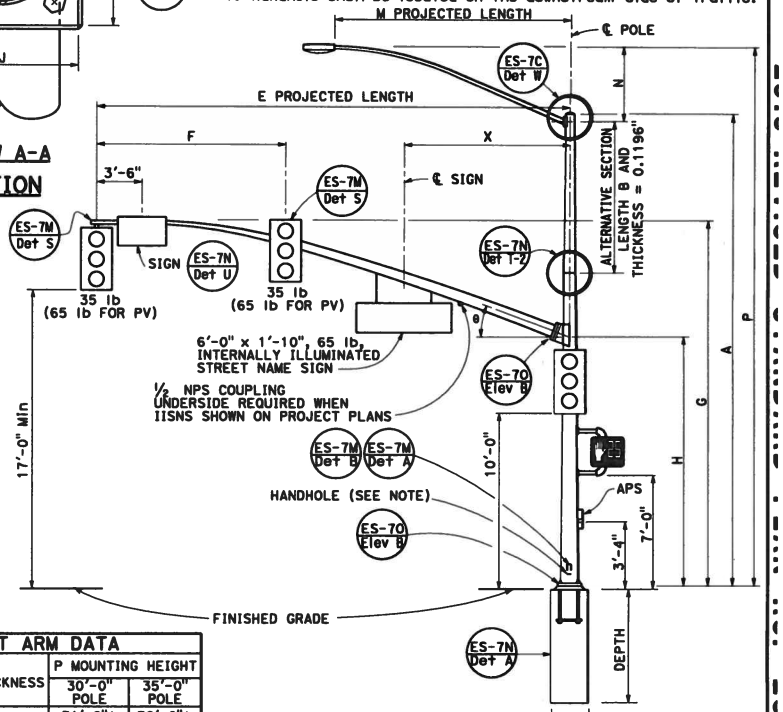


ELEVATION C — VIEW A-A

SIGNAL MAST ARM CONNECTION
DETAIL A



BASE PLATE
DETAIL B



TYPE 19-4-100, 19A-4-100, 24-4-100, 24A-4-100, 26-4-100, 26A-4-100
ELEVATION B

SIGNAL MAST ARM DATA												
E PROJECTED LENGTH	F Min SPACING	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM ℄ THICKNESS	L POLE ℄ THICKNESS	θ	X Max
25'-0"	10'-0"	22'-8"±	16'-0"	7⅜"	0.2391"	12"	1¼"-7NC-3"	1'-0"	1¼"	1½"	23°	10'-6"
30'-0"	12'-0"	23'-0"±		8"								
35'-0"	14'-0"			8⅛"		13½"		1'-1½"	1½"	1¾"	21°	
40'-0"	15'-0"			9⅜"							15°	13'-0"
45'-0"		23'-8"±		10¼"								

LUMINAIRE MAST ARM DATA					
M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT 30'-0" POLE	P MOUNTING HEIGHT 35'-0" POLE
6'-0"	2'-0"±	3¼"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3½"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3⅞"		32'-9"±	37'-9"±
12'-0"	4'-3"±			33'-9"±	38'-9"±
15'-0"	4'-9"±	4¼"		34'-3"±	39'-3"±

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA A HEIGHT	Min OD BASE	Min OD TOP	THICKNESS	ALTERNATIVE SECTION B LENGTH	ALTERNATIVE SECTION BOTTOM	ALTERNATIVE SECTION TOP	BASE PLATE DATA C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION Dia	DEPTH	REINFORCED
18-4-100	4	100	17'-0"	12⅛"	9⅝"	0.3125"	NONE	9⅛"	7⅛"	1'-7"	1'-5½"	3"	2" ø x 42"	NONE	25'-0", 30'-0"	3'-0"	11'-0"	YES
19-4-100			30'-0"		7¼"		10'-0"							6'-15' 12'-0"				
19A-4-100			35'-0"		6⅝"		15'-0'							6'-15' 15'-0"				
23-4-100			17'-0"		9⅝"		NONE							NONE	35'-0"			
24-4-100			30'-0"		7¼"		10'-0"	9⅛"	7⅛"					6'-15' 12'-0"				
24A-4-100			35'-0"		6⅝"		15'-0"		6⅝"					6'-15' 15'-0"				
26-4-100			30'-0"	14"	8¾"		10'-0"	9⅝"	8⅜"	2'-3"	2'-1"		2½" ø x 42"	6'-15' 12'-0"	40'-0", 45'-0"	3'-6"	12'-0"	
26A-4-100			35'-0"		7⅛"		15'-0"		7⅛"					6'-15' 15'-0"				
27-4-100			17'-0"		10⅛"		NONE							NONE				

[ ] INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

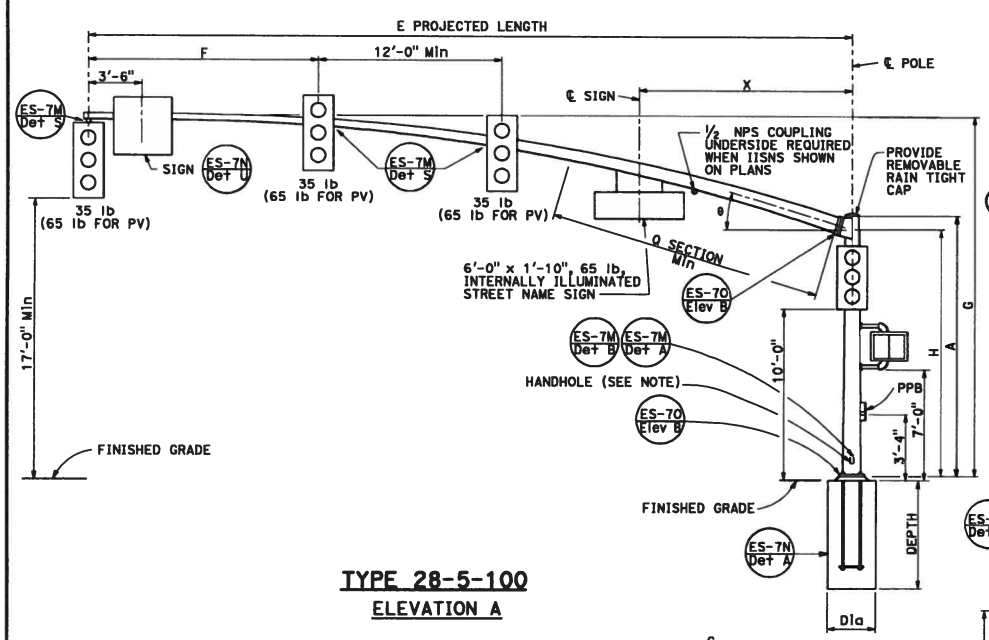
ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, CASE 4 SIGNAL MAST ARM LOADING, WIND VELOCITY=100 MPH AND SIGNAL MAST ARM LENGTHS 25' TO 45')

NO SCALE

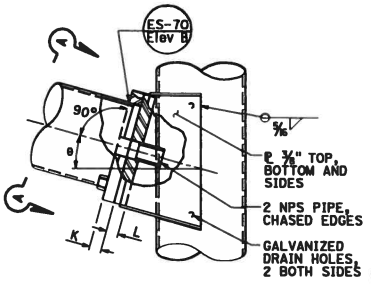
RSP ES-7F DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-7F DATED MAY 20, 2011 - PAGE 467 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP ES-7F

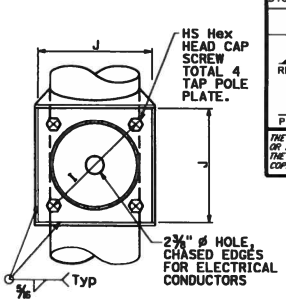
6-18-1



TYPE 28-5-100
ELEVATION A



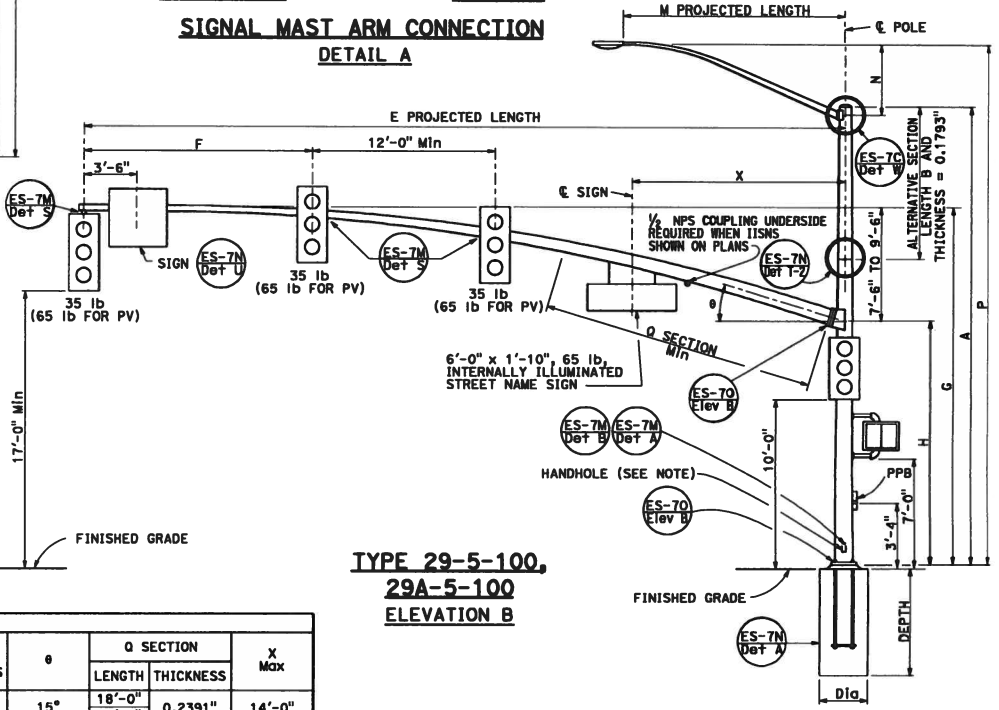
ELEVATION C



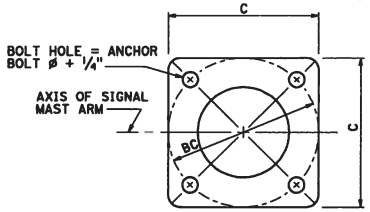
VIEW A-A

SIGNAL MAST ARM CONNECTION
DETAIL A

NOTE:
Handhole shall be located on the downstream side of traffic.



TYPE 29-5-100, 29A-5-100
ELEVATION B



BASE PLATE
DETAIL B

LUMINAIRE MAST ARM DATA					
M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT 30'-0" POLE	P MOUNTING HEIGHT 35'-0" POLE
6'-0"	2'-0"±	3¼"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3½"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3⅜"		32'-9"±	37'-9"±
12'-0"	4'-3"±			33'-9"±	38'-9"±
15'-0"	4'-9"±	4¼"		34'-3"±	39'-3"±

SIGNAL MAST ARM DATA													
E PROJECTED LENGTH	F Min SPACING	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM ℄ THICKNESS	L POLE ℄ THICKNESS	θ	Q SECTION LENGTH	Q SECTION THICKNESS	X Max
50'-0"	15'-0"	23'-7"± TO 25'-7"±	16'-0"	11⅞"	0.1793"	16"	1½"-6NC-3¼"	1'-4"	1¾"	1¾"	15°	18'-0"	0.2391"	14'-0"
55'-0"				1'-1¼"								23'-0"		

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA A HEIGHT	Min OD BASE	Min OD TOP	THICKNESS	ALTERNATIVE SECTION B LENGTH	ALTERNATIVE SECTION BOTTOM	ALTERNATIVE SECTION TOP	BASE PLATE DATA C	BC = BOLT CIRCLE	THICKNESS	ANCHOR BOLT SIZE	LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION Dia	DEPTH	REINFORCED
28-5-100	5	100	17'-0"	14"	11⅜"	0.3125"	NONE			23"	21"	3"	2½" ø x 42"	NONE	50'-0", 55'-0"	3'-6"	12'-0"	YES
29-5-100			30'-0"		9⅛"		10'-0"	11⅛"	9⅛"					6'-15' 15'-0"				
29A-5-100			35'-0"		8⅝"		15'-0"		8⅝"									

INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

May 20, 2011
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER Stanley P. Johnson No. C37793 Exp. 3-31-12 CIVIL STATE OF CALIFORNIA

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, CASE 5 SIGNAL MAST ARM LOADING, WIND VELOCITY=100 MPH AND SIGNAL MAST ARM LENGTHS 50' TO 55')

NO SCALE

ES-7G

8-9-10

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

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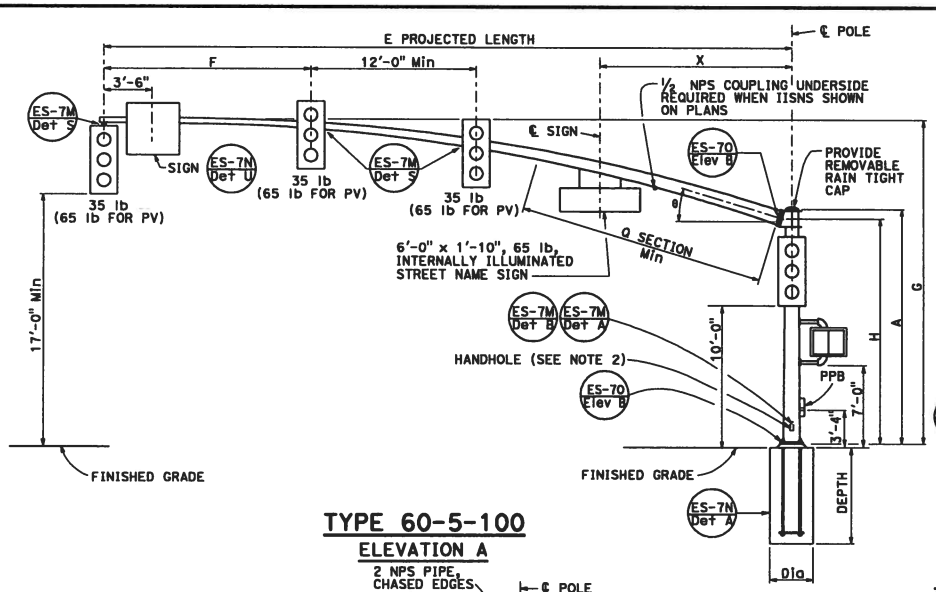
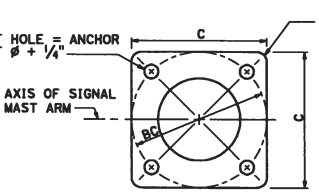
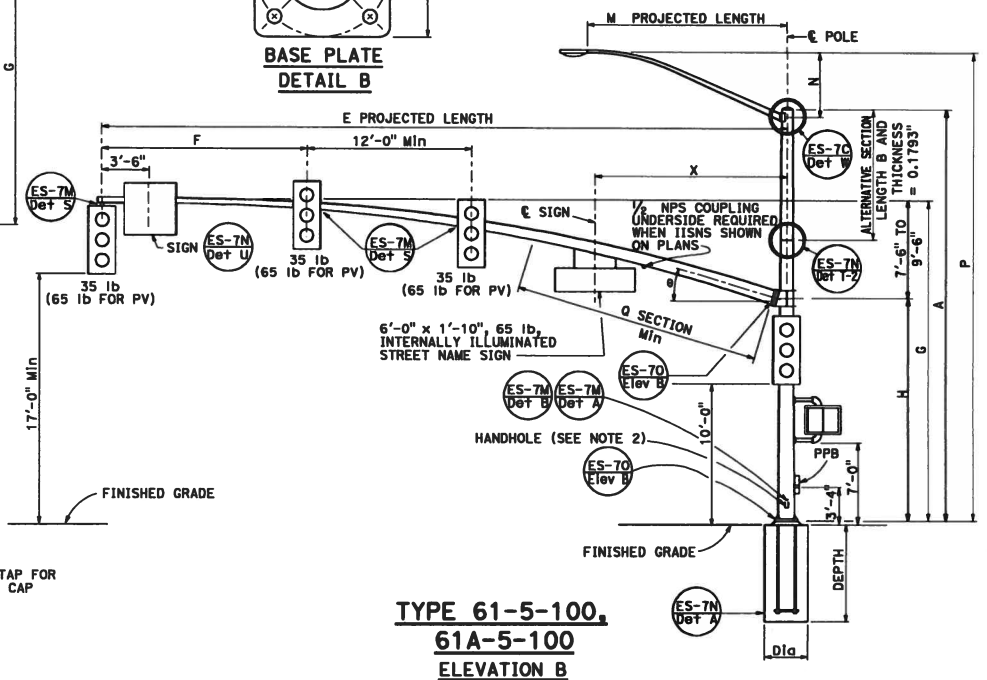
REGISTERED PROFESSIONAL ENGINEER — Stanley P. Johnson — No. C37753 — Exp. 3-31-12 — CIVIL — STATE OF CALIFORNIA



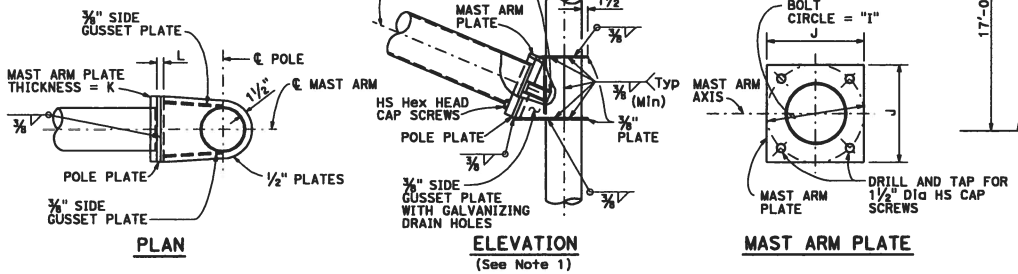


BASE PLATE
DETAIL B



TYPE 61-5-100,
61A-5-100
ELEVATION B

TYPE 60-5-100
ELEVATION A



SIGNAL MAST ARM CONNECTION
DETAIL A

SIGNAL MAST ARM DATA														
E PROJECTED LENGTH	F Min SPACING	G MOUNTING HEIGHT	H	Min OD AT POLE	THICKNESS	I BOLT CIRCLE	HS CAP SCREWS	J PLATE SIZE	K MAST ARM ℄ THICKNESS	L POLE ℄ THICKNESS	θ	Q SECTION LENGTH	Q SECTION THICKNESS	X Max
60'-0"	15'-0"	23'-7" TO 25'-7"	16'-0"	1'-1½"	0.1793"	20"	1½"-6NC-4"	1'-8"	2"	2"	15°	24'-0"	0.2391"	14'-0"
65'-0"					0.2391"							29'-0"	0.3125"	

LUMINAIRE MAST ARM DATA						
M PROJECTED LENGTH	N RISE	Min OD AT POLE	THICKNESS	P MOUNTING HEIGHT 30'-0" POLE	P MOUNTING HEIGHT 35'-0" POLE
6'-0"	2'-0"±	3¼"	0.1196"	31'-6"±	36'-6"±
8'-0"	2'-6"±	3½"		32'-0"±	37'-0"±
10'-0"	3'-3"±	3⅞"		32'-9"±	37'-9"±
12'-0"	4'-3"±			33'-9"±	38'-9"±
15'-0"	4'-9"±	4¼"		34'-3"±	39'-3"±

NOTES:
1. The radial separation between the face of the pole and the adjacent insides of the top and bottom gusset plates shall not exceed ⅜". Fillet weld size to be increased by amount of gap.
2. Handhole shall be located on the downstream side of traffic.

POLE TYPE	LOAD CASE	WIND VELOCITY (mph)	POLE DATA A HEIGHT	POLE DATA Min OD BASE	POLE DATA Min OD TOP	POLE DATA THICKNESS	BASE PLATE DATA C	BASE PLATE DATA BC = BOLT CIRCLE	BASE PLATE DATA THICKNESS	BASE PLATE DATA ANCHOR BOLT SIZE	LUMINAIRE MAST ARM	SIGNAL MAST ARM	CIDH PILE FOUNDATION DIAMETER	CIDH PILE FOUNDATION DEPTH	CIDH PILE FOUNDATION REINFORCED
60-5-100	5	100	17'-0"	16"	1'-1⅞"	0.3125"	2'-0"	1'-11"	3"	2½" ø x 60"	NONE	60'-0", 65'-0"	3'-6"	13'-0"	YES
61-5-100			30'-0"		11⅞"						6'-15' 15'-0"				
61A-5-100			35'-0"		10⅝"										

INDICATES MAST ARM LENGTH TO BE USED UNLESS OTHERWISE NOTED ON PLANS.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, CASE 5 SIGNAL MAST ARM LOADING, WIND VELOCITY=100 MPH AND SIGNAL MAST ARM LENGTHS 60' TO 65')

NO SCALE

ES-7H

8-9-10

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REGISTERED CIVIL ENGINEER

May 20, 2011
PLANS APPROVAL DATE

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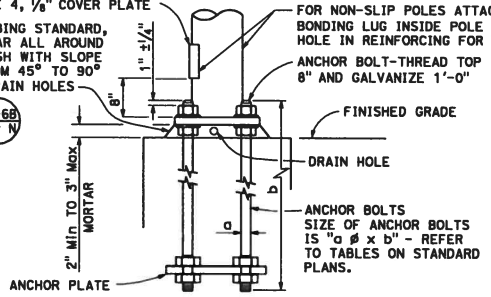
Stanley P. Johnson — No. C37793 — Exp. 3-31-12 — CIVIL — REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

4" x 6½" ROUNDED RECTANGLE HANDHOLE REINFORCED WITH RING WELDED TO OUTSIDE OF POLE. SEE NOTE 4, ⅛" COVER PLATE

AFTER PLUMBING STANDARD, PLACE MORTAR ALL AROUND BOLTS. FINISH WITH SLOPE RANGING FROM 45° TO 90° INCLUDES DRAIN HOLES

4 SIDES (ES-6B Det N)



HANDHOLE AND ANCHORAGE
DETAIL A

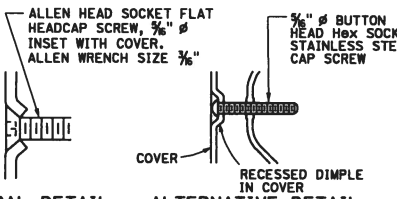
IDENTIFICATION NUMBER

1. Attach a stamped metal tag with pole's identification number above the handhole. ¼" high number, minimum.
2. Attach a stamped metal tag with mast arm's identification number to the bottom of the signal mast arm near the pole plate. ¼" high number, minimum.

