

Form Name	Attachment No	# Pages
Invitation for Bid- Cover Letter		
Invitation for Bid		
Bid Proposal, ADM 1412	1	1
Bidder Declaration form GSPD-05-105	2	
Contractor Certification Clauses	3	4
Non-Collusion Affidavit for Public Works	4	1
Bid/Bidder Certification Sheet	5	2
Bidder's Acknowledgement of Prevailing Wages	6	1
Darfur Contracting Act	7	1
Required Attachment Checklist	8	1
Proposed Form of Agreement, STD 213	9	23
For use if DVBE prime or DVBE subcontractor Copies of quotes from SB or DVBE subcontractors listed in form GSPD-05-105 (Attachment 2)	10	1

YOUR RETURN  
ADDRESS

**Agreement No. 56A0343**

**Bid Due Date: March 21, 2013**

Postage

Department of Transportation  
Division of Procurement and Contracts  
ATTN: Bid Unit  
1727 30th Street, 4<sup>th</sup> Floor, MS 65  
Sacramento, CA 95816-7006

**BID SUBMITTAL DO NOT OPEN**

**DEPARTMENT OF TRANSPORTATION**

ADMINISTRATION

DIVISION OF PROCUREMENT AND CONTRACTS MS-67

1727 30<sup>th</sup> STREET

SACRAMENTO, CA 95816-7006

PHONE (916) 227-0774 or 6000

FAX (916) 227-6155

TTY (800) 735-0193 or (916) 227-2857

INTERNET <http://caltrans-opac.ca.gov>Flex your power!  
Be energy efficient**March 11, 2013**

**INVITATION FOR BID (IFB)**  
**IFB # 56A0343**  
**Notice to Prospective Contractors**

You are invited to review and respond to this IFB # 56A0343, entitled, on-call TOSNET Fiber/Copper Maintenance and Repair service for Madera, Fresno, Tulare, Kings, and Kern Counties (Caltrans District 6). In submitting your bid, you shall comply with the instructions found herein. In addition to those programs and preferences that are specifically specified in this solicitation, Prospective Contractors are encouraged to consider programs and preferences that are available, such as those for the use of small businesses, disadvantaged businesses, disabled veteran businesses, and other businesses covered by State and Federal programs and preferences.

As required by Executive Order S-02-06, Department of Transportation (Caltrans) is committed to meeting the State's 25 percent (25%) Small Business (SB) participation goal. Certified SBs, Microbusinesses (MB), and contractors willing to commit to subcontracting a minimum of 25 percent (25%) of their net bid price to certified SBs or MBs, are encouraged to submit bids. See Section D, Item 1, in this IFB for requirements.

A Disabled Veteran Business Enterprises (DVBE) goal is not required, but DVBE participation is encouraged, and a DVBE incentive may apply to this IFB. See Section D, Item 2, in this IFB for requirements.

Note that all contracts entered into with Caltrans will include, by reference, General Terms and Conditions (GTC) and Contractor Certification Clauses (CCC) that may be viewed and downloaded at Internet site <http://www.ols.dgs.ca.gov/Standard+Language>.

This contract requires Prevailing Wages. Refer to Attachment 9, Proposed form of Agreement for requirement details.

The designated contact person for this IFB is:

**Betty Graham, Acquisition Analyst**  
Department of Transportation  
**Area Code & Telephone Number: (916) 227-6048**  
**Area Code & Fax Number: (916) 227-6007**  
**Email: [betty\\_graham@dot.ca.gov](mailto:betty_graham@dot.ca.gov)**

Please note that no *verbal* information given will be binding upon Caltrans unless such information is issued in writing as an official addendum.

\*Technical questions regarding this solicitation will be addressed, in writing, and in accordance with the Questions and Answers portion of this IFB. See **Section C 1, Time Schedule** for more details.

BETTY GRAHAM  
Acquisition Analyst

## Table of Contents

SECTION	PAGE
<b>A) Purpose and Description of Service</b>	1
<b>B) Bidder Minimum Qualifications</b>	1
<b>C) Bid Requirements and Information</b>	1
1. Time Schedule	1
2. Questions and Answers	1
3. Costs Included in Bid Rates	2
4. Employment of Undocumented Workers	2
5. Small Business Preference	2
6. State Prevailing Wages	2
7. Motor Carrier Permit	2
8. Contractor License	2
9. Subcontractor	2
10. Non-Collusion Affidavit for Public Works	3
11. Bonds	3
12. Insurance	3
13. Darfur Contracting Act	3
14. Bid Submittal	4
15. Evaluation and Selection	6
16. Award and Protest	6
17. Standard Conditions of Service	7
<b>D) Special Programs</b>	8
1. Small Business Preference	8
<b>Attachments</b>	
1. Bid Proposal, ADM 1412	
2. Bidder Declaration, GSPD 05-105	
3. Contractor Certification Clauses, CCC 307	
4. Non-Collusion Affidavit for Public Works	
5. Bid/Bidder Certification Sheet	
6. Bidder's Acknowledgement Of Prevailing Wage Requirements	
7. Darfur Contracting Act	
8. Required Attachment Check List	
9. Proposed Standard Agreement, STD 213	
Exhibit A, Scope of Work	
Exhibit B, Budget Detail and Payment Provisions	
Exhibit C, General Terms and Conditions	
Exhibit D, Special Terms and Conditions	
Exhibit E, Additional Provisions	
10. Quotes from SB or DVBE Subcontractors	

## A) Purpose and Description of Services

Refer to the **Proposed Form of Agreement, Exhibit A**, which is attached to this IFB as **Attachment 9** for a more complete description of services.

## B) Bidder's Minimum Qualifications

By submitting its bid, Bidder certifies, under penalty of perjury, that its California State License Board (CSLB) license is in a classification appropriate to the work to be undertaken as identified in the Proposed Form of Agreement, Exhibit A, Scope of Work, Attachment 9. This requirement has also been added in the Proposed Form of Agreement, Exhibit E, Attachment 9. Refer to Section C, Bid Requirements and Information, Paragraph 13, Contractor License, for submittal requirements.

If required by law, the lowest responsive responsible bidder must provide evidence, **before contract award** at a date specified by Caltrans, that it possesses and maintains in good standing a Motor Carrier Permit (MCP) issued by the California Department of Motor Vehicles (DMV). Caltrans will verify that the bidder has met this requirement prior to Agreement award and may check periodically throughout the term of the Agreement to ensure that the bidder's MCP is in effect and in good standing. Failure to meet this requirement will result in rejection of that bidder's bid or termination of the Agreement for default under the Termination and Default provisions in Ex. D of the Agreement, as applicable.

## C) Bid Requirements and Information

### 1. Time Schedule

It is recognized that time is of the essence. All bidders are hereby advised of the following schedule and will be expected to adhere to the required dates and times.

EVENT	DATE	TIME (Pacific Time)
IFB available to prospective bidders	March 11 2013	
Written Question Submittal	March 15, 2013	
Final Date and Time for Bid Submission	March 21, 2013	2:15 PM
Bid Opening	March 21, 2013	3:00 PM

### 2. Questions and Answers

- A. Questions regarding this IFB must be submitted in writing. Bidders are encouraged to submit their written questions by March 15, 2013.
- B. Written questions must include: the individual's name, firm name, complete address and must reference IFB No. 56A0343. Questions must be sent to the following

MAIL OR FAX TO:

Department of Transportation  
Division of Procurement and Contracts  
Attention: Betty Graham  
1727 - 30th Street, MS-65

Sacramento, CA 95816  
Fax No.: (916) 227-6007  
Email address: [betty\\_graham@dot.ca.gov](mailto:betty_graham@dot.ca.gov)

- C. Written responses to all questions will be collectively compiled and posted, as an Addendum, to the BidSync website (see below). It is the responsibility of the Bidder to access the website for any changes or Addenda that may be posted. Refer to this **IFB, Section C) 1, Time Schedule**, for the schedule of events and dates/times. It is the responsibility of the Bidder to check BidSync for all addenda. Bidder can contact the Acquisition Analyst named above:

<http://www.bidsync.com/>

### 3. Costs Included in Bid Rates

Bid prices/rates shall include the cost of employer payments to or on behalf of employees, subsistence, travel, compensation insurance premiums, unemployment contributions, social security taxes, contract bond premiums, and any other taxes or assessments, **including but not limited to, sales and use taxes** required by law or otherwise and no additional allowance will be paid unless separate payment provisions in the Agreement should specifically provide otherwise.

### 4. Employment of Undocumented Workers

No state agency or department, as defined in California Public Contract Code (PCC) section 10335.7, that is subject to this code, shall award a public works contract to a bidder or contractor, nor shall a bidder or contractor be eligible to bid for or receive a public works contract, who has, in the preceding five years, been convicted of violating a state or federal law regarding the employment of undocumented workers (PCC section 6101).

### 5. Small Business Preference: <http://www.pd.dgs.ca.gov/smbus>

SB Preference will be granted on this IFB. Only firms certified as a "Small Business" or "Microbusiness" with the Department of General Services (DGS), Office of Small Business and DVBE Service (OSDS) or Contractors who commit to subcontracting a minimum of 25 percent (25%) of their net bid price to SB or MB, in the categories most appropriate to accomplish the prescribed services, will be granted this preference.

### 6. State General Prevailing Wage Rates

State General Prevailing Wage Rates will apply for the County(ies) of Madera, Fresno, Tulare, Kings, and Kern as described in the attached Proposed Form of Agreement (Attachment 9). The predetermined general prevailing wage rates published by the Director of Industrial Relations may be obtained via the Internet: <http://www.dir.ca.gov> or from the District or Region Labor Compliance Officer, Attachment 3 (Attached at time of award). It is the bidder's responsibility to use the correct classification determination published by the Department of Industrial Relations.

### 7. Motor Carrier Permit

- A. If required by law, the lowest responsive responsible bidder must provide evidence, before contract award at a date specified by Caltrans, that it possesses and maintains in good standing a Motor Carrier Permit (MCP) issued by the California Department

of Motor Vehicles (DMV). Caltrans will verify that the bidder has met this requirement prior to Agreement award and may check periodically throughout the term of the Agreement to ensure that the bidder's MCP is in effect and in good standing. Failure to meet this requirement will result in rejection of that bidder's bid or termination of the Agreement for default under the Termination and Default provisions in Ex. D of the Agreement, as applicable.

- B. Bidder must complete Section 11(a) on the Bid/Bidder Certification sheet to certify whether or not the vehicles the bidder will use for this Agreement are subject to DMV/CHP Motor Carrier Permit laws and regulations. If the MCP is required, the bidder shall pay any fees required to obtain and maintain in good standing all necessary licenses and permits to accomplish the work.
- C. For more information, the bidder may call its local DMV permit office or the Sacramento DMV Motor Carrier Services Branch at (916) 657-8153. Prior to obtaining a Motor Carrier Permit, the bidder must have a California "CA Number" issued by the California Highway Patrol (CHP). To request a CA Number, the bidder may call its local CHP office or the Sacramento CHP Commercial Records Unit at (916) 375-2810. DMV: (<http://dmv.ca.gov/vehindustry/mcp/mcpinfo.htm>)

## **8. Contractor License**

Bidder must have, at time of bid submittal and for the duration of the contract, a valid, current Class A General Engineering license issued by the California Contractors State License Board (CSLB), for the type of work to be performed. Bidder shall obtain, pay for and maintain, in good standing, all necessary licenses and permits to accomplish the work. Bidders will be considered non-responsive unless proper licensing requirements are met. An invalid license will result in rejection of the bid. Positive verification of a valid license issued by the CSLB will be performed by Caltrans (reference Business & Professions Code section 7028.15).

## **9. Subcontractors**

Bidder may subcontract portions of the work as defined in the attached Proposed Form of Agreement. If a subcontractor(s) is / are used, complete the Bidder Declaration form GSPD-05-105, Attachment 2. Bidder must ensure that the subcontractor(s) will have all necessary licenses, permits, and/or certifications to accomplish its portion of the work. Failure of a subcontractor(s) to have the proper licenses, permits, and/or certifications, shall be cause for rejection of bid.

## **10. Non-Collusion Affidavit for Public Works**

Bidder must submit, as described herein, a notarized non-collusion affidavit for public works. The Non-collusion affidavit is attached to this IFB as attachment 4. Failure to submit a complete notarized affidavit shall be rejection of bid.

## **11. Bonds**

Payment Bond Requirement: The successful bidder will be required to provide, prior to commencement of work under a Task Order, a Payment Bond for 100 percent (100%) of the Task Order, if the Task Order is over \$25,000. The Payment Bond is not required at the time of bid submittal; however, it is required, as applicable, prior to the start date of

the Task Order. Refer to Bonds in Exhibit D of the Proposed Form of Agreement (Attachment 9).

## **12. Insurance**

- A. The bidder, who receives the Agreement award, must provide a certificate of insurance providing proof of insurance to the Division of Procurement and Contracts within ten (10) working days from the date of notification of award. The State's Office of Risk and Insurance Management will review insurance certificates and/or proof of self-insurance documentation before execution of the Agreement. Refer to Exhibit E in the Proposed Form of Agreement (Attachment 9), for the applicable and specific Insurance requirements and coverage limits.
- B. The insurance carrier shall provide an endorsement for the additional insured statement as follows:  
  
The State of California, its officers, agents, employees, and servants shall be included as additional insured, but only with respect to work performed for the State of California under this Agreement.

## **13. Darfur Contracting Act**

- A. The Darfur Contracting Act, PCC section 10475-10481, applies to any company that currently or within the previous three years has had business activities or other operations outside of the United States. The Act was passed by the California Legislature and signed into law by the Governor to preclude State agencies generally from contracting with "scrutinized" companies that do business in the African nation of Sudan (of which the Darfur region is a part), for the reasons described in PCC section, 10475. All bidders shall complete the Darfur Contracting Act Certification form, Attachment 7, and submit with bid.
- B. If your company has not, within the previous three years, had any business activities or other operations outside of the United States, complete Option 1 on the Darfur Contracting Act Certification form, Attachment 7.
- C. A scrutinized company is a company doing business in Sudan as defined in PCC section 10476. Scrutinized companies are ineligible to, and cannot bid on, or submit a proposal for a contract with a State agency for goods or services. (PCC section 10477(a)).
- D. Therefore, PCC section 10478 (a) requires a company that currently has (or within the previous three (3) years has had business activities or other operations outside of the United States to certify that it is not a "scrutinized" company when it submits a bid or proposal to a State agency.
- E. A scrutinized company may still; however, submit a bid or proposal for a contract with a State agency for goods or services if the company first obtains permission from the Department of General Services (DGS) according to the criteria set forth in PCC section 10477(b).



#### 14. Bid Submittal

- A. All bids must be submitted and received by Caltrans Division of Procurement and Contracts, Bid Unit by dates and times shown in the IFB, Section C) Bid Requirements and Information, Item 1) Time Schedule.
- B. The mailing package/envelope should be labeled as follows:

**Note: All packages not clearly or properly labeled as indicated below, including overnight mail and hand delivered packages may be rejected.**

<b>YOUR RETURN ADDRESS</b>	<b>Agreement No. <b>56A0343</b></b>	postage
	<b>Bid Due Date: March 21, 2013</b> <b>Bid Due Time: 2:15 P.M.</b> <b>Bid Opening: 3:00 P.M.</b> <b>Attention: <b>BETTY GRAHAM</b></b>	
	Department of Transportation Division of Procurement and Contracts ATTN: BID UNIT 1727 30th Street, 4 <sup>TH</sup> Floor, MS-65 Sacramento, CA 95816-7006	
<b>BID SUBMITTAL DO NOT OPEN</b>		

- C. **Late bids will not be considered.**
- D. All bids shall include the documents identified on the IFB's Required Attachment Checklist (Attachment 8). Bids not including the required attachment(s) shall be deemed non-responsive. A non-responsive bid is one that does not meet the basic bid requirements.
- E. Only an individual who is legally authorized to bind the proposing firm contractually shall sign all documents requiring a signature, and each document must bear an original ink signature.
- F. If your bid is hand delivered, you must date and time stamp the sealed envelope/package immediately upon arrival. The date/time stamp machine is located in the lobby on the first floor to the right of the security guard station at the address noted above. After date/time stamping, the bid should be placed in the locked bid cabinet located below the time stamp. If the bid package is too large to be electronically stamped, date/time stamp one of the labels provided and attach it to the proposal package. When the bid package is too large for the locked bid cabinet, ask the security guard to call the Division of Procurement and Contracts reception desk at 227-6000 to have your bid package picked up.
- G. Bid opening will be held at the above address at **3:00 PM** on the date specified in Section C - Bid Requirements and Information, 1 - Time Schedule. Bidders may participate in person or via teleconference by calling **1-866-700-7952** and entering the

pass code **7089821#**. Calls will be accepted beginning at **2:50 PM** until the conclusion of the Bid Opening. Bids will be read in Agreement numeric order; questions will not be allowed; and information will not be repeated. Bid Opening results will be posted online on the Division of Procurement and Contracts web site at <http://caltrans-opac.ca.gov/contracts/bidresults.htm> by 12:00 P.M. on the day following the bid opening. The Agreement will be awarded to the lowest responsible bidder meeting the requirements outlined in the IFB.

- H. Bids must include the performance of all the services described herein. Any attempt to modify the bid document to deviate from the work specifications will not be considered and will cause a bid to be rejected.
- I. A bid may be rejected if it is conditional, incomplete, or if it contains any alterations of form or other irregularities of any kind. Caltrans may reject any bid on the basis that it is not responsive or from a non-responsible bidder, and may waive any immaterial deviation in a bid. Caltrans waiver of an immaterial defect shall in no way modify the IFB document or excuse the bidder from full compliance with all requirements if awarded the agreement.
- J. Costs for developing bids and in anticipation of award of the contract is entirely the responsibility of the bidder and shall not be charged to the State.
- K. Only an individual who is authorized to bind the bidding firm contractually shall sign the Bid/Bidder Certification Sheet (Attachment 5). The signature must also indicate the title or position that the individual holds in the firm. **An unsigned bid may be rejected.**
- L. A bidder may modify a bid after its submission by first withdrawing the original bid and then by resubmitting a new bid prior to the bid submittal deadline. Bidder modifications offered in any other manner, oral or written, will not be considered.
- M. A bidder may withdraw a bid by, prior to bid opening, submitting a written withdrawal request to Caltrans, signed by the bidder or an agent authorized in accordance with Section K above. A bidder may thereafter submit a new bid prior to the bid submittal deadline. Bids may not be withdrawn without cause subsequent to bid submittal deadline.
- N. Caltrans may modify the IFB prior to the date fixed for submission of bids by the issuance of an addendum sent to all parties who received a bid package.
- O. Caltrans reserves the right to reject all bids for reasonable cause.
- P. Bidders are cautioned to not rely on Caltrans during its evaluation process to discover and report to the bidder any defects and errors in the submitted documents. Before submitting their documents, bidders should carefully proof them for errors and full adherence to the IFB requirements.
- Q. Where applicable, bidder should carefully examine work sites and specifications. Bidder shall investigate conditions, character, and quality of surface or subsurface materials or obstacles that might be encountered. No additions or increases to the contract amount will be made due to a lack of careful examination of work sites and specifications.

