

EL DORADO COUNTY DEPARTMENT OF TRANSPORTATION
Contract Change Order

Sheet 1 of 1

Change Requested by: Engineer ☒ Contractor

CCO No.	Suppl. No.	Contract No.	Contract Name	Federal Number(s)
5		PW 09 - 30493 CIP #7237 ²	White Rock Road Widening And Signalization	None

To Granite Construction Company

Contractor

You are directed to make the following changes from the plans and specifications or do the following described work not included in the plans and specifications for this contract.

NOTE: This change order must be approved by the Board of Supervisors. [X] Yes [] No

Description of work to be done, estimate of quantities and prices to be paid. (Segregate between additional work at contract price, agreed price and force account.) Unless otherwise stated, rates for rental of equipment cover only such time as equipment is actually used and no allowance will be made for idle time. The last percentage shown is the net accumulated increase or decrease from the original quantity in the Engineer's Estimate.

Temporary Suspension of Work

At the completion of the work required by the contract documents and all other contract change orders, the Engineer will suspend the work per Standard Specification Section 8-1.05, "Temporary Suspension of Work." This suspension will allow for procurement of signal hardware required by this contract change order. Once all signal hardware is on site, the Engineer will terminate the temporary suspension, and contract time will resume.

Extra Work at Agreed Lump Sum Price

Install a traffic signal system at the intersection of White Rock Road and Post Street in accordance with Attachments A and B to this contract change order, the Standard Plans, the Special Provisions, and the Standard Specifications.

For this work, the Contractor will be paid the Agreed Lump Sum Price of \$158,300.00. This price constitutes full and complete compensation, including all markups, for the work of this change.

Total Increase \$158,300.00

Estimated Cost:

Decrease ☐ Increase ☒ \$ 158,300.00

By reason of this order the time of completion will be adjusted as follows: twenty (20) working day extension

Submitted by Signature	(Print name & title) Greg P. Zeiss, P.E., Resident Engineer (HDR)	Date 8/5/2011
Approved: Signature	(Print name & title) John Kahling, P.E., Deputy Director, Engineering	Date 08/09/11
Approved: Signature	(Print name & title) Robert Slater, P.E., Asst. Director of Transportation	Date 8/11/11
Approved: Signature	(Print name & title) James W. Ware, P.E., Director of Transportation	Date 8/11/11
Approved: Signature	(Print name & title) Raymond J. Nutting, Chair, Board of Supervisors	Date

We the undersigned contractor, have given careful consideration to the change proposed and agree, if this proposal is approved, that we will provide all equipment, furnish the materials, except as may otherwise be noted above, and perform all services necessary for the work above specified, and will accept as full payment therefore the prices shown above. The prices and terms of payment shown above comprise full and final compensation for all direct costs, indirect costs, cumulative costs, and all overhead costs incurred as a result of this contract change order. NOTE: If you, the contractor, do not sign acceptance of this order, your attention is directed to the requirements of the specification as to proceeding with the ordered work and filing a written protest within the time therein specified.

Contractor Acceptance by

Signature	(Print name & title) Sean Carisatani, Proj. Manager	Date 8/4/11
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8/25/2011

CCO#5, Attachment A (Total 4 Pages)

White Rock Road Widening and Signalization Project

Note: In the case of a discrepancy between Contract Change Order#5 and Contract Change Order#2 or the Contract Bid Documents, Contract Change Order#5 will govern.

10-3.20 CONTROLLER

The Contractor shall furnish and install a new, brand-specific Naztec, Inc. Model 980 NEMA TS2, Type 1 Signal Controller with Ethernet Ready and internal FSK modem at the intersection of White Rock Road and Windfield Way. Contractor must quote brand and model indicated; alternative brands will not be accepted.

The Contractor shall relocate Naztec 980 controller from White Rock Road and Latrobe Road to the cabinet at White Rock Road and Post Street. Contractor to furnish and install external FSK modem in White Rock Road and Post Street Cabinet.

The Contractor shall furnish and install a new, brand-specific Naztec, Inc. Model 981 NEMA TS2, Type 1 Signal Controller with Ethernet Ready and external FSK modem at the intersection of White Rock Road and Latrobe Road. Contractor must quote brand and model indicated; alternative brands will not be accepted.

Pre-installation testing of the controllers shall be performed by the Contractor. County representative(s) shall have the option of being present for the pre-installation testing. Contractor shall provide the Engineer with the manufacturer's certification that the pre-installation testing indicates that the controller is functioning within acceptable standards and is ready for installation.