Type — Load case (Use SL for special load case) — Design wind velocity (mph) — Signal mast arm length (ft) (Near handhole: Maximum signal mast arm length for pole type / Near pole plate: Installed signal mast arm length) — Standard plan year — Only for poles or mast arms using Detail F — Only for poles or mast arms using ES-7D

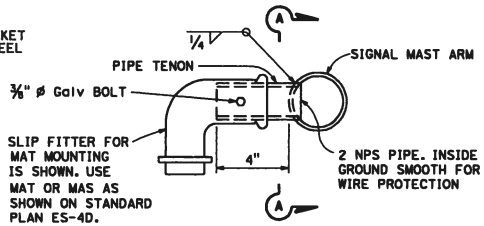
26A - 3 - 100 - 45 - 10 - F or FB

SAMPLE IDENTIFICATION NUMBER

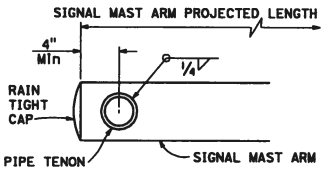


TYPICAL DETAIL
DETAIL B-1

ALTERNATIVE DETAIL
DETAIL B-2



SIDE TENON
DETAIL S-1

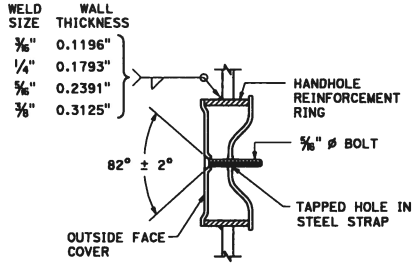


SECTION A-A

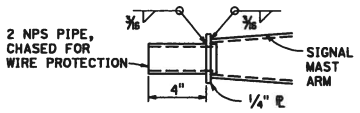
NOTES:

1. Provide a hex nut, leveling nut and 2 washers for each bolt.
2. Luminaire mast arms shall be round, tapered steel tubes, taper of 0.1375" to 0.143-inch per foot with an end section 2⅜" OD for mounting hardware. Extensions of 2 NPS Standard pipe and 7" long may be used at the option of the manufacturer. When low pressure sodium luminaires are required, the extension shall be 1'-3".
3. Signal mast arms shall be round, tapered steel tubes, maximum taper 0.143-inch per foot.
4. Handhole reinforcement ring shall be ¼" x 2" for 0.1196" to 0.2391" thick poles, ⅜" x 2" for 0.3125" thick poles.
5. Handholes shall be located on the downstream side of traffic.
6. Detail F, fatigue resistant weld, is required at socket welded signal mast arm plate and pole base plate.
7. Cap screws shall be tightened by the turn-of-nut method ⅓ turn from a snug tight condition. No washer will be required.
8. During pole installation, the post shall be raked as necessary with the use of leveling nuts to provide a plumb pole axis.
9. Outside diameter, wall thickness, and corresponding section properties of poles and mast arms as shown in the Standard Plans are minimums. Unless otherwise specified, alternative sections shall require approval by the Engineer.
10. Wind Loading (3 seconds gust): 100 mph
11. Unit Stresses (Structural steel):
    fy = 55,000 psi (tapered steel tube and anchor bolts)
    fy = 50,000 psi (unless otherwise noted)
12. Unit Stresses (Reinforced concrete):
    f'c = 3,625 psi
    fy = 60,000 psi

WELD SIZE	WALL THICKNESS
⅜"	0.1196"
¼"	0.1793"
⅝"	0.2391"
⅜"	0.3125"



TAMPER RESISTANT HANDHOLE COVER
DETAIL B

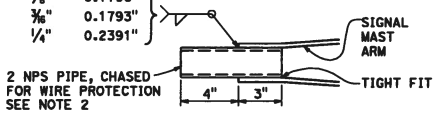


TIP TENON
DETAIL TL

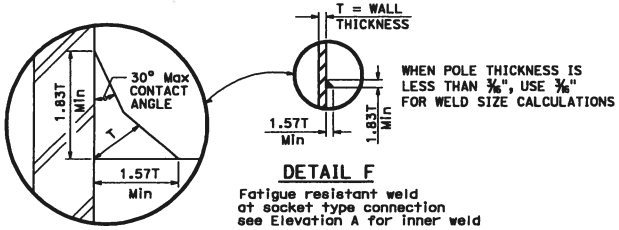
This detail supersedes Detail S when so designated

PIPE TENONS
DETAIL S

WELD SIZE	WALL THICKNESS
⅛"	0.1196"
⅜"	0.1793"
¼"	0.2391"

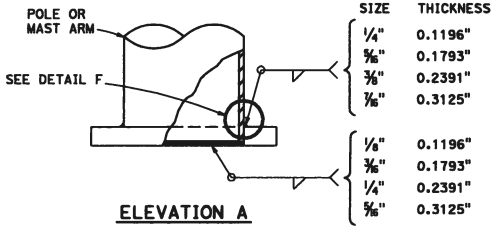


TIP TENON
DETAIL TS



DETAIL F

Fatigue resistant weld at socket type connection see Elevation A for inner weld



WELD SIZE	WALL THICKNESS
¼"	0.1196"
⅝"	0.1793"
⅜"	0.2391"
⅞"	0.3125"

WELD SIZE	WALL THICKNESS
⅛"	0.1196"
⅜"	0.1793"
¼"	0.2391"
⅝"	0.3125"

ELEVATION A

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, DETAIL No. 1)

NO SCALE

ES-7M

8-12-10

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REGISTERED CIVIL ENGINEER

May 20, 2011
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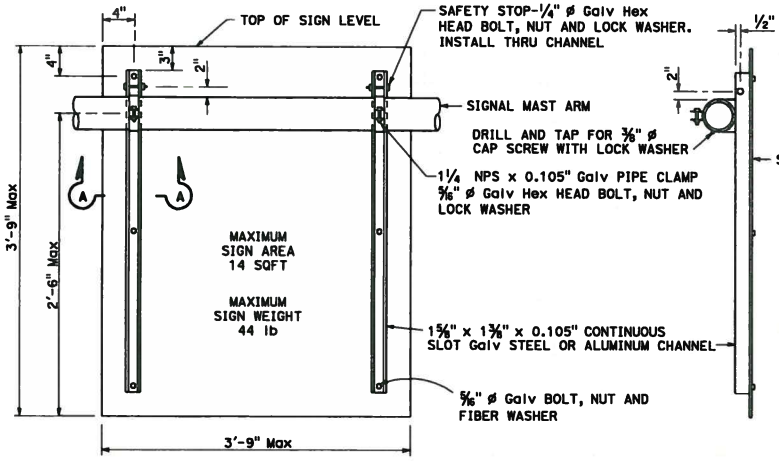
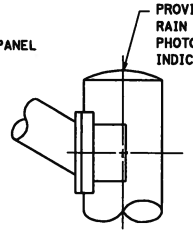


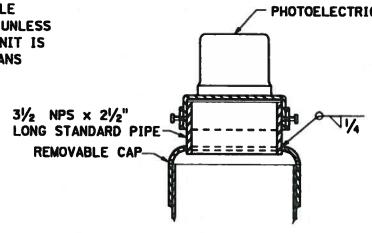
REAR VIEW

SIDE VIEW

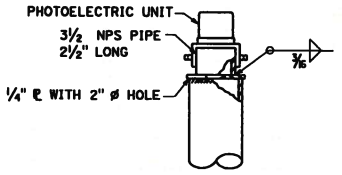
SIGN MOUNTING DETAILS
DETAIL U



STANDARD TOP
DETAIL B-1

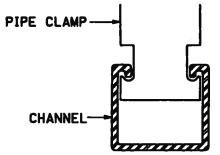


MOUNTING ADAPTER FOR PHOTOELECTRIC UNIT
DETAIL B-2

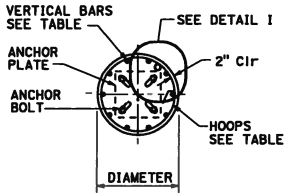


ALTERNATIVE MOUNTING ADAPTER
DETAIL B-3

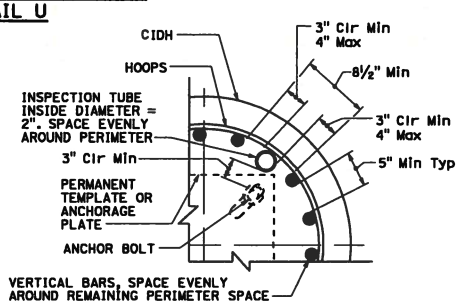
POLE TOP DETAILS
DETAIL B



SECTION A-A



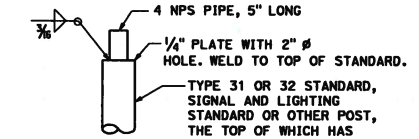
SECTION B-B



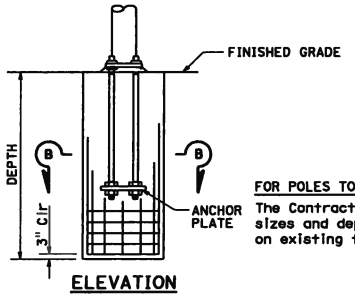
INSPECTION TUBE PLACEMENT
DETAIL I

CIDH REINFORCING AND INSPECTION TUBE SCHEDULE			
CIDH DIAMETER	VERTICAL BARS	HOOPS (WELDED)	INSPECTION TUBE
2 ft	8-#5	#4 AT 6	2
2.5 ft	10-#6		4*
3 ft	12-#7	#5 AT 6	
3.5 ft	14-#8		4
4 ft	18-#9	2-#4 AT 7	5
5 ft	22-#10	2-#5 AT 7	6
6 ft	26-#11	2-#6 AT 7	7

* FOR SLIP BASE VERSIONS WITH 3 ANCHOR BOLTS USE 3 INSPECTION TUBES.



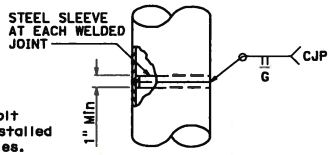
DETAIL C-1



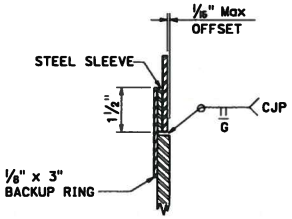
ELEVATION

CAST-IN-DRILLED HOLE PILE FOUNDATION, REINFORCED PILE
DETAIL A

FOR POLES TO BE INSTALLED ON EXISTING FOUNDATION:
The Contractor shall verify bolt circles, anchor bolt sizes and dependent dimensions for poles to be installed on existing foundations before fabricating the poles.

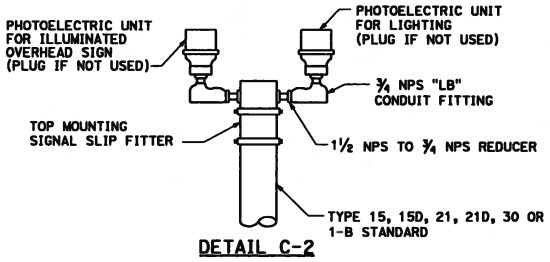


FOR UNIFORM TUBE THICKNESS
DETAIL T-1



AT TUBE THICKNESS CHANGE
DETAIL T-2

POLE SPLICES
DETAIL T



DETAIL C-2

DUAL PHOTOELECTRIC UNIT MOUNTING DETAIL
DETAIL C

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, DETAIL No. 2)

NO SCALE

ES-7N

11-1-10

2010 STANDARD PLAN ES-7N

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PLANS APPROVAL DATE

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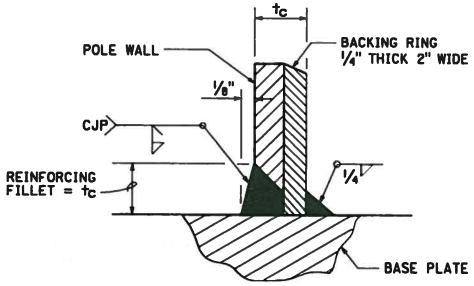
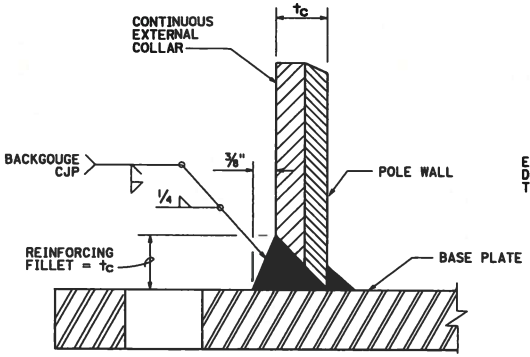
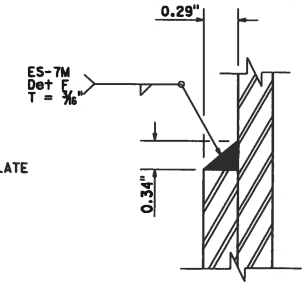
REGISTERED PROFESSIONAL ENGINEER — Stanley P. Johnson — No. C57793 — Exp. 9-31-12 — CIVIL — STATE OF CALIFORNIA



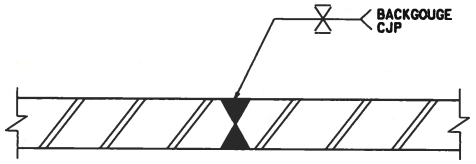
DETAIL B



DETAIL C1



DETAIL C2



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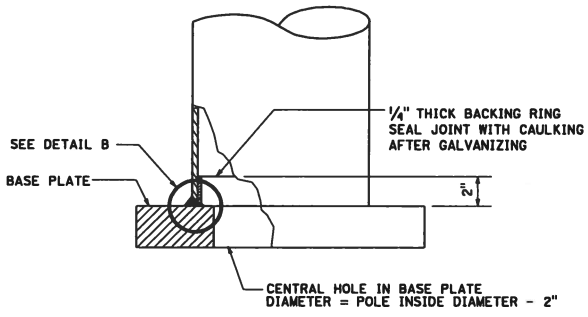
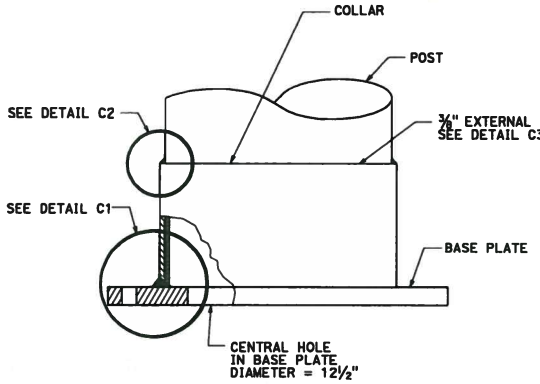
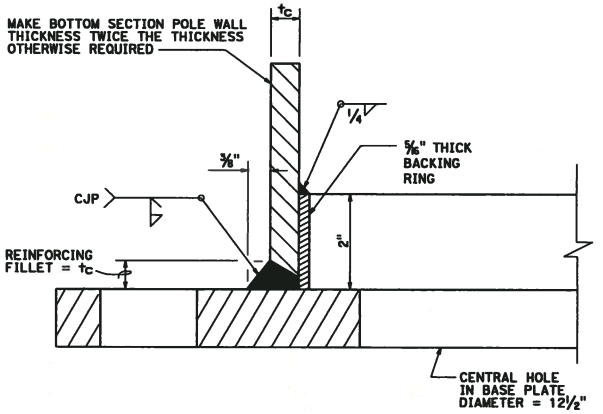


ELEVATION B



ELEVATION C

For alternative base, see Detail C4



DETAIL C4

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING STANDARD, DETAIL No. 3)

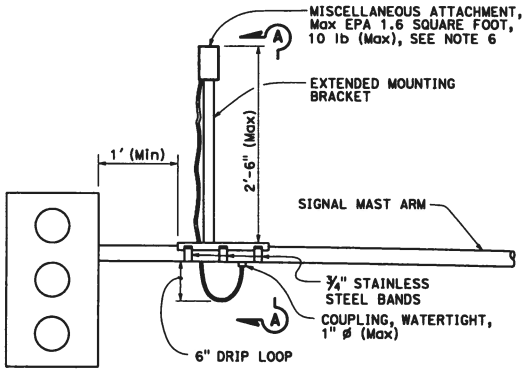
NO SCALE

ES-70

11-1-10

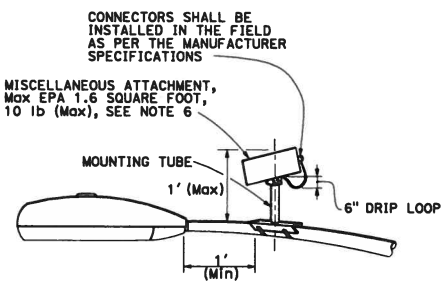
2010 STANDARD PLAN ES-70

Return to Table of Contents



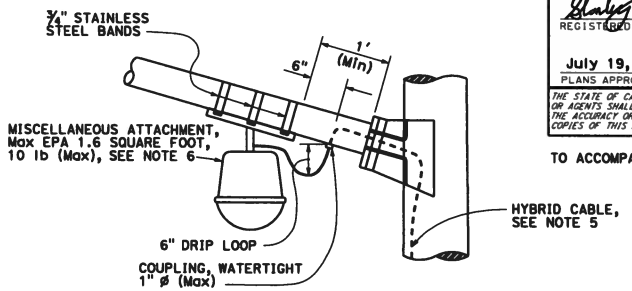
SIGNAL MAST ARM MOUNT

DETAIL A



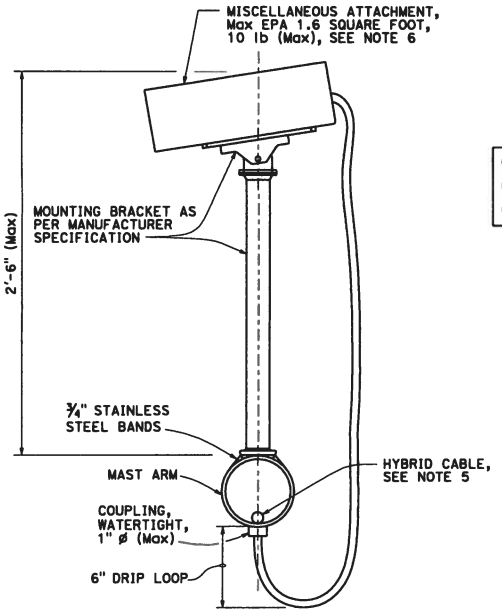
LUMINAIRE MAST ARM MOUNT

DETAIL B

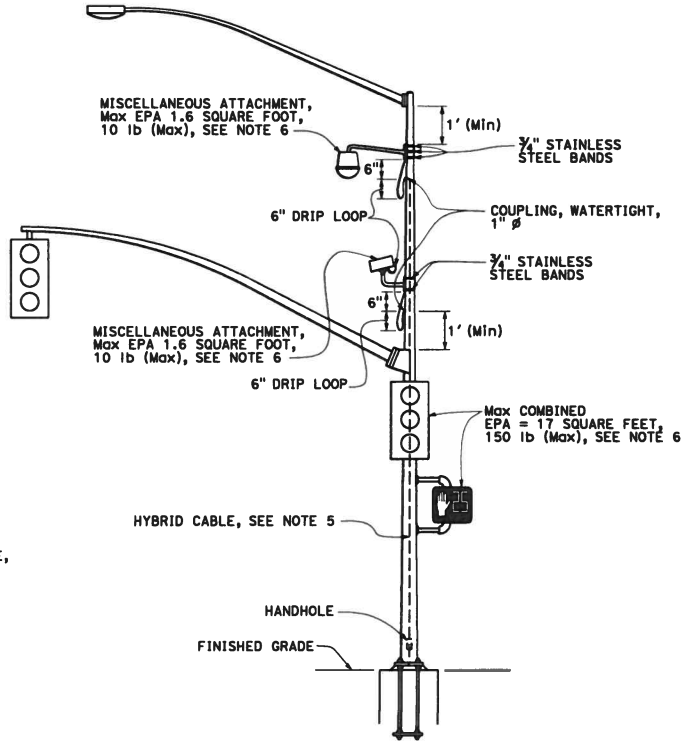


LUMINAIRE MAST ARM MOUNT

DETAIL C



SECTION A-A



SIGNAL POLE MOUNT

DETAIL D

NOTES:

1. Exact mounting location of miscellaneous attachment and bracket shall be approved by the Engineer per manufacturer's recommendation.
2. Location of cable entrances on signal pole shall be a minimum of 1' from any flange or base plate.
3. Hybrid cable entrances on signal pole shall be drilled for weathertight coupling as required.
4. Hybrid cable shall have a drip loop at the entrance into signal pole, luminaire mast arm and signal mast arm.
5. A single hybrid cable shall run continuous and shall not be twisted from the miscellaneous attachment to the controller cabinet. No splices shall be allowed.
6. Use the manufacturer's Effective Projected Area (EPA) for miscellaneous attachment. The maximum EPA for each miscellaneous attachment shall be 1.6 square feet.
7. Maximum of two miscellaneous attachments per traffic signal structure.
8. Maximum of one miscellaneous attachment per mast arm.
9. Miscellaneous attachment shall be mounted using clamping devices.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER

July 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Stanley P. Johnson — No. C57793 — Exp. 3-31-14 — CIVIL — STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED _____

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (SIGNAL AND LIGHTING, MISCELLANEOUS ATTACHMENT)

NO SCALE

RSP ES-7R DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-7R DATED MAY 20, 2011 - PAGE 479 OF THE STANDARD PLANS BOOK DATED 2010.

