Amendments to the PPP shall be submitted for review and approval by the Engineer in the same manner specified for the initial approval of the PPP. The Contractor shall date and attach all approved amendments to the PPP. Upon approval of the amendment, the Contractor shall implement the additional BMPs, revised construction activities or operations as described therein.

Pollution Prevention Plan Implementation:

Upon approval of the PPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting and maintaining the BMPs included in the PPP and any amendments thereto and for removing and disposing of temporary BMPs. Unless otherwise directed by the Engineer or specified in these Special Provisions, the Contractor's responsibility for PPP implementation and maintenance shall continued throughout any temporary suspension of work ordered in accordance with Section 8-1.05, "Temporary Suspension of the Work", of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal and disposal of BMPs are specified in the Caltrans Handbooks and these Special Provisions. The Contractor shall implement the PPP in accordance with the Caltrans Handbooks and these Special Provisions.

The Engineer may order the suspension of construction operations if the Contractor fails to comply with the requirements of "Stormwater and Non-Stormwater Pollution Control" as determined by the Engineer.

a. Stormwater Pollution Control - The Contractor shall implement soil stabilization practices and sediment control BMPs, including minimum requirements as presented in the Caltrans Handbooks, on all disturbed areas of the project site throughout the winter season, defined as between October 1st and May 31st.

   Implementation of soil stabilization practices and sediment control BMPs for soil-disturbed areas, including but not limited to, rough graded access roads, slopes, channel inverts, operational inlets and outlets of the project site shall be completed no later than ten (10) calendar days prior to the start of the winter season or upon start of applicable Contractor's construction activities for projects which begin either during or within ten (10) calendar days of the winter season.

   The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control BMPs to protect soil-disturbed areas of the project site by maintaining an adequate quantity of soil stabilization and sediment control materials onsite to protect exposed, soil-disturbed areas and a detailed plan for the mobilization of sufficient labor and equipment to fully deploy the required BMPs prior to the onset of precipitation and for the duration of the project.

Throughout the winter season, active soil-disturbed areas of the project site shall be fully protected at the end of each day with soil stabilization practices and sediment control BMPs. The Contractor shall monitor the weather forecast on a daily basis. The National Weather Service forecast shall be used or an alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted prior to the end of the following workday, construction scheduling shall be modified, as required, and the Contractor shall deploy functioning control measures prior to the onset of the precipitation.

Throughout the winter season, soil-disturbed areas of the project site shall be considered to be non-active whenever soil disturbing activities are expected to be discontinued for a period of fifteen (15) calendar days or more. Areas that will become non-active either during the winter season or within ten (10) calendar days thereof shall be fully protected with soil stabilization practices such as covering with mulch, temporary seeding, fiber rolls, blankets, etc. within ten (10) calendar days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur. Areas that will become non-active either during the winter season or within ten(10) calendar days thereof shall be fully protected with sediment control BMPs within ten (10) calendar days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur.

b. Non-Stormwater Pollution Control - The Contractor shall implement, year-round and throughout the duration of the project, BMPs included in the PPP for sediment tracking, wind erosion, non-stormwater management, and waste management and disposal.

c. Inspections and Reporting - The Contractor shall regularly inspect the construction site for BMPs identified in the PPP to ensure the proper implementation and functioning of BMPs. The Contractor shall identify corrective actions and time frames to address any deficient BMPs that have been discontinued.

At a minimum, the Contractor shall inspect the construction site as follows:

1. Prior to a forecast storm;
2. After any precipitation which causes runoff capable of carrying sediment from the construction site;
3. At 24 hour intervals during extended precipitation events; and
4. At regular interval of once every 2 weeks.

The construction site inspection checklist provided in the Caltrans Handbooks shall be used to ensure that the

necessary BMPs are being properly implemented and are functioning adequately. The Contractor shall submit one copy of each site inspection record to the Engineer.

d. Maintenance - The Contractor shall maintain construction site BMPs identified in the PPP to ensure the proper implementation and functioning of BMPs. If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified BMP, the deficiency shall be corrected by the Contractor immediately, or by a later date and time if requested by the Contractor and approved by the Engineer in writing, but not later than the onset of subsequent precipitation events. The correction of deficiencies shall be at no additional cost to the District.

e. Training - The Contractor shall describe the types of training that the Contractor's BMP inspection, maintenance, and repair personnel have received or will receive that is directly related to stormwater pollution prevention.

Payment:

Payment for implementing erosion control and water pollution control measures will be paid for under the bid item Water Pollution Control on a lump sum basis, for all the work performed, including plan preparation.

AGGREGATE BASE:

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

The first paragraph of Section 26-1.02A, "Class 2 Aggregate Base" shall be modified to read:

Aggregate for Class 2 aggregate base shall be free from organic matter and other deleterious matter, and shall be of such nature that it can be compacted readily under watering and rolling to form a firm and stable base. Aggregate may consist of broken and crushed asphalt concrete or Portland cement concrete and may contain crushed aggregate base or other rock materials. The material may contain no more than 3 percent brick by weight as determined by California Test Method 202 as modified: Brick material retained on a No.4 sieve shall be identified visually and separated manually. Brick quantification shall be based on total weight of dry sample. Also, material retained on the 4.75 mm (No.4) sieve shall contain no more than 15 percent of particles (gravel) that have no more than one fractured face.

The Quality Requirements contained in Section 26-1.02A shall be modified to read:

QUALITY REQUIREMENTS

Test	Contract Compliance
Resistance (R-Value) Virgin Rock Crushed Miscellaneous	 78 Minimum 80 Minimum
Sand Equivalent	35 Minimum
Durability Index	35 Minimum
Percentage Wear 100 Revolutions 500 Revolutions	 15 Maximum 52 Maximum

Quantities of Aggregate Base will be paid for at the contract unit price per cubic yard and in accordance with the provisions of Sections 26-1.06 and 26-1.07 of the Standard Specifications.

PREPARING EXISTING ROADBED FOR RESURFACING:

When hot mix asphalt is to be spread over existing pavement, the existing pavement shall first be cleaned of all dirt and extraneous material. The area shall be sprayed with paint binder prior to resurfacing.

The area to which paint binder has been applied shall be closed to public traffic. Care shall be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction. Full compensation for furnishing all labor, tools, and materials necessary to clean tracked paint binder shall be considered as included in the contract price paid per ton for Hot Mix Asphalt.

Hot mix asphalt shall be placed on all existing surfacing, including curve widening, public road connections, and left turn pockets, unless otherwise directed by the Engineer.

All raised pavement markers shall be removed prior to the application of paint binder.

The Contractor will be required to place and remove temporary pavement markings as directed by the Engineer.

At the end of each day's work, preceding a non-working day or a day on which the Contractor does not work, the distance between the ends of the adjacent surfaced lanes shall not be greater than 10 feet nor less than 5 feet.

The Contractor shall adjust to finish grade any valve covers encountered within the project limits, as required, for those utility valves that are provided with slip cans and are adjustable without the replacement of parts or the removal of concrete collars.

In cases where the owning utility company insists upon upgrades in the standards, or when additional parts or the removal of concrete collars are required for the adjustment, said adjustment will be the responsibility of the owning utility company.

The Contractor shall lower manholes and valves when and as necessary for the protection of the traveling public during construction, and shall coordinate all work on said facilities with the owning utility companies. Final adjustment to grade will be the responsibility of the owning utility company, except as provided herein.

Said work shall be performed in accordance with Section 15-2.05A, "Frames, Covers, Grates, and Manholes" of the Standard Specifications. Full compensation for adjustment of valve covers, including initial lowering of valves and manholes when required, shall be considered as included in the contract price paid for asphalt concrete.
Except as otherwise provided, full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in preparing existing roadbed as shown on the plans, as specified herein, and as directed by the Engineer shall be considered as included in the contract bid price paid per ton for Hot Mix Asphalt.

FINISHING ROADWAY:

Finishing roadway shall conform to Section 22 of the Standard Specifications and these Special Provisions.

Full compensation, except as otherwise provided herein, for conforming to the requirements of this article shall be paid for on a lump sum basis and no additional compensation will be allowed therefor.

HOT MIX ASPHALT:

The asphalt concrete shall be Type "A" and shall conform to the requirements of Section 39 of the Standard Specifications and the following:

> Aggregate grading shall be three-quarter inch (3/4") maximum, medium for base course and three-quarter inch (3/4") maximum, medium for the final course. One-half inch (1/2") maximum, medium for the final course shall be used if shown on the plans or as directed by the Engineer.

The asphalt lift thickness table, as shown in Section 39-6.01, "General Requirements" of the Standard Specifications, is revised as follows:

Total Thickness Shown on Plans	Minimum No. of Layers	Top Layer Thickness (foot)		Next Lower Layer Thickness (foot)		All Other Lower Layer Thickness (foot)	
		Min.	Max.	Min.	Max.	Min.	Max.
0.24-foot or less[a]	1	-	-	-	-	-	-
0.25-foot	2[b]	0.12	0.13	0.12	0.13	-	-
0.26 - 0.46 foot	2	0.12	0.21	0.14	0.25	-	-
0.47-foot or more	3 or more	0.15	0.21	0.15	0.25	0.17	0.25

Footnotes to asphalt thickness table are revised as follows:

a. No Change.
b. One layer of 0.25 foot thick may be placed as approved by the Engineer. When the Traffic Index specified is 5.5 or below, two layers shall be placed.

Asphalts:

Asphalt shall conform to the provisions in this Section, "Asphalts". Section 92, "Asphalts" of the Standard Specifications shall not apply.

Asphalt shall consist of refined petroleum or a mixture of refined liquid asphalt and refined solid asphalt, prepared from crude petroleum. Asphalt shall be:

1. Free from residues caused by the artifical distillation of coal, coal tar, or paraffin;
2. Free from water;
3. Homogeneous.

General:

The Contractor shall furnish asphalt in conformance with the State of California Department of transportation's Certification Program for Suppliers of Asphalt". The Department maintains the program requirements, procedures, and a list of approved suppliers at http://www.dot.ca.gov/hq/esc/Translab/fpmcoc.htm.

The Contractor shall ensure the safe transportation, storage, use, and disposal of asphalt.

The Contractor shall prevent the formation of carbonized particles caused by overheating asphalt during manufacturing or construction.

Grade:

Performance graded (PG) asphalt binder shall conform to the following:

Property	AASHTO Test Method	Specification Grade		
		PG 64-10	PG 64-16	PG 70-10
Original Binder				
Flash Point, Minimum °C	T48	230	230	230
Solubility, Minimum %[b]	T44	99	99	99
Viscosity at 135 °C, Maximum, Pa·s	T316	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T315	64 1.00	64 1.00	70 1.00
RTFO Test[e], Mass Loss, Maximum, %	T240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T315	64 2.20	64 2.20	70 2.20
Ductility at 25 °C Minimum, cm	T51	75	75	75
PAV[f] Aging, Temperature, °C	R28	100	100	110
RTFO Test and PAV Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum G*/sin(delta), kPa	T315	31[d] 5000	28[d] 5000	34[d] 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, Mpa Minimum M-value	T313	0 300 0.300	-6 300 0.300	0 300 0.300

Notes:

a. Not used.
b. The Engineer will waive this specification if the supplier is a Quality Supplier as defined by Department's "Certification Program for Suppliers of Asphalt".
c. The Engineer will waive this specification if the supplier certifies the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards.
d. Test the sample at 3 °C higher if it fails at the specified test temperature. G*sin(delta) shall remain 5000 kPa maximum.
e. "RTFO Test" means the asphaltic residue obtained using the Rolling Thin Film Oven Test, AASHTO Test Method T240 or ASTM Designation: D2827.
f. "PAV" means Pressurized Aging Vessel.

Performance graded polymer modified asphalt binder (PG Polymer Modified) is:

Performance Graded Polymer Modified Asphalt Binder [a]

Property	AASHTO Test Method	Specification Grade		
		PG 58-34 PM	PG 64-28 PM	PG 76-22 PM
Original Binder				
Flash Point, Minimum °C	T 48	230	230	230
Solubility, Minimum % [b]	T 44[c]	98.5	98.5	98.5
Viscosity at 135°C, [d] Maximum, Pa·s	T 316	3.0	3.0	3.0
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 1.00	64 1.00	76 1.00
RTFO Test , Mass Loss, Maximum, %	T 240	1.00	1.00	1.00
RTFO Test Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Minimum G*/sin(delta), kPa	T 315	58 2.20	64 2.20	76 2.20
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum (delta), %	T 315	Note e 80	Note e 80	Note e 80
Elastic Recovery[f], Test Temp., °C Minimum recovery, %	T 301	25 75	25 75	25 65
PAV[g] Aging, Temperature, °C	R 28	100	100	110
RTFO Test and PAV Aged Binder				
Dynamic Shear, Test Temp. at 10 rad/s, °C Maximum G*sin(delta), kPa	T 315	16 5000	22 5000	31 5000
Creep Stiffness, Test Temperature, °C Maximum S-value, MPa Minimum M-value	T 313	-24 300 0.300	-18 300 0.300	-12 300 0.300

Notes:

a. Do not modify PG Polymer Modified using acid modification.
b. The Engineer waives this specification if the supplier is a Quality Supplier as defined by the Department's "Certification Program for Suppliers of Asphalt".
c. The Department allows ASTM D 5546 instead of AASHTO T 44.
d. The Engineer waives this specification if the supplier certifies the asphalt binder can be adequately pumped and mixed at temperatures meeting applicable safety standards.
e. Test temperature is the temperature at which G*/sin(delta) is 2.2 kPa. A graph of log G*/sin(delta) plotted against temperature may be used to determine the test temperature when G*/sin(delta) is 2.2 kPa. A graph of (delta) versus temperature may be used to determine delta at the temperature when G*/sin(delta) is 2.2 kPa. The Engineer also accepts direct measurement of (delta) at the temperature when G*/sin(delta) is 2.2 kPa.
f. Tests without a force ductility clamp may be performed.
g. "PAV" means Pressurized Aging Vessel.

Sampling:

The Contractor shall provide a sampling device in the asphalt feed line connecting the plant storage tanks to the asphalt weighing system or spray bar. The sampling device shall be accessible between 24 and 30 inches above the platform. The Contractor shall provide a receptacle for flushing the sampling device.

The sampling device shall include a valve:

1. With a diameter between 1/2 and 3/4 inches;

2. Manufactured in a manner that a one-quart sample may be taken slowly at any time during plant operations;

3. Maintained in good condition.

The Contractor shall replace failed valves.

In the presence of the Engineer, the Contractor shall take 2 one-quart samples per operating day. The Contractor shall provide round friction top containers with one-quart capacity for storing samples.

Applying Asphalt:

Unless otherwise specified, the Contractor shall heat and apply asphalt in conformance with the provisions in Section 93, "Liquid Asphalts" of the Standard Specifications.

Section 39-2.01, "Asphalts" is replaced in its entirety with the followings:

Asphalt binder to be mixed with aggregate shall conform to the provisions in "Asphalts" of these Special Provisions.

The grade of asphalt binder shall be 64-10 (Inland Valleys).

Liquid asphalt for prime coat shall conform to the provisions in Section 93, "Liquid Asphalts" of the Standard Specifications and shall be Grade 64-10 unless otherwise designated by the contract item or otherwise specified in the Special Provisions.

Asphaltic emulsion for paint binder (tack coat) shall conform to the provisions in Section 94, "Asphaltic Emulsion" of the Standard Specifications for the rapid-setting or slow-setting type and grade approved by the Engineer.

Section 39-3.01B (1) shall be amended to include:

Aggregate of the 3/4 inch or 1/2 inch maximum size and aggregate for asphalt concrete base shall be separated into 3 or more sizes and each size shall be stored in separate bins.

If 3 sizes are used, one bin shall contain that portion of the material which will pass the maximum size specified and be retained on a 3/8 inch sieve; one bin shall contain that portion of the material which will pass a 3/8 inch sieve and be retained on a No. 8 sieve; and one bin shall contain that portion of the material which will pass a No. 8 sieve.

Aggregate of 3/8 inch maximum size shall be separated into 2 sizes and each size shall be stored in separate bins. One bin shall contain that portion of the material which will pass the maximum size specified and be retained on a No. 8 sieve and one bin shall contain that portion of the material which will pass a No. 8 sieve.

The bin containing the fine material shall not contain more than 15 percent of material retained on the No. 8 sieve. The material in any of the other bins shall not contain more than 15 percent of material passing a No. 8 sieve. Failure to comply with this requirement shall be corrected immediately, and the material in the bins not meeting these requirements shall be re-screened or wasted.

All asphalt concrete for this project shall be supplied from one source unless approved by the Engineer. Said source shall be listed on the Contractors Source of Materials List as required in Section 6 of the Standard Specifications.

Asphaltic emulsion shall be furnished and applied as provided in Section 39-4.02.

The miscellaneous area shall be paid for at the contract price per square yard for Place Asphalt Concrete (Miscellaneous Area) in addition to the price paid for the materials involved.

In addition to the provisions in Section 39-5.01, "Spreading Equipment" of the Standard Specifications, asphalt paving equipment shall be equipped with automatic screed controls and a sensing device or devices.

When placing asphalt concrete to the lines and grades established by the Engineer, the automatic controls shall control the longitudinal grade and transverse slope of the screed. Grade and slope references shall be furnished, installed, and maintained by the Contractor. Should the Contractor elect to use a ski device, the minimum length of the ski device shall be 30 feet. The ski device shall be a rigid one piece unit and the entire length shall be utilized in activating the sensor.

When placing the initial mat of asphalt concrete on existing pavement, the end of the screed nearest the centerline shall be controlled by a sensor activated by a ski device not less than 30 feet. The end of the screed farthest from centerline shall be controlled by an automatic transverse slope device set to reproduce the cross slope designated by the Engineer, by a sensor activated by a similar ski device or as directed by the Engineer.

When paving contiguously with previously placed mats, 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 0.12 inch tolerance. The end of the screed farthest from the previously placed mat shall be controlled in the same way it was controlled when placing the initial mat.

Should the methods and equipment furnished by the Contractor fail to produce a layer of asphalt concrete conforming to the provisions, including straightedge tolerance, of Section 39-6.03, "Compacting" of the Standard Specifications or elsewhere in these Special Provisions, the paving operations shall be discontinued and the Contractor shall modify the equipment or methods, or furnish substitute equipment.

Should the automatic screed controls fail to operate properly during a day's work, the Contractor may manually control the spreading equipment for the remainder of that day. However, the equipment shall be corrected or replaced with alternative automatically controlled equipment conforming to the provisions in this section before starting another day's work.

General Criteria For Profiling:

In addition to the straightedge provisions in Section 39-6.03, "Compacting" of the Standard Specifications, asphalt concrete pavement shall conform to the surface tolerances specified herein.

The uppermost layer of asphalt concrete surfacing shall be profiled in the presence of the Engineer using a California Profilograph or equivalent in conformance with California Test 526 and as specified in these Special Provisions.

The California Profilograph or equivalent will not be required for the following areas of the pavement surface but shall conform to the straightedge requirements in Section 39-6.03, "Compacting" of the Standard Specifications:

1. Pavement with a total thickness less than 0.24 foot;

2. Pavement on horizontal curves with a centerline curve radius of less than 1,000 feet and the pavement within the superelevation transition on those curves;

3. Pavement placed in a single lift when required by the Special Provisions;

4. Pavement with extensive grade or cross slope correction which does not receive advance leveling operations in conformance with the provisions in Section 39-6.02, "Spreading" of the Standard Specifications;

5. Pavement for ramps and connectors with steep grades and high rates of superelevation, as determined by the Engineer;

6. Shoulders and miscellaneous areas.

The Contractor shall conform to California Test 526, except a zero (null) blanking band shall be used for determining the Profile Index. Prior to beginning profiles, the profilograph shall be calibrated in the presence of the Engineer. Two profiles shall be obtained within each traffic lane, 3 feet from and parallel with the edges of the lane.

Pavements profiled shall conform to the following Profile Index requirements:

1. Pavement on tangent alignment and pavement on horizontal curves having a centerline curve radius of 2,000 feet or more shall have a Profile Index of 0.16 foot or less for each 330 feet section profiled;

2. Pavement on horizontal curves having a centerline curve radius of 1,000 feet or more but less than 2,000 feet, including the pavement within the superelevation transition of these curves, shall have a Profile Index of 0.32 foot or less for each 330 feet section profile;

3. Pavement within any 330 feet section, containing high point areas with deviations in excess of 0.025 foot in a length of 25 feet or less, when tested in conformance with the requirements in California Test 526, shall be corrected by the Contractor regardless of the Profile Index.

