

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
OFFICE ENGINEER, MS 43
1727 30TH STREET
P.O. BOX 168041
SACRAMENTO, CA 95816-8041
PHONE (916) 227-6230
FAX (916) 227-6214
TTY (916) 227-8454



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**** WARNING ** WARNING ** WARNING ** WARNING ****
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April 5, 2005

04-Ala-580-73.7/75.5
04-162004
ER-1597(004)E

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for construction on State highway in ALAMEDA COUNTY IN OAKLAND FROM 0.30 KM MACARTHUR BOULEVARD ON RAMP TO DISTRIBUTION STRUCTURE.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on May 3, 2005. The original bid opening date was previously postponed indefinitely under Addendum No. 1, dated October 21, 2004.

This addendum is being issued to set a new bid opening date as shown herein and revise the Project Plans, the Notice to Contractors and Special Provisions, the Proposal and Contract and the Federal Minimum Wages with Modification Number 16 dated 2-11-05.

Project Plan Sheets 2, 3, 4, 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 39, 40, 41, 42, 43, 44, 52 and 53 are revised. Half-sized copies of the revised sheets are attached for substitution for the like-numbered sheets.

Project Plan Sheets 2A, 16A, 33A, 39A and 39B are added. Half-sized copies of the added sheets are attached for addition to the project plans.

Project Plan Sheets 11, 12 and 30 are deleted.

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In the Notice to Contractors and Special Provisions book, on the first page, the following A+B BIDDING Special Notice is added:

"A+B BIDDING Special Notice

The bidder's attention is directed to Section 2, "Proposal Requirements and Conditions," Section 3, "Award and Execution of Contract," and Section 4, "Beginning of Work, Time of Completion and Liquidated Damages," in the special provisions. In addition to the item prices and totals, the proposal shall set forth the number of working days bid to complete the work on the contract. Bids will be compared on the basis of the sum of the item totals on the Engineer's Estimate for the work to be done (TOTAL BID (A)), plus the product of the number of working days bid to complete all work and the cost per day shown on the Engineer's Estimate (TOTAL BID (B)). The lowest bid will be determined on the basis of the "Total Basis for Comparison of Bids (A+B)" set forth in the Engineer's Estimate.

Bids in which the number of working days bid for completion of the work exceed the maximum number of days specified will be considered non-responsive and will be rejected."

In the Special Provisions, Section 2-1.01, "GENERAL," is revised as attached.

In the Special Provisions, Section 3, "AWARD AND EXECUTION OF CONTRACT," is revised as attached.

In the Special Provisions, Section 4, "BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES," is revised as follows:

"SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

Attention is directed to the provisions in Section 8-1.03, "Beginning of Work," in Section 8-1.06, "Time of Completion," and in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and these special provisions.

The Contractor shall begin work within 15 calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

The work shall be diligently prosecuted to completion before the expiration of **the NUMBER OF WORKING DAYS BID** beginning on the fifteenth calendar day after approval of the contract.

The Contractor shall pay to the State of California the sum of \$5,000.00 per day, for each and every calendar day's delay in finishing the work after expiration of the number of working days bid, until work requiring closure of lanes or shoulders on State Highway Route 580 is complete.

The Contractor shall pay to the State of California the sum of \$4,100.00 per day, for each and every calendar day's delay in finishing the work after expiration of the number of working days bid, if no further lane or shoulder closures are required on State Highway Route 580 to complete the remaining work."

In the Special Provisions, Section 5-1.13, "FORCE ACCOUNT PAYMENT," is replaced as attached.

In the Special Provisions, Section 5-1.18, "PROJECT INFORMATION," is added as attached.

In the Special Provisions, Section 5-1.19, "INTERNET DAILY EXTRA WORK REPORT," is added as attached.

In the Special Provisions, Section 8-1.01, "SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS," is replaced as attached.

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In the Special Provisions, Section 8-1.02, "PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS," is replaced as attached.

In the Special Provisions, Section 8-1.03, "STATE-FURNISHED MATERIALS," the following is added to the second paragraph:

"E. Marker panels, including reflectors, for Type P and Type R object markers."

In the Special Provisions, Section 10-1.135, "SOLID WASTE DISPOSAL AND RECYCLING REPORT," is added as attached.

In the Special Provisions, Section 10-1.15, "TIME-RELATED OVERHEAD," is replaced as attached.

In the Special Provisions, Section 10-1.29, "EXISTING HIGHWAY FACILITIES," Subsection, "REMOVE DRAINAGE FACILITY," is revised as follows:

"REMOVE DRAINAGE FACILITY

Existing reinforced concrete pipe, inlets, and grates, where any portion of these structures is within one meter of the grading plane in excavation areas, or within 0.3-m of original ground in embankment areas, or where shown on the plans to be removed, shall be completely removed and disposed of."

Attention is directed to "Asbestos-Containing Material" of these special provisions."

In the Special Provisions, Section 10-1.29, "EXISTING HIGHWAY FACILITIES," the following new Subsection, "REMOVE ASPHALT CONCRETE," is added before the Subsection, "REMOVE ROADSIDE SIGN":

"REMOVE ASPHALT CONCRETE

Existing asphalt concrete, where shown on the plans to be removed, shall be removed and disposed of.

The asphalt concrete shall be disposed of outside the highway right of way in conformance with the provisions in Section 7-1.13 of the Standard Specifications.

Removing asphalt concrete will be measured by the cubic meter in the same manner specified for roadway excavation in Section 19, "Earthwork," of the Standard Specifications.

The contract price paid per cubic meter for remove asphalt concrete shall include full compensation for removing asphalt concrete at the locations shown on the plans, and for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in remove asphalt concrete, complete in place as shown on the plans, as specified in the Standard Specifications and these special provisions and as directed by the Engineer."

In the Special Provisions, Section 10-1.29, "EXISTING HIGHWAY FACILITIES," Subsection "BRIDGE REMOVAL," Subsection "Asbestos-Containing Material," the first paragraph is revised as follows:

"Asbestos-Containing Material

Asbestos-containing material (ACM), as defined in Section 1529, "Asbestos," of the Construction Safety Orders, Title 8, of the California Code of Regulations, is presumed to be present in the bridge rail shims located on the structure proposed for demolition and in the existing reinforced concrete pipe located inside and adjacent to the footings."

In the Special Provisions, Section 10-1.29, "EXISTING HIGHWAY FACILITIES," subsection "REMOVE CONCRETE CURB" is deleted.

In the Special Provisions, Section 10-1.35, "AGGREGATE BASE," is deleted.

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In the Special Provisions, Section 10-1.38, "PILING," subsection "GENERAL," the sixth paragraph is revised as follows:

"Difficult pile installation is anticipated due to the presence of caving soils, hazardous and contaminated materials, high ground water, underground utilities, sound control, existing CIDH piles, existing box culvert, the variability in the soil, man-made fill materials, construction debris, and traffic control."

In the Special Provisions, Section 10-1.38, "PILING," subsection "CAST-IN-DRILLED-HOLE CONCRETE PILES," the following paragraphs are added after the fifth paragraph:

"Prior to CIDH construction, the Contractor shall locate the existing culvert.

Temporary casings may be used to construct CIDH concrete piles at bents BC16, BC17, BC18, BC19, BC20, BC21, and BM36. If used, temporary casings shall extend at least one pile diameter below the bottom of the culvert and may be left in place. Installation of the casings shall not adversely impact the box culvert either through vibration or removal of supporting soils. Casing may be oscillated, drilled or pressed into place. Vibratory or impact hammers shall not be used."

In the Special Provisions, Section 10-1.435, "SHOTCRETE," is added as follows:

"10-1.435 SHOTCRETE

Shotcrete shall conform to the provisions in Section 53, "SHOTCRETE," of the Standard Specifications."

In the Special Provisions, Section 10-1.445, "PLASTIC PIPE," is added as follows:

"10-1.445 PLASTIC PIPE

Plastic pipe shall conform to the provisions in Section 64, "PLASTIC PIPE," of the Standard Specifications."

In the Special Provisions, Section 10-1.50, "TYPE WM FENCE," is replaced with Section 10-1.50, "CHAIN LINK FENCE," as follows:

"10-1.50 CHAIN LINK FENCE

Chain link fence shall be Type CL-1.8 and shall conform to the provisions in Section 80, "Fences," of the Standard Specifications."

In the Special Provisions, Section 10-1.54, "CRASH CUSHION (REACT)," is replaced with Section 10-1.54, "CRASH CUSHION (ADIEM)," as attached.

In the Special Provisions, Section 10-1.555, "THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE)," is added as attached.

In the Special Provisions, Section 10-3.01, "DESCRIPTION," Item 3 of the second paragraph is revised as follows

"3. General packet radio system wireless modem assembly."

In the Special Provisions, Section 10-3.14, "EXTINGUISHABLE MESSAGE SIGN," is deleted.

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In the Special Provisions, Section 10-3.16, "CELLULAR DIGITAL PACKET DATA WIRELESS MODEM," is replaced with Section 10-3.16, "GENERAL PACKET RADIO SYSTEM WIRELESS MODEM ASSEMBLY," as attached.

In the Special Provisions, Section 10-3.175, "LONG LEAD-IN CABLE LOOP DETECTOR (LLLD) SENSOR UNIT," is added as attached.

In the Special Provisions, Section 10-3.18, "PAYMENT," Items 1 and 2 of the fifth paragraph are revised as follows

- "1. Extinguishable Message Sign Panel (LED).
2. General Packet Radio System Wireless Modem Assembly."

In the Proposal and Contract, the Engineer's Estimate Items 13, 15, 16, 17, 19, 21, 24, 30, 34, 35, 39, 40, 52, 54, 55, 61, 62, 63, 68, 69, 72, 77, 80, 82, 83, 86, 87, 89, 90, 91, and 98 are revised, Items 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, and 112 are added and Items 14, 23, 31, 51, 53, 71, 76, 79, 81, 88, 97 and 99 are deleted as attached.

To Proposal and Contract book holders:

Replace the entire Engineer's Estimate in the Proposal with the attached revised Engineer's Estimate. The revised Engineer's Estimate is to be used in the bid.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the proposal.

Submit bids in the Proposal and Contract book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

Inform subcontractors and suppliers as necessary.

This office is sending this addendum by UPS overnight mail to Proposal and Contract book holders to ensure that each receives it. A copy of this addendum and the modified wage rates are available for the contractor's use on the Internet Site:

http://www.dot.ca.gov/hq/esc/oe/weekly_ads/addendum_page.html

If you are not a Proposal and Contract book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

ORIGINAL SIGNED BY

REBECCA D. HARNAGEL, Chief
Office of Plans, Specifications & Estimates
Office Engineer

Attachments

2-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation of the Proposal form and the submission of the bid.

In addition to the subcontractors required to be listed in conformance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the portion of work that will be performed by each subcontractor listed.