REVISED STANDARD PLAN RSP ES-7R

6-17

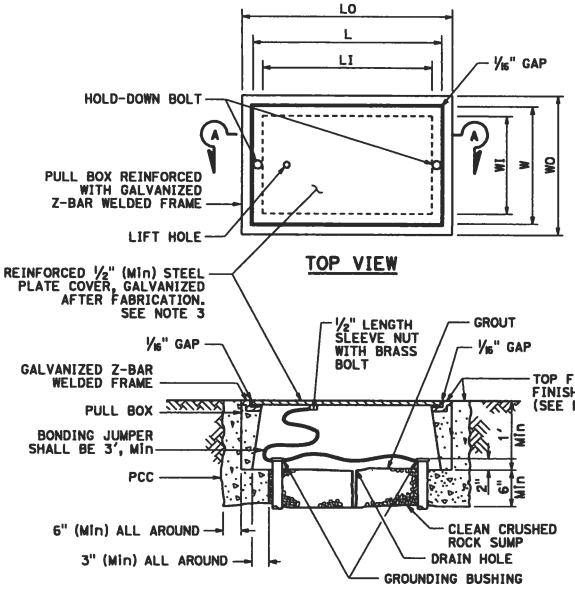
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Jeffrey G. McRae
REGISTERED ELECTRICAL ENGINEER

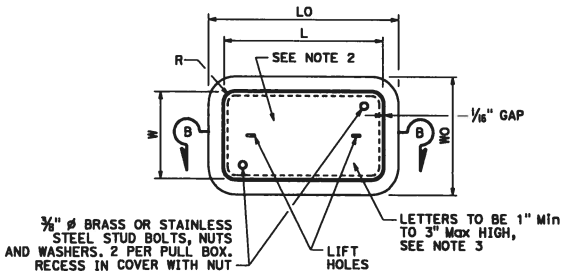
May 20, 2011
PLANS APPROVAL DATE

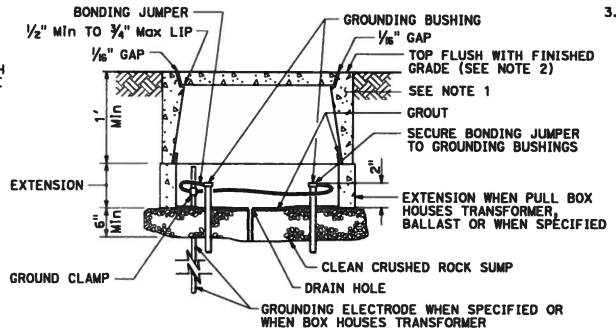
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER — Jeffrey G. McRae — No. E14512 — Exp. 6-30-12 — ELECTRICAL — STATE OF CALIFORNIA



SECTION A-A
TRAFFIC PULL BOX
DETAIL A





SECTION B-B
PULL BOX
DETAIL B

NOTES:

1. Steel reinforcing shall be as regularly used in the standard products of the respective manufacturer.
2. Top of pull boxes shall be flush with surrounding grade or top of adjacent curb, except that in unpaved areas where pull box is not immediately adjacent to and protected by a concrete foundation, pole or other protective construction, the box shall be placed with its top 1¼" above surrounding grade. Where practicable, pull boxes shown in the vicinity of curbs shall be placed adjacent to the back of curb, and pull boxes shown adjacent to standards shall be placed on side of foundation facing away from traffic, unless otherwise noted. When pull box is installed in sidewalk area, the depth of the pull box shall be adjusted so that the top of the pull box is flush with the sidewalk.
3. Pull box covers shall be marked as follows:
   A) "SERVICE", service circuits between service point and service disconnect.
   B) "SPRINKLER-CONTROL", sprinkler control circuit where voltage is 50 V or less.
   C) "CALTRANS", on all pull boxes unless noted otherwise.
   D) "TELEPHONE", telephone service.
   E) No. 3½ pull box.
      1) "SIGNAL", traffic signal circuits with or without street or sign lighting circuits.
      2) "ST LIGHTING", street or sign lighting circuits where voltage is under 600 V.
   F) No. 5, 6, 9 or 9A pull box.
      1) "TRAFFIC SIGNAL", traffic signal circuits with or without street or sign lighting circuits.
      2) "STREET LIGHTING", street or sign lighting circuits where voltage is under 600 V.
      3) "STREET LIGHTING-HIGH VOLTAGE", street or sign lighting circuits where voltage is above 600 V.
      4) "IRRIGATION", circuits to irrigation controller 120 V or more.
      5) "RAMP METER", ramp meter circuits.
      6) "COUNT STATION", count or speed monitor circuits.
      7) "COMMUNICATION", communication circuits.
      8) "TOS COMMUNICATIONS", TOS communications line.
      9) "TOS POWER", TOS power.
      10) "TDC POWER", telephone demarcation cabinet power.
      11) "CCTV", closed circuit television circuits.
      12) "TMS", traffic monitoring station circuits.
      13) "CMS", changeable message sign circuits.
      14) "HAR", highway advisory radio circuits.
      15) "LIGHTING", lighting circuits.
4. Dimensions are nominal values. The dimension of the opening in which the cover sets in shall be 1/8" greater than dimension of the cover.
5. Covers and boxes shall be interchangeable with California standard male and female gages. When interchanged with a standard male or female gage, the top surfaces shall be flush within 1/8". Top outside edge of concrete covers and pull boxes shall have a 1/4" minimum radius.
6. Pull boxes shall not be installed within the boundaries of new or existing curb ramps.
7. Pull boxes for electroliers, post and signal standards shall be located within 5'-0" from the station of the adjacent electrolier, post or signal standard. Pull boxes shall be placed adjacent to back of curb or edge of shoulder except where this is impractical, a box may be placed in another suitable protected and accessible location.

PULL BOX

PULL BOX	CONCRETE BOX				NON-PCC BOX		CONCRETE OR NON-PCC COVERS				
	MINIMUM * THICKNESS	MINIMUM DEPTH BOX AND EXTENSION	WO	LO	MINIMUM ** THICKNESS	MINIMUM DEPTH BOX AND EXTENSION	W **	L **	R	EDGE THICKNESS	EDGE TAPER
No. 3½	2"	NO EXTENSION	1'-2"	1'-7"	5/16"	NO EXTENSION	10"	1'-3"	1 1/16"	1¾"	1/8"
No. 5	2"	1'-10"	1'-6"	2'-4"	5/16"	1'-8"	1'-2"	2'	1¼"	2"	1/8"
No. 6	2"	2'	1'-10"	2'-10"	3/8"	1'-8"	1'-6"	2'-6"	1¼"	2"	1/8"

* EXCLUDING CONDUIT WEB ** TOP DIMENSION

TRAFFIC PULL BOX

PULL BOX	CONCRETE BOX						STEEL COVER		
	MINIMUM * THICKNESS	MINIMUM DEPTH BOX AND EXTENSION	WO	LO	WI	LI	W **	L **	EDGE THICKNESS
No. 3½(T)	2½"	1'	1'-4"	1'-10"	11"	1'-5"	1'-2"	1'-8"	½"
No. 5(T)	3"	1'	1'-7"	2'-6"	1'-1"	2'	1'-4"	2'-3"	½"
No. 6(T)	3½"	1'	2'	3'-1"	1'-5"	2'-6"	1'-8"	2'-9"	½"

* EXCLUDING CONDUIT WEB ** TOP DIMENSION

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (PULL BOX)

NO SCALE

ES-8

4-9-10

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

Jeffery L. McRae
REGISTERED ELECTRICAL ENGINEER
May 20, 2011
PLANS APPROVAL DATE
Jeffery L. McRae No. E14512 Exp. 6-30-12 ELECTRICAL STATE OF CALIFORNIA
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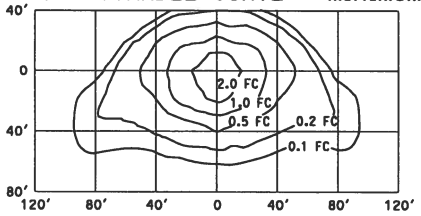
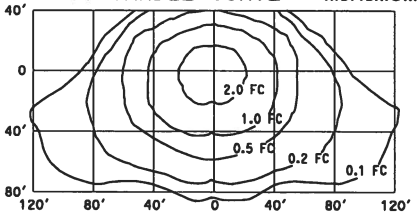
ISOFOOTCANDLE CURVE - MINIMUM



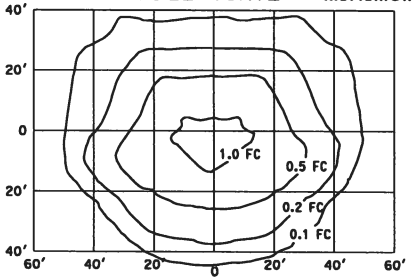
TYPE III MEDIUM CUTOFF
Cutoff Luminaire
34' Mounting Height
Lamp operated at 22,000 lm
200-W high pressure sodium lamp
ANSI Designation S66

ISOFOOTCANDLE CURVE - MINIMUM



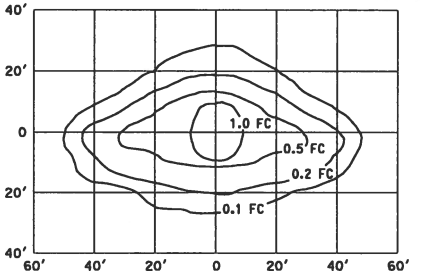
TYPE III MEDIUM CUTOFF
Cutoff Luminaire
40' Mounting Height
Lamp operated at 37,000 lm
310-W high pressure sodium lamp
ANSI Designation S67

ISOFOOTCANDLE CURVE - MINIMUM



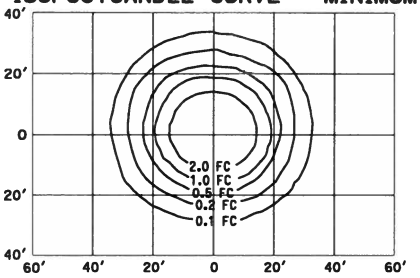
FLUSH SOFFIT LUMINAIRE
17' Mounting Height
Lamp operated at 5,800 lm
70-W high pressure sodium lamp
ANSI Designation S62

ISOFOOTCANDLE CURVE - MINIMUM



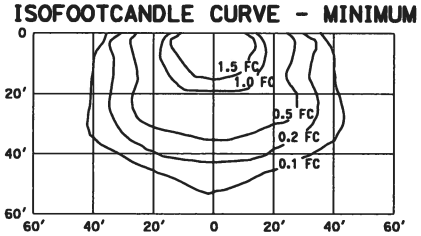
PENDANT SOFFIT LUMINAIRE
TYPE III SHORT
17' Mounting Height
Lamp operated at 5,800 lm
70-W high pressure sodium lamp
ANSI Designation S62

ISOFOOTCANDLE CURVE - MINIMUM



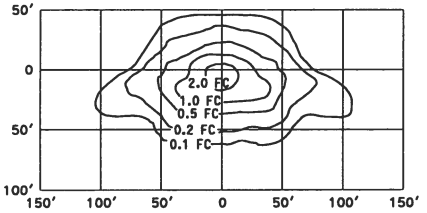
PENDANT SOFFIT LUMINAIRE
17' Mounting Height
Lamp operated at 5,800 lm
70-W high pressure sodium lamp
ANSI Designation S62

ISOFOOTCANDLE CURVE - MINIMUM



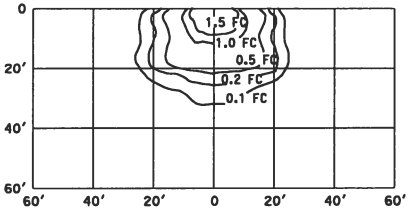
WALL LUMINAIRE
15' Mounting Height
Lamp operated at 9,500 lm
100-W high pressure sodium lamp
ANSI Designation S54

ISOFOOTCANDLE CURVE - MINIMUM



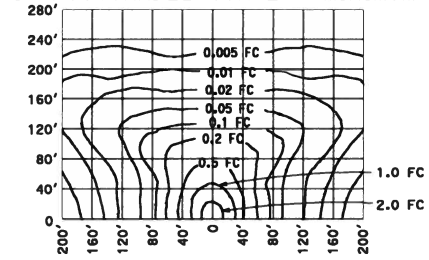
TYPE III MEDIUM CUTOFF
Cutoff Luminaire
30' Mounting Height
Lamp operated at 16,000 lm
150-W high pressure sodium lamp
ANSI Designation S55

ISOFOOTCANDLE CURVE - MINIMUM

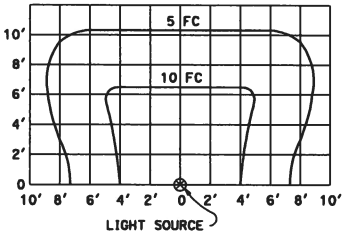


WALL LUMINAIRE
15' Mounting Height
Lamp operated at 5,800 lm
70-W high pressure sodium lamp
ANSI Designation S62

ISOFOOTCANDLE CURVE - MINIMUM



LOW PRESSURE SODIUM LUMINAIRE
40' Mounting Height
Lamp operated at 33,000 lm
180-W low pressure sodium lamp



SIGN LIGHTING FIXTURE
ISOFOOTCANDLE DIAGRAM

NOTES:

1. Curves represent the minimum footcandle (FC) of initial illumination on a 10'-0" x 20'-0" panel.
2. The FC shown are with the fixture attached to the light fixture mounting channel which places the center of the source 4'-8" in front of panel and 1'-0" below the bottom edge.
3. Applicable lamp: 85-W fluorescent phosphor coated induction lamp.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (ISOFOOTCANDLE DIAGRAMS)

NO SCALE

ES-10

4-5-10

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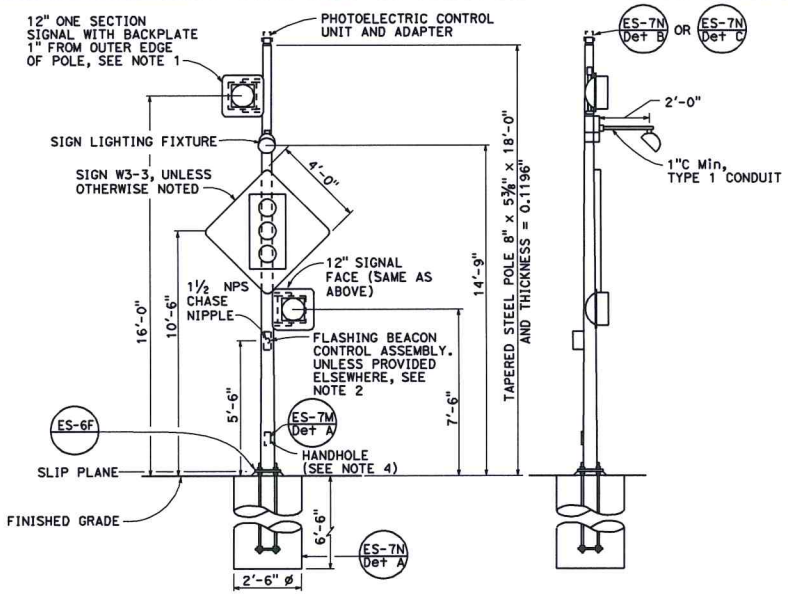
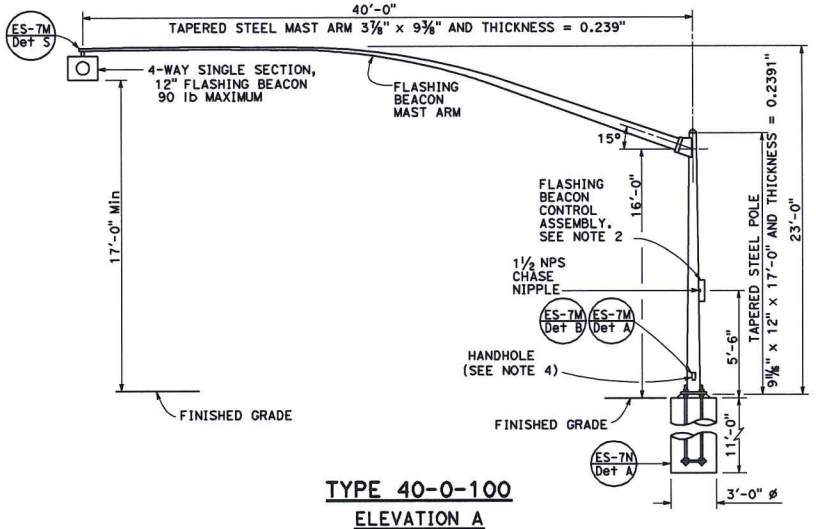
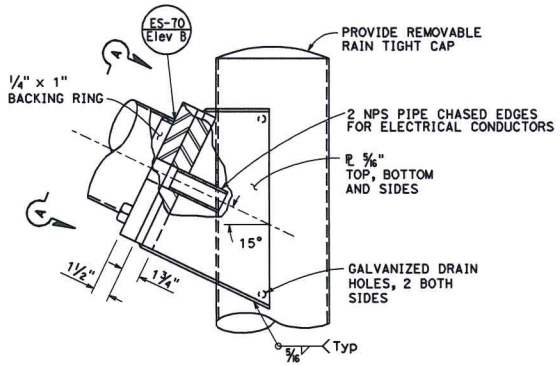


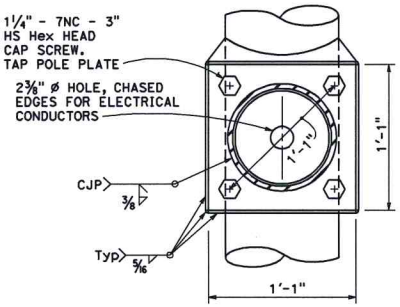
TYPE 15-FBS
ADVANCE FLASHING BEACON WITH SLIP BASE INSTALLATION
DETAIL A



TYPE 40-0-100
ELEVATION A

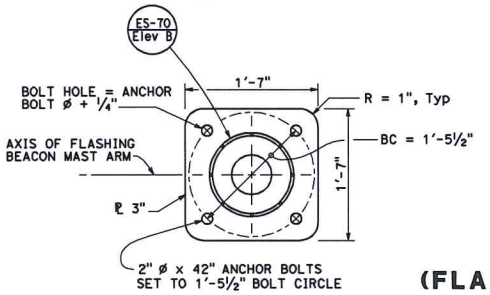


ELEVATION B

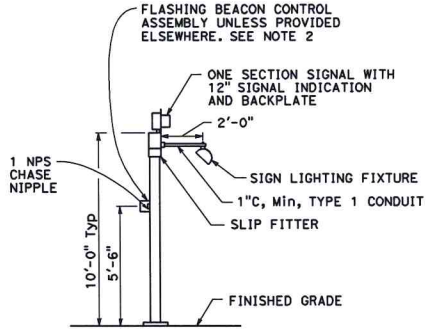


VIEW A-A

FLASHING BEACON MAST ARM CONNECTION DETAIL
DETAIL B



BASE PLATE
DETAIL C



TYPE 1-A, 1-B, 1-C AND 1-D
ADVANCE FLASHING BEACON INSTALLATION
DETAIL D
See Note 5

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER
July 19, 2013
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Stanley P. Johnson — No. C57793 — Exp. 3-31-14 CIVIL — STATE OF CALIFORNIA

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TO ACCOMPANY PLANS DATED _____

NOTES:

1. See Revised Standard Plan RSP ES-4A and Standard Plan ES-4D for attachment fitting details.
2. For wiring diagram, see Standard Plan ES-14B.
3. For additional notes and details, see Standard Plans ES-7M and ES-7N.
4. Handhole shall be located on the downstream side of traffic.
5. See project plans for type of standard to be installed.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

ELECTRICAL SYSTEMS (FLASHING BEACON ON A TYPE 1, TYPE 15-FBS AND TYPE 40 STANDARD)

NO SCALE

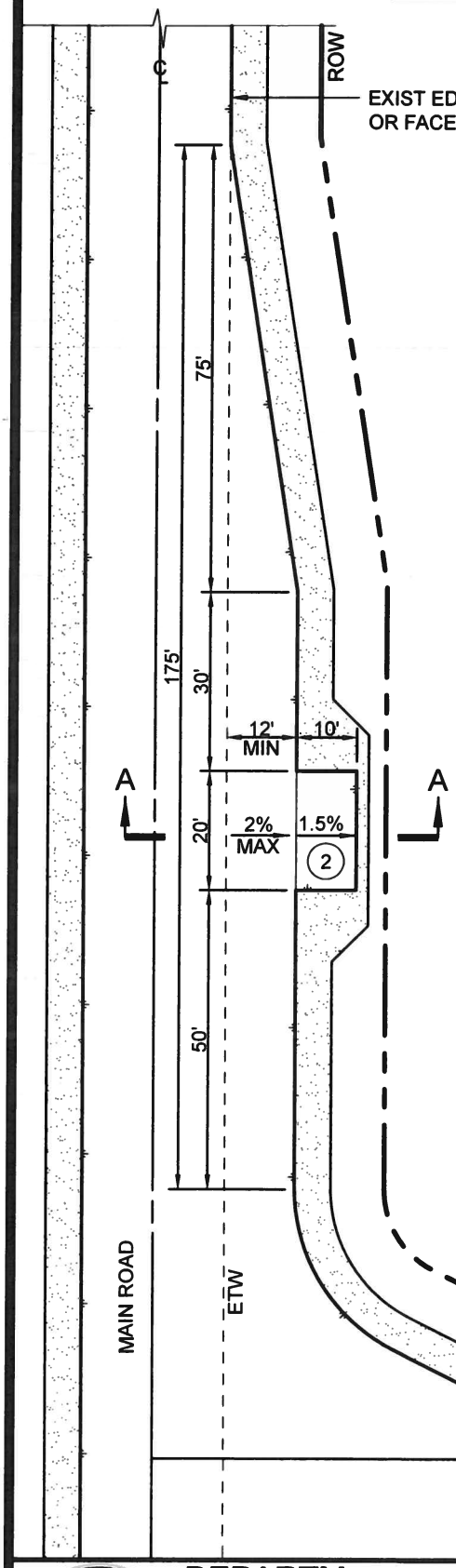
RSP ES-7J DATED JULY 19, 2013 SUPERSEDES STANDARD PLAN ES-7J DATED MAY 20, 2011 - PAGE 471 OF THE STANDARD PLANS BOOK DATED 2010.