- R. Caltrans does not accept alternate contract language from a bidder. A bid with such language will be considered a counter proposal and will be rejected. The State's GTC are not negotiable. The GTC 610 may be viewed at <http://www.ols.dgs.ca.gov/Standard+Language/default.htm>

## **15. Evaluation and Selection**

- A. At the time of bid opening, each bid proposal's total and any Small Business and/or Micro Business information (if applicable) will be read aloud. Bids are considered preliminary pending review and verification of applicable bid requirements such as: small business preference, DVBE, DBE, licensing, bonding, qualifications, or other requirements as stated in the IFB. Contracts will be awarded to the lowest responsive responsible bidder.
- B. Each bid will be checked for the presence or absence of required information in conformance with the submission requirements of this IFB. Caltrans will check the bid submittal package to verify it received all required documents. Positive verification of required documents will be performed to determine its responsiveness to the State's needs.
- C. Bids that contain false or misleading statements, or which provide references, which do not support an attribute or condition claimed by the bidder, shall be rejected.
- D. The contract, if awarded, shall be awarded to the lowest responsible bidder meeting the specifications. A bid meets the specifications if it complies with all of the requirements in this solicitation. In the event of a tie bid, Caltrans will draw lots to determine the successful contractor. Only one proposal or bid may be submitted by an entity: individual, firm, partnership, corporation, joint venture or combination thereof. Receipt of more than one bid from an entity will result in all bids from that entity being rejected and returned to the bidder.

## **16. Award and Protest**

- A. Bid results may be viewed on the internet at 12:00 P.M. (Noon) on the first business day following the bid due date at <http://caltrans-opac.ca.gov>.
- B. Whenever a contract is awarded under a procedure that provides for competitive bidding, but the contract is not to be awarded to the low Bidder, the low Bidder shall be given notice five (5) working days prior to the award of the contract by telegram, electronic facsimile transmission, overnight courier, Internet transmission, or personal delivery.
- C. Upon written request by any bidder, notice of the proposed award shall be posted in a public place in the office of the awarding agency at least five (5) working days prior to awarding the contract.
- D. Grounds for Filing a Protest: After the issuance of the applicable contract award notices as specified in this IFB, the right to protest the proposed award of a contract is afforded any bidder who claims it should have been awarded the agreement because it was the lowest responsible bidder meeting the specifications.
- E. Filing a Protest: The initial protest must be submitted to the Caltrans, Protest Unit prior to the award of contract. When a protest has been submitted, the contract shall

not be awarded until either the protest has been withdrawn or DGS has decided the matter.

- F. Within five (5) days after filing the initial protest, the protesting bidder shall file with DGS and Caltrans, Protest Unit with a full and complete written statement specifying the grounds for the protest. The written protest must be sent to the addresses below:

---

**Department of Transportation**  
**Division of Procurement & Contracts**  
Attention: Bid, Protest, & Dispute Branch Chief  
1727 30<sup>th</sup> Street, MS 65  
Sacramento, CA 95816  
**Phone Number:** (916) 227-0774  
**Fax Number:** (916) 227-1950

---

It is suggested that you submit any protest by certified or registered mail.

- G. Upon award of the contract contractor shall complete and submit to Caltrans, the Payee Data Record form (STD 204), to determine if the contractor is subject to State income tax withholding pursuant to California Revenue and Taxation Code section 18662 et seq. This form can be found on the Internet at [www.osp.dgs.ca.gov](http://www.osp.dgs.ca.gov) under the heading STANDARD FORMS. No payment shall be made unless a completed STD 204 has been returned to Caltrans.
- H. Prior to the award of the contract, the awarded bidder(s) must sign and submit to Caltrans, page one (1) of the Contractor Certification Clauses (CCC), Attachment 3, or this form can be obtained via the Internet at <http://www.ols.dgs.ca.gov/Standard+Language/default.htm> Bidder may also, as an option, submit the CCC with bid package.

## **17. Standard Conditions of Service**

- A. After award of the contract and execution of the contract, should the contractor fail to commence work within five (5) working days after notification of the starting date, or suspend work for a period of five (5) continuous working days after work has begun, Caltrans may provide five (5) calendar days written notice, posted at the job site or mailed to the contractor, to timely prosecute and complete the work or the contract may be terminated and liquidated damages of \$500.00 assessed for administrative costs for re-bidding the work or awarding the work to another contractor. In addition, that contractor shall be liable to Caltrans for the difference between the contractor's bid price and the actual cost of performing the work by the second low bidder or by another contractor.
- B. All performance under the contract shall be completed on or before the termination date of the contract.
- C. Antitrust Provisions
- 1) The contractor offers and agrees and will require all of his other subcontractors and suppliers to agree to assign to the awarding body all rights, title, and interest in and to all causes of action they may have under Section 4 of the Clayton Act (15 USC section 15) or under the Cartwright Act [Chapter 2, commencing with section 16700, of Part 2 of Division 7 of the Business and Professions Code

(BPC)] arising from purchases of goods, services, or materials pursuant to the public works contract or subcontract. The assignment made by the contractor and all additional assignments made by the subcontractors and suppliers shall be deemed to have been made and will become effective at the time the awarding body tenders final payment to the contractor without further acknowledgment or the necessity of tendering to the awarding body any written assignments.

- 2) If an awarding body receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under GC sections 4550 - 4554, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, on demand, recover from the public body any portion of the recovery, including treble damages, and attributable overcharges that were paid by the assignor but were not paid by the public body as a part of the bid price, less the expenses incurred in obtaining that portion of the recovery. On demand in writing by the assignor, the assignee shall, within one year from such demand, reassign the cause of action assigned under GC sections 4550 - 4554 if the assignor has been or may have been injured by the violation of law for which the cause of action arose and (a) the assignee has not been injured thereby, or (b) the assignee declines to file a court action for the cause of action.
- D. If the bidder is awarded the Agreement and refuses to sign the Agreement presented for signature within the time and manner required, the bidder will be liable to Caltrans for actual damages resulting to Caltrans therefrom or ten percent (10%) of the amount bid, whichever is less.
- E. Loss Leader usage is prohibited in this Solicitation: It is unlawful for any person engaged in business within this State to sell or use any article or product as a "loss leader" as defined in Section 17030 of the California Business and Professions Code. "Loss Leader" means any article or product sold at less than cost: a) where the purpose is to induce, promote or encourage the purchase of other merchandise; or b) where the effect is a tendency or capacity to mislead or deceive purchasers of prospective purchasers; or c) where the effect is to divert trade from or otherwise injure competitors.
- F. No oral understanding or agreement shall be binding on either party.

## **D) Special Programs**

The following Special Programs are applicable to this IFB.

### **1. Small Business (SB) or Microbusiness (MB) Preference**

- A. GC section 14835 *et seq.* requires that a five percent (5%) preference be given to contractors who qualify as a certified SB or MB. References to a SB shall also include MB. The rules and regulations of this law, including the definition of a SB for the delivery of services, are contained in Title 2, California Code of Regulations (2 CCR) 1896 *et seq.*
- B. To claim the SB preference, your firm must have its principal place of business located in California and be certified by the California Department of General Services (DGS), Office of Small Business and DVBE Services (OSDS). The preference amount may not exceed fifty thousand dollars (\$50,000) for any bid. If

prospective Contractor is claiming the five percent (5%) SB preference, complete Section 16 of the Bid/Bidder Certification Sheet (Attachment 5).

- C. Pursuant to GC section 14838 and 2 CCR 1896, if a bidder is not a certified SB, but wishes to be eligible for the five percent (5%) non-small business (NSB) preference, the bidder must subcontract at least 25 percent (25%) of its net bid price to one or more certified SBs. If Bidder is claiming the five percent (5%) NSB preference, complete Section 17 of the Bid/Bidder Certification Sheet, Attachment 5, and Bidder Declaration, GSPD-05-105, Attachment 2. Bidder shall list the names of all certified SB firms being claimed for credit on the GSPD-05-105 form. For each certified SB subcontractor listed, the Bidder shall submit a copy of the quotes from each SB as Attachment 10, titled "Quotes from SB Subcontractors." This preference shall not be awarded to a noncompliant bidder and shall not be used to achieve any applicable minimum requirements.
- D. Certified SB bidder(s) shall have precedence over NSB bidders in the application of SB preference(s).
- E. SB preferences may not be applied to any bid deemed non-responsive with the solicitation instructions or from a non-responsible bidder.
- F. Questions regarding the certification approval process or SB program should be directed to OSDS at (800) 559-5529 or (916) 375-4940. For the 24-Hour Recording & Mail Request call (916) 322-5060, or E-mail: [osdshelp@dgs.ca.gov](mailto:osdshelp@dgs.ca.gov).
- G. Additional references are at <http://www.dgs.ca.gov/pd/Programs/OSDS.aspx>.

## **2. Disabled Veteran Business Enterprise (DVBE) Programs**

### **A. DVBE Participation Program with NO Goals**

A DVBE goal is not required, but DVBE participation is encouraged, and a DVBE incentive will apply to this IFB as described below.

### **B. DVBE Incentive Program**

- 1) The DVBE Incentive Program applies to this solicitation. It is separate from the DVBE Participation Program and was established in MVC §999 et seq., and 2 CCR §1896.99 et seq., to encourage bidders to partner with DVBE subcontractors. A dollar cap of \$100,000 is set for all combined incentives and preferences. The incentive is used only for evaluation purposes to arrive at the successful bidder and does not alter the amounts of the actual bid. Any responsive and responsible bidder with the confirmed DVBE participation per the Tables in paragraph 3) below is eligible to receive the incentive. Bidders who are not responsive and responsible regardless of the amount of DVBE participation are not eligible to receive the incentive.
- 2) Caltrans will apply an incentive to bids proposing the utilization of DGS Certified DVBE firms identified on the Bidder Declaration, GSPD-05-105. Information provided on the Bidder Declaration, GSPD-05-105 shall be verified by Caltrans prior to the award of the contract. The incentive amount is equal to a percentage of the lowest responsive and responsible bid based on the amount of DVBE participation in the bid being evaluated per the Tables below.
- 3) Tables for IFB (Low Price Method)

**Goal Not Required**

<b>Verified DVBE Participation</b>	<b>DVBE Incentive Amount</b>
5% or more	5%
4% - 4.99%	4%
3% - 3.99%	3%
2% - 2.99%	2%
0.1% - 1.99%	1%

- 4) When applying the DVBE Incentive, a NSB shall not displace an award to a DGS Certified Small Business.

Additional information: <http://www.dgs.ca.gov/pd/Programs/OSDS.aspx>



**BID PROPOSAL****ATTACHMENT 1  
District 6**

ADM-1412 (REV. 06/02) PAGE 1 OF 1

CONTRACTOR'S NAME (Please Print):			CONTRACT NO. 56A0343	PAGE 1 OF 1	
ITEM NO.	ESTIMATED QUANTITY	UNIT OF MEASURE	ITEM	AVERAGE UNIT PRICE (per unit of measure)	TOTAL (Est. QTY. X unit price)
1	200	Hour	Perform Excavation: Digging, Trenching, and Underground cable placement.		
2	200	Hour	Install Fiber Optic and Copper cables, conduits, & pull boxes.		
3	200	Hour	Perform Fiber Optic Fusion splice and Optical Time Domain Reflectometer (OTDR) testing		
4	200	Hour	Electrical work for 110 Volts and above		
5	1	Each	OTDR Reader/Software 2-year License	INCLUSIVE	INCLUSIVE
6			<b><u>ITEMS 7, 8, and 9 ARE PRE-FILLED, AMOUNTS TO BE ADDED INTO TOTAL BIDS.</u></b>		
7			<b>Travel Expenses PERFORMED with PRIOR Caltrans approval for actual miles traveled in EXCESS of 50-mile radius from TMC at state authorized mileage rates</b>		\$1,000
8			<b>Materials and equipment rental expenses WITH prior Caltrans approval.</b>		\$15,000
9			<b>Temporary Traffic Control Expenses</b>		\$1,000

(1) THE ABOVE QUANTITIES ARE ESTIMATES ONLY AND ARE GIVEN AS A BASIS FOR COMPARISON OF BIDS. NO GUARANTEE IS MADE OR IMPLIED AS TO THE EXACT QUANTITY THAT WILL BE NEEDED.

(2) IN CASE OF DISCREPANCY BETWEEN THE UNIT PRICE AND THE TOTAL SET FORTH FOR A UNIT BASIS ITEM, THE UNIT PRICE SHALL PREVAIL.

(3) ANY BID MAY BE REJECTED IF IT IS UNREASONABLE AS TO PRICE. UNREASONABLENESS OF PRICE INCLUDES NOT ONLY THE TOTAL PRICE OF THE BID, BUT INDIVIDUAL LINE ITEM PRICES AS WELL.

**TOTAL THIS  
PROPOSAL**



**BIDDER DECLARATION****1. Prime bidder information (Review attached Bidder Declaration Instructions prior to completion of this form):**

- a. Identify current California certification(s) (MB, SB, SB/NVSA, DVBE):** \_\_\_\_\_ **or None** \_\_\_\_ (If "None," go to Item #2)
- b. Will subcontractors be used for this contract? Yes** \_\_\_\_ **No** \_\_\_\_ (If yes, indicate the distinct element of work your firm will perform in this contract e.g., list the proposed products produced by your firm, state if your firm owns the transportation vehicles that will deliver the products to the State, identify which solicited services your firm will perform, etc.). Use additional sheets, as necessary.
- \_\_\_\_\_
- \_\_\_\_\_

- c. If you are a California certified DVBE:** (1) Are you a broker or agent? **Yes** \_\_\_\_ **No** \_\_\_\_  
(2) If the contract includes equipment rental, does your company own at least 51% of the equipment provided in this contract (quantity and value)? **Yes** \_\_\_\_ **No** \_\_\_\_ **N/A** \_\_\_\_

**2. If no subcontractors will be used, skip to certification below. Otherwise, list all subcontractors for this contract. (Attach additional pages if necessary):**

Subcontractor Name, Contact Person, Phone Number & Fax Number	Subcontractor Address & Email Address	CA Certification (MB, SB, DVBE or None)	Work performed or goods provided for this contract	Corresponding % of bid price	Good Standing?	51% Rental?

**CERTIFICATION: By signing the bid response, I certify under penalty of perjury that the information provided is true and correct.**

## BIDDER DECLARATION Instructions

### All prime bidders (the firm submitting the bid) must complete the Bidder Declaration.

- 1.a.** Identify all current certifications issued by the State of California. If the prime bidder has no California certification(s), check the line labeled "None" and proceed to Item #2. If the prime bidder possesses one or more of the following certifications, enter the applicable certification(s) on the line:
- Microbusiness (MB)
  - Small Business (SB)
  - Small Business Nonprofit Veteran Service Agency (SB/NVSA)
  - Disabled Veteran Business Enterprise (DVBE)

- 1.b.** Mark either "Yes" or "No" to identify whether subcontractors will be used for the contract. If the response is "No," proceed to Item #1.c. If "Yes," enter on the line the distinct element of work contained in the contract to be performed or the goods to be provided by the prime bidder. Do not include goods or services to be provided by subcontractors.

Bidders certified as MB, SB, SB/NVSA, and/or DVBE must provide a commercially useful function as defined in Military and Veterans Code Section 999(e)(2)(A) for DVBEs and Government Code Section 14837(d)(4)(A) for small/microbusinesses. For questions regarding commercially useful function determinations made in conjunction with certification approval, contact the Department of General Services, Procurement Division, Office of Small Business and DVBE Certification (OSDC), OSDC Certification and Compliance Unit via email at: [osdchelp@dgs.ca.gov](mailto:osdchelp@dgs.ca.gov)

Bids must propose that certified bidders provide a commercially useful function for the resulting contract or the bid will be deemed non-responsive and rejected by the State. For questions regarding the solicitation, contact the procurement official identified in the solicitation.

Note: A subcontractor is any person, firm, corporation, or organization contracting to perform part of the prime's contract.

- 1.c.** This item is only to be completed by businesses certified by California as a DVBE.

(1) Declare whether the prime bidder is a broker or agent by marking either "Yes" or "No". The Military and Veterans Code Section 999.2 (b) defines "broker" or "agent" as a certified DVBE contractor or subcontractor that does not have title, possession, control, and risk of loss of materials, supplies, services, or equipment provided to an awarding department, unless one or more of the disabled veteran owners has at least 51-percent ownership of the quantity and value of the materials, supplies, services, and of each piece of equipment provided under the contract.

(2) If bidding rental equipment, mark either "Yes" or "No" to identify if the prime bidder owns at least 51% of the equipment provided (quantity and value). If **not** bidding rental equipment, mark "N/A" for "not applicable."

- 2.** If no subcontractors are proposed, do not complete the table. Read the certification at the bottom of the form and complete "Page \_\_\_\_ of \_\_\_\_" on the form.

If subcontractors will be used, complete the table listing all subcontractors. If necessary, attach additional pages and complete the "Page \_\_\_\_ of \_\_\_\_" accordingly.

### 2. (continued) Column Labels

**Subcontractor Name, Contact Person, Phone Number & Fax Number**—List each element for all subcontractors.

**Subcontractor Address & Email Address**—Enter the address and if available, an Email address.

**CA Certification (MB, SB, DVBE or None)**—If the subcontractor possesses a current State of California certification(s), verify on the OSDC website ([www.pd.dgs.ca.gov/smbus](http://www.pd.dgs.ca.gov/smbus)) that it is still valid and list all current certifications here. Otherwise, enter "None". [Note: A SB/NVSA should not be participating as a subcontractor]

**Work performed or goods provided for this contract**—Identify the distinct element of work contained in the contract to be performed or the goods to be provided by each subcontractor. Certified subcontractors must provide a commercially useful function for the contract. (See paragraph 1.b above for code citations regarding the definition of commercially useful function.) If a certified subcontractor is further subcontracting a greater portion of the work or goods provided for the resulting contract than would be expected by normal industry practices, attach a separate sheet of paper explaining the situation.

**Corresponding % of bid price**—Enter the corresponding percentage of the total bid price for the goods and/or services to be provided by each subcontractor. Do not enter a dollar amount.

**Good Standing?**—Provide a response for each subcontractor listed. Enter either "Yes" or "No" to indicate that the prime bidder has verified that the subcontractor(s) is in good standing for all of the following:

- Possesses valid license(s) for any license(s) or permits required by the solicitation or by law
- If a corporation, the company is qualified to do business in California and designated by the State of California Secretary of State to be in good standing
- Possesses valid State of California certification(s) if claiming MB, SB, and/or DVBE status
- Is **not** listed on the OSDC website as ineligible to transact business with the State

**51% Rental?**—This pertains to the applicability of rental equipment. Based on the following parameters, enter either "N/A" (not applicable), "Yes" or "No" for each subcontractor listed.

Enter "**N/A**" if the:

- Subcontractor is NOT a DVBE (regardless of whether or not rental equipment is provided by the subcontractor) or
- Subcontractor is NOT providing rental equipment (regardless of whether or not subcontractor is a DVBE)

Enter "**Yes**" if the subcontractor is a California certified DVBE providing rental equipment and the subcontractor owns at least 51% of the rental equipment (quantity and value) it will be providing for the contract.