County shall prepare AM and PM peak hour coordination timing plans in Synchro and provide it to Contractor. Controller factory certified signal timing technician shall be responsible for inputting signal timing and coordination plans into controllers and debugging system.

Should there be a need for more detection devices (Loops, Video etc.) than the NEMA STANDARD TYPE "P" TS2 TYPE 1 SIGNAL CONTROLLER CABINET can house, then use the EXPANDED TYPE "STRETCH P" SIGNAL CONTROLLER CABINET:

ITEM
Signal Controller Cabinet
Configured according to Specifications

SPECIFICATION
NEMA "Stretch P" TS2 Type 1
68"H x 26"D x 44" H
White interior
RAL 7004 Grey Exterior – Full Gloss
Wired for Emergency Vehicle Detection System

Cabinet to include:

- One (1) Cabinet Light
- Two (2) Adjustable Shelves
- One (1) Document Drawer
- One (1) Sixteen (16) position Load Bay
- Four (4) Sixteen (16) Channel Detector Panels
- Four (4) Two (2) Channel Detector Racks
- Two (2) TS2 Power Supplies
- One (1) Malfunction Management Unit (TS2 Conflict Monitor)
- Six (6) Bus Interface Units (Load Bay and Detector BIUs)
- Sixteen (16) Model 200 Load Switches Dual Indicating I/O
- Thirty two (32) Two (2) Channel Loop Detectors, LCD Display, Oracle

21-074 C.2
2/5/11

- One (1) Model 204 Flasher
- Four (4) Model 430 Flash Transfer Relays

A minimum four-hour session of advanced training shall be provided to County personnel in the operation and signal timing input for Model 980/981 controller unit. Instruction and materials shall be provided from controller factory certified instructors for a maximum of 15 persons, and shall be conducted at a location selected by the end-user public agency.

The Contractor shall arrange to have a representative with responsibility and authority to address any controller related issues that may arise present in the field at the time the signal equipment is turned on. The representative shall check all signal heads, phases, and pedestrian heads to insure proper operation, shall activate for proper operation, and shall install initial signal timing. Local turn-on support services may be arranged with the local factory authorized controller manufacturer's dealer, Western Pacific Signal, (510) 276-6400.

Following the manufacturers completed successful standard 8 phase 4 pedestrian functional testing the Traffic Signal Cabinet and associated Naztec Controller assembly shall be functionally tested for 72 hours at controller manufacturers authorized facilities for functional "Burn In" testing." The testing shall include the following conditions supplied by the local agency: local intersection timing, CMU/MMU programming, IO and detection channel programming per intersection engineering specifications. A signed test sheet shall be supplied with cabinet and controller assembly by manufacturers authorized representative indicating a pass condition of functional "Burn in" testing.

All modems must be capable of rejecting a 60 Hz voltage and communicating between controllers and other devices with communication ports.

10-3.25 MICROWAVE DETECTION SYSTEM

Purpose

The purpose of this specification is to define a microwave based sensor that will detect trucks, vehicles, motorcycles and bicycles and send a signal representative of a loop type detector in a presence mode to a traffic controller device. Herein are the specification and minimum requirements for this sensor in preparation of purchasing and operating the sensor in the field. The sensor shall be easily installed with minimum effort and shall be easy to set up and program. The sensor shall operate in the field under harsh environments and shall be immune to the effects of weather, sunlight, night problems, headlight glare, and not be susceptible to in-road breakage. It shall not be necessary to mount any hardware in the roadway, or above the roadway. The sensor shall be immune to all privacy issues that other detection devices may have.

Environmental/Power Requirements

The sensor shall function in the field without any degradation of operation within the following temperature range: - 40oC to + 85oC.

The sensor plus interface board shall operate with 24DVC supplied to the interface board card and require no other power supplies. Total current shall be no more than 415mA at anytime during operation with no output active. Typical is 360mA with no output active.

Operation shall be within 20 seconds from a cold start up. Full operation shall be no greater than 2 minutes, and provide for full automatic recover from a power failure.

The sensor unit shall be FCC approved.

Physical Description

The sensor shall weigh no more than 5.5 pounds, and be no longer than 11 inches, no wider than 8.5 inches and no higher than 7 inches.

Operation

The sensor shall be a microwave-based motion and presence sensor used for intersection control. The sensor shall interface with a traffic control cabinet, and shall output signals when vehicles are present in user defined zones. These zones shall be able to be created on site using an X-Y coordinate system, and have its operation verified and optimized using a laptop with Internet Explorer TM 6.0 or greater as part of the installation process or resident on the PC.