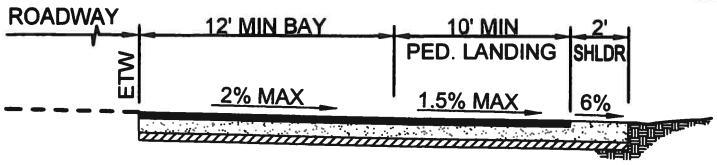
REVISED STANDARD PLAN RSP ES-7J

2010 REVISED STANDARD PLAN RSP ES-7J

6-26-13

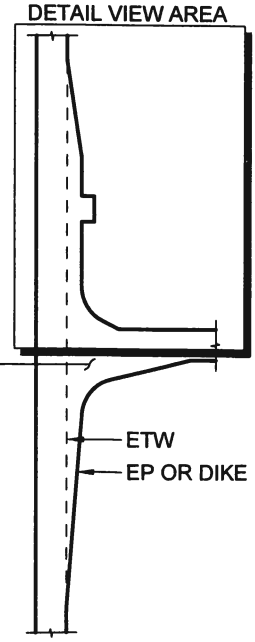
Revisions					
Description	Approved	Date	Description	Approved	Date
NEW STANDARD	GDM	NOV 08			
REPLACE AC WITH HMA, NOTE 2	GDM	JAN 11			





SECTION A-A
NTS

NOTES:
1. BUS TURNOUT BAY STRUCTURAL SECTION SHALL MATCH NEW OR EXISTING ROADWAY STRUCTURAL SECTION.
2. A MINIMUM 10' WIDE x 20' LONG HMA SIDEWALK SHALL BE REQUIRED ADJACENT TO THE BAY.
3. BUS STOP AND SCHEDULE INFORMATION SIGN(S) MAY BE REQUIRED AND SHALL BE APPROVED AND LOCATED BY THE REGIONAL TRANSIT AUTHORITY (RTA).
4. MINIMUM RIGHT-OF-WAY OR PEDESTRIAN ACCESS EASEMENT SHALL BE REQUIRED WHICH INCORPORATES SIDEWALKS, SHELTERS, AND OTHER REQUIRED ROAD EDGE APPURTENANCES.
5. FINAL LOCATION AND DESIGN OF BUS TURNOUT AND LOADING AREA SHALL BE APPROVED BY THE DEPARTMENT AND THE RTA.
6. THE PROJECT ENGINEER MAY BE REQUIRED TO PROVIDE A SIGHT DISTANCE EXHIBIT AND A ROADWAY STRIPING PLAN FOR DEPARTMENT APPROVAL.



OVERALL VIEW
NTS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

RURAL BUS TURNOUT & LOADING AREA

Scale:	Adopted:
1"=30'	2011

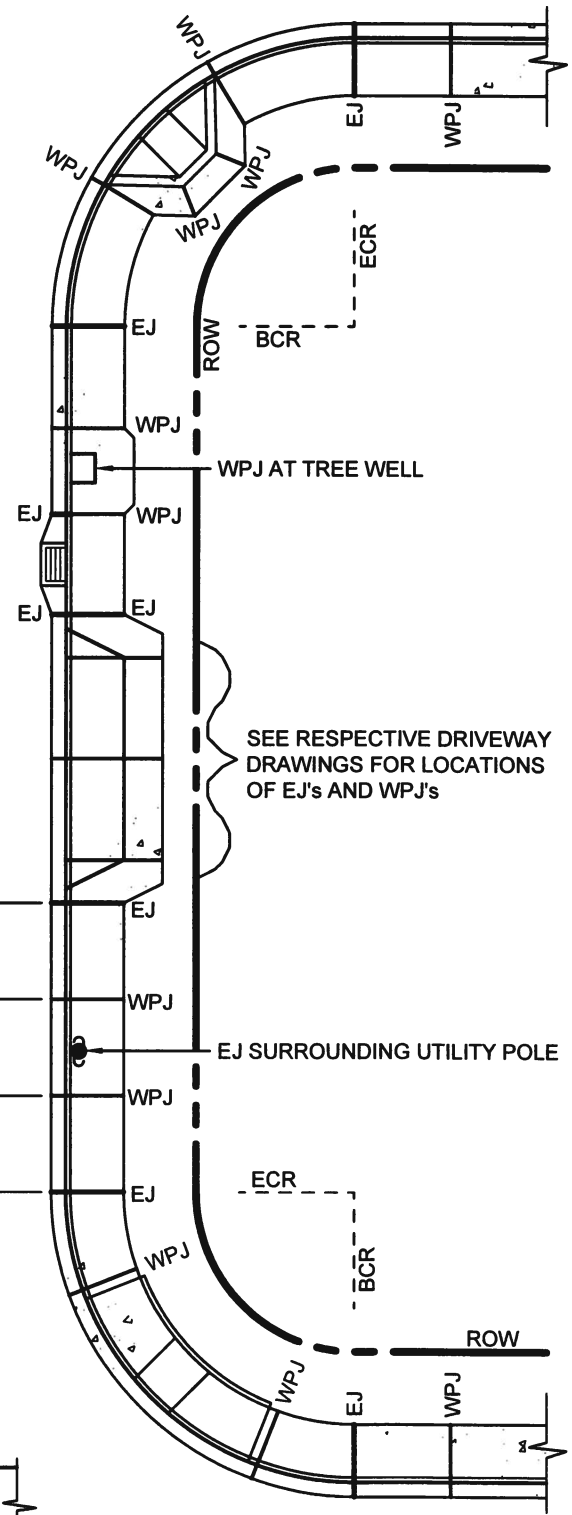
Drawing No: A-6c.1

Sheet No: 1 OF 1

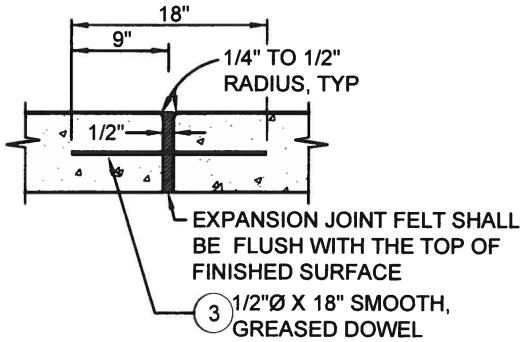
Revisions					
Description	Approved	Date	Description	Approved	Date

NOTES:

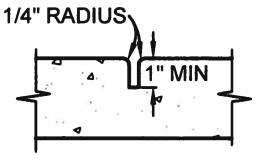
1. EXPANSION JOINTS (EJ) SHALL BE PLACED AT CURB RETURNS, DRIVEWAYS, STORM DRAIN CATCH BASINS, AROUND UTILITY POLES, AT LONGITUDINAL CURB GUTTER AND SIDEWALK INTERVALS NOT TO EXCEED 30-FEET, AND AT ALL OTHER LOCATIONS AS DIRECTED BY THE DEPARTMENT. THE INTERVALS BETWEEN EXPANSION JOINTS SHALL VARY TO ALLOW MATCHING OF JOINTS IN ADJACENT EXISTING IMPROVEMENTS AS APPLICABLE.
2. WEAKENED PLANE JOINTS (WPJ) SHALL BE A MINIMUM 1-INCH IN DEPTH AND PLACED AT LONGITUDINAL CURB GUTTER AND SIDEWALK INTERVALS NOT EXCEEDING 10-FEET BETWEEN EXPANSION JOINTS. THE INTERVALS BETWEEN WEAKENED PLANE JOINTS SHALL VARY TO ALLOW MATCHING OF JOINTS IN ADJACENT EXISTING IMPROVEMENTS AS APPLICABLE.
3. 1/2"Ø x 18" SMOOTH, GREASED DOWELS SHALL BE PLACED AT ALL EXPANSION JOINTS, ONE IN THE NEW CURB FACE, ONE IN THE NEW GUTTER, AND AT 18-INCHES ON CENTER IN NEW SIDEWALK.
4. WHEN PLACED IN SIDEWALKS, BOTH EXPANSION JOINTS AND WEAKENED PLANE JOINTS SHALL EXTEND THROUGH THE ADJACENT CURB AND GUTTER.
5. REFER TO RESPECTIVE IMPROVEMENT (CURB, GUTTER, SIDEWALK, RAMP, DRIVEWAY, ETC) STANDARD DRAWING FOR ADDITIONAL CONSTRUCTION INFORMATION.



REFER TO DRAWING R-3 FOR REPAIR OF EXISTING SIDEWALKS



EXPANSION JOINT (1)



WEAKENED PLANE JOINT (2)

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

EXPANSION & WEAKENED PLANE JOINT REQUIREMENTS

Scale:	Adopted:
1"=20'	2011

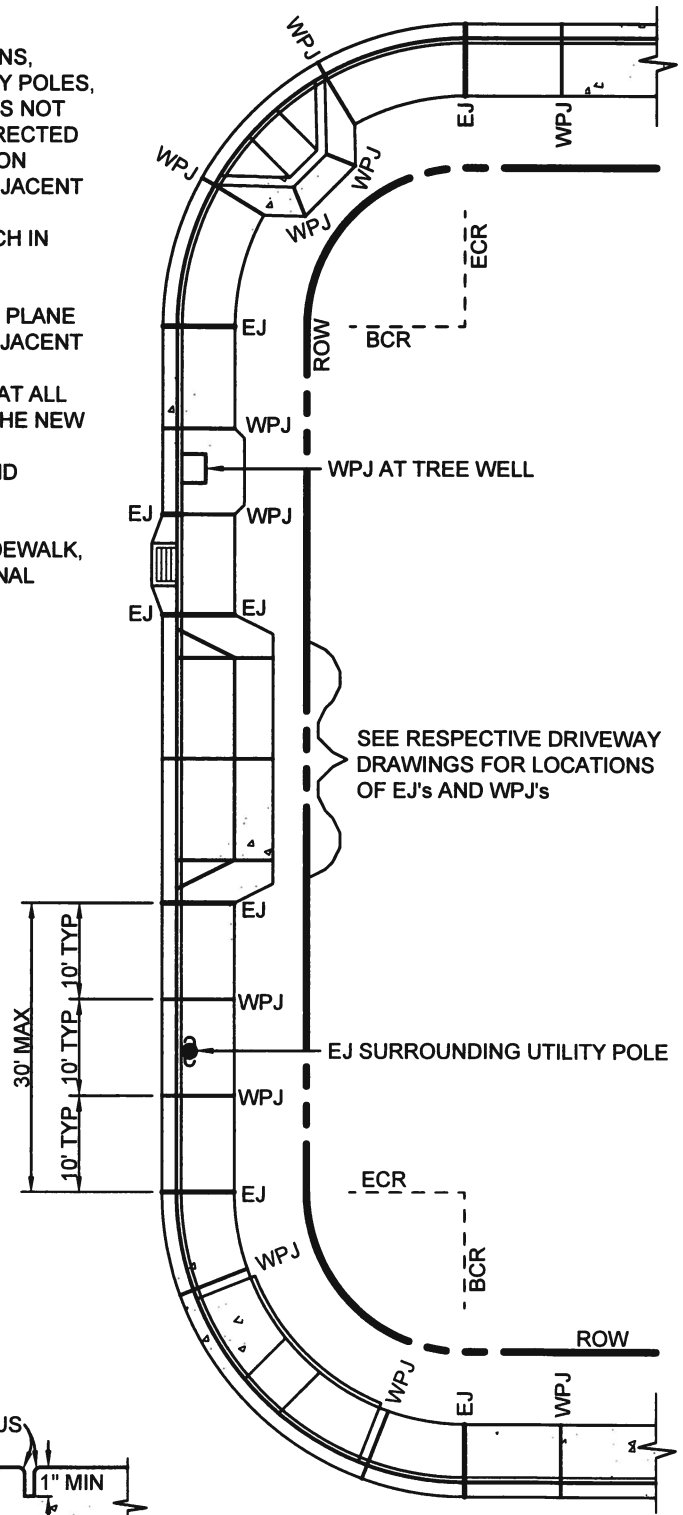
Drawing No: C-1

Sheet No: 1 OF 1

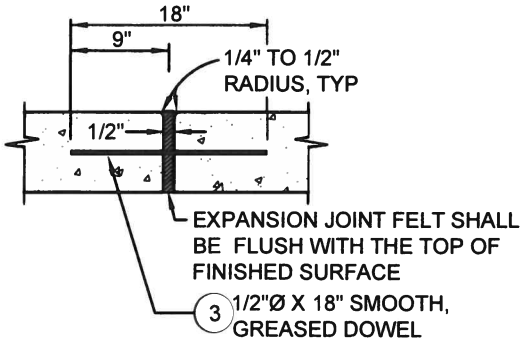
Revisions					
Description	Approved	Date	Description	Approved	Date

NOTES:

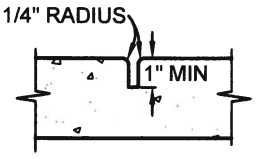
1. EXPANSION JOINTS (EJ) SHALL BE PLACED AT CURB RETURNS, DRIVEWAYS, STORM DRAIN CATCH BASINS, AROUND UTILITY POLES, AT LONGITUDINAL CURB GUTTER AND SIDEWALK INTERVALS NOT TO EXCEED 30-FEET, AND AT ALL OTHER LOCATIONS AS DIRECTED BY THE DEPARTMENT. THE INTERVALS BETWEEN EXPANSION JOINTS SHALL VARY TO ALLOW MATCHING OF JOINTS IN ADJACENT EXISTING IMPROVEMENTS AS APPLICABLE.
2. WEAKENED PLANE JOINTS (WPJ) SHALL BE A MINIMUM 1-INCH IN DEPTH AND PLACED AT LONGITUDINAL CURB GUTTER AND SIDEWALK INTERVALS NOT EXCEEDING 10-FEET BETWEEN EXPANSION JOINTS. THE INTERVALS BETWEEN WEAKENED PLANE JOINTS SHALL VARY TO ALLOW MATCHING OF JOINTS IN ADJACENT EXISTING IMPROVEMENTS AS APPLICABLE.
3. 1/2"Ø x 18" SMOOTH, GREASED DOWELS SHALL BE PLACED AT ALL EXPANSION JOINTS, ONE IN THE NEW CURB FACE, ONE IN THE NEW GUTTER, AND AT 18-INCHES ON CENTER IN NEW SIDEWALK.
4. WHEN PLACED IN SIDEWALKS, BOTH EXPANSION JOINTS AND WEAKENED PLANE JOINTS SHALL EXTEND THROUGH THE ADJACENT CURB AND GUTTER.
5. REFER TO RESPECTIVE IMPROVEMENT (CURB, GUTTER, SIDEWALK, RAMP, DRIVEWAY, ETC) STANDARD DRAWING FOR ADDITIONAL CONSTRUCTION INFORMATION.



REFER TO DRAWING R-3 FOR REPAIR OF EXISTING SIDEWALKS



EXPANSION JOINT (1)



WEAKENED PLANE JOINT (2)

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

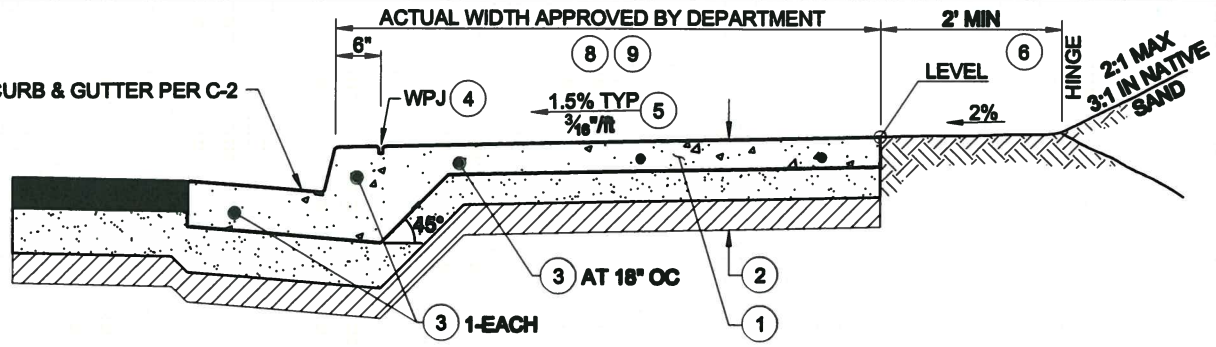
EXPANSION & WEAKENED PLANE JOINT REQUIREMENTS

Scale:	Adopted:
1"=20'	2011

Drawing No: C-1

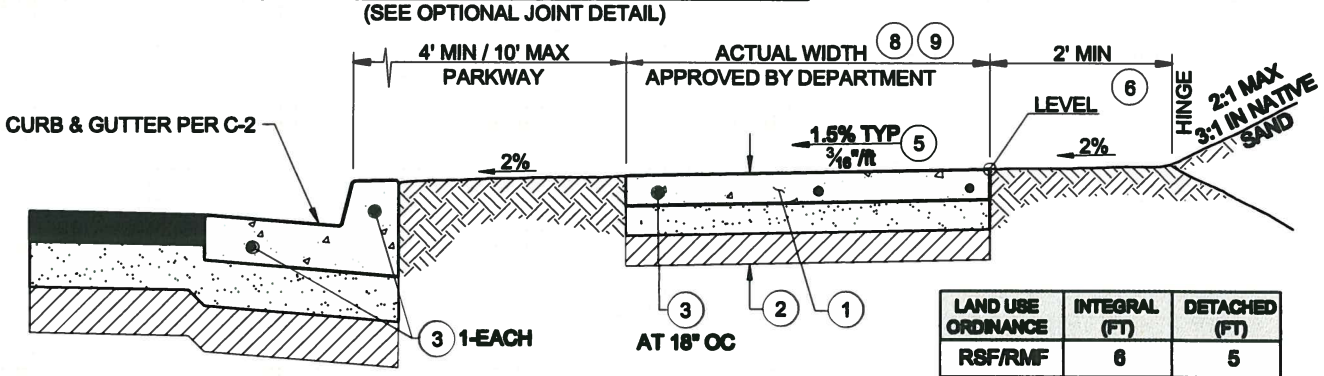
Sheet No: 1 OF 1

Revisions					
Description	Approved	Date	Description	Approved	Date
NOTE 1, ADD NOTE 11, "TYPICAL" TO JOINT DETAIL, & LABEL "THICKEN"	RBM	NOV 07	REVISE NOTE 2	FH	AUG 14
INCREASED DETACHED SIDEWALK WIDTH	GDM	JAN 11			



INTEGRAL SIDEWALK (MONOLITHIC)

(SEE OPTIONAL JOINT DETAIL)



DETACHED OR MEANDERING SIDEWALK

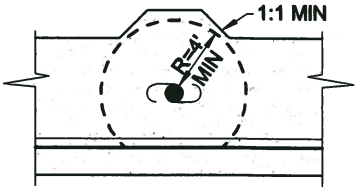
NOTES:

1. CONCRETE SIDEWALK SHALL CONFORM TO STATE STANDARD 90-1.01, MINOR (520 LBS CEMENTITIOUS MATERIAL PER CUBIC YARD [5-1/2 SACK]). CONCRETE CURING SHALL BE BY PIGMENTED CURING COMPOUND METHOD USING WHITE PIGMENT TYPE.
2. TYPICAL SECTION SHALL BE:
   - 4-INCH MIN PCC (6-INCH OR 8-INCH WHEN WITHIN A DRIVEWAY), OVER
   - 4-INCH MIN CLASS II AGGREGATE BASE TO 95% RELATIVE COMPACTION, OVER
   - 12-INCH MIN SUBGRADE TO 95% RELATIVE COMPACTION

   IF THE R-VALUE OF THE NATIVE MATERIAL IS 55 OR GREATER THEN THE 4-INCH OF AGGREGATE BASE UNDER THE SIDEWALK ONLY MAY BE SUBSTITUTED WITH COMPACTED NATIVE MATERIAL.
3. EXPANSION JOINTS (EJ) SHALL BE CONSTRUCTED AT LONGITUDINAL INTERVALS NOT EXCEEDING 30-FEET. 1/2"Ø x 18" SMOOTH, GREASED DOWELS SHALL BE PLACED IN THE EJ, ONE IN CURB FACE, ONE IN GUTTER, AND AT 18-INCHES ON CENTER IN SIDEWALKS PER STANDARD DRAWING C-1.
4. WEAKENED PLANE JOINTS (WPJ) SHALL BE CONSTRUCTED BETWEEN EXPANSION JOINTS AT LONGITUDINAL INTERVALS NOT EXCEEDING 10-FEET, AND AT 6-INCHES BEHIND THE CURB FACE FOR ATTACHED SIDEWALKS PER STANDARD DRAWING C-1.
5. THE CROSS SLOPE OF THE SIDEWALK SHALL NOT EXCEED 2% (1/4-INCH PER 12-INCHES). 1.5% (3/16-INCH PER 12-INCHES) IS RECOMMENDED.
6. THE 2-FOOT BENCH IS NOT REQUIRED FOR ADJOINING SLOPES OF 5h:1v OR FLATTER.
7. ALTHOUGH THE PROJECT CONDITIONS OF APPROVAL OR THE AREA SPECIFIC PLAN MAY REQUIRE AN ALTERNATIVE SIDEWALK CONFIGURATION, THE CONSTRUCTION SPECIFICATIONS OF THIS STANDARD SHALL APPLY.
8. THE SIDEWALK SHALL BE WIDENED WHERE REQUIRED TO ALLOW FOR A 4-FOOT CLEAR PASSAGE AROUND ALL ABOVE GRADE OBSTACLES LOCATED WITHIN THE SIDEWALK.
9. WATER PURVEYOR METER BOXES ARE ALLOWED WITHIN THE SIDEWALK PROVIDED THAT ALL LIDS AND LIDS WITH A.M.R. SYSTEMS ARE SET FLUSH WITH THE SIDEWALK.
10. ALL UTILITY VAULTS AND LIDS MUST BE LOCATED OUTSIDE OF THE SIDEWALK OR HAVE PRIOR DEPARTMENT APPROVAL FOR LOCATION WITHIN THE SIDEWALK. UTILITY LIDS WITHIN THE SIDEWALK SHALL HAVE A NON-SLIP SURFACE.
11. SEE DRAWING M-5 FOR TREE PLANTING REQUIREMENTS WITHIN RIGHT-OF-WAY.

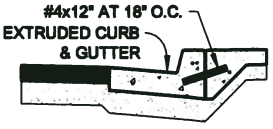
LAND USE ORDINANCE	INTEGRAL (FT)	DETACHED (FT)
RSF/RMF	6	5
CR	10	6
CS	6	5
OP	8	5
IND	6	5

SIDEWALK WIDTH TABLE



SIDEWALK SHALL BE WIDENED BEHIND ALL ABOVE GRADE OBSTACLES TO PROVIDE A 4-FEET MINIMUM CLEARANCE.

8 SIDEWALK WIDENING DETAIL NTS



WHEN EXTRUDED CURB & GUTTER IS USED AND SIDEWALK PORTION IS NOT PLACED WITHIN 1-HOUR THEN REBAR SHALL BE PLACED PER THIS JOINT DETAIL.