Enter "**No**" if the subcontractor is a California certified DVBE providing rental equipment but the subcontractor does NOT own at least 51% of the rental equipment (quantity and value) it will be providing.

**Read the certification at the bottom of the page and complete the "Page \_\_\_\_ of \_\_\_\_" accordingly.**

**ATTACHMENT 3**  
**CONTRACTOR CERTIFICATION CLAUSES**

**CCC-307**

**CERTIFICATION**

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY that I am duly authorized to legally bind the prospective Contractor to the clause(s) listed below. This certification is made under the laws of the State of California.

<i>Contractor/Bidder Firm Name (Printed)</i>	<i>Federal ID Number</i>
<i>By (Authorized Signature)</i>	
<i>Printed Name and Title of Person Signing</i>	
<i>Date Executed</i>	<i>Executed in the County of</i>

**CONTRACTOR CERTIFICATION CLAUSES**

1. STATEMENT OF COMPLIANCE: Contractor has, unless exempted, complied with the nondiscrimination program requirements. (Gov. Code §12990 (a-f) and CCR, Title 2, Section 8103) (Not applicable to public entities.)
2. DRUG-FREE WORKPLACE REQUIREMENTS: Contractor will comply with the requirements of the Drug-Free Workplace Act of 1990 and will provide a drug-free workplace by taking the following actions:
  - a. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.
  - b. Establish a Drug-Free Awareness Program to inform employees about:
    - 1) the dangers of drug abuse in the workplace;
    - 2) the person's or organization's policy of maintaining a drug-free workplace;
    - 3) any available counseling, rehabilitation and employee assistance programs; and,
    - 4) penalties that may be imposed upon employees for drug abuse violations.
  - c. Every employee who works on the proposed Agreement will:
    - 1) receive a copy of the company's drug-free workplace policy statement; and,
    - 2) agree to abide by the terms of the company's statement as a condition of employment on the Agreement.

Failure to comply with these requirements may result in suspension of payments under the Agreement or termination of the Agreement or both and Contractor may be ineligible for award of any future State agreements if the department determines that any of the following has occurred: the Contractor has made false certification, or violated the certification by failing to carry out the requirements as noted above. (Gov. Code §8350 et seq.)
3. NATIONAL LABOR RELATIONS BOARD CERTIFICATION: Contractor certifies that no more than one (1) final unappealable finding of contempt of court by a Federal court has been issued against

### **ATTACHMENT 3**

#### **CONTRACTOR CERTIFICATION CLAUSES**

Contractor within the immediately preceding two-year period because of Contractor's failure to comply with an order of a Federal court, which orders Contractor to comply with an order of the National Labor Relations Board. (Pub. Contract Code §10296) (Not applicable to public entities.)

4. CONTRACTS FOR LEGAL SERVICES \$50,000 OR MORE- PRO BONO REQUIREMENT:

Contractor hereby certifies that contractor will comply with the requirements of Section 6072 of the Business and Professions Code, effective January 1, 2003.

Contractor agrees to make a good faith effort to provide a minimum number of hours of pro bono legal services during each year of the contract equal to the lessor of 30 multiplied by the number of full time attorneys in the firm's offices in the State, with the number of hours prorated on an actual day basis for any contract period of less than a full year or 10% of its contract with the State.

Failure to make a good faith effort may be cause for non-renewal of a state contract for legal services, and may be taken into account when determining the award of future contracts with the State for legal services.

5. EXPATRIATE CORPORATIONS: Contractor hereby declares that it is not an expatriate corporation or subsidiary of an expatriate corporation within the meaning of Public Contract Code Section 10286 and 10286.1, and is eligible to contract with the State of California.

6. SWEATFREE CODE OF CONDUCT:

a. All Contractors contracting for the procurement or laundering of apparel, garments or corresponding accessories, or the procurement of equipment, materials, or supplies, other than procurement related to a public works contract, declare under penalty of perjury that no apparel, garments or corresponding accessories, equipment, materials, or supplies furnished to the state pursuant to the contract have been laundered or produced in whole or in part by sweatshop labor, forced labor, convict labor, indentured labor under penal sanction, abusive forms of child labor or exploitation of children in sweatshop labor, or with the benefit of sweatshop labor, forced labor, convict labor, indentured labor under penal sanction, abusive forms of child labor or exploitation of children in sweatshop labor. The contractor further declares under penalty of perjury that they adhere to the Sweatfree Code of Conduct as set forth on the California Department of Industrial Relations website located at [www.dir.ca.gov](http://www.dir.ca.gov), and Public Contract Code Section 6108.

b. The contractor agrees to cooperate fully in providing reasonable access to the contractor's records, documents, agents or employees, or premises if reasonably required by authorized officials of the contracting agency, the Department of Industrial Relations, or the Department of Justice to determine the contractor's compliance with the requirements under paragraph (a).

7. DOMESTIC PARTNERS: For contracts over \$100,000 executed or amended after January 1, 2007, the contractor certifies that contractor is in compliance with Public Contract Code Section 10295.3.

## **ATTACHMENT 3**

### **CONTRACTOR CERTIFICATION CLAUSES**

#### **DOING BUSINESS WITH THE STATE OF CALIFORNIA**

The following laws apply to persons or entities doing business with the State of California.

1. **CONFLICT OF INTEREST**: Contractor needs to be aware of the following provisions regarding current or former state employees. If Contractor has any questions on the status of any person rendering services or involved with the Agreement, the awarding agency must be contacted immediately for clarification.

Current State Employees (Pub. Contract Code §10410):

- 1). No officer or employee shall engage in any employment, activity or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any state agency, unless the employment, activity or enterprise is required as a condition of regular state employment.
- 2). No officer or employee shall contract on his or her own behalf as an independent contractor with any state agency to provide goods or services.

Former State Employees (Pub. Contract Code §10411):

- 1). For the two-year period from the date he or she left state employment, no former state officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any state agency.
- 2). For the twelve-month period from the date he or she left state employment, no former state officer or employee may enter into a contract with any state agency if he or she was employed by that state agency in a policy-making position in the same general subject area as the proposed contract within the 12-month period prior to his or her leaving state service.

If Contractor violates any provisions of above paragraphs, such action by Contractor shall render this Agreement void. (Pub. Contract Code §10420)

Members of boards and commissions are exempt from this section if they do not receive payment other than payment of each meeting of the board or commission, payment for preparatory time and payment for per diem. (Pub. Contract Code §10430 (e))

2. **LABOR CODE/WORKERS' COMPENSATION**: Contractor needs to be aware of the provisions which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions, and Contractor affirms to comply with such provisions before commencing the performance of the work of this Agreement. (Labor Code Section 3700)

3. **AMERICANS WITH DISABILITIES ACT**: Contractor assures the State that it complies with the Americans with Disabilities Act (ADA) of 1990, which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA. (42 U.S.C. 12101 et seq.)

4. **CONTRACTOR NAME CHANGE**: An amendment is required to change the Contractor's name as listed on this Agreement. Upon receipt of legal documentation of the name change the State will process the amendment. Payment of invoices presented with a new name cannot be paid prior to approval of said amendment.

**ATTACHMENT 3**  
**CONTRACTOR CERTIFICATION CLAUSES**

5. CORPORATE QUALIFICATIONS TO DO BUSINESS IN CALIFORNIA:

- a. When agreements are to be performed in the state by corporations, the contracting agencies will be verifying that the contractor is currently qualified to do business in California in order to ensure that all obligations due to the state are fulfilled.
- b. "Doing business" is defined in R&TC Section 23101 as actively engaging in any transaction for the purpose of financial or pecuniary gain or profit. Although there are some statutory exceptions to taxation, rarely will a corporate contractor performing within the state not be subject to the franchise tax.
- c. Both domestic and foreign corporations (those incorporated outside of California) must be in good standing in order to be qualified to do business in California. Agencies will determine whether a corporation is in good standing by calling the Office of the Secretary of State.

6. RESOLUTION: A county, city, district, or other local public body must provide the State with a copy of a resolution, order, motion, or ordinance of the local governing body which by law has authority to enter into an agreement, authorizing execution of the agreement.

7. AIR OR WATER POLLUTION VIOLATION: Under the State laws, the Contractor shall not be: (1) in violation of any order or resolution not subject to review promulgated by the State Air Resources Board or an air pollution control district; (2) subject to cease and desist order not subject to review issued pursuant to Section 13301 of the Water Code for violation of waste discharge requirements or discharge prohibitions; or (3) finally determined to be in violation of provisions of federal law relating to air or water pollution.

8. PAYEE DATA RECORD FORM STD. 204: This form must be completed by all contractors that are not another state agency or other governmental entity.

## ATTACHMENT 4

# NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS

This document must be notarized.

STATE OF CALIFORNIA )  
 ) SS  
COUNTIES OF Madera, Fresno, Tulare, Kings, and Kern. )

, being first duly sworn, deposes and

says that he or she is \_\_\_\_\_ of  
(position or title)

(the bidder)

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

Dated: \_\_\_\_\_ By \_\_\_\_\_  
(person signing for bidder)



**ATTACHMENT 5**  
**BID/BIDDER CERTIFICATION SHEET**

Only an individual who is authorized to bind the bidding firm contractually shall sign the Bid/Bidder Certification Sheet. The signature must indicate the title or position that the individual holds in the firm. This Bid/Bidder Certification Sheet must be signed and returned along with all "required attachments" as an entire package with original signatures. The bid must be transmitted in a sealed envelope in accordance with IFB instructions.

- A. Our all-inclusive bid is submitted in a sealed envelope marked "**Bid Submittal - Do Not Open**".
- B. All required attachments are included with this certification sheet.
- C. The signature affixed hereon and dated certifies compliance with all the requirements of this bid document. The signature below authorizes the verification of this certification.
- D. The signature and date affixed hereon certifies that this bid is a firm offer for a 90-day period.

**An Unsigned Bid/Bidder Certification Sheet May Be Cause for Bid Rejection**

1. Company Name	2. Telephone Number (    )	2a. Fax Number (    )
3. Address		
Indicate your organization type:		
4. <input type="checkbox"/> Sole Proprietorship	5. <input type="checkbox"/> Partnership	6. <input type="checkbox"/> Corporation
Indicate the applicable employee and/or corporation number:		
7. Federal Employee ID No. (FEIN)	8. California Corporation No.	
Indicate applicable license and/or certification information:		
9. Contractor's State Licensing Board Number	10. PUC License Number CAL-T-	11. Required
11(a) Are the vehicles being used for this Agreement subject to DMV/CHP Motor Carrier Permit laws? <input type="checkbox"/> Yes    No <input type="checkbox"/> If yes (If required by law), the lowest responsive responsible bidder must provide evidence, before contract award.		
12. Bidder' Name (Print)	13. Title	
14. <b>Signature</b>	15. Date	
16. Are you certified with the Department of General Services, Office of Small Business and Disabled Veteran Business Enterprise Services (OSDS) as:		
a. Small Business Enterprise    Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, enter certification number: _____	b. Disabled Veteran Business Enterprise    Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, enter your service code below: _____	
<b>NOTE:</b> A copy of your Certification is required to be included if either of the above items is checked " <b>Yes</b> ". Date application was submitted to OSDS, if an application is pending: _____		
17. Are you a Non-Small Business committing to the use of 25% Certified Small Business Subcontractor Participation?    Yes <input type="checkbox"/> No <input type="checkbox"/>		
If Yes, complete and return the Bidder Declaration form, GSPD-05-105 with your bid.		



### Completion Instructions for Bid/Bidder Certification Sheet

Complete the numbered items on the Bid/Bidder Certification Sheet by following the instructions below.

Item Numbers	Instructions
<b>1, 2, 2a, 3</b>	Must be completed. These items are self-explanatory.
<b>4</b>	Check if your firm is a sole proprietorship. A sole proprietorship is a form of business in which one person owns all the assets of the business in contrast to a partnership and corporation. The sole proprietor is solely liable for all the debts of the business.
<b>5</b>	Check if your firm is a partnership. A partnership is a voluntary agreement between two or more competent persons to place their money, effects, labor, and skill, or some or all of them in lawful commerce or business, with the understanding that there shall be a proportional sharing of the profits and losses between them. An association of two or more persons to carry on, as co-owners, a business for profit.
<b>6</b>	Check if your firm is a corporation. A corporation is an artificial person or legal entity created by or under the authority of the laws of a state or nation, composed, in some rare instances, of a single person and his successors, being the incumbents of a particular office, but ordinarily consisting of an association of numerous individuals.
<b>7</b>	Enter your federal employee tax identification number.
<b>8</b>	Enter your corporation number assigned by the California Secretary of State's Office. This information is used for checking if a corporation is in good standing and qualified to conduct business in California.
<b>9</b>	Complete if your firm holds a California contractor's license. This information will be used to verify possession of a contractor's license for public works agreements.
<b>10</b>	Complete if your firm holds a PUC license. This information will be used to verify possession of a PUC license for public works agreements.
<b>11</b>	Complete, if applicable, by indicating the type of license and/or certification that your firm possesses and that is required for the type of services being procured.
<b>11a</b>	Bidder has read the required scope of services for this Agreement and is certifying whether or not the vehicles the bidder will use for this Agreement are subject to DMV/CHP Motor Carrier Permit laws.
<b>12, 13, 14, 15</b>	Must be completed. These items are self-explanatory.
<b>16</b>	If certified as a Small Business Enterprise, place a check in the "yes" box, and enter your certification number on the line. If certified as a Disabled Veterans Business Enterprise, place a check in the "Yes" box and enter your service code on the line. If you are not certified to one or both, place a check in the "No" box. If your certification is pending, enter the date your application was submitted to the Department of General Services, Office Small Business and DVBE Services. To get certified, go to <a href="http://www.pd.dgs.ca.gov/smbus/default.htm">http://www.pd.dgs.ca.gov/smbus/default.htm</a>
<b>17</b>	Check the applicable box. Complete and return GSPD-05-105 with your Bid.

**ATTACHMENT 6**

**Invitation for Bid 56A0343**

**BIDDER'S ACKNOWLEDGEMENT OF PREVAILING WAGE REQUIREMENTS**

\_\_\_\_\_ acknowledges that State General Prevailing Wage Rates will  
Print Name of Bidder  
apply for the County(ies) of Madera, Fresno, Tulare, Kings, and Kern. If awarded this contract, I  
acknowledge it will be my responsibility to ensure the payment of appropriate prevailing wages  
rates to all employees who participate on this contract throughout the duration of this contract.

\_\_\_\_\_  
Bidder's Signature

\_\_\_\_\_  
Date

**Attachment 7**  
**Darfur Contracting Act**

**Instructions:** Complete, as applicable, and submit with bid.

Public Contract Code Sections 10475 -10481 applies to any company that currently or within the previous three years has had business activities or other operations outside of the United States. For such a company to bid on or submit a proposal for a State of California contract, the company must certify that it is either a) not a scrutinized company; or b) a scrutinized company that has been granted permission by the Department of General Services to submit a proposal.

**OPTION #1 - CERTIFICATION**

If your company has not, within the previous three years, had any business activities or other operations outside of the United States, complete and sign this section and submit with bid package.

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY that a) the prospective proposer/bidder named below has not, within the previous three years, had any business activities or other operations outside of the United States. b) I am duly authorized to legally bind the prospective proposer/bidder named below. This certification is made under the laws of the State of California.

Company/Vendor Name (Printed)	Federal ID Number
By (Authorized Signature)	
Printed Name and Title of Person Signing	

**OPTION #2 - CERTIFICATION**

If your company, within the previous three years, has had business activities or other operations outside of the United States, in order to be eligible to submit a bid or proposal, please insert your company name and Federal ID Number and complete the certification below.

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY that a) the prospective proposer/bidder named below is not a scrutinized company per Public Contract Code 10476; and b) I am duly authorized to legally bind the prospective proposer/bidder named below. This certification is made under the laws of the State of California.

Company/Vendor Name (Printed)	Federal ID Number
By (Authorized Signature)	
Printed Name and Title of Person Signing	
Date Executed	Executed in the County and State of

**OPTION #3 – WRITTEN PERMISSION FROM DGS**

Pursuant to Public Contract Code section 10477(b), the Director of the Department of General Services may permit a scrutinized company, on a case-by-case basis, to bid on or submit a proposal for a contract with a state agency for goods or services, if it is in the best interests of the state. If you are a scrutinized company that has obtained written permission from the DGS to submit a bid or proposal, complete the information below.

We are a scrutinized company as defined in Public Contract Code section 10476, but we have received written permission from the Department of General Services to submit a bid or proposal pursuant to Public Contract Code section 10477(b). **A copy of the written permission from DGS is included with our bid or proposal.**

Company/Vendor Name (Printed)	Federal ID Number
By (Authorized Signature)	
Printed Name and Title of Person Signing	
Date Executed	Executed in the County and State of

**ATTACHMENT 8**  
**Invitation for Bid No. 56A0343**

**REQUIRED ATTACHMENT CHECKLIST**

A complete bid or bid package will consist of the items identified below.

Complete this checklist to confirm the items in your bid package. Place a check mark or "X" next to each item that you are submitting to Caltrans. All attachments identified below (unless noted otherwise) are required and must be returned as instructed or your bid may be considered non-responsive. **Return the Attachment Checklist with your bid package.**

Do NOT submit the Proposed Form of Agreement, Attachment 9, company advertisements, brochures, informational pamphlets or any other document unless specifically noted in the IFB Requirements and/or as listed below.

<b><u>Attachments</u></b>	<b><u>Attachment Name/Description</u></b>
Attachment 1	Bid Proposal, ADM 1412
Attachment 2	Bidders Declaration, GSPD-05-105
Attachment 3	Contractor Certification Clauses (CCC 307). The CCC 307 can also be found on the Internet at <a href="http://www.dgs.ca.gov/ols/home.aspx">http://www.dgs.ca.gov/ols/home.aspx</a> . Page one (1) must be signed and submitted prior to the award of the contract.
Attachment 4	Non-Collusion Affidavit for Public Works (must be notarized)
Attachment 5	Bid/Bidder Certification Sheet
Attachment 6	Bidder's Acknowledgement of Prevailing Wage Requirements
Attachment 7	Darfur Contracting Act
Attachment 8	Required Attachment Checklist
Attachment 10	Quotes from SB Subcontractors
Copy	Valid Motor Carrier Permit shall be made available upon request by Caltrans for the lowest responsive bidder

**ATTACHMENT # 9**  
**Public Works (State)**

AGREEMENT NUMBER

TBD

REGISTRATION NUMBER

- 1 This Agreement is entered into between the State Agency and the Contractor named below:

STATE AGENCY'S NAME

**Department of Transportation (Caltrans)**

CONTRACTOR'S NAME

TBD

**Note to Bidders:**

The following 23 pages represent a sample of the Agreement that will be awarded, if any, from this IFB. Please review it carefully and present any questions in writing to the contact identified for this IFB.

- 2 The term of this Agreement is: 5/1/13 through 4/30/15

- 3 The maximum amount of this Agreement is: TBD

- 4 The parties agree to comply with the terms and conditions of the following exhibits/attachments, which are by this reference made a part of the Agreement.