The Contractor shall complete initial runs of the profilograph prior to opening the pavement to public traffic. If initial profiles can not made prior to opening the pavement to public traffic, the initial runs of the profilograph shall be made the next day that traffic control is permitted for the area to be profiled.

Areas of the top surface of the uppermost layer of asphalt concrete pavement that do not meet the specified surface tolerances shall be brought within tolerance by abrasive grinding.

Abrasive grinding shall be performed to reduce individual deviations in excess of 0.025 foot, and to reduce the Profile Index of the pavement to be within the specified tolerance. Areas which have been subjected to abrasive grinding shall receive a seal coat. Deviations in excess of 0.025 foot which cannot be brought into specified tolerance by abrasive grinding shall be corrected by either (1) removal and replacement or (2) placing an overlay of asphalt concrete. The corrective method for each area shall be selected by the Contractor and shall be approved by the Engineer prior to beginning the corrective work. Replacement or overlay pavement not meeting the specified tolerances shall be corrected by the methods specified above. Corrective work shall be at the Contractor's expense. The Contractor shall run profilograms on the areas that have received abrasive grinding or corrective work until the final profilograms indicate the Profile Index of the area is within the specifed tolerance.

When abrasive grinding is used to bring the top surface of the uppermost layer of asphalt concrete surfacing within the specified surface tolerances, additional abrasive grinding shall be performed as necessary to extend the area ground in each lateral direction so that the lateral limits of grinding are at a constant offset from, and parallel with, the nearest lane line or pavement edge, and in each longitudinal direction so that the grinding begins and ends at lines normal to the pavement centerline, within a ground area. Ground areas shall be neat rectangular areas of uniform surface appearance.

The original of the final profilograms that indicate the pavement surface is within the Profile Index specified shall become the property of the County and shall be delivered to the Engineer prior to acceptance of the contract.

Payment:

Hot Mix Asphalt will be paid for at a unit price per ton as a combined item, including mineral aggregate and asphalt binder in place on the roadbed.

Full compensation for furnishing and applying asphaltic emulsion (paint binder) shall be considered as included in the contract price paid for Hot Mix Asphalt.

ASPHALT CONCRETE DIKE:

Asphalt concrete dikes shall conform to the County Road Improvement Standards And Specifications, as specified and as directed by the Engineer.

The pay quantity of asphalt concrete dikes, the placing of which are to be paid for as a separate item of work in addition to the price paid for the asphalt concrete material.

The contract unit bid price paid per linear foot for Asphalt Concrete Dike, which price shall include full compensation for furnishing all labor, material, tools, equipment and doing all the work involved and complete in place including compacting, and no additional compensation will be allowed therefor.

Asphalt binder to be mixed with the aggregate shall be PG 70-10 in accordance with the Special Provisions for Asphalts, or as directed by the Engineer.

COMPENSATION ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS:

The provisions of this section shall apply only to the following contract items:

ITEM CODE	ITEM
390130	Hot Mix Asphalt

The compensation payable for asphalt binder used in hot mix asphalt and tack coat will be increased or decreased in conformance with the provisions of this section for paving asphalt price fluctuations exceeding 10 percent (Iu/Ib is greater than 1.10 or less than 0.90) which occur during performance of the work.

The quantity of asphalt binder used in tack coat will be determined by multiplying the item quantity for tack coat included in a monthly estimate by the minimum percent residue specified in Section 94, "Asphaltic Emulsions" of the Standard Specifications. The asphaltic emulsion minimum percent residue will be based on the type of emulsion used by the Contractor.

At the Contractor's option, the Contractor may provide actual daily test results for asphalt binder residue for the tack coat used. Test results provided by the Contractor shall be from an independent testing laboratory that participates in the AASHTO Proficiency Sample Program. The Contractor shall take samples of asphaltic emulsion from the distributor truck at mid-load from a sampling tap or thief. Two separate one-half (½) gallon samples shall be taken in the presence of the Engineer. The Contractor shall provide one sample to the Contractor's independent testing laboratory within 24 hours of sampling. The second sample shall be given to the Engineer. The test results from the Contractor independent testing laboratory shall be delivered to the Engineer within 10 days from sample date.

The adjustment in compensation will be determined in conformance with the following formulae when the item of hot mix asphalt or tack coat or both are included in a monthly estimate:

A. Total monthly adjustment = AQ

B. For an increase in paving asphalt price index exceeding 10 percent:

$$A = 0.90 (Iu/Ib - 1.10) Ib$$

C. For a decrease in paving asphalt price index exceeding 10 percent:

$$A = 0.90 (Iu/Ib - 0.90) Ib$$

D. Where:

A = Adjustment in dollars per ton of paving asphalt used to produce hot mix asphalt and asphaltic emulsion residue used as tack coat rounded to the nearest $0.01.

Iu = The California Statewide Paving Asphalt Price Index which is in effect on the first business day of the month within the pay period in which the quantity subject to adjustment was included in the estimate.

Ib = The California Statewide Paving Asphalt Price Index for the month in which the bid opening for the project occurred.

Q = Quantity in tons of asphalt binder that was used in producing the quantity of hot mix asphalt shown under "This Estimate" on the monthly estimate using the amount of asphalt binder determined by the Engineer plus the quantity in tons of asphalt binder that would have been used as residue in the tack coat shown under "This Estimate" on the monthly estimate.

The adjustment in compensation will also be subject to the following:

A. The compensation adjustments provided herein will be shown separately on payment estimates. The Contractor shall be liable to the State for decreased compensation adjustments and the Department may deduct the amount thereof from moneys due or that may become due the Contractor.

B. Compensation adjustments made under this section will be taken into account in making adjustments in conformance with the provisions in Section 4-1.03B, "Increased or Decreased Quantities" of the Standard Specifications.

C. In the event of an overrun of contract time, adjustment in compensation for paving asphalt included in estimates during the overrun period will be determined using the California Statewide Paving Asphalt Price Index in effect on the first business day of the month within the pay period in which the overrun began.

The California Statewide Paving Asphalt Price Index is determined each month on the first business day of the month by the Department using the median of posted prices in effect as posted by Chevron, Mobil, and Unocal for the Buena Vista, Huntington Beach, Kern River, Long Beach, Midway Sunset, and Wilmington fields.

In the event that the companies discontinue posting their prices for a field, the Department will determine an index from the remaining posted prices. The Department reserves the right to include in the index determination the posted prices of additional fields.

The California Statewide Paving Asphalt Price Index is available on the Division of Engineering Services website at: http://www.dot.ca.gov/hq/esc/oe/asphalt_index/astable.html

CONCRETE CURB RAMP:

Concrete curb ramps shall be constructed in accordance with the County Road Improvement Standard Plans and in conformance with Sections 51, 73 and 90 of the Standard Specifications.

Class 3 concrete shall be used.

Preparation of subgrade for the concrete structures shall be done in conformance with the requirements of Section 73-1.02 of the Standard Specifications.

Excess material resulting from the excavation of the subgrade shall be disposed of as elsewhere provided in these Special Specifications.

The Contractor is responsible for meeting requirements of all American with Disability Act (ADA).

Construction of curb ramps shall include, but not be limited to, the following:

1. Removal and disposal of existing soil and aggregate as required;
2. Establishing grades, and assuring that all grades are met;
3. Performing all grading and compaction - including all required aggregate import, as directed by the Engineer;
4. Construction of new sidewalk, curb, and/or curb and gutter;
5. All scoring/grooving and required saw cutting;
6. Repair of existing asphalt and PCC surfacing;
7. Installing 1/2-inch wide expansion joints;
8. All landscaping, and related work, to return the area adjacent to the curb ramp to its original condition and to conform the area to the new improvements.

At a minimum, the area from the BCR to ECR shall meet all required ADA standards. Therefore, to conform to existing conditions and/or to achieve the required four-foot level area (maximum of 2.0% crossfall) at the top potion of the curb ramp, it may be necessary to extend the work beyond the BCR/ECR in certain instances.

The contract unit bid price paid per each for Minor Concrete (Curb Ramp) shall include full compensation for furnishing all labor, tools, materials and equipment, and doing all work involved in the construction including the placing of expansion joints and any other work incidental thereto.

THERMOPLASTIC CROSSWALK AND PAVEMENT MARKING:

Thermoplastic crosswalk and pavement marking 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.

At the option of the Contractor, STAMARK Brand Pavement Tape, Pliant Polymer Grade, manufactured by the 3M Company; or Cata-Tile Elastoplastic Roadmarking Tile, manufactured by the Cataphote Division of the Ferro Corporation; or STAMARK Brand Pavement Tape, Bisymmetric 1.75 Grade, manufactured by the 3M Company, may be placed instead of the thermoplastic crosswalk and pavement marking specified herein. Pavement tape and roadmarking tile, if used, shall be installed in accordance with the manufacturer's specifications. If pavement tape or roadmarking tile is placed instead of thermoplastic crosswalk and pavement marking, the pavement tape or roadmarking tile will be measured and paid for as thermoplastic crosswalk and pavement marking.

Payment for Thermoplastic Crosswalk and Pavement Marking shall be paid by the square foot price bid and shall be considered as full compensation for furnishing all labor, materials, tools, equipment, and incidentals and doing all the work necessary to place the crosswalk and pavement marking complete in place and no additional compensation will be allowed.

PAVEMENT MARKERS:

Pavement markers shall conform to the provisions in Section 85, "Pavement Markers" of the Standard Specifications and these Special Provisions.

Pavement markers shall be placed to the line established by the Engineer. All additional work necessary to establish satisfactory lines for markers shall be performed by the Contractor.

Pavement markers shall be installed where indicated on the plans in accordance with the indicated striping detail. Refer to Standard Plans A20-A through A20-D for striping and markings details.

Markers and adhesive removal shall be performed by a method approved by the Engineer. Any pavement scarring resulting from the markers removal shall be repaired to the satisfaction of the Engineer.

Payment for furnishing and placing Pavement Markers will be at the unit price bid and shall include full compensation for furnishing all labor, materials, tools, equipment and no additional compensation will be allowed therefor.

ROADSIDE SIGNS (INSTALL/RELOCATE/SALVAGE):

Roadside signs (install/relocate/salvage) shall conform to the provisions in Section 56-2, "Roadside Signs" of the Standard Specifications and as directed by the Engineer.

Roadside signs shall be installed at the locations shown on the construction plans or where directed by the Engineer.

Roadside signs furnished by the Contractor shall be of the standard size specified in the State of California Department of Transportation Sign Specification Sheets, unless otherwise indicated on the construction plans.

Sheeting shall be guaranteed against defects for a period of ten years from the date of fabrication.

The base metal shall be new aluminum, 0.08 gauge, of alloys 6061-T6 or 5052-H38 conforming to the requirements of ASTM Designation : B209.

Any reflective sheeting supplied as a part of this contract, whether as a legend or background, shall be FHWA FP-85 Type IIA or AASHTO M268 Type III.

Reflective sheeting shall be applied to the sign by a method approved by the manufacturer of the sheeting and shall produce a durable bond equal to or greater than the strength of the reflective sheeting. No air pockets or bubbles shall exist between the sheeting and aluminum backing.

The reflective material and screening inks or overlay film shall be graffiti proof. The graffiti proofing method shall be supplied by and/or approved by the sheeting manufacturer. Neither the color nor the reflective intensity of the finished sign shall be significantly diminished by the use of graffiti remover when used in a manner approved by the Transportation Department in conjunction with the sheeting manufacturer. Any signs graffitied by over the counter spray paint or marking pens, which fail to be restored, shall be replaced by the sign sheeting manufacturer.

All letters and numerals shall be in accordance with the "Standard Alphabet of Highway Signs" as used by the State of California, Department of Transportation.

All signs shall be installed using hex head bolts, washers, nuts and jam nuts in accordance with Standard Plans RS2 or as directed by the Engineer.

Salvaged roadside signs shall be delivered to the County Maintenance Yard located at 2950 Washington Street, Riverside, CA 92504 or as directed by the Engineer.

The contract unit prices paid per each for Roadside Signs (Install/Relocate/Salvage) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals

and for doing all the work including all necessary concrete, excavation and backfill as specified in the Standard Specification and these Special Provisions and no additional compensation will be allowed therefor.

PAINT TRAFFIC STRIPE:

Painting traffic stripe shall conform to the provisions in Sections 84-1, "General", 84-3, "Painted Traffic Stripes and Pavement Markings" and 84-3.05, "Application" of the Standard Specifications and these Special Provisions.

Traffic striping shall be applied in two coats with airless equipment and shall be performed with a roadliner truck mounted striping machine. Where the configuration or location of a traffic stripe is such that the use of a roadliner truck mounted striping machine is unsuitable, traffic striping and glass spheres may be applied by other methods and equipment approved by the Engineer.

Newly painted traffic striping shall be protected from damage by public traffic or other causes until the paint is thoroughly dry. Any newly painted traffic striping which are damaged as a result of the construction, including wheel markings by public traffic and the construction equipment, shall be repainted by the Contractor and any associated removals shall be performed as called for in these Special Provisions.

The contract price paid per linear foot for Paint Traffic Stripe (2 Coats) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in painting traffic stripe (regardless of the number, widths, and types of individual stripes involved in each traffic stripe) including any necessary cat tracks, dribble lines any layout work, complete in place as shown on the plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the Engineer.

SIGNAL AND LIGHTING:

Furnishing and installing traffic signal and highway lighting systems and payment shall conform to the provisions in Section 86, "Signals and Lighting" of the Standard Specifications and these Special Provisions.

EQUIPMENT ORDERS

The first order of work shall be to place the order for the traffic signal equipment. All equipment shall be new. The Contractor shall furnish the Engineer with a written statement from the vendor and state that the order for the said equipment has been received and accepted by said vendor within twenty-one calendar days of the date of the award of the project by the County of Riverside Board of Supervisors. Delays in the delivery of equipment shall not be

considered as justification for the suspension of the construction contract.

COUNTY FURNISHED EQUIPMENT

Attention is directed to Section 6-1.02, "State Furnished Materials" of the Standard Specifications.

The following equipment and materials will be furnished to the Contractor, for installation on project, by the County of Riverside:

1. Signal and Lighting Standards and Anchor Bolts;

2. IISNS 10' Galvanized Steel Mast Arm.

The Contractor shall pick up the County furnished equipment from either of the following locations, or as otherwise directed by the Engineer, and shall transport the equipment to the project site: Riverside County Transportation Yard, 220 "G" Street, Perris, California 92570, telephone (951) 657-7165.

The cost of transportation and installing County furnished equipment including all labor, equipment, materials and incidentals, as specified herein and as specified elsewhere in these Special Provisions, shall be included in the lump sum price for Signal And Lighting, and no additional compensation will be allowed therefor.

START OF WORK

Location where signalization and highway lighting work is to be performed:

LOCATION	AREA
Walnut Avenue and Sherman Avenue	Perris

FOUNDATIONS

Foundations shall conform to the provisions in Section 51, "Concrete Structures" and Section 86-2.03, "Foundations" of the Standard Specifications and these Special Provisions.

Portland cement concrete shall conform to Section 90-10, "Minor Concrete" of the Standard Specifications and shall be Class 3, except concrete for pole foundations which shall be Class 2.

All foundation concrete shall be vibrated to eliminate air pockets.

Costs to install foundations for controller assemblies, service pedestals, posts, standards, pedestals and all other traffic signal facilities, shall be considered to be included in the lump sum price paid for Signal And Lighting, and no additional compensation shall be allowed therefor.

STANDARDS, STEEL PEDESTALS AND POSTS

Standards, steel pedestals, and posts shall conform to the provisions in Section 86-2.04, "Standards, Steel Pedestals, and Posts" of the Standard Specifications and these Special Provisions. Type 1A standards shall be spun aluminum, unless shown otherwise on the construction plans.

Poles installed at the near-right approach of each intersection shall be banded for the emergency installation of stop signs. Banding shall conform to the strap and saddle method per Standard Plan RS4.

Mast arms shall be installed in accordance with the "Signal Arm Connection Details" of the Standard Plans, unless specifically directed otherwise on the construction plans.

A special street name sign mast arm shall be installed in accordance with the provisions of the subsection entitled "Internally Illuminated Street Name Signs" and these requirements:

> The Contractor shall install a County furnished 10 feet galvanized steel mast-arm extending from the shaft of the pole above and parallel to the signal mast arm in accordance with County Standard 1200. Each 10 feet arm shall have 3 mounting tabs welded to it. The tabs shall be spaced to allow installation of either an 8 feet or 6 feet internally illuminated street name sign. A set-bolt/set-screw shall be used to assure the mast arm will not change position after it is installed and aligned.

If required by the serving electric utility, and confirmed by the Engineer, State Certified Electric Workers shall be utilized for the installation of standards, steel pedestals and posts in accordance with State of California High Voltage Safety Orders.

The cost of installing, testing, transportation and/or shipping of each standard, steel pedestal and post shall be included in the lump sum price paid for Signal And Lighting and no additional compensation shall be allowed therefor.

CONDUITS

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

Conduit depth shall not exceed 60 inches below finished grade.

All conduits shall be Type 3 schedule 80 conduit and shall conform to the requirements in UL Standard for Rigid Non-Metallic Conduit (Publication UL 651). Type 3 conduit shall be installed at underground locations only.

Conduit shall be the sizes shown on the plans, or as specified in the Special Provisions. New conduit shall not pass through foundations or standards.

Minimum conduit size shall be 2" unless otherwise specified.

At locations where conduit can not be installed by jacking or drilling as provided in Section 86-2.05C, "Installation" of the Standard Specifications, the Contractor may request permission, on a case by case basis, to install conduit by trenching. Jacking/Drilling shall be attempted a minimum of three times prior to requesting trenching installation.

Trenching Installation of Conduit

Conduit shall be placed under existing paving in a trench 2" wider than the outside diameter of the conduit being installed. Trenching shall not exceed 6" in width. Conduit depth shall be at a minimum of 30" below finished grade, with a minimum 26" cover over the conduit.

If ordered by the Engineer, all pavement shall be cut to a depth of 3" with an abrasive type saw or with a rock cutting excavator specifically designed for this purpose. Cuts shall be neat and true with no shatter outside the removal area.

The conduit shall be placed in the bottom of the trench and the trench shall be backfilled with two sack slurry to finish grade. Prior to final paving, the slurry backfill shall be excavated to a depth of 0.30' below the final pavement surface.

If so directed by the Engineer, the two sack slurry backfill shall be installed to a depth of 0.30' below the final pavement surface. The slurry shall be allowed to cure a minimum of two days prior to final paving with a commercial Type B asphalt concrete.

Prior to paving, the Contractor shall grind the existing pavement a minimum of 0.10' deep at a width of 3 feet minimum, centered along the full length of the trench.

Insulated bonding bushings will be required on all conduit.

After conductors have been installed, the ends of conduits terminating in pull boxes and controller cabinets shall be sealed with an approved type of sealing compound.

When a standard coupling cannot be used for coupling metal type conduit, the Contractor may request permission, prior to installation, on a case by case basis, to use a U.L. or E.T.L. listed threaded union coupling.

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 installed at the locations shown on the plans and shall be spaced at no more than 500 feet intervals. No mid-run pull boxes shall be installed.

Pull boxes shall be placed with their tops flush with surrounding finished grade, except as required by the Engineer.
Pull boxes installed in unimproved areas shall be marked with Type "L" markers and be traffic bearing. All traffic bearing pull boxes shall be constructed with galvanized 2-bar welded frame. Unimproved areas are defined as locations not protected by concrete curb and gutter.

All pull boxes shall be located behind the curb or at the locations shown on the plans.

Pull box covers shall be marked in accordance with Standard Plans ES-8. Pull box covers shall not be marked "Caltrans", except for projects on State of California right of way.

CONDUCTORS AND WIRING

Conductors and wiring shall conform to the provisions in Section 86-2.08, "Conductors", and Section 86-2.09, "Wiring" of the Standard Specifications and these Special Provisions.

Multiple circuit conductors shall conform to the provisions in Section 86-2.08B, "Multiple Circuit Conductors" of the Standard Specifications.

Signal cable conductors shall conform to the provisions in Section 86-2.08D, "Signal Cable" of the Standard Specifications. Signal cable shall be installed continuously without splicing from the controller cabinet to each traffic signal pole.

Subparagraph 5 of the first paragraph of Section 86-2.09D, "Splicing and Terminations" of the Standard Specifications is deleted.