TYPICAL JOINT DETAIL NTS

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

SIDEWALKS

Scale:	Adopted:
1"=2'	2014

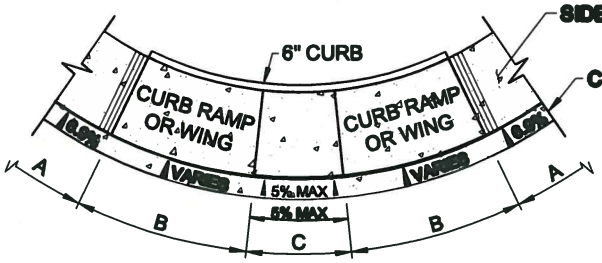
Drawing No: C-4

Sheet No: 1 OF 1

Revisions					
Description	Approved	Date	Description	Approved	Date
ADD NOTE 6	REM	NOV 07	ADDED NOTES 1, 2, 3, & 5; RENUMBER NOTES	GDM	JAN 11
MODIFY NOTE 1, ADD NOTE 7	GDM	NOV 08	REVISE NOTES 1 AND 8	FH	AUG 14

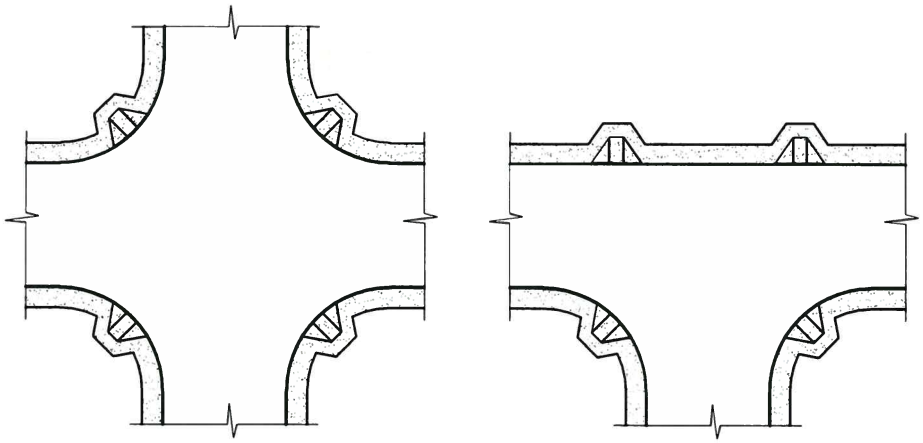
NOTES:

1. ALL CURB RAMPS FOR NEW CONSTRUCTION, RETROFIT, AND REPLACEMENT SHALL CONFORM TO STATE STANDARDS A88A & A88B, CASE A, AND STATE SPECIFICATION 90-1.01, MINOR (520 LBS CEMENTITIOUS MATERIAL PER CUBIC YARD [5-1/2 SACK]). CONCRETE CURING SHALL BE BY PIGMENTED CURING COMPOUND METHOD USING WHITE PIGMENT TYPE.
2. CURB RAMPS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AND 3-FEET DEPTH OF THE RAMP PER NOTE 3 (BELOW) AND SHALL CONFORM TO THE DETAILS OF CALTRANS STANDARD A88A.
3. CURB RAMP DETECTABLE WARNING SURFACES SHALL BE:
   YELLOW COLOR COMPLYING WITH FEDERAL STANDARD 595B, COLOR No. 33538
   PREFABRICATED
   RAISED TRUNCATED DOMES
   INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS
4. NEW SIDEWALKS AND PATHS SHALL BE PROVIDED WITH CURB RAMPS AT ALL INTERSECTIONS.
5. NO UTILITY APPURTENANCES OR LIDS SHALL BE LOCATED WITHIN THE CURB RAMP AND WINGS.
6. MID-BLOCK CURB RAMPS ARE DISCOURAGED AND SHALL REQUIRE PRIOR DEPARTMENT APPROVAL.
7. THE PROJECT ENGINEER SHALL DETAIL EACH CURB RAMP ON THE PLANS. MINIMUM DETAIL REQUIREMENTS SHALL INCLUDE DIMENSIONS, SLOPES, AND SPOT ELEVATIONS.
8. THE DEPARTMENT MAY GRANT EXCEPTIONS TO THESE STANDARDS PER CHAPTER 1.2. THE DEPARTMENT ADA COORDINATOR SHALL REVIEW AND PROVIDE PRIOR APPROVAL OF ALL EXCEPTIONS.
9. MULTIPLE RAMPS SHALL BE REQUIRED AT ALL BULB-OUTS AND SHALL BE ALIGNED WITH APPROACH SIDEWALK, REFER TO STANDARD DRAWINGS A-6c & A-6d.
10. INTERNET LINKS TO CALTRANS CURB RAMP STANDARDS (A88A & A88B):
    http://www.dot.ca.gov/hq/esc/oe/project_plans/highway_plans/stdplans_US-customary-units_06/viewable_pdf/rapa88a.pdf
    http://www.dot.ca.gov/hq/esc/oe/project_plans/highway_plans/stdplans_US-customary-units_06/viewable_pdf/a88b.pdf



NOTES:
A. GUTTER CROSS SLOPE = 1-1/4" IN 18" = 6.9%
B. GUTTER CROSS SLOPE TRANSITION ZONE (VARIES)
C. GUTTER CROSS SLOPE = 7/8" IN 18" = 4.9% (5% MAX)
LONGITUDINAL SLOPE = 2% MAX

TYPICAL GUTTER TRANSITION AT CURB RAMP



TYPICAL CURB RAMP PLACEMENT

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION

CURB RAMPS

Scale:	Adopted:
NTS	2014

Drawing No: C-5

Sheet No: 1 OF 1

PLANS

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INDEX OF SHEETS

SHEET NO. 1	TITLE SHEET
SHEET NO. 2	TRAFFIC SIGNAL SITE PLAN AND NOTES
SHEET NO. 3	TRAFFIC SIGNAL PLAN AND NOTES
SHEET NO. 4	TRAFFIC SIGNAL ELEVATION & SCHEDULES
SHEET NO. 5	ROADSIDE SIGN AND STRIPING PLAN
SHEET NO. 6	PEDESTRIAN REFUGE/CURB CUTS

COUNTY OF SAN LUIS OBISPO, CALIFORNIA
PUBLIC WORKS DEPARTMENT
TRANSPORTATION DIVISION

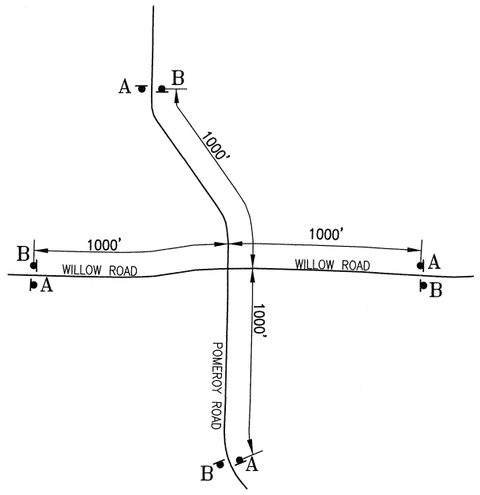
ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1034	300510	1	6

APPROVED: 22 JUNE, 2015

WADE HORTON, DIRECTOR OF PUBLIC WORKS – R.C.E. 64745

PLANS FOR THE INSTALLATION OF TRAFFIC SIGNAL ON POMEROY ROAD AT WILLOW ROAD IN NIPOMO, CA CONTRACT NO. 300510

To Be Supplemented By State Standard Plans Dated May, 2006



CONSTRUCTION AREA SIGN PLAN

NOT TO SCALE

LEGEND

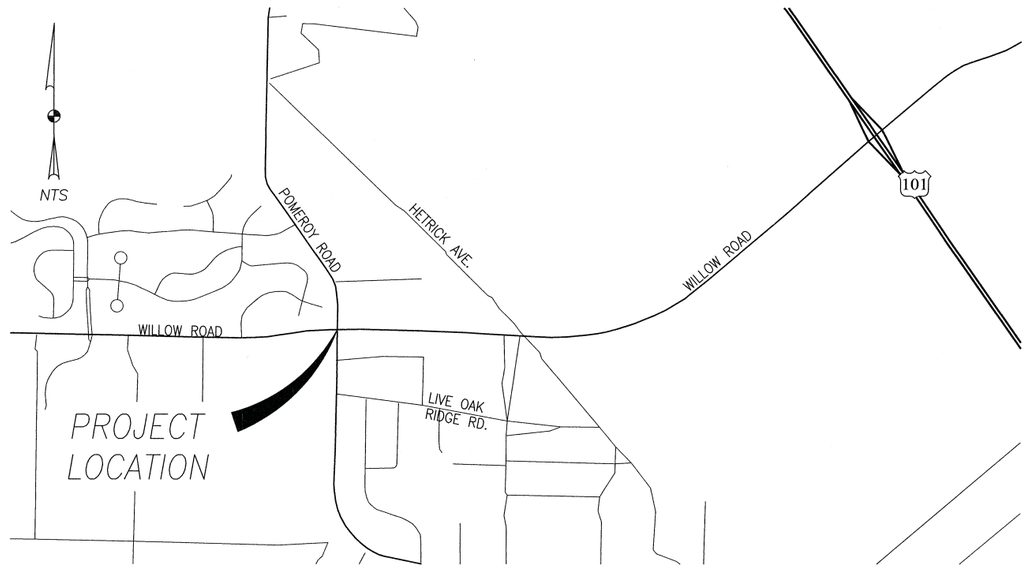
No.	Type	Size	Message	Quantity
A	W20–1	36"x36"	"ROAD WORK AHEAD"	4
B	G20–2	36"x18"	"END ROAD WORK"	4

NOTES:

All Signs Shall Be Stationary Mounted on 4x4 Wood Posts, Unless Noted Otherwise.

All Construction Signs Shall be Placed Approximately 4' off the Edge of Pavement, the Exact Location and Position of Signs Shall be Determined by the Engineer.

Traffic control shall be placed per the CAMUTCD. During shoulder work traffic control shall be placed per TA–3. For lane closures traffic control shall be placed per TA–10.

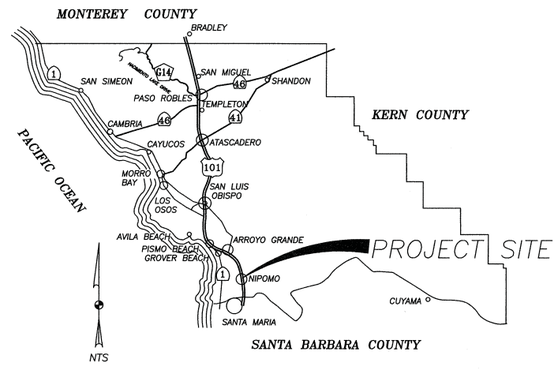


LOCATION MAP

NOT TO SCALE

LICENSE REQUIREMENTS

The successful bidder shall possess a Class A general engineering contractor's license or a Class C10 electrical contractor's license at the time this contract is awarded. In the alternative, the successful bidder shall possess a specialty contractor's license at the time this contract is awarded that permits the successful bidder to perform with his or her own organization contract work amounting to not less than 30% of the original total contract price and to subcontract the remaining work in accordance with Section 8–1.01, "Subcontracting," of the Standard Specifications.



VICINITY MAP

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
MICHELLE M. MATSON
C 73131
Exp. 12/31/16
CIVIL
STATE OF CALIFORNIA

POMEROY ROAD AT WILLOW ROAD

TITLE SHEET

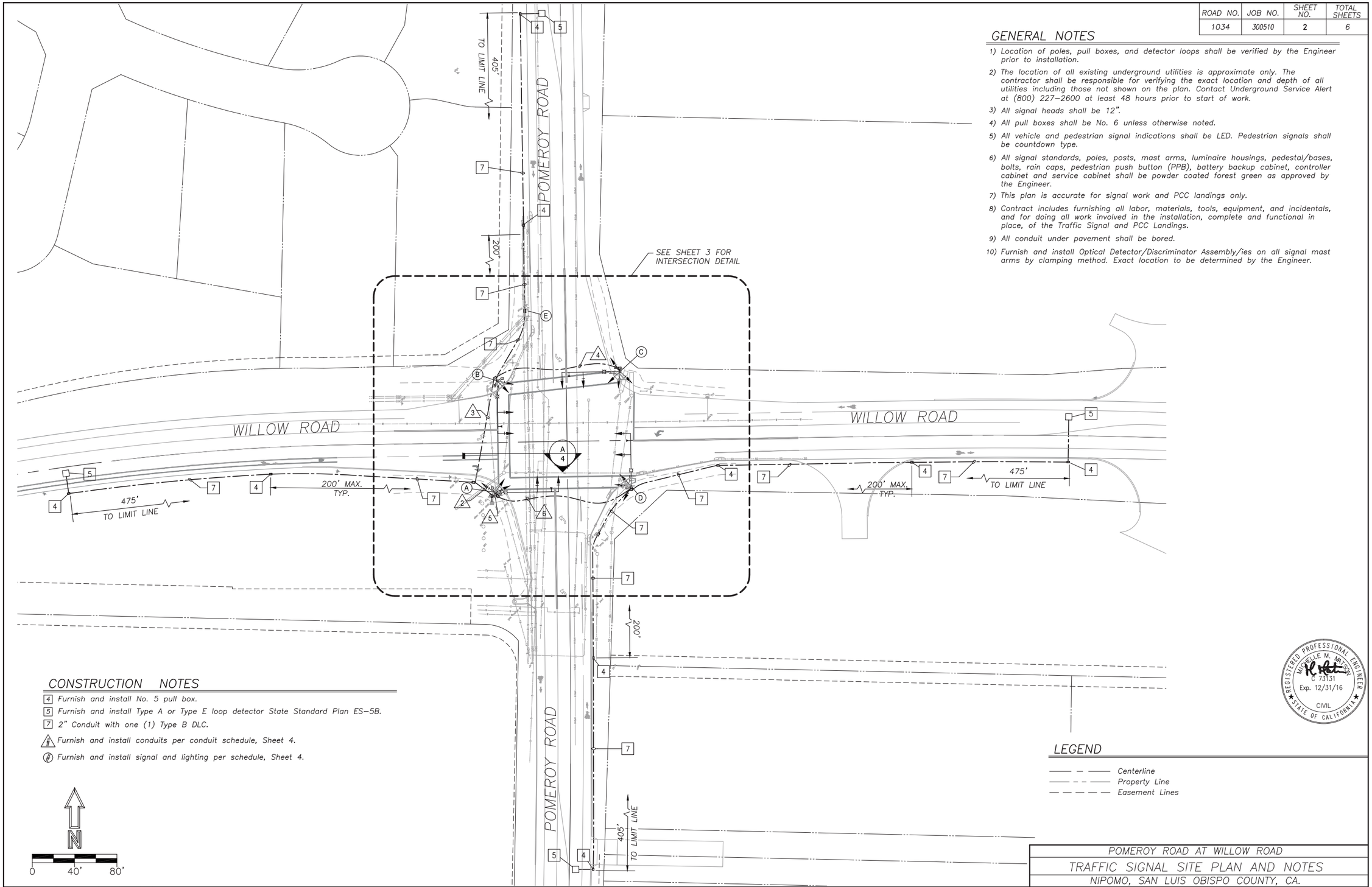
NIPOMO, SAN LUIS OBISPO COUNTY, CA.

Designer	Date	Drawn By	Date	Traffic Engineer	Date
M. MATSON	04/2015	JPF	04/2015	M. MATSON	04/2015

ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1034	300510	2	6

GENERAL NOTES

1) Location of poles, pull boxes, and detector loops shall be verified by the Engineer prior to installation.
2) The location of all existing underground utilities is approximate only. The contractor shall be responsible for verifying the exact location and depth of all utilities including those not shown on the plan. Contact Underground Service Alert at (800) 227–2600 at least 48 hours prior to start of work.
3) All signal heads shall be 12".
4) All pull boxes shall be No. 6 unless otherwise noted.
5) All vehicle and pedestrian signal indications shall be LED. Pedestrian signals shall be countdown type.
6) All signal standards, poles, posts, mast arms, luminaire housings, pedestal/bases, bolts, rain caps, pedestrian push button (PPB), battery backup cabinet, controller cabinet and service cabinet shall be powder coated forest green as approved by the Engineer.
7) This plan is accurate for signal work and PCC landings only.
8) Contract includes furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in the installation, complete and functional in place, of the Traffic Signal and PCC Landings.
9) All conduit under pavement shall be bored.
10) Furnish and install Optical Detector/Discriminator Assembly/ies on all signal mast arms by clamping method. Exact location to be determined by the Engineer.



CONSTRUCTION NOTES

4 Furnish and install No. 5 pull box.
5 Furnish and install Type A or Type E loop detector State Standard Plan ES–5B.
7 2" Conduit with one (1) Type B DLC.
△# Furnish and install conduits per conduit schedule, Sheet 4.
(#) Furnish and install signal and lighting per schedule, Sheet 4.

LEGEND

Centerline
Property Line
Easement Lines

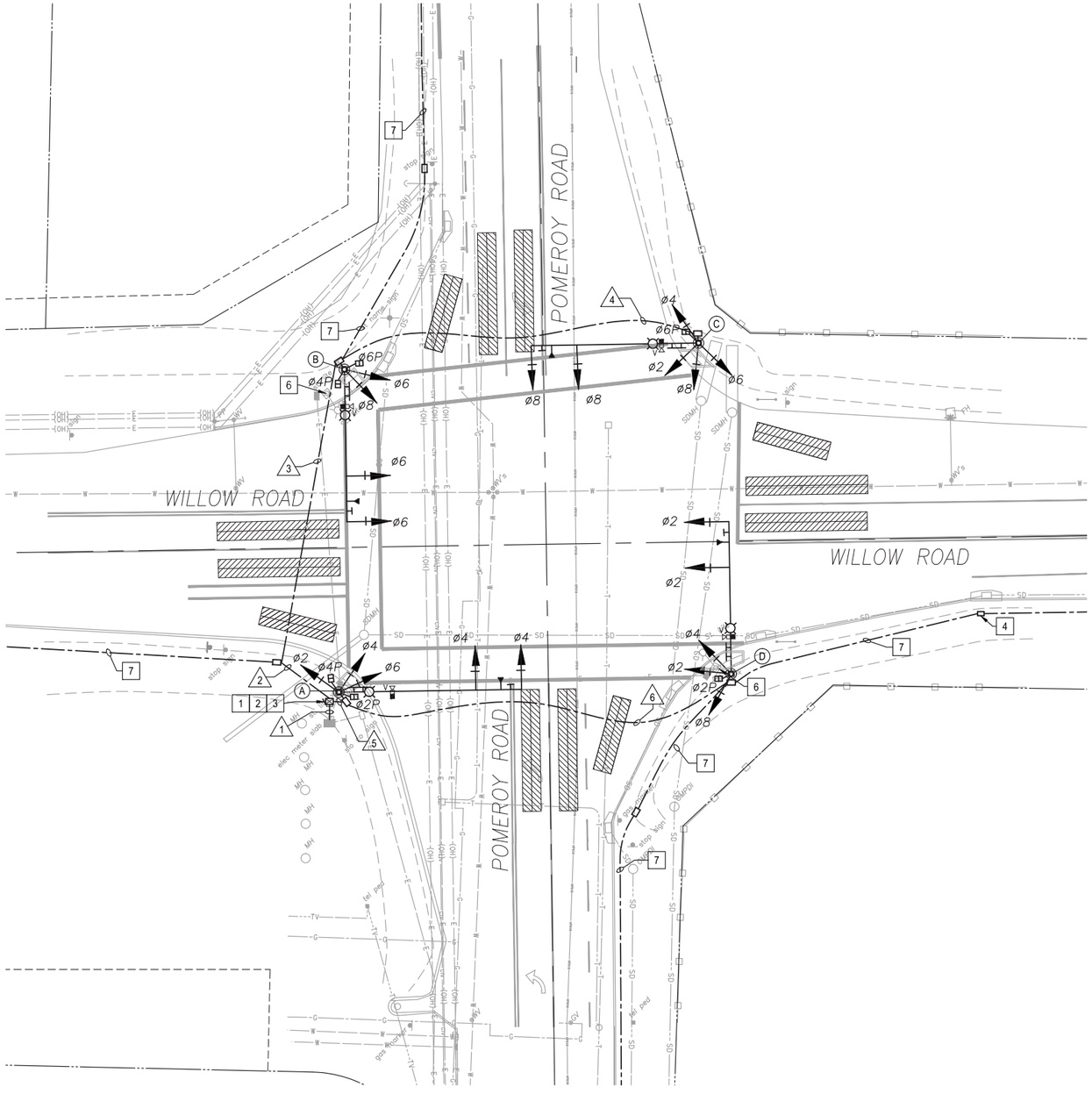
REGISTERED PROFESSIONAL ENGINEER
MICHELLE M. MATSON
C 73131
Exp. 12/31/16
CIVIL
STATE OF CALIFORNIA

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS (0 1 2 3)

POMEROY ROAD AT WILLOW ROAD
TRAFFIC SIGNAL SITE PLAN AND NOTES
NIPOMO, SAN LUIS OBISPO COUNTY, CA.

Designer	Date	Drawn By	Date	Traffic Engineer	Date
M. MATSON	04/2015	JPF	04/2015	M. MATSON	04/2015

ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1034	300510	3	6



GENERAL NOTES

1) Location of poles, pull boxes, and detector loops shall be verified by the Engineer prior to installation.
2) The location of all existing underground utilities is approximate only. The contractor shall be responsible for verifying the exact location and depth of all utilities including those not shown on the plan. Contact Underground Service Alert at (800) 227–2600 at least 48 hours prior to start of work.
3) All signal heads shall be 12".
4) All pull boxes shall be No. 6 unless otherwise noted.
5) All vehicle and pedestrian signal indications shall be LED. Pedestrian signals shall be countdown type.
6) All signal standards, poles, posts, mast arms, luminaire housings, pedestal/bases, bolts, rain caps, pedestrian push button (PPB), battery backup cabinet, controller cabinet and service cabinet shall be powder coated forest green as approved by the Engineer.
7) This plan is accurate for signal work and PCC landings only.
8) Contract includes furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in the installation, complete and functional in place, of the Traffic Signal and PCC Landings.
9) All conduit under pavement shall be bored.
10) Furnish and install Optical Detector/Discriminator Assembly/ies on all signal mast arms by clamping method. Exact location to be determined by the Engineer.

CONSTRUCTION NOTES

1 Furnish and install Model 332L Controller Cabinet with Type 170E Controller Assembly and 4–channel Emergency Vehicle Detector System. Door hinge on right as shown.

2 Existing dual–metered Type III–AF Service Equipment Enclosure per State Standard Plan ES–2F. Type V PEU to be mounted on the north side in the service section, 18" minimum from the bottom of the enclosure. Service shall include the following circuit breakers:
120/240V – 100A Main
120V – 50A Metered Signals
240V 30A Metered Lighting
Dual Type V – P.E.C.
Existing service to be confirmed with PG&E.