<b>Exhibit A</b> – Scope of Work	7 Pages
<b>Exhibit B</b> – Budget Detail and Payment Provisions	8 Pages
<b>Exhibit C*</b> – General Terms and Conditions (Electronic File: GTC 610)	
<b>Exhibit D</b> - Special Terms and Conditions	4 Pages
<b>Exhibit E</b> – Additional Provisions	4 Pages
<b>Attachment 1</b> - Bid Proposal	1 Page
<b>Attachment 2</b> – Bidder Declaration Form, GSPD-05-105	1 Page
<b>Attachment 3</b> – Labor Compliance Officers ( <i>attached at time of award</i> )	1 Page
<b>Appendix 1</b> – Fiber Optic Specifications	28 Pages
<b>Appendix 2</b> – Signals, Lighting and Electrical System	4 Pages
<b>Appendix 3</b> – Work Authorization and Completion Form (Task Order)	1 Page
<b>Appendix 3.a.</b> – Monthly Maintenance Activity Report (timesheet)	1 Page
<b>Appendix 3.b.</b> – Activity Report Instructions	1 Page

Items shown with an Asterisk (\*), are hereby incorporated by reference and made part of this Agreement as if attached hereto. *These documents can be viewed at <http://www.dgs.ca.gov/ols/Home.aspx>.*

**IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.**

**CONTRACTOR**

CONTRACTOR'S NAME (*if other than an individual, state whether a corporation, partnership, etc.*)

BY (*Authorized Signature*)



DATE SIGNED (*Do not type*)

PRINTED NAME AND TITLE OF PERSON SIGNING

ADDRESS

**STATE OF CALIFORNIA**

AGENCY NAME

**Department of Transportation (Caltrans)**

BY (*Authorized Signature*)



DATE SIGNED (*Do not type*)

PRINTED NAME AND TITLE OF PERSON SIGNING

ADDRESS

1727 30<sup>th</sup> Street, (MS 65)  
Sacramento, CA 95816

**California Department of  
General Services Use Only**

☒ Exempt per:

Public Contract Code 10295 ( c ) ( 2 )

SCM 10.00

Public Contract Code 10107

**EXHIBIT A**  
**Public Works (State)**

**SCOPE OF WORK**

1. Contractor agrees to provide to the Department of Transportation (Caltrans) on-call TOSNET Fiber/Copper Maintenance and Repair service as described herein:
2. The services shall be performed in Caltrans District 06 in the following counties: Madera, Fresno, Tulare, Kings, and Kern.
3. The reporting location for the Contractor is at 1635 West Pine Avenue, Fresno, CA 93728
4. This Agreement will commence on the start date May 1, 2013 (estimate) as presented herein or upon approval by Caltrans, whichever is later and no work shall begin before that time. This Agreement is of no effect unless approved by the Caltrans. The Contractor shall not receive payment for work performed prior to approval of the Agreement and before receipt of notice to proceed by the Caltrans Contract Manager. This Agreement shall expire on April 30, 2015 (estimate). The services shall be provided during (time frame i.e., working hours, Monday through Friday, except State holidays. The parties may amend this Agreement as permitted by law.
5. Department of Transportation's Standard Specifications (dated 2010): This Agreement cites specific portions of the Caltrans's Standard Specifications. Only the sections of the Standard Specifications cited in this Agreement are requirements and are hereby incorporated by this reference as if attached to this Agreement. All other portions of the Standard Specifications are not applicable to this Agreement. The Standard Specifications can be accessed via the internet at <http://www.dot.ca.gov/hq/esc/oe/>.
6. All inquiries during the term of this Agreement will be directed to the project representatives listed below:

Department of Transportation		Contractor: TBD	
Section/Unit:		Section/Unit	
Contract Manager TBD		Project Manager	
Address (Street Address, City, State, Zip Code)		Address (Street Address, City, State, Zip Code)	
Business Phone Number ( )	Facsimile Number ( )	Business Phone Number ( )	Facsimile Number ( )

7. Assignment of Work:

- A. **Telephone Access:** The Contractor's phone, including cell phones will be answered by an office employee between the hours of 8:00 AM and 5:00 PM., Monday through Friday, except State holidays. An answering service or mechanical

**EXHIBIT A**  
**Public Works (State)**

- device is not acceptable. An answering device may be used after working hours stated above and on weekends and State holidays. On-Call service assigned, via the telephone, will be followed up with a written Work Authorization and Completion Form (Task Order), Appendix 3.
- B. It is understood and agreed that any Work Authorization and Completion Form (Task Order) shall be performed, started and completed in accordance with this Agreement.
  - C. Caltrans recognized the Contractor's need to schedule its work in order in which it is received. However, failure to timely complete the Work Authorization and Completion Form (Task Order (s)), Appendix 3 may be cause for termination of this Agreement per default, Exhibit D, Section 2.
  - D. The Contractor shall only perform the work authorized by the Caltrans Contract Manager or his designee. If additional unauthorized work is required to accomplish the intent of the Task Order, an additional authorization must be obtained from the Caltrans Contract Manager **before** the additional work is begun. Any additional unauthorized work or change in the work to be performed must be approved in writing in advance by the Caltrans Contract Manager or his designee by amendment to the Work Authorization and Completion Form (Task Order), Appendix 3.
8. Detailed description of work to be performed and duties of all parties:
- A. **SCOPE OF WORK**: The purpose of this Agreement is to provide maintenance related support for the statewide Fiber Optic and Copper Cable Plant infrastructure within TOSNET in highways, freeways, overhead bridge structures and district Transportation Management Centers (TMC(s)) in Caltrans District 6. The Contractor shall provide services that include repair, testing, trenching, splicing, restoration, and recovery. The Fiber Optic system includes both single-mode and multi-mode fiber optic cables.
  - B. **DEFINITION OF TERMS**
    - 1) **Traffic Operations System Network (TOSNET)** – The total Caltrans -owned communications and/or network systems including associated equipment which is to operate as an integrated system. TOSNET includes all Caltrans -owned aerial and/or underground communications infrastructure and network equipment system that provide communication link between the district Traffic Management Center (TMC) and all the Traffic Management System (TMS) field elements. TOSNET applies to voice, video and data communication equipment, fiber optic and twisted pair cables, conduits, splice vaults and cabinets, pull boxes, splice

**EXHIBIT A**  
**Public Works (State)**

trays and patch panels, coaxial cables, low voltage copper power cabling and all cable termination facilities that provides communication link from TMS field elements to the TMC. These systems and associated equipment are located in the TMC and in facilities along the Caltrans highway and freeway system including overhead bridge structures.

- 2) **TMC** -- Transportation Management Center.
- 3) **TMS** -- Transportation Management System.
- 4) **TMS Field Elements** – are comprised of those monitoring and traffic controlling devices deployed along the roadway. Field elements includes but are not limited to CCTV Camera Station, Changeable Message Signs (CMS), Extinguishable Message Signs (EMS), High Advisory Radio (HAR) Transmitter Station, Ramp Metering Stations (RMS), Loop Detector Stations (LDS), and Roadway Weather Information Stations (RWIS).
- 5) **TOSNET Infrastructure** – Voice, Video, and Data Communication equipment, Fiber Optic and twisted pair cables, Conduits, Splice Vaults and cabinets, Pull boxes, Splice Trays and Patch Panels, Coaxial cables, low voltage copper power cabling, and all cable termination facilities used to connect field elements to the TMC.
- 6) **Support Service** – Any preventative or corrective maintenance, restoration, recovery or other work performed on the TOSNET System mentioned in this Scope of Work.
- 7) **Outage Time** – The time the system is inoperable.
- 8) **Response Time** – The time interval from the time the Caltrans Contract Manager notifies the Contractor of a service request for maintenance to the time of arrival of Contractor service personnel to the site of maintenance.
- 9) **Repair Time** -- The time interval from the time of arrival of Contractor service personnel at the site of maintenance until time of restored operation.
- 10) **Response Area** – Caltrans District 6 in the State of California



**EXHIBIT A**  
**Public Works (State)**

- 11) **Task Order** – A specific project initiated by Caltrans and assigned to the Contractor, See **Appendix 3** – Work Authorization and Completion Form (Task Order).
- 12) **As-Built Plans** – These represent existing field conditions of completed Caltrans construction improvement projects. It also reflects all pertinent changes or corrections made during the life of this Agreement.

**C. RESPONSIBILITIES OF CONTRACTOR**

- 1) On an on-call basis, when requested by the Caltrans Contract Manager or an on-call basis, Contractor shall provide all labor, tools, equipment, material, traffic control, and shoulder closures required to troubleshoot, repair and/or replace any damaged or non-functional fiber optic and copper cable servicing the TOSNET infrastructure. Fiber Optic services work shall conform to the specifications in **Appendix 1**, Fiber Optic Specifications. All parts, tools, test equipment, and materials shall be subject to scheduled or unscheduled inspection.
- 2) The Contractor shall respond to a Fiber or Copper trouble call by reporting to the problem site that is specified by the Caltrans Contract Manager within 24 hours after verbal, written or email notification. Each trouble-call shall be initiated as follows:
  - Verbal instructions via directly or commonly used modes of electronic communication such as phone/fax/email, to facilitate immediate action.
  - Task order form (See **Appendix 3**). The contractor shall follow schedule, order of work and provide all information as shown on the **Appendix 3**. . Regardless of how Tasks are communicated by Caltrans to the contractor, the following are the typical steps per call.
    - a) Contractor shall perform an initial site visit to estimate the extent of the repair for the referenced Task Order. There shall be no charge for the initial site visit.
    - b) Caltrans Contract Manager will provide termination directions to the Contractor. Any changes to termination directions shall be preapproved by the Caltrans Contract Manager. For this, where applicable, Contractor shall

**EXHIBIT A**  
**Public Works (State)**

gather up necessary documents. Maps and/or As-built plans and/or other relevant documents which shall if required be provided by the Caltrans Contract Manager

- c) Contractor shall then provide a detailed estimate to the Caltrans Contract Manager for the repair and restoration of the problem site. The detailed and comprehensive estimate shall be written in accordance with **Attachment 1** Bid Proposal.
- d) A Contract Task Order must be issued by the Caltrans Contract Manager to the Contractor for each trouble-call prior to commencement. Such orders could be a combination of verbal/written/electronic communication as described in Item C2 above.
- e) After Caltrans Contract Manager's review and approval of the estimate, the Contractor will proceed with the repair and restoration. The start date and completion date shall be noted on the Task Order).
- f) Upon completion of a Task Order (that includes fiber or copper repair as applicable), for fiber repairs, Contractor must perform an Optical Time Domain Reflectometer (OTDR) test and submit the test results to the Caltrans Contract Manager. OTDR testing shall include but is not limited to splice and span loss testing. Test results shall be submitted as an email file attachment or as directed by the Caltrans Contract Manager. Hard copy of schematics of any changes must also be submitted. The Contractor shall secure the required software license and provide Caltrans with the software necessary to interpret OTDR test results.
- g) Once the Caltrans Contract Manager or designee is satisfied with the work done under a Task Order, the Contractor must connect communications links and equipment from the TMC to the field elements, and notify the Caltrans Contract Manager when connecting work is completed.
- h) Caltrans Contract Manager or designee will verify that communications and links are functioning to the satisfaction of Caltrans Contract Manager.
- i) The Contractor shall provide a summary of work performed as required on **Appendix 3**.

**EXHIBIT A**  
**Public Works (State)**

- j) The Contractor shall provide documentation of all support services. This shall include daily timesheet (see **Appendix 3.a**), bill of materials, and copy of material invoices during the performance of the task order. The documentation shall be in electronic form or hardcopy as directed by the Caltrans Contract Manager.
- k) Upon final approval from the Caltrans Contract Manager or designee of all work completed under a task order, the task order is closed out.
- 3) The Contractor shall provide ALL NECESSARY SHOULDER CLOSURES AND TRAFFIC CONTROL which shall comply with the latest Department's 2010 (or later) Standard Specifications manual, Section 12 – Construction Area Traffic Control Devices. All lane closures shall be provided by Caltrans

Contractor shall also note **Appendix 1 and Appendix 2** – “Fiberoptic Specifications” and “Signals, Lighting and Electrical Systems”, and shall incorporate as applicable. Contractors should be aware that all Caltrans specifications and plans are constantly being revised to insure conformity with the latest State and Federal laws and regulations.

Contractor is responsible for obtaining required shoulder closure and permits and shall submit the original, signed invoice to Caltrans Contract Manager for reimbursement. Work within State highway right of way is exempt from a written encroachment permit when it is performed under a State highway service contract and when work is located in non-operating right of way as specified in Department's Encroachment Permits Manual, chapter 100, section 106 (can be viewed on the Caltrans publicly accessible website <http://www.dot.ca.gov>) All referenced closures shall be approved by the Caltrans Contract Manager prior to commencement of task.

- 4) The Contractor shall comply with all traffic handling procedures as specified in the Department's current Manual of Traffic Controls for Construction and Maintenance Work Zones. This manual can be found at: <http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/pdf/camutcd/CAMUTCD-Part6.pdf>
- 5) When required, temporary paving (cut back or cold asphalt concrete) shall be placed on all paved surface excavations within the right of way at the end of each day's work. Said temporary paving will require an encroachment permit

**EXHIBIT A**  
**Public Works (State)**

as specified in Department's Encroachment Permits Manual, chapter 300, section 302.3. When ordered by Caltrans or a City or County inspector to fix the temporary paving, the Contractor shall immediately take action to correct the temporary paving. In the event no action is taken within one (1) working day, Caltrans, City or County may order the work done and may invoice the Contractor for the total cost of all corrective work. The Contractor shall pay the total cost of such corrective work and will not be reimbursed by Caltrans.

- 6) The Contractor shall provide all tools, equipment and incidentals necessary for providing traffic control and underground work.

Contractor shall maintain an inventory of standard parts and supplies in specific quantities provided by the Caltrans Contract Manager. Such inventory shall be subject to scheduled or unscheduled inspections.

- 7) The Contractor shall provide a monthly Maintenance Activity Report to the Caltrans Contract Manager.
- 8) All repairs shall be made in accordance with manufacturer specifications. Replacement parts are to be of the same color as the original (cable, fibers, jumpers, pigtail, or other parts). Installed replacement parts shall be the same manufacturer brand name as originally installed, unless an alternative is approved in advance in writing by the Caltrans Contract Manager or designee.
- 9) All cables, splices, terminations and repaired facilities shall be relabeled in accordance with Caltrans District's labeling scheme or the labeling section of the Fiber Optic Cable Plant Specification in the attached **Appendix 1** and 2. The Caltrans Contract Manager will direct which labeling scheme shall be used.
- 10) The Contractor shall provide corrections (redlines) to "as-built plans" within seven working days of restoration of service. Caltrans will update the as-built and the Contractor shall sign-off on corrections.
- 11) The Contractor shall assign a Lead person responsible to manage and coordinate all repair support activities with the Caltrans Contract Manager. This person shall report to Caltrans Contract Manager and be available and responsible to coordinate and schedule all repairs. This person shall provide detailed report on work progress and be familiar with cabling and related skills.

**EXHIBIT A**  
**Public Works (State)**

- 12) The Caltrans Contract Manager or designee shall at all times have access to the worksite. All work and materials shall be subject to inspection. The Caltrans Contract Manager reserves the right to terminate a particular Task Order for any reason.

**For additional requirements, see the Appendices 1, 2, 3, 3a and 3b, which are attached to this Agreement and incorporated herein by this reference.**

**EXHIBIT B**  
**Public Works - State**

**BUDGET DETAIL AND PAYMENT PROVISIONS**

**1. Invoicing and Payment**

- A. For Work Authorization and Completion Form, Appendix 3 orders satisfactorily rendered and approved by the Caltrans Contract Manager, and upon receipt and approval of the invoices and timesheet Appendix 3.a, Caltrans agrees to compensate the Contractor in accordance with the rates specified in the Bid Proposal, Attachment 1. Incomplete or disputed invoices shall be returned to the Contractor, unpaid, for correction.
- B. Invoices shall be itemized in accordance with Bid Proposal, Attachment 1, and shall be signed and submitted in triplicate not more frequently than **monthly** in arrears of the service.
- C. Each invoice shall include:
  - 1. Agreement Number
  - 2. Dates of Service
  - 3. Location of Service
  - 4. Signed work authorization form, Appendix 3
  - 5. Signed Timesheet, Appendix 3.a.
  - 6. Receipts for Itemized list of materials, parts and equipment (if applicable)
  - 7. Original signed receipts and permits (if applicable)
- D. Each invoice shall be submitted in triplicate to:

Department of Transportation  
**Office of Radio Communications (ORC)**  
Attention: **Contract Manager's Name: TBD**  
**1120 N. Street, MS #77,**  
**Sacramento, CA 95814**
- E. The Contractor shall submit a certified copy of all payroll records for verification by the Caltrans Contract Manager and/or designee with each invoice. Delinquent or inadequate certified payrolls or other required documents will result in the withholding of payment until such documents are submitted by the Contractor.

**2. Budget Contingency Clause**

- A. It is mutually understood between the parties that this Agreement may have been written before ascertaining the availability of congressional or legislative appropriation of funds, for the mutual benefit of both parties in order to avoid program and fiscal delays that would occur if the Agreement were executed after that determination was made.

**EXHIBIT B**  
**Public Works - State**

- B. This Agreement is valid and enforceable only if sufficient funds are made available to the State of California by the United States Government or the California State Legislature for the purpose of this program. In addition, this Agreement is subject to any additional restrictions, limitations, conditions, or any statute enacted by the Congress or the State Legislature that may affect the provisions, terms or funding of this Agreement in any manner.
- C. It is mutually agreed that if the Congress or the California State Legislature does not appropriate sufficient funds for the program, this Agreement shall be amended to reflect any reduction in funds.
- D. Pursuant to Government Code (GC), Section 927.13, no late payment penalty shall accrue during any time period for which there is no Budget Act in effect, nor on any payment or refund that is the result of a federally mandated program or that is directly dependent upon the receipt of federal funds by a state agency.
- E. Caltrans has the option to terminate the Agreement under the 30-day termination clause or to amend the Agreement to reflect any reduction of funds. Refer to Exhibit D, 4. B. Termination.

**3. Prompt Payment Clause**

Payment will be made in accordance with, and within the time specified in, GC, Section 927.

**4. Cost Limitation**

- A. Total amount of this Agreement shall not exceed **TBD**.
- B. It is understood and agreed that this total is an estimate and that Caltrans will pay only for those services actually rendered as authorized by the Caltrans Contract Manager or its designee up to the maximum.

**5. Materials/Supplies**

The Contractor will be reimbursed for the actual cost of materials/supplies purchased to be consumed or installed at the work site in performance of the Agreement (including applicable sales tax), without additional allowance for markup. Contractor costs associated with the purchase and installation of materials/supplies are considered as a component of the Contractor's hourly rate for services that include wages, overhead, general and administrative expenses and profit. The cost of materials/supplies are to be substantiated by a copy of the appropriately signed original invoice verifying the actual cost and delivery of the material/supplies to Caltrans.