Nylon Jacketed Conductors shall not be used. Conductors with "Type THHN" insulation shall not be permitted for installation on this project.

Conductors shall be spliced by the use of Type "C" or Type "T" splice as shown in the Standard Plans (ES-13A).

Splices shall be insulated by "Method B".

Traffic signal conductors, multiple circuit conductors, signal cable and inter-connect cable shall not be spliced unless otherwise shown on the plans.

Emergency vehicle pre-emption cable shall be in accordance with the Special Provision entitled "Emergency Vehicle Pre-Emption System" herein, or approved alternative.

Minimum luminaire wiring shall be 10 gauge, including wiring within poles and mast arms. The color code for the luminaire common shall be white with a purple stripe.

BONDING AND GROUNDING

Bonding and grounding shall conform to the provisions in Section 86-2.10, "Bonding and Grounding" of the Standard Specifications and these Special Provisions. For Equipment grounding purposes in Type 3 conduit, a No. 8 solid wire shall be run continuously. Equipment bonding and grounding are not required in conduits which contain only lead-in cable or signal interconnect.

Grounding jumper shall be attached by a 3/16 inch or larger brass bolt in the signal standard or controller pedestal and shall be run to the conduit, ground rod or bonding wire in adjacent pull box.

Grounding jumper shall be visible after cap has been poured on foundation.

Equipment grounding jumpers shall be installed for all conduits.

SERVICE

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

Service equipment enclosure shall be Type III-CF, as shown on the Standard Plans ES-2F, and shall conform to the following:

1. 120 / 240 volt, 2 meter service unless otherwise shown on the plans.

2. Circuit breakers required:

   2 - 100 Amp 2 pole (signal main, lighting main)
   1 - 30 Amp 1 pole (luminaires)
   1 - 20 Amp 1 pole (illuminated street name signs)
   1 - 50 Amp 1 pole (signals)
   1 - 15 Amp 1 pole (luminaire photoelectric control)
   1 - 15 Amp 1 pole (street name sign photoelectric control)
   1 - 20 Amp 1 pole (for each beacon, if applicable)
   1 - 15 Amp 1 pole (for cameras)

3. Cabinet shall be fabricated from aluminum sheeting and finish shall be anodic coating in accordance with Section 86-3.04A "Cabinet Construction".

4. Circuit breakers shall be marked with identifying labels for each circuit breaker.

Type V photoelectric control contactor and test switch assembly shall be installed in the service cabinet. Photoelectric control contactors shall be as follows:

Luminaires	- 60 amp electrically held contractor
Street name signs	- 30 amp electrically held contractor

Photo Electric Control assembly shall be installed within the circuit breaker compartment of the service equipment enclosure, and accessible to the County after installation of electrical meters. Direct burial service conductors will not be approved.

The Contractor shall be responsible for contacting the power company, and arranging and providing for the electrical service connection, and ensuring that adequate notice is provided to the serving electric company in advance of need. The County of Riverside will pay all fees required.

The service equipment enclosure shall be separated from the controller by a minimum of 15 feet, and separated from all utility poles by a minimum of 10 feet, unless otherwise directed by the Engineer.

SERVICE IDENTIFICATION

The service equipment enclosure shall provide the address of the intersection as shown on the approved plan. Address location shall be on the front upper panel. The meters shall also be labeled "LS3" (lighting meter) and "TC1" (signal meter) by lettering applied to the exterior of the enclosure in accordance with these Special Provisions, or as directed by the Engineer.

Lettering markings shall be black in color, with a 2 inches minimum size in block letter form. Markings shall be applied to a brushed aluminum, stainless steel, or other non-corroding metallic plate, as approved by the Engineer. Plate shall be white in color. All paint and lettering markings shall conform in all respects to Federal Specification TT-E-489, latest revision, Class A, Air Drying. Said plate shall be affixed in a permanent manner by riveting or with stainless steel bolts and nuts. Bolts shall be peened after tightening. All materials used for affixing address plate shall be non-corroding. All alternate materials and methods must be approved by the Engineer prior to implementation.

MODEL 170 CONTROLLER ASSEMBLY (CONTRACTOR FURNISHED)

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

The Contractor shall furnish and install the controller unit, Model 170, its cabinet, Model 332, or cabinet as otherwise specified, and all ancillary equipment.

The controller unit, Model 170 (233 program) and its cabinet, Model 332 or cabinet as otherwise specified, shall be in accordance to the provisions of Section 86, "Signals, Lighting and Electrical Systems" of the latest edition of the State of California Standard Specifications, Attachment "A", entitled "Model 170 Controller Assembly Specifications" and these Special Provisions.

The Contractor shall arrange to have a signal technician qualified to work on the controller and employed by the controller manufacturer or his representative, present at the time the equipment is turned on.

Spare equipment shall be delivered to the County of Riverside Traffic Signal Shop, McKenzie Highway Operations Center, 2950 Washington Street, Riverside, California, or another location as directed by the Engineer.

Furnishing and installing the controller assembly, including cabinet, and the requirement for the operational and functional testing of the equipment shall be considered as included in the lump sum price for Signal And Lighting, and no additional compensation will be allowed therefor.

TESTING

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

The complete controller assembly and the cabinet shall be delivered to the County of Riverside, Transportation Department, McKenzie Highway Operations Center, 2950 Washington Street, Riverside, California 92504 for testing, as directed by the Engineer.

The Contractor shall allow a minimum of 15 working days for operational testing and adjustment, with the added provisions that if the equipment should fail, an additional 15 days period shall be allowed for retesting.

The cost for transportation and/or shipping of the Model 170 controller assembly and the cabinet to and from the County Lab shall be included in the lump sum price paid for Signal And Lighting, and no additional compensation shall be allowed.

GPS UNIVERSAL TIME SOURCE

The GPS Universal Time Source shall be a McCain Model M32755 or approved equal. Approval of an alternate Time Source shall be made by the Riverside County Traffic Engineer.

The GPS Universal Time Source shall incorporate a precision GPS receiver and a microprocessor to decode the time signals received from the GPS satellite network. The Universal Time Source shall interface this time signal to a Model 170E controller (Using Bi-Tran local software) to provide an accurate clock update to the traffic signal controller.

The GPS Universal Time Source shall, at a minimum, meet or exceed the following criteria:

> The physical dimension shall be apx. 6"L x 3.5"W x 1.5"H and shall include built-in mounting flanges for easy installation in a traffic signal cabinet. The unit shall operate in temperatures from -30°C to +80°C. The unit shall be powered by the traffic signal controller through the appropriate ACIA port. A data cable shall be provided with the correct pin assignments to supply proper communication between the traffic signal controller and the time source. The unit shall supply the traffic signal controller with the time, date and day of the week data. The unit shall be software configurable to support RS-232C serial data rates of 300, 600, 1200, 2400, 4800, 9600 or 19200 bps. Time zone and daylight savings operation shall also be software configurable. The unit shall have an LED indicator to display the status of the communication to a satellite. The antenna shall be a weatherproof disc antenna designed to mount directly to the top of the traffic signal controller cabinet. The dimensions shall be no greater than 3" diameter x 1" height. All cabling and connectors to interface the antenna and GPS unit shall be provided. Proper gaskets or other weatherproofing materials shall be supplied to prevent water or moisture from entering the traffic signal controller cabinet.

Full compensation for furnishing and installing GPS Universal Time Source shall be considered as included in the lump sum contract price for Signal And Lighting, and no additional compensation will be allowed therefor.

SIGNAL FACES AND SIGNAL HEADS

Signal faces and signal heads and auxiliary equipment as shown on the plans, and the installation thereof shall conform to the provisions in Section 86-4.01, "Vehicle Signal Faces", Section 86-4.04, "Backplates", and Section 86-4.08, "Signal Mounting Assemblies" of the Standard Specifications and these Special Provisions.

Signal Mounting Assemblies, Backplates, Signal Sections and Housing shall be made from the same manufacturer and the section assemblies shall be uniform in appearance and alignment. All equipment shall be new and purchased by the Contractor in a single purchase for this project. Surplus equipment, which may be in the Contractor's possession, will not be allowed, unless specifically allowed by the Engineer.

Red, Yellow and Green signal and beacon indications shall be LED modules in accordance with the Standard Specifications and these Special Provisions. All LED modules shall be furnished by the Contractor.

ARROWS LED CIRCULAR SIGNAL MODULE

General:

1. The purpose of this specification is to provide the minimum performance requirements for Light Emitting Diode circular traffic signal modules hereafter called modules. This includes 8" and 12", circular vehicle traffic signal modules and 12" omni-directional arrows. All modules will comply with either the **Vehicle Traffic Control Heads - Light Emitting Diode (LED) Circular Supplement, Adopted June 27, 2005**, or the ITE arrow spec **Vehicle Traffic Control Signal heads - Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement, Adopted July 1, 2007**, hereafter called VTCSH for both specs, which are published by the Institute of Transportation Engineers, hereafter called ITE. The following requirements are in addition to, or clarification of the VTCSH.

2. All modules must fit in existing signal housings without the use of special tools.

3. All modules must be certified in the **Intertek LED Traffic Signal Modules Certification Program** and be labeled with the ETL Verified Label shown in Figure 1.

Figure 1 -- Intertek- ETL Verified Label

4. Luminous intensity requirements of the VTCSH must be met across the entire temperature range from -40°C to +74°C, (-40°F to +165°F).

5. The following cable colors shall be used for the AC power leads on all modules: white for common, red for the red module line, yellow for the yellow module line, and brown for the green module line.

6. The AC power leads shall exit the module via a rubber grommeted strain relief, and shall be terminated with quick connect

terminals with spade tab adapters. The lead shall be separate at the point at which they leave the module.

7. All external wiring used in the module shall be anti-capillary type cable to prevent the wicking of moisture to the interior of the module.

8. All power supplies shall be conformally coated for additional moisture and thermal protection.

9. The module shall have an incandescent, non-pixilated appearance when illuminated.

10. Nominal power usage is measured at 25°C, 120 VAC. For the 8" modules it shall not exceed 8 watts for Red, 8 watts for Yellow, and 8 watts for Green modules. For the 12" modules it shall not exceed 10 watts for Red, 19 watts for Yellow, and 11 watts for Green modules. For the arrows it shall not exceed 6 watts for any color.

11. All modules shall use LEDs that have been manufactured with materials that have industry acceptance as being suitable for uses in outdoor applications. At no time is the use of LEDs that utilize AIGaAs technology acceptable.

12. The external lens shall have a smooth outer surface to prevent the build up of dirt & dust and shall be designed to minimize the potential for sun phantom signals.

13. The module lens material must be tinted for bids that require tinted lens. A tinted transparent film or coating is not permitted. Individual bids may require clear, non-tinted lenses.

14. A module shall be sealed against dust and moisture intrusion, including rain and blowing rain per Mil-Std-810F Method 506.4, Procedure 1.

15. Arrow modules shall be clearly marked with the phrase "Suitable for mounting in any orientation".

16. Manufacturers shall provide a written 60 months minimum warranty.

17. Modules shall, at the manufacturer's option, be repaired or replaced if the module fails to function as intended due to workmanship or material defects within warranty period.

18. Modules shall, at the manufacturer's option, be repaired or replaced if the module exhibit luminous intensities less than the minimum specified values within the first 60 months of the date of delivery.

19. Upon request, the LED lamp module manufacturer shall provide written documentation of its ability to satisfy a worst-case, catastrophic warranty claim. A current corporate annual report

duly-certified by an independent auditing firm, containing financial statements illustrating sufficient cash-on-hand and net worth to satisfy a worst-case, catastrophic warranty claim is an example of suitable documentation.

20. The documentation shall clearly disclose the country in which the factory of module origin is located, the name of the company or organization that owns the factory including all of its parent companies and/or organizations, and their respective country of corporate citizenship.

Signal section housing, backplates and visors shall be metal type. Backplates shall be louvered.

Signal lenses shall be made of glass. Plastic will not be allowed. All lenses shall be 12 inches in diameter. Arrow lenses shall be provided with integrated arrow masking. Visors shall be in accordance with Section 86-4.01D, "Visors" and shall be the "tunnel" type, unless otherwise specified.

Top opening of signal heads shall be sealed with neoprene gaskets.

The Contractor shall furnish the Engineer with the manufacturer's standard written warranty pertaining to defects in materials and workmanship for the LED modules. All warranty documentation shall be given to the Engineer prior to random sample testing.

PEDESTRIAN SIGNAL FACES

Pedestrian signals shall conform to the provisions in Section 86-4.06, "Pedestrian Signal Faces" of the Standard Specifications and these Special Provisions.

LED PEDESTRIAN TRAFFIC SIGNAL MODULE

General:

1. The purpose of this specification is to provide the minimum performance requirements for LED pedestrian signal modules, hereafter called Ped Modules. All Ped Modules will comply with the most current ITE specification: **Pedestrian Traffic Control Signal Indications Part 2: Light Emitting Diode (LED) Pedestrian Traffic Signal Modules, Adopted March 19, 2004**, hereafter called PTCSI which is published in the Equipment and Materials Standards of the Institute of Transportation Engineers, hereafter called ITE.

2. The PTCSI does not cover the countdown features of Ped Modules so this specification contains additional requirements for countdowns, for long term reliability and for performance.

3. All Ped Modules must fit in existing signal housings without the use of special tools.

4. All modules must be certified in the **Intertek LED Traffic Signal Modules Certification Program** and be labeled with the ETL Verified Label shown in Figure 1.

Figure 1 -- Intertek- ETL Verified Label

5. The countdown ped module shall be compatible with all traffic signal controllers that are fully compliant to NEMA TS-1, NEMA TS-2, Type 170, and Type 2070 traffic signal controller specifications.

6. The countdown portion of the ped module shall have a high off-state input impedance so as not to provide a load indication to conflict monitors and interfere with the monitoring of the pedestrian signal. The input impedance of the countdown circuitry shall maintain a voltage reading above 25 VAC to the conflict monitor for up to four units connected on the same channel.

7. The countdown drive circuitry shall not be damaged when subjected to defective load switches providing a half wave signal input.

8. The countdown ped module shall have an internal conflict monitor circuit preventing any possible conflicts between the Hand, Person and Countdown signal indications. It shall be impossible for the display to countdown during a solid Hand indication.

9. Per MUTCD Manual 2003 edition, with revisions 1 and 2 incorporated dated December 2007, section 4E.07: "Countdown displays should ONLY be used during the Clearance Cycle. They should NOT be used during the walk interval or during the yellow change interval of a concurrent vehicular phase".

10. The countdown ped module shall have a micro-processor capable of recording its own time when connected to a traffic controller. It shall be capable of displaying the digits 0 through 99.

11. When power is first applied or restored to the ped module, the countdown display will be blank during the initial cycle while it records the countdown time using the walk (person) and don't walk (flashing hand) signal indications. The normal hand and person icons shall be displayed during this cycle.

12. The countdown ped module shall continuously monitor the traffic controller for any changes to the pedestrian phase time and re-program itself automatically if needed.

13. The countdown ped module shall register the time for the walk and clearance intervals individually and shall begin counting down at the beginning of the pedestrian clearance interval. The digits shall not flash during the countdown.

14. When the flashing hand becomes solid, the ped module shall display 0 for one second and then blank-out. The display shall remain dark until the beginning of the next countdown.

15. In the event of a pre-emption, the countdown ped module shall skip the remaining time, reach 0 at the same time as the flashing Hand becomes solid, and remain dark until the next cycle.

16. In the cycle following a pre-emption call, the signal shall display the correct time and not be affected by the reduced previous cycle. The countdown shall remain synchronized with the signal indications and always reach 0 at the same time as the flashing Hand becomes solid.

17. If a pedestrian button is activated during the clearance interval, some controllers can change to a second walk cycle without a don't walk phase. The countdown module shall also be capable of consecutive walk cycles. The display digits will be blank during the second walk and countdown properly during the second flashing hand.

18. The countdown ped module shall not display an erroneous or conflicting time when subjected to defective load switches. Should there be a short power interruption during the PED clearance interval or if voltage is applied to both the hand and person simultaneously the display will go to "0" then blank.

19. The countdown ped module shall have accessible dip-switches for the user selectable options. The unit shall have a removable plug on the rear allowing easy access to control the user selectable functions. The countdown is disabled when all the switches are in the "ON" position. The unit shall be shipped from the factory with the specified default setting

20. Switch 1 - Blank Cycle Following a Timing Change - Factory default is "OFF". When this switch is "OFF" the unit will allow the time to be displayed normally during the cycle following a truncated timing such as a preemption call. The countdown shall be capable of displaying the correct time and not affected by the previous reduced cycle. The unit will require 2 consecutive reduced cycles of identical value to validate and record a new time setting. If the timing is extended the unit will record it immediately. In the "ON" position when a change in timing is detected the unit will blank out during the following cycle while the new cycle time is measured and recorded if confirmed.

21. Switch 2 - Disables Auto-sync Mode- Factory default setting is "OFF". When this switch is in the "OFF" position the auto-sync is enabled. When the clearance interval begins and the initial flash of the hand is not in sync with the walk signal the unit will measure the offset and reduce the duration of the first second by the value of the offset. This will ensure the countdown reached zero at the same time as the flashing hand becomes solid. In the "ON" position there is no time correction when the flashing hand is in offset with the walk signal. The duration of the first second will not be reduced and the hand will appear solid shortly before the countdown reaches zero.

22. Switch 3 - Countdown Starts with Flashing Hand Signal - Factory default setting is "ON". When this switch is "ON" the countdown begins when the hand signal is turned on. With this switch "ON" and the auto-sync mode enabled a short power interruption will have no effect on the countdown display. With switch 3 in the "OFF" position the countdown begins when the walk signal is turned off. This eliminates the effect of an offset hand signal. When switch 3 is in the "OFF" position the auto-sync switch 2 has no effect on the countdown. In this mode if the power to the walk signal is interrupted, the unit will interpret this as the start of the clearance interval and will display the countdown time for 2 seconds before the operation is cancelled. The countdown will resume with the normal ending of the walk signal.

23. Switch 4 - Stores Time Value in Memory, Immediate. Restart. - Factory default setting is "OFF". When this switch is in the "OFF" position and power is removed from the unit, the time value stored in the unit is erased. The unit will need to run a dark cycle before it can display the countdown again. In the "ON" position the countdown timing is stored in memory. Following a power interruption, the unit will restart with the stored value and not remain dark during the learning cycle. If the value is different after restart, it will be recorded and displayed correctly at the following cycle.

24. Switch 5 - All LEDs "ON", Test Mode - Factory default setting is "OFF". With this switch in the "ON" position all LEDs are turned on simultaneously. With both switches 4 and 5 in the "ON" position the LED test mode will also scan the 7 individual segments of both digits.

25. The countdown shall be disabled when all switches are placed in the "ON" position.

26. Nominal power usage for Ped Modules at 25ºC (77ºF), 120 VAC input shall not exceed the values shown in Table 1.

Table 1 -- Nominal Power of Pedestrian Signals

Size	Description	Wattage @ 25°C		
		Hand	Person	Countdown[1]
9"x9"	Person Only	N/A	6	N/A
9"x9"	Hand Only	6	N/A	N/A
12"x12"	Overlay Hand & Person	8	6	N/A
12"x12"	Person Only	N/A	7	N/A
12"x12"	Hand Only	8	N/A	N/A
12"x12"	Countdown Only	N/A	N/A	5
16"x18"	Overlay Hand & Person	8	6	N/A
16"x18"	Side by Side Hand & Person	8	7	N/A
16"x18"	Hand & Person Overlay with Countdown	9	7	5

[1] Wattage for the countdown is measured when the digits 18 are displayed.

27. All wiring shall meet the requirements of Section 13.02 of the VTCSH standard. Secured, color coded, 600V, 18 AWG jacketed wires, 1 meter (39 inch) in length, conforming to the NFPA 70, National Electrical Code, and rated for service at +105°C, shall be provided.

28. The following color scheme shall be used for the ped module's AC power leads: Orange for the upraised hand, Blue for the walking person, and White for common. The countdown portion of the LED ped module shall be internally wired to the hand and walking person power.

29. The AC power leads shall exit the ped module via a rubber grommeted strain relief, and shall be terminated with insulated female quick connect terminals with spade/tab adapters. The leads shall be separate at the point at which they leave the ped module.

30. All external wiring utilized in the ped modules shall be anti-capillary type wire to prevent the wicking of moisture to the interior of the ped module.