The sensor shall allow the user to create up to eight (8) zones and assign vehicle presence in each of these zones with up to four (4) outputs to the control cabinet – representing phase movements. Detection zones shall be able to be created to a maximum distance of 300 feet from the sensor itself.

The sensor shall track the presence of a vehicle in a detection zone for a predetermined time, user selectable from 0 to 960 seconds.

The sensor shall be able to track up to 32 moving and stationary vehicles simultaneously.

Each vehicle shall be tracked using its X-Y coordinates to determine the vehicle's location.

The sensor shall update the X-Y coordinates typically 20 times per second.

The sensor range from the front of the sensor shall be a minimum of 50 feet to a maximum of 400 feet.

The sensor shall be able to program eight (8) independent zones, and provide up to four independent optical isolated outputs to the controller cabinet inputs via one of three optional sensor interface boards (modules).

The sensor shall be able to determine and display the speed of each vehicle in the detection zones.

The sensor shall be able to provide grid tracking for the live interactive zones.

The sensor shall be able to provide a histogram to verify setup of the zones.

The sensor interface shall use either English (standard) or metric units at the option of the user.

The sensor shall be able to provide user defined delay and/or extension times for each zone.

The sensor interface shall be able to provide a graphical representation of the vehicle track as they approach the intersection.

The sensor shall provide a diagnostic and demonstration mode for various operations.

The sensor shall operate via an Ethernet interface with power supplied over the Ethernet connector (POE).

Mounting

The sensor is to be mounted for head-on (front fire) detection of approaching vehicles. When mounted on a pole a maximum 30 degree offset from the traffic direction shall be allowed to provide for optimal operation.

The sensor shall operate optimally, and shall be mounted on a pole at a height from 14 to 19 feet.

The range of operation shall be from 50 feet to 400 feet from the front of the sensor.

Mounting hardware shall be supplied with each sensor to allow the device to be attached to a pole with standard stainless steel strapping bands.

Radar

The sensor shall support five (5) selectable channels of microwave operation and operate in the FSK-4 mode.

24.075 GHz
24.100 GHz
24.125 GHz
24.150 GHz
24.175 GHz

The beam angle shall be an Azimuth of 25 degrees to 100 feet, and then 20 degrees out to 400 feet. The elevation shall be 12 degrees.

Interface Boards

Interface boards shall be optionally available for the sensor and shall be compatible with NEMA, 170, 179 and 2070 cabinets. For each sensor one interface board shall be required and supplied as required by the user.

The Interface board shall communicate with the controller cabinet. The interface board shall meet the requirements of CALTRANS 170/2070 222 and 224 modules with respect to size and form.

There shall be three optional Interface boards available with the following functions:

There shall be a two (2) output Interface board that fits in a single input file slot.

There shall be a four (4) output Interface board that fits in a double input file slot.

There shall be a four (4) output Interface board that fits in a single input file slot.

Interface Board – Operation

The interface board shall operate at 24VDC and provide the power supply for the sensor over the Ethernet cable.

The Interface board shall have up to four (4) LEDs to indicate the activity of each zone. (Only 2 LEDs are active on the 2 channel board).

Each output shall be optically isolated with a LED status indicator.

There shall be an indication for a fault mode (no Ethernet connection) such that all LEDs and Opto-isolators are on. This action shall place calls on the traffic controller.

There shall be an RS-232 port for diagnostics on each Interface board.

The Interface board shall provide power and short circuit protection for the sensor.

The Interface board shall automatically recover from a power failure and start up within 20 seconds of a cold start.

The Interface board shall be hot swappable and shall be able to be plugged in and out of the input file slot without adversely effecting its operation. (Unplugging of the Interface board shall take power off the Interface board and off the sensor.)