**6. Costs Included in Bid Rates**

- A. The cost of employer payments to or on behalf of employees, subsistence, travel, compensation insurance premiums, unemployment contributions, social security taxes, Agreement bond premiums, and any other taxes or assessments including

**EXHIBIT B**  
**Public Works - State**

sales and use taxes required by law or otherwise shall be included in the Agreement rates and no additional allowance will be made thereof, unless separate payment provision should specifically so provide.

- B. Contractor shall make travel and subsistence payments to each worker in compliance with Labor Code sections 1773.1 and 1773.9. Travel and subsistence requirements are available on the of Industrial Relations website at <http://www.dir.ca.gov/DLSR/PWD/>.

**7. Cost Principles**

- A. The Contractor agrees that the Contract Cost Principles and Procedures, 48 CFR, Federal Acquisition Regulations System, Chapter 1, Part 31 *et seq.*, shall be used to determine the allowable individual items of cost.
- B. The Contractor also agrees to comply with Federal procedures in accordance with Title 49 CFR, Part 18, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments.
- C. Any costs for which payment has been made to Contractor that are determined by subsequent audit to be unallowable under Title 48 CFR, Part 31 *et seq.*, or Title 49 CFR, Part 18, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments are subject to repayment by Contractor to State.
- D. Any subcontract entered into as a result of this Agreement shall contain all of the provisions of this article.

**8. Payroll Records**

- A. The Contractor and each Subcontractor shall comply with the following provisions. The Contractor shall be responsible for compliance by its Subcontractors.
- 1) Each Contractor and Subcontractor shall keep accurate payroll records and supporting documents as mandated by Section 1776 of the California Labor Code (LC) and as defined in Section 16000 of Title 8 of the California Code of Regulations, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by the Contractor or Subcontractor in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:
- a) The information contained in the payroll record is true and correct.
- b) The employer has complied with the requirements of LABOR CODE Sections 1771, 1811, and 1815 for any work performed by its employees on the public works project.



**EXHIBIT B**  
**Public Works - State**

- 2) The payroll records enumerated under paragraph (1) above shall be certified. The certified payrolls and records related to employee wages, fringe benefits, payroll tax and deductions shall be available for inspection and copying by Caltrans representative at all reasonable hours at the Contractor's principal office. Certified payrolls shall be made available as follows:
  - a) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or the employee's authorized representative on request.
  - b) A certified copy of all payroll records enumerated in paragraph (1) above, shall be made available for inspection or furnished upon request to a representative of Caltrans, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the of Industrial Relations. Certified payrolls submitted to Caltrans, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards shall not be altered or obliterated by the Contractor.
  - c) The public shall not be given access to certified payroll records by the Contractor. The Contractor is required to forward any requests for certified payrolls to the Caltrans Contract Manager by both facsimile and regular mail on the business day following receipt of the request.
- 3) Each Contractor shall submit a certified copy of the records enumerated in paragraph (1) above, to the entity that requested the records within ten (10) days after receipt of a written request.
- 4) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by Caltrans shall be marked or obliterated in such a manner as to prevent disclosure of each individual's name, address and social security number. The name and address of the Contractor awarded the Agreement or performing the Agreement shall not be marked or obliterated.
- 5) The Contractor shall inform Caltrans of the location of the records enumerated under paragraph (1) above, including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.
- 6) The Contractor or Subcontractor shall have ten (10) days in which to comply subsequent to receipt of written notice requesting the records enumerated in paragraph (1) above. In the event the Contractor or Subcontractor fails to comply within the ten-day period, it shall, as a penalty to Caltrans, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Such penalties shall be withheld by Caltrans from payments then due. A Contractor is not subject to a penalty assessment

**EXHIBIT B**  
**Public Works - State**

pursuant to this section due to the failure of a Subcontractor to comply with this section.

- B. The penalties specified in paragraph 6 above for noncompliance with the provisions of said LABOR CODE Section 1776 will be deducted from any monies due or which may become due to the Contractor. Penalties assessed for failure to submit certified payrolls are forfeitures and not retentions that will be returned to the Contractor.
- C. Payrolls shall contain the full name, address and social security number of each employee, the correct work classification (including apprentices, if applicable), rate of pay, daily and weekly number of hours worked, itemized deductions made and actual wages paid. The employee's address and social security number need only appear on the first payroll on which his name appears. The payroll shall be accompanied by a "Statement of Compliance" signed by the employer or employer's agent indicating that the payrolls are correct and complete and that the wage rates contained therein are not less than those required by the Agreement. The "Statement of Compliance" shall be on forms furnished by Caltrans or on any form with identical wording. Any payroll that does not include the required "Statement of Compliance" will be deemed inadequate and unacceptable. The Contractor shall be responsible for the submission of copies of payrolls of all Subcontractors.
- D. The Contractor and each Subcontractor shall preserve their payroll records for a period of three (3) years from the date of completion of the Agreement.
- E. The Contractor shall submit a certified copy of all payroll records for verification by the Caltrans Contract Manager and/or designee with each invoice. When progress payments are called for, the Contractor shall submit a certified copy of all payroll records for verification for the work completed to date with each invoice. Delinquent or inadequate certified payrolls or other required documents will result in the withholding of payment until such documents are submitted by the Contractor.
- F. Any subcontract entered into as a result of this Agreement shall contain all of the provisions of this clause.

**9. Penalty**

- A. The Contractor and any Subcontractor under the Contractor shall comply with Labor Code (LC) Sections 1774 and 1775. In accordance with said LABOR CODE Section 1775, the Contractor shall forfeit, as a penalty to Caltrans, not more than fifty dollars (\$50) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates for such work or craft in which such worker is employed for any public work done under the Agreement by him or her, or by any Subcontractor under him/her, in violation of the provisions of the Labor Code and, in particular, Labor Code Sections 1775 to 1780, inclusively.
- B. The amount of this forfeiture shall be determined by the Labor Commissioner and shall be based on consideration of the mistake, inadvertence, or neglect of the

**EXHIBIT B**  
**Public Works - State**

Contractor or Subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or Subcontractor in meeting his or her prevailing wage obligations, or a Contractor's willful failure to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor or Subcontractor had knowledge of the obligations under the Labor Code. Any Contractor that executes and receives a copy of this Agreement is deemed to have knowledge of his or her obligations regarding the Labor Code's prevailing wage requirements. In addition to the penalty and pursuant to Labor Code Section 1775, the difference between the prevailing wage rates and the amount paid to each worker for each calendar day, or portion thereof, for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor or Subcontractor.

- C. If a worker employed by a Subcontractor on a public works project is not paid the general prevailing per diem wages by the Subcontractor, the prime Contractor of the project is not liable for any penalties described above unless the prime Contractor had knowledge of that failure of the Subcontractor to pay the specified prevailing rate of wages to those workers or unless the prime Contractor fails to comply with all of the following requirements:
- 1) The Agreement executed between the Contractor and the Subcontractor for the performance of work on the public works project shall include a copy of the provisions of Sections 1771, 1775, 1775.5, 1776, 1813 and 1815 of the Labor Code.
  - 2) The Contractor shall monitor the payment of the specified general prevailing rate of per diem wages by the Subcontractor to the employees by periodic review of the certified payroll records of the Subcontractor.
  - 3) Upon becoming aware of the failure of the Subcontractor to pay his or her workers the specific prevailing rate of wage, the Contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited, to retaining sufficient funds due the Subcontractor for work performed on the public works project.
  - 4) Prior to making final payment to the Subcontractor for work performed on the public works project, the Contractor shall obtain an affidavit signed under penalty of perjury for the Subcontractor that the Subcontractor has paid the specified general prevailing rate of per diem wages to his or her employees on the public works project and any amounts due pursuant to LABOR CODE Section 1813.
- D. Pursuant to LABOR CODE Section 1775, Caltrans shall notify the Contractor on a public works project within 15 days of receipt of a complaint that a Subcontractor has failed to pay workers the general prevailing rate of per diem wages.

**EXHIBIT B**  
**Public Works - State**

- E. If Caltrans determines that employees of a Subcontractor were not paid the general prevailing rate of per diem wages and if Caltrans did not retain sufficient money under the Agreement to pay those employees the balance of wages owed under the general prevailing rate of per diem wages, the Contractor shall withhold an amount of moneys due the Subcontractor sufficient to pay those employees the general prevailing rate of per diem wages if requested by Caltrans.
- F. Any subcontract entered into as a result of this Agreement shall contain all of the provisions of this clause.

**10. State General Prevailing Wage Rates**

- A. The Contractor agrees to comply with all of the applicable provisions of the Labor Code including those provisions requiring the payment of not less than the general prevailing rate of wages. The Contractor further agrees to the penalties and forfeitures provided in said Code in the event a violation of any of the provisions occurs in the execution of this Agreement.
- B. Pursuant to LABOR CODE Section 1771.5, not less than the general prevailing wage rate of per diem wages and the general prevailing rate of per diem wages for holiday and overtime work for work of a similar character in the county in which the work is to be performed shall be paid to all workers employed on this Agreement, if this Agreement is for:
  - 1) More than \$25,000 for public works construction or,
  - 2) More than \$15,000 for the alteration, demolition, installation, repair, or maintenance of public works.
- C. Any subcontract entered into as a result of this Agreement shall contain all of the provisions of this clause.

**11. State Prevailing Wage Rate Determinations**

- A. The General Prevailing Wage Rate Determinations applicable to the project are available and on file with Caltrans Regional/District Labor Compliance Office. These wage rate determinations are made a specific part of this Agreement by reference pursuant to Labor Code Section 1773.2. Any special wage rate determinations applicable to this project are attached.
- B. General Prevailing Wage Rate Determinations applicable to this project may also be obtained from the Department of Industrial Relations Internet site at:  
<http://www.dir.ca.gov/>
- C. After award of the Agreement, and prior to commencing work, all applicable General Prevailing Wage Rate Determinations are to be obtained by the Contractor from Caltrans District/Regional Labor Compliance Officer. These wage rate determinations are to be posted by the Contractor at the job site in accordance with Section 1773.2 of the California Labor Code.

**EXHIBIT B**  
**Public Works - State**

- D. Questions pertaining to predetermined wage rates should be directed to Caltrans Regional or District Labor Compliance Office. A list of local Labor Compliance Offices is attached as Attachment 3 (Attached at time of award).

**12. Hours of Labor**

- A. Eight (8) hours labor constitutes a legal day's work. The Contractor shall forfeit, as a penalty to Caltrans, twenty-five dollars (\$25.00) for each worker employed in the execution of the Agreement by the Contractor or any Subcontractor under the Contractor for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of the Labor Code (LC), and in particular LABOR CODE Sections 1810 to 1815 thereof, inclusive, except that work performed by employees in excess of eight (8) hours per day, and forty (40) hours during any one week, shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day and forty (40) hours in any week, at not less than one and one-half times the basic rate of pay, as provided in Section 1815.
- B. Any subcontract entered into as a result of this Agreement shall contain all of the provisions of this clause.

**13. Employment of Apprentices**

- A. Where either the prime contract the subcontract exceeds \$30,000, the Contractor and any Subcontractors under him or her shall comply with all applicable requirements of Labor Code Sections 1777.5, 1777.6 and 1777.7 in the employment of apprentices.
- B. Contractors and Subcontractors are required to comply with all Labor Code requirements regarding the employment of apprentices, including mandatory ratios of journey level to apprentice workers. Prior to commencement of work, Contractors and Subcontractors are advised to contact the State Division of Apprenticeship Standards, P. O. Box 420603, San Francisco, California 94142-0603, or one of its branch offices, for additional information regarding the employment of apprentices and for the specific journey-to-apprentice ratios for the Agreement work. The prime Contractor is responsible for all Subcontractors' compliance with these requirements Penalties are specified in Labor Code Section 1777.7.
- C. Any subcontract entered into as a result of this Agreement shall contain all of the provisions of this article.

**EXHIBIT D**  
**Public Works - State**

**SPECIAL TERMS AND CONDITIONS**

**1. Settlement of Disputes**

- A. Any dispute concerning a question of fact arising under this Agreement that is not disposed of by Agreement shall be decided by the Caltrans Contract Officer, who may consider any written or verbal evidence submitted by the Contractor. The decision of the Caltrans Contract Officer, issued in writing, shall be Caltrans' final decision on the dispute.
- B. Neither the pendency of a dispute nor its consideration by the Caltrans Contract Officer will excuse the Contractor from full and timely performance in accordance with the terms of the Agreement.

**2. Termination**

- A. If, after award and execution of the Agreement, the Contractor's performance is unsatisfactory, the Agreement may be terminated for default. Additionally, the Contractor may be liable to Caltrans for damages including the difference between the Contractor's original bid price and the actual cost of performing the work by another Contractor. Default is defined as the Contractor failing to perform services required by the Agreement in a satisfactory manner.
- B. Caltrans reserves the right to terminate this Agreement without cause upon thirty (30) days written notice to the Contractor or immediately in the event of default or material breach by the Contractor.
- C. The State may terminate this Agreement immediately for good cause. The term "good cause" may be defined as "impossibility of performance" or "frustration of purpose," but does not include material breach, default, or termination without cause. In this instance, the Agreement termination shall be effective as of the date indicated on the State's notification to the Contractor.
- D. In the event that the total Agreement amount is expended prior to the expiration date, Caltrans may, at its discretion, terminate this Agreement with 30 days notice to Contractor.

**3. Retention of Records/Audits**

- A. For the purpose of determining compliance with Government Code Section 8546.7, the Contractor, Subcontractors, and Caltrans shall maintain all books, documents, papers, accounting records, and other evidence pertaining to the performance of the Agreement, including but not limited to, the costs of administering the Agreement. All parties shall make such materials available at their respective offices at all reasonable times during the Agreement period and for three years from the date of final payment under the Agreement. Caltrans, the State Auditor, Federal Highway Administration (FHWA), or any duly authorized representative of the Federal government having jurisdiction under Federal laws or regulations (including the basis of Federal funding in

**EXHIBIT D**  
**Public Works - State**

whole or in part) shall have access to Contractor's books, records, and documents that are pertinent to the Agreement for audits, examinations, excerpts, and transactions, and copies thereof shall be furnished if requested.

- B. Any subcontract entered into as a result of this Agreement shall contain all the provisions of this clause.

**4. Subcontractors**

- A. Nothing contained in this Agreement or otherwise, shall create any contractual relation between Caltrans and any Subcontractors, and no subcontract shall relieve the Contractor of its responsibilities and obligations hereunder. The Contractor agrees to be as fully responsible to Caltrans for the acts and omissions of its Subcontractors and of persons either directly or indirectly employed by any of them as it is for the acts and omissions of persons directly employed by the Contractor. The Contractor's obligation to pay its Subcontractors is an independent obligation from Caltrans obligation to make payments to the Contractor.
- B. The Contractor shall perform the work contemplated with resources available within its own organization and no portion of the work shall be subcontracted except for Subcontractors listed on the Bidder Declaration, GSPD-05-105, Attachment 2.
- C. Any subcontract in excess of \$25,000, entered into as a result of this Agreement, shall contain all the provisions stipulated in this Agreement to be applicable to Subcontractors.
- D. Any substitution of Subcontractors shall comply with the requirements of Public Contract Code Section 4100 *et seq.*, and must be approved in writing by the Caltrans Contract Manager in advance of assigning work to a substitute Subcontractor.

**5. Disabled Veterans Business Enterprise (DVBE) Participation (Without Goals)**

Caltrans has established no goals for the DVBE participation for this Agreement. However, the Contractor shall be fully informed respecting the California Public Contract Code Section 10115 *et seq.*, which is incorporated by reference. Contractor is urged to obtain DVBE Subcontractor participation should clearly defined portions of the work become available.

**6. Laws to be Observed**

The Contractor shall keep fully informed of all existing and future state and federal laws and county and municipal ordinances and regulations which in any manner affect those engaged or employed in the work, the materials used in the work, or which in any way affect the conduct of the work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. Contractor shall at all times observe and comply with, and shall cause all agents and employees to observe and comply with all such existing and future laws, ordinances, regulations, orders, and decrees of bodies or tribunals having any jurisdiction or authority over the work. The Contractor shall

**EXHIBIT D**  
**Public Works - State**

protect and indemnify the State of California and all officers and employees thereof connected with the work against any claim, injury, or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor, its Subcontractor(s), or an employee(s). If any discrepancy or inconsistency is discovered in the plans, drawings, specifications, or Agreement for the work in relation to any such law, ordinance, regulation, order, or decree, the Contractor shall immediately report the same to the Caltrans Contract Manager in writing.

**7. Specific Statutory Reference**

Any reference to certain statutes in this Agreement shall not relieve the Contractor from the responsibility of complying with all other statutes applicable to the service, work, or rental to be furnished thereunder.

**8. Equipment Indemnification**

- A. The Contractor shall indemnify Caltrans for any claims against Caltrans for loss or damage to the Contractor's property or equipment during its use under this Agreement and shall at the Contractor's own expense maintain such fire, theft, liability or other insurance as deemed necessary for this protection. The Contractor assumes all responsibility which may be imposed by law for property damage or personal injuries caused by defective equipment furnished under this Agreement or by operations of the Contractor or the Contractor's employees under this Agreement.
- B. Any subcontract entered into as a result of this Agreement shall contain all of the provisions of this clause.

**9. Force Majeure**

Except for defaults of Subcontractors, neither party shall be responsible for delays or failures in performance resulting from acts beyond the control of the offending party. Such acts shall include, but shall not be limited to, acts of God, fire, flood, earthquake, other natural disaster, nuclear accident, strike, lockout, riot, freight embargo, public regulated utility, or governmental statutes or regulations superimposed after the fact. If a delay or failure in performance by the Contractor arises out of a default of its Subcontractor, and if such default of its Subcontractor, arises out of causes beyond the control of both the Contractor and Subcontractor, and without the fault or negligence of either of them, the Contractor shall not be liable for damages of such delay or failure, unless the supplies or services to be furnished by the Subcontractor were obtainable from other sources in sufficient time to permit the Contractor to meet the required performance schedule.

**10. Employment of Undocumented Workers**

By signing this Agreement, the Contractor swears or affirms that it has not, in the preceding five years, been convicted of violating a State or Federal law relative to the employment of undocumented workers.



**EXHIBIT D**  
**Public Works - State**

**11. Bonds (Task Order)**

Prior to commencement of work under this Task Order, the Contractor shall submit a Payment Bond for 100% of the Task Order, if the Task Order is over \$25,000. The Payment Bond is due prior to the start date of the Task Order. No work may commence without receipt of a valid Payment Bond as noted herein.