The proposal shall set forth in clearly legible figures and in the respective spaces provided:

- A. Unit Prices
- B. Item Totals
- C. TOTAL BID (A)
- D. Number of working days bid for completion of the work
- E. TOTAL BID (B) - product of the working days bid and the cost per day shown on the Engineer's Estimate
- F. TOTAL BASIS FOR COMPARISON OF BIDS (A+B)

The proposal shall be signed by the bidder, who shall fill out the blanks in the proposal form as therein required.

The Bidder's Bond form mentioned in the last paragraph in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications will be found following the signature page of the Proposal.

The amount of the bidder's security required in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications shall be based on the "TOTAL BID (A)" set forth on the proposal form.

Submit request for substitution of an "or equal" item, and the data substantiating the request to the Department of Transportation, Submit request for substitution of an "or equal" item, and the data substantiating the request to the Department of Transportation, 111 Grand Avenue, Oakland, CA 94612, so that the request is received by the Department by close of business on the fourth day, not including Saturdays, Sundays and legal holidays, following bid opening.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance.

Failure of the bidder to fulfill the requirements of the Special Provisions for submittals required to be furnished after bid opening, including but not limited to DBE or DVBE submittals, or escrowed bid documents, where applicable, may subject the bidder to a determination of the bidder's responsibility in the event it is the apparent low bidder on a future public works contracts.

SECTION 3. AWARD AND EXECUTION OF CONTRACT

The bidder's attention is directed to the provisions in Section 3, "Award and Execution of Contract," of the Standard Specifications and these special provisions for the requirements and conditions concerning award and execution of contract.

Bid protests are to be delivered to the following address: Department of Transportation, MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, CA 95816 or by facsimile to the Office Engineer at (916) 227-6282.

Bids will be compared on the basis of the Engineer's Estimate of the quantities of work to be done and the number of working days bid for completion of the work. The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goal for DBE participation or has demonstrated, to the satisfaction of the Department, adequate good faith efforts to do so. Meeting the goal for DBE participation or demonstrating, to the satisfaction of the Department, adequate good faith efforts to do so is a condition for being eligible for award of contract. The lowest bid will be determined on the basis of the "Total Basis for Comparison of Bids (A+B)" set forth in the proposal. The contract price for the awarded contract will be the "Total Bid (A)" set forth in the proposal.

Bids in which the number of working days bid for completion of the work exceed 310 will be considered non-responsive and will be rejected.

The contract shall be executed by the successful bidder and shall be returned, together with the contract bonds, to the Department so that it is received within 10 days, not including Saturdays, Sundays and legal holidays, after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address: Department of Transportation MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, CA 95816.

A "Payee Data Record" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, payee shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or suppliers. Failure to complete and return the "Payee Data Record" form to the Department as provided herein will result in the retention of 31 percent of payments due the contractor and penalties of up to \$20,000. This retention of payments for failure to complete the "Payee Data Record" form is in addition to any other retention of payments due the Contractor.

The contract shall be executed by the successful bidder and shall be returned, together with the contract bonds, to the Department so that it is received within 10 days, not including Saturdays, Sundays and legal holidays, after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address: Department of Transportation MS 43, Attn: Office Engineer, 1727 30th Street, Sacramento, CA 95816

A "Payee Data Record" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, payee shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or suppliers. Failure to complete and return the "Payee Data Record" form to the Department as provided herein will result in the retention of 20 percent of payments due the contractor and penalties of up to \$20,000. This retention of payments for failure to complete the "Payee Data Record" form is in addition to any other retention of payments due the Contractor.

Attention is also directed to "Small Business Preference" of these special provisions. Any bidder who is certified as a Small Business by the Department of General Services, Office of Small Business Certification and Resources will be allowed a preference in the award of this contract, if it be awarded, under the following conditions:

- A. The apparent low bidder is not certified as a Small Business, or has not filled out and signed the Request for Small Business Preference included with the bid documents and attached a copy of their Office of Small Business Certification and Resources (OSBCR) small business certification letter to the form; and
- B. The bidder filled out and signed the Request for Small Business Preference form included with the bid documents and attached a copy of their Office of Small Business Certification and Resources (OSBCR) small business certification letter to the form.

The small business preference will be a reduction in the bid submitted by the small business contractor, for bid comparison purposes, by an amount equal to 5 percent of the amount bid by the apparent low bidder, the amount not to exceed \$50,000. If this reduction results in the small business contractor becoming the low bidder, then the contract will be awarded to the small business contractor on the basis of the actual bid of the small business contractor notwithstanding the reduced bid price used for bid comparison purposes.

Attention is also directed to "California Company Preference" of these special provisions.

The amount of the California company reciprocal preference shall be equal to the amount of the preference applied by the state of the nonresident contractor with the lowest responsive bid, except where the "California company" is eligible for a California Small Business Preference, in which case the preference applied shall be the greater of the two, but not both.

If the bidder submitting the lowest responsive bid is not a "California company" and with the benefit of the reciprocal preference, a "California company's" responsive bid is equal to or less than the original lowest responsive bid, the "California company" will be awarded the contract at its submitted bid price except as provided below.

Small business bidders shall have precedence over non-small business bidders in that the application of the "California company" preference for which non-small business bidders may be eligible shall not result in the denial of the award to a small business bidder.

5-1.13 FORCE ACCOUNT PAYMENT

Payment for extra work at force account will be determined by either non-subcontracted or subcontracted force account payment unless otherwise specified.

Non-Subcontracted Force Account Payment:

When extra work to be paid for on a force account basis is performed by the Contractor, compensation will be determined in accordance with Section 9-1.03, "Force Account Payment," of the Standard Specifications and these special provisions.

The second, third and fourth paragraphs of Section 9-1.03A, "Work Performed by Contractor," in the Standard Specifications, shall not apply.

Attention is directed to "Time-Related Overhead" of these special provisions.

To the total of the direct costs for work performed on a force account basis, computed as provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications, there will be added the following markups:

Cost	Percent Markup
Labor	28
Materials	10
Equipment Rental	10

The above markups shall be applied to work performed on a force account basis, regardless of whether the work revises the current contract completion date.

The above markups, together with payments made for time-related overhead pursuant to "Time-Related Overhead" of these special provisions, shall constitute full compensation for all overhead costs for work performed on a force account basis. These overhead costs shall be deemed to include all items of expense not specifically designated as cost or equipment rental in conformance with the provisions in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications. The total payment made as provided above and in the first paragraph of Section 9-1.03A, "Work Performed by Contractor," of the Standard Specifications shall be deemed to be the actual cost of the work performed on a force account basis, and shall constitute full compensation therefor.

Full compensation for overhead costs for work performed on a force account basis, and for which no adjustment is made to the lump sum price bid for time-related overhead conforming to the provisions in "Time-Related Overhead" of these special provisions, shall be considered as included in the markups specified above, and no additional compensation will be allowed therefor.

Subcontracted Force Account Payment:

When extra work to be paid for on a force account basis is performed by a subcontractor approved in conformance with the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, compensation will be determined in accordance with the provisions in Section 9-1.03, "Force Account Payment," of the Standard Specifications.

5-1.18 PROJECT INFORMATION

The information in this section has been compiled specifically for this project and is made available for bidders and Contractors. Other information referenced in the Standard Specifications and these special provisions do not appear in this section. The information is subject to the conditions and limitations set forth in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," and Section 6-2, "Local Materials," of the Standard Specifications. Bidders and Contractors shall be responsible for knowing the procedures for obtaining information.

Information attached to the project plans is as follows:

- A. Log of test borings

Information available for inspection at the District Office is as follows:

- A. On-ramp Cross Section

Cross sections are available in paper copy.

The District Office in which the work is situated is located at Office of the Duty Senior, 111 Grand Ave, Oakland CA 94612.

5-1.19 INTERNET DAILY EXTRA WORK REPORT

When extra work is being paid for on a force account basis, the Contractor shall submit daily extra work reports in conformance with the provisions in Section 9-1.03C, "Records," of the Standard Specifications and these special provisions.

The Contractor shall send daily extra work reports to the Engineer using the Department's Internet extra work billing system. The reports shall conform to the requirements in the "iCAS User's Guide" (Guide). The Guide is available from the Department, and is also found on the Internet at:

http://www.dot.ca.gov/hq/construc/ewb/EWB_INSTRUCTION.pdf

The Department will provide system accounts to the Contractor's authorized representatives when at least one of the representatives has received training. The Department will provide system training to at least one of the Contractor's authorized representatives within 30 days of the Contractor's request for training. The Department will assign an account and user identification to the Contractor's authorized representatives, and each Contractor's authorized representative shall maintain a unique password. A daily extra work report that the Contractor's authorized representative sends to the Department using the Internet extra work billing system will be considered signed by the Contractor. A daily extra work report that the Engineer approves using the Internet extra work billing system will be considered signed by the Engineer.

Daily extra work reports that include billing for materials shall be substantiated by a valid copy of a vendor's invoice in conformance to the requirements in Section 9-1.03C, "Records," of the Standard Specifications. Each materials invoice shall clearly identify the relative daily extra work report and the associated cost of the materials. In addition to postal service and parcel service and if approved by the Engineer, invoices may be sent by facsimile or as an electronic-mail attachment.

The Contractor shall maintain the Contractor's interface with the Department's Internet extra work billing system. If the Contractor is using the file transfer process to submit extra work reports, it shall conform to the file transfer format and process defined in the Guide.

8-1.01 SUBSTITUTION OF NON-METRIC MATERIALS AND PRODUCTS

Only materials and products conforming to the requirements of the specifications shall be incorporated in the work. When metric materials and products are not available, and when approved by the Engineer, and at no cost to the State, materials and products in the United States Standard Measures which are of equal quality and of the required properties and characteristics for the purpose intended, may be substituted for the equivalent metric materials and products, subject to the following provisions:

- A. Materials and products shown on the plans or in the special provisions as being equivalent may be substituted for the metric materials and products specified or detailed on the plans.
- B. Before other non-metric materials and products will be considered for use, the Contractor shall furnish, at the Contractor's expense, evidence satisfactory to the Engineer that the materials and products proposed for use are equal to or better than the materials and products specified or detailed on the plans. The burden of proof as to the quality and suitability of substitutions shall be upon the Contractor and the Contractor shall furnish necessary information as required by the Engineer. The Engineer will be the sole judge as to the quality and suitability of the substituted materials and products and the Engineer's decision will be final.
- C. When the Contractor elects to substitute non-metric materials and products, including materials and products shown on the plans or in the special provisions as being equivalent, the list of sources of material specified in Section 6-1.01, "Source of Supply and Quality of Materials," of the Standard Specification shall include a list of substitutions to be made and contract items involved. In addition, for a change in design or details, the Contractor shall submit plans and working drawings in conformance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The plans and working drawings shall be submitted at least 7 days before the Contractor intends to begin the work involved.