3 Furnish and install Battery Back–Up System in external cabinet.

4 Furnish and install No. 5 pull box.

6 Remove and salvage existing luminaries and pull box. Deliver existing luminaries and pull boxes to the Los Osos yard. Contact Ron Wallravin at (805) 781–4475 ten (10) days prior to start.

7 2" Conduit with one (1) TYPE B DLC.

△# Furnish and install conduits per conduit schedule, Sheet 4.

(#) Furnish and install signal and lighting per schedule, Sheet 4.

LEGEND

——— – ——— Centerline
——— – – ——— Property Line
— — — — — Easement Lines
▨ Video detection zone (typical)

REGISTERED PROFESSIONAL ENGINEER
MICHELLE M. MATSON
C 73131
Exp. 12/31/16
CIVIL
STATE OF CALIFORNIA

N

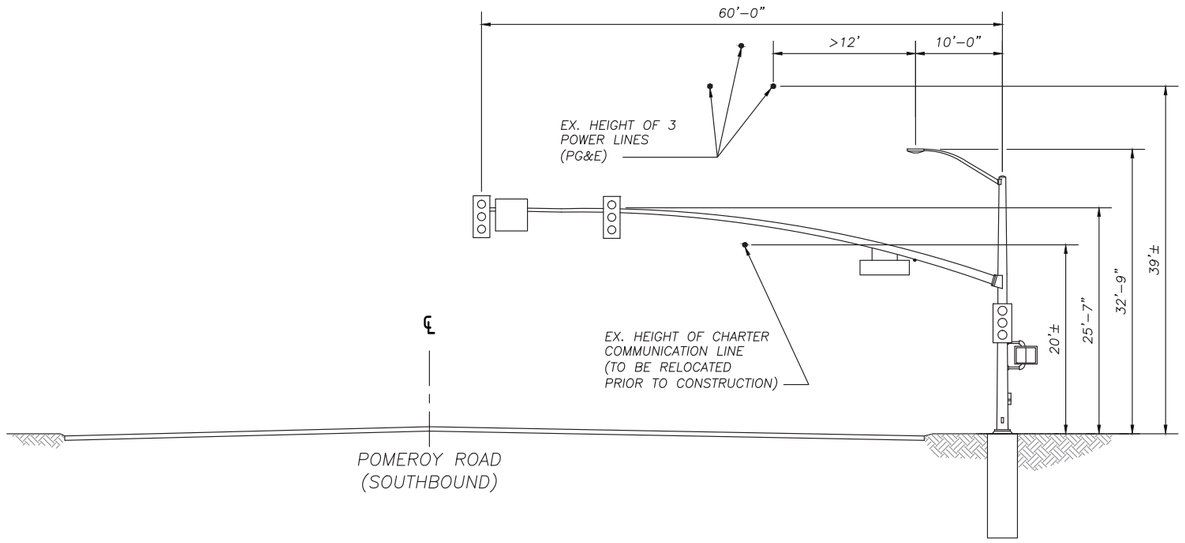
0 20' 40'

0 1 2 3
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

POMEROY ROAD AT WILLOW ROAD
TRAFFIC SIGNAL PLAN AND NOTES
NIPOMO, SAN LUIS OBISPO COUNTY, CA.

Designer	Date	Drawn By	Date	Traffic Engineer	Date
M. MATSON	04/2015	JPF	04/2015	M. MATSON	04/2015

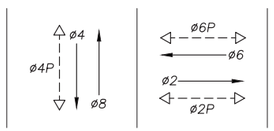
ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1034	300510	4	6



ELEVATION - POLE A

SCALE: 1" = 8'

A



PHASE DIAGRAM

CONDUIT SCHEDULE

CONDUCTOR AND CABLE SCHEDULE			CONDUIT RUN NUMBER					
CABLE TYPE	STD	PHASE	1	2	3	4	5	6
VEH-PED (12C)	Ⓐ	(1),2,4,6,(7), 2P,&4P / 2,&4					2 / 2	
	Ⓑ	(1),(3),6,8, 4P,&6P / 4,&6		2 / 2	2 / 2			
	Ⓒ	2,(3),4,(5),6, 8,&6P / 6		2 / 1	2 / 1	2 / 1		
PPB(3C)	Ⓓ	2,4,(5),(7), 8,&2P / 2					2 / 1	2 / 1
VEH-PED (12C) / PPB(3C)		TOTAL	0 / 0	4 / 3	4 / 3	2 / 1	4 / 3	2 / 1

AWG	CIRCUIT						
#6 AWG	SERVICE	3					
#10 AWG	LIGHTING	2	2	2	2	2	2
#14 AWG	PEU	1					
EVP			2	2	1	2	1
VIDEO DETECTION POWER CABLE & COAXIAL CABLE			2	2	1	2	1
DETECTOR LEAD IN CABLE							
PHASE	ϕ2		1				
	ϕ4		1	1			
	ϕ6					1	1
	ϕ8					1	1
	DLC		2	1	0	2	2
CONDUIT SIZE (in.)		2"	2x3"	2x3"	3"	4"	3"
%FILL		0.13	0.21	0.21	0.20	0.24	0.22

NOTE: (X) Wiring included for future left turn phasing when warranted

POLE AND EQUIPMENT SCHEDULE

STANDARD				VEH SIG MTG		PED. SIGNAL	PPB		L.E.D.	MAST ARM MOUNTED SIGNS
No.	TYPE	SIG. M.A.	LUM. M.A.	MAST ARM	POLE	MOUNTING	PHASE	ARROW	LUMINAIRE	
Ⓐ	61-5-100	60'	10'	MAS	SV-3-TC	SP-2-T	ø2/ø4	←/→	165W	G7-1 "Willow Road"; R10-12
Ⓑ	29-5-100	50'	15'	MAS	SV-2-TC	SP-2-T	ø6/ø4	←/→	165W	G7-1 "Pomeroy Road"; R10-12
Ⓒ	29-5-100	55'	15'	MAS	SV-4-TC	SP-1-T	ø6	←	165W	G7-1 "Willow Road"; R10-12
Ⓓ	29-5-100	50'	15'	MAS	SV-3-TC	SP-1-T	ø2	→	165W	G7-1 "Pomeroy Road"; R10-12

REGISTERED PROFESSIONAL ENGINEER
MICHELLE M. MATSON
C 73131
Exp. 12/31/16
CIVIL
STATE OF CALIFORNIA

0 1 2 3
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

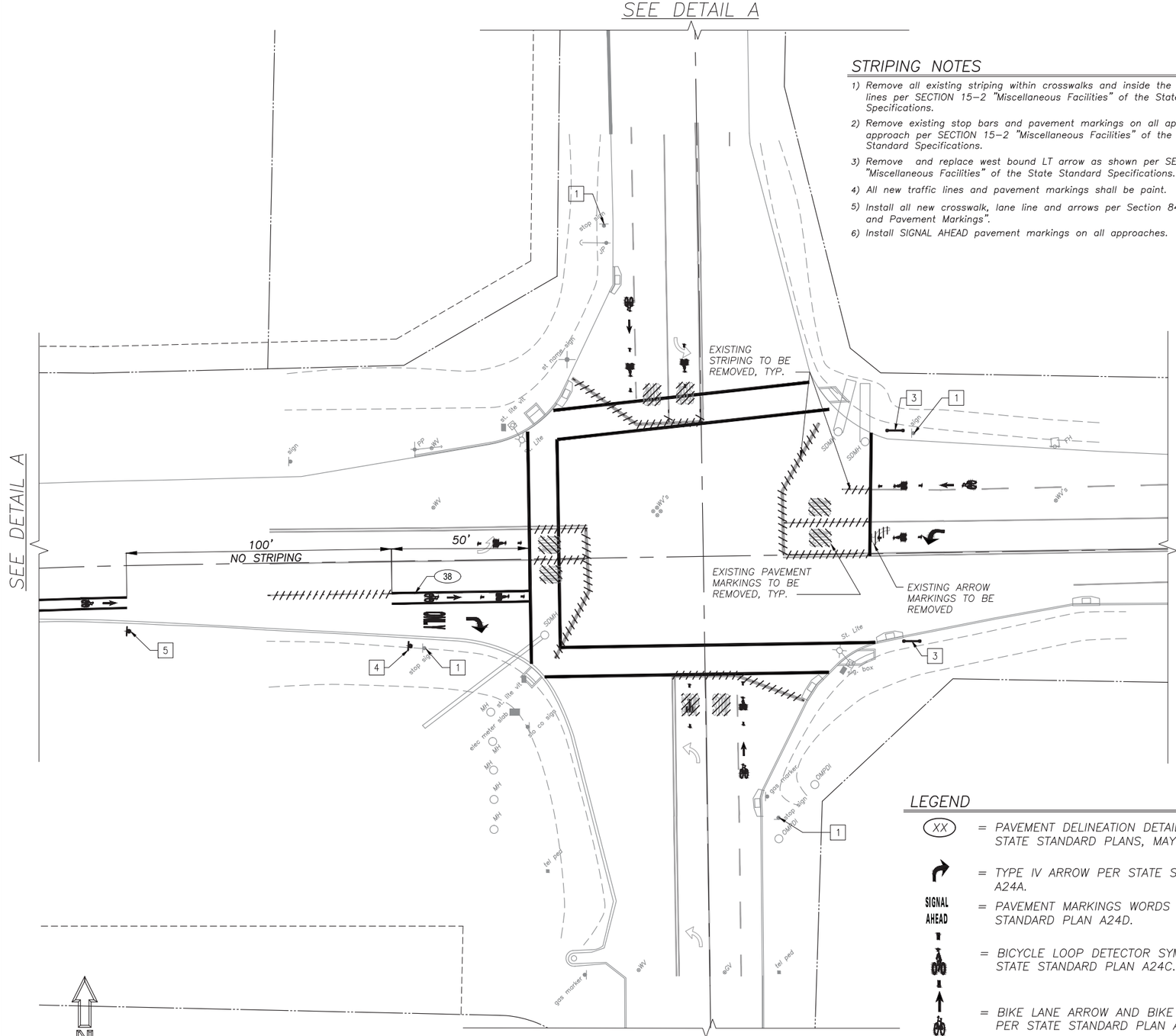
POMEROY ROAD AT WILLOW ROAD

TRAFFIC SIGNAL ELEVATION & SCHEDULE

NIPOMO, SAN LUIS OBISPO COUNTY, CA.

Designer	Date	Drawn By	Date	Traffic Engineer	Date
M. MATSON	04/2015	JPF	04/2015	M. MATSON	04/2015

ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1034	300510	5	6



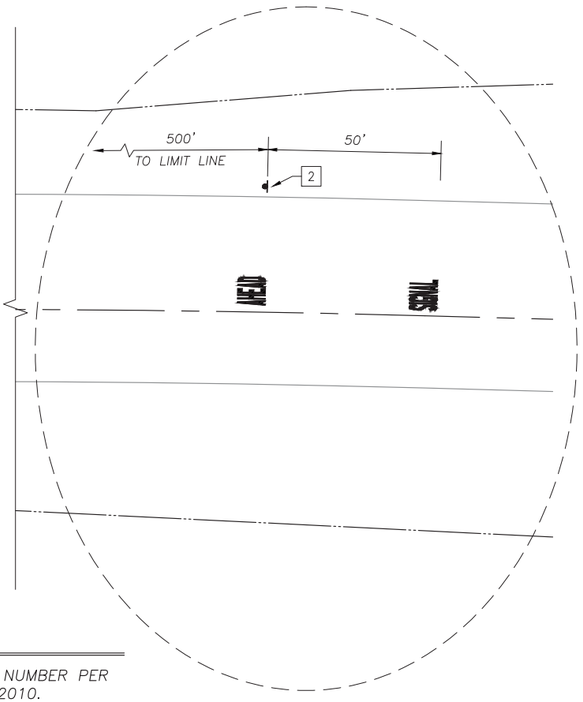
STRIPING NOTES

1) Remove all existing striping within crosswalks and inside the approach limit lines per SECTION 15–2 "Miscellaneous Facilities" of the State Standard Specifications.
2) Remove existing stop bars and pavement markings on all approaches approach per SECTION 15–2 "Miscellaneous Facilities" of the State Standard Specifications.
3) Remove and replace west bound LT arrow as shown per SECTION 15–2 "Miscellaneous Facilities" of the State Standard Specifications.
4) All new traffic lines and pavement markings shall be paint.
5) Install all new crosswalk, lane line and arrows per Section 84, "Traffic Stripes and Pavement Markings".
6) Install SIGNAL AHEAD pavement markings on all approaches.

ROADSIDE SIGN NOTES

1. All existing R1–1 stop signs and W3–1 stop signs ahead signs to be removed and slavaged.
2. Furnish and install W3–3 with solar flashing beacon on all approaches.
3. Furnish and install Type I pedestrian barricade per State Standard Plan ES–7P.
4. Furnish and install R3–7R.
5. Furnish and install R4–4.

DETAIL A



LEGEND

- (XX) = PAVEMENT DELINEATION DETAIL NUMBER PER STATE STANDARD PLANS, MAY 2010.
- = TYPE IV ARROW PER STATE STANDARD PLAN A24A.
- SIGNAL AHEAD = PAVEMENT MARKINGS WORDS PER STATE STANDARD PLAN A24D.
- = BICYCLE LOOP DETECTOR SYMBOL PER STATE STANDARD PLAN A24C.
- = BIKE LANE ARROW AND BIKE LANE SYMBOL PER STATE STANDARD PLAN A24A AND A24C.
- = CENTERLINE
- = PROPERTY LINE
- = EASEMENT LINES

REGISTERED PROFESSIONAL ENGINEER
MICHELLE M. MATSON
C 73131
Exp. 12/31/16
CIVIL
STATE OF CALIFORNIA

0 1 2 3
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

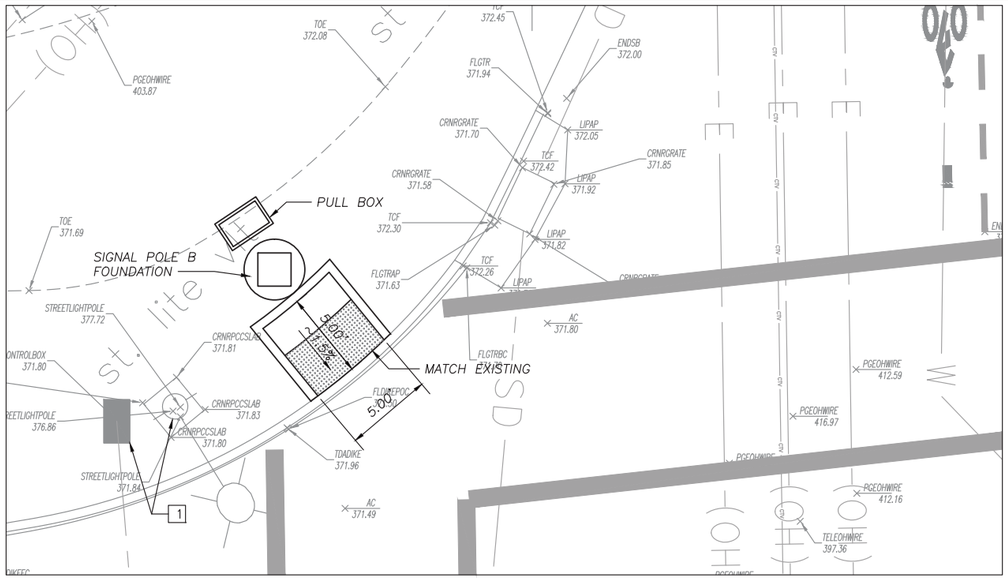
POMEROY ROAD AT WILLOW ROAD

ROAD SIGN AND STRIPING PLAN

NIPOMO, SAN LUIS OBISPO COUNTY, CA.

Designer	Date	Drawn By	Date	Traffic Engineer	Date
M. MATSON	04/2015	JPF	04/2015	M. MATSON	04/2015

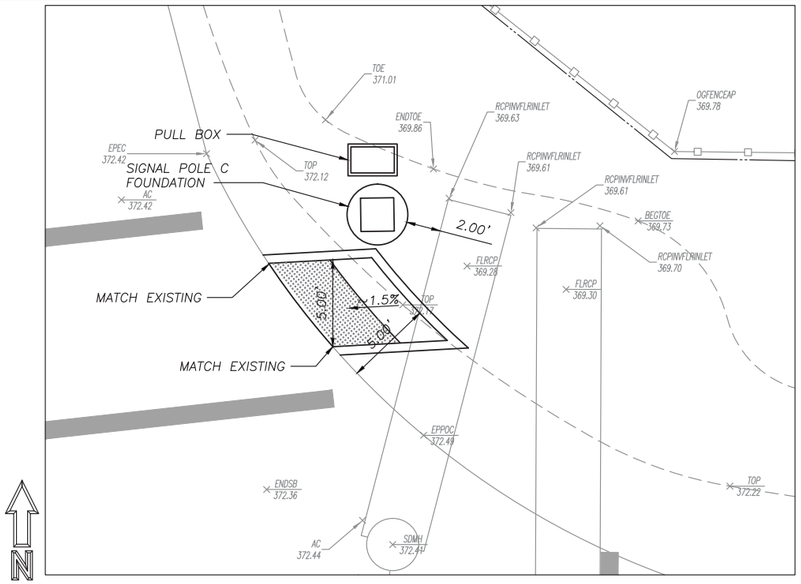
ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1034	300510	6	6



POLE B

SCALE: 1" = 4'

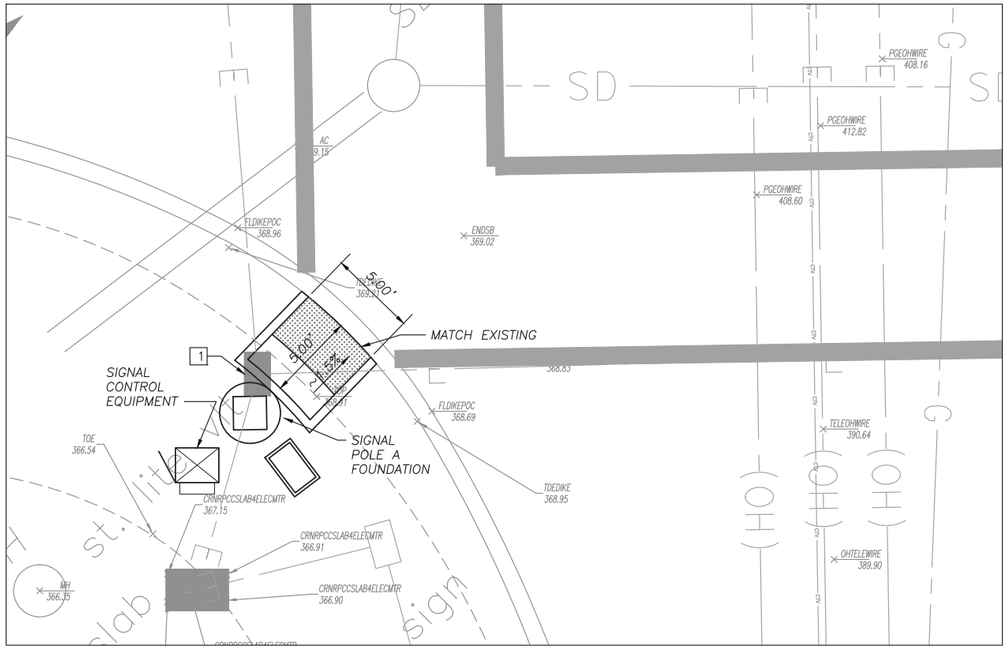
1



POLE C

SCALE: 1" = 4'

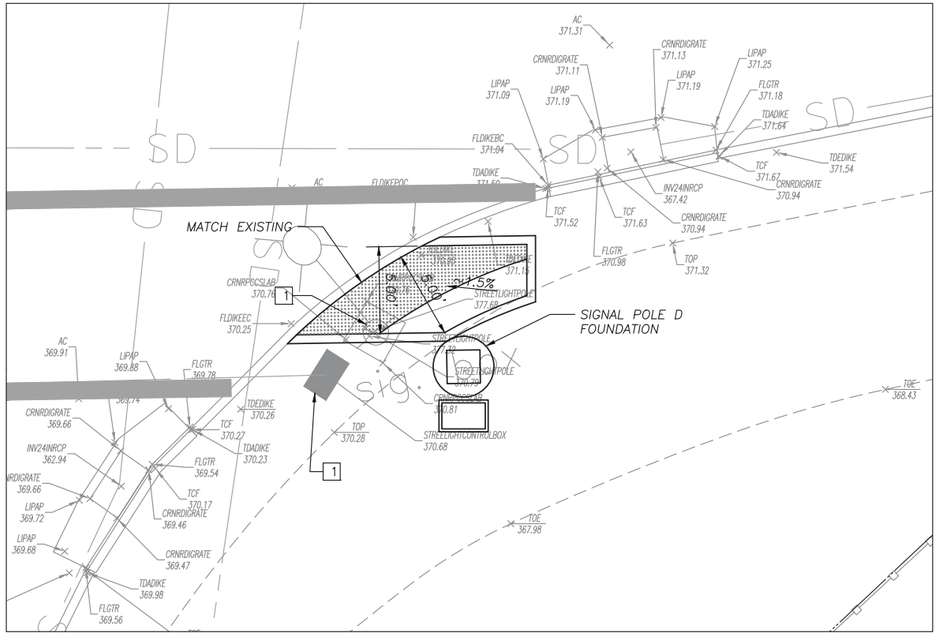
2



POLE A

SCALE: 1" = 4'

3



POLE D

SCALE: 1" = 4'

4

GENERAL NOTES

1) Install modified Case C PCC ramps per State Standard Plan A88A.
2) Grade as necessary tp conform new ramps to existing grade, 5:1 slope typical, 3:1 maximum.
3) Poles are offset from flow line to allow for future sidewalk construction.

[1] Existing lighting foundation, conduit, and pull box to be removed and salvaged.

REGISTERED PROFESSIONAL ENGINEER
MICHELLE M. MATSON
C 73131
Exp. 12/31/16
CIVIL
STATE OF CALIFORNIA

0 1 2 3
ORIGINAL SCALE IN INCHES FOR REDUCED PLANS

POMEROY ROAD AT WILLOW ROAD

PEDESTRAIN REFUGE/CURB CUTS

NIPOMO, SAN LUIS OBISPO COUNTY, CA.

