SECTION D - CONSTRUCTION DETAILS

1. BUY AMERICA REQUIREMENTS

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a) and the regulations adopted pursuant thereto. In accordance with said law and regulations, all manufacturing processes for steel and iron materials furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, palletized, and reduced iron ore manufactured outside the Untied States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting, and any other coating that protects or enhances the value of such steel or iron materials shall be considered a manufacturing process subject to the "Buy America" requirements.

A Certificate of Compliance, conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications, shall be furnished for steel and iron materials. The certificates, in addition to certifying that the materials comply with the specifications, shall also specifically certify that all manufacturing processes for the materials occurred in the United States, except for the exceptions allowed herein.

The requirements imposed by said law and regulations do not prevent a minimal use of foreign steel and iron materials if the total combined cost of such materials used does not exceed one-tenth of 1 percent (0.1%) of the total contract cost or $2,500, whichever is greater. The Contractor shall furnish the Engineer acceptable documentation of the quantity and value of any foreign steel and iron prior to incorporating such materials into the work.

2. MATERIALS

Attention is directed to Section 6, “Control of Materials,” of the Standard Specifications and these special provisions.

The Contractor shall furnish all materials required to complete the work under this contract.

A. Weighing and Measuring Devices

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

B. Aggregates

Attention is directed to 26-1.02, “Materials,” and 39-2.02, “Aggregate,” respectively, of the Standard Specifications.

2. MATERIALS (Continued)

If the results of either or both the aggregate grading and Sand Equivalent tests do not meet the requirements specified for "Contract Compliance," the material, which is represented by these tests, shall be removed. However, if requested by the Contractor and approved by the Engineer, said material may remain in place and the Contractor shall pay to the State (County) the following amounts for all such material left in place:

Item	Adjustment
Aggregate Base	**$1.00/Ton**
Asphalt Concrete	**$1.75/Ton**

The Department may deduct such amounts from any moneys due, or that may become due, to the Contractor under the contract.

C. Surface Mining and Reclamation Act

Attention is directed to the Surface Mining and Reclamation Act of 1975, commencing in Public Resources Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations.

Material from the mining operations furnished for this project shall only come from permitted sites in compliance with the Surface Mining Reclamation Act of 1975.

The requirements of this section shall apply to all materials furnished for the project, except for acquisition of materials in conformance with Section 4-1.05, “Use of Materials Found on the Work,” of the Standard Specifications.

D. Prequalified & Tested Signing & Delineation Materials

The California Department of Transportation maintains a list of Pre-qualified and Tested Signing and Delineation materials. The Engineer shall not be precluded from sampling and testing products on the list of Pre-qualified and Tested Signing and Delineation Materials.

The manufacturer of products on the list of Pre-qualified 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 in the list of Pre-qualified 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 in the list of Pre-qualified and Tested Signing and Delineation Materials may be used in the work, provided they conform to the requirements of the Standard Specifications.

Materials and products may be added to the list of Pre-qualified and Tested Signing and Delineation Materials if the manufacture submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Departmental request for samples,

2. MATERIALS (Continued)

sufficient samples shall be submitted to permit performance of required tests. Approval of materials or products will depend upon compliance with the specifications, and tests the Department may elect to perform.

The following is a partial listing of previously approved pre-qualified and tested delineation materials and products:

MATERIALS AND PRODUCTS

Pavement markers, retroreflective
Pavement markers, Temporary Type
Retroreflective sheeting for markers and delineators
Retroreflective sheeting for traffic cone sleeves

PAVEMENT MARKERS, PERMANENT TYPE
Retroreflective With Abrasion Resistant Surface (ARS)
1. Apex, Model 921AR (4" x 4")
2. Ennis Paint, Models C88 (4" x 4"), 911 (4" x 4") and 953 (2.75" x 4.5")
3. Ray-O-Lite, Model "AA" ARS (4" x 4")
4. 3M Series 290 (3.5" x 4")
5. 3M Series 290 PSA, with pressure sensitive adhesive pad (3.5" x 4")

Retroreflective With Abrasion Resistant Surface (ARS)
(for recessed applications only)
1. Ennis Paint, Model 948 (2.3" x 4.7")
2. Ennis Paint, Model 944SB (2" x 4")*
3. Ray-O-Lite, Model 2002 (2" x 4.6")
4. Ray-O-Lite, Model 2004 ARS (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)
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)

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")

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. Filtrona Extrusion, 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. MATERIALS (Continued)

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 5730
7. 3M, "Stamark" Series 420 (For transverse application only)

Temporary (Removable) Striping and Pavement Marking Tape (180 days or less)
1. Advanced Traffic Marking, Series 200
2. Brite-Line, Series 100
3. Garlock Rubber Technologies, Series 2000
4. P.B. Laminations, Aztec, Grade 102
5. Swarco Industries, "Director-2"
6. Trelleborg Industries, R140 Series
7. 3M Series 620 "CR", and Series A750
8. 3M Series A145, Removable Black Line Mask
(Black Tape: for use only on Hot mix asphalt surfaces)
9. Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: for use only on Hot mix asphalt surfaces)
10. Brite-Line "BTR" Black Removable Tape
(Black Tape: for use only on Hot mix asphalt surfaces)
11. Trelleborg Industries, RB-140
(Black Tape: for use only on Hot mix asphalt surfaces)

Preformed Thermoplastic (Heated in place)
1. Flint Trading Inc., "Hot Tape"
2. Flint Trading Inc., "Premark Plus"
3. Ennis Paint Inc., "Flametape"

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

CLASS 1 DELINEATORS
One Piece Driveable Flexible Type, 66-inch
1. Filtrona Extrusion, "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. Filtrona Extrusion, Model FG 560 (with 18-inch U-Channel base)
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

Surface Mount Type, 48-inch

2. MATERIALS (Continued)

1. Bent Manufacturing Company, Masterflex Model MF-180EX-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

CHANNELIZERS
Surface Mount Type, 36-inch
1. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) and MF-180-36 (Flat)
2. Filtrona Extrusion, 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
8. Impact Recovery Model D36, with #101 Fixed (Surface-Mount) Base
9. Safe-Hit, Guide Post, Model SH236SMA
10. Three D Traffic Works "Boomerang" ID No. 522053W

Lane Separation System
1. Filtrona Extrusion, "Flexi-Guide (FG) 300 Curb System"
2. Qwick Kurb, "Klemmfix Guide System"
3. Dura-Curb System

CONICAL DELINEATORS, 42-inch
(For 28-inch Traffic Cones, see Standard Specifications)
1. Bent Manufacturing Company "T-Top"
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

OBJECT MARKERS
Type "K", 18-inch
1. Filtrona Extrusion, Model FG318PE
2. Carsonite, Model SMD 615
3. FlexStake, Model 701 KM
4. Safe-Hit, Model SH718SMA

Type "K-4" / "Q" Object Markers, 24-inch
1. Bent Manufacturing "Masterflex" Model MF-360-24
2. Filtrona Extrusion, 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

CONCRETE BARRIER MARKERS AND
TEMPORARY RAILING (TYPE K) REFLECTORS

Impactable Type

2. MATERIALS (Continued)

1. ARTUK, "FB"
2. Filtrona Extrusion, Models PCBM-12 and PCBM-T12
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 9304

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"

METAL BEAM GUARD RAIL POST MARKERS

(For use to the left of traffic)

1. Filtrona Extrusion, "Mini" (3" x 10")
2. Creative Building Products, "Dura-Bull, Model 11201"
3. Duraflex Corp., "Railrider"
4. Plastic Vacuum Forming, "Cap-It C300"

CONCRETE BARRIER DELINEATORS, 16-inch

(For use to the right of traffic)

1. Filtrona Extrusion, Model PCBM T-16
2. Safe-Hit, Model SH216RBM

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. Filtrona Extrusion, 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

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
3. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
4. Reflexite, PC-1000 Metalized Polycarbonate
5. Reflexite, AC-1000 Acrylic
6. Reflexite, AP-1000 Metalized Polyester
7. Reflexite, Conformalight, AR-1000 Abrasion Resistant Coating
8. 3M, High Intensity

2. MATERIALS (Continued)

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

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

Barricades: Type I, Medium-Intensity (Typically Enclosed Lens, Glass-Bead Element)
1. Nippon Carbide Industries, CN8117
2. Avery Dennison, W 1100 series 3. 3M Series CW 44

Barricades: Type II, Medium-High-Intensity (Typically Enclosed Lens, Glass-Bead Element)
1. Avery Dennison, W-2100 Series

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

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

Signs: Type VI, Elastomeric (Roll-Up) High-Intensity, without Adhesive
1. Avery Dennison, WU-6014
2. Novabrite LLC, "Econobrite"
3. Reflexite "Vinyl"
4. Reflexite "SuperBright"
5. Reflexite "Marathon"
6. 3M Series RS20

Signs: Type VII, Super-High-Intensity (Typically Unmetallized Microprismatic Element)
1. 3M Series 3924S, Fluorescent Orange
2. 3M LDP Series 3970

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

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

2. MATERIALS (Continued)

6. Avery Dennison, W9514, Fluorescent Orange

SPECIALTY SIGNS

1. Reflexite "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 Only

1. Alcan Composites "Dibond Material, 80 mils"
2. Mitsubishi Chemical America, Alpolic 350

Note: For questions regarding this listing contact the:
Division of Signs & Delineation, Traffic Operations, (916) 654-5869
CALNET 8-464-5869 Chemical Testing Branch,
Transportation Laboratory, (916) 227-7289, 8-498-7289

CONTROLLER ASSEMBLIES FOR MODEL 170/2070 TRAFFIC CONTROLLER

Model 170E Controller Unit

Automatic/Eagle Singal	Model: AAZ11516P001
Dynamic Traffic Systems(Dynatrol)	Model: 170Ewith 412
IDC/Topping Electronics, LTD.	Model: 170E
McCain Traffic Supply	Model: M11347
Peek Traffic/Signal Control Company	Model: 170E
Phillips/Sission Industries, Inc. (PSI)	Model: 170E-0000
Safetran Traffic Systems, Incorporated	Model: 289447A170
Topping Electronics, LTD.	Model: 170E

Model 2070L Controller Unit

Econolite Control Products, Inc (OSC F1E6-75F1 using chksum version 1.13)
(Errata 1 dated 10/27/03 & Errata 2 dated 6/8/04)
Eagle Traffic Control Systems (OSC F3D5-323E using chksum version 1.13)
(Errata 1 dated 10/27/03 & Errata 2 dated 6/8/04)
Naztec, Inc (OSC 6244-7CF6 using chksum version 1.13)
(Errata 1 dated 10/27/03 & Errata 2 dated 6/8/04)
Quixote Traffic Corporation (OSC 30E2-BDES using chksum version 1.13)
(Errata 1 dated 10/27/03 & Errata 2 dated 6/8/04)

Model 2070-6A Modem

General Devices, Incorporated (GDI)
Eagle Traffic Control Systems

Model 2070-6B Modem

2. MATERIALS (Continued)

General Devices, Incorporated (GDI)

Model 2070-7A Serial Comm. Card

Eagle Traffic Control Systems
Econolite- Version
McCain Traffic Supply
Naztec, Inc – Versions
Safetran Traffic Systems, Incorporated

Model 200 Switch Packs

General Devices, Incorporated (GDI) Rev. A
Intersection Development Corporation
PDC—SSS-88
Traffic Sensor(TSC)—83A059A(C/N SP4200)

Model 204 Flashers

General Devices, Incorporated (GDI) Rev. A
Intersection Development Corporation
PDC—SSS-88
Traffic Sensor(TSC)(C/N FU 4204)

Model 206 Power Supply Module

Eagle Traffic Control Systems
Intersection Development Corporation
McCain Traffic Supply
Peek Traffic/Signal Control Company
Phillips/Sission Industries, Inc. (PSI)
Safetran Traffic Systems, Incorporated
Traffic Sensor(TSC)

Model 208 Monitor Unit

Intersection Development Corporation
McCain Traffic Supply
Peek Traffic/Signal Control Company
Safetran Traffic Systems, Incorporated

Model 210 Monitor Unit

Eberle Design Incorporated (EDI)
Peek Traffic/Signal Control Company
Phillips/Sission Industries, Inc. (PSI)
Solid State Devices (SP20) (SP-22) (SP32)

Model 222 Two-Channel Loop Detectors

Detector Systems Incorporated
Diablo Engineering (DSP 222)

2. MATERIALS (Continued)

Eberle Design Incorporated (EDI)
Intersection Development Corporation
Northstar Controls, LLC
Peek Traffic/Signal Control Company
Reno A&E (Model G) (rev. 5 w/audible detect buzzer)

Model 224 Four-Channel Loop Detectors

Peek Traffic – Sarasota (GP5)

Model 231 Magnetic Detector Element

M-Systems
Safetran Traffic Systems Inc.
TEECO Safety Incorporated (311-M)

Model 232 Dual Magnetic Detector Sensor Unit

Safetran Traffic Systems Inc.

Model 242 Two-Channel DC Isolators

Detector Systems Incorporated
Eberle Design Incorporated (EDI)
General Devices, Incorporated (GDI) --- DIM242
Intersection Development Corporation
PDC --- DCI-82
Traffic Sensor (TSC)

Model 252 Two-Channel AC Isolators

General Devices, Incorporated (GDI) --- 252CA
Intersection Development Corporation
PDC --- ACI-88
Traffic Sensor (TSC)

Model 332A Cabinets

Eagle Traffic Control Systems
Intersection Development Corporation
McCain Traffic Supply
Peek Traffic/Signal Control Company
Phillips/Sission Industries, Inc. (PSI)
Safetran Traffic Systems, Incorporated
Temple, Inc.
Traffic Sensor (TSC)

Model 334C Cabinets

Intersection Development Corporation
McCain Traffic Supply

2. MATERIALS (Continued)

Peek Traffic/Signal Control Company
Safetran Traffic Systems, Incorporated

Model 340 Cabinets

Eagle Traffic Control Systems
Safetran Traffic Systems, Incorporated

Model 342 Cabinets

Eagle Traffic 354 Cabinets
Safetran Traffic Systems, Incorporated

Model 354 Cabinets

Eagle Traffic 354 Cabinets
Safetran Traffic Systems, Incorporated

Model 400 Modems

General Devices, Incorporated (GDI) rev E
General Devices, Incorporated (GDI) rev F
PDC --- MDM 97
Intersection Development Corporation

Model 412 Program Module

Automatic/Eagle Signal – 412C
Dynamic Traffic Systems (Dynatrol) 412C
McCain Traffic Supply – 412C
Peek Traffic/Signal Control Company – 412C
Phillips/Sission Industries, Inc. (PSI)
Safetran Traffic Systems, Incorporated –412C
Intersection Development Corporation (Topping Electronics, Incorporated) – 412C

PDA2 (Power Distribution Assembly)

Intersection Development Corporation
McCain Traffic Supply – 412C
Peek Traffic/Signal Control Company
Phillips/Sission Industries, Inc. (PSI)
Safetran Traffic Systems, Incorporated
Traffic Sensor (TSC)

PDA3 (Power Distribution Assembly)

McCain Traffic Supply – 412C
Peek Traffic/Signal Control Company
Safetran Traffic Systems, Incorporated

Revised Date October 2006 (Current)

LED TRAFFIC SIGNAL MODULES			
Manufacturer	**12" RED**	**8" RED**	**12" RED ARROW**
Dialight John Castner 11576 Suburnas Way Santa Ana, CA 92705 Tel:714-832-2883 Fax:714-832-3439 Email: jcastner@dialight.com	Model: 433-1210-003 Date Tested: 8/2/99 Model: 433-1210-OC1 Date Tested: 3/26/2004	Model: 433-1110-003 Date Tested: 8/2/99 Model: 433-1110-OC3 Date Tested: 1/5/2004	Model: 432-1314-001 Date Tested: 1/23/2001
Gelcore Chris Mclaughlin 1750 Howe Ave, Ste 220 Sacramento, CA 95825 Tel: 916-921-9673 Fax: 916-914-2440 Email: chris.mclaughlin@gelcore.com	Model: D12RA4-A4C Date Tested: 1/19/2001 Model: DR6-RTFB-20A-22 Date Tested: 7/18/2002	Model: D08RA2-A4C Date Tested: 1/22/2001 Model: DR4-RTFB-20A-22 Date Tested: 10/28/2002	Model: D12RA7-A4C Date Tested: 1/23/2001 Model:DR6-RTAA-21A-22 Date Tested: 7/18/2002 Model: DR6-RTAA-22A-22 Tested: 10/9/2003
Leotek Electronics Carol Durbin 1330 Memorex Dr. Santa Clara, CA 95050 Tel:888-806-1188 Fax:408-980-0538 Email:cdurbin@leotek.com	Model: TSL-12R-MG Date Tested: 1/25/2001 Model: TSL-12R-LX-IL1-A1 Date Tested: 3/28/2005	Model: TSL-08R-QE Date Tested: 1/10/2000 Model: TSL-EV08R-HP2-A1 Date Tested: 8/22/2002 Model: TSL-08R-LX-IL1-A1 Date Tested: 11/08/2004	Model: TSL-12RA-MF Date Tested: 1/23/2001 Model: TSL-12RA-QF Date Tested: 1/26/2000 Model: TSL-12RA-LD-CA01 DateTested:2/10/2005
Actone Peter Lien 12735 Schabarum Ave. Irwindale, CA 91706 Tel: 888-228-6631 Ext 210 Fax: 626-856-3325 Email:hi@acetone1.com	Model: T1-12R-001 Date Tested: 11/20/2000 Model: T1-12R-004 Date Tested: 1/22/2001	Model: T1-8R-4 Date Tested: 6/26/2001 Model: T1-8R-1 Date Tested: 2/5/2001	Model: TA-12R-1 Date Tested: 2/26/2001 Model: TA-12R-5 Date Tested: 3/9/2004