**EXHIBIT E**  
**Public Works - State**

**ADDITIONAL PROVISIONS**

**1. General Provisions Required in all Insurance Policies**

- A. Deductible: Contractor is responsible for any deductible or self-insured retention contained within the insurance program.
- B. Coverage Term: Coverage must be in force for the complete term of this Agreement. If insurance expires during the term of this Agreement, a new certificate must be received by the Caltrans Contract Manager at least ten (10) days prior to the expiration of the insurance. Any new insurance must continue to comply with the original terms of this Agreement **56A0343**.
- C. Policy Cancellation or Termination and Notice of Non-Renewal: Contractor shall provide, to the Caltrans Contract Manager within five (5) business days, following receipt by Contractor, a copy of any cancellation or non-renewal of insurance required by this Agreement. In the event Contractor fails to keep, in effect at all times, the specified insurance coverage, the State may, in addition to any other remedies it may have, terminate this Agreement upon the occurrence of such event, subject to the provisions of this Agreement.
- D. Primary Clause: Any required insurance contained in this Agreement shall be primary, and not excess or contributory, to any other insurance carried by the State.
- E. Inadequate Insurance: Inadequate or lack of insurance does not negate the Contractor's obligations under this Agreement.
- F. Endorsements: Any required endorsements requested by the State must be physically attached to all requested certificates of insurance and not substituted by referring to such coverage on the certificate of insurance.
- G. Insurance Carrier Required Rating: All insurance companies must carry a rating acceptable to the Department of General Services, Office of Risk and Insurance Management (ORIM). If the Contractor is self insured for a portion or all of its insurance, review of financial information including a letter of credit may be required. Department of General Services, ORIM Website:  
<http://www.dgs.ca.gov/orim/home.aspx>
- H. Contractor shall include all of its subcontractors as insured's under Contractor's insurance or supply evidence of insurance to the State equal to the policies, coverage's and limits required of Contractor.
- I. The State will not be responsible for any premiums or assessments on the policy.

**2. Insurance Requirements**

- A. Commercial General Liability
  - 1) Contractor shall maintain general liability on an occurrence form with limits not less than **\$1,000,000** per occurrence and **\$2,000,000** aggregate for bodily injury

**EXHIBIT E**  
**Public Works - State**

and property damage liability. The policy shall include coverage for liabilities arising out of premises, operations, independent contractors, products, completed operations, personal and advertising injury, and liability assumed under an insured Agreement. This insurance shall apply separately to each insured against whom claim is made or suit is brought subject to the Contractor's limit of liability. The policy must include:

Caltrans, State of California, its officers, agents, employees and servants are included as additional insured but only with respect to work performed under this Agreement.

- 2) This endorsement must be supplied under form acceptable to the Department of General Services, Office of Risk and Insurance Management.

**B. Automobile Liability**

Contractor shall maintain motor vehicle liability with limits not less than **\$1,000,000** combined single limit per accident. Such insurance shall cover liability arising out of a motor vehicle including owned, hired and non-owned motor vehicles. The same additional insured designation and endorsement required for general liability is to be provided for this coverage.

**C. Workers' Compensation and Employer's Liability**

Contractor shall maintain statutory worker's compensation and employer's liability coverage for all its employees who will be engaged in the performance of the Agreement. Employer's liability limits of **\$1,000,000** are required. When work is performed on State owned or controlled property the workers' compensation policy shall contain a waiver of subrogation in favor of the State. The waiver of subrogation endorsement shall be provided to the Caltrans' Contract Manager.

**3. Motor Carrier Permit Requirements**

Contractor must have a valid Motor Carrier Permit issued from the Department of Motor Vehicles (DMV). Contractor shall pay fee to obtain and maintain, in good standing, all necessary licenses and permits to accomplish this work.

**4. Licenses and Permits**

- A. The Contractor shall be properly licensed in accordance with the laws of the State of California and shall possess a Class A, General Engineering license.
- B. The Contractor shall be an individual or firm licensed to do business in California and shall obtain at its expense all license(s) and permit(s) required by law for accomplishing any work required in connection with this Agreement.
- C. If Contractor is located within the State of California, the Contractor must have a business license from the city/county in which it is headquartered, however, if Contractor is a corporation, a copy of its incorporation documents/letter from the

**EXHIBIT E**  
**Public Works - State**

Secretary of State's Office may substitute for a business license. If Contractor is located outside the State of California, Contractor must provide a current copy of its business license or incorporation papers for its State of residence showing that the Contractor is in good standing with their State to Caltrans.

- D. In the event any license(s) and/or permit(s) expire at any time during the term of this Agreement, Contractor agrees to provide Caltrans a copy of the renewed license(s) and/or permit(s) within 30 days following the expiration date. In the event the Contractor fails to keep in effect at all times all required license(s) and permit(s), Caltrans may, in addition to any other remedies it may have, terminate this Agreement upon occurrence of such event.

**5. Licensed Contractor Standards for Quality of Work**

- A. Licensed Contractors must observe professional standards for quality of work or the California Contractors State License Board (CSLB) will invoke disciplinary action.
- B. Notice is hereby given that certain actions by a Contractor, including, but not limited to the following, constitute grounds for disciplinary action by the CSLB once Caltrans has notified the license board of all violations:
  - 1) A willful departure from plans and specifications or disregard of trade standards for good and workmanlike construction in any material respect that might prejudice Caltrans, owner of the property upon which you perform work (Bus. & Prof. Code, 7109).
  - 2) The failure to observe and comply with all of the applicable labor laws (Bus. & Prof. Code 7110).
  - 3) Material failure to complete this Agreement (Bus. & Prof. Code 7113).
- C. Should Caltrans determine that the work or materials provided vary materially from the specifications, or, that defective work when completed was not performed in a workmanlike manner, then the Contractor warrants that it shall perform all necessary repairs, replacement and corrections needed to restore the property according to the Agreement plans and specifications, all at no further or additional cost to Caltrans.

**EXHIBIT E**  
**Public Works - State**

**6. Debarment and Suspension Certification**

- A. The Contractor's signature affixed herein shall constitute a certification under penalty of perjury under the laws of the State of California, that the Contractor or any person associated therewith in the capacity of owner, partner, director, officer, or manager:
- 1) is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
  - 2) has not been suspended, debarred, voluntarily excluded, or determined ineligible by any federal agency within the past three (3) years;
  - 3) does not have a proposed debarment pending; and
  - 4) has not been indicted, convicted, or had a civil judgment rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three (3) years.
- B. Any exceptions to this certification must be disclosed to Caltrans. Exceptions will not necessarily result in denial of recommendation for award, but will be considered in determining bidder responsibility. Disclosures must indicate the party to whom the exceptions apply, the initiating agency, and the dates of agency action.

**7. Interfacing with Pedestrian Vehicular Traffic**

Pursuant to the authority contained in the Vehicle Code (VC), Section 591, Caltrans has determined that within such areas as are within the limits of the project and are open to public traffic, the Contractor shall comply with all of the requirements set forth in the Vehicular Code, Divisions 11, 12, 13, 14 and 15. The Contractor shall take all necessary precautions for safe operations of the Contractor's equipment and the protection of the public from injury and damage from such property.

SECTION 10-4. COMMUNICATIONS CABLE PLANT .....	2
10-4.01 FIBER OPTICS CABLE .....	2
10-4.02 FIBER OPTIC GLOSSARY .....	2
DEFINITIONS .....	2
10-4.03 FIBER OPTIC OUTSIDE PLANT CABLE .....	3
GENERAL .....	3
FIBER CHARACTERISTIC .....	4
COLOR CODING .....	5
CABLE CONSTRUCTION .....	5
GENERAL CABLE PERFORMANCE SPECIFICATIONS .....	6
PACKAGING AND SHIPPING REQUIREMENTS .....	7
10-4.04 CABLE INSTALLATION .....	7
10-4.05 SPLICING .....	8
10-4.06 FIBER OPTIC SPLICE CLOSURE .....	8
SPLICE CLOSURES .....	8
SPLICE TRAYS .....	9
10-4.07 PASSIVE CABLE ASSEMBLIES AND COMPONENTS .....	10
10-4.08 FIBER OPTIC CABLE LABELING .....	10
10-4.09 FIBER OPTIC CABLE TERMINATIONS .....	13
DISTRIBUTION BREAK .....	14
DISTRIBUTION INTERCONNECT PACKAGE .....	14
FIBER OPTIC CABLE ASSEMBLIES AND PIGTAILS .....	14
10-4.10 FIBER DISTRIBUTION UNIT .....	15
10-4.11 FAN OUT TERMINATION .....	15
10-4.12 FIBER OPTIC CABLE TESTING .....	16
10-4.13 PAYMENT .....	16
SECTION 10-8 SYSTEM TESTING AND DOCUMENTATION.....	22
10-8.04 FIBER OPTIC TESTIN .....	23
GENERAL .....	23
FACTORY TESTING .....	23
AFTER CABLE INSTALLATION .....	24
OUTDOOR SPLICES .....	24
DISTRIBUTION INTERCONNECT PACKAGE TESTING AND DOCUMENTATION .....	24
FIBER OPTIC SYSTEM GAIN MARGIN .....	24
ACTIVE COMPONENT TESTING .....	24
SYSTEM VERIFICATION AT COMPLETION .....	24

Contract No. 12-0A7904

**SECTION 10-4. COMMUNICATIONS CABLE PLANT****10-4.01 FIBER OPTICS CABLE**

Fiber optic cable shall conform to the details shown on the plans and these special provisions.

**10-4.02 FIBER OPTIC GLOSSARY****DEFINITIONS**

The following definitions shall apply to these special provisions:

- A. **Active Component Link Loss Budget** — The active component link loss budget is the difference between the average transmitter launch power (in dBm) and the receiver maximum sensitivity (in dBm).
- B. **Backbone** — Fiber cable that provides connections between the TMC and hubs, as well as between equipment rooms or buildings, and between hubs. The term is used interchangeably with "trunk" cable.
- C. **Connector** — A mechanical device used to align and join two fibers together to provide a means for attaching to and decoupling from a transmitter, receiver, or another fiber (patch panel).
- D. **Connectorized** — The termination point of a fiber after connectors have been affixed.
- E. **Connector Module Housing (CMH)** — A patch panel used to terminate single mode fibers with most common connector types. It may include a jumper storage shelf and a hinged door.
- F. **Couplers** — Devices which mate fiber optic connectors to facilitate the transition of optical light signals from one connector into another. They are normally located within FDU's, mounted in panels. They may also be used unmounted, to join two simplex fiber runs.
- G. **Distribution Cable** — Fiber cable that provides connections between hubs. Drop cables are typically spliced into a distribution cable.
- H. **Drop Cable** — Fiber cable that provides connections between a distribution cable to a field element. Typically these run from a splice vault to a splice tray within a field cabinet. Drop cables are usually short in length (less than 20m) and are of the same construction as outside plant cable. The term "breakout cable" is used interchangeably with drop cable.
- I. **End-to-End Loss** — The maximum permissible end-to-end system attenuation is the total loss in a given link. This loss could be the actual measured loss, or calculated using typical (or specified) values. A designer should use typical values to calculate the end-to-end loss for a proposed link. This number will determine the amount of optical power (in dB) needed to meet the System Performance Margin.
- J. **Fan Out Termination** — Permits the branching of fibers contained in an optical cable into individual cables and can be done at field locations; thus, allowing the cables to be connectorized or terminated per system requirements. A kit provides pull-out protection for individual bare fibers to support termination. It provides three layers of protection consisting of a Teflon inner tube, a dielectric strength member, and an outer protective PVC jacket. Fan out terminations shall not be used for more than 6 fibers. Using a patch panel would be appropriate.
- K. **Fiber Distribution Frame (FDF)** — A rack mounted system that is usually installed in hubs or the Transportation Management Center (TMC), that may consist of a standard equipment rack, fiber routing guides, horizontal jumper troughs and Fiber Distribution Units (FDU). The FDF serves as

the termination and interconnection of passive fiber optic components from cable breakout, for connection by jumpers, to the equipment.

- L. **Fiber Distribution Unit (FDU)** —An enclosure or rack mountable unit containing both a patch panel with couplers and splice tray(s). The unit's patch panel and splice trays may be integrated or separated by a partition.
- M. **F/O** —Fiber optic.
- N. **FOIP** —Fiber optic inside plant cable.
- O. **FOOP** —Fiber optic outside plant cable.
- P. **FOTP** —Fiber optic test procedure(s) as defined by TIA/EIA standards.
- Q. **Jumper** —A short cable, typically one meter or less, with connectors on each end, used to join two CMH couplers or a CMH to active electronic components.
- R. **Light Source** —Portable fiber optic test equipment that, when coupled with a power meter, is used to perform end-to-end attenuation testing. It contains a stabilized light source operating at the wavelength of the system under test.
- S. **Link** —A passive section of the system, the ends of which are connectorized. A link may include splices and couplers. For example, a video link may be from a F/O transmitter to a video multiplexer (MUX).
- T. **Loose Tube Cable** —Type of cable construction in which fibers are placed in buffer tubes to isolate them from outside forces (stress). A flooding compound or material is applied to the interstitial cable core to prevent water migration and penetration. This type of cable is primarily for outdoor applications.
- U. **Mid-span Access Method** —Description of a procedure in which fibers from a single buffer tube are accessed and spliced to an adjoining cable without cutting the unused fibers in the buffer tube, or disturbing the remaining buffer tubes in the cable.
- V. **MMFO** —Multimode Fiber Optic Cable.
- W. **Optical Time Domain Reflectometer (OTDR)** —Fiber optic test equipment similar in appearance to an oscilloscope that is used to measure the total amount of power loss in a F/O cable between two points. It provides a visual and printed display of the losses associated with system components such as fiber, splices and connectors.
- X. **Optical Attenuator** —An optical element that reduces the intensity of a signal passing through it.
- Y. **Patchcord** —A term used interchangeably with "jumper".
- Z. **Patch Panel** —A precision drilled metal frame containing couplers used to mate two fiber optic connectors.
- AA. **Pigtail** —A short optical fiber permanently attached to a source, detector, or other fiber optic device.
- AB. **Power Meter** —Portable fiber optic test equipment that, when coupled with a light source, is used to perform end-to-end attenuation testing. It contains a detector that is sensitive to light at the designed wavelength of the system under test. Its display indicates the amount of optical power being received at the end of the link.
- AC. **Riser Cable** —NEC approved cable installed in a riser (a vertical shaft in a building connecting floors).
- AD. **Segment** —A section of F/O cable that is not connected to any active device and may or may not have splices per the design.
- AE. **SMFO** —Singlemode Fiber Optic Cable.
- AF. **Splice** —The permanent joining of two fiber ends using a fusion splicer.
- AG. **Splice Closure** —A environmentally sealed container used to organize and protect splice trays.



The container allows splitting or routing of fiber cables from multiple locations. Normally installed in a splice vault.

- AH. **Splice Module Housing (SMH)** .—A unit that stores splice trays as well as pigtails and short cable lengths. The unit allows splitting or routing of fiber cables to or from multiple locations.
- AI. **Splice Tray**.—A container used to organize and protect spliced fibers.
- AJ. **Splice Vault**.—An underground container used to house excess cable and/or splice closures.
- AK. **System Performance Margin**.—A calculation of the overall "End to End" permissible attenuation from the fiber optic transmitter (source) to the fiber optic receiver (detector). The system performance margin should be at least 6 dB. This includes the difference between the active component link loss budget, the passive cable attenuation (total fiber loss) and the total connector/splice loss.
- AL. **Tight Buffered, Non-Breakout Cable (Tight Buffer Cable)**.—Type of cable construction where each glass fiber is tightly buffered (directly coated) with a protective thermoplastic coating to 900  $\mu\text{m}$  (compared to 250  $\mu\text{m}$  for loose tube fibers).

#### 10-4.03 FIBER OPTIC OUTSIDE PLANT CABLE

##### GENERAL

Each fiber optic outside plant cable (FOOP) for this project shall be all dielectric, gel filled or water-blocking material, duct type, with loose buffer tube construction with a maximum outside diameter of 14 mm and shall conform to these special provisions. Cables shall contain single mode (SM) dual-window (1310 nm and 1550 nm) fibers with the numbers described below and as shown on the plans:

Type A cable	36 SM fibers
Type B cable	72 SM fibers
Type C cable	72 SM fibers
Type D cable	12 SM fibers

The optical fibers shall be contained within loose buffer tubes. The loose buffer tubes shall be stranded around an all dielectric central member. Aramid yarn and/or fiberglass shall be used as a primary strength member, and apply ethylene outside jacket shall provide for overall protection.

All F/O cable of each specific type shall be from the same manufacturer, who is regularly engaged in the production of this material.

The cable shall comply with all the requirements of the United States Department of Agriculture Rural Electrification Administration specifications REA-PE-90.

The cable shall be qualified as compliant with RUS Federal Rule 7CFR1755.900.

##### FIBER CHARACTERISTICS

Each optical fiber shall be glass and consist of a doped silica core surrounded by concentric silica cladding. All fibers in the buffer tube shall be usable fibers, and shall be sufficiently free of surface imperfections and occlusions to meet the optical, mechanical, and environmental requirements of these

specifications. The required fiber grade shall reflect the maximum individual fiber attenuation, to guarantee the required performance of each and every fiber in the cable.

The coating shall be a dual layered, UV cured acrylate. The coating shall be mechanically strippable without damaging the fiber.

The cable shall comply with the optical and mechanical requirements over an operating temperature range of -40°C to +70°C. The cable shall be tested in accordance with EIA-455-3A\ (FOTP-3), "Procedure to Measure Temperature Cycling Effects on Optical Fiber, Optical Cable, and Other Passive Fiber Optic Components." The change in attenuation at extreme operational temperatures (-40°C to +70°C) for single mode fiber shall not be greater than 0.20 dB/km, with 80 percent of the measured values no greater than 0.10 dB/km. The single mode fiber attenuation shall be measured at 1550 nm.

For all fibers the attenuation specification shall be a maximum attenuation for each fiber over the entire operating temperature range of the cable.

Single mode fibers within the finished cable shall meet the requirements in the following table:

**Fiber Characteristics Table**

Parameters	Characteristic
Type	Step Index
Core diameter	8.3 $\mu\text{m}$ (nominal)
Cladding diameter	<0.8 $\mu\text{m}$
Core to Cladding Offset	125 $\mu\text{m} \pm 1.0 \mu\text{m}$
Core diameter	250 $\mu\text{m} \pm 15 \mu\text{m}$
Cladding Non-circularity defined as: [1-(min. cladding dia $\div$ max. cladding dia.)]x100	< 2.0%
Proof/Tensile Test	345 MPa, Min
Attenuation: @1310 nm @1550 nm	<0.4 dB/km <0.3 dB/km
Attenuation at the Water Peak	£2.1 dB/km @ 1383 $\pm$ 3 nm
Chromatic Dispersion: Zero Dispersion Wavelength] Zero Dispersion Slope Maximum Dispersion:	1301.5 to 1321.5 nm <0.092 ps/(nm <sup>2</sup> * km) <3.3 ps/(nm * km) for 1285 to 1330 nm <18 ps/(nm * km) for 1550 nm
Cut-Off Wavelength	<1250 nm
Mode Field Diameter (Petermann II)	9.3 $\pm$ 0.5 $\mu\text{m}$ at 1310 nm 10.5 $\pm$ 1.0 $\mu\text{m}$ at 1550 nm

## COLOR CODING

In buffer tubes containing multiple fibers, each fiber shall be distinguishable from others in the same tube by means of color coding according to the following:

1. Blue (BL)	7. Red (RD)
2. Orange (OR)	8. Black (BK)
3. Green (GR)	9. Yellow (YL)
4. Brown (BR)	10. Violet (VL)
5. Slate (SL)	11. Rose (RS)
6. White (WT)	12. Aqua (AQ)

Buffer tubes containing fibers shall also be color coded with distinct and recognizable colors according to the same table listed above for fibers.