GENERAL NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD PLANS AND STANDARD SPECIFICATIONS DATED MAY 2006 AND THE SPECIAL PROVISIONS.
2. LOCATION OF EXISTING UTILITIES SHOWN ON THE PLAN ARE APPROXIMATE AND MAY NOT BE COMPLETE. CONTRACTOR SHALL VERIFY THE EXISTANCE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES / DISTRICTS AND UNDERGROUND SERVICE ALERT (USA. 800-642-2444) AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
3. THE LOCATION OF ALL PULL BOXES, CONDUITS, AND OTHER EQUIPMENT SHOWN ON THE PLAN ARE APPROXIMATE AND MAY BE CHANGED TO SUIT FIELD CONDITION AS DIRECTED BY ENGINEER.
5. ALL DETECTOR LOOPS SHALL BE INSTALLED AT THE CENTER OF THE TRAVEL LANE UNLESS OTHERWISE NOTED ON THE PLAN. SEE SHEET E-3 FOR TYPICAL DETECTOR LOOP LAYOUT.
6. THE PEU SHALL BE MOUNTED IN THE SERVICE EQUIPMENT ENCLOSURE.
7. THESE PLANS ARE ACCURATE FOR ELECTRICAL WORK ONLY.
8. CONTRACTOR TO INSTALL COMPLETE INTERCONNECTED SYSTEM BETWEEN WINDFIELD, LATROBE & POST ALONG WHITE ROCK ROAD. COUNTY TO SUPPLY SYNCHRO OUTPUT FILES WITH 2 TIME OF DAY PLANS FOR COORDINATING WHITE ROCK ROAD BETWEEN THESE SIGNALS. CONTRACTOR TO USE CONTROLLER MANUFACTURER SIGNAL TIMING TECHNICIAN TO INPUT COORDINATION & TIMING PLANS. TECHNICIAN TO DEBUG SYSTEM AND ASSIST COUNTY IN ADJUSTING PLANS AS NEEDED.
9. CONTRACTOR TO FURNISH AND INSTALL EMERGENCY VEHICLE PREEMPTION EQUIPMENT.
10. CONTRACTOR TO INSTALL NEW 981 NAZTEC CONTROLLER IN WHITE ROCK & LATROBE CABINET. CONTRACTOR TO RELOCATE 980 CONTROLLER FROM LATROBE ROAD TO POST STREET. CONTRACTOR TO SUPPLY AND INSTALL (IF NEEDED) EXTERNAL FSK MODEM.

1 CONTROLLER CABINET DETAIL

SCALE:

REMOVE & SALVAGE EXIST STREET SIGN & FOUNDATION

Ø6PPB
Ø8PPB

(E) 2" c, INSTALL 3-#2

TO SERVICE POINT

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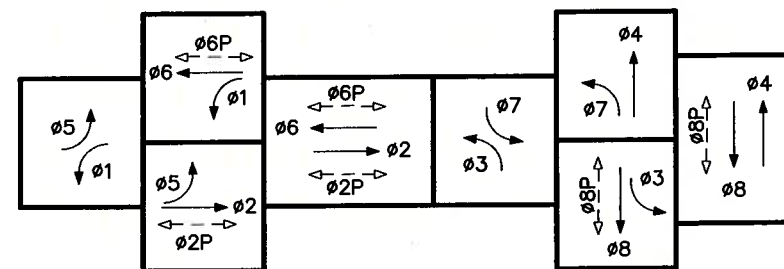
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297

CONDUCTOR SCHEDULE			CONDUIT SIZE AND RUN NUMBER																
AWG SIZE OR CABLE TYPE	PHASE #	POLE OR CIRCUIT	EX 1	EX 2	EX 3	EX 4	EX 5	EX 6	EX 7	EX 8	EX 9	EX 10							
3/12 CONDUCTOR SIGNAL CABLES	Ø2, Ø2P, Ø5	POLE (A)	1	1	1	1	1	1	1										
	Ø2PPB	POLE (B)		1	1	1	1	1	1										
	Ø3, Ø4	POLE (C)			1	1	1	1	1										
	Ø8, Ø8P, Ø3	POLE (D)				1	1	1	1										
	Ø2PPB, Ø8PPB	POLE (E)				1	1	1	1										
	Ø1, Ø2, Ø2P	POLE (F)					1	1	1	1									
	Ø1, Ø4PPB, Ø6, Ø6P	POLE (G)					1	1	1	1									
	Ø7, Ø8, Ø8P, Ø6PPB	POLE (H)						1	1	1	1								
	Ø7, Ø4	POLE (I)							1	1	1								
	Ø6PPB	POLE (J)							1	1									
	Ø5, Ø6, Ø6P	POLE (K)								1	1	1							
	TOTAL CABLES 3/12 CONDUCTORS		1	1	2	1	3	2	4	3	5	4	6	5	7	1	2	1	
#8	LIGHTING		2	2	2	2	2	2	2	2	4	2						4	
#6	CONTROLLER SERVICE										2							2	
TYPE B DLC	Ø1 – L1									1	1	1							
	Ø2 – L7						1	1	1	1									
	Ø2 – L6						1	1	1	1									
	Ø2 – L5						1	1	1	1									
	Ø2 – L4						1	1	1	1									
	Ø2 – L3						1	1	1	1									
	Ø3 – L9								1	1									
	Ø4 – L11			1	1	1	1	1	1	1									
	Ø5 – L17						1	1	1	1									
	Ø6 – L23									1	1	1							
	Ø6 – L22									1	1	1							
	Ø6 – L21									1	1	1							
	Ø6 – L20									1	1	1							
	Ø6 – L19									1	1	1							
	Ø7 – L25			1	1	1	1	1	1	1									
Ø8 – L27									1	1									
	TOTAL DLC			2	2	8	8	10	16	6	6								
EMERGENCY VEHICLE PRE-EMPTION CABLE	EVA		1	1	1	1	1	1	1										
	EVB								1	1									
	EVC						1	1	1										
	EVD				1	1	1	1	1										
	TOTAL EV CABLES PER RUN		1	1	2	2	3	3	3	4	1								
SIC						1	1	1	1										
CONDUIT SIZE			2	3	3	4	1-3	2-4	2-4	2	2	2							
% FILL			20	20	27	26	20	19	24	24	28	9							