Ledtronics 23105 Kashiwa Court Torrance, CA 90505 Tel: 800-579-4875 Fax: 310-534-1424 Email: n/a	Model: TRF-112A-OER-120A Date Tested: 6/12/2001	Model: TRF-108-OER-120A Date Tested: 10/30/2001	
Electro Tech's Ray Deese 1875 Sampson Ave. Corona, CA 91719 Tel: 909-734-1812 Fax: 909-734-5424 Email:ray@electro-techs.net	Model: RD1210FM Date Tested: 1/29/2001	Model: CT-330-08FM Date Tested: 8/2/1999	Model: AR12FM Date Tested: 1/23/2001
EOI(ExcellenceOpto Inc.) Cheryl Huang 1400 W. Lambert Road, Ste B. Brea, CA 92821 Tel: 562-694-1246 Fax: 562-691-3087 Email: cherylhuang@eoius.com	Model: TRV-R12EG-A Date Tested: 5/23/2002 Model: TRV-R12SG-D2T Date Tested: 9/27/2007	Model: TRV-R08EG-J Date Tested: 4/8/2002	Model: TRA-R12DG-G Date Tested: 5/23/2002 TRA-R12DG-IN Date Tested: 9/13/2007
US Traffic Corp. Michael J. Hutchins 9603 John Street Santa Fe Springsa, CA 90670 Tel: 800-733-7872 Fax: 562-923-9655 Email: n/a	Model: LEDT-12RB-002 Date Tested: 10/10/2002	Model: LEDT-08RB-002 Date Tested: 10/2/2002	Model: LEDT-12RA-002 Date Tested: 1/29/2003
Duralight Peter Tian 860 N. Dorothy Dr. Ste 612 Richardson, TX 75081 Tel: 972-480-0888 Fax: 972-480-8884 Email: ptian@trastarusa.com	Model: JXC300-HFR-01 Date Tested: 2/20/2007 Model: JXC300-CAR Date Tested: 5/18/2004	Model: JXC-200VIR Date Tested: 12/6/2004	Model: JXJ-300VIRB Date Tested: 9/29/2004

SwarcoTraffic Management, Inc. Steve Robertson 270 Ruthford Lane P.O. Box 89 Columbia, TN 38402 Tel: 860-307-4262 Fax: 508-374-2682 Web: www.swarco.com	Model: FL-12R-S1 Date Tested: 10/21/2005	Model: FL-8R-S1 Date Tested: 10/11/2005	
Western Pacific Signal Donald R. Shupp 1793 E. 14th Street San Leandro, CA 94577 Tel: 510-483-6400 Fax: 510-483-1402 Email: n/a	Model: SB-12R-110-T1 Date Tested: 4/4/2006	Model: SB-08R-110-T1 Date Tested: 3/29/2006	Model: SB-12GA-110-T1 Date Tested: 5/11/2006
Duron Technology Robin Yang 9660 Flair Drive, Suite 230 El Monte, CA 91731 Tel: 626-454-5100 Fax: 626-454-2600 Email: n/a	Model: FX300-3-10 Date Tested: 6/11/2007		Model: FX300-3-11 Date Tested: 3/21/2007
Manufacturer	**12" GREEN**	**8" GREEN**	**12" GREEN ARROW**
Dialight John Castner 11576 Suburnas Way Santa Ana, CA 92705 Tel:714-832-2883 Fax:714-832-3439 Email: jcastner@gelcore.com	Model: 432-2270-001 Date Tested: 1/17/2001 Model: 433-2270-001 Date Tested: 2/5/2001 Model: 433-2220-001 Date Tested: 8/15/2001 Model: 433-2220-0C1 & 433-2270-OC1 Date Tested: 1/6/2004	Model: 432-2170-001 & 430-2170-001 Date Tested: 11/20/2000 Model: 433-2170-001 Date Tested: 2/15/2001 Model: 433-2120-001 Date Tested: 10/18/2001 Model: 433-2120-0C1 & 433-2170-OC1 Date Tested:	Model: 432-2374-001 Date Tested: 1/24/2001

		1/5/2004	
Gelcore Chris Mclaughlin 1750 Howe Ave, Ste 220 Sacramento, CA 95825 Tel:916-921-9673 Fax:916-914-2440 Email: chris.mclaughlin@gelcore.com	Model: D12GA4-4C Date Tested: 1/19/2001 Model: DR6-GCFB-20A-22 Date Tested: 7/18/2002	Model: DR4-GCFB-20A-22 Date Tested: 1/22/2001 Model: DR4-GCFB-20A-22 Date Tested: 1/22/2001	Model: D12GA7-4C Date Tested: 1/25/2001 Model: DR6-GCAAN-21A-22 Date Tested: 7/18//2002 Model: DR6-GCAAN-22A-22 Date Tested: 10/9/2003
American Signal Corp. Douglas Houlab 3713 Dividend Drive Garland, TX 75042 Tel: 972-276-9955 Fax: 972-276-9904 Email: info@americansignalcorp.com	Model: ASC-0300-GB1 Date Tested: 11/15/2004	Model: ASC-0200-GB1 Date Tested: 2/15/2006	Model: ASC-0300-GA1 Date Tested: 12/5/2005
Leotek Electronics Carol Durbin 1330 Memorex Dr. Santa Clara, CA 95050 Tel:888-806-1188 Fax:408-980-0538 Email:cdurbin@leotek.com	Model: TSL-12G-MG Date Tested: 1/25/2001 Model: TSL-12G-LX-IL1-A1 Date Tested: 1/24/2005	Model: TSL-08G-QF Date Tested: 11/23/2001 Model: TSL-08G-MF Date Tested: 1/25/2001 Model: TSL-08G-LX-IL1-A1 Date Tested: 11/01/2004	Model: TSL-12GA-MF Date Tested: 1/25/2001 Model: TSL-12GA-LD-A1 Date Tested: 9/8/2004
Ledtronics 23105 Kashiwa Court Torrance, CA 90505 Tel: 800-579-4875 Fax: 310-534-1424	Model: TRF-112-OBG-120A Date Tested: 6/6/2001	Model: TRF-108-OBG-120A Date Tested: 10/30/2001	

Email: n/a			
Electro Tech's Ray Deese 1875 Sampson Ave. Corona, CA 91719 Tel: 909-734-1812 Fax: 909-734-5424 Email:ray@electro-techs.net	Model: BG1210FM Date Tested: 1/29/2001	Model: BG0806FM Date Tested: 1/29/2001	Model: AG12FM Date Tested: 1/25/2001
ActOne Peter Lien 12735 Schabarum Ave. Irwindale, CA 91706 Tel: 888-228-6631 Ext 210 Fax: 626-856-3325 Email:hi@acetone1.com	Model: T1-12G-1 Date Tested: 12/20/2000	Model: T1-08G-1 Date Tested: 12/20/2000 Model: T1-08G-004 Date Tested: 8/8/2001	Model: TA-12G-1 Date Tested: 2/21/2001 Model: TA-12G-5 Date Tested: 3/9/2004
EOI(ExcellenceOpto Inc.) Cheryl Huang 1400 W. Lambert Road, Ste B. Brea, CA 92821 Tel: 562-694-1246 Fax: 562-691-3087 Email: cherylhuang@eoius.com	Model: TRV-G12EG-B1 Date Tested: 5/30/2002 Model: TRV-G12EG-B2 Date Tested: 5/31/2006	Model: TRV-G08EG-N Date Tested: 6/4/2002	Model: TRA-G12DF-G Date Tested: 11/19/2001
Duralight Peter Tian 860 N. Dorothy Dr. Ste 612 Richardson, TX 75081 Tel: 972-480-0888 Fax: 972-480-8884 Email: ptian@trastarusa.com	Model: JXC300-HFG-01 Date Tested: 6/26/2007 Model: JXC300-CAG Date Tested: 1/5/2004	Model: JXC-200VIG Date Tested: 10/21/2004	Model: JXJ-300VIGB Date Tested: 1/5/2004

US Traffic Corp. Michael J. Hutchins 9603 John Street Santa Fe Springsa, CA 90670 Tel: 800-733-7872 Fax: 562-923-9655 Email: n/a	Model: LEDT-12GB-002 Date Tested: 10/3/2002	Model: LEDT-08GB-001 Date Tested: 4/22/2002	Model: LEDT-12GA-001 Date Tested: 4//22/2002
SwarcoTraffic Management, Inc. Steve Robertson 270 Ruthford Lane P.O. Box 89 Columbia, TN 38402 Tel: 860-307-4262 Fax: 508-374-2682 Web: www.swarco.com	Model: FL-12G-S1 Date Tested: 8/8/2005	Model: FL-8G-S1 Date Tested: 11/18/2005	
Western Pacific Signal Donald R. Shupp 1793 E. 14th Street San Leandro, CA 94577 Tel: 510-483-6400 Fax: 510-483-1402 Email: n/a	Model: SB-12G-110-T1 Date Tested: 4/5/2006	Model: SB-08G-110-T1 Date Tested: 3/13/2006	Model: SB-12GA-110-T1 Date Tested: 5/11/2006
Duron Technology Robin Yang 9660 Flair Drive, Suite 230 El Monte, CA 91731 Tel: 626-454-5100 Fax: 626-454-2600 Email: n/a	Model: FX300-3-30 Date Tested: 3/13/2007		Model: FX300-3-31 Date Tested: 3/26/2007
Manufacturer	**12" YELLOW**	**8" YELLOW**	**12"YELLOW ARROW**

Dialight John Castner 11576 Suburnas Way Santa Ana, CA 92705 Tel:714-832-2883 Fax:714-832-3439 Email: jcastner@dialight.com	Model: 431-3230-001 Date Tested: 1/17/2001 Model: 433-3270-001 Date Tested: 2/5/2001 Model: 433-3220-001 Date Tested: 8/15/2001 433-3230-0C1 Date Tested: 1/5/2004	Model: 431-3130-001 Date Tested: 1/17/2001 Model: 433-3170-001 Date Tested: 2/15/2001 Model: 433-3130-001 Date Tested: 10/18/2001 Model: 433-3130-0C1 Date Tested: 1/5/2004	Model: 433-3334-001 Date Tested: 1/18/2001
Gelcore Chris Mclaughlin 1750 Howe Ave, Ste 220 Sacramento, CA 95825 Tel:916-921-9673 Fax:916-914-2440 Email: chris.mclaughlin@gelcore.com	Model: D12YA4-4C Date Tested: 1/18/2001 Model: DR6-YTFB-20A-22 Date Tested: 8/5/2002	Model: D08YA2-4C Date Tested: 1/18/2001 Model: DR4-YTFB-20A-22 Date Tested: 10/28/2002	Model: D12YA7-4C Date Tested: 1/18/2001 Model: DR6-YTAAN-21A-22 Date Tested: 8/5/2002 Model: DR6-YTAAN-22A-22 Date Tested: 10/9/2003
ActOne Peter Lien 12735 Schabarum Ave. Irwindale, CA 91706 Tel: 888-228-6631 Ext 210 Fax: 626-856-3325 Email:hi@acetone1.com	Model: T1-12A-1 Date Tested: 1/18/2001	Model: T1-08A-0004 Date Tested: 7/11/01	Model: TA-12A-1 Date Tested: 2/21/2001 Model: TA-12A-5 Date Tested: 3/9/2004
Leotek Electronics Carol Durbin 1330 Memorex Dr. Santa Clara, CA 95050 Tel:888-806-1188 Fax:408-980-0538 Email:cdurbin@leotek.com	Model: T12Y-H-CA01 Date Tested: 10/4/2001 Model: TSL-12Y-LX-IL1-A1	Model: T08Y-H-CA01 Date Tested: 10/4/2001 Model: TSL-08Y-LX-IL1-A1	Model: TSL-12YA-MF Date Tested: 1/18/2001 Model: TSL-12YA-LD-A1 Date Tested:

	Date Tested: 1/24/2005	Date Tested: 11/01/2004	9/9/2004
Electro Tech's Ray Deese 1875 Sampson Ave. Corona, CA 91719 Tel: 909-734-1812 Fax: 909-734-5424 Email:ray@electro-techs.net	Model: YL12-650FM Date Tested: 2/5/2001	Model: YL0806FM Date Tested: 1/18/2001	Model: AY12FM Date Tested: 1/18/2001
SwarcoTraffic Management, Inc. Steve Robertson 270 Ruthford Lane P.O. Box 89 Columbia, TN 38402 Tel: 860-307-4262 Fax: 508-374-2682 Web: www.swarco.com	Model: FL-12Y-S1 Date Tested: 10/21/2005	Model: FL-8Y-S1 Date Tested: 11/22/2005	
US Traffic Corp. Michael J. Hutchins 9603 John Street Santa Fe Springsa, CA 90670 Tel: 800-733-7872 Fax: 562-923-9655 Email: n/a		Model: LEDT-08YB-002 Date Tested: 9/30/2002	Model: LEDT-12YA-001 Date Tested: 5/23/2002
EOI(ExcellenceOpto Inc.) Cheryl Huang 1400 W. Lambert Road, Ste B. Brea, CA 92821 Tel: 562-694-1246 Fax: 562-691-3087 Email: cherylhuang@eoius.com	Model: TRV-Y12EG-M Date Tested: 5/23/2002 Model: TRV-Y12EG-A1 Date Tested: 5/22/2006 TRV-Y12SG-DT2* Date Tested: 9/13/2007	Model: TRV-Y08EG-P Date Tested: 7/11/2002 Model: TRV-Y08EG-N2 Date Tested: 3/12/2007	Model: TRA-Y12DG-G Date Tested: 5/23/2002 Model: TRA-Y12DG-IN Date Tested: 9/13/2007

Duralight Peter Tian 860 N. Dorothy Dr. Ste 612 Richardson, TX 75081 Tel: 972-480-0888 Fax: 972-480-8884 Email: ptian@trastarusa.com	Model: JXC300-CAY Date Tested: 1/5/2004	Model: JXC-200VIY Date Tested: 10/21/2004	Model: JXJ-300VIYB Date Tested: 1/5/2004
Western Pacific Signal Donald R. Shupp 1793 E. 14th Street San Leandro, CA 94577 Tel: 510-483-6400 Fax: 510-483-1402 Email: n/a	Model: SB-12Y-110-T1 Date Tested: 4/4/2006	Model: SB-08Y-110-T1 Date Tested: 3/13/2006	Model: SB-12YA-110-T1 Date Tested: 5/11/2006
Duron Technology Robin Yang 9660 Flair Drive, Suite 230 El Monte, CA 91731 Tel: 626-454-5100 Fax: 626-454-2600 Email: n/a	Model: FX300-3-20 Date Tested: 3/13/2007		Model: FX300-3-21 Date Tested: 3/21/2007
Manufacturer	**PV Signal Head Red Cluster**	**PV Signal Head Yellow Cluster**	**PV Signal Head Green Cluster**
Electro Tech's Ray Deese 1875 Sampson Ave. Corona, CA 91719 Tel: 909-734-1812 Fax: 909-734-5424 Email:ray@electro-techs.net	Model: PV18X10RD Date Tested: 2/5/2001	Model: PV18X10YL Date Tested: 2/5/2001	Model: PV30X6BG Date Tested: 2/5/2001
Leotek Electronics Carol Durbin 1330 Memorex Dr. Santa Clara, CA 95050 Tel:888-806-1188 Fax:408-980-0538 Email:cdurbin@leotek.com	Model: T05R-A-6100 Date Tested: 8/15/2002	Model: T05Y-A-6100 Date Tested: 8/15/2002	Model: T05G-A-CA01 Date Tested: 8/20/2003
Gelcore Chris Mclaughlin	Model: DR3-RCFB-01A	Model: DR3-YCFB-01A	Model: DR3-GCFB-01A

1750 Howe Ave, Ste 220 Sacramento, CA 95825 Tel:916-921-9673 Fax:916-914-2440 Email: chris.mclaughlin@gelcore.com	Date Tested: 10/24/2002	Date Tested: 10/24/2002	Date Tested: 10/24/2002
Dialight John Castner 11576 Suburnas Way Santa Ana, CA 92705 Tel:714-832-2883 Fax:714-832-3439 Email: jcastner@gelcore.com	Model: P46-3R33-003 Date Tested: 10/20/2004	Model: P46-3Y33-003 Date Tested: 9/27/2004	Model: P46-3G33-003 Date Tested: 9/27/2004
Manufacturer	**Pedestrian Sign Upraised Hand**	**Pedestrian Traffic Signal Head**	**Lane Control Signal Red X/ Green Arrow**
Dialight John Castner 11576 Suburnas Way Santa Ana, CA 92705 Tel:714-832-2883 Fax:714-832-3439 Email: jcastner@gelcore.com	Model: 432-5401-001 Date Tested: 4/25/2000	Model: 430-6473-001 Date Tested: 6/11/2001	
Leotek Electronics Carol Durbin 1330 Memorex Dr. Santa Clara, CA 95050 Tel:888-806-1188 Fax:408-980-0538 Email:cdurbin@leotek.com		Model: TSL-PED-16-DIL Date Tested: 12/13/2005 Model: TSL-PED-DA Date Tested: 12/20/2000	
Gelcore Chris Mclaughlin 1750 Howe Ave, Ste 220 Sacramento, CA 95825 Tel:916-921-9673 Fax:916-914-2440 Email: chris.mclaughlin@gelcore.com	Model: P11PA3-S4T Date Tested: 8/20/1998	Model: PS7-CFC1-26A-22 Date Tested: 7/11/2006 Model: P11PAC-6S Date Tested: 1/30/2001	Model: D12RGA4-4C Date Tested: 1/30/2001

<u>Electro Tech's</u> Ray Deese 1875 Sampson Ave. Corona, CA 91719 Tel: 909-734-1812 Fax: 909-734-5424 Email:ray@electro-techs.net		Model: HMSXS Date Tested: 2/1/2001	Model: REDXBGAR Date Tested: 1/30/2001
<u>US Traffic Corp.</u> Michael J. Hutchins 9603 John Street Santa Fe Springsa, CA 90670 Tel: 800-733-7872 Fax: 562-923-9655 **Email: n/a**		Model: LEDP-HMM-002 Date Tested: 6/6/2001	
ActOne Peter Lien 12735 Schabarum Ave. Irwindale, CA 91706 Tel: 888-228-6631 Ext 210 Fax: 626-856-3325 Email:hi@acetone1.com		Model: TP-16WP-1 Date Tested: 11/19/2001	
<u>Duralight</u> Peter Tian 860 N. Dorothy Dr. Ste 612 Richardson, TX 75081 Tel: 972-480-0888 Fax: 972-480-8884 Email: ptian@trastarusa.com		Model: JXM-400VIA Date Tested: 9/26/2005 Model: JXH-300VIR Date Tested: 4/28/2004	
<u>EOI(ExcellenceOpto Inc.)</u> Cheryl Huang 1400 W. Lambert Road, Ste B. Brea, CA 92821 Tel: 562-694-1246 Fax: 562-691-3087 Email: cherylhuang@eoius.com		Model: TRP-C45DG-W2 Date Tested: 5/29/2007	
Manufacturer	**LED "METER ON"**		

ActOne Peter Lien 12735 Schabarum Ave. Irwindale, CA 91706 Tel: 888-228-6631 Ext 210 Fax: 626-856-3325 Email:hi@acetone1.com	Model: TL-16W-1 Date Tested: 2/1/2005		
Leotek Electronics Carol Durbin 1330 Memorex Dr. Santa Clara, CA 95050 Tel:888-806-1188 Fax:408-980-0538 Email:cdurbin@leotek.com	Model: TP16T-ME Date Tested: 2/28/2005		
Electro Tech's Ray Deese 1875 Sampson Ave. Corona, CA 91719 Tel: 909-734-1812 Fax: 909-734-5424 Email:ray@electro-techs.net	Model: METERON Date Tested: 9/5/2006		

REVISED DATE: 4/04/2008

3. 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 shall request a schedule of signal hardware, from the distributor or his sub-contractor(s), including signal standards, mast arms, and electrical equipment pertinent to completing the traffic signal, and a time line of when the signal hardware shall be delivered from the manufacturer to the site. The schedule of signal hardware deliveries shall be forwarded to the Butte County Resident Project Engineer, by the Contractor, no later than 10 days after the Notice to Proceed has been issued for the Contract. All changes with respect to the signal hardware delivery date(s) shall be forwarded to the Resident Project Engineer within 1 working day of contractor's receipt of notice. Upon receiving the proposed schedule of signal hardware deliveries from the Contractor, various items of work may be suspended, at the Engineer's discretion, to allow the signal hardware delivery timeline to be coordinated.