31. The Hand and Person Icons shall utilize separate power supplies. On countdown products, the countdown ped module must have its own power supply but may take the incoming AC power from the hand/person AC signal lines. All power supplies shall be located inside the ped module.

32. All power supplies shall be conformally coated for additional protection.

33. Off State Voltage Decay: When the hand or person icon is switched from the On state to the Off state the terminal voltage shall decay to a value less than 10 VAC RMS in less

than 100 milliseconds when driven by a maximum allowed load switch leakage current of 10 milliamps peak (7.1 milliamps AC).

34. For a minimum period of 60 months, measured at 80 to 135 VAC RMS and over the ambient temperatures of -40°C to +74°C (-40°F to +165°F), the minimum maintained luminance values for the ped modules, when measured normal to the plane of the icon surface, shall not be less than:

    Walking Person, White: 2,200 cd/m^2
    Upraised Hand, Portland Orange: 1,400 cd/m^2
    Countdown Digits, Portland Orange: 1,400 cd/m^2

35. The external lens shall have a textured outer surface to reduce glare.

36. Icons that are printed on the lens shall be on the interior surfaces in order to prevent scratching and abrasion to the icons.

37. All icons and numbers shall have a uniform incandescent non-pixilated appearance.

38. All exposed components of a ped module shall be suitable for prolonged exposure to the environment, without appreciable degradation that would interfere with function or appearance. As a minimum, selected materials shall be rated for service for a period of a minimum of 60 months in a south-facing Arizona Desert installation.

39. All LEDs used to illuminate the ped module shall use material that has industry acceptance for use in outdoor applications. At no time is the use of LEDs that utilize AlGaAs technology acceptable.

40. The countdown display shall consist of two 7 segment digits as shown in Figure 2. All countdown display digits shall be 9 inches in height (225mm) for use in all size crosswalks in compliance with MUTCD recommendations.

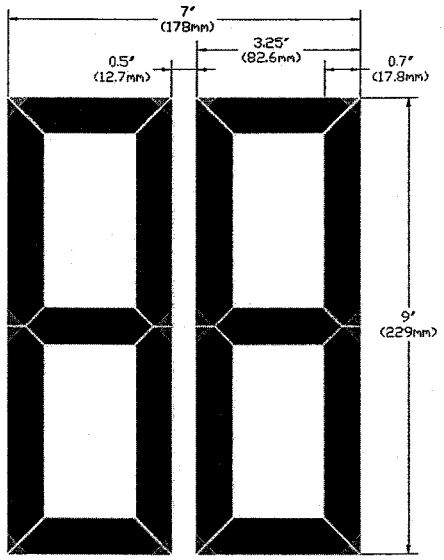


Figure 2 : Countdown Display

41. Manufacturers shall provide a written 60 month minimum warranty.

42. Ped modules shall, at the manufacturer's option, be repaired or replaced if the ped module fails to function as intended due to workmanship or material defects within warranty period.

43. Ped modules shall, at the manufacturer's option, be repaired or replaced if the ped module exhibit luminous intensities less than the minimum specified values within the first 60 months of the date of delivery.

44. Upon request, the LED lamp ped module manufacturer shall provide written documentation of its ability to satisfy a worst-case, catastrophic warranty claim. A current corporate annual report duly-certified by an independent auditing firm, containing financial statements illustrating sufficient cash-on-hand and net worth to satisfy a worst-case, catastrophic warranty claim is an example of suitable documentation.

45. The documentation shall clearly disclose the country in which the factory of ped module origin is located, the name of the company or organization that owns the factory including all of its parent companies and organizations, and their respective country of corporate citizenship.

Pedestrian Signal Mounting Assemblies and Pedestrian Signal Housings shall be made from the same manufacturer and the section assemblies shall be uniform in appearance and alignment. All equipment shall be new and purchased by the Contractor in a single purchase for this project. Surplus equipment, which may be in the Contractor's possession, will not be allowed, unless specifically allowed by the Engineer.

Pedestrian signals shall be provided with a polycarbonate eggcrate or Z-crate screen (Type 2).

LED modules for pedestrian signals shall be furnished by the Contractor.

PEDESTRIAN PUSH BUTTONS

Pedestrian and bicycle push buttons shall conform to the provisions in Section 86-5.02, "Pedestrian Push Buttons" of the Standard Specifications and these Special Provisions. Attention is directed to State of California Standard Plan ES-5C.

Pedestrian push buttons shall be Type B.

Pedestrian push button housings shall be die-cast or permanent mold cast aluminum.

Pedestrian push button signs shall be porcelain enameled metal.

Paragraph 3 of Section 86-5.02, "Pedestrian Push Buttons" of the Standard Specifications is deleted.

The pedestrian push button shall be ADA compliant, constructed of high density thermoplastic and utilize solid state Piezo switch technology. Button shall be yellow, outer body color shall be black.

Pedestrian push buttons shall be Polara Model MPBP-BY, Campbell Co. Model 700P or approved equal.

LUMINAIRES

Luminaires shall conform to the provisions in Section 86-6, "Lighting" of the Standard Specifications and these Special Provisions.

Luminaires shall be of the cutoff type and shall be 200 or 250 Watt High Pressure Sodium Vapor as shown on the construction plans. The fixtures shall be constructed with flat lenses, integral ballasts, and detachable power unit assemblies. The power unit assemblies shall contain the ballast, starter board, capacitors, and a heavy duty terminal block.

Each luminaire shall be furnished without photoelectric unit receptacle. If the luminaire housing is provided with a hole for the receptacle, the hole shall be closed in a weatherproof manner.

INTERNALLY ILLUMINATED STREET NAME SIGNS

Internally illuminated street name signs shall conform to the provisions in Sections 86-6.06, "Sign Lighting Fixtures - Incandescent", and 86-6.065, "Internally Illuminated Street Name Signs" of the Standard Specifications and these Special Provisions.

The third paragraph of Subsection 86-6.065, "Internally Illuminated Street Name Signs" of the Standard Specifications is amended to read:

> The sign fixture shall be designed and constructed to prevent deformation or failure when subjected to 100 mph wind loads, as set forth in the AASHTO publication, "Standard Specifications for Structural Supports of Highway Signs, Luminaires, and Traffic Signals" and amendments thereto. The sign panels shall not deform or wrap under an 100 mph wind loading. A certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance" shall be submitted by the manufacturer with each lot of internally illuminated street name signs.

Subsection 86-6.065, "Internally Illuminated Street Name Signs" of the Standard Specifications is amended with the addition of the following between the third and fourth paragraphs:

> The signs shall be attached to a 10 feet galvanized steel mast-arm extending from the shaft of the pole above and parallel to the signal mast arm as described in the subsection entitled "STANDARDS, STEEL PEDESTALS AND POSTS" and the requirements herein. Each 10 feet arm shall have 3 mounting tabs welded to it. The tabs shall be spaced to allow installation of either an 8 feet or 6 feet sign. A set bolt shall be used to assure the mast arm will not change position after it is installed and aligned.

Subsection 86-6.065, "Internally Illuminated Street Name Signs" of the Standard Specifications, the fifth paragraph is hereby amended to read: Signs shall be Type A.

Subsection 86-6.065, "Internally Illuminated Street Name Signs" of the Standard Specifications, item number two, "Reflectors" of the fifth paragraph is hereby deleted.

Subsection 86-6.065, "Internally Illuminated Street Name Signs" of the Standard Specifications, paragraph number one of item number three, "Sign Panels" of the fifth paragraph is hereby deleted and replaced with the following:

> The sign panels shall be slide-mounted or rigid mounted in a frame with white translucent diamond grade reflective legend, symbol, arrows, and border on each face, the background shall be blue.

Subsection 86-6.065, "Internally Illuminated Street Name Signs" of the Standard Specifications, item number twelve, "Mounting Assemblies" of the fifth paragraph is hereby amended with the addition of the following between the first and second paragraphs:

> The mounting assembly shall be designed and constructed to prevent failure when subjected to 100 mph wind loads, as set forth in the AASHTO publication, "Standard Specifications for

Structural Supports of Highway Signs, Luminaires, and Traffic Signal" and amendments thereto.

Support brackets shall be 3/8" x 1.5" minimum.

PHOTOELECTRIC CONTROLS

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

Photoelectric controls shall be a dual Type V for luminaires and internally illuminated street name signs conforming to the detail on the plans.

Photoelectric units shall be the delay type.

TRAFFIC SIGNAL FIELD TESTS

Field Tests shall conform to the provisions in Section 86-2.14, "Testing" of the Standard Specifications.

EMERGENCY VEHICLE PRE-EMPTION

A complete, functioning emergency vehicle pre-emption (EVP) system shall be furnished and installed for each project location as indicated on the construction plans. The transmitting equipment is not included in this contract.

Emergency vehicle pre-emption equipment to be furnished and installed or provided shall include:

1. Optical detector for each approach, as shown on the plans.
2. Rack-mounted 2-channel phase selectors in each controller assembly, as specified on the construction plans, sufficient for 8 phase operation.
3. Detector cable.
4. One spare 2-channel phase selector.
5. One spare optical detector.

The EVP system shall be designed to prevent simultaneous pre-emption by two or more emergency vehicles on separate approaches to the intersection.

The County Traffic Engineer shall approve EVP sequence of operation prior to timing and turn-on of each respective traffic signal.

The Contractor shall arrange for, and pay the cost of, the services of a knowledgeable representative from the EVP manufacturer, to be present for the first day of the traffic signal and lighting function test to insure proper installation and functioning of the EVP equipment.

The Contractor shall furnished and installed EVP equipment in a complete operative manner, as intended by the manufacturer, and these Special Provisions. The Contractor shall arrange for, and pay the cost of, the services of the controller manufacturer to perform any controller modifications required for the installation, or operation, of the EVP equipment.

OPTICAL DETECTION/DISCRIMINATION ASSEMBLY

General:

Each optical detection/discrimination assembly shall consist of one or more optical detectors, connecting cable, and discrimination modules.

Optical Detector:

The optical detector shall be mounted on the indicated signal mast arm per Riverside County Standard No. 1202.

Each optical detector shall be waterproof unit capable of receiving optical energy from a single direction. The reception angle for each optical detector unit shall be a minimum of 8 degrees in all directions about the aiming axis of the unit.

Internal circuitry shall be solid state and electrical power shall be provide by the associated discrimination module.

Each optical detector unit shall have a minimum of a ½ inch NPT opening used for mounting and for bringing the connecting cable into the terminal block located within the assembly. 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 shall meet the requirements of IPCEA-S-61-402/NEMA WC5, Section 7.4, 600 V Control cable, 75 degrees C, Type B, and the following:

1. The cable shall contain 3 conductors, each of which shall be AWG#20 (7 x 28) stranded, tinned copper. Insulation of individual conductors shall be color-coded: 1-Yellow, 1-Orange, and 1-Blue.

2. The shield shall be either tinned copper braid or aluminized polyester film with a nominal 20% overlap. When film is used, an AWG#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.

3. The jacket shall be marked as required by IPCEA/NEMA.

The cable run between each detector and the traffic controller cabinet shall be continuous without splices.

Phase Selector Module:

Each phase selector shall conform to the requirements of Chapter 1 of the State of California, Department of Transportation, "Traffic Signal Control Equipment Specifications", shall be compatible and usable with a Model 170E or 2070 controller unit, and shall be mounted in the input file of a Model 332 or Model 333 controller cabinet.

Each phase selector shall be capable of operating at least two or more channels, each of which shall provide and independent output for each separate input.

Each phase selector, when used with its associated optical detectors, shall perform as a minimum, the following:

1. Receive Class I and Class II signals.

2. Decode the signals based on optical frequency, at 9.639 Hz + or -0.119 Hz for Class I signals and 14.035 Hz + or - 0.255 Hz for Class II signals.

3. Establish the validity of received signals based on optical 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 signal for a minimum period of 4.0 seconds.

4. 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 a Class I signal, the output shall be a 6.25 Hz + or -0.1%, rectangular waveform with a 50% duty cycle. For Class II signal, the output shall be steady.

Each phase selector shall receive power from the controller cabinet at either 12 VDC or 120 VAC.

Auxiliary inputs for each channel may enter each module through a front panel connector or by a parallel hook-up of the associated detector cables at the input location.

The phase selector shall provide an optically isolated output for each channel to the Model 170 controller unit. All outputs signals shall comply with NEMA signal level definitions and shall be compatible with the Model 170 controller assemblies' inputs.

Each phase selector shall be provided with means of preventing transients received by the detector from affecting the Model 170 controller assembly.

Each phase selector shall have a single connector board and shall occupy one slot of the input file. The front panel of each phase selector module shall have a handle to facilitate withdrawal and have the following controls and functions for each channel:

1. Range adjustments for both Class I and Class II signals.

2. 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.

3. A "signal" indication and a "call" indication each for Class I and for Class II signals. The "signal" indications denote that a signal, which is not valid, has been received; a "call" indication denotes a steady, valid signal has been received. These 2 indications may be accomplished with a single indication lamp.

In addition, the front panel shall be provided with additional connectors or ports used to perform other functions as specified by the manufacturer.

Cabinet Wiring:

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

1. Slots 12 and 13 of input file "J" shall be wired to accept a 2-channel or a 4-channel module.

2. Field wiring for the primary detectors, except the 24 VDC power, shall terminate on either terminal block 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:

TB-9 - 1 = Not Used
TB-9 - 2 = +24 VDC Out (Orange)
TB-9 - 3 = +24 VDC Out (Orange)
TB-9 - 4 = EVA Detector (Yellow)
TB-9 - 5 = EVC Detector (Yellow)
TB-9 - 6 = DC Common Out (Blue)
TB-9 - 7 = EVB Detector (Yellow)

TB-9 - 8 = EVD Detector (Yellow)
TB-9 - 9 = DC Common Out (Blue)

Assuming TB9-2 & TB9-3 are unused on the "J" File. Move wires on J11-J & J11-K (Twisted Pair) to J12-E & J13-E respectively.

Field wiring for auxiliary detectors may terminate on terminal board TB-0 (If Unused) in the controller cabinet. Use manufactures recommended wiring for these connections.

System Operation:

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

1. Each system to be used for testing shall consist of an optical detector, an optical detector cable and a phase selector module.

2. The phase selector shall be installed in the proper input file slot of the Model 332 or 333 controller cabinet assembly.

3. Two tests shall be conducted; one using a Class I signal emitter and a distance of 1000 feet between the emitter and the detector, the other using a Class II signal emitter and a distance of 1800 feet between the emitter and the detector. Range adjustments on the phase selector shall be set to "Maximum" for each test.

4. During the tests of the Class I and Class II emitters, the proper response from the Model 170E and 2070 controller unit during the "ON" interval and there shall be no improper operation of the Model 170E or 2070 controller unit or the monitor during the "OFF" interval.

The cost of furnishing, installing and testing the complete EVP system equipment shall be included in the lump sum price paid for Signal And Lighting, and no additional compensation will be allowed therefor.

BATTERY BACK-UP SYSTEM:

General:

The battery backup system shall conform to the July 2009 Caltrans Battery Backup System (BBS) specifications and these Special Provisions, and shall be listed on Caltrans pre-qualified BBS List.

This specification establishes the minimum requirements for a complete emergency battery backup system for use with Light Emitting Diode (LED) Traffic Signal Modules. The battery backup system (BBS)

shall include, but not be limited to the following: inverter/charger, power transfer relay, batteries, a separate manually operated non-electronic bypass switch (See Figure 1 - BBS Block Diagram) and all necessary hardware and interconnect wiring. The BBS shall provide reliable emergency power to a traffic signal system (Vehicle and Pedestrian Traffic) in the event of a power failure or interruption.

The BBS shall be capable of providing power for full run-time operation for an "LED-only" intersection (all colors: red, yellow, green and pedestrian heads) or flashing mode operation for an intersection using Red LED's.

The BBS shall be designed for outdoor applications, in accordance with the Transportation Electrical Equipment Specifications (TEES), dated August 16, 2002, Chapter 1, Section 8 requirements.

The BBS for traffic signal shall have been installed and operational for a period of one year at an intersection in the United States.

Unless specified otherwise, the Battery Backup system Batteries shall be external to the controller cabinet, as specified under Section 2.3 "External Battery Cabinet Option" herein.

These specifications and the attached approved list of vendors are consistent with the Caltrans specifications for battery back-up systems, dated July 2004, and available at the Caltrans website: http://www.dot.ca.gov/hq/esc/ttsb/electrical/bbs.htm.

Operation:

The BBS shall provide a minimum two (2) hours of full run-time operation for an "LED-only" intersection (minimum 1500W/2000VA active output capacity, with 80% minimum inverter efficiency).

The maximum transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, shall be 65 milliseconds. The same maximum allowable transfer time shall also apply when switching from inverter line voltage to utility line voltage.

The BBS shall provide the user with 6-sets of fully programmable normally open (NO) and normally closed (NC) single-pole double-throw (SPDT) dry relay contact closures, available on a panel-mounted terminal block, rated at a minimum 120V/1A, and labeled so as to identify each contact. For typical configuration, see Figure 3(b).

The first and second set of NO and NC contact closures shall be energized whenever the unit switches to battery power. Contact shall be labeled or marked "On Batt".

The third and fourth set of NO and NC contact closures shall be energized whenever the battery approaches approximately 40% of remaining useful capacity. Contact shall be labeled or marked "Low Batt".

The fifth and sixth set of NO and NC contact closures shall be energized two hours after the unit switches to battery power. Contact shall be labeled or marked "Timer".

The six programmable NO and NC contact closures shall be independently configured to activate under any of the following conditions: On Battery, Low Battery, Timer, Alarm, or Fault.

Operating temperature for both the inverter/charger, power transfer relay and manual bypass switch shall be -37 °C to +74 °C.

Both the Power Transfer Relay and Manual Bypass Switch shall be rated at 240VAC/30 amps, minimum.

The BBS shall use a temperature-compensated battery charging system. The charging system shall compensate over a range of 2.5 - 4.0 mV/ °C per cell.

The temperature sensor shall be external to the inverter/charger unit. The temperature sensor shall come with 10 feet of wire.

Batteries shall not be recharged when battery temperature exceeds 50 °C ± 3 °C.

BBS shall bypass the utility line power whenever the utility line voltage is outside of the following voltage range: 100VAC to 130VAC (± 2VAC).

When utilizing battery power, the BBS output voltage shall be between 110 VAC and 125 VAC, pure sine wave output, ≤ 3% THD, 60Hz ± 3Hz.

BBS shall be compatible with NEMA and Model 332 Cabinets, Model 170 & 390 Controllers, Model 2070 Controllers and cabinet components for full time operation.

In cases of low (below 100VAC) or absent utility line power, when the utility line power has been restored at above 105 VAC ± 2 VAC for more than 30 seconds, the BBS shall transfer from battery backed inverter mode back to utility line mode.

In cases of high utility line power (above 130VAC), when the utility line power has been restored at below 125VAC ± 2 VAC for more than 30 seconds, the BBS shall transfer from battery backed inverter mode back to utility line mode.

The BBS shall have an automatic tap to step up or step down the output voltage by 10 percent. The resulting output voltages shall remain within the above prescribed voltage range: 100VAC to 130VAC. This capability will extend BBS range for operating on input AC and not reverting to battery power.

BBS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service.

In the event of inverter/charger failure, battery failure or complete battery discharge, the power transfer relay shall revert to the NC (and de-energized) state, where utility line power is connected to the cabinet.

Recharge time for the battery, from "protective low-cutoff" to 80% or more of full battery charge capacity, shall not exceed twenty (20) hours.

Mounting/Configuration:

Inverter/Charger, Power Transfer Relay and manually operated Bypass Switch shall fit inside a typical fully equipped controller cabinet.

Mounting method inside the 332 cabinet shall be shelf-mount, rack-mount or combination of either. Front-mounted available rack space inside the 332 cabinet is 3U or approximately 6 inches.

All interconnect wiring provided between Power Transfer Relay, Bypass Switch and Cabinet Terminal Service Block shall be no less than 6.5 feet of UL Style 1015 CSA TEW with the following characteristics:

AWG Rating: 10 AWG
Stranding: 105 strands of 30 AWG tinned copper
Rating: 600 V, 105 °C, PVC Insulation

Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be 6.5 feet of UL Style 1015 CSA TEW 18 AWG wire, same ratings as above, except 16 strands of 30 AWG tinned copper.

See Figure 4 that provides clarification as to how BBS Power Transfer Relay and Manual Bypass Switch are interconnected with controller cabinets in order to ensure interchangeability between all BBS manufacturers.