POLE AND EQUIPMENT SCHEDULE											
NO.	STANDARD			VEHICLE SIGNAL MOUNTING		PEDESTRIAN SIGNAL MOUNTING	PPB	HPS LUMINAIRE (WATTS)	STATION	OFFSET	NOTE
	TYPE	SIG. MA (FT)	LUM. MA (FT)	MAST ARM	POLE						
(A)	29-5-100	50'	15'	MAS Ø5 MAS Ø2	SV-1-T	SP-1-T		200	38+94.9	50.00 RT	F = 18' NEW FOUNDATION REQUIRED
(B)	PPB POST						Ø2P				USE EXIST FOUNDATION
(C)	15-TS		15'		SV-2-TA			200			USE EXIST FOUNDATION
(D)	29-5-100	40'	15'	MAS Ø7 MAS Ø4	SV-1-T	SP-1-T		200			F = 16'. USE EXIST FOUNDATION
(E)	PPB POST						Ø2P Ø8P				USE EXIST FOUNDATION
(F)	15-TS		15'		SV-2-TA	SP-1-T		200			USE EXIST FOUNDATION
(G)	60-5-100	60'		MAS Ø1 MAS Ø6	SV-1-T	SP-1-T	Ø6P				MAS Ø1 = 12' FROM END OF MAST ARM AND F = 12'. EXIST FOUNDATION
(H)	15-TS		15'		SV-2-TA	SP-1-T		200			USE EXIST FOUNDATION
(I)	19-4-100	30'	15'	MAS Ø3 MAS Ø8	SV-1-T			200			F = 12'. USE EXIST FOUNDATION
(J)	PPB POST						Ø6P		38+74.2	53.87 LT	NEW FOUNDATION REQUIRED
(K)	1-B				TV-2-T	SP-1-T					USE EXIST FOUNDATION
(L)	PPB POST						Ø6P Ø8P		37+89.8	53.53 LT	NEW FOUNDATION REQUIRED

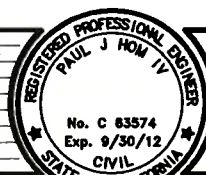
- * OTHER REQUIREMENTS ARE COVERED BY NOTES, LEGEND, SPECIAL PROVISIONS AND STANDARD SPECIFICATIONS. FOR TYPE OF STANDARD AND VEHICLE SIGNAL MOUNTING, SEE STANDARD PLANS.
- * INSTALL PEU ON ELECTRICAL SERVICE CABINET.