The following roadway construction and traffic signal items that shall be completed before suspending contract working days shall include: all curbs, ramps, culverts and culvert extensions, pavement widening, grading, traffic signal conduit, all relocation work, pole foundations, and pull boxes. All pertinent existing striping shall remain intact just prior to overlay.

4. COOPERATION

Attention is directed to Sections 7-1.14, "Cooperation," and 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications and these special provisions.

Work by public utility forces and/or Butte County crews may be underway within and/or adjacent to the limits of this contract at the time work under these special provisions is being performed. The Contractor, for the work herein specified, shall cooperate with all forces engaged in performing other work as above described. Such forces may conduct their operations with as little inconvenience and delay as possible. The Contractor shall permit such forces passage through the work to transport materials and equipment to the site of their operations.

In lieu of the conflicting provisions in Section 8-1.10, full compensation for conforming to the above requirements or for any delay or inconvenience to the Contractor's operations by reason of his conformance with such requirements, 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. OBSTRUCTIONS

Attention is directed to Sections 8-1.10, "Utility and Non-Highway Facilities," and 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions. The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include but are not limited to the following:

NOTIFICATION CENTER	TELEPHONE
Underground Service Alert Northern California	**1-800-227-2600**
(USA)	**1-800-642-2444**

The contract work shall be so conducted as to permit utility companies to maintain their services without interruption. Abandoned utility pipelines, telephone cables, and conduits, if encountered, shall be removed and disposed of off the job site. Attention is directed to the existence of storm drain and utility facilities, which are to remain and which are located within the area of work. The Contractor shall locate these facilities, work around them and protect them from damage during the course of his construction. Should the Contractor damage any of the existing facilities, they will be repaired and/or replaced immediately, any costs for repair and/or replacement shall be borne by the Contractor.

In lieu of conflicting provisions of Section 8-1.10, full compensation for conforming to the above requirements or for delay or inconvenience to the Contractor's operations by reason of his conformance with such requirements, shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefor.

6. MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 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 his responsibility as provided in said Section 7-1.09.

The Contractor will be allowed to intermittently close sections of the roadway to through traffic only for various safety issues and construction operations. The Contractor shall submit to the Engineer for approval a Traffic Control Plan that includes the proposed times and lengths of road closures. The Traffic Control Plan shall be submitted to the Engineer at the pre-job conference. The Traffic Control Plan shall be considered as included in the contract lump sum price paid for the item "Traffic Control" and no additional compensation will be allowed therefor.

Illuminated traffic cones when used during the hours of darkness shall be affixed or covered with reflective cone sleeves as specified in Section 12-3.10, "Traffic Cones," of the Standard Specifications.

In addition to the existing warning and directional signs, the Contractor shall furnish the posts, mounting hardware and erect, within or adjacent to the limits of work, such construction supplemental warning and directional signs as ordered by the Engineer. These signs will be furnished by the County of Butte and stored in the maintenance warehouse in Oroville. The Contractor shall haul them from storage to the site of the work, frame and erect them. After erection, the Contractor shall maintain these and the existing signs and keep them in good repair until he has returned them to the storage location in Oroville at the completion of the Contract.

Except as provided above for County-furnished signs, the Contractor, at his/her own expense, shall furnish and maintain all lights, signs, barricades, Type III barricades or other devices necessary for the protection of public traffic. The contractor shall place (2) CMS Boards on The Skyway, one for each direction, Paradise bound and Chico bound, to inform traffic of construction activities as specified by the Engineer. In lieu of payment as extra work as specified in Section 7-1.08, "Public Convenience," the cost of installing and removing signs and sign covers, the cost of accommodating public traffic prior to commencing and during construction operations, the cost of furnishing pilot cars, drivers and flagmen, the cost of furnishing, installing and maintaining signs, lights, flares, barricades, Type III barricades and other facilities for the safety, sole convenience and direction of public traffic through and around the work area, the cost of loading, hauling, unloading, erecting, maintaining and returning County-furnished signs, all as determined by the Engineer shall be considered as included in the contract lump sum price paid for the item "Traffic control," and no additional compensation will be allowed therefor.

In lieu of Section 12-2.02, "Flagging Costs," the cost of furnishing all flagmen and guards to provide for passage of public traffic through the work under the provisions in Section 7-1.08, "Public Convenience," and Section 7-1.09, 'Public Safety," shall be considered as included in the contract lump sum price paid for the item "Traffic Control," and no additional compensation will be allowed therefor.

Construction operations shall be performed in such a manner that there will be at least one 11-foot-wide lane open to public traffic at times of allowable traffic flow. At the end of the day's work and when construction operations are suspended, a passageway shall be maintained through

the work of sufficient width to provide for a minimum of two 11-foot-wide traffic lanes for public traffic.

Full compensation for conforming to the requirements of the article shall be considered as included in the contract lump sum price paid for the item "Traffic Control," and no additional compensation will be allowed therefor.

A. Traffic Control System for Lane Closure

A traffic control system shall consist of closing traffic lanes in accordance with the provisions of Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and the provisions under "Maintaining Traffic," elsewhere in these special provisions. If any component in the traffic control system is displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the component to its original condition or replace the component and shall restore the component to its original location.

STATIONARY TYPE LANE CLOSURE

When lane closures are made for work periods only, at the end of each work period, all components of the traffic control system shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations, approved by the Engineer, within the limits of the highway right-of-way.

Utilizing a pilot car will be at the option of the Contractor. If the Contractor elects to use a pilot car, cones along the centerline 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.

MOVING TYPE LANE CLOSURE

Flashing arrow signs used in moving lane closures shall be truck-mounted. Flashing arrow signs shall be in the caution display mode when used on two-lane highways. Changeable message signs used in moving lane closure operations shall conform to Section 12-3.12, "Portable Changeable Message Signs," of the Standard Specifications, except the signs shall be truck-mounted and the full operation height of the bottom of the sign may be less than 7 feet above the ground, but should be as high as practicable.

Truck-mounted crash cushions (TMCC) for use in moving lane closures shall be any of the following approved models, or equal:

(1) Hexfoam TMA Series 3000 and
Alpha 1000 TMA Series 1000 and
Alpha 2001 TMA Series 2001

Manufacturer	**Distributor (Northern)**
Energy Absorption Systems, Inc.	Traffic Control Service, Inc.

One East Wacker Drive
Chicago, IL 60601-2076
Phone (312) 467-6750
Phone (800) 884-8274

8585 Thys Court
Sacramento, CA 95828

FAX (916) 387-9734

Distributor (Southern)

Traffic Control Service, Inc
1881 Betmor Lane
Anaheim, CA 92805
Phone (800) 222-8274

(2) Cal T-001 Model 2 or Model 3:

Manufacturer

Hexcel Corporation
11711 Dublin Boulevard
P.O. Box 2312
Dublin, CA 94568
Phone: (510) 828-4200

Distributor

Hexcel Corporation
11711 Dublin Boulevard
P.O. Box 2312
Dublin, CA 94568
Phone: (510) 828-4200

(3) Renco Rengard Model Nos. CAM 8-815 and RAM 8-815

Manufacturer

Renco, Inc.
1582 Pflugerville Loop Road
P.O. Box 730
Pflugerville, TX 78660-0703
Phone (800) 654-8182

Distributor

Renco, Inc.
1582 Pflugerville Loop Road
P.O. Box 730
Pflugerville, TX 78660-0703
Phone (800) 654-8182

Each TMCC shall be individually identified with the manufacturer's name, address, TMCC model number, and a specific serial number. The names and numbers shall each be a minimum ½ inch high, and located on the left (street) side at the lower front corner. The TMCC shall have a message next to the name and model number in ½ inch high letters that states, "The bottom of this TMCC shall be ____ inches ± ___ inches above the ground at all points for proper impact performance." Any TMCC, which is damaged or appears to be in poor condition, shall not be used unless recertified by the manufacturer. The Engineer shall be the sole judge as to whether used TMCCs supplied under this contract need recertification. The manufacturer shall determine that each unit meets the requirements for TMCCs in accordance with the standards established by the Transportation Laboratory Structures Research Section.

Approvals for new TMCC designs proposed as equal to the above-approved models shall be in accordance with the procedures, (including crash testing), established by the Transportation Laboratory Structures Research Section. For information regarding submittal of new designs for evaluation contact:

Transportation Laboratory
Structures Research Section
P. O. Box 19128
5900 Folsom Boulevard
Sacramento, CA 95819

New TMCCs proposed as equal to approved TMCCs or approved TMCCs determined by the Engineer that need recertification shall not be used until approved or recertified by the Transportation Laboratory Structures Research Section.

B. Temporary Laneline and Centerline Delineation

Whenever the existing roadway is obliterated, the minimum laneline and centerline delineation to be provided shall consist entirely of temporary reflective raised pavement markers placed at longitudinal intervals of not more than 24 feet. The temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Engineer.

Temporary reflective raised pavement markers shall be placed in accordance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers.

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

Full compensation for furnishing, placing, and maintaining the temporary reflective raised pavement markers used for temporary laneline and/or centerline delineation shall be considered as included in the contract prices paid for the item "Traffic Control," and no additional compensation will be made therefor.

Full compensation for furnishing, placing and maintaining warning lights will be considered as included in the contract lump sum price paid for, "Traffic Control," and no additional allowance will be made therefor.

7. 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. Existing roadside traffic signs that are in conflict with construction operations shall be removed and placed at the right-of-way line adjacent to the location where removed or at a location determined by the Engineer. Full payment for the removal of the traffic signs shall be included in the contract lump sum price paid for the item "Clearing and Grubbing," and no additional payment will be made therefor.

The Contractor shall remove the existing stop signs at the intersection of Honey Run Road, and Longest Drive, and shall replace them with portable stop signs.

7. EXISTING HIGHWAY FACILITIES(Continued)

Full payment for the removal of the stop signs and the furnishing of portable stop signs shall be included in the contract lump sum price paid for the item “Traffic Control,” and no additional payment will be made therefor.

A. Pavement Grinding

Pavement grinding shall be done at the locations as shown on the plans and as determined by the Engineer. Pavement grinding shall be in accordance with Section 42-2, “Grinding” of the Standard Specifications and these special provisions.

Unless otherwise determined by the Engineer, the pavement grinding residue shall be disposed of off of the roadway right-of-way. However, upon approval by the Engineer, the residue can be used in roadway embankment construction and/or for shoulder backing material.

Pavement grinding residue used as shoulder backing material shall not be larger than 1½ inches in any dimension.

The contract lump sum price paid for the item “Pavement Grinding”, as specified herein, shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in grinding the existing pavement as well as removing and relocating the residue.

8. WATER POLLUTION CONTROL PLAN(WPCP)

10-1.02 WATER POLLUTION CONTROL

Water pollution control work shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

Water pollution control work shall conform to the requirements in the "Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual" and the "Construction Site Best Management Practices (BMPs) Manual," and addenda thereto issued up to, and including, the date of advertisement of the project. These manuals are hereinafter referred to respectively as the "Preparation Manual" and the "Construction Site BMPs Manual," and collectively, as the "Manuals." Copies of the Manuals may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520, and may also be obtained from the Department's Internet website at:

http://www.dot.ca.gov/hq/construc/stormwater.html.

The Contractor shall know and fully comply with applicable provisions of the Manuals, and Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from both the project site and areas of disturbance outside the project limits during construction. Attention is directed to Sections 7-1.01, "Laws to be Observed," and 7-1.12, "Indemnification and Insurance," of the Standard Specifications.

Water pollution control requirements shall apply to storm water and non-storm water discharges from areas outside the project site which are directly related to construction activities

for this contract including, but not limited to, asphalt batch plants, material borrow areas, concrete plants, staging areas, storage yards and access roads. The Contractor shall comply with the Manuals for those areas and shall implement, inspect and maintain the required water pollution control practices. Installing, inspecting and maintaining water pollution control practices on areas outside the highway right of way not specifically arranged and provided for by the Department for the execution of this contract, will not be paid for.

The Contractor shall be responsible for penalties assessed or levied on the Contractor or the Department as a result of the Contractor's failure to comply with the provisions in this section "Water Pollution Control" including, but not limited to, compliance with the applicable provisions of the Manuals, and Federal, State and local regulations and requirements as set forth therein.

Penalties as used in this section shall include fines, penalties and damages, whether proposed, assessed, or levied against the Department or the Contractor, including those levied under the Federal Clean Water Act and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred in settlement for alleged violations of the Manuals, or applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, in mitigation or to remediate or correct violations.

RETENTION OF FUNDS

Notwithstanding any other remedies authorized by law, the Department may retain money due the Contractor under the contract, in an amount determined by the Department, up to and including the entire amount of Penalties proposed, assessed, or levied as a result of the Contractor's violation of the Manuals, or Federal or State law, regulations or requirements. Funds may be retained by the Department until final disposition has been made as to the Penalties. The Contractor shall remain liable for the full amount of Penalties until such time as they are finally resolved with the entity seeking the Penalties.

Retention of funds for failure to conform to the provisions in this section, "Water Pollution Control," shall be in addition to the other retention amounts required by the contract. The amounts retained for the Contractor's failure to conform to provisions in this section will be released for payment on the next monthly estimate for partial payment following the date when an approved WPCP has been implemented and maintained, and when water pollution has been adequately controlled, as determined by the Engineer.

When a regulatory agency identifies a failure to comply with the Manuals, or other Federal, State or local requirements, the Department may retain money due the Contractor, subject to the following:

A. The Department will give the Contractor 30 day’s notice of the Department's intention to retain funds from partial payments which may become due to the Contractor prior to acceptance of the contract. Retention of funds from payments made after acceptance of the contract may be made without prior notice to the Contractor.

B. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.

C. If the Department has retained funds, and it is subsequently determined that the State is not subject to the entire amount of the Costs and Liabilities assessed or proposed in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained for the period of the retention. The interest rate payable shall be 6 percent per annum.

During the first estimate period that the Contractor fails to conform to the provisions in this section, "Water Pollution Control," the Department may retain an amount equal to 25 percent of the estimated value of the contract work performed. The Contractor shall notify the Engineer immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and the Department shall provide copies of correspondence, notices of violations, enforcement actions or proposed fines by regulatory agencies to the requesting regulatory agency.

WATER POLLUTION CONTROL PROGRAM PREPARATION, APPROVAL AND AMENDMENTS

As part of the water pollution control work, a Water Pollution Control Program (WPCP) is required for this contract. The WPCP shall conform to the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Manuals, and these special provisions. Upon the Engineer's approval of the WPCP, the WPCP shall be considered to fulfill the provisions in Section 7-1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution shall be performed until the WPCP has been approved by the Engineer. Approval shall not constitute a finding that the WPCP complies with applicable requirements of the Manuals and applicable Federal, State and local laws, regulations, and requirements.

The Contractor shall designate a Water Pollution Control Manager. The Water Pollution Control Manager shall be responsible for the preparation of the WPCP and required modifications or amendments, and shall be responsible for the implementation and adequate functioning of the various water pollution control practices employed. The Contractor may designate different Water Pollution Control Managers to prepare the WPCP and to implement the water pollution control practices. The Water Pollution Control Managers shall serve as the primary contact for issues related to the WPCP or its implementation. The Contractor shall assure that the Water Pollution Managers have adequate training and qualifications necessary to prepare the WPCP, implement and maintain water pollution control practices.

Within 10 working days after the approval of the contract, the Contractor shall submit 3 copies of the draft WPCP to the Engineer. The Engineer will have 10 working days to review the WPCP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the WPCP within 10 working days of receipt of the Engineer's comments. The

Engineer will have 5 working days to review the revisions. Upon the Engineer's approval of the WPCP, 4 approved copies of the WPCP, incorporating the required changes, shall be submitted to the Engineer. In order to allow construction activities to proceed, the Engineer may conditionally approve the WPCP while minor revisions are being completed. In the event the Engineer fails to complete the review within the time allowed, and if, in the opinion of the Engineer, completion of the work is delayed or interfered with by reason of the Engineer's delay in completing the review, the Contractor 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," of the Standard Specifications.

The WPCP shall incorporate water pollution control practices in the following categories:

A. Soil stabilization.
B. Sediment control.
C. Wind erosion control.
D. Tracking control.
E. Non-storm water management.
F. Waste management and materials pollution control.

The Contractor shall develop a Water Pollution Control Schedule that describes the timing of grading or other work activities that could affect water pollution. The Water Pollution Control Schedule shall be updated by the Contractor to reflect changes in the Contractor's operations that would affect the necessary implementation of water pollution control practices.

The Contractor shall complete the BMP checklists for each of the six categories presented in Section 3 of the Preparation Manual and shall incorporate the completed checklists and water pollution control practices into Sections 30.1, 30.2, and 30.3 of the WPCP. Water pollution control practices include the "Minimum Requirements" and other Contractor-selected water pollution control practices from the BMP checklists and "Project-Specific Minimum Requirements" identified in the Water Pollution Control Cost Break-Down of this section.

The WPCP shall include, but not be limited to, the items described in the Manuals and related information contained in the contract documents.

The Contractor shall prepare an amendment to the WPCP when there is a change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, municipal storm drain systems, or when the Contractor's activities or operations violate Federal, State or local regulations, or when directed by the Engineer.

Amendments shall identify additional water pollution control practices or revised operations, including those areas or operations not identified in the initially approved WPCP. Amendments to the WPCP shall be prepared and submitted for review and approval within a time approved by the Engineer, but in no case longer than the time specified for the initial submittal and review of the WPCP.

The Contractor shall keep one copy of the approved WPCP and approved amendments at the project site. The WPCP shall be made available upon request by a representative of the Regional Water Quality Control Board, State Water Resources Control Board, United States

Environmental Protection Agency, or the local storm water management agency. Requests by the public shall be directed to the Engineer.