Unless otherwise specified, the following substitutions of materials and products will be allowed:

SUBSTITUTION TABLE FOR PLAIN WIRE REINFORCEMENT
ASTM Designation: A 82

METRIC SIZE SHOWN ON THE PLANS ² mm	SIZE TO BE SUBSTITUTED ² inch x 100
MW9	W1.4
MW10	W1.6
MW13	W2.0
MW15	W2.3
MW19	W2.9
MW20	W3.1
MW22	W3.5
MW25	W3.9, except W3.5 in piles only
MW26	W4.0
MW30	W4.7
MW32	W5.0
MW35	W5.4
MW40	W6.2
MW45	W6.5
MW50	W7.8
MW55	W8.5, except W8.0 in piles only
MW60	W9.3
MW70	W10.9, except W11.0 in piles only
MW80	W12.4
MW90	W14.0
MW100	W15.5

SUBSTITUTION TABLE FOR BAR REINFORCEMENT

METRIC BAR DESIGNATION NUMBER ¹ SHOWN ON THE PLANS	BAR DESIGNATION NUMBER ² TO BE SUBSTITUTED
10	3
13	4
16	5
19	6
22	7
25	8
29	9
32	10
36	11
43	14
57	18

¹Bar designation numbers approximate the number of millimeters of the nominal diameter of the bars.

²Bar numbers are based on the number of eighths of an inch included in the nominal diameter of the bars.

No adjustment will be required in spacing or total number of reinforcing bars due to a difference in minimum yield strength between metric and non-metric bars.

SUBSTITUTION TABLE FOR SIZES OF:

(1) STEEL FASTENERS FOR GENERAL APPLICATIONS (ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55), and

(2) HIGH STRENGTH STEEL FASTENERS (ASTM Designation: A 325 or A 449)

METRIC SIZE SHOWN ON THE PLANS mm	SIZE TO BE SUBSTITUTED inch
6 or 6.35	1/4
8 or 7.94	5/16
10 or 9.52	3/8
11 or 11.11	7/16
13, 12.70, or M12	1/2
14 or 14.29	9/16
16, 15.88, or M16	5/8
19, 19.05, or M20	3/4
22, 22.22, or M22	7/8
24, 25, 25.40, or M24	1
29, 28.58, or M27	1-1/8
32, 31.75, or M30	1-1/4
35 or 34.93	1-3/8
38, 38.10, or M36	1-1/2
44 or 44.45	1-3/4
51 or 50.80	2
57 or 57.15	2-1/4
64 or 63.50	2-1/2
70 or 69.85	2-3/4
76 or 76.20	3
83 or 82.55	3-1/4
89 or 88.90	3-1/2
95 or 95.25	3-3/4
102 or 101.60	4

SUBSTITUTION TABLE FOR NOMINAL THICKNESS OF SHEET METAL

UNCOATED HOT AND COLD ROLLED SHEETS		HOT-DIPPED ZINC COATED SHEETS (GALVANIZED)	
METRIC THICKNESS SHOWN ON THE PLANS mm	GAGE TO BE SUBSTITUTED inch	METRIC THICKNESS SHOWN ON THE PLANS mm	GAGE TO BE SUBSTITUTED inch
7.94	0.3125	4.270	0.1681
6.07	0.2391	3.891	0.1532
5.69	0.2242	3.510	0.1382
5.31	0.2092	3.132	0.1233
4.94	0.1943	2.753	0.1084
4.55	0.1793	2.372	0.0934
4.18	0.1644	1.994	0.0785
3.80	0.1495	1.803	0.0710
3.42	0.1345	1.613	0.0635
3.04	0.1196	1.461	0.0575
2.66	0.1046	1.311	0.0516
2.28	0.0897	1.158	0.0456
1.90	0.0747	1.006 or 1.016	0.0396
1.71	0.0673	0.930	0.0366
1.52	0.0598	0.853	0.0336
1.37	0.0538	0.777	0.0306
1.21	0.0478	0.701	0.0276
1.06	0.0418	0.627	0.0247
0.91	0.0359	0.551	0.0217
0.84	0.0329	0.513	0.0202
0.76	0.0299	0.475	0.0187
0.68	0.0269	-----	-----
0.61	0.0239	-----	-----
0.53	0.0209	-----	-----
0.45	0.0179	-----	-----
0.42	0.0164	-----	-----
0.38	0.0149	-----	-----

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SUBSTITUTION TABLE FOR WIRE

METRIC THICKNESS SHOWN ON THE PLANS mm	WIRE THICKNESS TO BE SUBSTITUTED inch	GAGE NO.
6.20	0.244	3
5.72	0.225	4
5.26	0.207	5
4.88	0.192	6
4.50	0.177	7
4.11	0.162	8
3.76	0.148	9
3.43	0.135	10
3.05	0.120	11
2.69	0.106	12
2.34	0.092	13
2.03	0.080	14
1.83	0.072	15
1.57	0.062	16
1.37	0.054	17
1.22	0.048	18
1.04	0.041	19
0.89	0.035	20

SUBSTITUTION TABLE FOR PIPE PILES

METRIC SIZE SHOWN ON THE PLANS mm x mm	SIZE TO BE SUBSTITUTED inch x inch
PP 360 x 4.55	NPS 14 x 0.179
PP 360 x 6.35	NPS 14 x 0.250
PP 360 x 9.53	NPS 14 x 0.375
PP 360 x 11.12	NPS 14 x 0.438
PP 406 x 12.70	NPS 16 x 0.500
PP 460 x T	NPS 18 x T"
PP 508 x T	NPS 20 x T"
PP 559 x T	NPS 22 x T"
PP 610 x T	NPS 24 x T"
PP 660 x T	NPS 26 x T"
PP 711 x T	NPS 28 x T"
PP 762 x T	NPS 30 x T"
PP 813 x T	NPS 32 x T"
PP 864 x T	NPS 34 x T"
PP 914 x T	NPS 36 x T"
PP 965 x T	NPS 38 x T"
PP 1016 x T	NPS 40 x T"
PP 1067 x T	NPS 42 x T"
PP 1118 x T	NPS 44 x T"
PP 1219 x T	NPS 48 x T"
PP 1524 x T	NPS 60 x T"

The thickness in millimeters (T) represents an exact conversion of the thickness in inches (T").

SUBSTITUTION TABLE FOR CIDH CONCRETE PILING

METRIC SIZE SHOWN ON THE PLANS	ACTUAL AUGER SIZE TO BE SUBSTITUTED inches
350 mm	14
400 mm	16
450 mm	18
600 mm	24
750 mm	30
900 mm	36
1.0 m	42
1.2 m	48
1.5 m	60
1.8 m	72
2.1 m	84
2.4 m	96
2.7 m	108
3.0 m	120
3.3 m	132
3.6 m	144
4.0 m	156

SUBSTITUTION TABLE FOR STRUCTURAL TIMBER AND LUMBER

METRIC MINIMUM DRESSED DRY, SHOWN ON THE PLANS mm x mm	METRIC MINIMUM DRESSED GREEN, SHOWN ON THE PLANS mm x mm	NOMINAL SIZE TO BE SUBSTITUTED inch x inch
19x89	20x90	1x4
38x89	40x90	2x4
64x89	65x90	3x4
89x89	90x90	4x4
140x140	143x143	6x6
140x184	143x190	6x8
184x184	190x190	8x8
235x235	241x241	10x10
286x286	292x292	12x12

SUBSTITUTION TABLE FOR NAILS AND SPIKES

METRIC COMMON NAIL, SHOWN ON THE PLANS	METRIC BOX NAIL, SHOWN ON THE PLANS	METRIC SPIKE, SHOWN ON THE PLANS	SIZE TO BE SUBSTITUTED Penny-weight
Length, mm Diameter, mm	Length, mm Diameter, mm	Length, mm Diameter, mm	
50.80 2.87	50.80 2.51	————	6d
63.50 3.33	63.50 2.87	————	8d
76.20 3.76	76.20 3.25	76.20 4.88	10d
82.55 3.76	82.55 3.25	82.55 4.88	12d
88.90 4.11	88.90 3.43	88.90 5.26	16d
101.60 4.88	101.60 3.76	101.60 5.72	20d
114.30 5.26	114.30 3.76	114.30 6.20	30d
127.00 5.72	127.00 4.11	127.00 6.68	40d
————	————	139.70 7.19	50d
————	————	152.40 7.19	60d

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SUBSTITUTION TABLE FOR IRRIGATION
COMPONENTS

METRIC WATER METERS, TRUCK LOADING STANDPIPES, VALVES, BACKFLOW PREVENTERS, FLOW SENSORS, WYE STRAINERS, FILTER ASSEMBLY UNITS, PIPE SUPPLY LINES, AND PIPE IRRIGATION SUPPLY LINES SHOWN ON THE PLANS DIAMETER NOMINAL (DN) mm	NOMINAL SIZE TO BE SUBSTITUTED inch
15	1/2
20	3/4
25	1
32	1-1/4
40	1-1/2
50	2
65	2-1/2
75	3
100	4
150	6
200	8
250	10
300	12
350	14
400	16

Unless otherwise specified, substitutions of United States Standard Measures standard structural shapes corresponding to the metric designations shown on the plans and in conformance with the requirements in ASTM Designation: A 6/A 6M, Annex 2, will be allowed.

8-1.02 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department maintains the following list of Prequalified and Tested Signing and Delineation Materials. The Engineer shall not be precluded from sampling and testing products on the list of Prequalified and Tested Signing and Delineation Materials.

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

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

Materials and products may be added to the list of Prequalified and Tested Signing and Delineation Materials if the manufacturer submits a New Product Information Form to the New Product Coordinator at the Transportation Laboratory. Upon a Departmental request for samples, sufficient samples shall be submitted to permit performance of required tests. Approval of materials or products will depend upon compliance with the specifications and tests the Department may elect to perform.