All necessary hardware for mounting (shelf angles, rack, etc) shall be included in the bid price of the BBS.

Internal Mounted Battery Option (Allowed only if requested on the plans):

Complete BBS, including batteries, shall fit inside a typical, fully equipped NEMA or Model 332 Cabinets, that includes one Model 170 or 390 controller.

The controller cabinet shall be equipped with a Hubble generator locking flanged inlet, configuration 6CS6375, 50A, 125VAC and manual transfer switch (see Figure 5 for details). The generator inlet shall be located behind a locking watertight cover. The bypass switch shall transfer the load, including the UPS to the twist lock inlet receptacle. The manual transfer switch shall be wired to prevent any back feed to the utility service.

Batteries mounted shall be swing-tray mounted below the controller shelf. A minimum of 6 bolts/fasteners shall be used to secure swing-trays to the 332 Cabinet standard EIA 19" rack. All bolts/fasteners and washers shall meet the following requirements:

Screw type: Pan Head Phillips machine screw
Size and Thread pitch: 10-32
Material: 18-8 stainless steel (Type 316 stainless steel is acceptable as an alternate)
Washer: Use one flat washer (18-8 stainless steel) under the head of each 10-32 screw (provided that the screws are properly tightened, lock washers are unnecessary).

Number of screws per swivel bracket, minimum: 6 screws (minimum) per swivel bracket. Spaced evenly along bracket, with one screw near each end. Batteries may be shelf mounted in area behind controller so long as shelf and batteries do not interfere with controller unit and C1 plug.

External Battery Cabinet Option:

Batteries shall be housed in a NEMA 3R rated cabinet mounted to the side of the controller cabinet (see Figure 2 for details). This external battery cabinet shall conform to TEES, August 16, 2002 Chapter 7, Section 2-Housings for the construction and finish of the cabinet and shall be anodic coating.

The battery back-up system shall be installed either at the back or the front of the existing controller cabinet. If installed at the back of controller cabinet, the modification shall include concrete walkway access to the BBS without encroaching outside the right-of-way. BBS shall be installed at the front of the controller cabinet (in locations where the back of the controller cabinet has limited right-of-way or conflicting structures and facilities and other obstructions), the BBS cabinet shall not cover the police panel. The BBS cabinet shall also not hinder the access ramp's compliance with ADA requirements.

Batteries shall be mounted on individual shelves.

Four shelves shall be provided. There shall be a minimum of 12 inches clearance between shelves. Each shelf shall be a minimum of 9" X 25", and capable of supporting a minimum of 125 lbs.

The external battery cabinet shall mount to the controller cabinet with a minimum of eight bolts. See Figure 2 for typical mounting location.

The external battery cabinet shall be ventilated through the use of louvered vents, filter, and one thermostatically controlled fan as per TEES Chapter 7 Section 2-Housings.

External battery cabinet fan shall be AC operated from the same line output of the Manual Bypass Switch that supplies power to the controller cabinet.

The external battery cabinet shall have a door opening to the entire cabinet. The door shall be attached to the cabinet through the use of either a continuous stainless steel piano hinge or four, two-bolts per leaf, hinges as per TEES Chapter 7 Section 2. The door shall use a three point, roller locking mechanism and standard #2 key lock to lock the door. The door shall have a stainless steel handle.

The external battery cabinet shall be equipped with a Hubble generator locking flanged inlet, configuration 6CS6375, 50A, 125 VAC and manual transfer switch (see Figure 5 for details). The generator inlet shall be located behind a locking watertight cover. The bypass switch shall transfer the load, including the UPS to the twist lock inlet receptacle. The manual transfer switch shall be wired to prevent any back feed to the utility service.

The BBS with external battery cabinet shall come with all bolts, conduits and bushings, gaskets, shelves, and hardware needed for mounting.

Maintenance, Displays, Controls And Diagnostics:

The BBS shall include a 2 line by 40 character LCD display to indicate current battery charge status, input/output voltages, time and settings of various conditions. The same parameters shall be available via RS232 and USB interfaces on the face of the BBS.

The BBS shall have lightning surge protection compliant with IEEE/ANSI C.62.41.

The BBS shall be capable of accepting firmware upgrades of the non-volatile, read-only memory via serial port communications. The updates shall be accomplished by uploading the software to the BBS over the RS232 serial port located on the face of the BBS.

The BBS shall be equipped with an integral system to prevent battery from destructive discharge and overcharge.

The BBS shall be capable of performing a SELF-TEST, locally from the BBS front panel LCD, or remotely via RS232 or USB interface. The duration of the SELF-TEST shall be programmable in 1-minute increments from 1 minute to 255 minutes.

The BBS and batteries shall be easily replaced with all needed hardware and shall not require any special tools for installation.

The BBS shall include a re-settable inverter event counter to indicate the number of times the BBS was activated and the total number of hours the unit has operated on battery power, accessible via the LCD screen or remotely via RS232 and USB.

The BBS shall be equipped with an event log that stores for a minimum the last 100 events. The events shall be time and date stamped. The event log shall be retrievable vial RS232, USB or from the BBS LCD screen. The event log shall be display and print out in plain English when output the RS232 or USB ports.

Manufacturer shall include a set of equipment lists, operation and maintenance manuals, and board-level schematic and wiring diagrams of the BBS, and the battery data sheets.

Battery System:

Individual batteries shall be 12V type, 105 amp-hour maximum, and shall be easily replaced and commercially available off the shelf.

Batteries used for BBS shall consist of 4 batteries with a cumulative minimum rated capacity of 240 amp-hours.

Batteries shall be deep cycle, sealed prismatic lead-calcium based AGM/VRLA (Absorbed Glass Mat/ Valve Regulated Lead Acid).

Batteries shall be certified by the manufacturer to operate over a temperature range of - 25 °C to +74 °C.

The batteries shall be provided with appropriate interconnect wiring and corrosion-resistant mounting trays and/or brackets appropriate for the cabinet into which they will be installed.

Batteries shall indicate maximum recharge data and recharging cycles.

Battery Harness:

Battery interconnect wiring shall be via two-part modular harness.

Part I shall be equipped with red (+) and black (-) 12 inches cabling that can be permanently connected to the positive and negative posts of each battery. Each red and black pair shall be terminated into an Molex, polarized - keyed battery cable connector or equivalent.

Part II shall be equipped with the mating Power Pole style connector for the batteries and a single, insulated Power Pole style connection to the inverter/charger unit. Harness shall be fully insulated and constructed to allow batteries to be quickly and easily connected in any order to ensure proper polarity and circuit configuration.

Power Pole connectors may be either one-piece or two-piece. If a two-piece connector is used, a locking pin shall be used to prevent the connectors from separating.

The length of the battery interconnect harness (Part II) shall be a minimum of 5 feet from the Inverter/Charger plug to the first battery in the string. The length of the harness between batteries shall be a minimum of 12 inches.

All battery interconnect harness wiring shall be UL Style 1015 CSA TEW or Welding Style Cable or equivalent, all of proper gauge with respect to design current and with sufficient strand count for flexibility and ease of handling.

Battery terminals shall be covered and insulated with molded boots so as to prevent accidental shorting.

Quality Assurance:

Each BBS shall be manufactured in accordance with a manufacturer Quality Assurance (QA) program. The QA program shall include two Quality Assurance procedures: (1) Design QA (see "Design Qualification Testing" below) and (2) Production QA. The Production QA shall include statistically controlled routine tests to ensure minimum performance levels of BBS units built to meet this specification and a documented process of how problems are to be resolved.

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

Battery Backup System designs not satisfying Design QA Testing and Production QA Testing requirements shall not be labeled, advertised, or sold as conforming to this specification.

The Contractor shall arrange to have a technician, qualified to work on the battery backup system and employed by the battery backup system manufacturer or employed by the manufacturers authorized distributor, present at the time the equipment is turned on. It shall be the responsibility of the Contractor to implement and fund any traffic signal controller assembly modifications required to achieve the traffic signal operation as shown on the construction plans and as required in these Special Provisions.

Design Qualification Testing:

The manufacturer, or an independent testing lab hired by the manufacturer, shall perform Design Qualification Testing on new BBS system(s) offered, and when any major design change has been implemented on an existing design. A major design change is defined as any modification, either material, electrical, physical or theoretical, that changes any performance characteristics of the system, or results in a different circuit configuration. Where a dispute arises in determining if a system is a new design or if the system has had a major design change, the County will make the final determination if Design Qualification Testing is required prior to production consideration.

Riverside County Quality Assurance Testing:

Riverside County will perform random sample testing on all shipments, consistent with ANSI/ASQC Z1.4-1993 Sampling Procedures and Tables for Inspection by Attributes.

Sample testing will normally be completed within 30 days after delivery to the County Laboratory, barring deficiencies in the shipment, which would reset the clock.

All parameters of the specification may be tested on the shipment sample.

The number of units tested (sample size) shall be determined by the quantity in the shipment. The sample size and acceptance or rejection of the shipment shall conform to ANSI/ASQC Z1.4.

Warranty:

Manufacturers shall provide a two (2) year factory-repair warranty for parts and labor on the BBS from date of acceptance by the County. Batteries shall be warranted for full replacement for two (2) years from date of purchase. The warranty shall be included in the total bid price of the BBS.

VIDEO DETECTION

Video detection systems shall be installed at the intersection of Walnut Avenue and Sherman Avenue for the following approaches and phasing:

Southbound	- presence detection for signal phase 4 & 7
Eastbound	- presence detection for signal phase 2
Westbound	- presence detection for signal phase 6
Northbound	- presence detection for signal phase 3 & 8

The Contractor shall furnish and install a pointing device, a drawer mounted 17" LCD monitor, video detection cameras (VDC), video detection processors (VDP), extension modules (EM), surge suppressors, and all necessary cabling and auxiliary equipment to make the video detection systems fully functional for the intended operation at each intersection. The Contractor shall furnish a spare VDC, a spare EM, and a spare VDP to the Engineer.

A video detection camera shall be attached to each signal mast arm using Pelco Products camera mount kit as recommended by the manufacturer. Camera shall be centered above the travel way with unobstructed field of view. Final camera placement shall be approved by the Engineer.

The video detection systems shall be installed by supplier factory certified installers and as recommended by the supplier and documented in installation materials provided by the supplier. Proof of factory certification shall be provided.

Detection Zones:

Placement of detection zones shall be done by using a pointing device connected to the VDP to draw the detection zones on the video image from the video camera displayed on a video monitor using the menu and graphical interface built into the VDP. No separate computer shall be required to program the detection zones. The menu shall facilitate placement of detection zones and setting of zone parameters or to view system parameters.

Detection zone setup shall not require site-specific information such as latitude, longitude, date and time to be entered into the system.

Each detection zone shall be user definable in size and shape to suit the site and the desired vehicle detection region. A detection zone shall be approximately the width and length of one car.

A single detection zone shall be able to replace multiple inductive loops and the detection zones shall be OR'ed as the default or may be AND'ed together to indicate vehicle presence on a single phase of traffic movement.

When a vehicle is detected crossing a detection zone, the corners of the detection zone shall flash on the video overlay display screen to conform the detection of the vehicle.

Distance between the detection zone placement and the camera shall not be more than a distance of ten times the mounting height of the camera.

Functional Capabilities:

System must have a single point access to multiple rack-mounted video detection units. The access device shall provide interface capabilities to enable multiple rack-mounted video detection processors to be locally and remotely accessed from a single point via one set of user interface devices.

The video detection processor (VDP) shall process video from one or two sources. The video input to the VDP shall be in NTSC or PAL composite video format and shall be digitized and analyzed in real time. Dual video VDP's shall process images from both inputs simultaneously.

The camera shall be able to transmit the composite video signal, with minimal signal degradation, up to 1000 feet under ideal conditions.

The VDP shall have a nine-pin RS-232 port that is multi-drop compatible for communications with an external computer. The VDP shall be able to accept new detector patterns from and send its detection patterns to an external computer through this RS-232 port. A Windows™ based software designed for local or remote connection for uploading and downloading data, and providing video capture, real-time detection indication and detection zone modification capability shall be provided with the system.

The extension module (EM) shall be available to avoid the need of rewiring the detector rack, by enabling the user to plug an extension module into the appropriate slot in the detector rack. The extension module shall be connected to the VDP by an 8-wire cable with modular connectors. VDP and EM communications shall be accommodated by methods using differential signals to reject electrically coupled noise. The extension module shall be available

in both 2 and 4 channel configurations. EM configurations shall be programmable from the VDP.

The VDP shall provide a minimum of 24 channels of vehicle presence detection/detection zones per camera through a standard detector rack edge connector and one or more extension modules.

The VDP shall store up to three different detection zone patterns within the VDP memory. The VDP's memory shall be non-volatile to prevent data loss during power outages. The VDP shall continue to operate (e.g. detect vehicles) using the existing zone configurations even when the operator is defining/modifying a zone pattern. The new zone configuration shall not go into effect until the operator saves the configuration. Each configuration can be uniquely labeled for identification and the current configuration letter is displayed on the monitor. The selection of the detection zone pattern for current use shall be done through a local menu selection or remote computer via RS-232 port. It shall be possible to activate a detection zone pattern for a camera from VDP memory and have that detection zone pattern displayed within 1 second of activation.

The VDP shall provide dynamic zone reconfiguration (DZR) to enable normal detector operation of existing channels except the one where a zone is being added or modified during the setup process. The VDP shall output a constant call on any detection channel corresponding to a zone being modified.

The VDP shall detect vehicles in real time as they travel across each detector zone.
The VDP shall output a constant call for each enabled detector output channel if a loss of video signal occurs. The VDP shall output a constant call during the background learning period.

The VDP shall be capable of detecting a low-visibility condition automatically, such as fog, and place all defined detection zones in a constant call mode. The VDP shall automatically revert to normal detection mode when the low-visibility condition no longer exists. A user-selected output shall be active during the low-visibility condition that can be used to modify the controller operation if connected to the appropriate controller input modifier(s).

Detection shall be at least 98% accurate in good weather conditions and at least 96% accurate under adverse weather conditions (rain, snow, or fog). Detection accuracy is dependent upon site geometry; camera placement, camera quality and detection zone location, and these accuracy levels do not include allowances for occlusion or poor video due to camera location or quality.

Detection zone outputs shall be configurable to allow the selection of presence, pulse, extend, and delay outputs. Timing parameters of pulse, extend, and delay outputs shall be user definable between 0.1 to 25 seconds.

Up to six detection zones shall be capable to count the number of vehicles detected. The count value shall be internally stored for later retrieval through the RS-232 port. The data collection interval shall be user definable in periods of 5, 15, 30 and 60 minutes.

Video Detection Processor (VDP) & Extension Module (EM) Hardware:

The VDP and EM shall be specifically designed to mount in a standard NEMA TS-1, TS-2, 2070 ATC, 170 type detector rack, using the edge connector to obtain power and provide contact closure outputs. No adapters shall be required to mount the VDP or EM in a standard detector rack. Detector rack rewiring shall not be required or shall be minimized.

The VDP and EM shall operate in a temperature range from -34°C to +74°C and a humidity range from 0%RH to 95%RH, non-condensing.

The VDP and EM shall be powered by 12 or 24 volts DC. These modules shall automatically compensate for the different input voltages.

VDP power consumption shall not exceed 300 milliamps at 24 VDC. The EM power consumption shall not exceed 120 milliamps at 24 VDC.

The VDP shall include an RS-232 port for serial communications with a remote computer. The VDP RS-232 port shall be multi-drop compatible. This port shall be a 9-pin "D" subminiature connector on the front of the VDP.

The VDP shall utilize flash memory technology to enable the loading of modified or enhanced software through the RS-232 port without modifying the VDP hardware.

The VDP and EM shall include detector output pin out compatibility with industry standard detector racks.

The front of the VDP shall include detection indications, such as LED's, for each channel of detection that display detector outputs in real time when the system is operational.

The front of the VDP shall include one or two BNC video input connection suitable for RS-170 video inputs as required. The video input shall include a switch selectable 75-ohm or high impedance termination to allow camera video to be route to other devices, as well as input to the VDP for vehicle detection. Video must be inputted via a BNC connector on the front face of the processor. RCA type connectors/jacks for video input are not allowed. Video shall not be routed via the edge connectors of the processor.

The front of the VDP shall include one BNC video output providing real time video output that can be routed to other devices. A RCA type connector/jack for video output is not allowed.

The front panel of the VDP and EM shall have a detector test switch to allow the user to place calls on each channel. The test switch shall be able to place either a constant call or a momentary call depending on the position of the switch.

Video Detection Camera:

The VDC used for traffic detection shall be furnished by the VDP supplier and shall be qualified by the supplier to ensure proper system operation.

The camera shall produce a useable video image of the bodies of vehicles under all roadway lighting conditions, regardless of time of day. The minimum range of scene luminance over which the camera shall produce a useable video image shall be the minimum range from nighttime to daytime, but not less than the range 0.1 lux to 10,000 lux.

The camera shall use a CCD sensing element and shall output monochrome video with resolution of not less than 380 lines horizontal.

The camera shall include an electronic shutter control based upon average scene luminance and shall be equipped with a factory adjusted manual iris. Auto-iris lenses are not allowed.

The camera shall include a variable focal length lens with variable focus that can be adjusted, without opening up the camera housing, to suit the site geometry by means of a portable interface device designed for that purpose and manufactured by the detection system supplier. The horizontal field of view shall be adjustable from 8.1 to 45.9 degrees. A single camera configuration shall be used for all approaches in order to minimize the setup time and spares required by the user.

The camera electronics shall include Automatic Gain Control (AGC) to produce a satisfactory image at night or low light conditions.

The camera shall be housed in a weather-tight sealed enclosure. The housing shall be field rotatable to allow proper alignment between the camera and the traveled road surface.

The camera enclosure shall be equipped with a sunshield. The sunshield shall include a provision for water diversion to prevent water from flowing in the camera's field of view. The camera enclosure with sunshield shall be less than 153-mm diameter, less than 380-mm long, and shall weigh less than 2.7 kg when the camera and lens are mounted inside the enclosure.

The camera enclosure shall include a thermostatically controlled heater to assure proper operation of the lens shutter at low temperatures and prevent moisture condensation on the optical faceplate of the enclosure.

When mounted outdoors in the enclosure, the camera shall operate satisfactorily in a temperature range from -34°C to +60°C and a humidity range from 0%RH to 100%RH.

The camera shall be powered by 120-240 VAC 50/60 Hz. Power consumption shall be 15 watts or less under all conditions.

The camera enclosure shall be equipped with separate, weather-tight connections for power and setup video cables at the rear of the enclosure. These connections may also allow diagnostic testing and viewing of video at the camera while the camera is installed on a mast arm or pole using a lens adjustment module supplied by the VDP supplier. Video and power shall not be connected within the same connector.

The video signal output by the camera shall be black and white in RS-170 or CCIR format.

The video signal shall be fully isolated from the camera enclosure and power cabling.

Cabling And Cable Connections:

Interface among the VDPs and EMs shall be RJ-45 interface connectors.

The coaxial cable to be used between the camera and the VDP in the traffic cabinet shall be Belden 8281. The coax cable shall be a continuous unbroken run from the camera to the VDP. This cable shall be suitable for installation in conduit or overhead with appropriate span wire. 75-ohm BNC plug connectors should be used at both the camera and cabinet ends. The coaxial cable, BNC connector, and crimping tool shall be approved by the supplier of the video detection system, and the manufacturer's instructions must be followed to ensure proper connection.

The power cabling shall be 16 AWG three conductor cable with a minimum outside diameter of 0.325 inch and a maximum diameter of 0.49 inch. The cabling shall comply with the National Electric Code, as well as local electrical codes. Cameras may not acquire power from the luminaire.

Limited Warranty:

The supplier shall provide a limited three-year warranty on the video detection systems.

During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory-certified personnel or factory-certified installers.

Maintenance And Support:

The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the system. These parts shall be available for delivery within 30 days of placement of an acceptable order at the supplier's then current pricing and terms of sale for said parts.

The supplier shall maintain an ongoing program of technical support for the access unit and video detection system. This technical support shall be available via telephone, or via personnel sent to the installation site upon placement of an acceptable order at the supplier's then current pricing and terms of sale for on site technical support services.

Installation or training support shall be provided by factory-authorized representative.

All product documentation shall be written in the English language.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and installation of the Video Detection Systems shall be included in the lump price paid for Signal And Lighting and no additional compensation will be allowed therefor.