COST BREAK-DOWN

The Contractor shall include a Water Pollution Control Cost Break-Down in the WPCP which itemizes the contract lump sum for water pollution control work. The Contractor shall use the Water Pollution Control Cost Break-Down provided in this section as the basis for the cost break-down submitted with the WPCP. The Contractor shall use the Water Pollution Control Cost Break-Down to identify items, quantities and values for water pollution control work, excluding Temporary Water Pollution Control Practices for which there is a separate bid item. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-down submitted with the WPCP. Partial payment for the item of water pollution control will not be made until the Water Pollution Control Cost Break-Down is approved by the Engineer. Line items indicated in the Water Pollution Control Cost Break-Down in this section with a specified Estimated Quantity shall be considered a "Project-Specific Minimum Requirement."

The Contractor shall incorporate the items with Contractor designated quantities and values into the Water Pollution Control Cost Break-Down submitted with the WPCP Line items indicated in the Water Pollution Control Cost Break-Down in this section without a specified Estimated Quantity shall be considered by the Contractor for selection to meet the applicable "Minimum Requirements" as defined in the Manuals, or for other water pollution control work as identified in the BMP checklists presented in Section 3 of the Preparation Manual. In the Water Pollution Control Cost Break-Down submitted with the WPCP, the Contractor shall list only those water pollution control practices selected for the project, including quantities and values required to complete the work for those items. The sum of the amounts for the items of work listed in the Water Pollution Control Cost Break-Down shall be equal to the contract lump sum price bid for water pollution control.

8. WATER POLLUTION CONTROL PLAN(WPCP) (Continued)

WATER POLLUTION CONTROL COST BREAK-DOWN

ITEM	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	EXTENDED AMOUNT
SS-6	Straw Mulch	Acre			
SC-5	Fiber Rolls	LF			
SC-6	Gravel Bag Berm	EA			
SC-7	Street Sweeping and Vacuuming	LS			
SC-10	Storm Drain Inlet Protection	LS			
NS-8	Vehicle and Equipment Cleaning	LS			
NS-9	Vehicle and Equipment Fueling	LS			
NS-10	Vehicle and Equipment Maintenance	LS			
WM-1	Material Delivery and Storage	LS			
WM-3	Stockpile Management	LS			
WM-4	Spill Prevention and Control	LS			

TOTAL _____

Adjustments in the items of work and quantities listed in the approved cost break-down shall be made when required to address amendments to the WPCP, except when the adjusted items are paid for as extra work.

No adjustment in compensation will be made to the contract lump sum price paid for water pollution control due to differences between the quantities shown in the approved cost break-down and the quantities required to complete the work as shown on the approved WPCP. No adjustment in compensation will be made for ordered changes to correct WPCP work resulting from the Contractor's own operations or from the Contractor's negligence.

The approved cost break-down will be used to determine partial payments during the progress of the work and as the basis for calculating the adjustment in compensation for the item of water pollution control due to increases or decreases of quantities ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost breakdown item, the adjustment in compensation will be determined in the same manner specified for increases and decreases in the quantity of a contract item of work in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications. If an ordered change requires a new item which is not on the approved cost break-down, the adjustment in compensation will be determined in the same manner specified for extra work in conformance with Section 4-1.03D, "Extra Work," of the Standard Specifications.

If requested by the Contractor and approved by the Engineer, changes to the water pollution control practices listed in the approved cost break-down, including addition of new

water pollution control practices, will be allowed. Changes shall be included in the approved amendment of the WPCP. If the requested changes result in a net cost increase to the lump sum price for water pollution control, an adjustment in compensation will be made without change to the water pollution control item. The net cost increase to the water pollution control item will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

WPCP IMPLEMENTATION

Unless otherwise specified, upon approval of the WPCP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, removing, and disposing of the water pollution control practices specified in the WPCP and in the amendments. Unless otherwise directed by the Engineer, 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. Requirements for installation, construction, inspection, maintenance, removal, and disposal of water pollution control practices shall conform to the requirements in the Manuals and these special provisions.

If the Contractor or the Engineer identifies a deficiency in the implementation of the approved WPCP or amendments, the deficiency shall be corrected immediately. The deficiency may be corrected at a later date and time if requested by the Contractor and approved by the Engineer in writing, but shall be corrected prior to the onset of precipitation. If the Contractor fails to correct the identified deficiency by the date agreed or prior to the onset of precipitation, the project shall be in nonconformance with this section. Attention is directed to Section 5-1.01, "Authority of Engineer," of the Standard Specifications, and to "Retention of Funds" of this section for possible nonconformance penalties.

If the Contractor fails to conform to the provisions of this section, "Water Pollution Control," the Engineer may order the suspension of construction operations until the project complies with the requirements of this section. Implementation of water pollution control practices may vary by season. The Construction Site BMPs Manual and these special provisions shall be followed for control practice selection of year-round, rainy season and non-rainy season water pollution control practices.

Year-Round Implementation Requirements

The Contractor shall have a year-round program for implementing, inspecting and maintaining water pollution control practices for wind erosion control, tracking control, non-storm water management, and waste management and materials pollution control.

The National Weather Service weather forecast shall be monitored and used by the Contractor on a daily basis. An alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation.

Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur or will occur during the ensuing 21 days. Nonactive areas shall

be protected as prescribed in the Construction Site BMPs Manual within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

Rainy Season Implementation Requirements

Soil stabilization and sediment control practices conforming to the requirements of these special provisions shall be provided throughout the rainy season, defined as between October 15th and April 15th. An implementation schedule of required soil stabilization and sediment control practices for disturbed soil areas shall be completed no later than 20 days prior to the beginning of each rainy season. The implementation schedule shall identify the soil stabilization and sediment control practices and the dates when the implementation will be 25 percent, 50 percent and 100 percent complete, respectively. For construction activities beginning during the rainy season, the Contractor shall implement applicable soil stabilization and sediment control practices.

Non-Rainy Season Implementation Requirements

The non-rainy season shall be defined as days outside the defined rainy season. The Contractor's attention is directed to the Construction Site BMPs Manual for soil stabilization and sediment control implementation requirements on disturbed soil areas during the non-rainy season. Disturbed soil areas within the project shall be protected in conformance with the requirements in the Construction Site BMPs Manual with an effective combination of soil stabilization and sediment control.

MAINTENANCE

To ensure the proper implementation and functioning of water pollution control practices, the Contractor shall regularly inspect and maintain the construction site for the water pollution control practices identified in the WPCP. The construction site shall be inspected by the Contractor as follows:

A. Prior to a forecast storm.
B. After a precipitation event which causes site runoff.
C. At 24 hour intervals during extended precipitation events.
D. Routinely, a minimum of once every two weeks outside of the defined rainy season.
E. Routinely, a minimum of once every week during the defined rainy season.

The Contractor shall use the Storm Water Quality Construction Site Inspection Checklist provided in the Preparation Manual or an alternative inspection checklist provided by the Engineer. One copy of each site inspection record shall be submitted to the Engineer within 24 hours of completing the inspection.

REPORTING REQUIREMENTS

Report of Discharges, Notices or Orders

If the Contractor identifies discharges into surface waters or drainage systems in a manner causing, or potentially causing, a condition of pollution, or if the project receives a written notice or order from a regulatory agency, the Contractor shall immediately inform the Engineer. The Contractor shall submit a written report to the Engineer within 7 days of the discharge event, notice or order. The report shall include the following information:

A. The date, time, location, nature of the operation, and type of discharge, including the cause or nature of the notice or order.
B. The water pollution control practices deployed before the discharge event, or prior to receiving the notice or order.
C. The date of deployment and type of water pollution control practices deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent reoccurrence.
D. An implementation and maintenance schedule for affected water pollution control practices.

Report of First-Time Non-Storm Water Discharge

The Contractor shall notify the Engineer at least 3 days in advance of first-time non-storm water discharge events. The Contractor shall notify the Engineer of the operations causing non-storm water discharges and shall obtain field approval for first-time non-storm water discharges. Non-storm water discharges shall be monitored at first-time occurrences and routinely thereafter.

PAYMENT

The contract lump sum price paid for prepare water pollution control program shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising, and amending the WPCP, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. Attention is directed to Section 9-1.06, "Partial Payments," and Section 9-1.07, "Payment After Acceptance," of the Standard Specifications. Payments for Prepare Water Pollution Control Program will be made as follows:

A. After the WPCP has been approved by the Engineer, 75 percent of the contract item price for Prepare Water Pollution Control Program will be included in the monthly partial payment estimate.
B. After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, payment for the remaining 25 percent of the contract item price for Prepare Water Pollution Control Program will be made in conformance with the provisions in Section 9-1.07.

The contract lump sum price paid for water pollution control shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing, constructing, maintaining, removing, and disposing of water pollution control practices, including non-storm water management, and waste management and materials pollution water pollution control practices, except those for which there is a contract item of work as specified in the Standard Specifications and these special provisions, and as directed by

8. WATER POLLUTION CONTROL PLAN(WPCP) (Continued)

the Engineer. Water pollution control practices for which there is a contract item of work will be measured and paid for as that contract item of work

9. CLEARING AND GRUBBING

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions. Clearing limits shall be as determined by the Engineer.

Clearing and grubbing shall also include but not be limited to; cleaning and re-grading the roadside ditches and shoulders after reconstruction, removing existing fences, removing existing cobbles, which shall be salvaged, replaced, and re-graded within the ditches where shown on the typical sections and on the plan views upon completion, removing and/or salvaging existing culverts and flared end sections, grinding existing thermoplastic markings or striping, as shown on the plans and as determined by the Engineer.

Prior to the commencement of fencing removal operations the Contractor shall notify the adjacent property owners in order to avoid any possible problems with wandering livestock in the event that the fields are enclosed. New fencing may have to be installed before or immediately after removal of the existing fence. The County shall provide to the Contractor the property owner's names and telephone numbers.

The existing fencing to be removed is primarily three to five strand barbed wire with wooden and steel posts. The Fences are at locations as shown on the plans and as determined by the Engineer.

The removed fencing and posts shall become the property of the Contractor and shall be disposed of outside the roadway right of way limits in accordance with the provisions in Section 7-1.13, "Disposal of Material Outside the Right of Way," of the Standard Specifications and these special provisions.

The removed metal portions of the fencing material shall **NOT** be disposed of at the Neal Road Landfill without prior approval of the landfill managers. A metal recycling facility shall be utilized to dispose of the fencing material if the fencing material is determined to be unacceptable refuse by the Neal Road Landfill .

No adjustment in compensation will be made for any decrease or increase in the quantity of fencing removal required, regardless of the reason for such decrease or increase. The provisions in Section 4-1.03B, "Increased or Decreased Quantities", of the Special provisions shall not apply to the item "Clearing and Grubbing".

Nothing herein shall be construed as relieving the Contractor of his responsibility for final cleanup of the highway as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

Full compensation for furnishing all the labor, materials, tools, and equipment needed for the removal, hauling and disposal of the fencing and posts, removing and disposing of vegetation, grinding and removing existing asphalt, cleaning and regrading ditches and shoulders, removing

9. CLEARING AND GRUBBING(Continued)

existing storm drain pipes and culverts, salvaging existing pipes and flared end sections, removing, salvaging, replacing, and re-grading cobble in the existing ditches, and grinding any existing thermoplastic striping or markings from the roadway, as specified herein and as determined by the Engineer, shall be considered as included in the contract lump sum price paid for the item "Clearing and Grubbing," and no additional payment will be made therefor.

10. DEVELOP WATER SUPPLY

Developing water supply shall conform to the provisions in Section 10, "Dust Control," and Section 17, "Watering," of the Standard Specifications and these special provisions.

Full compensation for applying water for all the various phases of work, including applying water for dust control, all as determined by the Engineer, shall be considered as included in the lump sum price paid for the item "Develop Water Supply," and no additional compensation will be allowed therefor.

11. ROADWAY EXCAVATION

Roadway excavation shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

The quantity of roadway excavation for payment shall be the "Project Total" quantity for cubic yards of excavation as shown on the plans and as determined by the Engineer.

Subgrade shall be compacted in conformance to the provisions in Section 19-5.03, "Relative Compaction (95 percent)," of the Standard Specifications except that the provisions in the second paragraph of section 19-5.03 will not apply in areas of excavation.

It is anticipated that there will be a surplus of approximately **1070** cubic yards of excavated material. The surplus excavated material shall become the property of the Contractor and shall be disposed of outside the highway right-of-way in accordance with Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications and as determined by the Engineer. All excavation quantities are calculated as in situ or "in place" and shall be paid for accordingly. No expansion due to excavation will be considered for excavation payment quantities.

The contract unit price paid per cubic yard for the item "Roadway Excavation," shall include full compensation for furnishing all labor, materials, tools, equipment, incidentals, and for doing all work in removing, hauling and disposal of the excess material as well as grading and compacting the in place material, all as specified herein, and as determined by the Engineer.

The portion of imported borrow placed within the sub-grade shall have a Resistance (R-Value) of not less than 45.

Imported borrow shall be well graded, mineral including rock, sand, gravel, or earth. The Contractor shall not use man-made refuse in imported barrow or any material having a maximum diameter greater than 6-inches including:

11. ROADWAY EXCAVATION(Continued)

A. Portland Cement Concrete
B. Asphalt Concrete
C. Hot Mix Asphalt
D. Material planed from roadway surfaces
E. Residue from grooving or grinding operations
F. Metal
G. Rubber
H. Mixed Debris
I. Rubble

The contract unit price paid per cubic yard for the item "Imported Fill," shall include full compensation for furnishing all labor, materials, tools, equipment, incidentals, and for doing all work including locating, testing, loading, and hauling imported borrow material as well as placing, grading and compacting the material in place, all as specified herein, and as determined by the Engineer and no additional compensation will be allowed therefor.

Current soil conditions on site are typically volcanic in nature. Lava Cap is at or near the surface in many locations throughout the site.

In the course of construction, should any material be encountered that is deemed by the Engineer to be unsuitable material for subgrade, and has an R-Value less than 45, the Contractor shall excavate and dispose of the material according to the requirements detailed in this section. After the unsuitable material has been removed and disposed of, the resulting space shall be filled with suitable material approved by the Engineer. The resultant volume shall be measured and the amount added to the amount of cubic yards of roadway excavation for payment. Payment shall include full compensation for doing all the work furnishing the equipment and personnel needed for the removal and disposal of unsuitable material as well as furnishing and placing suitable material. Suitable material shall fall within the requirements of imported borrow as outlined above.

12. AGGREGATE BASE

Aggregate base shall be Class 2, 3/4 inch maximum grading, and shall conform to the provisions in Section 26, "Aggregate Bases," of the Standard Specifications and these Special Provisions.

The contract price paid per ton for the item "Aggregate Base" shall include full compensation for doing all the work involved in furnishing, hauling, grading, compacting and moisture conditioning all aggregate base areas referenced on the plans and as determined by the Engineer, and no additional compensation will be allowed therefor.

13. PAVEMENT REINFORCING FABRIC

Pavement reinforcing fabric shall conform to the provisions in Sections 39-2.03 and 39-4.03, "Pavement Reinforcing Fabric," and Section 88, "Engineering Fabrics," of the Standard Specifications and these Special Provisions.

13. PAVEMENT REINFORCING FABRIC (Continued)

The maximum width of pavement reinforcing fabric for payment shall be 12 feet per through lane and 6 feet along the neat cut pavement joints.

Paving asphalt binder for pavement reinforcing fabric shall conform to the provisions in Section 92, "Asphalts," of the Standard Specifications and shall be **Grade PG-64-10** unless otherwise ordered by the Engineer. Asphalt binder for pavement reinforcing fabric shall not be applied when pavement temperature is below **70 degrees F.**

Installation of pavement reinforcing fabric shall cover the same limits as the overlay as shown on the plans and as directed by the engineer.

The contract price paid per square yard of reinforcing fabric shall include full compensation for doing all the work involved in furnishing, hauling, placing, all as specified and as determined by the Engineer, and no additional compensation will be allowed therefor.

No adjustment in compensation will be made for any increase or decrease in the quantity of pavement reinforcing fabric required, regardless of the reason for such increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities", of the Standard Specifications shall not apply to the item "Pavement Reinforcing Fabric" which may be eliminated in its entirety.

14. LIQUID ASPHALT PRIME COAT AND SAND COVER

Liquid asphalt prime coat shall be Grade SC-250, or as otherwise determined by the Engineer, and shall conform to the provisions in Section 39, "Liquid Asphalts," and in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," of the Standard Specifications and these special provisions.

At locations where public traffic is being routed over the roadbed to be treated, the prime coat shall not be applied to more than one-half the width of the traveled way at a time, and the remaining width shall be kept free of obstructions and open for use by public traffic until the prime coat first applied is sanded.

Liquid asphalt shall not be applied when the atmospheric temperature is below 50 degrees Fahrenheit.

Full compensation for placing liquid asphalt prime coat shall be paid for by the ton and considered as included in the item "Liquid Asphalt, Prime Coat," and no additional compensation will be allowed therefor.

After the application of the liquid asphalt, the surface shall be covered with sand at the time determined by the Engineer and conforming to these special provisions.

Sand cover shall be free from clay and organic material and shall be of such size that from 90 percent to 100 percent will pass through a No. 4 size sieve and not more than 5 percent will pass a No. 200 size sieve and shall be spread uniformly at the approximate rate of 12 to 15 pounds per square yard. The exact spread rate shall be as determined by the Engineer. All loose sand shall

14. LIQUID ASPHALT PRIME COAT AND SAND COVER (Continued)

be removed from the treated area at a time determined by the Engineer. The treated surface shall be maintained in a smooth and satisfactory condition.

Full compensation for placing all sand shall be paid for by the ton and considered as included in the item "Sand Cover," and no additional compensation will be allowed therefor.

No adjustment in compensation will be made for any increase or decrease in the quantity of liquid asphalt (prime coat) or sand cover, regardless of the reason for such increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the

Standard Specifications shall not apply to the contract items "Paving Asphalt Binder," and "Sand Cover," which may be deleted in their entirety.

15. ASPHALT CONCRETE

Asphalt Concrete shall be Type A ½ inch maximum, medium grading and shall conform to the provisions in Section 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

All leveling courses shall be considered as included with and paid for by the item "Asphalt Concrete" and no additional compensation will be allowed therefor.

The grade of paving asphalt shall be **PG 64-10** or as determined by the Engineer and shall conform to the provisions of Section 92, "Asphalts," of the Standard Specifications.

If the Contractor selects the batch mixing method, asphalt concrete shall be produced by the automatic batch mixing method as provided in Section 39-3.03A(2), "Automatic Proportioning," of the Standard Specifications.