PAVEMENT MARKERS, PERMANENT TYPE

Retroreflective With Abrasion Resistant Surface (ARS)

- A. Apex, Model 921AR (100 mm x 100 mm)
- B. Avery Dennison, Models C88 (100 mm x 100 mm), 911 (100 mm x 100 mm) and 953 (70 mm x 114 mm)
- C. Ray-O-Lite, Model "AA" ARS (100 mm x 100 mm)
- D. 3M Series 290 (89 mm x 100 mm)
- E. 3M Series 290 PSA, with pressure sensitive adhesive pad (89 mm x 100 mm)

Retroreflective With Abrasion Resistant Surface (ARS)

(for recessed applications only)

- A. Avery Dennison, Model 948 (58 mm x 119 mm)
- B. Avery Dennison, Model 944SB (51 mm x 100 mm)*
- C. Ray-O-Lite, Model 2002 (58 mm x 117 mm)
- D. Ray-O-Lite, Model 2004 ARS (51 mm x 100 mm)*

*For use only in 114 mm wide (older) recessed slots

Non-Reflective, 100 mm Round

- A. Apex Universal (Ceramic)
- B. Apex Universal, Models 929 (ABS) and 929PP (Polypropylene)
- C. Glowlite, Inc., (Ceramic)
- D. Hi-Way Safety, Inc., Models P20-2000W and 2001Y (ABS)
- E. Interstate Sales, "Diamond Back" (ABS) and (Polypropylene)
- F. Novabrite Models Cdot (White) Cdot-y (Yellow), Ceramic
- G. Novabrite Models Pdot-w (White) Pdot-y (Yellow), Polypropylene
- H. Road Creations, Model RCB4NR (Acrylic)
- I. Three D Traffic Works TD10000 (ABS), TD10500 (Polypropylene)

PAVEMENT MARKERS, TEMPORARY TYPE

Temporary Markers For Long Term Day/Night Use (6 months or less)

- A. Vega Molded Products "Temporary Road Marker" (75 mm x 100 mm)

Temporary Markers For Short Term Day/Night Use (14 days or less)

(For seal coat or chip seal applications, clear protective covers are required)

- A. Apex Universal, Model 932
- B. Bunzl Extrusion, Models T.O.M., T.R.P.M., and "HH" (High Heat)
- C. Hi-Way Safety, Inc., Model 1280/1281
- D. Glowlite, Inc., Model 932

STRIPING AND PAVEMENT MARKING MATERIAL

Permanent Traffic Striping and Pavement Marking Tape

- A. Advanced Traffic Marking, Series 300 and 400
- B. Brite-Line, Series 1000
- C. Brite-Line, "DeltaLine XRP"
- D. Swarco Industries, "Director 35" (For transverse application only)
- E. Swarco Industries, "Director 60"
- F. 3M, "Stamark" Series 380 and 5730
- G. 3M, "Stamark" Series 420 (For transverse application only)

Temporary (Removable) Striping and Pavement Marking Tape (6 months or less)

- A. Advanced Traffic Marking, Series 200
- B. Brite-Line, Series 100
- C. Garlock Rubber Technologies, Series 2000
- D. P.B. Laminations, Aztec, Grade 102
- E. Swarco Industries, "Director-2"
- F. Trelleborg Industri, R140 Series
- G. 3M, Series 620 "CR", and Series A750
- H. 3M, Series A145, Removable Black Line Mask
(Black Tape: for use only on Asphalt Concrete Surfaces)
- I. Advanced Traffic Marking Black "Hide-A-Line"
(Black Tape: for use only on Asphalt Concrete Surfaces)
- J. Brite-Line "BTR" Black Removable Tape
(Black Tape: for use only on Asphalt Concrete Surfaces)
- K. Trelleborg Industri, RB-140
(Black Tape: for use only on Asphalt Concrete Surfaces)

Preformed Thermoplastic (Heated in place)

- A. Avery Dennison, "Hotape"
- B. Flint Trading, "Premark," "Premark 20/20 Flex," and "Premark 20/20 Flex Plus"

Ceramic Surfacing Laminate, 150 mm x 150 mm

- A. Highway Ceramics, Inc.

CLASS 1 DELINEATORS

One Piece Driveable Flexible Type, 1700 mm

- A. Bunzl Extrusion, "Flexi-Guide Models 400 and 566"
- B. Carsonite, Curve-Flex CFRM-400
- C. Carsonite, Roadmarker CRM-375
- D. FlexStake, Model 654 TM
- E. GreenLine Models HWD1-66 and CGD1-66

Special Use Type, 1700 mm

- A. Bunzl Extrusion, Model FG 560 (with 450 mm U-Channel base)
- B. Carsonite, "Survivor" (with 450 mm U-Channel base)
- C. Carsonite, Roadmarker CRM-375 (with 450 mm U-Channel base)
- D. FlexStake, Model 604
- E. GreenLine Models HWDU and CGD (with 450 mm U-Channel base)
- F. Impact Recovery Model D36, with #105 Driveable Base
- G. Safe-Hit with 200 mm pavement anchor (SH248-GP1)
- H. Safe-Hit with 380 mm soil anchor (SH248-GP2) and with 450 mm soil anchor (SH248-GP3)

Surface Mount Type, 1200 mm

- A. Bent Manufacturing Company, Masterflex Model MF-180EX-48
- B. Carsonite, "Super Duck II"
- C. FlexStake, Surface Mount, Models 704 and 754 TM
- D. Impact Recovery Model D48, with #101 Fixed (Surface-Mount) Base
- E. Three D Traffic Works "Channelflex" ID No. 522248W

CHANNELIZERS

Surface Mount Type, 900 mm

- A. Bent Manufacturing Company, Masterflex Models MF-360-36 (Round) and MF-180-36 (Flat)
- B. Bunzl Extrusion, Flexi-Guide Models FG300PE and FG300UR
- C. Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
- D. Carsonite, "Super Duck II" Model SDCF203601MB "The Channelizer"
- E. FlexStake, Surface Mount, Models 703 and 753 TM
- F. GreenLine, Model SMD-36
- G. Hi-Way Safety, Inc. "Channel Guide Channelizer" Model CGC36
- H. Impact Recovery Model D36, with #101 Fixed (Surface-Mount) Base
- I. Repo, Models 300 and 400
- J. Safe-Hit, Guide Post, Model SH236SMA
- K. Three D Traffic Works "Channelflex" ID No. 522053W

Lane Separation System

- A. Bunzl "Flexi-Guide (FG) 300 Curb System"
- B. Qwick Kurb, "Klemmfix Guide System"
- C. Recycled Technology, Inc. "Safe-Lane System"

CONICAL DELINEATORS, 1070 mm

(For 700 mm Traffic Cones, see Standard Specifications)

- A. Bent Manufacturing Company "T-Top"
- B. Plastic Safety Systems "Navigator-42"
- C. Radiator Specialty Company "Enforcer"
- D. Roadmaker Company "Stacker"
- E. Traffix Devices "Grabber"
- F. Three D Traffic Works "Ringtop" TD7000, ID No. 742143

OBJECT MARKERS

Type "K", 450 mm

- A. Bunzl, Model FG318PE
- B. Carsonite, Model SMD 615
- C. FlexStake, Model 701 KM
- D. Repo, Models 300 and 400
- E. Safe-Hit, Model SH718SMA

Type "K-4" / "Q" Object Markers, 600 mm

- A. Bent Manufacturing "Masterflex" Model MF-360-24
- B. Bunzl Extrusion, Model FG324PE
- C. Carsonite, Super Duck II
- D. FlexStake, Model 701KM
- E. Repo, Models 300 and 400
- F. Safe-Hit, Models SH8 24SMA_WA and SH8 24GP3_WA
- G. The Line Connection, Model DP21-4Q
- H. Three D Traffic Works "Q" Marker, ID No. 531702W

**CONCRETE BARRIER MARKERS AND
TEMPORARY RAILING (TYPE K) REFLECTORS**

Impactable Type

- A. ARTUK, "FB"
- B. Bunzl Extrusion, Models PCBM-12 and PCBM-T12
- C. Duraflex Corp., "Flexx 2020" and "Electriflexx"
- D. Hi-Way Safety, Inc., Model GMKRM100
- E. Plastic Safety Systems "BAM" Models OM-BARR and OM-BWAR
- F. Sun-Lab Technology, "Safety Guide Light Model TM-5"
- G. Three D Traffic Works "Roadguide" 9304 Series, ID No. 903176 (One-Way), ID No. 903215 (Two-Way)

Non-Impactable Type

- A. ARTUK, JD Series
- B. Plastic Safety Systems "BAM" Models OM-BITARW and OM-BITARA
- C. Vega Molded Products, Models GBM and JD

METAL BEAM GUARD RAIL POST MARKERS

(For use to the left of traffic)

- A. Bunzl Extrusion, "Mini" (75 mm x 254 mm)
- B. Creative Building Products, "Dura-Bull, Model 11201"
- C. Duraflex Corp., "Railrider"

CONCRETE BARRIER DELINEATORS, 400 mm

(For use to the right of traffic)

- A. Bunzl Extrusion, Model PCBM T-16
- B. Safe-Hit, Model SH216RBM
- C. Sun-Lab Technology, "Safety Guide Light, Model TM16," (75 mm x 300 mm)
- D. Three D Traffic Works "Roadguide" ID No. 904364 (White), ID No. 904390 (Yellow)

CONCRETE BARRIER-MOUNTED MINI-DRUM (260 mm x 360 mm x 570 mm)

- A. Stinson Equipment Company "SaddleMarker"

SOUND WALL DELINEATOR

(Applied vertically. Place top of 75 mm x 300 mm reflective element at 1200 mm above roadway)

- A. Bunzl Extrusion, PCBM S-36
- B. Sun-Lab Technology, "Safety Guide Light, Model SM12," (75 mm x 300 mm)

GUARD RAILING DELINEATOR

(Place top of reflective element at 1200 mm above plane of roadway)

Wood Post Type, 686 mm

- A. Bunzl Extrusion, FG 427 and FG 527
- B. Carsonite, Model 427
- C. FlexStake, Model 102 GR
- D. GreenLine GRD 27
- E. Safe-Hit, Model SH227GRD
- F. Three D Traffic Works "Guardflex" TD9100 Series, ID No. 510476

Steel Post Type

- A. Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

RETROREFLECTIVE SHEETING

Channelizers, Barrier Markers, and Delineators

- A. Avery Dennison T-6500 Series (For rigid substrate devices only)
- B. Avery Dennison WR-6100 Series
- C. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
- D. Reflexite, PC-1000 Metalized Polycarbonate
- E. Reflexite, AC-1000 Acrylic
- F. Reflexite, AP-1000 Metalized Polyester
- G. Reflexite, Conformalight, AR-1000 Abrasion Resistant Coating
- H. 3M, High Intensity

Traffic Cones, 330 mm Sleeves

- A. Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

Traffic Cones, 100 mm and 150 mm Sleeves

- A. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
- B. Reflexite, Vinyl, "TR" (Semi-transparent) or "Conformalight"
- C. 3M Series 3840

Barrels and Drums

- A. Avery Dennison WR-6100
- B. Nippon Carbide Industries, Flexible Ultralite Grade (ULG) II
- C. Reflexite, "Conformalight", "Super High Intensity" or "High Impact Drum Sheeting"
- D. 3M Series 3810

Barricades: Type I, Medium-Intensity (Typically Enclosed Lens, Glass-Bead Element)

- A. American Decal, Adcolite
- B. Avery Dennison, T-1500 and T-1600 series
- C. 3M Engineer Grade, Series 3170

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

- A. Avery Dennison, T-2500 Series
- B. Kiwalite Type II
- C. Nikkalite 1800 Series

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

- A. Avery Dennison, T-2500 Series
- B. Kiwalite, Type II
- C. Nikkalite 1800 Series

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

- A. Avery Dennison, T-5500 and T-5500A Series
- B. Nippon Carbide Industries, Nikkalite Brand Ultralite Grade II
- C. 3M Series 3870

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

- A. Avery Dennison, T-6500 Series
- B. Nippon Carbide Industries, Crystal Grade, 94000 Series
- C. Nippon Carbide Industries, Model No. 94847 Fluorescent Orange
- D. Nippon Carbide Industries, Model No. 94844 Fluorescent Yellow Green