PAYMENT

The lump sum price paid for Signal And Lighting shall include full compensation for furnishing all materials, equipment and labor and doing all work necessary.

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.

Existing utility and privately owned facilities shall be protected in accordance with Section 7-1.11, "Preservation of Property" and these Special Provisions. The Contractor is also responsible to protect those facilities that are to be relocated by others prior to or during construction, and shall protect those facilities in both their existing and their ultimate locations. The Contractor shall cooperate with owners and their Contractors of utility and privately owned facilities, for the relocation of said facilities, in accordance with Section 7-1.14, "Cooperation" of the Standard Specifications.

All water valves, gas valves, sewer manholes, survey monuments, survey markers and any other utility appurtenances shall be protected in place. Full compensation for such protection shall be considered as included in the various bid items.

The Contractor's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workmen and the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipe lines greater than 6 inches in diameter or pipe lines operating at pressures greater than 60 psi (gage); underground electric supply system conductors or cables either directly buried or in duct or conduit which do not have concentric neutral conductors or other effectively grounded metal shields or sheaths; and underground electrical conductors with potential to ground of more than 300 volts. The Contractor shall notify the Engineer at least twenty-four hours prior to performing any work in the vicinity of such facilities.

Attention is directed to the requirements of Government Code Sections 4216-4216.9 pertaining to existing utility facilities.

The Contractor shall assume that every house, building and lot within the project limits has utility service pipes and conductors (laterals), and that utility main and trunk facilities exist within the project limits. The Contractor shall determine if it is warranted to determine the exact location of these utility service laterals and existing main lines, unless directed by the Engineer to pot-hole at specific locations, or as otherwise required herein. The Contractor will not be directly reimbursed for determining the exact location of the utility main lines or services laterals but shall include any compensation for this work in the contract price paid for the various items of work. Any damage to existing main lines or service laterals for which pot-holing was not performed shall be considered damage due to not using reasonable care and the damage shall be repaired at the Contractor's expense.

The Contractor shall conduct his operations with the assumption that underground utility facilities exist within the project limits. The Contractor shall exercise caution and best construction practices for safety and for protection of underground facilities. The approximate locations of underground utility facilities, as shown on the plans, are based on information provided by the respective owners, listed below. The Contractor shall also utilize the markings of the regional notification center (Underground Service Alert), and above-ground utility appurtenances to determine the existence and approximate location of underground utilities.

No excavation shall be made within 4 feet of any underground utilities, as listed below, unless and until such utilities have been positively located as to horizontal and vertical position. This requirement applies to all underground electric, natural gas, toxic or flammable gas, chlorine, oxygen or petroleum facilities.

Forty-eight hours prior to beginning construction, the Contractor shall notify the following agencies:

Underground Service Alert	800-227-2600
Southern California Edison Company	951-928-8318
Southern California Gas Company	818-701-4546
MWD	213-217-6961
Elsinore Valley Municipal Water District	951-674-3146
Kinder Morgan Energy Partners, L.P.	714-560-4400
Nuevo Water Company	951-928-1922
Time Warner Cable	951-549-3977
Mediacom Cable	951-672-8385

Full compensation for all costs, including labor, equipment, materials and incidentals, required to comply with the requirements of this section shall be considered as included in the various items of work, and no additional compensation will be allowed therefor.

Attachment "A"

COUNTY OF RIVERSIDE
TRANSPORTATION AND LAND MANAGEMENT AGENCY
TRANSPORTATION DEPARTMENT

MODEL 170 CONTROLLER ASSEMBLY SPECIFICATIONS

September 11, 1998 revised October 16, 2007

The controller unit, Model 170E, and its cabinet, Model 332, shall be in accordance with the provisions of Section No. 86 "Signals, Lighting and Electrical Systems" of the latest edition of the State of California Standard Specifications and these Special Provisions.

Furnishing and installing the required controller assemblies shall be in accordance with the current edition of the State of California Standard Plans, Standard Specifications, the construction plans and the special provisions and these equipment specifications.

All Model 170E controllers supplied shall have dual Asynchronous Communications Interface Adaptor (ACIA) capability. Dual ACIA's shall be integral to the controller unit. Horizontal printed circuit board controllers will not be accepted.

The complete control system, including the Model 332 cabinet, shall conform to current State of California, Business and Transportation Agency, Department of Transportation, "Transportation Electrical Equipment Specifications" (TEES) and "Traffic Signal Control Equipment Specifications" (TSCES), including issued addenda.

The above-referenced document is available from the State of California, Department of Transportation, Sacramento, for a fee.

The cabinet features shall include push-buttons for manual actuation of all vehicular and pedestrian phases. The buttons shall be rack-mounted. The cabinet shall also be provided with a fluorescent lamp for interior lighting and a pull out drawer assembly. Door lock shall be Corbin No. 2.

An aluminum shelf with integral compartment shall be provided as the next unit installed below the 170E Local Controller, on all 332A Cabinets. The storage compartment shall have telescoping drawer guides for full extension. The compartment top shall have a non-slip plastic laminate permanently attached. The non-slip laminate SHALL NOT be attached with silicon adhesive.

MODEL 170 CONTROLLER ASSEMBLY SPECIFICATIONS
Updated 10/16/07

Each Type 170 controller assembly consisting of a Model 170E controller unit shall be furnished with completely wired Model 332 controller cabinet, Model 222 inductive loop detector sensor units, Model 242 isolators, and Model 210 ECL or equivalent conflict monitor. Conflict monitor shall be capable of monitoring green, amber and red indications. Model 400 Modem, Model 204 flasher units and other equipment required to provide a complete control system shall be furnished. The Model 332 cabinet shall incorporate a Power Distribution Assembly No. 2 (PDA2) power distribution assembly. Bitrans Systems, Inc. No. 200SA1.E software shall be furnished and installed in each controller unit supplied. Said software shall be furnished on a Model 412-F Prom Module with No. 27256 EPROM.

System memory modules shall be Model 412-F as described in the CALTRANS Specifications, and provide for 32K EPROM (27256), 16K RAM, and 8K zero power RAM (memory method two, memory select four).

If the purchase order or contract plan(s) indicates two each Model 170E controller units to be housed in one each 332 cabinet, one unit shall serve as the field master control for coordinated traffic operations between signalized intersections. The cabinet shall be completely wired including all appurtenances for this operation. The supplier shall furnish and install Bitrans Systems, Inc. No. 210 FM software on each field master controller. Said software shall be furnished on a Model 412-F prom Module with No. 27256 EPROM.

A twelve- position interconnect terminal strip shall be provided for termination of the interconnect cable for communication lines.

One C2P modem interconnect harness with a six foot cable shall be wired to the interconnect terminal strip. (Local intersection controller to interconnect terminal strip).

In the cabinet in which the Field Master is installed, an additional C2P modem interconnect harness with a six foot cable shall be wired to the interconnect terminal strip (Field Master controller to interconnect terminal strip). An additional Model 400 modem shall be furnished for the Field Master controller.

Load switch switching circuits shall each be contained in a replacement module (cube type) sealed in epoxy and rated at 15 amperes load (25 amperes triac). Pin 11 on all load switch sockets shall be wired to AC. Output indicators shall be installed on all load switches.

All load switch sockets shall have individual wire terminals; printed circuit boards will not be allowed.

The switching circuit for the flasher unit shall be contained in a replacement module (cube type) sealed in epoxy. The unit shall be rated for 15 amperes load (25 amperes triac).

The Model 332 cabinet shall be equipped with a thermostatically controlled electric fan with ball or roller bearings. A capacity rating of at least 100 cubic feet per minute is required.

Cabinet finish (interior and exterior) shall be anodic coating.

A test program for the Model 170E controller unit as required in Chapter One, Section VII, of the Traffic Signal Control Equipment Specifications shall be furnished for the Prom Module to be supplied; said Module shall be 412-F.

412-F Module shall be fully programmed to support Bitrans 200 on a single 27256 Eprom, test program shall be supplied on a single 27256 Eprom.

Two (2) complete manuals and four (4) complete cabinet wiring diagrams for each furnished controller assembly shall be supplied in accordance with the above-referenced April of 1978 Specifications. The cabinet wiring diagram shall include a reduced schematic drawing (apx. 5.5" X 5.5") of the project intersection, which shall include the following information, at a minimum:

1. Basic intersection geometry, including marked lanes and crosswalks, north arrow and street names.
2. Poles.
3. Traffic signal heads with phase designations.
4. Pedestrian signal heads with phase designations.
5. Loop detectors with input file designations.

The Model 170E controller and controller cabinet shall be manufactured and furnished by the same manufacturer, and shall form a complete functional controller system capable of providing the traffic signal operation specified. All traffic control equipment to be furnished shall be currently acceptable to CALTRANS Laboratory, Sacramento, CA, and shall currently be listed on the Department of Transportation Quality Production List (QPL).

The supplier shall perform operational and functional testing of the supplied controller assemblies and additional supplied equipment in accordance with the specifications of the State of California Department of Transportation.

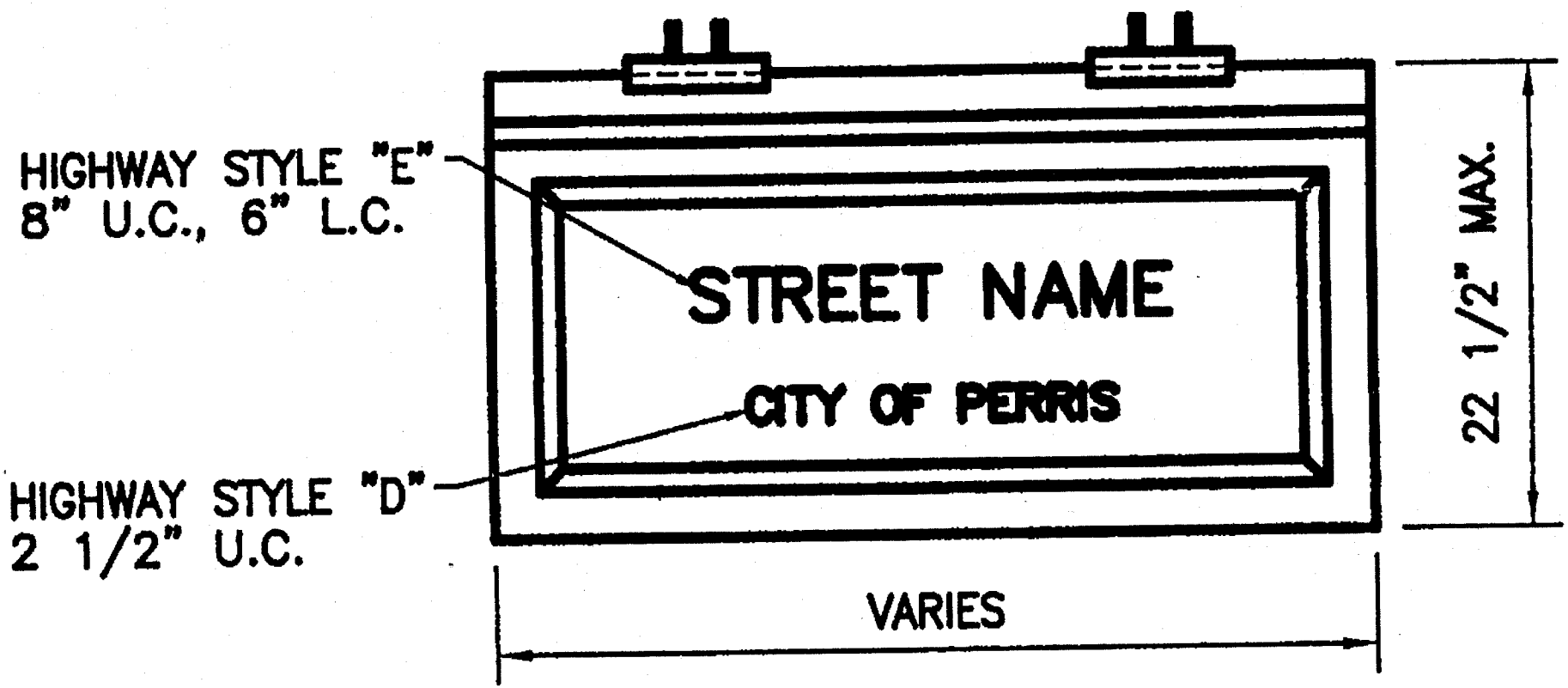
Said tests shall be performed in accordance with current State of California Department of Transportation guidelines, and a Certificate of Compliance shall be issued for each successfully tested controller assembly and additional supplied equipment.

The requirement for the operational and functional testing of the equipment shall be considered as included in the lump sum price paid for traffic signal and lighting, and no additional compensation shall be allowed therefor.

Furnishing, transporting, installing and wiring of traffic signal controller assemblies, including labor, equipment, materials and incidentals, shall be considered as included in the lump sum price paid for traffic signal and lighting, and no additional compensation shall be allowed therefor.

REFERENCE DRAWINGS

CITY OF PERRIS I.I.S.N.S. DETAIL



NOTES:

1. WHITE LETTERS AND BORDER ON INTERSTATE BLUE BACKGROUND.
2. SIGNS SHALL BE ATTACHED TO A 10 FOOT ARM, EXTENDING FROM THE SHAFT OF THE POLE AND PARALLEL TO THE SIGNAL MAST ARM.
3. REFER TO CALTRANS STD. PLAN ES-70 FOR DETAILS (TYPE 'A' SIGN).

Battery Back Up System (BBS) Block Diagram

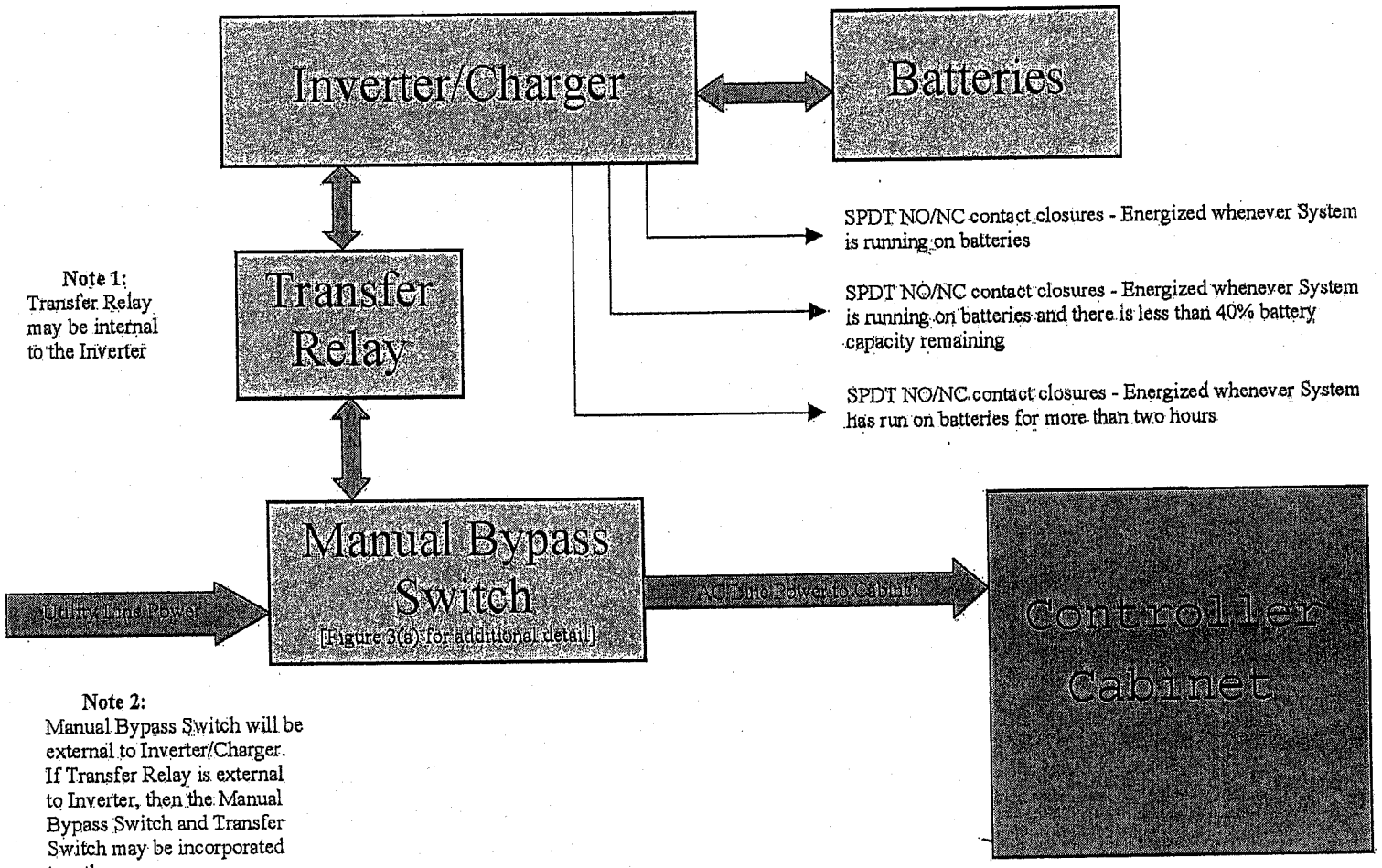
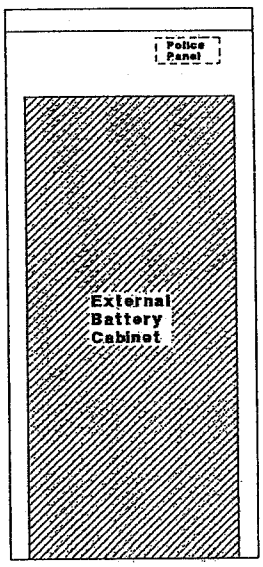


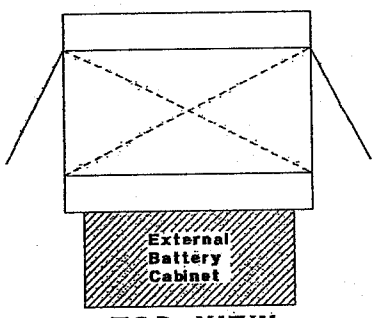
Figure 1

Typical External Battery Cabinet Placement

Model 332 Cabinet

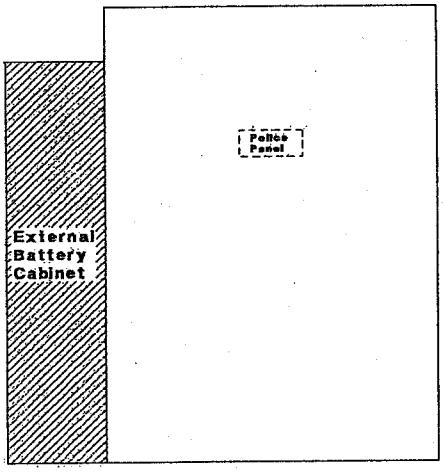


SIDE VIEW

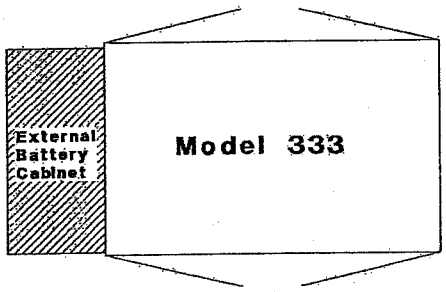


TOP VIEW

Model 333/Type P Cabinet



FRONT VIEW



TOP VIEW

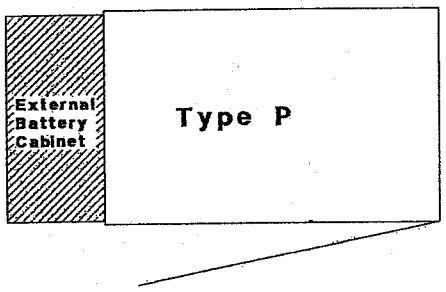
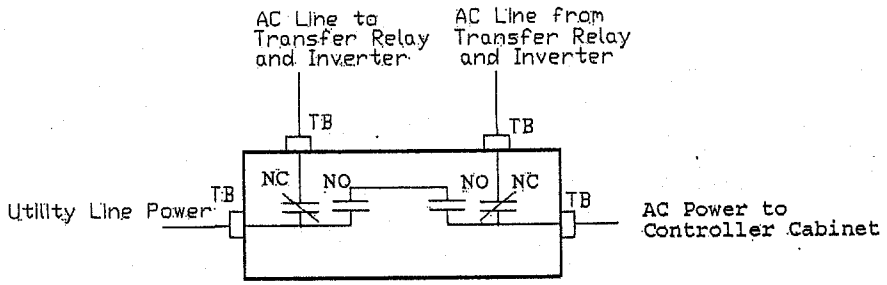


Figure 2

Note: External battery cabinet shall be attached as shown above unless otherwise directed by the Engineer

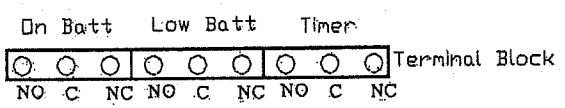
BBS Specification Clarifications

(a) Manual Bypass Switch (shown in non-bypass, or BBS, mode)



Notes:
1. TB - #8 Terminal Blocks
2. NO - Normally Open
3. NC - Normally Closed
4. NO/NC contacts shall all toggle simultaneously with one single manually operated switch.
5. Manual Bypass Switch shall only switch line. Neutral and Equipment Ground are not switched and shall be connected to Controller Cabinet buses.