An Asphalt Concrete paint binder shall be required on all existing pavements prior to placing Asphalt Concrete and shall conform to Section 39, "Asphalt Concrete," of the Standard Specifications. Paint binder shall be either paving asphalt grade **PG 64-10** or Asphaltic Emulsion SS-1. The amount of asphalt binder to be mixed with the aggregate shall be determined by the Engineer and shall conform to the provisions of Sections 39-3.03, "Proportioning," and Section 92, "Asphalts," of the Standard Specifications.

Full compensation for furnishing and placing the asphalt paint binder shall be included in the contract price paid per ton for the item "Asphalt Concrete (Type A,1/2" Max. Medium Grading)," and no additional compensation will be allowed therefor.

Longitudinal pavement joints shall be at lanelines established by the Engineer. Driveways and intersections are to be paved as determined by the Engineer. Unless otherwise permitted by the Engineer, mainline paving shall be completed prior to placement of any other paving. Driveway paving shall not be done until placement of the adjacent mainline paving has been completed.

Asphalt Concrete used in the construction of driveways shall be Type A ½" maximum, medium grading. Payment for furnishing and placing the Asphalt Concrete used in the paving of

driveways and intersections shall be paid for at the contract price per ton for the item "Asphalt Concrete " and no additional compensation will be allowed therefor.

Asphalt Concrete "Miscellaneous Areas" shall conform to the provisions of Section 39-7.01, "Miscellaneous Areas," of the Standard Specifications. Miscellaneous Areas shall include curb ramps at the end of all concrete returns and other areas outside the traveled way which are designated on the plans or areas as determined by the Engineer.

Miscellaneous Asphalt Concrete shall be paid for at the contract price per ton for the item "Asphalt Concrete," and also for placement at the contract price per square yard for the item "Asphalt Concrete (misc. areas)," as included in Section 39-8.02, "Payment," of the Standard Specifications and no additional compensation will be allowed therefor.

In addition to the requirements in Section 39-5.01, "Spreading Equipment," of the Standard Specifications, Asphalt Concrete equipment shall be equipped with automatic screed controls and sensing devices.

When placing the initial mat of Asphalt Concrete, the end of the screed nearest the centerline, shall be controlled by a sensor activated by a ski device not less than twenty nine feet in length. The opposite end of the screed shall be controlled by an automatic transverse slope device set to produce the cross slope to match the existing slope or as otherwise determined by the Engineer.

When paving contiguously with a previously placed mat, the end of the screed adjacent to the previously placed mat shall be controlled by a sensor that responds to the grade of the previously placed mat and will reproduce the grade in the new mat within a 0.02 of a foot tolerance. The opposite end of the screed shall be controlled in the same manner mentioned in the paragraph above.

All paving operations shall be discontinued should the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the requirements in Section 39-6.03, "Compacting," of the Standard Specifications, these special provisions and as determined by the Engineer. Upon approval by the Engineer, the Contractor may resume paving operations following modifications to the existing equipment, procedures or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during any day's work, the Contractor may use manual control of spreading equipment for the remainder of the day, however, the equipment shall be repaired or replaced with equipment conforming to the requirements in this section before starting another day's work.

The Contractor shall schedule his paving operations such that each layer of Asphalt Concrete is placed on contiguous lanes along the traveled way. At the end of each work shift, the distance between the ends of the layers of asphalt concrete on adjacent lanes shall not be greater than 10 feet nor less than 5 feet. Additional paving shall be placed along the transverse edge at the end of each lane and along the exposed longitudinal edges between adjacent lanes, hand raked and compacted to form temporary conforms. Kraft paper, or other approved bond breaker

shall be placed under the conform tapers to facilitate the removal of the taper when paving operations resume.

Full compensation for furnishing and placing the Kraft paper or other bond breaking material on the pavement joints shall be included in the contract prices paid for the various items of work and no other compensation will be allowed therefor.

During and after the rolling operations and when ordered by the Engineer, the Asphalt Concrete may be cooled by applying water. Applying water shall conform to the provisions in Section 17, "Watering." of the Standard Specifications. No layer shall be cooled with water unless ordered or permitted by the Engineer.

Full compensation for furnishing and applying water during rolling operations will be considered as included in the contract price paid per ton for "Asphalt Concrete," and no additional compensation will be allowed therefor.

Asphalt Concrete shall be compacted to a relative compaction of not less than 95 percent and shall be finished to the lines and cross sections as shown on the plans and as determined by the Engineer.

Asphalt Concrete shall conform to the straightedge requirements in Section 39-6.03, "Compacting," of the Standard Specifications and these special provisions.

Areas of the top surface of the uppermost layer of Asphalt Concrete that do not meet the specified surface tolerances shall be brought within tolerance by abrasive grinding followed with the application of a fog seal coat on the ground areas.

Deviations in excess of 0.03 of a foot which, cannot be brought to the specified tolerances by abrasive grinding shall be corrected by either (1) removal and replacement; or (2) placement of a Asphalt Concrete overlay. The Contractor shall select the corrective method for each area with approval by the Engineer prior to the beginning of corrective work.

Any replacement and/or overlay pavement not meeting the specified tolerances shall be corrected by the aforementioned methods as approved by the Engineer.

The abrasive grinding used to bring the finished surface of the Asphalt Concrete within specified surface tolerances may be expanded in each direction so that the lateral limits of the grinding are at a constant offset from and parallel to the nearest lane line or pavement edge, while the longitudinal grinding limits are normal to the pavement centerline. All ground areas shall be uniform in appearance and rectangular in shape.

Abrasive grinding shall conform to the requirements in the first paragraph and the last four paragraphs in Section 42-2.02, "Construction," of the Standard Specifications.

Full compensation for doing all the work in performing profile checks, supplying all required tools, equipment and materials, performing all corrective work to the pavement surface including abrasive grinding, furnishing and placing Asphalt Concrete for use in removal and

15. ASPHALT CONCRETE (Continued)

replacement as well as the Asphalt Concrete overlay methods of correction shall be borne by the Contractor and no additional payment will be made therefor.

Full compensation for placing asphalt concrete shall be paid for by the ton and considered as included in the item "Asphalt Concrete," and no additional compensation will be allowed therefor.

16. ASPHALT CONCRETE (OPEN GRADED)

Asphalt Concrete(Open Graded) shall be placed on all new overlay segments and shall be Type 3/8" maximum grading and shall conform to the provisions in Section 39 "Asphalt Concrete" and 39-6, "Spreading and Compacting", of the Standard Specifications and these special provisions.

The grade of paving asphalt shall be **PG 64-10** or as determined by the Engineer and shall conform to the provisions of Section 92, "Asphalts," of the Standard Specifications.

Asphalt Concrete - Open Grade shall be spread by depositing the mix on the roadbed in windrows, then transferring it to an asphalt paver by means of a pick-up machine attached to the hot mix asphalt paver.

The aggregate for open graded hot mix asphalt concrete shall have a Cleanness Value of a 63 minimum for "Contract compliance" and a 66 minimum for "Operating Range" as determined by California Test method 227, modified as follows; Samples will be obtained from the weight box area during or immediately after discharge from each bin of the batching plant. The bin samples will be blended together in the proportion that each leg is being used in combined mix to make the test sample.

The test specimen will be prepared by hand shaking, for 30 seconds, a single loading of the entire test sample on an 8-inch diameter No. 4 sieve nested on top of an 8-inch diameter No. 8 sieve. That material retained on the aforementioned sieves shall be recombined and shall comprise the test specimen. The test specimen weight and wash water volume specified for seal coat screenings will be used to determine the Cleanness Value.

At drier drum and continuous plants with cold feed control, Cleanness Value test samples will be obtained from the discharge of each coarse aggregate storage bin. An aggregate sampling device shall be provided by the material suppliers, which will provide a 50-pound sample of each coarse aggregate.

If the results of the Cleanness Value tests do not meet the requirements specified for "Operating Range" but meet the "Contract Compliance" requirements, placement of the material may be continued for the remainder of the day. However, another day's work may not be started until tests, or other information, indicate, to the satisfaction of the Engineer, that the next material to be used in the work will comply with the requirements specified for "operating range".

If results of the Cleanness Value tests do not meet the requirements specified for "contract compliance," the material, which is represented by these tests, shall be removed. However, if requested by the Contractor and approved by the Engineer, said material having a Cleanness

16. ASPHALT CONCRETE (OPEN GRADED) (Continued)

Value of 48 or greater may remain in place and accepted on a basis of reduced payment for all such material left in place.

Asphalt Concrete (open graded) that is accepted on the basis of reduced payment will be paid for at the contract prices for the items of asphalt concrete involved multiplied by the following factors;

Test Value	Pay Factor
56	0.90
55	0.85
54	0.80
53	0.75
52	0.70
51	0.65
50	0.60
49	0.55
48	0.50

If asphalt concrete is accepted on the basis of reduced payment due to a cleanliness value range of 48 to 56, and also accepted on the basis of aggregate Grading or Sand Equivalent tests not meeting the "Contract Compliance" requirements, the reduced payment for Cleanness Value shall not apply.

Full compensation for furnishing and applying the Liquid Asphalt (Prime Coat), as specified in Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," of the Standard Specifications, shall be included in the contract price paid per ton of "Liquid Asphalt (Prime Coat)" and no additional compensation will be allowed therefor.

Full compensation for placing Asphalt Concrete (Open Graded) shall be paid for by the ton and considered as included in the item "Asphalt Concrete (Open Graded)" and no additional compensation will be allowed therefor.

17. ASPHALTIC EMULSION (FOG SEAL COAT)

Asphaltic emulsion (fog seal coat) shall be the asphaltic emulsion designation SS-1H and shall conform to Sections 37-1, "Seal Coats," and 39, "Asphalt Concrete," of the Standard Specifications and these special provisions.

No adjustment in compensation will be made for any increase or decrease in the quantity of fog seal required, regardless of the reason for such increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications shall not apply to the item of "Asphaltic Emulsion (Fog Seal Coat)," which may be eliminated in its entirety.

18. REINFORCED CONCRETE PIPE

Reinforced concrete pipe shall conform to the special provisions in Section 65, "Reinforced Concrete Pipe", of the Standard Specifications and these special provisions.

Where embankment will not be placed over the top of the pipe, a relative compaction of not less than 85 percent shall be required below the pipe spring line for pipe installed using

18. REINFORCED CONCRETE PIPE (Continued)

method I backfill in trench, as shown on Standard plan A62D. Where the pipe is to be placed under the traveled way, a relative compaction of not less than 90 percent shall be required unless the minimum distance between the top of pipe and the pavement surface is the greater of 1.2 m or one half of the outside diameter of the pipe. This paragraph shall not apply to those sections of reinforced concrete pipe that are designated on the plans as being backfilled by slurry cement.

Except as otherwise designated by classification on the plans or in the specifications, joints for culvert and drainage pipes shall conform to the plans or specifications for standard joints.

When reinforced concrete pipe is installed in conformance with the details shown on Standard Plan A62DA, the fifth paragraph of section 19-3.04, "Water Control and Foundation Treatment", of the Standard Specifications shall not apply.

When solid rock or other unyielding material is encountered at the planned elevation of the bottom of the bedding, the material below the bottom of the bedding shall be removed to a depth of 1/50 of the height of the embankment over the top of the culvert, but not less than 6-inches or more than 1-foot. the resulting trench below the bottom of the bedding shall be backfilled with structure backfill material in conformance with the provisions in Section 19-3.06, "Structure backfill", of the Standard Specifications.

The unit price paid for installation of concrete pipe shall include full compensation for furnishing all labor, tools, materials, and equipment, and for doing all the work as shown on the plans, and shall be included in the item for the specified diameter of pipe reinforced concrete pipe, as specified in the Standard Specifications, in these Special Provisions and as determined by the Engineer.

19. CORRUGATED METAL PIPE

Corrugated metal pipe shall be 0.079 inch thick and conform to the provisions in Section 66, "Corrugated Metal Pipe," of the Standard Specifications and these special provisions.

Structure backfill shall have a sand equivalent value of not less than 30.

Culvert joints shall conform to the plans or specifications for standard joints.

The Contractor's attention is directed to the existing corrugated steel culverts shown on the plans and the extensions of those culverts to be installed. The portion of the existing pipe to remain shall be trimmed as determined by the Engineer to provide a clean joint for attachment to the new bituminous coated corrugated steel pipe.

Payment for all excavation required for inlet and outlet ditches for pipe culverts shall be considered as included in the contract price paid per linear foot for such pipe and no additional compensation will allowed therefor.

Furnishing and installing, as well as payment for furnishing and installing, the pipe and couplings shall conform to the provisions in Section 66, "Corrugated Metal Pipe", of the Standard Specifications. Payment for pipe installation shall be by the Linear Foot and no additional compensation will allowed therefor.

20. INTERCEPTOR DRAINS

Two inch by six inch steel tubing shall be installed at the end of the concrete curb ramps as specified on the plans to drain the flowline. Tubing shall be primered , cut to length, and placed under the asphalt curb ramps with a 1% slope to drain behind the curbs, or as specified on the plans or as directed by the Engineer.

Full compensation for placing steel tubing shall be paid for by the lump sum and considered as included in the item "Interceptors Drains" and no additional compensation will be allowed therefor.

21. SLURRY CEMENT BACKFILL

Slurry cement backfill shall conform to the special provisions in Section 19-3.062, "Slurry Cement Backfill", of the Standard Specifications and these special provisions. Slurry cement backfill shall be utilized on new concrete pipe as specified on the plans where inadequate cover is provided.

The unit price paid for installation of slurry cement backfill shall include full compensation for furnishing all labor, tools, materials, and equipment, and for doing all the work as shown on the plans, as specified in the Standard Specifications, in these Special Provisions and as determined by the Engineer.

22. SIGNALS AND LIGHTING

Cost Breakdown

The Signal Contractor shall submit a cost breakdown of all major components of the traffic signal to the Project Engineer. Major components are considered to be items such as all signal standard poles and mast arms, signal heads, foundations, controller and service cabinets, battery backup systems, and all conduit and pull box unit prices.

Scheduling of Work

Scheduling of work shall conform to the provisions in Section 86-1.06, "Scheduling of Work," of the Standard Specifications and these special provisions.

The Contractor shall not perform any electrical work above ground at any location until all the electrical materials for that location have been delivered to the site of the work. The Contractor shall place underground materials such as the conduits, pull boxes and foundations prior to receiving the electrical material.

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.

The Contractor shall furnish two maintenance and operation manuals for the controller units, auxiliary equipment, vehicle detector sensor units, control units and amplifiers. 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, previous to purchase. The maintenance manual shall include, but not limited to, the following items:

a. Specifications

b. Design characteristics

f. Block circuit diagram

g. Geographical layout of components

c. General operation theory

d. Function of all controls

e. Troubleshooting procedure (diagnostic routine)

h. Schematic diagrams

i. List of replaceable component parts with stock numbers

Signs

Except as provided for elsewhere in these special provisions, all sign panels, posts and hardware shall be furnished and installed by the Contractor. Materials and installation shall conform to the provisions in Section 56, "Signs," of the Standard Specifications and these special provisions. All signs shall be installed at the locations shown on the plans and as determined by the Engineer.

All backgrounds, borders, letters, numerals, shields and arrows on all permanent signs shall be constructed of encapsulated lens sheeting. The reflective sheeting shall conform to the requirements as found in the California Department of Transportation Publication, "SPECIFICATIONS FOR REFLECTIVE SHEETING ALUMINUM SIGNS," dated July 1987.

The Contractor shall provide certification that the sheeting not only conforms to aforementioned standards but also carries the manufacturer's ten-year warranty.

The sign mounting hardware shall conform to Detail U of the Standard Plan Sheet ES-6T and shall be installed at the locations as shown on the plans and as determined by the Engineer.

Full compensation for furnishing and installing the signs, posts and accompanying hardware shall be considered as included in the contract prices paid for the various items of work and no additional compensation will be allowed therefor.

Internally Illuminated Street Name Signs (IISNS)

Internally Illuminated Street Name Signs (IISNS) shall be Type 'A' as shown on Standard Plan Sheet ES-70 and as shown on the plans.

Full compensation for furnishing and installing the Internally Illuminated Street Name Signs, all mounting and electrical hardware, including all tools, materials, and associated hardware, shall be considered as included in the item "Traffic Signal Installation" and no additional compensation will be allowed therefor.

Foundations

Foundations shall conform to the provisions in Section 86-2.03, "Foundations," of the Standard Specifications and these special provisions.

The Contractor shall notify all concerned utility companies prior to excavating for the standard foundations.

The first sentence of the eighth paragraph in Section 86-2.03, "Foundations," of the Standard Specifications is amended to read:

"Anchor bars or studs and nuts, except for Type 30 and Type 31 lighting standards, shall conform to the ASTM Designation: A 307. Headed anchor bolts for foundations shall conform to the specifications of ASTM Designation: A 307, Grade B with S1 supplementary requirements. At the option of the Contractor, nonheaded anchor bolts for foundations shall conform either to the specifications of ASTM Designation: a 307, Grade C or to the provisions in AASHTO

Designation: M314, Grade 36 of 55 with S1 supplementary requirements. When non-headed anchor bolts conforming to the specifications, of ASTM Designation: A 307 Grade C, are furnished, the end of each fabricated anchor bolt shall be either coded by end stamping, as required in ASTM Designation: A 307, or the end that projects from the concrete shall be permanently coded with a green color by the manufacturer."

Portland cement concrete shall conform to the requirements of Section 90-10, "Minor Concrete," of the Standard Specifications and shall contain not less than 470 pounds of cement per cubic yard, except concrete for the reinforced pile foundations shall contain not less than 564 pounds of cement per cubic yard.

Standards, Steel Pedestals and Posts

Standards, steel pedestals and posts shall conform to the provisions in Section 86-2.04, "Standards," of the Standard Specifications and these special provisions.

In lieu of the pipe tenon being at 90 degrees to the end of the signal arm as shown on Detail S of the Standard Plan ES-6S, the tip tenon shall be used.

All lighting standards, or combined signal and lighting standards, shall be provided with handholds and handhold covers.

Conduit

Conduits shall conform to the provisions in Section 86-2.05, "Conduit," of the Standard Specifications and these special provisions.

Conduits to be installed underground shall be the rigid steel or rigid non-metallic type unless otherwise specified. Detector termination conduits may be the rigid non-metallic type.

The conduit in a foundation and between a foundation and the nearest pull box shall be the same as in the foundation when a standard coupling cannot be used for coupling metal type conduit, a UL listed threaded union coupling, as specified in the third paragraph of Section 86-2.05C, "Installation," of the Standard Specifications, or a concrete-tight split coupling or concrete-tight set screw coupling shall be used.