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

- A. Avery Dennison, WU-6014
- B. Novabrite LLC, "Econobrite"
- C. Reflexite "Vinyl"
- D. Reflexite "SuperBright"
- E. Reflexite "Marathon"
- F. 3M Series RS34 Orange and RS20 Fluorescent Orange

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

- A. 3M LDP Series 3924 Fluorescent Orange
- B. 3M LDP Series 3970

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

- A. Avery Dennison, T-7500 Series
- B. Avery Dennison, T-7511 Fluorescent Yellow
- C. Avery Dennison, T-7513 Fluorescent Yellow Green
- D. Avery Dennison, W-7514 Fluorescent Orange
- E. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92802 White
- F. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92844 Fluorescent Yellow/Green
- G. Nippon Carbide Industries, Nikkalite Crystal Grade Model 92847 Fluorescent Orange

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

- A. 3M VIP Series 3981 Diamond Grade Fluorescent Yellow
- B. 3M VIP Series 3983 Diamond Grade Fluorescent Yellow/Green
- C. 3M VIP Series 3990 Diamond Grade

SPECIALTY SIGNS

- A. Hallmark Technologies, Inc., All Sign STOP Sign (All Plastic), 750 mm
- B. Reflexite "Endurance" Work Zone Sign (with Semi-Rigid Plastic Substrate)

SIGN SUBSTRATE

Fiberglass Reinforced Plastic (FRP)

- A. Fiber-Brite
- B. Sequentia, "Polyplate"
- C. Inteplast Group "InteCel" (13 mm for Post-Mounted CZ Signs, 1200 mm or less)

Aluminum Composite

- A. Alcan Composites "Dibond Material, 2 mm" (for temporary construction signs only)
- B. Mitsubishi Chemical America, Alpolic 350 (for temporary construction signs only)

10-1.135 SOLID WASTE DISPOSAL AND RECYCLING REPORT

This work shall consist of reporting disposal and recycling of construction solid waste, as specified in these special provisions. For the purposes of this section, solid waste includes construction and demolition waste debris, but not hazardous waste.

Annually by the fifteenth day of January, the Contractor shall complete and certify Form CEM-2025, "Solid Waste Disposal and Recycling Report," which quantifies solid waste generated by the work performed and disposed of in landfills or recycled during the previous calendar year. The amount and type of solid waste disposed of or recycled shall be reported in either metric tonnes or cubic meters. The Contractor shall also complete and certify Form CEM-2025 within 5 days following contract acceptance.

Form CEM-2025, "Solid Waste Disposal and Recycling Report" can be downloaded from the following website:

<http://www.dot.ca.gov/hq/construc/manual2001>

If the Contractor has not submitted Form CEM-2025, by the dates specified above, the Department will withhold the amount of \$10 000 for each missing or incomplete report. The moneys withheld will be released for payment on the next monthly estimate for partial payment following the date that a complete and acceptable Form CEM-2025 is submitted to the Engineer. Upon completion of all contract work and submittal of the final Form CEM-2025, remaining withheld funds associated with this section, "Solid Waste Disposal and Recycling Report," will be released for payment. Withheld funds in conformance with this section shall be in addition to other moneys withheld provided for in the contract. No interest will be due the Contractor on withheld amounts.

Full compensation for preparing and submitting Form CEM-2025, "Solid Waste Disposal and Recycling Report," shall be considered as included in the contract price for the various items of work involved and no additional compensation will be allowed therefor.

10-1.15 TIME-RELATED OVERHEAD

The Contractor will be compensated for time-related overhead as described below and in conformance with "Force Account Payment" of these special provisions. The Contractor will not be compensated for time-related overhead for delays to the controlling operations caused by the Engineer that occur prior to the first working day, but will be compensated for actual overhead costs incurred, as determined by an independent Certified Public Accountant audit examination and report.

Attention is directed to "Beginning of Work, Time of Completion and Liquidated Damages," "Force Account Payment," and "Progress Schedule (Critical Path Method)" of these special provisions.

The provisions in Section 9-1.08, "Adjustment of Overhead Costs," of the Standard Specifications shall not apply.

Time-related overhead shall consist of those overhead costs, including field and home office overhead, that are in proportion to the time required to complete the work. Time-related overhead shall not include costs that are not related to time, including but not limited to, mobilization, licenses, permits, and other charges incurred only once during the contract. Time-related overhead shall not apply to subcontractors of any tier, suppliers, fabricators, manufacturers, or other parties associated with the Contractor.

Field office overhead expenses include time-related costs associated with the normal and recurring operations of the construction project, and shall not include costs directly attributable to the work of the contract. Time-related costs of field office overhead include, but are not limited to, salaries, benefits, and equipment costs of project managers, general superintendents, field office managers and other field office staff assigned to the project, and rent, utilities, maintenance, security, supplies, and equipment costs of the project field office.

Home office overhead or general and administrative expenses refer to the fixed costs of operating the Contractor's business. These costs include, but are not limited to, general administration, insurance, personnel and subcontract administration, purchasing, accounting, and project engineering and estimating. Home office overhead costs shall exclude expenses specifically related to other contracts or other businesses of the Contractor, equipment coordination, material deliveries, and consultant and legal fees.

The amount of time-related overhead associated with a reduction in contract time for cost reduction incentive proposals accepted and executed in conformance with the provisions in Section 5-1.14, "Cost Reduction Incentive," of the Standard Specifications shall be considered a construction cost attributable to the resultant estimated net savings due to the cost reduction incentive.

If the final increased amount of time-related overhead exceeds 149 percent of the contract lump sum price bid, the Contractor shall, within 60 days of the Engineer's written request, submit to the Engineer an audit examination and report performed by an independent Certified Public Accountant of the Contractor's actual overhead costs. The audit examination and report shall depict the Contractor's project and company-wide financial records and shall specify the actual overall average daily rates for both field and home office overhead for the entire duration of the project, and whether the costs have been properly allocated. The rates of field and home office overhead shall exclude unallowable costs as determined in the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31.

Independent Certified Public Accountant's audit examinations shall be performed in conformance with the requirements of the American Institute of Certified Public Accountants Attestation Standards. Audit examinations and reports shall determine if the rates of field office overhead and home office overhead are:

- A. Allowable in conformance with the requirements of the Federal Acquisition Regulations, 48 CFR, Chapter 1, Part 31.
- B. Adequately supported by reliable documentation.
- C. Related solely to the project under examination.

Within 20 days of receipt of the Engineer's written request, the Contractor shall make its financial records available for audit by the State for the purpose of verifying the actual rate of time-related overhead specified in the audit submitted by the Contractor. The actual rate of time-related overhead specified in the audit, submitted by the Contractor, will be subject to approval by the Engineer.

If the Engineer requests the independent Certified Public Accountant audit, or if it is requested in writing by the Contractor, the contract lump sum payment for time-related overhead, in excess of 149 percent of the lump sum price bid, will be adjusted to reflect the actual rate.

The cost of performing an independent Certified Public Accountant audit examination and submitting the report, requested by the Engineer, will be borne equally by the State and the Contractor. The division of the cost will be made by determining the cost of providing an audit examination and report in conformance with the provisions of Section 9-1.03B, "Work Performed by Special Forces or Other Special Services" of the Standard Specifications, and paying to the Contractor one-half of that cost. The cost of performing an audit examination and submitting the independent Certified Public Accountant audit report for overhead claims other than for the purpose of verifying the actual rate of time-related overhead shall be entirely borne by the Contractor. The cost of performing an audit examination and submitting the independent Certified Public Accountant audit report to verify actual overhead costs incurred prior to the first working day shall be entirely borne by the Contractor.

Time-related overhead will be paid for at a lump sum price. The contract lump sum price bid for time-related overhead will be increased or decreased only as a result of suspensions or adjustments of contract time which revise the current contract completion date and which satisfy any of the following criteria:

- A. Suspensions of work ordered in conformance with the provisions in Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications, except:
 1. Suspensions ordered due to weather conditions being unfavorable for the suitable prosecution of the controlling operation or operations.
 2. Suspensions ordered due to the failure on the part of the Contractor to carry out orders given, or to perform the provisions of the contract.
 3. Suspensions ordered due to factors beyond the control of and not caused by the State or the Contractor, for which the Contractor is granted extensions of time in conformance with the provisions of the third paragraph of Section 8-1.07, "Liquidated Damages," of the Standard Specifications.
 4. Other suspensions that mutually benefit the State and the Contractor.
- B. Extensions of contract time granted by the State in conformance with the provisions in the fifth paragraph in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and set forth in approved contract change orders, in conformance with the provisions in Section 4-1.03, "Changes," of the Standard Specifications.
- C. Reductions in contract time set forth in approved contract change orders, in conformance with the provisions in Section 4-1.03, "Changes," of the Standard Specifications.

For each day the number of working days bid to complete the contract, in conformance with the provisions in "Beginning Of Work, Time Of Completion And Liquidated Damages," of these special provisions, is increased or decreased due to suspensions or adjustments of contract time as specified above, the lump sum price for time-related overhead will be increased or decreased by an amount equal to the contract lump sum price bid for time-related overhead divided by the number of working days bid to complete the contract.

In the event an early completion progress schedule, as defined in "Progress Schedule (Critical Path Method)" of these special provisions, is submitted by the Contractor and approved by the Engineer, the amount of time-related overhead eligible for payment will be based on the total number of working days for the project, in conformance with the provisions in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions, rather than the Contractor's early completion progress schedule.

The contract lump sum price paid for time-related overhead shall include full compensation for time-related overhead, including the Contractor's share of costs of an independent Certified Public Accountant audit of overhead costs requested by the Engineer, as specified in these special provisions, and as directed by the Engineer.

The provisions in Sections 4-1.03B, "Increased or Decreased Quantities," and 4-1.03C, "Changes in Character of the Work," of the Standard Specifications shall not apply to the contract item of time-related overhead.

Full compensation for additional overhead costs incurred during days of inclement weather when the contract work is extended into additional construction seasons due to delays caused by the State shall be considered as included in the time-related overhead paid during the contract working days, and no additional compensation will be allowed therefor.

Full compensation for additional overhead costs involved in performing additional contract item work that is not a controlling operation shall be considered as included in the contract items of work involved, and no additional compensation will be allowed therefor.

Full compensation for overhead, other than time-related overhead measured and paid for as specified above, and other than overhead costs included in the markups specified in "Force Account Payment" of these special provisions, shall be considered as included in the various items of work and no additional compensation will be allowed therefor.

Overhead costs incurred by subcontractors of any tier, suppliers, fabricators, manufacturers, and other parties associated with the Contractor shall be considered as included in the various items of work and as specified in Section 9-1.03, "Force Account Payment," of the Standard Specifications.