PROPOSED PHASE DIAGRAM
EMERGENCY VEHICLE PREEMPTION

EVA = Ø2 + Ø5
EVb = Ø4 + Ø7
EVC = Ø1 + Ø6
EVD = Ø3 + Ø8

CHANGE ORDER #5 TO INSTALL TRAFFIC SIGNAL
AT WHITE ROCK ROAD AND POST STREET
SCALE : N/A



PREPARED UNDER THE SUPERVISION OF:
Paul J. Hom IV
REGISTERED CIVIL ENGINEER
DATE: 7-7-2011

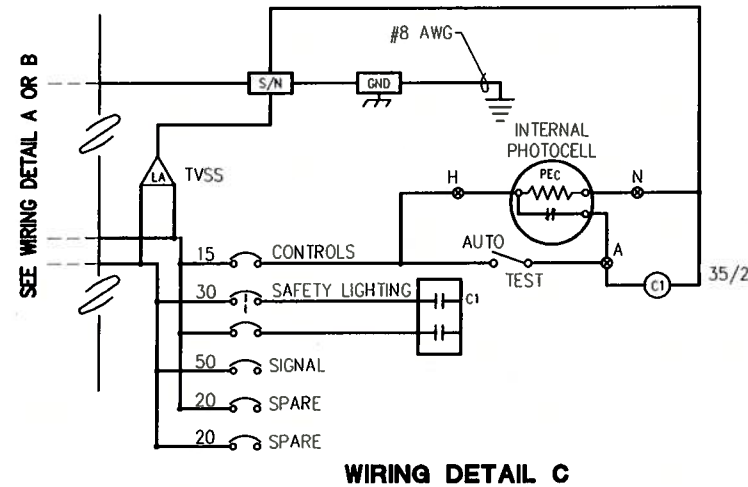
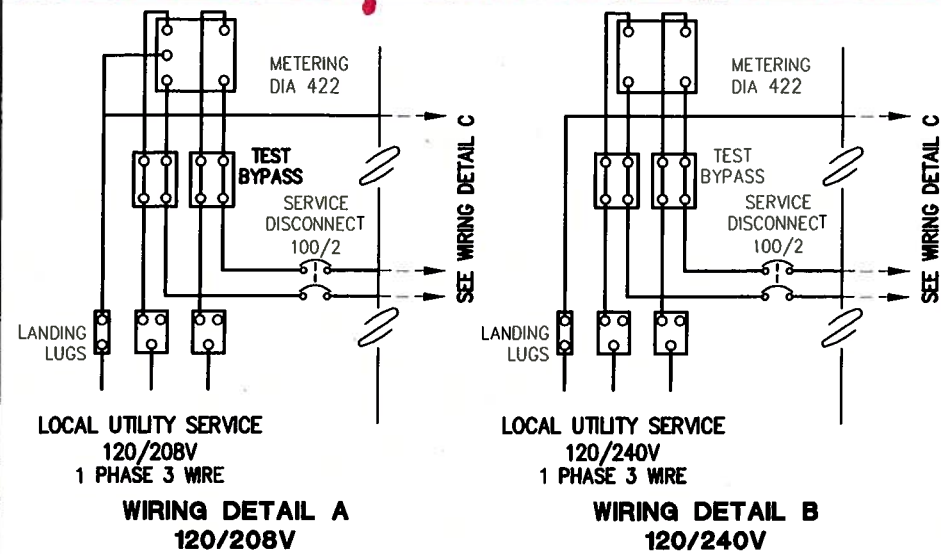
DESIGNED: PH
DRAWN: AN/DRF
CHECKED: DOT
DATE: 7/7/2011
ROAD NUMBER: 34



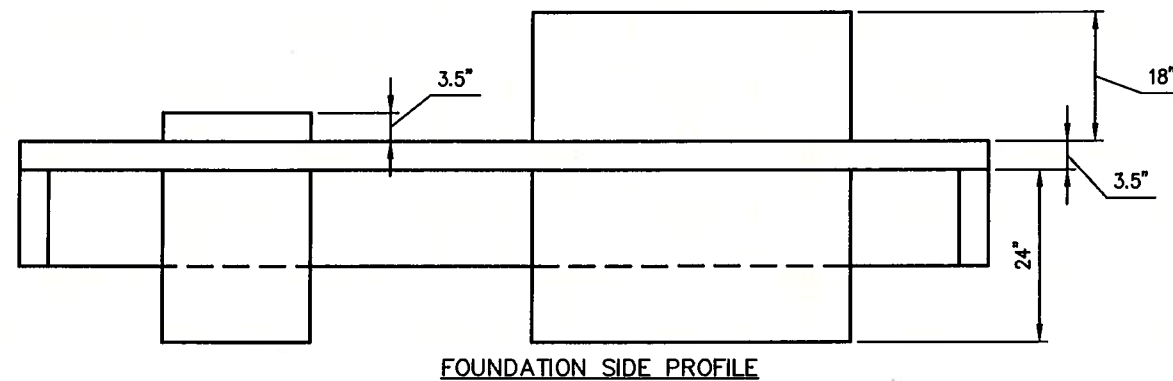
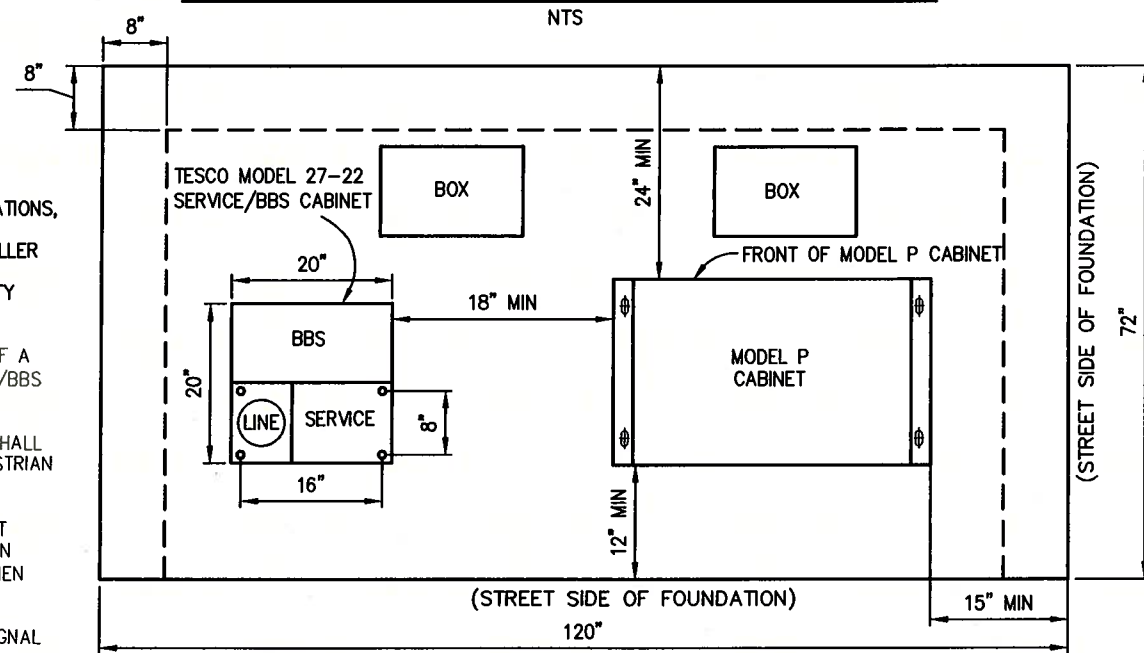
EL DORADO COUNTY
DEPARTMENT OF TRANSPORTATION