Non-metallic conduits placed in trenches that are within the limits of asphalt surfacing shall be backfilled with a slurry cement backfill in accordance with the provisions in Section 19-3.062, "Slurry Cement Backfill," of the Standard Specifications. The trench shall be backfilled to within 2 inches of the existing roadway surface. The remaining 2 inches of the trench shall be backfilled with commercial quality asphalt concrete in accordance with Section 39, "Asphalt Concrete," of the Standard Specifications.

After conductors have been installed, the ends of the conduits terminating in the service and controller cabinets shall be sealed with a type of sealing compound approved by the Engineer.

Insulated bonded bushings will be required on metal conduits.

Pull Boxes

Pull boxes shall conform to the provisions in Section 86-2.06, "Pull Boxes," of the Standard Specifications and these special provisions.

Pull boxes shall be Type 5 except as otherwise noted on the plans. However, those pull boxes containing four or more conduit runs shall be Type 6. Pull boxes shall be installed at locations shown on the plans and as determined by the Engineer. Grout shall be placed in the bottom of the pull boxes.

Covers for the pull boxes shall be marked as follows:

a. "**TRAFFIC SIGNAL**" where the pull box contains traffic signal conductors with or without street lighting conductors.

b. "**SERVICE**" for pull boxes in service runs and where conduits from utility facilities terminate.

Conductors and Wiring

Conductors and wiring shall conform to the provisions in Section 86-2.08, "Conductors," of the Standard Specifications and these special provisions.

Splices shall be insulated by "Method B" or, at the option of the Contractor; splices of conductors shall be insulated with heat-shrink tubing of the appropriate size after thoroughly painting the spliced conductors with electrical insulating coating.

Fused Splice Connectors

Fused splice connectors shall conform to the requirements in Section 86-2.095, "Fused Splice Connectors," of the Standard Specifications.

Bonding and Grounding

Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding," of the Standard Specifications.

Service

The Butte County Building Department shall be contacted to sign off the newly proposed signal meter prior to PG&E connection. Contact Information: (530) 538-7541.

Service shall conform to the provisions in Section 86-2.11, "Service," of the Standard Specifications and these special provisions.

If the service equipment cabinet design deviates in any way from the details shown on the plans, the details of such deviation shall be submitted to the Engineer for approval prior to the fabrication of the cabinets.

The removable rain cap for Style A, Type III, service equipment cabinets, as shown on the plans, may be less than eight inches in height when a lesser dimension is permitted by the serving utility.

Type III service equipment enclosures shall be the aluminum type.

Continuous welding of exterior seams in service equipment enclosures is not required.

All overlapping exterior seams and doors shall meet the requirements for Type 3R enclosures specified in the NEMA Enclosure Standards.

The Contractor shall notify the Engineer, in writing, at least 15 calendar days in advance of the date on which he desires any service connections or disconnection. The Contractor shall not be entitled to an extension of time or other compensation for delays to his operations resulting from his failure to comply with the aforementioned time frame.

The Contractor's attention is directed to the "Power Source" site as shown on the plans. The service utility will furnish and install a riser on the service pole and pull the conductor down the service pole into the service pull box at the "Power Source" and connect the wire. The Power Utility Company shall supply reference plans for the service connection as a supplement to the project plans. Utility Grading shall be complete at the location designated on the plans as "Controller Cabinet", "Service Enclosure" and "Utility Source Pole" designated with a "U", in order to supply power from the source to the Service Equipment. The Contractor shall supply the Conductor and Conduit, Service Equipment Cabinet, Meter Pedestal, and Pull Box for the base of the service pole. The Contractor shall install wiring from the source Pull Box to the Service Equipment Cabinet and Meter Pedestal, and groom the finished surface around the Controller Cabinet, Meter Pedestal, and source Pull Box upon completion of the installation of Power Source and all underground conduit runs.

Testing

Testing shall conform to the provisions in Section 86-2.14, "Testing," of the Standard Specifications and these special provisions.

The third Paragraph in Section 86-2.14C, "Functional Testing," of the Standard Specifications is amended to read:

"The functional test for each lighting system shall consist of not less than 14 days of continuous, satisfactory operation. If unsatisfactory performance of the system develops, the conditions shall be corrected and the test shall be repeated until the 14 days of continuous, satisfactory operation is obtained."

Solid-State Traffic-Actuated Controllers

Type 170 solid-state traffic-actuated controller units, cabinets and auxiliary equipment shall conform to the provisions in Section 86-3, "Controller Assemblies," of the Standard Specifications and these special provisions.

Model 170 Controller Assemblies

Model 170 controller assembly or assemblies, shall be furnished by the Contractor. The Contractor shall provide, along with the Model 170 Controller Assemblies, all equipment required to operate the traffic signals according to the phase diagrams shown on the plans.

The manufacturers of all the electrical equipment used in the controller cabinet shall be on the State of California Qualified Products List (QPL).

The Contractor shall construct the controller cabinet foundation (including furnishing and installing anchor bolts), install the controller cabinet on said foundation and make all field wiring connections to the terminal blocks in the controller cabinet.

Anchor bolts for the controller cabinet shall extend 1-1/2 inches (plus or minus 1/8 inch) above the top of the foundation.

The Contractor shall arrange to have a representative of the controller unit manufacturer, qualified to work on the unit, present at the time the unit is turned on. The representative shall, upon the request made by the Engineer, enter all program and/or timing information and make all adjustments necessary for the operation of each controller assembly. The Engineer will furnish the desired time settings for the adjustable intervals.

Full compensation for providing a qualified representative of the controller unit manufacturer shall be considered as included in the contract lump sum price paid for the item "Traffic Signal Installation" and no additional compensation will be allowed therefor.

In lieu of testing of the equipment by the State, as required in the first paragraph of Section 86-2.14A, "Materials Testing," of the Standard Specifications, the Contractor shall deliver the equipment to the following address for the assembled controller testing and final programming.

Mr. Jason Hayes (1-800-544-4876)
Republic Electric
1513 Sports Drive, Suite 250
Sacramento, CA 95834

After the testing has been completed the equipment shall then be delivered to the jobsite for installation.

Payment for furnishing the controller unit as well as testing, handling and shipping to and from the testing location shall be included in the contract lump sum price paid for the item "Traffic Signal Installation" and no additional compensation will be allowed therefor.

Traffic Signal Control Equipment and Programming Specifications

Specifications for traffic signal control equipment and programming shall be in accord with the State of California Department of Transportation's "Signal Control Equipment Specifications", dated July, 1992, the latest edition, with the latest revisions, of the Department of Transportation's Traffic Control Local Intersection Program Manual" and these special provisions.

The 170 controller shall be supplied with a programmable, read-only memory (prom) module that has been programmed with the equivalent of the latest edition of the State of California Department of Transportation's "Traffic Signal Control Local Intersection Program" and the latest revisions thereof.

The following components shall be furnished and installed by the Contractor:

1 ea.	Traffic Signal Controller, Model #170
1 ea.	Traffic Cabinet, Model #332
1 ea.	Monitor Unit, Model #210
12 ea.	Switch Packs, Model #200
3 ea.	Isolators, Model #242 (Stop time, flash sense)
12 ea.	Two-channel Loop Sensors, Model #222
1 ea.	Model #412C, Memory Module.

Vehicle Signal Faces and Signal Heads

Signal faces, signal heads and auxiliary equipment, as shown on the plans and the installation thereof, shall conform to the provisions in Sections 86-4.01, "Vehicle Signal Faces," 86-4.03, "Directional Louvers," 86-4.04, "Backplates'" of the Standard Provisions and these special provisions.

A clear silicone seal shall be applied around the bolts for mounting the mast arm signal heads and where the slip fitter fits over the mast arm tenon. The seal shall be waterproof, shall not chip or peel and shall remain flexible in a temperature range from -60 degrees to 300 degrees F.

22. <u>SIGNALS AND LIGHTING</u> (Continued)

Signal section housings shall be the metal type and all signal faces will be provided with backplates.

All signal heads shall be 12”.

In Section 86-4, “Traffic Signal Faces and Fittings,” of the Standard Provisions, all references to “ANSI Standard D-10.1” are changed to the Institute of Traffic Engineers’ Publication: ST-008B, “Vehicle Traffic Control Signal Heads”.

Light Emitting Diode Signal Modules

All signal head modules shall be light emitting diode (LED). Red, Yellow, & Green.

Each light emitting diode (LED) signal module shall consist of an assembly that utilizes light emitting diodes as the light source in lieu of an incandescent lamp for use in traffic signal sections.

Each Type 2 LED signal module shall be designed to mount in the standard lamp socket normally used with an incandescent lamp. When a Type 2 LED signal module is used, a standard traffic signal lens in the doorframe shall be used or, at the option of the Contractor, the standard lens may be replaced with a translucent red lens to seal the signal section from weather. The installation of a Type 2 LED signal module shall not require any modification to the standard lamp socket or reflector.

LED signal modules used on this project shall be from the same manufacturer, and each size shall be the same model.

Type 2 LED signal modules shall be a sealed unit containing all components necessary for operation except, at the option of the Contractor, use of a corresponding lens mounted in the doorframe will be allowed.

Type 2 LED signal modules shall not require a specific mounting orientation or have a variance in light output, pattern or visibility for any mounting orientation.

The LEDs shall utilize AllnGaP technology and shall be the ultra bright type rated for 100,000 hours of continuous operation from -40°C to 74°C.

The individual LEDs shall be wired such that a catastrophic failure of one LED will result in the loss of not more than 5 percent of the signal module light output.

The failure of an individual LED in a string shall only result in the loss of that LED, not the entire string or indication.

The LED signal modules tested or submitted for testing shall be representative of typical average production units. Circular modules shall be tested according to California Test No. 604. All optical testing shall be performed with the module mounted in a standard traffic signal section but without a visor or hood attached to the signal section.

Maximum initial power requirements for LED signal modules shall be 25 W for 300 mm red, 15 W for 200 mm red and 15 W for 300 mm red arrow at 25°C.

LED signal modules shall be rated for a minimum useful life of 48 months and shall maintain not less than 85 percent of the standard light output values found in the ITE publication ST-008B, "Vehicle Traffic Control Signal Heads" (VTCSH ST-017), after 48 months of continuous use in a traffic signal operation over the temperature range of -40°C to +74°C.

In addition to the requirements for circular LED signal modules, arrow modules shall conform to the following:

The LED red arrow indication shall meet existing specifications stated in the VTCSH Section 9.01 for arrow lenses. The LEDs shall be spread evenly across the illuminated portion of the arrow area. Each LED signal section indication shall provide a minimum average luminous intensity shall of 5,500 candela/m2, as measured by the VTCSH. All measurements shall be performed at rated operating voltage of 120 VAC.

Physical and Mechanical Requirements

LED traffic signal modules shall be designed as retrofit replacements for existing optical units of signal lamps and shall not require special tools for installation. LED signal modules shall fit into existing traffic signal section housings built to the VTCSH without modification to the housing.

Installation of a LED signal module shall only require the removal of the optical unit components, i.e., lens, lamp module, gaskets, and reflector; shall be weather tight and fit securely in the housing; and shall connect directly to electrical wiring.

LED Signal Module Lens.--The LED signal module shall be capable of replacing the optical unit. The lens may be tinted or may use transparent film or materials with similar characteristics to enhance ON/OFF contrasts. The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.

If a polymeric lens is used, a surface coating or chemical surface treatment shall be used to provide front surface abrasion resistance.

Environmental Requirements.--The LED signal module shall be rated for use in the operating temperature range of -40°C (-40°F) to +74°C (+165°F).

The LED signal module shall be protected against dust and moisture intrusion per the requirements of NEMA Standard 250-1991 for Type 4 enclosures to protect all internal components.

The LED signal module lens shall be UV stabilized.

Construction.--The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply for the LED signal module shall be integral to the unit.

The assembly and manufacturing process for the LED signal assembly shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Materials.--Material used for the lens and signal module construction shall conform to ASTM specifications for the materials where applicable.

Enclosures containing either the power supply or electronic components of the signal module shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

Module Identification.--Each LED signal module shall have the manufacturer's name, trademark, and other necessary identification permanently marked on the back of the module. Each individual LED signal module shall be identified for warranty purposes.

The following operating characteristics shall be identified: rated voltage, power consumption, and volt-ampere.

Photometric Requirements

An LED traffic signal module shall meet at least 85 percent of the minimum VTCSH intensity requirements while operating throughout the operating temperature range of -40°C to +74°C.

The minimum initial luminous intensity values for LED traffic signal modules shall be as defined in Section 11.04 of the VTCSH standard at 25°C.

The measured chromaticity coordinates of LED signal modules shall conform to the chromaticity requirements of Section 8.04 and Figure 1 of the VTCSH standard.

Electrical

LED signal modules shall operate from a 60 Hz ±3 Hz AC line over a voltage ranging from 80 volts to 135 volts. The LED circuitry shall prevent perceptible flicker over the voltage range specified above. The fluctuations of line voltage shall have no visible effect on the luminous intensity of the indications. Rated voltage for all measurements shall be 120 volts.

The signal module on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients as stated in Section 2.1.6 of NEMA Standard TS-2, 1992.

LED signal modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors).

LED signal modules and associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

The LED signal module shall provide a power factor of 0.90 or greater.

Total harmonic distortion (current and voltage) induced into an AC power line by a LED signal module shall not exceed 20 percent.

Quality Assurance

LED signal modules shall be manufactured in accordance with a vendor 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 LED signal modules built to meet this specification.

QA process and test results documentation shall be kept on file for a minimum period of seven years.

LED signal module designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

Manufacturer's Serial Numbers.--Identification of the component and sub-assembly level may be required if the reliability and performance of the module must be traceable to the original item manufacturers of the module components and subassemblies.

Production Quality Assurance Testing.--The following Production Quality Assurance tests shall be performed on each new LED signal module prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. The manufacturer for warranty purposes shall retain test results for seven years.

Each LED signal module shall be tested for rated initial intensity after burn-in. Burn-in period shall consist of each signal module being energized at rated voltage for a 30-minute stabilization period before the measurement is made. A single point measurement with a correlation to the intensity requirements of Section 1.04 of the VTCSH may be used. The ambient temperature for this measurement shall be +25°C (+77°F).

Each LED signal module not meeting minimum luminous intensity requirements per Table 1 of VTCSH shall be cause for rejection.

Each LED signal module shall be tested for required power factor after burn-in.

Each LED signal module shall be measured for current flow in amperes after burn-in. The measured current values shall be compared against current values resulting from design qualification measurements under "Design Qualification Testing". The current flow shall not exceed the rated value. The measured ampere values with rated voltage shall be recorded as volt-ampere (VA) on the product labels.

Each LED signal modules shall be visually inspected for any exterior physical damage or assembly anomalies. Careful attention shall be paid to the surface of the lens to ensure there are no scratches (abrasions), cracks, chips, discoloration, or other defects. Any such defects shall be cause for rejection.

Design Qualification Testing.--Design Qualification testing shall be performed on new LED signal module designs, and when a major design change has been implemented on an existing design. The minimum sample quantity of LED signal modules shall be as stated for each test. Failure to meet requirements for any of these tests shall be cause for rejection.

A random sample of six LED signal modules shall be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, in a temperature of 74°C (+165°F) before performing any design qualification testing. Any failure within an LED signal module after burn-in shall be cause for rejection.

Rated Initial Luminous Intensity.--After burn-in, a sample of six LED signal modules shall be tested for rated initial intensity per the requirements of "Photometric Requirements". Before measurement, each LED signal module shall be energized at rated voltage, with 100 percent on-time duty cycle, for a time period of 30 minutes. The ambient temperature for this measurement shall be 25°C (77°F). The test results for this test shall have recorded the current voltage, total harmonic distortion (THD), and power factor (PF) associated with each measurement.

Chromaticity (Color).--A sample of two LED signal modules shall be measured for chromaticity (color) per the requirements of "Chromaticity requirements under "Photometric Requirements." A spectroradiometer shall be used for this measurement. The ambient temperature for this measurement shall be 25°C (77°F).

Electrical.--A sample of six LED signal modules shall be measured for current flow in amperes. The measured current values shall be used for quality comparison of Production Quality Assurance current measurement on production modules.

A sample of six LED signal modules shall be measured for power factor. A commercially available power factor meter may be used to perform this measurement.

A sample of six LED modules shall be measured for total harmonic distortion. A commercially available total harmonic distortion meter may be used to perform this measurement.

A sample of six LED signal modules shall be tested per the requirements of "Electrical", with reference to Class A emission limits referenced in Federal Communications Commission (FCC) Title 47, SubPart B, Section 15.

A sample of six LED signal models shall be tested for compatibility with the controller unit, conflict monitor, and load switch. Each signal module shall be connected to any AC voltage supply between the values of 80 and 135 VAC. The AC voltage developed across each LED signal module so connected shall not exceed 10 volts rms. as the input AC voltage is varied from 80 volts rms. to 135 volts rms.

A sample of six LED modules shall be tested for transient immunity per "Electrical" using the procedure described in NEMA Standard TS-1992.

Mechanical vibration testing shall be performed on a sample of three LED signal modules per MIL-STD-883, Test Method 2007, using three 4-minute cycles along each x, y, and z-axis, at a force of 2.5 Gs, with a frequency sweep from 2 Hz to 120 Hz. The loosening of the lens, of any internal components, or other physical damage shall be cause for rejection.

Temperature cycling shall be performed on a sample of three LED signal modules per MIL-STD-883, Test method 1010. The temperature range shall be per "Environmental Requirements". A minimum of 20 cycles shall be performed with a 30-minute transfer time between temperature extremes and a 30-minute dwell time at each temperature. Signal under test shall be non-operating. Failure of a module to function properly or any evidence of cracking of the module lens or housing after temperature cycling shall be cause for rejection.

Moisture resistance testing shall be performed on a sample of three LED signal modules per NEMA Standard 250-1991 for Type 4 enclosures. Any evidence of internal moisture after testing shall be cause for rejection.

Certificate of Compliance.--The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall certify that the LED signal modules comply with the requirements of these specifications. The certificate shall also include a copy of all applicable test reports on the LED signal modules.

Guarantee

LED signal modules shall be guaranteed by the Contractor for a period of 5-years starting on the day after the Engineer accepts the project. Modules that fail during this period shall be replaced at no cost to the County, except that County forces will change out the modules in the field. The replacement modules shall be delivered to the Engineer, at the office of the Director of Public Works located at #7 County Center Drive, Oroville, CA 95965 within five working days after notification. The failed modules will be made available to the Contractor at the above address at the same time as the replacement is delivered.

Full compensation for furnishing and installing all LED signal modules shall be considered as included in the contract lump sum price paid for traffic signal installation and no additional compensation will be allowed therefor.