For the purpose of making partial payments pursuant to the provisions in Section 9-1.06, "Partial Payments," of the Standard Specifications, the amount of time-related overhead in each monthly partial payment will be based on the number of working days that occurred during that monthly estimate period, including compensable suspensions and right of way delays. Working days granted by contract change order due to extra work or changes in character of work, will be compensated upon completion of the contract. The amount earned per working day for time-related overhead shall be the lesser of the following amounts:

- A. The contract lump sum price for time-related overhead, divided by the number of working days bid to complete the contract, in conformance with the provisions in "Beginning Of Work, Time Of Completion And Liquidated Damages," of these special provisions.
- B. Twenty percent of the original total contract amount, divided by the number of working days bid to complete the contract, in conformance with the provisions in "Beginning Of Work, Time Of Completion And Liquidated Damages," of these special provisions.

After acceptance of the contract in conformance with the provisions in Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount of the contract lump sum price for time-related overhead not yet paid, will be included for payment in the first estimate made after acceptance of the contract in conformance with the provisions in Section 9-1.07, "Payment After Acceptance," of the Standard Specifications.

10-1.54 CRASH CUSHION (ADIEM)

Crash cushion shall be furnished and installed as shown on the plans and in conformance with the provisions in the Standard Specifications and these special provisions.

Crash cushion shall be an ADIEM II-350 as manufactured by Trinity Industries, Inc., and shall include the items detailed for crash cushion shown on the plans.

The successful bidder can obtain the crash cushion from the manufacturer, Trinity Industries, Inc., P.O. Box 99, 950 West 400S, Centerville, Utah 84014, telephone 1-800-772-7976.

The price quoted by the manufacturer for ADIEM II-350, FOB Centerville, Utah is \$12,950, not including sales tax.

The above price will be firm for orders placed on or before May 23, 2005, provided delivery is accepted within 90 days after the order is placed.

The Contractor shall furnish the Engineer one copy of the manufacturer's plan and parts list.

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in conformance with the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The Certificate of Compliance shall certify that the crash cushion conforms to the contract plans and specifications, conforms to the prequalified design and material requirements, and was manufactured in conformance with the approved quality control program.

Crash cushion shall be installed in conformance with the manufacturer's installation instructions.

Surplus excavated material remaining after the crash cushion has been installed shall be disposed of in a uniform manner along the adjacent roadway where designated by the Engineer.

Crash cushion (ADIEM) will be measured by the unit as determined from actual count in place in the completed work.

The contract unit price paid for crash cushion (ADIEM) shall include full compensation for furnishing all labor, materials (including anchor bolts, nuts, washers, and marker panels), tools, equipment, and incidentals, and for doing all the work involved in furnishing and installing the ADIEM type crash cushion, complete in place, including structure excavation, structure backfill, and disposing of surplus material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.555 THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE)

Sprayable thermoplastic traffic stripes (traffic lines) shall be applied in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

Sprayable thermoplastic material shall be free of lead and chromium, and shall conform to the requirements in State Specification No. PTH-02SPRAY.

Retroreflectivity of the sprayable traffic stripes shall conform to the requirements in ASTM Designation: D 6359-99. White sprayable thermoplastic traffic stripes shall have a minimum initial retroreflectivity of $250 \text{ mcd}\cdot\text{m}^{-2}\cdot\text{lx}^{-1}$. Yellow sprayable thermoplastic traffic stripes shall have a minimum initial retroreflectivity of $150 \text{ mcd}\cdot\text{m}^{-2}\cdot\text{lx}^{-1}$.

Where striping joins existing striping, as shown on the plans, the Contractor shall begin and end the transition from the existing striping pattern into or from the new striping pattern a sufficient distance to ensure continuity of the striping pattern.

Sprayable thermoplastic material shall be applied to the pavement at a minimum thickness of one millimeter and a minimum rate of 0.2-kg/m. The minimum application rate is based on a solid stripe of 100 mm in width.

Sprayable thermoplastic material shall be applied to the pavement at a temperature between 177°C and 205°C, unless a different temperature is recommended by the manufacturer.

Sprayable thermoplastic traffic stripes shall be free of runs, bubbles, craters, drag marks, stretch marks, and debris.

Sprayable thermoplastic traffic stripes will be measured by the meter along the line of the traffic stripes, without deductions for gaps in broken traffic stripes. A double traffic stripe, consisting of two 100-mm wide yellow stripes, will be measured as one traffic stripe.

The contract price paid per meter for thermoplastic traffic stripe (sprayable) shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in applying sprayable thermoplastic traffic stripes (regardless of the number, widths, and patterns of individual stripes involved in each traffic stripe) including establishing alignment for stripes, and 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.

10-3.16 GENERAL PACKET RADIO SYSTEM WIRELESS MODEM ASSEMBLY

The General Packet Radio System (GPRS) Wireless Modem Assembly shall be configured with the following major components:

- A. Modem
- B. Power supply
- C. Modem mounting bracket and hardware
- D. Serial communication cable
- E. Antenna

MODEM

All modems shall be configurable remotely through the wireless network and through the modem serial port. The Contractor shall configure all modems prior to acceptance. The Contractor shall provide the Engineer with the modem serial and SIM numbers 30 days prior to requiring the PDP context. The Engineer will make available the PDP context comprising the IP (assigned) and APN (obtained from service provider) and configuration parameters (if different from those listed below) after the serial and SIM numbers are provided to the Engineer by the Contractor. All modems shall be complete with all cables, conductors, hardware, antenna and other equipment as required to make the system completely operational. Location and mounting of the equipment shall be directed by the Engineer and details shown on the plans. The modems shall be fully compliant with PCCA STD-101.

Environmental Requirements

The operating temperature range of the modem shall range from -30°C to +70°C, with humidity from 5 percent to 95 percent (non-condensing) and have transmissions at 10 percent duty cycle above 60°C.

Physical Characteristics

The modem shall weigh less than 1 kg and shall have overall dimensions of less than 180 mm × 90 mm × 30 mm. The housing shall be constructed of anodized aluminum.

The modem shall have the following status indicators:

- 1. Power (on).
- 2. Channel acquired.
- 3. Link status.
- 4. Network registration.
- 5. Received signal strength indicator.
- 6. Transmit and receive data.
- 7. Block errors.

Operational Parameters

The modem shall operate in a dynamic IP addressing environment of GPRS Networks at 1900/850 MHz and meet the following operational parameters:

Transmit power at antenna port	1.0 W for 1900 MHz 0.8 W for 850 MHz
Transmit frequency	1850-1910 MHz and 824-849 MHz
Receiver frequency	1930-1990 MHz and 869-894 MHz
Receiver sensitivity	-107 dBm (2.439 % bit error rate)
Input voltage	10 V(dc) to 28 V(dc)
Input current	40 mA to 200 mA

Application Interfaces

The modem shall have the following standard interfaces:

1. The AT command serial character stream uses TCP/IP.
2. Host communicates with modem using either UDP or TCP packet modes.
3. Computer terminal platform using Windows 98/2000/NT and Dial-Up Networking communicates with the modem using PPP.

Features

The modem shall have the following features:

1. 53.6 kbps raw data transfer rate minimum.
2. Full duplex transceiver.
3. 1900/850 MHz dual band networking.
4. Integrated TCP/IP protocol stack with UDP.
5. Security such to prevent unauthorized access.
6. Includes a DC power cable at least 1 meter in length with a connector compatible with the modem power connector.
7. Packet buffering and forwarding feature that provides discipline to the output of the serial port. The packet forwarding time interval shall be configurable from a rate of 0 (undisciplined) to 400 ms in increments of 100 ms or less.
8. Choice of "Friends Only" access mode.

Configuration parameters

The modem shall be configured with the following parameters (using the default AT command mode):

Command	Current value and Description
ADBGP=n(?)	n=0
AIP=n(?)	n=1: Allow any incoming IP to connect when UDP auto answer is enabled.
DAE=n(?)	n=0: Enable +++AT escape sequence detection.
E=n(?)	n=1: Toggle AT command echo On.
FM=n(?)	n=0: Disable Friends mode.
HOR=n(?)	n=0: No response codes when UDP session is initiated.
I0?	#####GPRS: Returns the product name.
I1?	#####: Returns firmware version, hardware ID, and copyright.
I2?	#####: Returns firmware version and relevant hardware ID.
I3?	#####: Returns the OEM Modem's unique ID.
MD=nn(?)	nn=00: normal (AT command) mode.
MVLEN=n(?)	n=0: Modbus-Variant length
MVMSK=nn(?)	nn=00:Modbus-Variant ID Mask
MVOFF=n(?)	n=0:Modbus-Variant offset
MVTYP=n(?)	n=0: Modbus –Variant Type
Q=n(?)	n=1: Quiet-mode On
RKEY=n(?)	n=0: Disable Transceiver Keying
S0=n(?)	n=1: On, TCP Auto Answer Mode
S7=nn(?)	nn=30: TCP Establishment Timeout in seconds
S23=<speed>,<databits>,<parity>,<stopbits>	9600,8,N,1: Serial line parameters are set
S50=n(?)	n=1: Data Forwarding Timeout in tenths of seconds
S51=n(?)	n=0: No Data Forwarding character
S53=d/[ppppp](?)	T/12345: Destination IP address,port and method
S60=n(?)	n=1: Telnet echo mode, Local echo(Default)
S82=n(?)	n=2: Enable UDP auto answer mode
S83=n(?)	n=10: UDP auto answer timeout in seconds
S110=d.d.d.d/[ppppp](?)	192.168.36.24/12345: IP address and port for GPRS modems
S211=n(?)	n=1: Ignore DTR.
S221=n(?)	n=1: Delay Connect Response in seconds.

TCPS=n(?)	n=0: TCP connection timeout in minutes.
TCPT=n(?)	n=6: TCP inactive timeout in minutes.
V=n(?)	n=1: Command Response Mode, Verbose(default)
&C=n(?)	n=1: Assert DCD when in a data mode.
&D=n(?)	n=0: Ignore DTR
&S=n(?)	n=1: Assert DSR when in a data mode.
*CTSE=n(?)	n=0: Clear To Send Enable, Disabled (default)
*DATE=[mm/dd/yyyy],[hh:mm:ss](?)	Sets the date and time, hours specified in 24-hours format.
*DATZ=n(?)	n=0: Normal Reset (default) on ATZ.
*DEVICEID=n(?)	Queries the 64-bit Device ID that is used by the modem to identify itself to the server.
*DNS1=d.d.d.d(?)	209.183.48.10: Sets the DNS addresses to be returned during the PPP negotiations.
*DNS2=d.d.d.d(?)	209.183.48.11: Sets the DNS addresses to be returned during the PPP negotiations.
*DPORT=n(?)	12345: Sets the modem's Device Port.
*DU=n(?)	n=0: dial command always uses UDP.
*ENQ=n(?)	n=0: Outputs an ENQ after the TCP CONNECT delay, Disabled (default).
*HOSTPRIVMODE=n(?)	n=0: public IP to be used when the Host initiates a PPP connection to the modem.
*HOSTPRIVIP=d.d.d.d(?)	0.0.0.0: private IP address if *HOSTPRIVMODE=1
*IPMANAGER1=d.d.d.d(?)	155.173.38.215: IP addresses to send IP change notifications to.
*IPMANAGER2=d.d.d.d(?)	155.173.38.210: Second IP address to send IP notifications to.
*IPMGRKEY1=[key](?)	0000000000: Sets the 128-bit key to use to authenticate the IP update notifications. If the key's value is all zeros, a default key will be used, with IPMANAGER1.
*IPMGRKEY2=[key](?)	0000000000: Sets the 128-bit key to use to authenticate the IP update notifications. If the key's value is all zeroes, default key will be used with IPMANAGER2.
*IPMGRUPDATE1=n(?)	xx: Sets the number of minutes to periodically send an IP update to IPMANAGER1.
*IPMGRUPDATE2=n(?)	xx: Sets the number of minutes to periodically send an IP update to IPMANAGER2.
*MODEMNAME=[name](?)	Name of the modem(up to 20 characters long) to use when performing IP change notices to IPManager. This name should not be a fully qualified domain name, but simply the first portion.
*MSCIUPDADDR=[name/port](?)	Modem Status Update Address-where Name/Port is the domain name and port of the machine where the modem status updates will be sent.