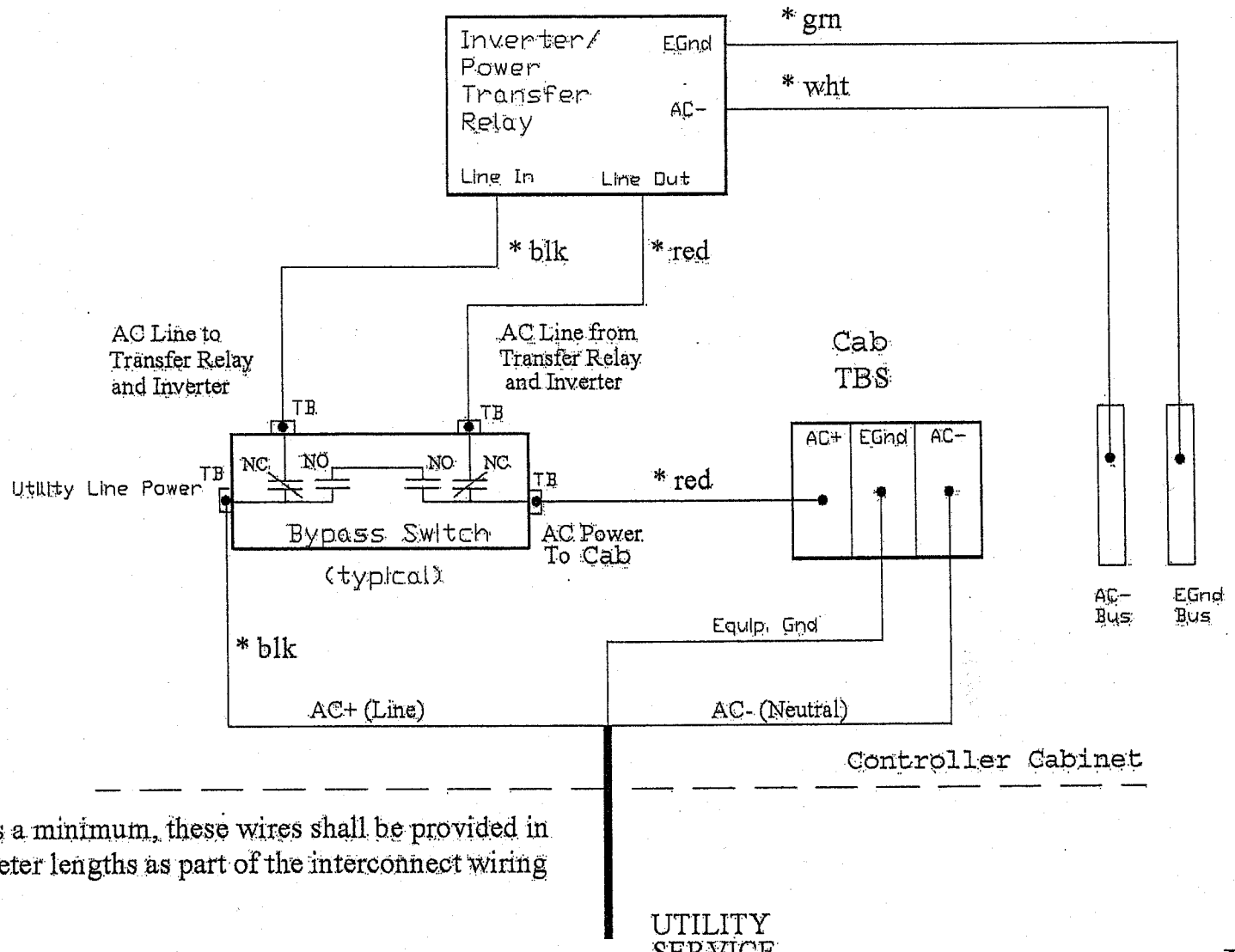
(b) Relay contacts (NO/NC) available on panel-mounted terminal block (typ)



Notes:
1. NO/NC contacts may either share or use separate commons.

Figure 3

BBS Utility Power Connection Diagram



* As a minimum, these wires shall be provided in 3-meter lengths as part of the interconnect wiring kit.

Figure 4

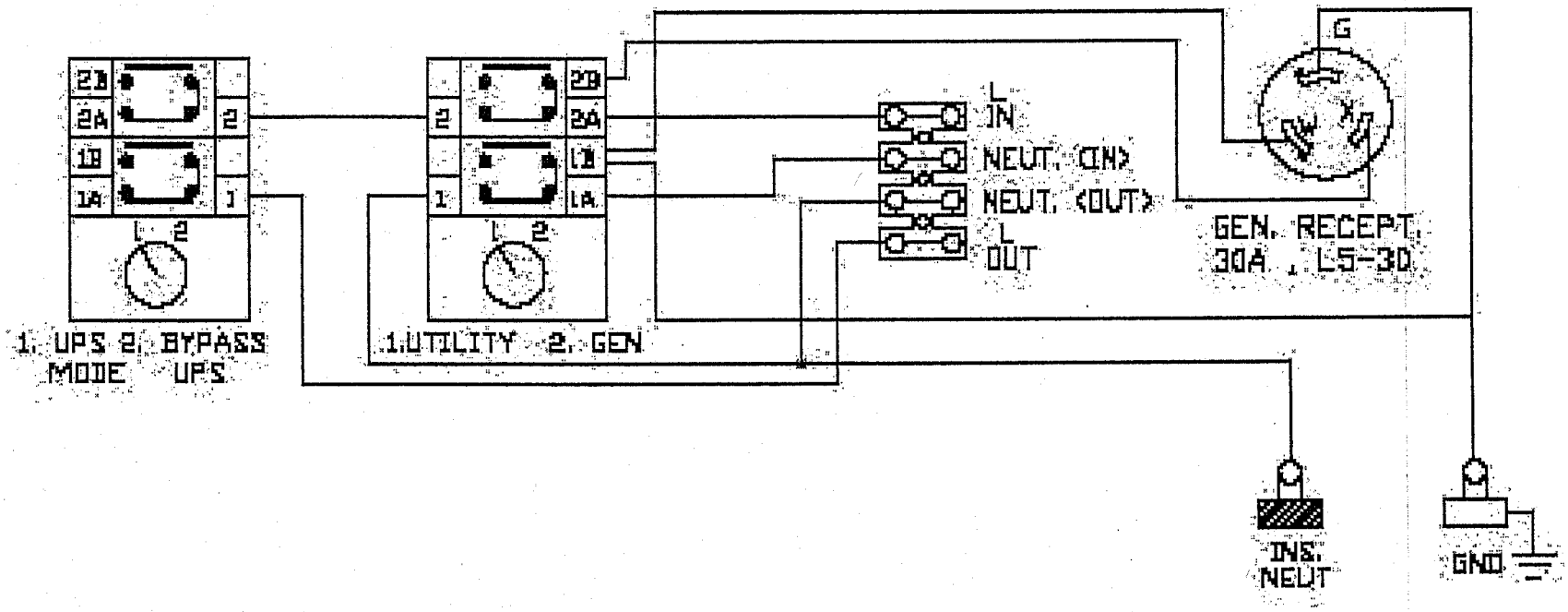

2B
2A
1B
1A
2
1
L 2
1. UPS 2. BYPASS
MODE UPS
2B
2A
1B
1A
2
1
L 2
1.UTILITY 2. GEN
L
IN
NEUT. <IN>
NEUT. <OUT>
L
OUT
G
GEN. RECEPT.
30A , L5-30
IN&
NEUT
GND

Figure 5

ACCEPTABLE BRANDS LIST (ABL) for BATTERY BACKUP SYSTEMS

This list was obtained from the website of the State of California Department of Transportation during the month of December, 2007, and is not warranted to be up to date.

US Traffic Corporation
A Quixote Company
9603 John Street
Santa Fe Springs, CA 90670
Tel: 1-800-733-7872
Fax: 1-562-923-7555
Russ Colthorpe Project Manager
2511 Corporate Way
Palmetto, FL 34221
Email: Russ.Colthorpe@quixotecorp.com
Web: www.ustraffic.net
Model: PB-1250C-PC / PN: G30190

Airpax Dimensions Unlimited, Inc.
4467 White Bear Pkwy
St. Paul, MN 55110-7626
Tel: 1-800-553-6418
Fax: 1-651-653-7600
Mike Olsen, Product/Marketing Manager
Email: mike.olsen@airpax.net
Web: www.airpaxdimensions.com
24 Vdc Models: ADI-24M11 & ADY-2411
48 Vdc Models: ADI-48M17 & ADI-48Y17

Alpha Technologies, Inc.
3767 Alpha Way
Bellingham, WA 98226
Tel: 1-360-647-2360
Fax: 1-360-671-4936
Frank Albano, VP Sales
Email: falbano@alpha.com
Web: www.alpha.com
Model: Novus 1000TP

Myers Power Products, Inc.
725 E. Harrison Street
Corona, CA 92879
Tel: 1-951-520-1900
Fax: 1-951-520-1961
Robert Young
Email: bob.young@myerspower.com
Web: www.myerspowerproducts.com
Model: MP2000 (2000VA / 1500 Watt)

Acceptable Brands List for External Battery Cabinets:

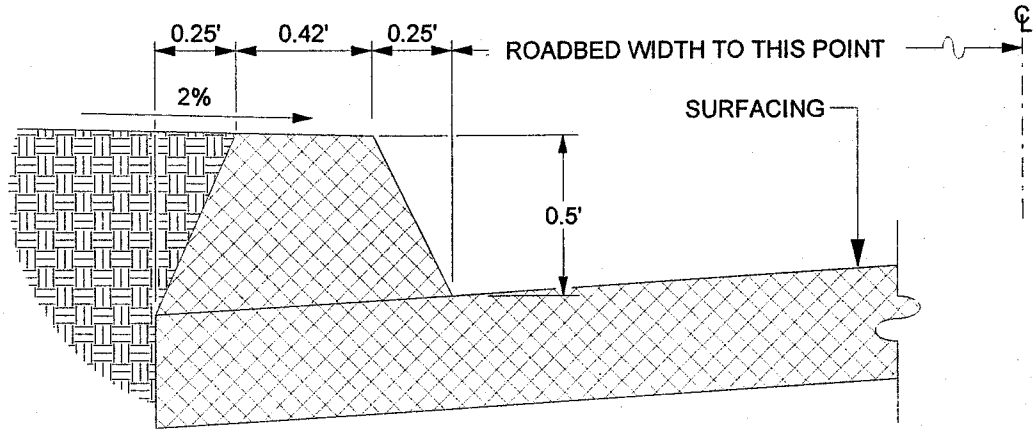
California Chassis
3356 E. La Palma Avenue
Anaheim, CA 92806
Tel: 1-714-666-8511
Fax: 1-714-666-8509
David Kohl, CEO
Email: dkohl@calchassis.com
Web: www.calchassis.com
PN: 103886

Myers Power Products
725 E. Harrison Street
Corona, CA 92879
Tel: 1-951-520-1900
Fax: 1-951-520-1961
Robert Young
Email: bob.young@myerspower.com
Web: www.myerspowerproducts.com
Model: BC280-CA-A (Anodized)

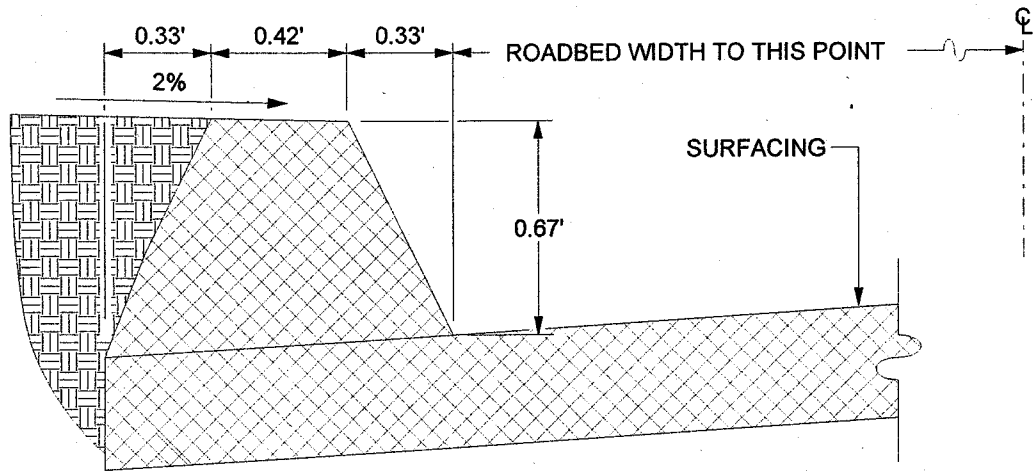
McCain Traffic Supply
2365 Oak Ridge Way
Vista, CA 92081
Tel: 1-760-734-5016
Fax: 1-760-597-7103
Diana Hawkins, Sales Representative
Email: dhawkinsl@mccaintraffic.com
Web: www.mccaintraffic.com
PN: M34196

Safetrans Traffic Systems, Inc.
1485 Garden of the Gods Road
Colorado Springs, CA 80933
Tel: 1-719-599-5600
Fax: 1-719-599-3853
Bob Russo
Email: rrusso@safetran-traffic.com
Web: www.safetran-traffic.com
Model: 088397D332-00B

US Traffic Corporation
A Quixote Company
9603 John Street
Santa Fe Springs, CA 90670
Tel: 1-800-733-7872
Fax: 1-562-923-7555
Russ Colthorpe Project Manager
2511 Corporate Way
Palmetto, FL 34221
Email: Russ.Colthorpe@quixotecorp.com
Web: www.ustraffic.net
Model: BC280-CA-A-K2



6" A.C. DIKE



8" A.C. DIKE

NOT TO SCALE

NOTE: A.C. DIKE REQUIRED WHERE FILL SLOPES ARE STEEPER THAN 4:1, MATERIAL IS SUSCEPTIBLE TO EROSION, OR WHERE ROADWAY GRADIENT EXCEEDS 3%.

APPROVED BY:

DATE: 05/01/07

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

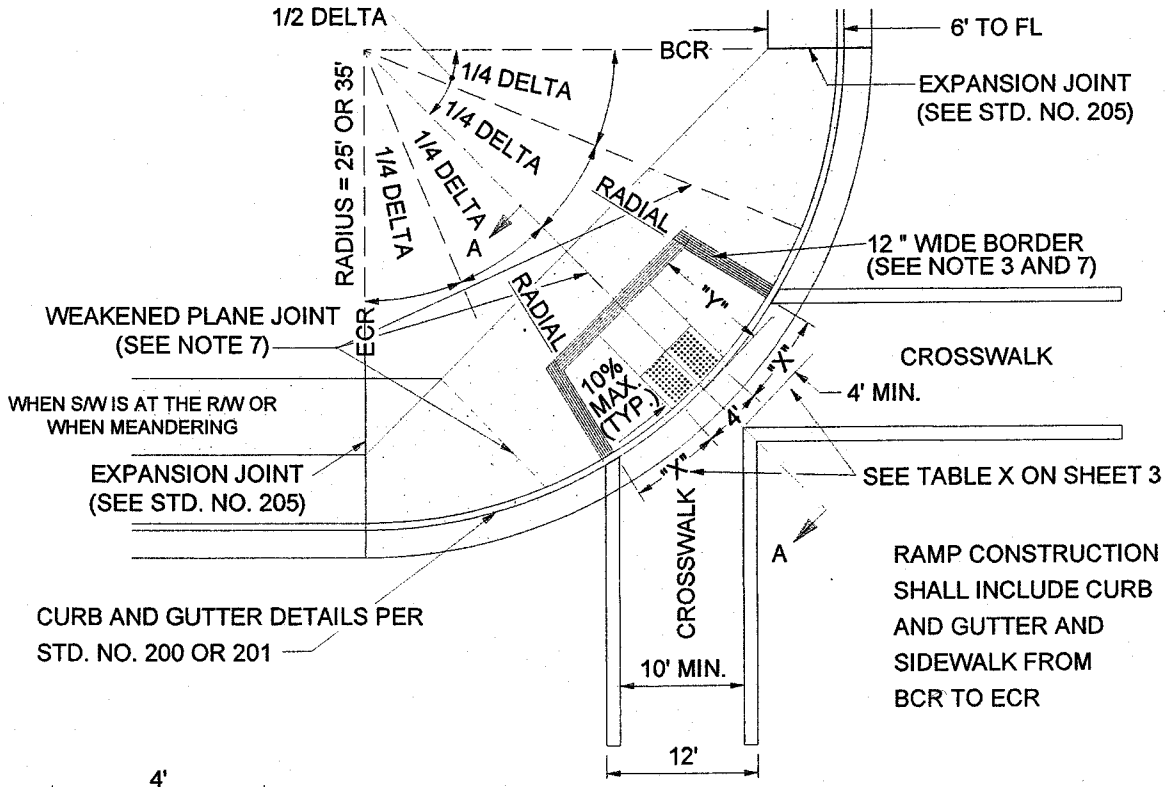
REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

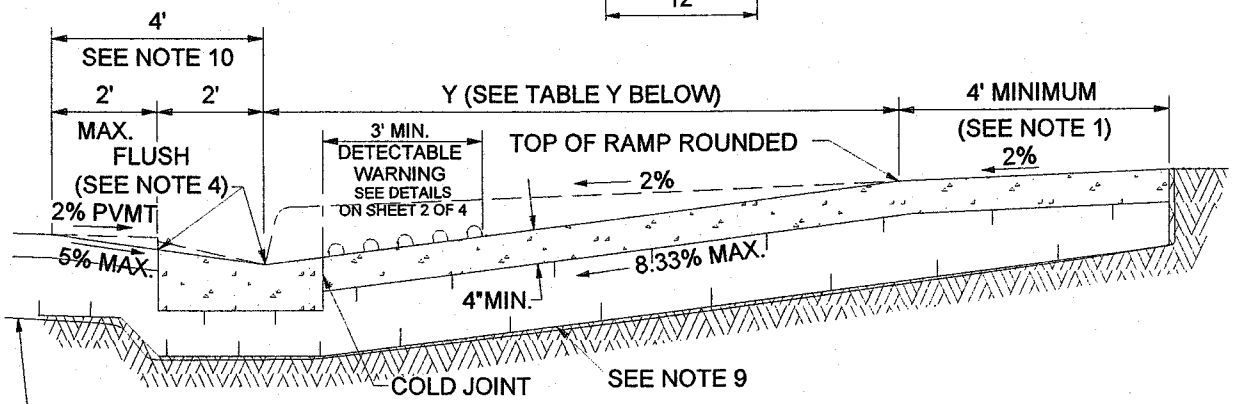
COUNTY OF RIVERSIDE

ASPHALT CONCRETE DIKES

STANDARD NO. 212

REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
		1				4			
		2				5			
		3				6			





SECTION A-A

TABLE Y

CF	Y
6"	7.90'
8"	10.53'

$$Y = \frac{\text{CURB FACE (FT.)}}{6.33\%}$$

NOT TO SCALE

SEE SHEET 4 OF 4 FOR NOTES.