Pedestrian Signals

Pedestrian traffic signals shall be the countdown type conforming to Section 4E.07, “Countdown Pedestrian Signals,” of the Manual on Uniform Traffic Control Devices, 2003 Edition. The

display shall be the two-row LED type in a 16" x 18" housing, Daylight Corporation Part No. 430-6479-001 or approved equal.

General

LED ped modules used on this project shall be from the same manufacturer.

The circuit board and power supply shall be contained inside the module. Circuit boards shall conform to Chapter 1, Section 6 of the "Transportation Electrical Equipment Specifications".

LED ped modules shall not require a specific mounting orientation or have a variance in light output, pattern or visibility for any mounting orientation.

The LEDs shall utilize AllnGaP technology and shall be the ultra bright type rated for 100 000 hours of continuous operation from -40°C to 74°C.

The individual LEDs shall be wired such that a catastrophic failure of one LED will result in the loss of not more than 5 percent of the signal module light output.

The failure of an individual LED in a string shall only result in the loss of that LED, not the entire string or indication.

The LED ped modules tested or submitted for testing shall be representative of typical average production units. LED ped modules shall be tested according to California Test No. 610 and as described herein. All optical testing shall be performed with the module mounted in a standard Type "A" Pedestrian Housing but without a visor or hood attached to the housing.

Maximum initial power requirements for LED ped modules shall be 15 W at 25°C.

Luminance Requirements

The uniformity ratio of an illuminated symbol shall not exceed 4 to 1 between the highest luminance area and the lowest luminance area. LED ped module shall be rated for a minimum useful life of 48 months and shall maintain not less than 85 percent of 3750 cd/m2 after 48 months of continuous use in a traffic signal operation over the temperature range of -40°C to +74°C.

Physical and Mechanical Requirements

LED ped module traffic signal modules shall be designed as retrofit replacements for existing optical units of signal lamps and shall not require special tools for installation. LED ped module shall fit into existing traffic signal section housings built to the VTCSH without modification to the housing.

Installation of a LED ped module shall only require the removal of the lamp.

Environmental Requirements.--LED ped modules shall be rated for use in the operating temperature range of -40°C (-40°F) to +74°C (+165°F).

Construction.--LED ped modules shall be a single, self-contained device, not requiring on-site assembly for installation into an existing Type "A" housing. The power supply for the LED ped module shall be integral to the unit.

The assembly and manufacturing process for the LED ped module assembly shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

Materials.--Material used for the LED ped module construction shall conform to ASTM specifications for the materials where applicable.

Enclosures containing either the power supply or electronic components of the LED ped module shall be made of UL94VO flame retardant materials.

Module Identification.--Each LED ped module shall have the manufacturer's name, trademark, and other necessary identification permanently marked on the back of the module. Each individual LED ped module shall be identified for warranty purposes.

The following operating characteristics shall be identified: rated voltage, power consumption, and volt-ampere.

Photometric Requirements

An LED ped module shall meet at least 85 percent of the minimum 3750 cd/m2 while operating throughout the operating temperature range of -40°C to +74°C. The minimum initial luminous intensity values for LED ped modules shall be 3750 cd/m2 at 25°C.

The measured chromaticity coordinates of LED ped modules shall conform to the chromaticity requirements of Section 5.3.2.1 and Figure C of the VTCSH standard.

Electrical

LED ped modules shall operate from a 60 ±3 Hz AC line over a voltage ranging from 80 V to 135 V. The LED ped module circuitry shall prevent perceptible flicker over the voltage range specified above. The fluctuations of line voltage shall have no visible effect on the luminous intensity of the indications. Rated voltage for all measurements shall be 120 V.

The LED ped module on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients as stated in Section 2.1.6 of NEMA Standard TS-2, 1992.

LED ped modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors).

LED ped modules and associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

The LED ped module shall provide a power factor of 0.90 or greater.

Total harmonic distortion (current and voltage) induced into an AC power line by a LED ped module shall not exceed 20 percent.

Quality Assurance

LED ped modules shall be manufactured in accordance with a vendor 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 LED ped modules built to meet this specification.

QA process and test results documentation shall be kept on file for a minimum period of seven years.

LED ped module designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

Manufacturer's Serial Numbers.--Identification of the component and sub-assembly level may be required if the reliability and performance of the module must be traceable to the original item manufacturers of the module components and subassemblies.

Production Quality Assurance Testing.--The following Production Quality Assurance tests shall be performed on each new LED ped module prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. The manufacturer for warranty purposes shall retain test results for seven years.

Each LED ped module shall be tested for rated initial intensity after burn-in. Burn-in period shall consist of each signal module being energized at rated voltage for a 30-minute stabilization period before the measurement is made.

Each LED ped module not meeting 3750 cd/m2 luminous intensity requirements shall be cause for rejection.

Each ped module shall be tested for required power factor after burn-in.

Each LED ped module shall be measured for current flow in amperes after burn-in. The measured current values shall be compared against current values resulting from design qualification measurements under "Design Qualification Testing". The current flow shall not exceed the rated value. The measured ampere values with rated voltage shall be recorded as volt-ampere (VA) on the product labels.

Each LED ped module shall be visually inspected for any exterior physical damage or assembly anomalies. Careful attention shall be paid to the surface of the lens to ensure there are no scratches (abrasions), cracks, chips, discoloration, or other defects. Any such defects shall be cause for rejection.

Design Qualification Testing.--Design Qualification testing shall be performed on new LED ped module designs, and when a major design change has been implemented on an existing design.

The minimum sample quantity of LED ped modules shall be as stated for each test. Failure to meet requirements for any of these tests shall be cause for rejection.

A random sample of six LED ped modules shall be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, in a temperature of 74°C (+165°F.) before performing any design qualification testing. Any failure within an LED ped module after burn-in shall be cause for rejection.

Rated Initial Luminous Intensity.--After burn-in, a sample of six LED ped modules shall be tested for rated initial intensity per the requirements of "Photometric Requirements". Before measurement, each LED ped module shall be energized at rated voltage, with 100 percent on-time duty cycle, for a time period of 30 minutes. The ambient temperature for this measurement shall be 25°C (77°F.). The test results for this test shall have recorded the current voltage, total harmonic distortion (THD), and power factor (PF) associated with each measurement.

Chromaticity (Color).--A sample of two LED ped modules shall be measured for chromaticity (color) per the requirements of "Chromaticity requirements under "Photometric Requirements." A spectroradiometer shall be used for this measurement. The ambient temperature for this measurement shall be 25°C (77°F.).

Electrical.--A sample of six LED ped modules shall be measured for current flow in amperes. The measured current values shall be used for quality comparison of Production Quality Assurance current measurement on production modules.

A sample of six LED ped modules shall be measured for power factor. A commercially available power factor meter may be used to perform this measurement.

A sample of six LED ped modules shall be measured for total harmonic distortion. A commercially available total harmonic distortion meter may be used to perform this measurement.

A sample of six LED ped modules shall be tested per the requirements of "Electrical", with reference to Class A emission limits referenced in Federal Communications Commission (FCC) Title 47, SubPart B, Section 15.

A sample of six LED ped modules shall be tested for compatibility with the controller unit, conflict monitor, and load switch. Each signal module shall be connected to any AC voltage supply between the values of 80 and 135 VAC. The AC voltage developed across each LED ped module so connected shall not exceed 10 volts rms. as the input AC voltage is varied from 80 V rms. to 135 V rms.

A sample of six LED ped modules shall be tested for transient immunity per "Electrical" using the procedure described in NEMA Standard TS-1992.

Mechanical vibration testing shall be performed on a sample of three LED ped modules per MIL-STD-883, Test Method 2007, using three 4-minute cycles along each x, y, and z-axis, at a force of 2.5 g, with a frequency sweep from 2 Hz to 120 Hz. The loosening of the lens, of any internal components, or other physical damage shall be cause for rejection.

Temperature cycling shall be performed on a sample of three LED ped modules per MIL-STD-883, Test method 1010. The temperature range shall be per "Environmental Requirements". A minimum of 20 cycles shall be performed with a 30-minute transfer time between temperature extremes and a 30-minute dwell time at each temperature. Signal under test shall be non-operating. Failure of a module to function properly or any evidence of cracking of the module lens or housing after temperature cycling shall be cause for rejection.

Moisture resistance testing shall be performed on a sample of three LED ped modules per NEMA Standard 250-1991 for Type 4 enclosures. Any evidence of internal moisture after testing shall be cause for rejection.

Certificate of Compliance.--The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall certify that the LED ped modules comply with the requirements of these specifications. The certificate shall also include a copy of all applicable test reports on the LED ped modules.

Guarantee

LED ped modules shall be guaranteed by the Contractor for a period of 5-years starting on the day after the Engineer accepts the project. Modules that fail during this period shall be replaced at no cost to the State, except that State forces will change out the modules in the field. The replacement modules shall be delivered to the Engineer, at the office of the Director of Public Works, 7 County Center Drive, Oroville CA, within five working days after notification. The failed modules will be made available to the Contractor at the above address at the same time as the replacement is delivered.

Full compensation for furnishing and installing all LED ped modules shall be considered as included in the contract lump sum price paid for traffic signal installation and no additional compensation will be allowed therefor.

Pedestrian Push Button Signs

Pedestrian push button signs shall conform to the details shown on the plans except that the message and symbol shall conform to California Sign Specification Sheet R62A. The Engineer will provide copies of the sign specification sheets.

Pedestrian Push Buttons

Pedestrian push button housings shall be the metal type.

Detectors

Detectors shall conform to provisions in Section 86-5, "Detectors," of the Standard Specifications and these special provisions.

The Contractor shall test the detectors with a motor-driven cycle, as defined in the State of California Vehicle Code that is licensed for street use by the State of California Department of Motor Vehicles. The unladened weight shall not exceed 220 pounds and the engine displacement shall not exceed 100 cubic centimeters. Special features, components or vehicles designed to activate the detector will not be permitted. The Contractor shall provide an operator who shall drive the motor-driven cycle through the response or detection area of the detector at a speed of not more than seven miles per hour.

The first paragraph in Section 86-2.14B(3), "Insulation Resistance," is amended by the addition of the following two sentences:

"A final insulation resistance test shall be performed on the inductive loop detectors at the controller cabinet after said detectors have been installed in accordance with the plans and the final splices have been made between the loop detector at the pull box adjacent to the loop. Conductors for the inductive loop detectors shall be placed to a depth in the slots cut in the pavement to provide at least one inch of cover over the top conductor installed in the slot."

The slots shall be filled with an elastomeric sealant or hot-melt rubberized asphalt sealant. Residue resulting from the slot cutting operations shall not be permitted to flow across shoulders or public traffic lanes and shall be removed from pavement surface.

The special detector handhold shall be a type B.

Loop detector lead-in cable shall be Type B and the loop wire shall be Type 2. The number of lead-in cables required to achieve the specified detection shall be installed. The lead-in cables shall run continuously without splices from the detector termination pull box to the field terminals in the controller cabinet.

The Type C loop detector, as shown on the Standard Plan Sheet ES-5B, shall consist of two turns wound in two identical layers. Each turn shall start and finish in the termination pull box and shall be connected in series.

Luminaires

Luminaires shall conform to the provisions in Section 86-6.01, "High Pressure Sodium Luminaries," of the Standard Specifications and these special provisions.

All luminaires shall be the 200-watt, high-pressure sodium type and shall be the cutoff type.

Lighting distribution shall be the Type III medium cut-off. Ballasts shall be the lag or lead regulator type.

Glare shields shall be fabricated of the material specified for luminaires and shall have the same finish as the luminaires furnished.

Photoelectric Controls

Photoelectric controls shall conform to the provisions in Section 86-6.07, "Photoelectric Controls," of the Standard Specifications and these special provisions.

The photoelectric units shall be Type III. Contactors shall be the mechanical armature type.

Ballasts

Ballasts shall conform to the provisions in Section 86-6.01A, "High Pressure Sodium Lamp Ballasts," of the Standard Specifications and these special provisions.

The ballast for each high-pressure sodium lamp to be used in a mast arm mounted luminaire shall be mounted in the luminaire housing.

The ballast shall operate at 208 or 240 volts at locations shown on the plans.

Payment for the signals and lighting shall conform to the provisions in Section 86-8.01, "Payment," of the Standard Specifications and these special provisions.

The contract lump sum price paid for the item "Traffic Signal Installation" shall include full compensation for furnishing all labor, materials, tools, equipment, signs and incidentals for installing the signal system complete, in-place and in an operating condition all as specified herein and as determined by the Engineer. No additional compensation will be allowed.

Battery Backup System for Traffic Signal

Battery Backup System shall be Tesco Model Traffic 22 BBS self contained, metered distribution system specifically designed for traffic signal controllers or approved equal. All substitutes shall be approved by the Engineer prior to installation.

The Battery Backup UPS panel shall feature**:** Hot dipped galvanized steel construction, ambient enclosure compensation, vandal resistant construction with no exposed nuts bolts, screws, rivets, or fasteners on the exterior or enclosure. The UPS System shall feature tilt-out housing for ease of maintenance and the battery tray shall be seismically rated.

The Battery Backup UPS System shall feature: 1400 VA, 950 watts with a standard 3 hr. run time with LED system, 6 hr recharge time to a minimum of 95%. System shall contain full power bypass and isolation switches. UPS System shall conform to NEMA, NEC and UL standards.

The UPS System shall have RS-232 and USB ports for local or remote monitoring.

Battery shall be 24V 18AH compact lightweight and the management system shall be microprocessor controlled with smart battery charger and automatic self test.

System shall feature a minimum 2 year warranty.

Battery backup System Cabinet shall be all welded construction, hot dipped galvanized steel powder coated. All fasteners, latches, hinges, and hardware shall be stainless steel. Cabinet door shall be fully framed continuous hinge with swaged dose tolerance sides for flush fit with top drip lip and dosed cell neoprene flange compressed gaskets. Cabinet enclosure shall be ambient temperature enclosure compensated.

Battery Backup Cabinet shall be mounted to signal controller cabinet per manufacturer's specifications.

Battery backup system shall be tested and fully operational when traffic signal is activated for service.

Battery backup system shall be generator capable.

Full compensation for furnishing and installing Battery Backup System shall be considered as included in the contract lump sum price paid for traffic signal installation and no additional compensation will be allowed therefor.

23. 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 300 m (~1,000 ft.) from the optical detector.

Class II (emergency) vehicles shall be detected at ranges up to 550 m (~1,800 ft.) 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.

23. EMERGENCY VEHICLE DETECTOR SYSTEM (Continued)

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.

Each emitter assembly, including lamp, shall operate over an ambient temperature range of -34°C (~-29ºF) to 60°C (~140ºF) at both modulation frequencies and operate continuously at the higher frequency for a minimum of 3000 hours at 25°C (~77ºF) 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 300 m 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 verage of 0.0003-candela per energy pulse in the wavelength range of 380 nm to 750 nm when measured at a distance of 3 m (~9.84 ft.). 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 550 m (~1,800 ft.) 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 300 m for Class I signals and 550 m (~1,800 ft.) 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 300 m (~1,000 ft.) for a Type I emitter and at a range of 550 m (~1,800 ft.) 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 Size 21 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 1.1 kg (~2.43 lbs.) and shall present a maximum wind load area of 230 cm^2 (~35.65 $in.^2$). 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 (EVC) shall meet the requirements of IPCEA-S-61-402/NEMA WC 5, Section 7.4, 600-V (ac) control cable, 75°C (~167ºF), 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 0.63-mm (~0.025 in.). 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 (~176ºF) and a minimum average thickness of 1.1 mm (~0.043 in.). The jacket shall be marked as required by IPCEA/NEMA.

D. The finished outside diameter of the cable shall not exceed 8.9 mm (~0.35 in.).

E. The capacitance, as measured between any conductor and the other conductors and the shield, shall not exceed 157 pf per meter (~3.28 ft.) 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

Each discriminator module shall be designed to be compatible and usable with a Model 170 controller unit and to be mounted in the input file of a Model 332 or Model 336 controller cabinet, and
shall conform to the requirements of Chapter I of the State of California, Department of Transportation, "Traffic Signal Control Equipment Specifications."

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 300 m (~1,000 ft.) and Class II signals at a range of up to 550 m (~1,800 ft.).
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 Model 170 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 170 controller unit inputs.

Each discriminator module shall be provided with means of preventing transients received by the detector from affecting the Model 170 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 65 mm (~2.56 in.) maximum from the front panel surface of the discriminator module.

Cabinet Wiring

The Model 332 cabinet has provisions for connections between the optical detectors, the discriminator module and the Model 170 controller unit.

Wiring for a Model 332 cabinet shall conform to the following:

A. Slots 12 and 13 of input file "J" have each been wired to accept a 2-channel module.

B. Field wiring for the primary detectors, except 24-V (dc) power, shall terminate on either terminal board TB-9 in the controller cabinet or on the rear of input file "J," depending on cabinet configuration. Where TB-9 is used, position assignments shall be as follows:

Position	Assignment
4	Channel A detector input, 1st module (Slot J-12)
5	Channel B detector input, 1st module (Slot J-12)
7	Channel A detector input, 2nd module (Slot J-13)
8	Channel B detector input, 2nd module (Slot J-13)

The 24-V (dc) cabinet power will be available at Position 1 of terminal board TB-1 in the controller cabinet.

23. EMERGENCY VEHICLE DETECTOR SYSTEM (Continued)

Field wiring for the auxiliary detectors shall terminate on terminal board TB-O in the controller cabinet. Position assignments are as follows:FOR MODULE 1 (J-12)		FOR MODULE 2 (J-13)	
Position	Assignment	Position	Assignment
1	+24V (dc) from (J-12E)	7	+24V (dc) from (J-13E)
2	Detector ground From (J-12K)	8	Detector ground from (J-13K)
3	Channel A auxiliary detector input 1	9	Channel A auxiliary detector input 1
4	Channel A auxiliary detector input 2	10	Channel A auxiliary detector input 2
5	Channel B auxiliary detector input 1	11	Channel B auxiliary detector input 1
6	Channel B auxiliary detector input 2	12	Channel B auxiliary detector input 2

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 ft (~300 m.) between the emitter and the detector, the other using a Class II signal emitter and a distance of 1,800 ft (~550 m.) 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 Model 170 controller unit during each "on" interval and there shall be no improper operation of either the Model 170 controller unit or the monitor during each "off" interval.

Full compensation for furnishing and installing the Emergency Vehicle Detector System shall be considered as included in the contract lump sum price paid for traffic signal installation and no additional compensation will be allowed therefor.

24. ADVANCED FLASHING BEACON (TYPE 15-FBS)

The advanced flashing beacons shall conform to the provisions in Section 86-4.09, “Flashing Beacons,” of the Standard Specifications and these special provisions.