Designer	Date	Drawn By	Date	Traffic Engineer	Date
M. MATSON	04/2015	JPF	04/2015	M. MATSON	04/2015

ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1516	300524	1	7

COUNTY OF SAN LUIS OBISPO, CALIFORNIA
PUBLIC WORKS DEPARTMENT
TRANSPORTATION DIVISION

PLANS FOR THE INSTALLATION OF TRAFFIC SIGNAL ON THOMPSON AVENUE AT TITAN WAY IN NIPOMO, CONTRACT NO. 300524

To Be Supplemented By State Standard Plans Dated May, 2006

APPROVED: 22 JUNE , 2015

WADE HORTON, DIRECTOR OF PUBLIC WORKS
R.C.E. 64745

INDEX OF SHEETS

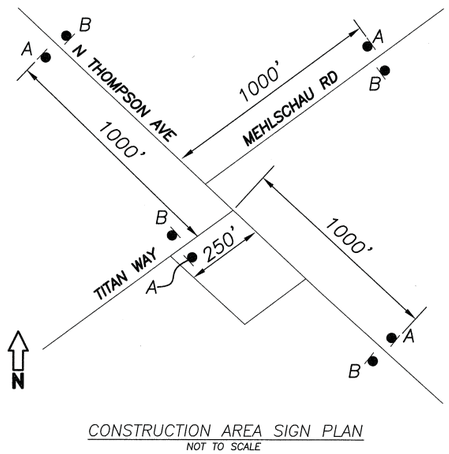
SHEET NO. 1	TITLE SHEET
SHEET NO. 2	CIVIL SHEET
SHEET NO. 3	DETAIL SHEET
SHEET NO. 4	TRAFFIC SIGNAL SITE PLAN AND NOTES
SHEET NO. 5	TRAFFIC SIGNAL PLAN AND NOTES
SHEET NO. 6	TRAFFIC SIGNAL ELEVATION AND SCHEDULE
SHEET NO. 7	ROADSIDE SIGN AND STRIPING PLAN

UTILITY LEGEND

WATER LINE	W
STORM DRAIN LINE	SD
GAS LINE	G
FIBER OPTIC LINE	FO
ELECTRICAL LINE	E
OVERHEAD POWER LINE	OHD POWER
OVERHEAD TELEPHONE LINE	OHD TEL

LICENSE REQUIREMENTS

The successful bidder shall possess a Class A general engineering contractor license or a Class C10 electrical contractor's license at the time this contract is awarded. In the alternative, the successful bidder shall possess a specialty contractor's license at the time this contract is awarded that permits the successful bidder to perform with his or her own organization contract work amounting to not less than 30% of the original total contract price and to subcontract the remaining work.

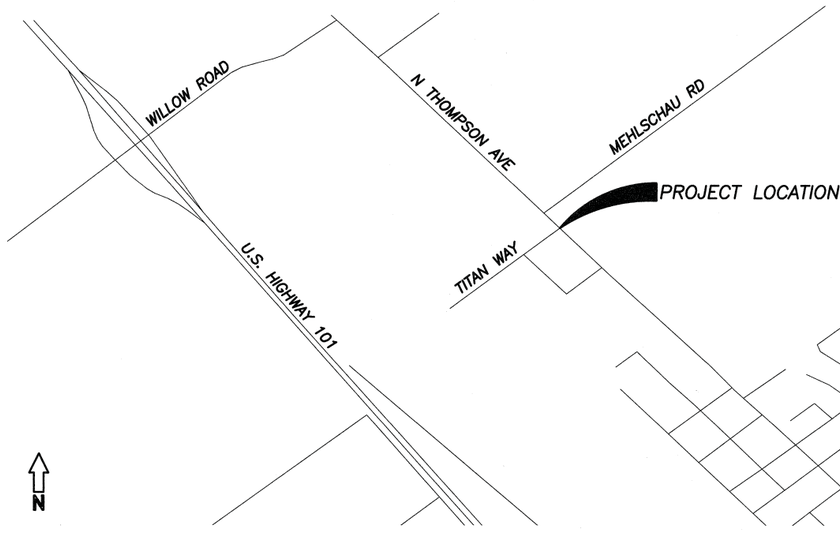


CONSTRUCTION AREA SIGN PLAN
NOT TO SCALE

No.	TYPE	SIZE	MESSAGE	QUANTITY
A	W20-1	36"X36"	"ROAD WORK AHEAD"	4
B	G20-2	36"X18"	"END ROAD WORK"	4

NOTES:

1. *All Signs Shall Be Stationary Mounted on 4x4 Wood Posts, Unless Noted Otherwise.*
2. *All Construction Signs Shall be Placed Approximately 4' off the Edge of Pavement, the Exact Location and Position of Signs Shall be Determined by the Engineer.*
3. *Traffic control shall be placed per the CAMUTCD. During shoulder work traffic control shall be placed per TA-3. For lane closures traffic control shall be placed per TA-10.*



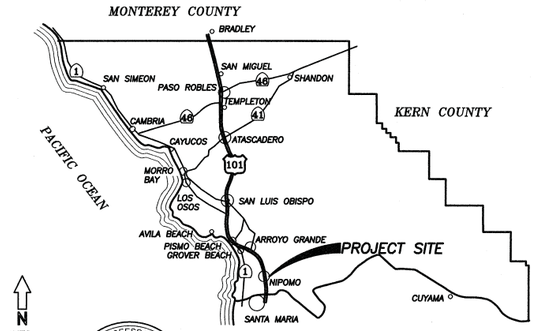
LOCATION MAP
NOT TO SCALE

SURVEY NOTES:

1. *FIELD SURVEY DATE: Nov 24, 2014*
2. *THE **BENCHMARK** FOR THIS PROJECT IS THE BRASS DISK "LPM 1 1938", PID FV0766, IN THE TOP OF THE SOUTHEASTERLY END OF A CONCRETE HEADWALL BEING N 41°32'08"W 2,119.59' FROM THE FOUND MONUMENT AT THE NORTHWESTERLY TERMINUS OF THE BASIS OF BEARINGS FOR THIS SURVEY AND HAVING AN NGVD 1929 ELEVATION OF 357.13' ACCORDING TO THE NGS DATA SHEET.*
3. *THE **BASIS OF BEARINGS** FOR THIS BASE MAP IS THE SOUTHWESTERLY RIGHT OF WAY LINE OF THOMPSON AVENUE BETWEEN THE FOUND SURVEY MONUMENTS AS SHOWN HEREON AND HAVING A BEARING OF S42°00'00"E AS SHOWN ON 77/LS/36.*

SUBSTRUCTURE NOTICES

1. *The existence and location of any underground utilities or substructures shown on these plans was obtained from a search of available records. to the best of our knowledge, there are no existing utilities except as shown on these plans. The contractor shall take all necessary precautions to protect the utilities or substructures shown and any others not of record or not shown on these plans.*
2. *The contractor shall notify dig alert (Call 811), at least 48 hours prior to the start of any excavation.*



REGISTERED PROFESSIONAL ENGINEER
CASEY BLANCO
NO 62853
EXPIRES 6/30/16
CIVIL
STATE OF CALIFORNIA

VICINITY MAP
NOT TO SCALE

THOMPSON AVENUE AT TITAN WAY

TITLE SHEET

SAN LUIS OBISPO COUNTY, CA

ENGINEERED BY:	DATE	CADD BY:	DATE	CHECKED BY:	DATE
E. BLANCO	05/2015	ACE	05/2015	E. BLANCO	05/2015

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ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1516	300524	2	7

GENERAL NOTES

1) ALL WORK SHALL CONFORM TO COUNTY OF SAN LUIS OBISPO 2014 PUBLIC IMPROVEMENT STANDARDS AND SUPPLEMENTED BY CALTRANS 2006 STANDARD PLANS.
2) ALL WORK SHALL COMPLY WITH ALL FEDERAL AND STATE CODES, REGULATIONS AND LAWS.
3) TRAFFIC CONTROL SHALL CONFORM TO THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD), 2014.
4) ALL EXISTING UTILITIES SHALL BE PROTECTED IN PLACE.
5) ALL WORK TO BE PERFORMED WITHIN COUNTY RIGHT OF WAY.
6) MATERIAL AND EQUIPMENT STORAGE AND STAGING MUST BE COORDINATED AND PRE-APPROVED BY THE COUNTY.
7) GRADING SHALL CONFORM WITH ROADWAY EXCAVATION, SECTION 19-2 OF THE CALTRANS STANDARD SPECIFICATIONS.
8) ASPHALT CONCRETE SHALL BE TYPE A, 1/2" MAX, COARSE.
9) AGGREGATE BASE SHALL BE CLASS 2, 3/4" MAXIMUM.
10) PORTLAND CEMENT CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI.

UTILITY NOTES

(1) CONTRACTOR SHALL POTHOLE AND VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO EXCAVATION. ANY CONFLICT WITH THIS PLAN SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER.

(2) WATER LINE TO BE ENCASED BY OTHERS PRIOR TO CONSTRUCTION. CONTRACTOR TO VERIFY LIMITS AND LOCATION OF ENCASEMENT PRIOR TO WORK IN THE VICINITY. WATER LINE AND ENCASEMENT TO BE PROTECTED IN PLACE.

(3) FIBER OPTICS CONDUIT APPROXIMATE TOP ELEV=340.3±. PROTECT IN PLACE.

CONSTRUCTION NOTES

1 PAVEMENT WIDENING, 4" AC / 12" CLASS II BASE.

2 6" THICK CONCRETE SIDEWALK PER COUNTY STANDARD C-1 AND C-4.

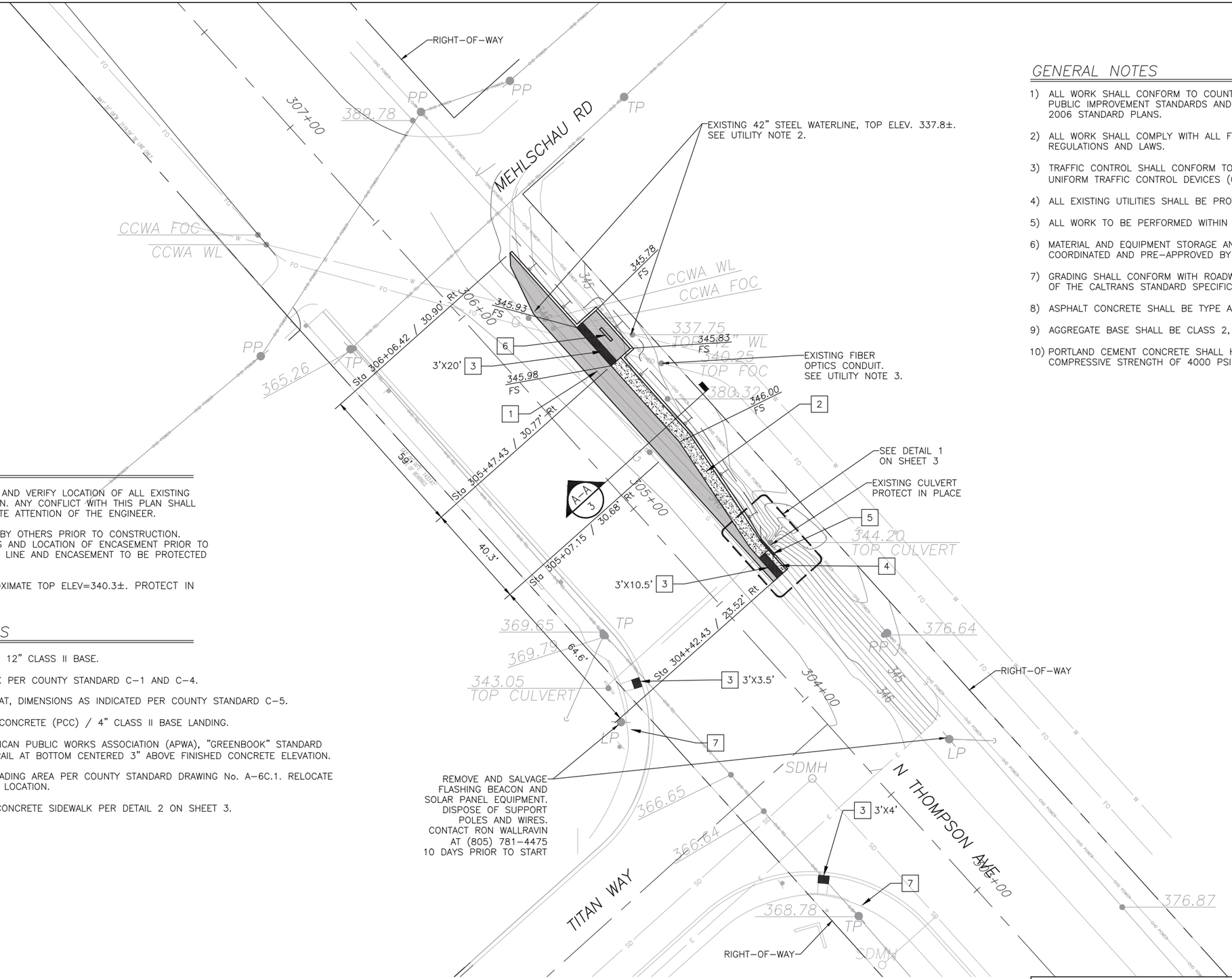
3 TRUNCATED DOME WARNING MAT, DIMENSIONS AS INDICATED PER COUNTY STANDARD C-5.

4 6" THICK PORTLAND CEMENT CONCRETE (PCC) / 4" CLASS II BASE LANDING.

5 8' LONG HANDRAIL PER AMERICAN PUBLIC WORKS ASSOCIATION (APWA), "GREENBOOK" STANDARD 606-4, TYPE A. ADD THIRD RAIL AT BOTTOM CENTERED 3" ABOVE FINISHED CONCRETE ELEVATION.

6 RURAL BUS TURNOUT AND LOADING AREA PER COUNTY STANDARD DRAWING No. A-6C.1. RELOCATE BENCH AND SIGNAGE TO NEW LOCATION.

7 REMOVE/GRIND PORTION OF CONCRETE SIDEWALK PER DETAIL 2 ON SHEET 3.



N

0 20' 40'

REGISTERED PROFESSIONAL ENGINEER
ESAU BLANCO
NO 62853
EXPIRES 6/30/16
CIVIL
STATE OF CALIFORNIA

THOMPSON AVENUE AT TITAN WAY					
CIVIL SHEET					
SAN LUIS OBISPO COUNTY, CA					
ENGINEERED BY:	DATE	CADD BY:	DATE	CHECKED BY:	DATE
E. BLANCO	05/2015	ACE	05/2015	E. BLANCO	05/2015

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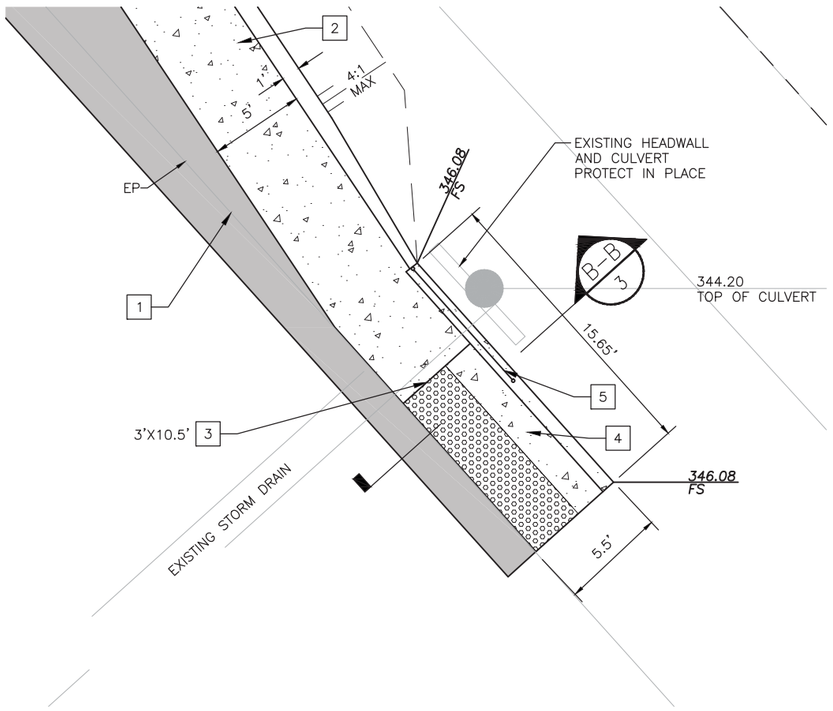
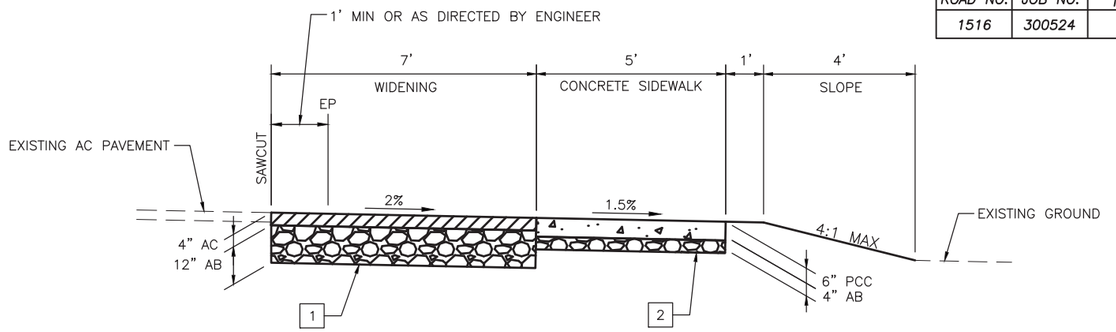
ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1516	300524	3	7

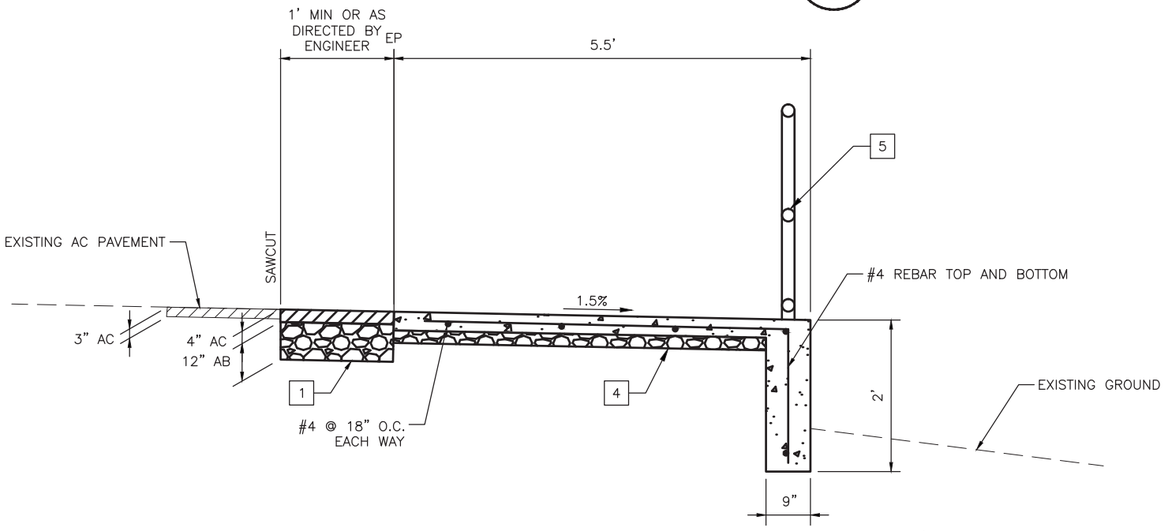


DETAIL 1
PEDESTRIAN LANDING
1"=4'



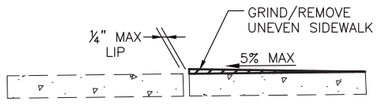
PAVEMENT WIDENING
N.T.S.

A-A
2



PEDESTRIAN LANDING
N.T.S.

B-B
3



DETAIL 2 – CROSS SECTION
SIDEWALK GRINDING
N.T.S.

N

CONSTRUCTION NOTES

1. PAVEMENT WIDENING, 4" AC / 12" CLASS II BASE.
2. 6" THICK CONCRETE SIDEWALK PER COUNTY STANDARD C–1 AND C–4.
3. TRUNCATED DOME WARNING MAT, DIMENSIONS AS INDICATED PER COUNTY STANDARD C–5.
4. 6" THICK PORTLAND CEMENT CONCRETE (PCC) / 4" CLASS II BASE LANDING.
5. 8' LONG HANDRAIL PER AMERICAN PUBLIC WORKS ASSOCIATION (APWA), "GREENBOOK" STANDARD 606–3, TYPE A. ADD THIRD RAIL AT BOTTOM CENTERED 3" ABOVE FINISHED CONCRETE ELEVATION.

REGISTERED PROFESSIONAL ENGINEER
ESAU BLANCO
No 62853
EXPIRES 6/30/16
CIVIL
STATE OF CALIFORNIA

THOMPSON AVENUE AT TITAN WAY					
DETAIL SHEET					
SAN LUIS OBISPO COUNTY, CA					
ENGINEERED BY:	DATE	CADD BY:	DATE	CHECKED BY:	DATE
E. BLANCO	05/2015	ACE	05/2015	E. BLANCO	05/2015

ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1516	300524	4	7

TRAFFIC SIGNAL NOTES

1) Location of poles, pull boxes, and detector loops shall be verified by the Engineer prior to installation.

2) The location of all existing underground utilities is approximate only. The contractor shall be responsible for verifying the exact location and depth of all utilities including those not shown on the plan prior to start of work. Contact Underground Service Alert at 811 at least 48 hours in advance.

3) All signal heads shall be 12"

4) All pull boxes shall be No. 6 unless otherwise noted.

5) All vehicle and pedestrian signal indications shall be LED. Pedestrian signals shall be countdown type.