APPROVED BY:

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

DATE: 11/15/04

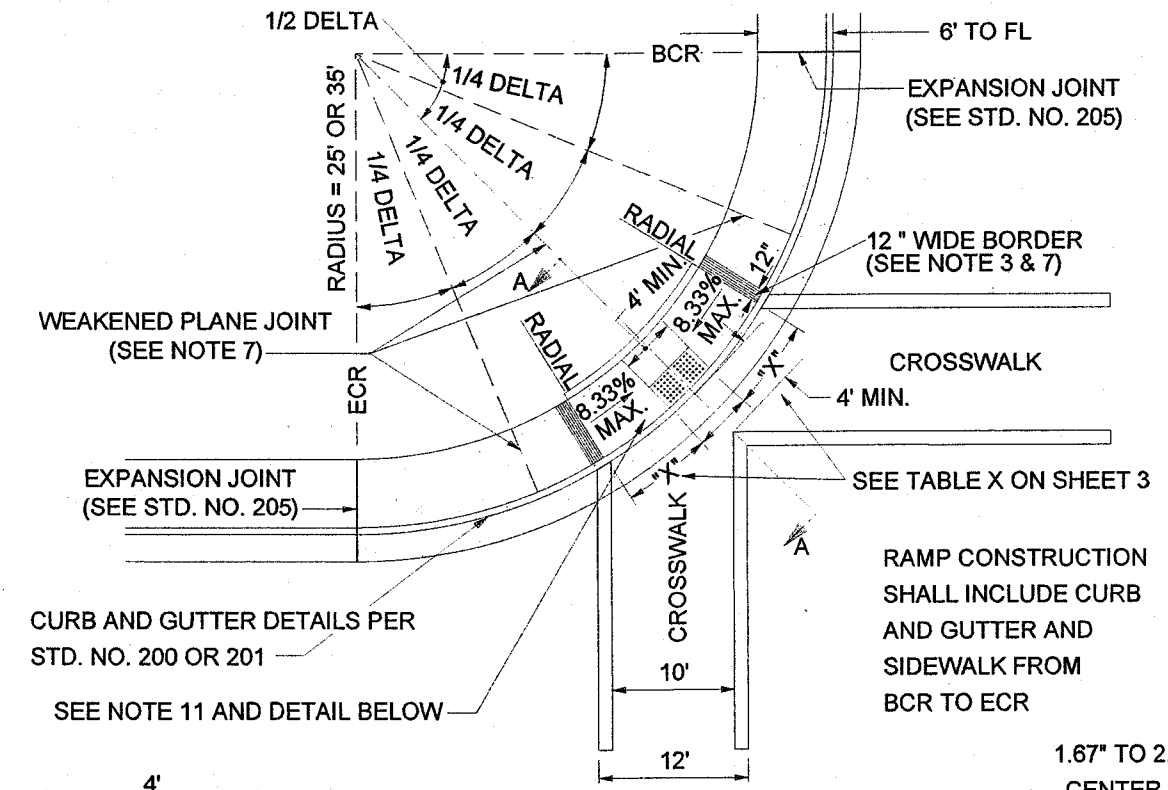
REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-06
CIVIL
STATE OF CALIFORNIA

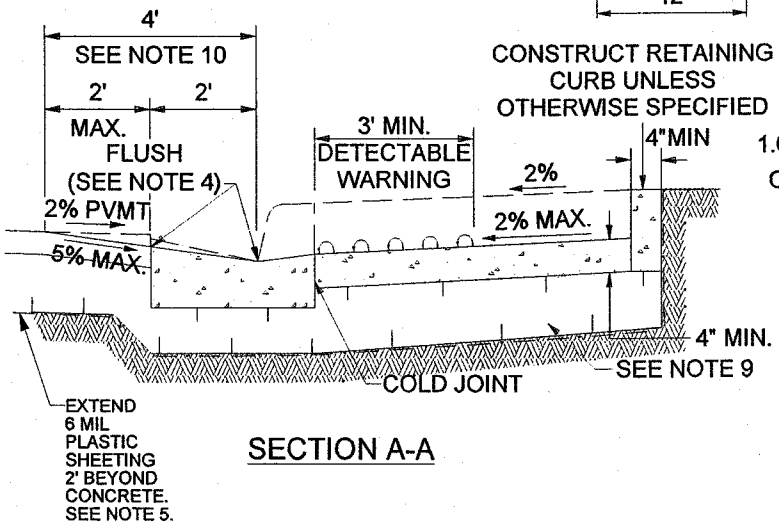
COUNTY OF RIVERSIDE

CURB RAMP CASE A

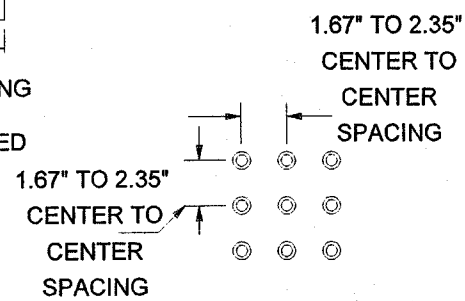
STANDARD NO. 403 (1 OF 4)

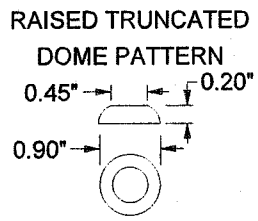
REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
8-77, 5-80	11-04	1				4			
10-81, 6-82		2				5			
9-88, 2-90		3				6			





SECTION A-A





RAISED TRUNCATED DOME
DETECTABLE WARNING SURFACE
SEE NOTE 11

SEE SHEET 4 OF 4 FOR NOTES.

NOT TO SCALE

APPROVED BY:

DATE: 11/15/04

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

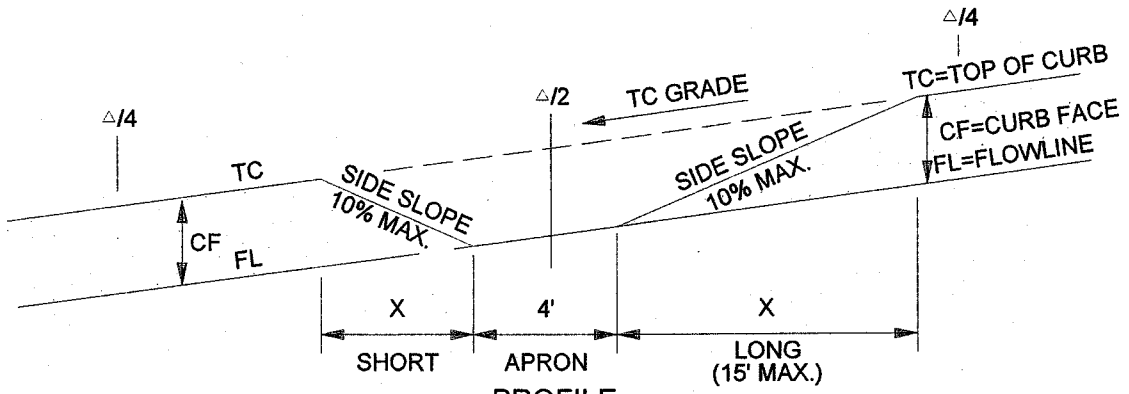
COUNTY OF RIVERSIDE

CURB RAMP CASE B

STANDARD NO. 403 (2 OF 4)

12-97

REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
8-77, 5-80	11-04	1				4			
10-81, 6-82		2				5			
9-88, 2-90		3				6			



PROFILE

TABLE X

CF (IN)	RADIUS (FT)	SIDE SLOPE	X	TC GRADE (ALONG CURB RETURN)					
				1%	2%	3%	4%	5%	6%
6"	35'	10%	X_S	4.6	4.2	3.9	3.6	3.4	3.2
			X_L	5.6	6.3	7.2	8.4	10.0	12.5
8"	35'	10%	X_S	6.1	5.6	5.2	4.8	4.5	4.2
			X_L	7.5	8.4	9.6	11.2	13.4	15.0

TO CALCULATE "X" DIMENSION:

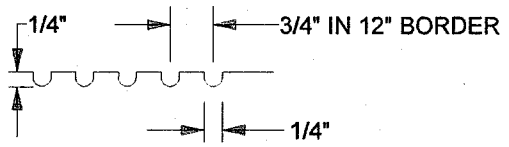
SHORT SIDE (DOWN SLOPE):

$$X_S\ (FT) = \frac{\text{CURB FACE (FT)}}{\text{SIDE SLOPE + TC GRADE}}$$

LONG SIDE (UP SLOPE):

$$X_L\ (FT) = \frac{\text{CURB FACE (FT)}}{\text{SIDE SLOPE - TC GRADE}}$$

ENGINEER TO SHOW X_S AND X_L ON IMPROVEMENT PLANS



GROOVING DETAIL

APPROVED BY:

DATE: 05/05/04

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-05
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

CURB RAMP

STANDARD NO. 403 (3 OF 4)

REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
8-77, 5-80	11-04	1				4			
10-81, 6-82		2				5			
9-88, 2-90		3				6			

CONSTRUCTION NOTES:

1. IF DISTANCE FROM CURB TO BACK OF SIDEWALK IS TOO SHORT TO ACCOMODATE RAMP AND 4' LANDING, THEN USE THE CASE "B" RAMP.
2. IF SIDEWALK IS LESS THAN 6' WIDE, THE FULL WIDTH OF THE SIDEWALK SHALL BE DEPRESSED AS SHOWN IN CASE B. MINIMUM SIDEWALK WIDTH IS 4' FROM BACK OF CURB.
3. THE RAMP SHALL HAVE A 12" WIDE BORDER WITH GROOVES 1/4" WIDE AND 1/4" DEEP APPROXIMATELY 3/4" ON CENTER. SEE GROOVING DETAIL.
4. TRANSITIONS FROM RAMPS TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
5. WHEN ABUTTING SOIL HAS A HIGH SULFATE CONTENT, SPECIAL CONSIDERATIONS ARE REQUIRED. SEE SPECIFICATIONS (SECTION 16.04).
6. RAMP SIDE SLOPE VARIES UNIFORMLY FROM A MAXIMUM OF UP TO 10% AT CURB TO CONFORM WITH LONGITUDINAL SIDEWALK SLOPE ADJACENT TO TOP OF THE RAMP (EXCEPT IN CASE B).
7. CONSTRUCT WEAKENED PLANE JOINTS AT 1/4 DELTAS WHEN RADIUS EQUALS 35' AND AT INSIDE EDGE OF GROOVED BORDER WHEN RADIUS EQUALS 25'.
8. IF EXPANSIVE SOIL IS ENCOUNTERED, THEN RAMP SHALL BE CONSTRUCTED OVER CLASS 2 AGGREGATE MATERIAL.
9. CONCRETE SHALL BE CLASS B.
10. MAXIMUM SLOPES OF ADJOINING GUTTERS: THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP AND CONTINUOUS PASSAGE TO THE CURB RAMP SHALL NOT EXCEED 5% WITHIN 4' OF THE BOTTOM OF THE CURB RAMP.
11. DETECTABLE WARNING SURFACES ARE REQUIRED ON ALL CURB RAMPS THAT ENTER INTO A VEHICULAR TRAVEL WAY.

APPROVED BY:

George A. Johnson DATE: 11/15/04

DIRECTOR OF TRANSPORTATION
GEORGE A. JOHNSON, RCE 42328

REGISTERED PROFESSIONAL ENGINEER
GEORGE A. JOHNSON
No. CE 42328
Exp. 3-31-08
CIVIL
STATE OF CALIFORNIA

COUNTY OF RIVERSIDE

CURB RAMP CONSTRUCTION NOTES

STANDARD NO. 403 (4 OF 4)

12-97

REVISIONS		REV.	BY:	APR'D	DATE	REV.	BY:	APR'D	DATE
8-77, 5-80	11-04	1				4			
10-81, 6-82		2				5			
9-88, 2-90		3				6			

OFFICE OF
CLERK OF THE BOARD OF SUPERVISORS
1st FLOOR, COUNTY ADMINISTRATIVE CENTER
P.O. BOX 1147, 4080 LEMON STREET
RIVERSIDE, CA 92502-1147
PHONE: (951) 955-1060
FAX: (951) 955-1071

KECIA HARPER-IHEM
Clerk of the Board of Supervisors

KIMBERLY A. RECTOR
Assistant Clerk of the Board

February 11, 2010

THE PRESS ENTERPRISE
ATTN: LEGALS
PO BOX 792
RIVERSIDE, CA 92501

VIA FAX (951) 368-9018
E-MAIL: legals@pe.com

RE: NOTICE INVITING BIDS: TRAFFIC SIGNAL & LIGHTING AT THE INTERSECTION OF WALNUT AVE AND SHERMAN AVE.

To Whom It May Concern:

Attached is a copy for publication in your newspaper for **TEN (10) TIMES:**

Sunday	- Feb. 14, 2010	Friday	- Feb. 19, 2010
Monday	- Feb. 15, 2010	Saturday	- Feb. 20, 2010
Tuesday	- Feb. 16, 2010	Sunday	- Feb. 21, 2010
Wednesday	- Feb. 17, 2010	Monday	- Feb. 22, 2010
Thursday	- Feb. 18, 2010	Tuesday	- Feb. 23, 2010

We require your affidavit of publication immediately upon completion of the last publication.

Your invoice must be submitted to this office in duplicate, WITH TWO CLIPPINGS OF THE PUBLICATION.

NOTE: PLEASE COMPOSE THIS PUBLICATION INTO A SINGLE COLUMN FORMAT.

Thank you in advance for your assistance and expertise.

Sincerely,

Mcgil
Cecilia Gil, Board Assistant to
KECIA HARPER-IHEM, CLERK OF THE BOARD

3.56 of 02-09-10

Gil, Cecilia

From: [redacted]
Sent: Thursday, February 11, 2010 10:03 AM
To: Gil, Cecilia
Subject: [redacted]

[redacted]

Please Note: We will be closed on Monday, Feb. 15th and the holiday deadlines are as follows:

Presidents Day Deadlines	
Pub. Date(s)	**Deadline**
2/13 – 2/16	Thurs. 2/11 @ 10:30 AM
2/17	Fri. 2/12 @ 10:30 AM
2/18	Tues. 2/16 @ 10:30 AM

From: Gil, Cecilia [mailto:CCGIL@rcbos.org]
Sent: Thursday, February 11, 2010 9:54 AM
To: PE Legals
Subject: FOR PUBLICATION: TRAFFIC SIGNAL AT WALNUT AVE & SHERMAN AVE.

Again,

Attached is a Notice Inviting Bids, for publication from Feb. 14 to Feb. 23, 2010 (10). Please confirm. THANK YOU!

Cecilia Gil
Board Assistant to the
Clerk of the Board of Supervisors
951-955-8464

THE COUNTY ADMINISTRATIVE CENTER IS CLOSED EVERY FRIDAY UNTIL FURTHER NOTICE.
PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING.

NOTICE INVITING BIDS

County of Riverside, herein called Owner, invites sealed proposals for:

TRAFFIC SIGNAL AND LIGHTING
AT THE INTERSECTION OF
WALNUT AVENUE AND SHERMAN AVENUE

PROJECT NO. B9-0986

Proposal shall be delivered to the Riverside County Transportation Department, 14th Street Annex, 3525 14th Street, Riverside, California 92501, telephone (951) 955-6780 not later than 2:00 p.m., on Wednesday, March 3, 2010, to be promptly opened in public at said address. Each proposal shall be in accordance with plans, specifications, and other contract documents, dated November 2009, and prepared by County of Riverside, whose address is same as the above, from whom they may be obtained upon deposit of $20.00 per set plus mailing. No refund. Prospective bidders may preview the plans, specifications and other contract documents, at no charge prior to purchase, at the above noted location.

The Contractor is required to have a Class "A" license or C-10 license at the time of bid submission.

Engineering Estimate:	$ 190,000.00 - $220,000.00
Bid Bond	10%
Performance Bond	100%
Payment Bond	100%
Working Days	35 Days

www.tlma.co.riverside.ca.us/trans

Dated: February 11, 2010

Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant

THE PRESS-ENTERPRISE PE.com

Legal Advertising Invoice

⑨ REMITTANCE ADDRESS
POST OFFICE BOX 12009
RIVERSIDE, CA 92502-2209
FAX (951) 368-9026

① BILLING PERIOD	② ADVERTISING/CLIENT NAME
02/23/10 - 02/23/10	BOARD OF SUPERVISORS

⑤ BILLING DATE	FOR BILLING INFORMATION CALL	④ PAGE NO
02/23/10	(951) 368-9713	1

⑦ TOTAL AMOUNT DUE	* UNAPPLIED AMOUNT	③ TERMS OF PAYMENT
919.60		Due Upon Receipt

⑧ BILLED ACCOUNT NAME AND ADDRESS

BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE
P.O. BOX 1147
RIVERSIDE CA 92502

⑥ BILLED ACCOUNT NUMBER: 045202 | REP NO: LE04

Statement #: 56525341 Amount Paid $_____ Your Check #_____

PLEASE DETACH AND RETURN UPPER PORTION WITH YOUR REMITTANCE

⑩ DATE	⑪ REFERENCE	⑫ ⑬ ⑭ DESCRIPTION-OTHER COMMENTS/CHARGES	⑮ SAU SIZE ⑯ BILLED UNITS	⑱ RATE	⑲ GROSS AMOUNT	⑳ NET AMOUNT
02/14	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.30		98.80
02/15	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20
02/16	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20
02/17	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20
02/18	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20
02/19	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20
02/20	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20
02/21	4155/39 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20
02/22	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20
02/23	4155739 CO	TRAFFIC SIGNAL AT WALNUT AND S Class : 10 Ctext Ad# 10161463 Placed By : Cecilia Gil	76 L	1.20		91.20

RECEIVED RIVERSIDE COUNTY
2010 MAR -2 AM 10:54

Thanks
3.56 of 02/09/10
1 hr

COMING SOON! Electronic Tearsheet Delivery Service
It's easy! Search, view, save, email notification & more

㉑ CURRENT NET AMOUNT DUE	㉒ 30 DAYS	60 DAYS	OVER 90 DAYS	* UNAPPLIED AMOUNT	㉓ PLEASE PAY THIS AMOUNT
					919.60

THE PRESS-ENTERPRISE PE.com
P.O. BOX 12009
RIVERSIDE, CA 92502-2209
TELEPHONE (951) 368-9711
(951) 368-9720 [] (951) 368-9713

ADVERTISING STATEMENT/INVOICE

sai™

* UNAPPLIED AMOUNTS ARE INCLUDED IN TOTAL AMOUNT DUE

㉔ STATEMENT NUMBER	㉕ ADVERTISER INFORMATION ① BILLING PERIOD	⑥ BILLED ACCOUNT NUMBER	⑦ ADVERTISER/CLIENT NUMBER	② ADVERTISER/CLIENT NAME
56525341	02/23/10 - 02/23/10	045202		BOARD OF SUPERVISORS

THE PRESS-ENTERPRISE

3450 Fourteenth Street
Riverside CA 92501-3878
951-684-1200
951-368-9018 FAX

PROOF OF PUBLICATION
(2010, 2015.5 C.C.P.)

Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: Traffic Signal at Walnut and Sherma

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper of general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673 and under date of August 25, 1995, Case Number 267864; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

02-14-10
02-15-10
02-16-10
02-17-10
02-18-10
02-19-10
02-20-10
02-21-10
02-22-10
02-23-10

I Certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: Feb. 23, 2010
At: Riverside, California

BOARD OF SUPERVISORS

P.O. BOX 1147
COUNTY OF RIVERSIDE
RIVERSIDE CA 92502

Ad #: 10161463

PO #:

Agency #: _____

Ad Copy:

NOTICE INVITING BIDS

County of Riverside, herein called Owner, invites sealed proposals for:

TRAFFIC SIGNAL AND LIGHTING
AT THE INTERSECTION OF
WALNUT AVENUE AND SHERMAN AVENUE
PROJECT NO. B9-0986

Proposal shall be delivered to the Riverside County Transportation Department, 14th Street Annex, 3525 14th Street, Riverside, California 92501, telephone (951) 955-6780 not later than 2:00 p.m., on Wednesday, March 3, 2010, to be promptly opened in public at said address. Each proposal shall be in accordance with plans, specifications, and other contract documents, dated November 2009, and prepared by County of Riverside, whose address is same as the above, from whom they may be obtained upon deposit of $20.00 per set plus mailing. No refund. Prospective bidders may preview the plans, specifications and other contract documents, at no charge prior to purchase, at the above noted location.

The Contractor is required to have a Class "A" license or C-10 license at the time of bid submission.

Engineering Estimate:	$ 190,000.00 - $220,000.00
Bid Bond	10%
Performance Bond	100%
Payment Bond	100%
Working Days	35 Days

www.tlma.co.riverside.ca.us/trans

Dated: February 11, 2010
Kecia Harper-Ihem, Clerk of the Board
By: Cecilia Gil, Board Assistant 2/14 - 2/23