The colors shall be targeted in accordance with the Munsell color shades and shall meet EIA/TIA-598 "Color Coding of Fiber Optic Cables."

The color formulation shall be compatible with the fiber coating and the buffer tube filling compound, and be heat stable. It shall not fade or smear or be susceptible to migration and it shall not affect the transmission characteristics of the optical fibers and shall not cause fibers to stick together.

## CABLE CONSTRUCTION

**General.**--The fiber optic cable samples (10 foot length) with part numbers shall be submitted to Resident Engineer, as well as its original catalogue and documents from manufactures.

The fiber optic cable shall consist of but not be limited to the following components:

- A. Buffer tubes
- B. Central member
- C. Filler rods
- D. Stranding
- E. Core and cable flooding
- F. Tensile strength member
- G. Ripcord
- H. Outer jacket

**Buffer tubes.**--Clearance shall be provided in the loose buffer tubes between the fibers and the inside of the tube to allow for expansion without constraining the fiber. The fibers shall be loose or suspended within the tubes. The fibers shall not adhere to the inside of the buffer tube. Each buffer tube shall contain 1, 6 or a maximum of or 12 fibers.

The loose buffer tubes shall be extruded from a material having a coefficient of friction sufficiently low to allow free movement of the fibers. The material shall be tough and abrasion resistant to provide

mechanical and environmental protection of the fibers, yet designed to permit safe intentional "scoring" and breakout, without damaging or degrading the internal fibers.

Buffer tube filling compound shall be a homogeneous hydrocarbon-based gel with anti-oxidant additives and used to prevent water intrusion and migration. The filling compound shall be non-toxic and dermatologically safe to exposed skin. It shall be chemically and mechanically compatible with all cable components, non-nutritive to fungus, non-hygroscopic and electrically non-conductive. The filling compound shall be free from dirt and foreign matter and shall be readily removable with conventional nontoxic solvents.

Buffer tubes shall be stranded around a central member by a method that will prevent stress on the fibers when the cable jacket is placed under strain, such as the reverse oscillation stranding process.

Each buffer tube shall be distinguishable from other buffer tubes in the cable by the color coding specified for the fibers.

**Central Member.**--The central member which functions as an anti-buckling element shall be a glass reinforced plastic rod with similar expansion and contraction characteristics as the optical fibers and buffer tubes. A water swell able yarn will be pulled in with the central member. A linear overcoat of Low Density Polyethylene shall be applied to the central member to achieve the optimum diameter to provide the proper spacing between buffer tubes during stranding.

**Filler rods.**--Fillers may be included in the cable to maintain the symmetry of the cable cross-section. Filler rods shall be solid medium or high-density polyethylene. The diameter of filler rods shall be the same as the outer diameter of the buffer tubes.

**Stranding.**--Completed buffer tubes shall be stranded around the overcoated central member using stranding methods, lay lengths and positioning such that the cable shall meet mechanical, environmental and performance specifications. A polyester binding shall be applied over the stranded buffer tubes to hold them in place. Binders shall be applied with sufficient tension to secure the buffer tubes to the central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking (or rendered so by the flooding compound), and dielectric with low shrinkage.

**Core and Cable Flooding.**--The cable core shall contain a water-blocking material or the cable core interstices shall be filled with a polyolefin based compound to prevent water ingress and migration. The water-blocking material or the flooding compound shall be homogeneous, non-hygroscopic, electrically non-conductive, and non-nutritive to fungus. The core shall be free from dirt and foreign matter and shall be readily removable with conventional nontoxic solvents. The compound shall also be nontoxic, dermatologically safe and compatible with all other cable components.

**Tensile Strength Member.**--Tensile strength shall be provided by high tensile strength aramid yarns and fiberglass which shall be helically stranded evenly around the cable core and shall not adhere to other cable components.

**Ripcord.**--The cable shall contain at least one ripcord under the jacket for easy sheath removal.

**Outer jacket.**--The jacket shall be free of holes, splits, and blisters and shall be medium or high density polyethylene (PE), or medium density cross-linked polyethylene with minimum nominal jacket

thickness of  $1000 \mu\text{m} \pm 76 \mu\text{m}$ . Jacketing material shall be applied directly over the tensile strength members and flooding compound and shall not adhere to the aramid strength material. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus.

The jacket or sheath shall be marked with the manufacturer's name, the words "Optical Cable", the number of fibers, "SM", year of manufacture, and sequential measurement markings every meter. The actual length of the cable shall be within  $-0/+1$  percent of the length marking. The marking shall be in a contrasting color to the cable jacket. The height of the marking shall be approximately  $2.5 \text{ mm} \pm 0.2 \text{ mm}$ .

## GENERAL CABLE PERFORMANCE SPECIFICATIONS

The fiber optic cables shall be fully compatible and interoperable with Caltrans District 12 existing fiber optic cable systems.

The Caltrans District 12 existing fiber optic cable system are Corning Cable Systems (Siecor), single mode Altos type, part number:

012RW4-14101A20 for 12 SM fibers,

036RW4-14101A20 for 36 SM fibers,

072RW4-14101A20 for 72 SM fibers.

The recommendation for the other fiber optic cable manufactures are:

1. Alcatel (singlemode EZ Span All Dielectric Self Support ADSS Loose Tube Cable) or
2. Lucent (singlemode DNX Dielectric Sheath LXE Light pack Cable) or equal.

If other fiber optic cables are proposed, they shall be tested subjectively by independent lab facility and these special provisions. The cost of the testing of any proposed optical fiber cable shall be borne by the Contractor.

The Contractor shall submit to the Engineer the original documents for fiber optic cable test compliant, the fiber optic manufacture catalogue, and its samples and test results.

The F/O cable shall withstand water penetration when tested with a one meter static head or equivalent continuous pressure applied at one end of a one meter length of filled cable for one hour. No water shall leak through the open cable end. Testing shall be done in accordance with EIA-455-82 (FOTP-82), "Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable."

A representative sample of cable shall be tested in accordance with EIA-455-81, "Compound Flow (Drip) Test for Filled Fiber Optic Cable". The cable shall exhibit no flow (drip or leak) at  $80^{\circ}\text{C}$  as defined in the test method.

Crush resistance of the finished F/O cables shall be  $220 \text{ N/cm}$  applied uniformly over the length of the cable without showing evidence of cracking or splitting when tested in accordance with EIA-455-41 (FOTP-41), "Compressive Loading Resistance of Fiber Optic Cables". The average increase in attenuation for the fibers shall be  $0.10 \text{ dB}$  at  $1550 \text{ nm}$  singlemode for a cable subjected to this load. The cable shall not exhibit any measurable increase in attenuation after removal of load. Testing shall be in accordance with EIA-455-41 (FOTP-41), except that the load shall be applied at the rate of  $3 \text{ mm}$  to  $20 \text{ mm}$  per minute and maintained for 10 minutes.

The cable shall withstand 25 cycles of mechanical flexing at a rate of  $30 \pm 1$  cycles/minute. The average increase in attenuation for the fibers shall be  $\leq 0.20$  dB at 1550 nm singlemode at the completion of the test. Outer cable jacket cracking or splitting observed under 10x magnification shall constitute failure. The test shall be conducted in accordance with EIA-455-104 (FOTP-104), "Fiber Optic Cable Cyclic Flexing Test," with the sheave diameter a maximum of 20 times the outside diameter of the cable. The cable shall be tested in accordance with Test Conditions and II of (FOTP-104).

Impact testing shall be conducted in accordance with EIA-455-25 (FOTP-25) "Impact Testing of Fiber Optic Cables and Cable Assemblies." The cable shall withstand 20 impact cycles. The average increase in attenuation for the fibers shall be  $\leq 0.20$  dB at 1550 nm. The cable jacket shall not exhibit evidence of cracking or splitting.

The finished cable shall withstand a tensile load of 2700 N without exhibiting an average increase in attenuation of greater than 0.20 dB (singlemode). The test shall be conducted in accordance with EIA-455-33 (FOTP-33), "Fiber Optic Cable Tensile Loading and Bending Test." The load shall be applied for one-half hour in Test Condition II of the EIA-455-33 (FOTP-33) procedure.

## **PACKAGING AND SHIPPING REQUIREMENTS**

The original documentation of manufacturer's compliance to the required optical fiber specifications shall be provided to the Engineer prior to ordering the material.

Attention is directed to "Fiber Optic Testing," elsewhere in these special provisions.

The completed cable shall be packaged for shipment on reels. The cable shall be wrapped in a weather and temperature resistant covering. Both ends of the cable shall be sealed to prevent the ingress of moisture.

Each end of the cable shall be securely fastened to the reel to prevent the cable from coming loose during transit. Four meters of cable length on each end of the cable shall be accessible for testing.

Each cable reel shall have a durable weatherproof label or tag showing the manufacturer's name, the cable type, the actual length of cable on the reel, the Contractor's name, the contract number, and the reel number. A shipping record shall also be included in a weatherproof envelope showing the above information and also include the date of manufacture, cable characteristics (size, attenuation, bandwidth, etc.), factory test results, cable identification number and any other pertinent information.

The minimum hub diameter of the reel shall be at least thirty times the diameter of the cable. The F/O cable shall be in one continuous length per reel with no factory splices in the fiber. The minimum total length of each reel shall be 6 km (6000 meters). Each reel shall be marked to indicate the direction the reel should be rolled to prevent loosening of the cable.

Installation procedures and technical support information shall be furnished at the time of delivery.

## **10-4.04 CABLE INSTALLATION**

Installation procedures shall be in conformance with the procedures specified by the cable manufacturer for the specific cable being installed. The contractor shall submit the manufacturer's recommended procedures for pulling fiber optic cables at least 20 working days prior to installing cable. Mechanical aids may be used provided that a tension measuring device, and a break away swivel are placed in tension to the end of the cable. The tension in the cable shall not exceed 2225 N or the manufacturer's recommended pulling tension, whichever is less.

During cable installation, the bend radius shall be maintained at a minimum of twenty times the

outside diameter. The cable grips for installing the fiber optic cable shall have a ball bearing swivel to prevent the cable from twisting during installation.

F/O cable shall be installed using a cable pulling lubricant recommended by the F/O cable and/or the inner duct manufacturer, and a pull tape conforming to the provisions described under "conduit" elsewhere in these special provisions. Contractor's personnel shall be stationed at each splice vault and pull box through which the cable is to be pulled to lubricate and prevent kinking or other damage.

F/O cable shall be installed without splices except where specifically allowed on the plans. If splice locations are not shown on the plans, splicing shall be limited to one cable splice every 6 km. Any midspan access splice or FDU termination shall involve only those fibers being spliced as shown on the plans. Cable splices shall be located in splice closures, installed in splice vaults shown on the plans. A minimum of 20 m of slack shall be provided for each F/O cable at each splice vault. Slack shall be divided equally on each side of the F/O splice closure.

Unless shown or provided otherwise, only F/O cable shall be installed in each inner duct. Pulling a separate F/O cable into a spare duct to replace damaged fiber will not be allowed.

At the Contractor's option, the fiber may be installed using the air blown method. If integral inner duct is used, the duct splice points or any temporary splices of inner duct used for installation must withstand a static air pressure of 758 kPa.

The fiber installation equipment must incorporate a mechanical drive unit or pusher, which feeds cable into the pressurized inner duct to provide a sufficient push force on the cable, which is coupled with the drag force created by the high-speed airflow. The unit must be equipped with controls to regulate the flow rate of compressed air entering the duct and any hydraulic or pneumatic pressure applied to the cable. It must accommodate longitudinally ribbed, or smooth wall ducts from nominal 16 mm to 51 mm inner diameter. Mid assist or cascading of equipment must be for the installation of long cable runs. The equipment must incorporate safety shutoff valves to disable the system in the event of sudden changes in pneumatic or hydraulic pressure.

The equipment must not require the use of a piston or any other air capturing device to impose a pulling force at the front end of the cable, which also significantly restricts the free flow of air through the inner duct. It must incorporate the use of a counting device to determine the speed of the cable during installation and the length of the cable installed.

#### **10-4.05 SPLICING**

Field splices shall be done either in splice vaults or cabinets as shown on the plans. All splices in splice vaults shall be done in splice trays, housed in splice closures. All splices in cabinets shall be done in splice trays housed in FDU's.

Unless otherwise specified, fiber splices shall be the fusion type. The mean splice loss shall not exceed 0.07 dB per splice. The mean splice loss shall be obtained by measuring the loss through the splice in both directions and then averaging the resultant values.

All splices shall be protected with a metal reinforced thermal shrink sleeve.

The individual fibers shall be looped one full turn within the splice tray to avoid micro bending. A 45 mm minimum bend radius shall be maintained during installation and after final assembly in the optical fiber splice tray. Each bare fiber shall be individually restrained in a splice tray. The optical fibers in buffer tubes and the placement of the bare optical fibers in the splice tray shall be such that there is no discernable tensile force on the optical fiber.

The Contractor will be allowed to splice a total of 02 fibers to repair any damage done during mid-

span access splicing without penalty. The Contractor will be assessed a fine of \$300.00 for each additional and unplanned splice. Any single fiber may not have more than 3 unplanned splices.

If any fiber requires more than 3 unplanned splices, the entire length of F/O cable must be replaced at the Contractor's expense (including splicing). The replacement fiber optic cable shall be identical to the original cable manufacture and shall be approved by the Engineer.

#### **10-4.06 FIBER OPTIC SPLICE CLOSURE**

##### **SPLICE CLOSURES**

The F/O field splices shall be enclosed in splice closures which shall be complete with splice organizer trays, brackets, clips, cable ties, seals and sealant, as needed. The splice closure shall be suitable for a direct burial or pull box application. Manufacturer's installation instructions shall be supplied to the Engineer prior to the installation of any splice closures. Location of the splice closures shall be where a splice is required as shown on the plans, designated by the Engineer, or described in these special provisions.

The fiber optic splice closure shall consist of an outer closure, an inner closure and splice trays, and shall conform to the following special provisions.

The fiber optic splice closure shall be suitable for a temperature range of 0°C to 50°C. The size of the closure shall allow all the fibers of the largest fiber optic cable to be spliced to a second cable of the same size, plus 12 additional pigtails. The closure shall be not more than 900 mm in length and not more than 203 mm in diameter. Two outer closures shall fit into the fiber optic splice vault and shall leave sufficient space for routing of the fiber optic communication cables, without exceeding the minimum bending radius of any cable. The closures shall be designed for butt splicing.

The splice closure shall conform to the following specifications:

- A. Non-filled thermoplastic case
- B. Rodent proof, water proof, re-enterable and moisture proof
- C. Expandable from 2 cables per end to 8 cables per end by using adapter plates
- D. Cable entry ports shall accommodate 10 mm to 25 mm diameter cables
- E. Multiple grounding straps
- F. Accommodate up to 8 splice trays
- G. Suitable for "butt" or "through" cable entry configurations
- H. Place no stress on finished splices within the splice trays

All materials in the closures shall be noncreative and shall not support galvanic cell action. The outer closure shall be compatible with the other closure components, the inner closure, splice trays, and cables.

The end plate shall consist of two sections and shall have capacity for two fiber optic trunk cables and 2 fiber optic branch cables.

The outer closure shall protect the splices from mechanical damage, shall provide strain relief for the cable, and shall be resistant to salt corrosion.

The outer closure shall be waterproof, re-enterable and shall be sealed with a gasket. The outer closure shall be flash-tested at 103 kPa.

The inner closure shall be of metallic construction. The inner closure shall be compatible with the outer closure and the splice trays and shall allow access to and removal of individual splice trays. The splice trays shall be compatible with the inner closure and shall be constructed of rigid plastic or metal.



Adequate splice trays shall be provided to splice all fibers of the largest fiber optic cable, plus 12 pigtails.

Vinyl markers shall be used to identify each spliced fiber in the trays as described under "Fiber Optic Cable Labeling" elsewhere in these special provisions.

Each splice shall be individually mounted and mechanically protected in the splice tray.

The Contractor shall install the fiber splice closure in the splice vaults where splicing is required. The fiber optic splice closures shall be securely fastened or bolted to the side wall of the splice vault using standard hardware found in communication manholes.

The Contractor shall provide all mounting hardware required to securely mount the closures to the splice vault.

The fiber splice closure shall be mounted horizontally in a manner that allows the cables to enter at the end of the closure. Not less than 9 m of each cable shall be coiled in the vault to allow the fiber splice closure to be removed for future splicing.

The unprotected fibers exposed for splicing within the closure shall be protected from mechanical damage using the fiber support tube or tubes and shall be secured within the fiber splice closure.

Upon completion of the splices, the splice trays shall be secured to the inner closure.

The Contractor shall verify the quality of each splice prior to sealing the splice closure. The splice closure shall not be sealed until link testing is performed and is approved by the Engineer.

The closure shall be sealed using a procedure recommended by the manufacturer that will provide a waterproof environment for the splices. Encapsulant shall be injected between the inner and outer closures.

Care shall be taken at the cable entry points to ensure a tight salt resistant and waterproof seal is made which will not leak upon aging. It is acceptable to have multiple pigtails enter the fiber splice closure through one hole as long as all spaces between the cables are adequately sealed.

The fiber optic splice closure model SCN-SCAN from Seicor, or model FibrDome from 3M, or equal are recommended.

## **SPlice TRAYS**

Splice trays must accommodate a minimum of 12 fusion splices and must allow for a minimum bend radius of 45 mm. Individual fibers must be looped one full turn within the splice tray to allow for future splicing. No stress is to be applied on the fiber when it is located in its final position. Buffer tubes must be secured near the entrance of the splice tray to reduce the chance that an inadvertent tug on the pigtail will damage the fiber. The splice tray cover may be transparent.

Splice trays in the splice closure shall conform to the following:

- A. Accommodate up to 24 fusion splices
- B. Place no stress on completed within the tray
- C. Stackable with a snap-on hinge cover
- D. Buffer tubes securable with channel straps
- E. Must be able to accommodate a fusion splice with the addition of an alternative splice holder
- F. Must be labeled after splicing is completed.

Only one single splice tray may be secured by a bolt through the center of the tray in the fiber termination unit. Multiple trays must be securely held in place as per the manufacturer's recommendation.

Full compensation for splice tray shall be considered as included in the contract unit price paid for fiber optic splice closure and no separate payment will be made therefor.

#### **10-4.07 PASSIVE CABLE ASSEMBLIES AND COMPONENTS**

The F/O assemblies and components shall be compatible components, designed for the purpose intended, and manufactured by a company regularly engaged in the production of material for the fiber optic industry. All components or assemblies shall be best quality, non-corroding, with a design life of at least 20 years.

The cable assemblies and components manufacturer shall be ISO9001 registered.

#### **10-4.08 FIBER OPTIC CABLE LABELING**

##### **General**

The Contractor shall label all fiber optic cabling in a permanent consistent manner. All tags shall be of a material designed for long term permanent labeling of fiber optic cables and shall be marked with permanent ink on non-metal types, or embossed lettering on metal tags. Metal tags shall be constructed of stainless steel. Non-metal label materials shall be approved by the Engineer. Labels shall be affixed to the cable per the manufacturer's recommendations and shall not be affixed in a manner which will cause damage to the fiber. Handwritten labels shall not be allowed.