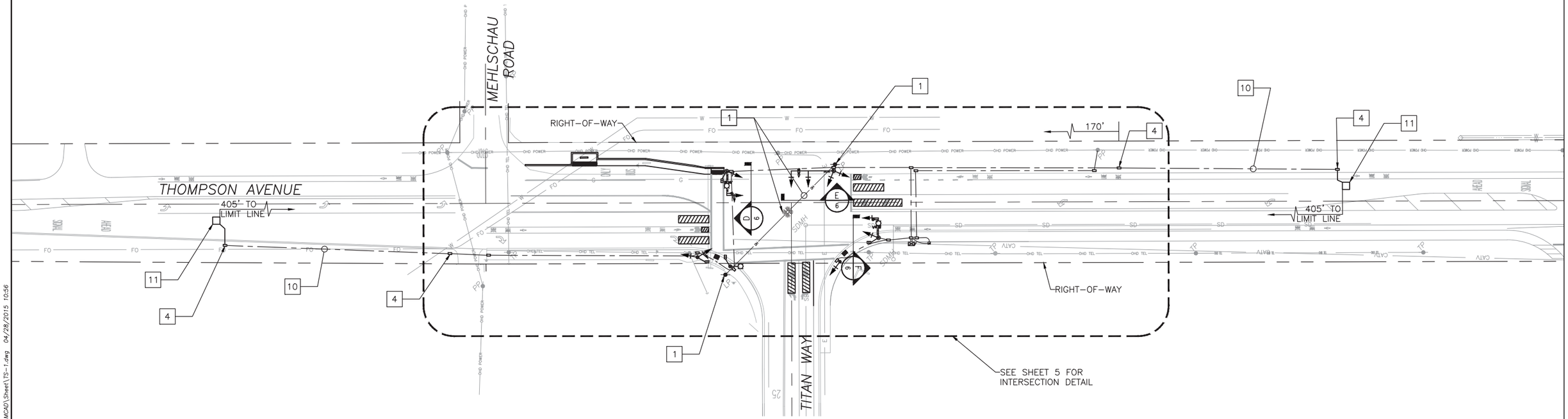
6) All signal standards, poles, posts, mast arms, luminarie housings, pedestal/bases, bolts, rain caps, PPB, vehicle signal faces and signal heads, pedestrian signal faces and signal heads, battery backup cabinet, controller cabinet and service cabinet shall be powder coated a forest green as approved by the Engineer.

7) This plan is accurate for signal work only.

8) Contract includes furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in the installation, complete and functional in place, of the Traffic Signal.

9) All conduit under pavement shall be bored.

10) Furnish and install Optical Detector/Discriminator Assembly/ies on all signal mast arms by clamping method. Exact location to be determined by the Engineer.



CONSTRUCTION NOTES (THIS SHEET ONLY)

1	Remove and salvage existing flashing beacon equipment. Dispose of support poles and wires.
4	Furnish and install No. 5 pull box.
10	2" conduit with one (1) Type B DLC.
11	Furnish and install Type A or Type E loop detector per State Standard Plan ES-5B.

N

0 40' 80'

REGISTERED PROFESSIONAL ENGINEER
DAVID MADERA
NO 71391
EXPIRES 12/31/15
CIVIL
STATE OF CALIFORNIA

THOMPSON AVENUE AT TITAN WAY					
TRAFFIC SIGNAL SITE PLAN AND NOTES					
SAN LUIS OBISPO COUNTY, CA					
ENGINEERED BY:	DATE	CADD BY:	DATE	CHECKED BY:	DATE
K. KO	05/2015	ACE	05/2015	D. MADERA	05/2015

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ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1516	300524	5	7

CONSTRUCTION NOTES (THIS SHEET ONLY)

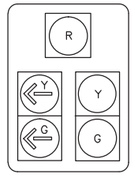
1. Furnish and install Model 332L Controller Cabinet with Type 170E Controller Assembly and 4–channel Emergency Vehicle Detector System. Door hinge on left as shown.
2. Furnish and install a single–meter Type III–BF Service Equipment Enclosure per State Standard Plan ES–2E with Type V PEU mounted on the north side in the service section, 18" minimum from the bottom of the enclosure. Service shall include the following circuit breakers:
   120/240V – 100A Main
   120V – 50A Metered Signals
   240V–30A Metered Lighting
   Dual Type V – P.E.C.
   New service location to be confirmed with PG&E.
3. Furnish and install Battery Back–Up System in external cabinet and wire per manufacturer's specifications.
4. Furnish and install No. 5 pull box.
5. Furnish and install No. 6(T) pull box.
6. Furnish and install emergency vehicle pre–emtion equipment and 4–channel discrimination equipment in the controller cabinet. EVPE optical detection shall be mounted on a signal mast arm by clamping method. Exact location of detector shall be determined in the field by the department.
7. Furnish and install video detection camera on luminaire arm with a standard bracket approximately 1' from the luminaire head.
8. Furnish and install video detection camera on signal mast arm with a 5' extension bracket.
9. 3" Conduit, 2#6, 1#6(G) service to new service point per PG&E requirements.
10. 2" Conduit with one (1) Type B DLC.

LEGEND

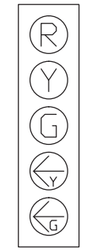
Video Detection Zone (typical)

(#) Furnish and install conduits per conduit schedule, see sheet 6.

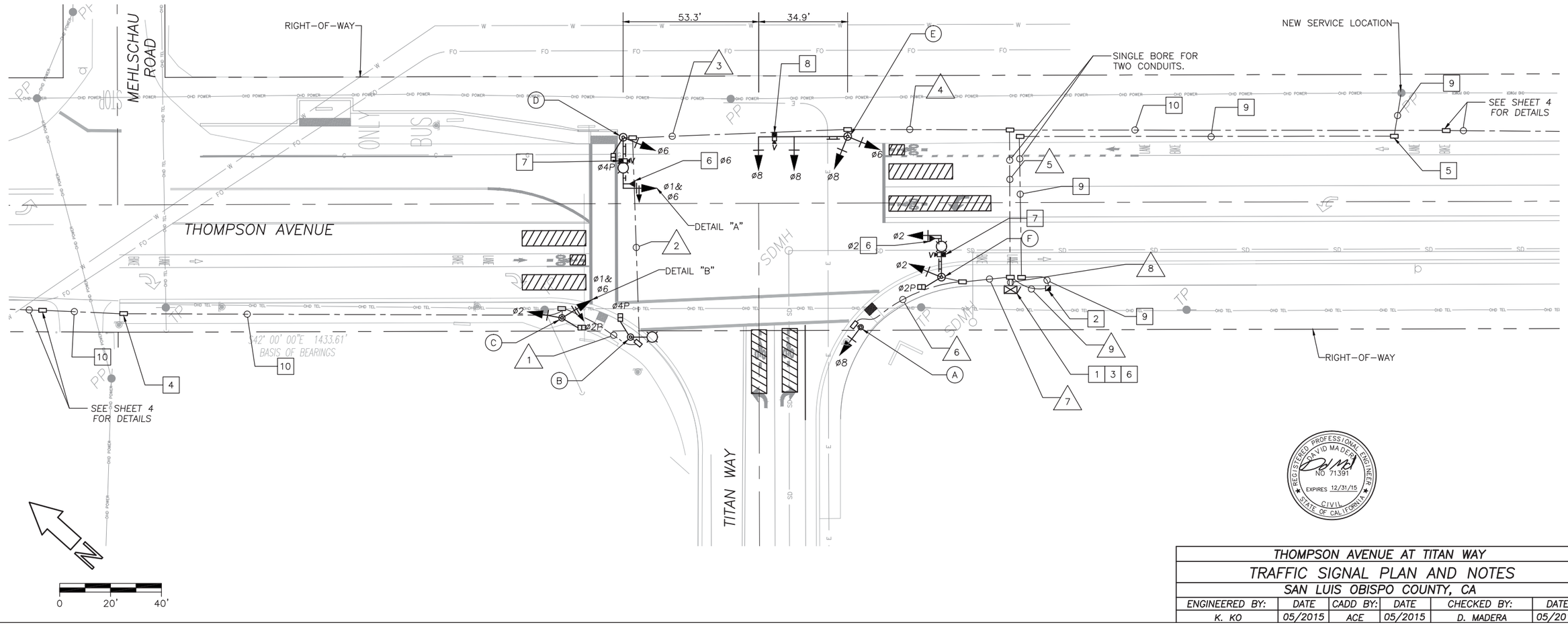
(#) Furnish and install signal and lighting standards per schedule, see sheet 6.



DETAIL "A"



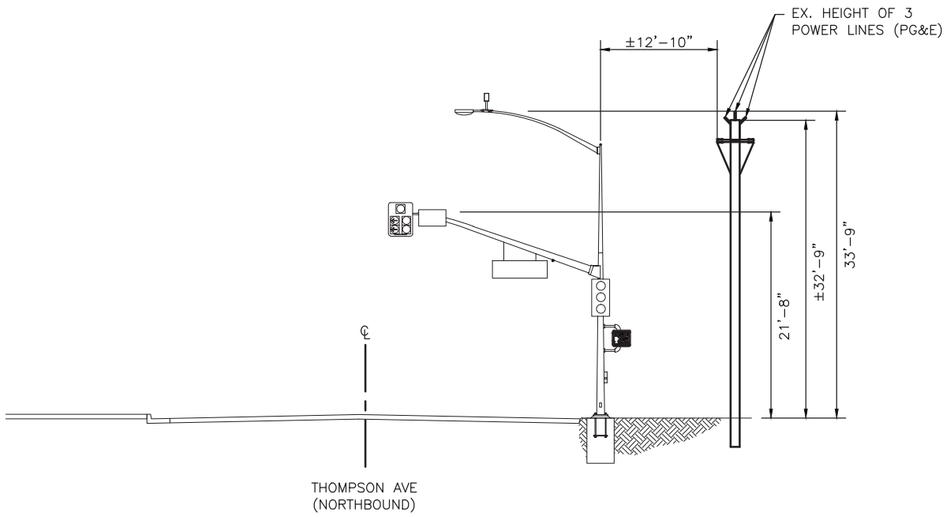
DETAIL "B"



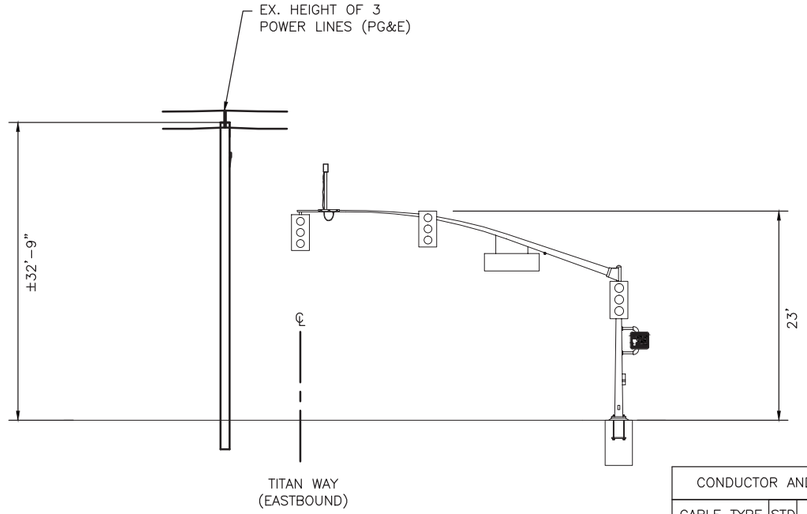
REGISTERED PROFESSIONAL ENGINEER
DAVID MADERA
No 71391
EXPIRES 12/31/15
CIVIL
STATE OF CALIFORNIA

THOMPSON AVENUE AT TITAN WAY					
TRAFFIC SIGNAL PLAN AND NOTES					
SAN LUIS OBISPO COUNTY, CA					
ENGINEERED BY:	DATE	CADD BY:	DATE	CHECKED BY:	DATE
K. KO	05/2015	ACE	05/2015	D. MADERA	05/2015

ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1516	300524	6	7



ELEVATION D 6
SCALE 1"=8'



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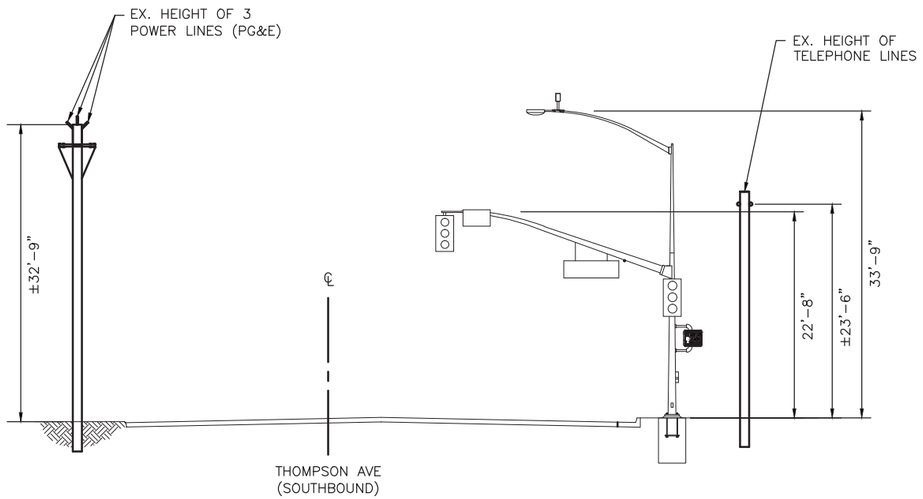
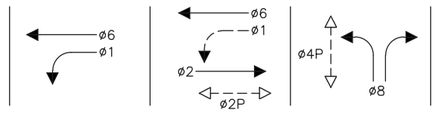


ELEVATION F 6
SCALE 1"=8'



PHASE DIAGRAM

CONDUIT SCHEDULE

CONDUCTOR AND CABLE SCHEDULE			CONDUIT RUN NUMBER								
CABLE TYPE	STD	PHASE	1	2	3	4	5	6	7	8	9
VEH-PED (12C)	Ⓐ	8 / 2	– / –	– / –	– / –	– / –	– / –	1 / 1	1 / 1	1 / 1	– / –
	Ⓑ	4P / 2,&4	– / –	1 / 2	1 / 2	1 / 2	1 / 2	– / –	– / –	1 / 2	– / –
	Ⓒ	1,2,6,&2P	1 / –	1 / –	1 / –	1 / –	1 / –	– / –	– / –	1 / –	– / –
	Ⓓ	1,6,&4P / 4	– / –	– / –	1 / 1	1 / 1	1 / 1	– / –	– / –	1 / 1	– / –
	Ⓔ	8,6	– / –	– / –	– / –	1 / –	1 / –	– / –	– / –	1 / –	– / –
PPB(3C)	Ⓕ	2,&2P	– / –	– / –	– / –	– / –	– / –	– / –	1 / –	1 / –	– / –
VEH-PED (12C) / PPB(3C)		TOTAL	1 / –	2 / 2	3 / 3	4 / 3	4 / 3	1 / 1	2 / 1	6 / 4	– / –

AWG	CIRCUIT								
#6 AWG	SERVICE	–	–	–	–	–	–	–	–	3
#10 AWG	LIGHTING	–	2	2	2	2	–	2	–	2
	GROUND	1	1	1	1	1	1	1	1	–
#12 AWG	AWG/VIDEO SERVICE	–	–	–	–	–	–	–	–	1
#14 AWG	PEU	–	–	–	–	–	–	–	–	1
EVP		–	–	1	1	1	–	1	2	–
VIDEO DETECTION POWER CABLE & COAXIAL CABLE		–	–	1	2	2	–	1	3	–
DETECTOR LEAD IN CABLE										
PHASE	ø2	1	1	1	1	1	–	–	1	–
	ø6	–	–	–	–	1	–	–	1	–
	DLC	1	1	1	1	2	–	–	2	–
CONDUIT SIZE (in.)		2"	3"	4"	4"	4"	2"	3"	2-4"	2"
%FILL		15	16	16	21	22	19	18	15	9

ALL CONDUCTORS ARE NEW UNLESS OTHERWISE NOTED.

POLE AND EQUIPMENT SCHEDULE

NO.	STANDARD			VEHICLE SIG MTG		PED SIGNAL MOUNTING	PPB		L.E.D. LUMINAIRE	MAST ARM MOUNTED SIGN
	TYPE	SIG. M.A.	LUM. M.A.	MAST ARM	POLE		PHASE	ARROW		
Ⓐ	1-A	–	–	–	TV-1-T	–	2	→	–	–
Ⓑ	15TS	–	15'	–	–	SP-1-T	2 / 4	→ / ←	165W	–
Ⓒ	1-A	–	–	–	TV-2-T	SP-1-T	–	–	–	–
Ⓓ	17-3-100	20'	15'	MAS-5A	SV-1-T	SP-1-T	4	→	165W	G7-1 "Titan Way"; R10-12
Ⓔ	23-4-100	35'	–	MAS (2)	SV-2-TA	–	–	–	–	G7-1 "Thompson Ave"
Ⓕ	19-4-100	25'	15'	MAS	SV-1-T	SP-1-T	–	–	165W	G7-1 "Titan Way"; R3-18

THOMPSON AVENUE AT TITAN WAY					
TRAFFIC SIGNAL ELEVATION & SCHEDULES					
SAN LUIS OBISPO COUNTY, CA					
ENGINEERED BY:	DATE	CADD BY:	DATE	CHECKED BY:	DATE
K. KO	05/2015	ACE	05/2015	D. MADERA	05/2015

ROAD NO.	JOB NO.	SHEET NO.	TOTAL SHEETS
1516	300524	7	7

ROADSIDE SIGN NOTES

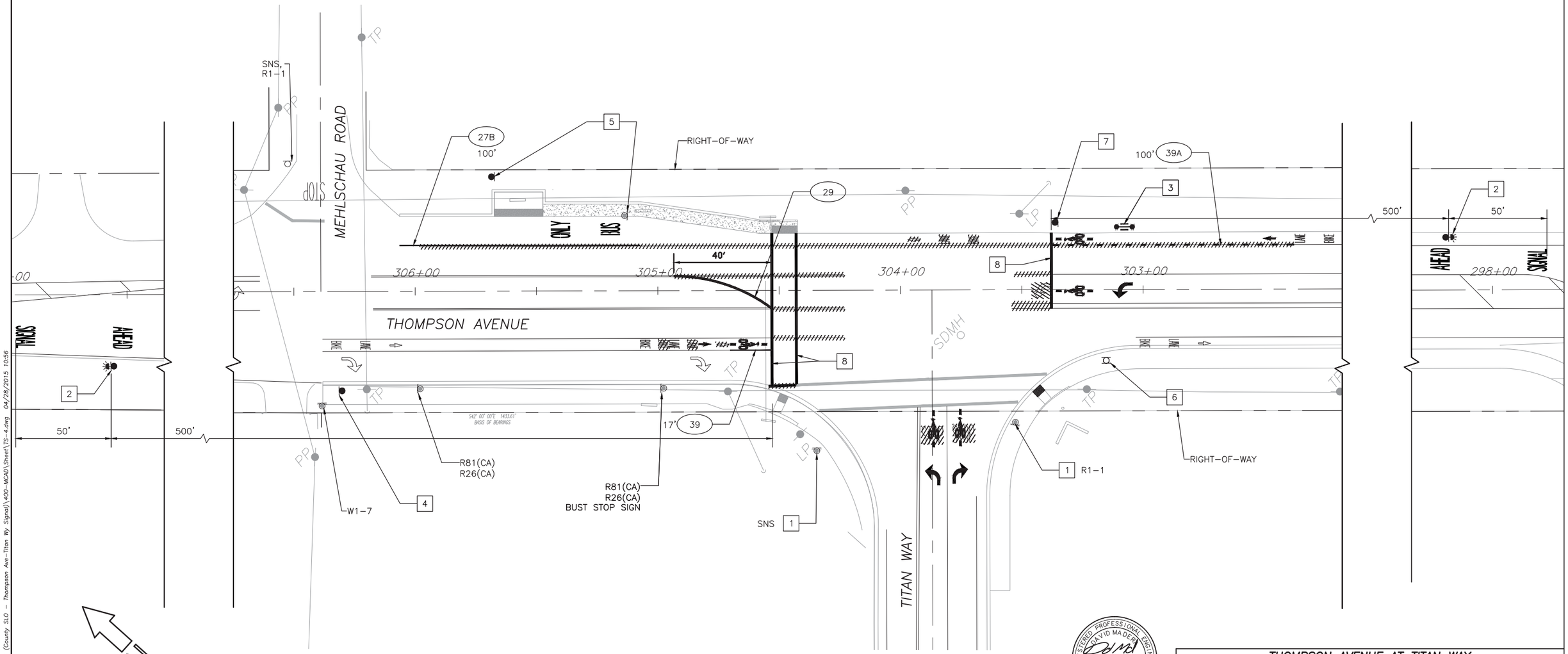
1. Remove and salvage existing sign as noted.
2. Furnish and install W3-3 with solar flashing beacon.
3. Furnish and install Type I pedestrian barricade per State Standard Plan ES-7P.
4. Furnish and install R3-7(Rt) and R4-4.
5. Relocate existing bus stop sign as noted.
6. Furnish and install R9-3, R9-3bP on pole F.
7. Furnish and install R81(CA) and R81B(CA).
8. Install 12" white limit line and crosswalk per State Standard Plan A24E.

LEGEND

- ### = PAVEMENT DELINEATION DETAIL NUMBER PER STATE STANDARD PLANS, MAY 2006.
- = TYPE IV ARROW PER STATE STANDARD PLAN A24A.
- SIGNAL AHEAD = PAVEMENT MARKING WORDS PER STATE STANDARD PLAN A24D.
- = BICYCLE LOOP DETECTOR SYMBOL PER STATE STANDARD PLAN A24C.
- BIKE LANE = BIKE LANE ARROW AND PAVEMENT MARKING WORDS PER STATE STANDARD PLAN A24A AND A24D.
- = SOLAR FLASHING BEACON
- = EXISTING STRIPING/PAVEMENT MARKING TO BE REMOVED AS SHOWN.
- BUS ONLY = PAVEMENT MARKING WORDS PER STATE STANDARD PLAN A24E.

STRIPING NOTES

1) Remove all existing striping within the crosswalks and inside the approach limit lines per SECTION 15-2 "Miscellaneous Highway Facilities" of the State Standard Specifications.
2) Remove existing stop bars and pavement markings on all approaches per SECTION 15-2 "Miscellaneous Highway Facilities" of the State Standard Specifications.
3) Remove and replace northbound LT arrow as shown per SECTION 15-2 "Miscellaneous Highway Facilities" of the State Standard Specifications.
4) All new traffic lines and pavement markings shall be paint.
5) Install new crosswalk, lane line and arrows per Section 84, "Traffic Stripes and Pavement Markings".
6) Install SIGNAL AHEAD pavement markings on Thompson Ave approaches.



REGISTERED PROFESSIONAL ENGINEER
DAVID MADERA
NO 71391
EXPIRES 12/31/15
CIVIL
STATE OF CALIFORNIA

THOMPSON AVENUE AT TITAN WAY					
ROADSIDE SIGN AND STRIPING PLAN					
SAN LUIS OBISPO COUNTY, CA					
ENGINEERED BY:	DATE	CADD BY:	DATE	CHECKED BY:	DATE
K. KO	05/2015	ACE	05/2015	D. MADERA	05/2015

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