WHITE ROCK ROAD WIDENING
AND SIGNALIZATION 11-0774.C.7

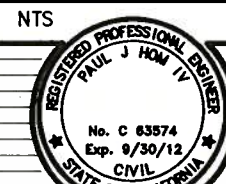
SHEET
CCO-5
2 OF 3
W.D. No. 72372



TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS) SERVICE EQUIPMENT WIRING DIAGRAM

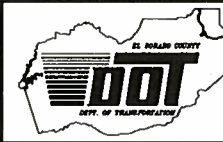


TYPICAL SIGNAL CONTROLLER PAD MODEL P CABINET W/ 18" RISER



PREPARED UNDER THE SUPERVISION OF:
Paul J. Hom
REGISTERED CIVIL ENGINEER
DATE: 7-7-2011

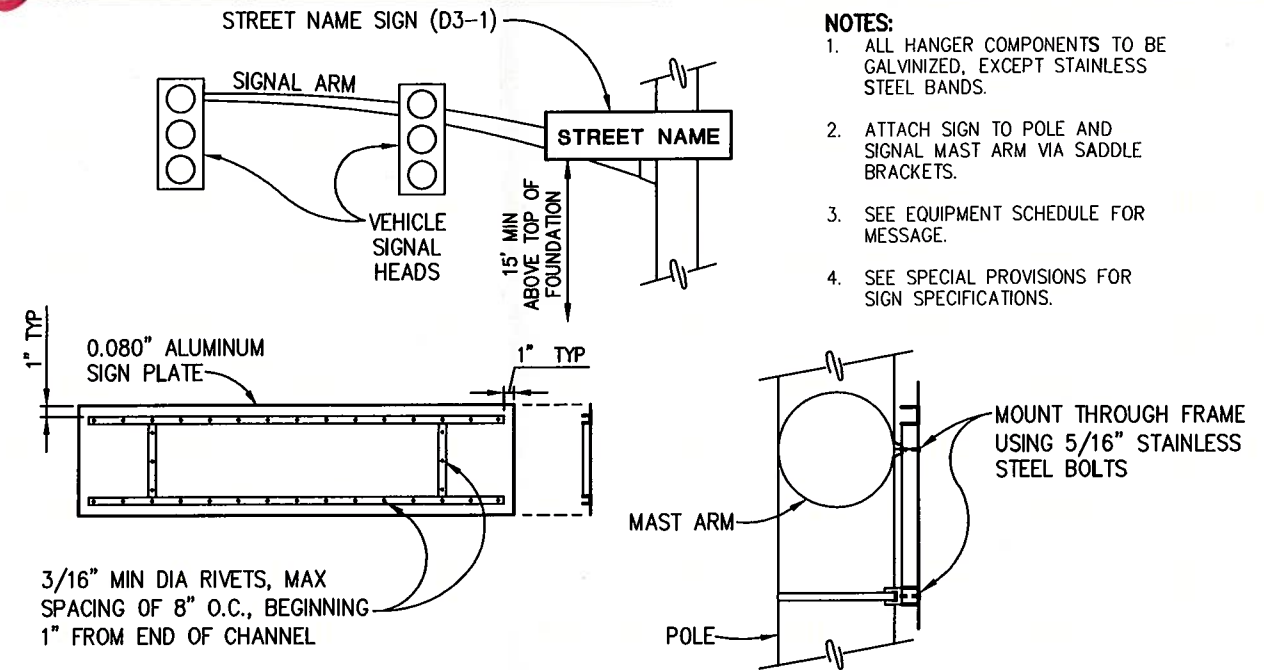
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ROAD NUMBER: 34