*MSCIUPDPERIOD=n(?)	Modem status update period- where n is in minutes.
*NETCHAN?	Returns the current active channel number.
*NETIP?	Queries the current public(network) IP address of the modem. Note: This could be 0.0.0.0 if there is no current network IP.
*NETPHONE?	Queries the device's phone number, if applicable.
*NETPW=pw(?)	The password that is used to login to wireless network.
*NETRSSI?	Returns the current RSSI of the modem as a negative dBm value.
*NETSTATE?	Queries the current network state.
*NETUID=[uid](?)	The login that is used to login to the network,when required
*TPORT=ppppp(?)	Sets or queries the port used for the AT Telnet server. Valid values are 0-65535.
*UALL=n(?)	n=0: No(default).If there is no UDP session active, an incoming UDP packet will be treated according to the UDP auto answer and AIP settings.
*UDPLAST=n(?)	n=0. Does not change S53 setting.(default). If enabled,sets S53 to the last accepted IP address through UDP auto answer.

System Compliance

The modem and associated firmware, software, hardware, protocol, and other features shall be fully and completely compatible with the existing GPRS network currently in use. The existing GPRS network utilizes the AT&T Wireless (now Cingular) cellular system (band compatible with this modem), the AirLink Raven GPRS modem, and the AirLink Gateway. The Contractor shall demonstrate the compatibility to the Engineer by actual installation demonstration or by other means approved by the Engineer.

Installation

The installation of the modem shall be according to the plans, the manufacturer's instructions, and adjusted per field conditions with the Engineers approval.

Certificate of Compliance

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all of the modems furnished for the project.

Warranty

The manufacturer shall provide a written warranty against defects in materials and workmanship for modems for a period of 12 months after installation for parts and labor. Replacement modems shall be provided within 5 days after receipt of failed modem at no cost to the State, except the cost of shipping the failed modem. All warranty documentation shall be given to the Engineer prior to installation. Replacement modems shall be delivered to Caltrans Maintenance Electrical Shop at 30 Rickard Street, San Francisco, CA 94134.

The software warranty shall be for one (1) year, including upgrades and feature enhancements.

POWER SUPPLY

The power supply shall be vertically mountable on a 483-mm standard rack rail using existing mounting hardware. An existing mounting hardware sample is available upon request; the Contractor may pick it up at 111 Grand Avenue, Oakland. The Contractor shall return the sample if it is not used in the installation. The power supply shall have provision to attach the modem power cable securely without the need for modifying the modem power cable.

The power supply shall meet the following requirements:

Power Cord	Standard 120 V(ac), 3 prong cord, at least 1 meter in length (may be added by Contractor)
Type	Switching mode type
Power Rated	40 W minimum with no minimum load required
Operating Temperature Range	From -30°C to +70°C
Operating Humidity Range	From 5 percent to 95 percent non-condensing
Input Voltage	From 85 V(ac) to 264 V(ac) or 120 V(dc) to 370 V(dc)
Input Frequency	From 47 Hz to 63 Hz
Inrush Current	Cold start, 25 A at 115 V
Output Voltage	12 V(dc), adjustable over a ±10 percent range
Overload Protection	From 105 percent to 150 percent in output pulsing mode
Over Voltage Protection	From 115 percent to 135 percent of output voltage
Setup, Rise, Hold Up Time	800 ms, 50 ms, 15 ms at 115 V(ac)
Withstand Voltage	I/P-0/P:3 kV, I/P-FG:1.5 kV, for 60 seconds
Working Temperature*	70°C@30%
Safety Standards	UL 1012, TUV EN60950
EMC Standards	EN55022 Class B, EN61000-4-2, 3, 4, 5 and EN61000-3-2, 3

A substitute may be proposed by the Contractor which meets the 70°C environmental rating at a lower load percentage as long as the temperature rating is maintained at the maximum modem load and all other electrical specifications are met.

Certificate of Compliance

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance" of the Standard Specifications for all of the power supplies furnished for the project.

Warranty

The manufacturer shall provide a written warranty against defects in materials and workmanship for power supplies for a period of 12 months after installation for parts and labor. Replacement power supplies shall be provided within 5 days after receipt of failed power supply at no cost to the State, except the cost of shipping the failed power supply. All warranty documentation shall be given to the Engineer prior to installation. Replacement power supplies shall be delivered to Caltrans Maintenance Electrical Shop at 30 Rickard Street, San Francisco, CA 94134.

MODEM MOUNTING BRACKET AND HARDWARE

The mounting bracket and hardware shall be stainless steel. The mounting bracket shall securely hold the modem in a vertical attitude with all cables and conductors installed. The mounting bracket shall contain the modem using a method that allows the removal of the modem without tools or without removing the bracket from its attachment to the cabinet frame.

D SERIAL COMMUNICATION CABLE

Where the modem is designed to interface with a Model 170E controller, the Contractor shall provide a communication cable known as the C2 cable. The C2 cable shall interface the Model 170E controller C2 connector and the GPRS modem and include all conductors and connectors required for that purpose. The GPRS modem connector shall meet EIA RS-232 standard using a DB-9 connector. The Model 170E controller end connector shall comply with AMP 201360-2-ND or equivalent. All pins in both connectors shall be gold plated. The cable shall have four No. 20 AWG conductors with (UL) Type CM shielded or AWM 2464 80C 300 Volts – C (UL) CMG. The cable shall be at least 1 meter long. The cable wiring shall comply with the following:

- AMP 201360-2-ND -L to DB9-P - 2
- AMP 201360-2-ND -K to DB9-P - 3
- AMP 201360-2-ND -N to DB9-P - 5
- AMP 201360-2-ND -D to AMP 201360-2-ND - H
- AMP 201360-2-ND -J to AMP 201360-2-ND – M

ANTENNA

The antenna shall be the low profile type, and shall adhere to the cabinet using a factory installed double-sided waterproof acrylic foam adhesive. The coax cable shall be at least 1 meter in length and shall have a 50 Ω TNC connector on the modem end. In addition, the antenna shall meet the following requirements:

VSWR (at resonant point)	2:1 or less
Frequency	1850-1990 MHz and 824-894 MHz
Nominal Impedance	50 Ω
Gain	2 dB
Radiation Pattern	Omni-directional
Polarization	Vertical
Ground Plane Required	Yes, see note below

Ground plane requirements: The antenna shall require a reflective ground plane to function properly. The required ground plane shall extend beyond the antenna at least 200 mm in all directions.

10-3.175 LONG LEAD-IN CABLE LOOP DETECTOR (LLLD) SENSOR UNIT

GENERAL

The Long Lead-in cable Loop Detector (LLLD) sensor unit shall comply with the following:

1. Chapter 5 of the Transportation Electrical Equipment Specifications (TEES), November 19, 1999.
2. Section 86-5.01 of the July 1999 Standard Specifications.
3. The enhancements as specified in this specification.

Sensitivity

The LLLD sensor unit shall have a sensitivity based on delta L threshold rather than delta L (only). There shall be 8 threshold levels ranging from 8 nanohenries to 1024 nanohenries (8, 16, 32, 64, 128, 256, 512, 1024). The LLLD shall be capable of detecting Agency licensed vehicles over the following configurations:

1. Single Type A, B, Q or round Loop with a 1,000 meter lead-in-cable.
2. Single Type A, B, Q or round Loops connected in series with a 1,000 meter lead-in-cable.

Variations

The LLLD sensor unit shall be permitted the following exceptions to the TEES and Standard Specifications:

- 1) Three frequency settings minimum.
- 2) The operating frequency of 40 kHz is not required as long as FCC rules are adhered to.
- 3) The minimum Q requirement of 5 is not required if all other functional requirements are met.
- 4) Pulse mode requirements may vary from TEES but are subject to the approval of the Engineer.

Certificate of Compliance

The Contractor shall provide the Engineer with a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all of the LLLD sensor units furnished for the project.

Warranty

The LLLD sensor unit shall have a complete manufacturer's warranty of at least 1 year parts.

(BECAUSE SOME COLORED INKS WILL NOT REPRODUCE IN COPY
MACHINES, PLEASE USE BLACK INK TO COMPLETE THIS PROPOSAL.)

(DO NOT DETACH)

PROPOSAL TO THE DEPARTMENT OF TRANSPORTATION

CONTRACT NO. 04-162004

NAME OF BIDDER _____

BUSINESS P.O. BOX _____

CITY, STATE, ZIP _____

BUSINESS STREET ADDRESS _____

(Please include even if P.O. Box used)

CITY, STATE, ZIP _____

TELEPHONE NO: **AREA CODE ()** _____

FAX NO: **AREA CODE ()** _____

CONTRACTOR LICENSE NO. _____

The work for which this proposal is submitted is for construction in conformance with the special provisions (including the payment of not less than the State general prevailing wage rates or the Federal minimum wage rates), the project plans described below, including any addenda thereto, the contract annexed hereto, and also in conformance with the Department of Transportation Standard Plans, dated July 1999, the Standard Specifications, dated July 1999, and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished.

The special provisions for the work to be done are dated September 20, 2004 and are entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; NOTICE TO CONTRACTORS AND
SPECIAL PROVISIONS FOR CONSTRUCTION ON STATE HIGHWAY IN ALAMEDA COUNTY IN
OAKLAND FROM 0.30 KM MACARTHUR BOULEVARD ON RAMP TO DISTRIBUTION STRUCTURE**

The project plans for the work to be done were approved August 23, 2004 and are entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT PLANS FOR
CONSTRUCTION ON STATE HIGHWAY IN ALAMEDA COUNTY IN OAKLAND FROM 0.30 KM
MACARTHUR BOULEVARD ON RAMP TO DISTRIBUTION STRUCTURE**

Bids are to be submitted for the entire work. The amount of the bid for comparison purposes will be the total of the following: the sum of the item totals; and, the product of the number of working days bid to complete the work and the cost per day shown on the proposal form. This amount shall be set forth as the "Total Basis for Comparison of Bids: (A) + (B)."