The Contractor shall furnish the complete and fully operational advanced flashing beacon assemblies. See Cal Trans 2006 Standard Plan ES-7J.

24. ADVANCED FLASHING BEACON (TYPE 15-FBS) (Continued)

The contract lump sum price paid for the item "Advanced Flashing Beacon (Type 15-FBS)" shall include all labor, materials, tools, equipment, and incidentals needed for installing the flashing beacon systems complete and in-place all as shown on the plans and as determined by the Engineer. No additional compensation will be allowed therefor.

25. CONCRETE PEDESTRIAN RAMP TYPE 'B'

Concrete returns with curb ramps, curbs and gutters, and sidewalks shall conform to the provisions in Section 73-1 "Concrete Curbs and Sidewalks," of the Standard Specifications and these Special Provisions and as shown on the plans.

The detectable warning surface and truncated domes shall conform to the requirements indicated on the revised Standard Plan A88A. Truncated domes shall be included in the unit price paid for the item "Concrete Pedestrian Ramp Type B" and no additional compensation will be allowed therefore.

The concrete used in the construction of the above mentioned items shall be class 3 and conform to the requirements in these Special Provisions.

Portland cement concrete facilities shall be constructed at the locations shown on the attached plan sheets, or as determined by the Engineer, and shall conform to the details and dimensions as shown on the attached plan sheets.

The Contractor shall ensure that any Utility Companies adjust all utility boxes to grade, which may be in conflict with the Concrete Pedestrian Ramp, prior to any concrete placement.

No concrete shall be placed until the sub-grade and forms have been reviewed for satisfactory compaction, alignment, and grade, and approved by the Engineer.

No adjustment in compensation will be made for any increase or decrease in the quantity of concrete facilities required, regardless of the reason for such increase or decrease. The provisions in Section 4-1.03B, "Increase or Decrease Quantities", of the Standard Specifications shall not apply to the item of "Concrete Pedestrian Ramp Type B".

The unit price paid for each curb ramp shall include full compensation for furnishing all labor, tools, materials, and equipment, and for doing all the work involved in constructing concrete facilities, removal of structural section material, placement of asphalt concrete adjacent to new concrete construction, adjustment of utility boxes to grade, setting forms and grades as shown on the plans, as specified in the Standard Specifications, in these Special Provisions and as determined by the Engineer. Pay limits for the item "Concrete Pedestrian Ramp Type B" shall be as shown on the plans, which include all curb, gutter, sidewalk, and ramps.

26. CONCRETE ISLAND (Type C Passageway)

Concrete radii with curb ramps, curbs and gutters, and sidewalks shall conform to the provisions in Section 73-1 "Concrete Curbs and Sidewalks," of the Standard Specifications and these Special Provisions.

26. CONCRETE ISLAND (Type C Passageway) (Continued)

The Concrete Island shall conform to the requirements of Standard Plan A88B, Type C Passageway.

The concrete used in the construction of the above mentioned items shall be class 3 and conform to the requirements in these Special Provisions.

Portland cement concrete facilities shall be constructed at the locations shown on the attached plan sheets, or as determined by the Engineer, and shall conform to the details and dimensions as shown on the attached plan sheets.

The Contractor shall ensure that any Utility Companies adjust utility boxes to grade prior to any concrete placement.

No concrete shall be placed until the sub-grade and forms have been reviewed for satisfactory compaction, alignment, and grade, and approved by the Engineer.

No adjustment in compensation will be made for any increase or decrease in the quantity of concrete facilities required, regardless of the reason for such increase or decrease. The provisions in Section 4-1.03B, "Increase or Decrease Quantities", of the Standard Specifications shall not apply to the item of Concrete Island (Type "C" Passageway).

The unit price paid for each concrete island shall include full compensation for furnishing all labor, tools, materials, and equipment, and for doing all the work involved in constructing concrete facilities, removal of structural section material, placement of asphalt concrete adjacent to new concrete construction, adjustment of any utility boxes to grade, construction of ramps, setting forms, and grades, and placing truncated domes as shown on the plans, as specified in the Standard Specifications, in these Special Provisions and as determined by the Engineer.

27. FENCING – TYPE WM (MODIFIED)

Fencing shall conform to the provisions in Section 15-2.05B, "Fences," and in Section 80, "Fences," of the Standard Specifications and these special provisions.

New fencing shall be Type WM (modified) with metal posts and shall comply with the provisions in Section 80-3, "Types BW and WM Fence," of the Standard Specifications and these special provisions.

The minimum width for the wire mesh fencing outlined in Section 80-3.01D, "Wire Mesh," of the Standard Specifications has been changed to 39 inches.

The barbed wire mentioned in section 80-1.01, "Description" and Section 80-3.01C, "Barbed Wire," of the Standard Specifications shall be placed in two lines.

All proposed fencing material, hardware and posts are subject to the "Buy America Requirements" of this contract and shall be approved by the Engineer prior to installation.

Braces shall be used at all angle points within the fencing limits. All metal post shall be utilized for the construction of the fence.

27. FENCING – TYPE WM (MODIFIED) (Continued)

The contract price paid per linear foot for the item "Fencing - Type WM (Modified)" shall include full compensation for furnishing all the labor, materials, tools, and equipment needed for the construction of the fencing in current soil conditions as noted, and no additional compensation will be allowed therefor.

28. THERMOPLASTIC TRAFFIC STRIPES AND PAVEMENT MARKINGS

Thermoplastic traffic stripes (traffic lines) and pavement markings shall conform to the provisions in Sections 84-1, "General," and 84-2, "Thermoplastic Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

Thermoplastic material for traffic stripes shall be applied at a minimum thickness of 0.080 inch.

Measurement of payment for all striping shall be paid for in equivalent 4" width per lineal foot.

Grinding to eliminate existing conflicting striping shall be paid for in the Item "Clearing & Grubbing"

Thermoplastic lettering stencils shall have the same dimensions as the "Hawkins Traffic Safety Supply" M8H Series. A copy of the stencil dimensions is available for review at the office of the Director of Public Works. Traffic arrows shall be of the dimensions pursuant to those shown in the State of California, Department of Transportation's Standard Plans.

Measurement of payment for the contract price paid per square foot of "Thermoplastic Pavement Markings" shall be the square footage for the completed markings as shown in the aforementioned Standard Plans.

The State Specification Number for glass beads in Section 84-2, "Materials," of the Standard Specifications is amended to read "8010-21C-22 (Type II)".

29. PAVEMENT MARKERS (RETROREFLECTIVE)

Pavement markers shall conform to the provisions in Section 85, "Pavement Markers," of the Standard Specifications and these special provisions. However, the second paragraph in Section 85-1.02, "Type of Markers," of the Standard Specifications shall not apply. Certificates of compliance shall be furnished for pavement markers as specified in "Pre-qualified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Pavement markers shall be 3M-290 or approved equal.

When bituminous adhesive is used for pavement marker placement, traffic control during placement operations shall conform to the requirements of "Traffic Control System For Lane Closure," of these special provisions.

The unit price paid for Pavement Markers shall include full compensation for furnishing all labor, tools, materials, and equipment, and for doing all the work involved in installing the markers and shall be included in the item "Pavement Markers (Retro-Reflective)" and no additional compensation will be allowed therefor.

30. FINAL EROSION CONTROL (TYPE D)

Erosion control (Type D) shall conform to the provisions in Section 20-3, "Erosion

Control," of the Standard Specifications and these special provisions and shall consist of applying erosion control materials to embankment and excavation slopes and other areas disturbed by construction activities. The areas to receive the erosion control (Type D), but not limited to, are shown on sheet 11 of 11 of the plans and represent a total area of approximately 0.39 acre. Areas disturbed for contractor staging and storage shall be hydro seeded at the contractor's expense and are not included in the 0.38 acre. The areas shown are for estimating purposes only, the exact amount and locations shall be as determined by the Engineer.

If the slope on which the erosion control is to be placed is finished during the month of October or later, the erosion control shall be applied immediately to the slope.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 2 inches in depth or width shall be leveled. Vegetative growth, temporary erosion control materials, and other debris shall be removed from areas to receive erosion control.

Materials

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions

Seed

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the project site in unopened separate containers with the seedtag attached. Containers without a seed tag attached will not be accepted. A sample of approximately 30 g of seed will be taken from each seed container by the Engineer.

Legume Seed

Legume seed shall be pellet-inoculated or industrial-inoculated and shall conform to the following:

A. Inoculated seed shall be inoculated in conformance with the provisions in Section 20-2.10, "Seed," of the Standard Specifications.

B. Inoculated seed shall have a calcium carbonate coating.

C. Industrial-inoculated seed shall be inoculated with Rhizobia and coated using an industrial process by a manufacturer whose principal business is seed coating and seed inoculation.

D. Industrial-inoculated seed shall be sown within 180 calendar days after inoculation.

1. Legume seeds shall consist of genetic material collected from Central Valley or

Foothills of Northern California below 2000 feet. Legume seed shall consist of the following

LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Pounds Pure Live Seed Per Acre (Slope Measurement)
*Lotus purshianus (Pershings Lotus)	70	5
*Lupinus bicolor (Pygmy-Leaf Lupine)	40	9
*Trifolium wildenovii (Tomcat Clover)	40	8

Non-Legume Seed

Non-Legume seeds shall consist of genetic material collected from Central Valley or Foothills of Northern California below 2000 feet. Non-legume seed shall consist of the following:

NON-LEGUME SEED

Botanical Name (Common Name)	Percent Germination (Minimum)	Pounds Pure Live Seed Per Acre (Slope Measurement)
*Leymus triticoides (Creeping Wildrye)	70	12
*Bromus carinatus (California Brome)	70	9
*Elymus glaucus (Blue Wildrye)	70	9
*Nassella pulchra (Purple Needlegrass)	70	9

Commercial Fertilizer

Commercial fertilizer shall conform to the provisions in Section 20-2.02, "Commercial Fertilizer," of the Standard Specifications and shall have a guaranteed chemical analysis of 20 percent nitrogen, 11 percent phosphoric acid and 12 percent water soluble potash.

Straw

Straw shall conform to the provisions in Section 20-2.06, "Straw," of the Standard Specifications and these special provisions. Straw shall be derived from rice and shall be applied at the rate of two (2) tons/acre.

Compost

Compost shall be derived from green material consisting of chipped, shredded or ground vegetation or clean processed recycled wood products or a Class A, exceptional quality biosolids composts, as required by the United States Environmental Protection Agency (EPA), 40 CFR, Part 503c regulations or a combination of green material and biosolids compost. The compost shall be processed or completed to reduce weed seeds, pathogens and deleterious material, and shall not contain paint, petroleum products, herbicides, fungicides or other chemical residues that would be harmful to plant or animal life. Other deleterious material, plastic, glass, metal or rocks shall not exceed 0.1 percent by weight or volume. A minimum internal temperature of 135˚F shall be maintained for at least 15 continuous days during the composting process. The compost shall be thoroughly turned a minimum of 5 times during the composting process and shall go through a minimum 90-day curing period after the 15-day thermophilic compost process has been completed. Compost shall be screened through a maximum 3/8 inch screen. The moisture content of the compost shall not exceed 35 percent. Compost products with a higher moisture content may be used provided the weight of the compost is increased to equal the compost with amoisture content of 35 percent. Moist samples of compost on an as received basis shall be dried in an oven at a temperature between 220°F and 240°F until a constant dry weight of the sample is achieved. The percentage of moisture will be determined by dividing the dry weight of the sample by the moist weight of the sample and then multiplying by 100. Compost may be tested for maturity and stability with a Solvita test kit. The compost shall measure a minimum of 6 on the maturity and stability scale.

Stabilizing Emulsion

Stabilizing emulsion shall conform to the provisions in Section 20-2.11, "Stabilizing Emulsion," of the Standard Specifications and these special provisions.

Stabilizing emulsion shall be in a dry powder form, may be reemulsifiable, and shall be a processed organic adhesive used as a soil tackifier.

Application

Erosion control materials shall be applied in separate applications in the following sequence:

A. The following mixture in the proportions indicated shall be applied with hydro-seeding equipment within 60 minutes after the seed has been added to the mixture:

Material	Pounds Per Acre (Slope Measurement)
Legume Seed	22
Non-Legume Seed	39
Fiber	357
Commercial Fertilizer	268

Material	Cubic Feet Per Acre (Slope Measurement)
Compost	47

30. FINAL EROSION CONTROL (TYPE D) (Continued)

B. The Contractor may dry apply compost at the total of the rates specified in the preceding table and the following table instead of including it as part of the hydro-seeding operations. In areas where the compost is dry applied, all compost for that area shall be applied before the next operation.

C. Straw shall be applied at the rate of 2 ton per acre based on slope measurements. Incorporation of straw will not be required. Straw shall be distributed evenly without clumping or piling.

The following mixture in the proportions indicated shall be applied with hydro-seeding equipment

Material	Pounds Per Acre (Slope Measurement)
Fiber	357
Commercial Fertilizer	268
Stabilizing Emulsion (Solids)	156

Material	Cubic Feet Per Acre (Slope Measurement)
Compost	47

The ratio of total water to total stabilizing emulsion in the mixture shall be as recommended by the manufacturer.

Once straw work is started in an area, stabilizing emulsion applications shall be completed in that area on the same working day.

The proportions of erosion control materials may be changed by the Engineer to meet field conditions.

Measurement and Payment

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing and applying compost, stabilizing emulsion, fertilizer, seed and straw for final erosion control, complete in place, as specified in the Standard Specifications, these special provisions, and as determined by the Engineer shall be included in the contract lump sum price paid for the item "Final Erosion Control (Type'D')".

31. FIBER ROLLS

Fiber rolls shall conform to these special provisions. Fiber Rolls are to be installed on all areas where erosion control (type D) is being placed and as determined by the Engineer.

Materials

Fiber rolls shall consist of one of the following:

A. Fiber rolls shall be constructed on the project site with manufactured blankets consisting of one or a combination of wood excelsior, rice, wheat or coconut fibers. The blanket shall measure approximately 12 ft. wide by 85 ft. to 100 ft. in length. Wood excelsior material shall have individual fibers, 80 percent of which shall be 6 inches or longer in fiber length. The blanket shall have a photodegradable plastic netting. The blanket shall be rolled on the blanket's width and secured with jute twine spaced 6 feet apart along the roll for the full length and 6 inches from each end of the individual rolls.

The blanket shall be rolled so that the netting is on the outside of the finished roll. The finished roll diameter shall be a minimum of 7 inches and a maximum of 9 inches and shall weigh not less than 2.5 pounds/yard.

B. Fiber rolls shall be pre-manufactured rice or wheat straw, wood excelsior or coconut fiber rolls encapsulated within a photodegradable plastic netting. Each roll shall be a minimum of 7 inches and a maximum of 9 inches in diameter and 23 ft. to 30 ft. in length and shall weigh not less than 2.5 pounds/yard. The netting shall be ultraviolet (UV) degradable plastic. The netting shall have a minimum durability of one year after installation. The netting shall be secured tightly at each end of the individual rolls.

C. Stakes shall be fir or pine and shall be a minimum of 1 inch x 1 inch x 2 ft. in length. Metal stakes may be used as an alternative. The Contractor shall submit a sample of the metal stake to the Engineer prior to installation. The tops of the metal stakes shall be bent over at a 90-degree angle. No additional compensation will be allowed for the use of a metal stake.

Installation

Fiber rolls shall be joined tightly together to form a single linear roll that is installed approximately parallel to the slope contour. Fiber rolls shall be installed prior to the application of other erosion control materials.

Furrows shall be constructed at a slight angle to the slope contour , to a depth of 2 inches to 4 inches, and at a sufficient width to hold the fiber rolls.

Rolls shall be installed at contour intervals of 6 ft. of elevation in the furrows with the first row installed 5 ft. above the toe of slope. Individual rolls shall be placed with adjacent ends butted firmly to each other to create a continuous linear roll.

Stakes shall be installed 3 ft. apart along the total length of the rolls and 5 inches from the end of each individual roll. Stakes shall be driven flush or a maximum of 2 inches above the roll.

Measurement and Payment

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing fiber rolls, complete in place, including stakes, as

31. FIBER ROLLS (Continued)

specified in the Standard Specifications, these special provisions and as determined by the Engineer shall be included in the contract lump sum price paid for the item "Final Erosion Control (Type'D')"

32 FINISHING ROADWAY

Finishing roadway shall conform to the provisions in Section 22, "Finishing Roadway," of the Standard Specifications and these Special Provisions.

Full compensation for finishing roadway shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

33. MONUMENTS

A Butte County Std S-11 monument and well shall be placed at the intersection of Skyway and Honey run Road and the intersection of Skyway and Longest Drive after the final paving overlay has been completed. The location for the monument wells shall be staked by the Butte County Surveying Department. Four "straddlers" shall be placed in the paved surface for reference location of the final well placement. The Butte County Surveying Department shall place the final punch marks in the brass cap once the monument and well has been placed in its final location. The survey department shall require a 72 hr. advance notice for all staking requests.

The contract price paid for the item "Monumentation" shall include full compensation for furnishing all the labor, materials, tools, and equipment needed for the placement of all Monument Wells per Butte County Standard S-11, and no additional compensation will be allowed therefor.

34 REFERENCED STANDARDS

Except as otherwise indicated, the current editions of the following Specifications and Standards apply to the WORK of this Section:

SSPC Steel Structures Painting Council, 4516 Henry Street, Pittsburgh, PA 15213.

NACE NACE International, the Corrosion Society, 1440 South Creek Drive, Houston, TX 77084.

ASTM American Society for Testing Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ANSI/AWWA American Water Works Association, 6666 West Quincy Ave., Denver, CO 80235.

TT-S230 type II Federal Specifications

29 CFR Codes of Federal Regulations Title 29, Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.

1926.62.1 Safety and Health Regulations for Construction, Lead.

1926.502.1 Fall protection systems criteria and practices.

Occupational Safety and Health Standards.

40 CFR (Code of Federal Regulations) Title 40, Environmental Protection Agency.

50 National primary and secondary ambient air quality standards

60 Standards of performance for new stationary sources.

262 Standards applicable to generators of hazardous waste.

263 Standards applicable to transporters of hazardous waste.

264 Standards for owners and operators of hazardous waste treatment, storage, and disposal facilities.

265 Interim status standards for owners and operators of hazardous waste treatment, storage, and disposal facilities.

268 Land disposal restrictions.

300 National Oil and Hazardous Substances Pollution Contingency Plan.

302 Designation, reportable quantities, and notification.

EPA Environmental Protection Agency

Method 1311 Toxicity Characteristic Leaching Procedure (TCLP).

SW 846 Test Methods for Evaluating Solid Waste Physical/Chemical Methods