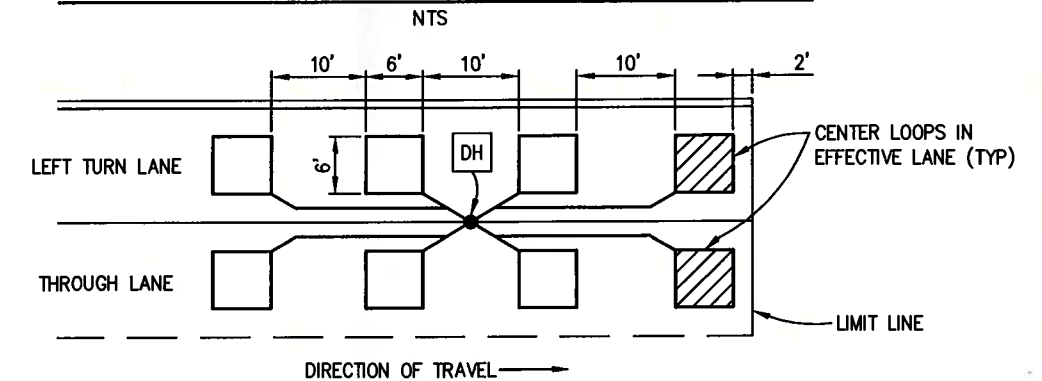
EL DORADO COUNTY
DEPARTMENT OF TRANSPORTATION

**WHITE ROCK ROAD WIDENING
AND SIGNALIZATION** 11-0774.C.8

SHEET
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STREET NAME SIGN MOUNTING DETAIL

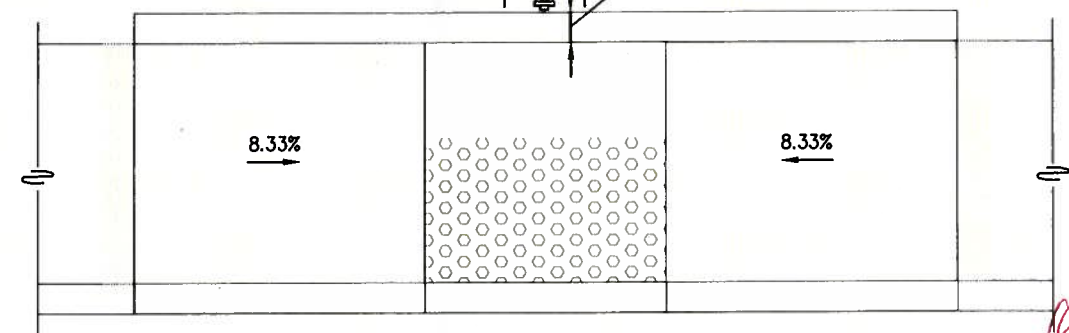


TYPICAL DETECTOR LOOP LAYOUT

NOTS:
TYPE C RAMP SHOWN, OTHER TYPES
SIMILAR

PPB TO BE LOCATED IN MIDDLE
1/3 OF LANDING

10" MAX FACE OF CURB
TO CENTER OF PPB BUTTON



TYPICAL PPB LOCATION DETAIL

CHANGE ORDER #5 TO INSTALL TRAFFIC SIGNAL
AT WHITE ROCK ROAD AND POST STREET
SCALE: N/A

ORIGINAL SCALE IS IN INCHES
Drawing name: C:\Civil 3D Projects\72372 White Rock Road to Keables\CADD Files\Change Order\Change Order 4.dwg Layout Tab: E-3 Jul 07 2011 - 1:01pm An Nguyen