The bidder shall set forth for each unit basis item of work a unit price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for that purpose. In the case of unit basis items, the amount set forth under the "Item Total" column shall be the product of the unit price bid and the estimated quantity for the item.

In case of discrepancy between the unit price and the total set forth for a unit basis item, the unit price shall prevail, except as provided in A. or B., as follows:

- A. If the amount set forth as a unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then the amount set forth in the item total column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price;
- B. (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentagewise the unit price or item total in the Department's Final Estimate of cost.

The bidder shall also set forth the number of working days bid to complete the work, and the product of the number of working days and the cost per day shown on the proposal form, in clearly legible figures in the respective spaces provided for that purpose. In the case of a discrepancy between the number of working days and the product, the number of working days shall prevail. If the number of working days is illegible, is omitted, or is the same amount as the entry for the product, then the amount set forth as the product shall prevail. In this case the product shall be divided by the cost per day shown and the number thus obtained shall be the number of working days.

If both the unit price and the item total are unreadable or otherwise unclear, or are omitted, the bid may be deemed irregular. Likewise if the item total for a lump sum item is unreadable or otherwise unclear, or is omitted, the bid may be deemed irregular unless the project being bid has only a single item and a clear, readable total bid is provided.

Symbols such as commas and dollar signs will be ignored and have no mathematical significance in establishing any unit price or item total or lump sums. Written unit prices, item totals and lump sums will be interpreted according to the number of digits and, if applicable, decimal placement. Cents symbols also have no significance in establishing any unit price or item total since all figures are assumed to be expressed in dollars and/or decimal fractions of a dollar. Bids on lump sum items shall be item totals only; if any unit price for a lump sum item is included in a bid and it differs from the item total, the items total shall prevail.

The foregoing provisions for the resolution of specific irregularities cannot be so comprehensive as to cover every omission, inconsistency, error or other irregularity which may occur in a bid. Any situation not specifically provided for will be determined in the discretion of the Department, and that discretion will be exercised in the manner deemed by the Department to best protect the public interest in the prompt and economical completion of the work. The decision of the Department respecting the amount of a bid, or the existence or treatment of an irregularity in a bid, shall be final.

If this proposal shall be accepted and the undersigned shall fail to execute the contract and return it, together with the contract bonds, to the Department of Transportation so that it is received within 10 days, not including Saturdays, Sundays and legal holidays, after the bidder has received the contract for execution, the Department of Transportation may, at its option, determine that the bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof shall be null and void and the forfeiture of the security accompanying this proposal shall operate and the same shall be the property of the State of California.

The undersigned, as bidder, declares that the only persons or parties interested in this proposal as principals are those named herein; that this proposal is made without collusion with any other person, firm, or corporation; that he has carefully examined the location of the proposed work, the annexed proposed form of contract, and the plans therein referred to; and he proposes, and agrees if this proposal is accepted, that he will contract with the State of California, in the form of the copy of the contract annexed hereto, to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the contract, in the manner and time therein prescribed, and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefor the following prices, to wit:

**ENGINEERS ESTIMATE
04-162004**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
1	070012	PROGRESS SCHEDULE (CRITICAL PATH METHOD)	LS	LUMP SUM	LUMP SUM	
2	070018	TIME-RELATED OVERHEAD	LS	LUMP SUM	LUMP SUM	
3	071301	TEMPORARY FENCE	M	325		
4	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM	LUMP SUM	
5	074020	WATER POLLUTION CONTROL	LS	LUMP SUM	LUMP SUM	
6	033616	NON-STORM WATER DISCHARGES	LS	LUMP SUM	LUMP SUM	
7	074026	TEMPORARY MULCH	M3	785		
8	074032	TEMPORARY CONCRETE WASHOUT FACILITY	EA	5		
9	074033	TEMPORARY CONSTRUCTION ENTRANCE	EA	2		
10 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	
11 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	
12 (S)	120120	TYPE III BARRICADE	EA	2		
13 (S)	120165	CHANNELIZER (SURFACE MOUNTED)	EA	172		
14	BLANK					
15 (S)	128650	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4		
16 (S)	129000	TEMPORARY RAILING (TYPE K)	M	634		
17 (S)	129100	TEMPORARY CRASH CUSHION MODULE	EA	4		
18	129150	TEMPORARY TRAFFIC SCREEN	M	470		
19	150662	REMOVE METAL BEAM GUARD RAILING	M	80		
20	150713	REMOVE PAVEMENT MARKING	M2	10		

**ENGINEERS ESTIMATE
04-162004**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	150714	REMOVE THERMOPLASTIC TRAFFIC STRIPE	M	2800		
22	150742	REMOVE ROADSIDE SIGN	EA	2		
23	BLANK					
24	150820	REMOVE INLET	EA	3		
25	033618	REMOVE WALL	M	160		
26	151270	SALVAGE METAL BRIDGE RAILING	M	473		
27	151531	RECONSTRUCT FENCE	M	150		
28	152391	RELOCATE ROADSIDE SIGN (METAL POST)	EA	1		
29	033619	REMOVE GRATE	EA	3		
30 (S)	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	M2	1600		
31	BLANK					
32	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM	LUMP SUM	
33	160101	CLEARING AND GRUBBING	LS	LUMP SUM	LUMP SUM	
34	190101	ROADWAY EXCAVATION	M3	60		
35	033620	ROADWAY EXCAVATION (TYPE R)	M3	1250		
36 (F)	192021	STRUCTURE EXCAVATION (TYPE DH)	M3	1510		
37 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	M3	605		
38	194001	DITCH EXCAVATION	M3	25		
39	198001	IMPORTED BORROW	TONN	3330		
40	033621	WASTE DISPOSAL (CLASS 1)	TONN	540		

**ENGINEERS ESTIMATE
04-162004**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	033622	HAZARDOUS MATERIALS MANAGEMENT REPORT	EA	1		
42	033623	HEALTH, SAFETY AND WORK PLAN	LS	LUMP SUM	LUMP SUM	
43	033624	HAZARDOUS MATERIALS MANAGEMENT PLAN	LS	LUMP SUM	LUMP SUM	
44	033625	ASBESTOS SURVEY	LS	LUMP SUM	LUMP SUM	
45	033626	AIR QUALITY PROGRAM	LS	LUMP SUM	LUMP SUM	
46 (S)	203003	STRAW (EROSION CONTROL)	TONN	2.4		
47 (S)	203014	FIBER (EROSION CONTROL)	KG	361		
48 (S)	203024	COMPOST (EROSION CONTROL)	M3	2.3		
49 (S)	203045	PURE LIVE SEED (EROSION CONTROL)	KG	64		
50 (S)	203061	STABILIZING EMULSION (EROSION CONTROL)	KG	73		
51	BLANK					
52	390102	ASPHALT CONCRETE (TYPE A)	TONN	720		
53	BLANK					
54	393001	PAVEMENT REINFORCING FABRIC	M2	1530		
55	397001	ASPHALTIC EMULSION (PAINT BINDER)	TONN	3		
56 (S)	490669	2.1 M CAST-IN-DRILLED-HOLE CONCRETE PILING	M	156		
57	049755	FURNISH PILING (CLASS 900C)(ALT "X" MODIFIED)	M	7039		
58 (S)	049756	DRIVE PILE (CLASS 900C)(ALT "X" MODIFIED)	EA	439		
59 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	M3	880		
60 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	M3	1540		

**ENGINEERS ESTIMATE
04-162004**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	M3	12		
62	512231	FURNISH PRECAST PRESTRESSED CONCRETE GIRDER (15 M - 20 M)	EA	42		
63	512232	FURNISH PRECAST PRESTRESSED CONCRETE GIRDER (20 M - 25 M)	EA	26		
64 (S)	512500	ERECT PRECAST PRESTRESSED CONCRETE GIRDER	EA	68		
65	515020	REFINISH BRIDGE DECK	M2	285		
66 (S)	519117	JOINT SEAL (MR 30 MM)	M	110		
67 (S-F)	520102	BAR REINFORCING STEEL (BRIDGE)	KG	576 000		
68	566011	ROADSIDE SIGN - ONE POST	EA	5		
69	566012	ROADSIDE SIGN - TWO POST	EA	1		
70	721420	CONCRETE (DITCH LINING)	M3	23		
71	BLANK					
72 (F)	750001	MISCELLANEOUS IRON AND STEEL	KG	642		
73 (S)	750050	INLET GRATE	EA	3		
74 (S-F)	750498	MISCELLANEOUS METAL (RESTRAINER - CABLE TYPE)	KG	1800		
75 (S-F)	750501	MISCELLANEOUS METAL (BRIDGE)	KG	6100		
76	BLANK					
77	033627	BARRIER DELINEATOR	EA	65		
78 (S-F)	833000	METAL RAILING	M	100		
79	BLANK					
80	839701	CONCRETE BARRIER (TYPE 60)	M	12		

**ENGINEERS ESTIMATE
04-162004**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
81	BLANK					
82 (F)	049757	CONCRETE BARRIER (TYPE 60A MODIFIED)	M	186		
83	839703	CONCRETE BARRIER (TYPE 60C)	M	42		
84 (F)	839720	CONCRETE BARRIER (TYPE 732)	M	460		
85 (F)	049758	CONCRETE BARRIER (TYPE 732A MODIFIED)	M	160		
86 (S)	840515	THERMOPLASTIC PAVEMENT MARKING	M2	23		
87 (S)	840561	100 MM THERMOPLASTIC TRAFFIC STRIPE	M	1700		
88	BLANK					
89 (S)	840563	200 MM THERMOPLASTIC TRAFFIC STRIPE	M	760		
90 (S)	033628	PAVEMENT MARKER (NON-REFLECTIVE TYPE A)	EA	200		
91 (S)	850104	PAVEMENT MARKER (REFLECTIVE-SPECIAL TYPE H)	EA	86		
92 (S)	850110	PAVEMENT MARKER (RETROREFLECTIVE-SPECIAL TYPE C)	EA	62		
93 (S)	850112	PAVEMENT MARKER (RETROREFLECTIVE-SPECIAL TYPE G)	EA	107		
94 (S)	860415	LIGHTING (STAGE CONSTRUCTION)	LS	LUMP SUM	LUMP SUM	
95 (S)	860460	LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM	LUMP SUM	
96 (S)	033629	TRAFFIC OPERATIONS SYSTEM	LS	LUMP SUM	LUMP SUM	
97	BLANK					
98 (S)	033631	EXTINGUISHABLE MESSAGE SIGN PANEL (LED)	EA	3		
99	BLANK					
100	150769	REMOVE ASPHALT CONCRETE	M3	26		