**Label Identification****1. Labeling of Cables**

Labeling of the backbone, distribution and drop fiber optic cables shall conform to the following unique identification code elements:

UNIQUE IDENTIFICATION CODE ELEMENTS for Backbone, Distribution or Drop Cables		
DESCRIPTION	CODE	NUMBER OF CHARACTERS
District	District number	2
Cable Type	Fiber: S: Singlemode, M: Multimode Copper: T: 18 AWG, U: 19 AWG, V: 20AWG, W: 22AWG, X: 24 AWG	1
Cable fiber (or copper pairs) Count	Number of fibers or conductor pairs (Examples: 144 fibers; or 100 TWP)	3
Route Number	Hwy. Rte (Example: 005)	3
Begin Function	T: TMC; H: HUB; V: Video Node; D: Data Node; C: Cable Node; M: CCTV Camera; N: CMS; P: Traffic Signal; Z: Ramp Meter; U: Traffic Monitoring/Count Station/Vehicle Count Station (VDS, TOS); S: Splice Vault	1
Begin Function Number	Unique ID number corresponds to Begin Function (Example: H02 [Hub 02])	2
End Function	T: TMC; H: HUB; V: Video Node; D: Data Node; C: Cable Node; M: CCTV Camera; N: CMS; P: Traffic Signal; Z: Ramp Meter; U: Traffic Monitoring/Count Station; S: Splice Vault	1
End Function Number	Unique ID number corresponds to Begin Function (Example: H03 [Hub 03])	2
Unique Identifier	XX: If two or more cables of the same count are in the same run	2
TOTAL		17

Each cable shall display one unique identification, regardless of where the cable is viewed. The begin function and end function correspond to the end points of each cable. The order of the begin and end function follow a hierarchy as listed below, where the lowest number corresponding to the begin/end function is listed first.

List of Hierarchy										
1	2	3	4	5	6	7	8	9	10	11
TMC	HUB	Video Node (VN)	Data Node (DN)	Cable Node	CCTV Camera	CMS	Traffic Signal	Ramp Meter	Traffic Monitoring/Count Station	Splice Vault

This scheme will work as follows: A cable between the TMC and a HUB will always have the TMC listed as the start function and the HUB as the end function. Between a CMS and a Splice Vault, the start function will always be listed as the CMS, and so on. If a cable is connected between HUBs, for example HUB-01 and HUB-03, the lowest number, in this case HUB-01, will be listed as the start function and HUB-03 as the end function.

**A. Example 1: 08S060010H02H0302**

This cable is located in District 8, identified as a singlemode fiber optic cable containing 60 fibers, installed along highway Route 10, beginning in Hub 2, and ending in Hub 3, with unique ID of number 2. The implication for the unique ID is that there may be another 60 fiber optic cable between those hubs. This is an example for a backbone cable.

**B. Example 2: 11S048008H01S04**

This cable is located in District 11, identified as a singlemode fiber optic cable containing 48 fibers, installed along highway Route 8, beginning in Hub 1, and ending in Splice Vault 04. In this case, no additional digits are necessary for a unique ID. This is an example for a distribution cable.

**C. Example 3: 11S006163N03S04**

This cable is located in District 11, identified as a singlemode fiber optic cable containing 6 fibers, installed along highway Route 163, beginning at CMS-03, and ending in Splice Vault 04. In this case, no additional digits are necessary for a unique ID. This is an example for a drop cable.

## 2. Labeling of Jumpers and Pigtails

Labeling of the jumpers and pigtails shall conform to the following unique identification code elements:

UNIQUE IDENTIFICATION CODE ELEMENTS for JUMPERS (active component to FDU) and PIGTAILS (to connector # on patch panel)		
DESCRIPTION	CODE	NUMBER OF CHARACTERS
Hub Identifier	Hub, TMC, VN or DN ID Numbers or Alphanumeric or both	2
From (Source) Device	MU: Multiplexer FD: FDU (Fiber Distribution Unit) RP: Repeater	2
From (Source) Device Identifier	Numbers or Alphanumeric or both	2
Transmitter or Receiver	T or R	1
To (Destination) Device	MU: Multiplexer FD: FDU (Fiber Distribution Unit) RP: Repeater	2
To (Destination) Device Identifier	Numbers or Alphanumeric or both	2
Connector Identifier	Connector ID	2
TOTAL		13

### A. Example 1: 01MU01TFD0203.

This pigtail is located in Hub 1, from multiplexer 01, transmitting to FDU 02 to patch panel position (connector) 03.

### B. Example 2: 02MUA1TFD0B08.

This jumper is located in Hub 2, from multiplexer A1, transmitting to FDU B, to patch panel position (connector) 08.

## Label Placement

### 1. Cables

All cables shall be clearly labeled with the unique identification code element method described elsewhere in these special provisions, at all terminations, even if no connections or splices are made, and at all splice vault entrance and exit points.

### 2. Cable to Cable Splices

All cable jackets entering the splice closure shall be labeled in accordance with the identification method described elsewhere in these special provisions.

### 3. Cable to Fiber Distribution Units

The cable jackets shall be clearly labeled at entry to the FDU in accordance with the unique identification code element method described elsewhere in these special provisions. In addition, each fiber shall be labeled with the Fiber ID and pigtails shall be labeled at the connector with the Fiber ID. The FDU shall be clearly labeled with the Cable ID on the face of the FDU. If multiple cables are connected to the FDU, each block of connectors relating to each individual cable shall be clearly identified by a single label with the Cable ID. Individual connections shall be clearly marked on the face of the FDU in the designated area with the Fiber ID.

### 4. Fiber

Fibers labels shall be placed next to the connectors of the individual fibers.

### 5. Patch Panels

The cable jackets shall be clearly labeled at entry to the Patch Panel in accordance with the unique identification code element method described elsewhere in these special provisions. In addition, each fiber shall be labeled with the Fiber ID and pigtails shall be labeled at the connector with the Fiber ID. The Patch panel shall be clearly labeled with the Cable ID on the face of the Panel. If multiple cables are connected to the Patch Panel, each block of connectors relating to each individual cable shall be clearly identified by a single label with the Cable ID. Individual connections shall be clearly marked on the face of the Panel in the designated area with the Fiber ID.

### 6. Jumpers

Equipment to FDU jumpers shall be labeled as to the equipment type connected and shall be labeled at both ends. FDU to FDU jumpers shall be labeled at each end in accordance with the unique identification code element method described elsewhere in these special provisions.

### 7. Pigtails

Pigtails shall be labeled at the connector in accordance with the unique identification code element method described elsewhere in these special provisions.

### 8. Copper Cable Labels

All twisted-pair communications cables shall be clearly labeled in a in accordance with the unique identification code element method described elsewhere in these special provisions.

Full compensation for fiber optic cable labeling shall be considered as included in the contract lump sum price paid for the various types of cables involved and no additional compensation will be allowed therefor.

## **10-4.09 FIBER OPTIC CABLE TERMINATIONS**

### **General**

Fiber optic outside plant (FOOP) cable entering a building shall be routed as described in these special provisions and as shown on the plans. The cable shall continue within the conduit to the designated termination point for cable termination. All components shall be the size and type required for the specified fiber. Fiber optic cable terminations may take place in several locations such as TMCs, hubs, data nodes, cable nodes, TOS cabinets, camera sites, etc.

### **Cable Termination**

Once the fiber optic cable arrives within the Traffic Management Center (TMC) communications room or hub, it shall be routed within conduit to a wall mounted fiber splice closure as shown on the plans.

Fiber Optic Inside Plant (FOIP) cable shall then be spliced to the incoming cable.

At the FDU, the cable jacket of the FOIP or outside plant cable, shall be removed exposing the aramid yarn, filler rods, and buffer tubes. The exposed length of the buffer tubes shall be at least the length recommended by the FDU manufacturer which allows the tubes to be secured to the splice trays. Each buffer tube shall be secured to the splice tray in which it is to be spliced. The remainder of the tubes shall be removed to expose sufficient length of the fibers in order to properly install on the splice tray, as described in "Splicing," elsewhere in these special provisions.

The cable shall then be spliced and secured with tie wraps and routed to its appropriate fiber distribution frame/unit (FDF/U) as shown on the plans.

When applicable, moisture blocking gel shall be removed from the exposed buffer tubes and fibers. The transition from the buffer tube to the bundle of jacketed fibers shall be treated by an accepted procedure for sleeve tubing, shrink tube and silicone blocking of the transition to prevent future gel leak. Manufacturer directions shall be followed to ensure that throughout the specified temperature range gel will not flow from the end of the buffer tube. The individual fibers shall be stripped and prepared for splicing.

Factory terminated pigtails shall then be spliced and placed in the splice tray.

All fibers inside a fiber optic cable entering an Fiber Distribution Unit (FDU), such as at a TMC or hub, shall be terminated and labeled. Attention is directed to "Fiber Distribution Unit" elsewhere in these special provisions.

A transition shall then be made, with flexible tubing, to isolate each fiber to protect the individual coated fibers. The final transition from bundle to individual fiber tube shall be secured with an adhesive heat shrink sleeve. Refer to Fan Out Termination, elsewhere in these special provisions.

### **DISTRIBUTION BREAKOUT**

The jacketed cable shall be lashed with tie wraps to the rack prior to entering the FDU. The cable shall also be tie-wrapped to the inside of the FDU near the point of entry. The glass fibers shall not be damaged during cutting and removal of the buffer tubes.

The jacketed area and bare fibers shall be cleaned to remove the moisture blocking gel. The transition from the buffer tube to the bundle of jacketed fibers shall be treated by an accepted procedure for sleeve tubing, shrink tube and silicone blocking of the transition to prevent future gel leak. A subsequent transition shall then be made, with flexible tubing, to isolate the fiber bundles of each buffer

tube to serve as a transition from the bundle to the separation point and to protect the individual coated fibers. The last transition point (bundle to single fiber) shall consist of inserting the individual fibers into 26 AWG clear Teflon tubing, to protect the fiber as it is routed toward the splice tray and to allow clear color identification of fibers for proper distribution. The final transition from bundle to individual fiber tube shall be secured with an adhesive heat shrink sleeve.

All fibers terminating in a cabinet or rack shall be properly terminated inside a FDU.

## **DISTRIBUTION INTERCONNECT PACKAGE**

**General.**--Distribution involves connecting the fibers to the active electronic components. The distribution equipment consists of FDUs with connector panels, couplers, splice trays, fiber optic pigtails and cable assemblies with connectors. The distribution interconnect package shall be assembled and tested by a company who is regularly engaged in the assembly of these packages. Attention is directed to "Fiber Optic Testing" elsewhere in these special provisions. All distribution components shall be products of the same manufacturers, who are regularly engaged in the production of these components, and the respective manufacturers shall have quality assurance programs.

## **FIBER OPTIC CABLE ASSEMBLIES AND PIGTAILS**

**General.**--Cable assemblies (jumpers) and pigtails shall be products of the same manufacturer. The cable used for cable assemblies (jumpers) and pigtails shall be made of fiber meeting the performance requirements of these special provisions for the F/O cable being connected.

**Pigtails.**--Pigtails shall be of simplex (one fiber) or duplex (two fibers) construction, in 900 mm tight buffer form, surrounded by aramid for strength, with a PVC jacket with manufacturer identification information. Singlemode cable jackets shall be yellow in color. Duplex pigtails shall be of duplex round cable construction, and shall not have zip cord (Siamese) construction. The two inner simplex jackets shall be color coded white and slate, respectively, to provide easy visual identification for polarity. All pigtails shall be at least one meter in length.

**Jumpers.**--Jumpers may be of simplex or duplex design. Duplex jumpers shall be of duplex round cable construction, and shall not have zip cord (Siamese) construction. All jumpers shall be at least 2 m in length, sufficient to avoid stress and orderly routing. The outer jacket of duplex jumpers shall be colored yellow. The two inner simplex jackets shall be color coded white and slate, respectively, to provide easy visual identification for polarity.

**Connectors.**--Connectors shall be of the ceramic ferrule SC type for SM. Indoor SC connector body housings shall be either nickel plated zinc or glass reinforced polymer construction. Outdoor SC connector body housing shall be glass reinforced polymer.

The associated coupler shall be of the same material as the connector housing.

All F/O connectors shall be the 2.5 mm SC connector ferrule type with Zirconia's Ceramic material with a PC (Physical Contact) pre-radiused tip.

The SC connector operating temperature range shall be -40 °C to +70 °C. Insertion loss shall not exceed 0.4 dB for singlemode, and the return reflection loss on singlemode connectors shall be at least -55 dB. Connection durability shall be less than a 0.2 dB change per 500 mating cycles per EIA-455-21A



(FOTP-21). All terminations shall provide a minimum 222 N pull out strength. Factory test results shall be documented and submitted to the Engineer prior to installing any of the connectors.

Singlemode connectors shall have a yellow color on the body and/or boot that renders them easily identifiable.

Field terminations shall be limited to splicing of adjoining cable ends and/or cables to SC pigtails.

**SC Couplers.**--The SC Couplers shall be made of polymer construction that is consistent with the material forming the associated SC connector body. The design mechanism for mounting the couplers to the ITU connector panel may be achievable using metal clips or fasteners but shall coincide with the ITU panel punch-outs.

All coupler sleeves shall be of the cylinder split ceramic or clover leaf design.

The operating temperature range for couplers shall be the same as that specified for the SC connectors.

#### **10-4.10 FIBER DISTRIBUTION UNIT**

The fiber distribution unit (FDU) racks shall be EIA standard mount type as shown on the plans.

The FDU shall be 482 mm rack mountable.

The FDU shall not exceed 250 mm in height and 380 mm in depth.

The Contractor shall furnish and install all components to terminate the incoming fiber optic communication cables.

The fiber distribution unit (FDU) shall include the following:

1. A patch panel to terminate the appropriate number of singlemode fibers with SC type connector feed through couplers.
2. Splice trays.
3. Storage for splice trays.
4. A slide out metal drawer for the storage of spare jumpers.

Strain relief shall be provided for the incoming fiber optic cable. Cable accesses shall have rubber grommets or similar material to prevent the cable from coming in contact with bare metal. All fibers shall be terminated and individually identified in the FDU and on the patch panel.

The patch panel shall be hinged or have coupler plates to provide easy access and maintenance. At hub, cable node, twelve 12-fiber patch panel plates shall be required for 144 fiber total capacity. Brackets shall be provided to spool the incoming fiber a minimum of two turns, each turn shall not be less than 300 mm, before separating out individual fibers to the splice tray.

The connector panel shall be located internal to the unit so as not expose fiber optic connections. Cable accesses shall have grommets.

FDUs shall be sized to contain sufficient connector module housings (CMHs) to handle the associated cables and their respective breakouts. In cables with smaller fiber counts, more than one cable may be assigned to an FDU but fibers from the same cable shall not be split between two FDUs. In all cases, FDUs shall be capable of housing and securing required splice trays in splice module housings (SMH).

All FDUs shall house the splice trays needed to store the "breakout to pigtail" splices. Connector module housings (CMH), splice module housings (SMH) shall be mounted with adjustable mounting brackets for horizontal positioning. The front covers shall be Lexan with a rear cover of metal

of the same gauge and color as the remainder of the FDU rack. Panels shall have at least six coupler capacities and all panel positions shall be filled with couplers. Where panels have spare SC positions, the couplers shall have dust covers on both sides.

Coupler capacities shall usually range from 12 to 144 fibers or couplers, as indicated on the plans. Couplers shall be mounted in panels housed within the FDU. Spare panel positions within the FDU shall have blanks or panels ready for future expansion. The front and back covers of the FDU shall be retractable or removable to facilitate internal installation.

Full compensation for the fiber distribution unit shall be considered as included in the contract lump sum price paid for equipment at location involved, and no additional compensation will be made therefor.

#### **10-4.11 FAN OUT TERMINATION**

A fan out termination shall be required as designated by the Engineer or described in these special provisions.

The fan out termination shall consist of a splice connector and the appropriate number of fiber optic pigtails which will be fusion spliced to the incoming fibers.

The pigtail shall be contained in a housing that will provide strain relief between the incoming fiber optic cable plant jacket, buffer tubes, fibers and pigtail jacket material.

Each fiber shall be spliced to a pigtail with a factory installed and polished SC connector, as specified elsewhere in these special provisions. The splices shall then be encapsulated in a weatherproof housing. Each connector shall have a weatherproof cap to protect it from the elements. The pigtail shall be of simplex (one fiber) construction, in a 900 mm tight buffer form, surrounded by Aramid yarn for strength. The buffer shall have a PVC jacket with manufacturer identification information, and a nominal outer jacket diameter of 3 mm. Singlemode simplex cable jackets shall be yellow in color. All pigtails shall be at least two meters in length.

Each pigtail shall be labeled, as specified elsewhere in these special provisions, and secured onto the cable using clear heat shrink tubing.

#### **10-4.12 FIBER OPTIC CABLE TESTING**

Attention is directed to "Fiber Optic Testing" elsewhere in these special provisions.

#### **10-4.13 PAYMENT**

The contract lump sum price paid for Type A cable shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Type A cable, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract lump sum price paid for Type B cable shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Type B cable, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract lump sum price paid for Type C cable shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Type C

cable, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract lump sum price paid for Type D cable shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in Type D cable, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract unit price paid for fiber optic splice closure shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in fiber optic splice closure, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for splice trays shall be considered as included in the contract lump sum price paid for fiber optic splice closure and no separate payment will be made therefor.

## **10-8.04 FIBER OPTIC TESTING**

### **GENERAL**

Testing shall include the tests on elements of the passive fiber optic components: (1) at the factory, (2) after installation but prior to connection to any other portion of the system, and (3) during final system testing. The active components shall be tested after installation. The Contractor shall provide all personnel, equipment, instrumentation and materials necessary to perform all testing. The Engineer shall be notified two working days prior to all field tests. The notification shall include the exact location or portion of the system to be tested.

Documentation of all test results shall be provided to the Engineer within 2 working days after the test involved.

Prior to arrival of the cable, the Contractor shall provide detailed test procedures for all field testing. The procedures shall include the tests involved and how the tests are to be conducted.

### **FACTORY TESTING**

Verification of the fiber specifications as listed in the Fiber Characteristics Table shall be supplied by the manufacturer with the appropriate documentation. After cabling, before shipment but while on the shipping reel, 100 percent of all fibers shall be tested for attenuation. Copies of the results shall be (1) maintained on file by the manufacturer with a file identification number for a minimum of 7 years, (2) attached to the cable reel in a waterproof pouch, and (3) submitted to the Contractor and to the Engineer.

### **AFTER CABLE INSTALLATION**

After the fiber optic cable has been pulled but before breakout and termination, 100 percent of all the fibers shall be tested with an OTDR for attenuation. Test results shall be recorded, dated, compared and filed with the previous copies of these tests. Copies of traces and test results shall be submitted to the Engineer. If the OTDR test results are unsatisfactory, the F/O cable shall be replaced at the Contractor's expense. The new cable shall then be tested to demonstrate acceptability. Copies of the test results shall be submitted to the Engineer.

Attenuation tests shall be performed with an OTDR capable of recording and displaying anomalies of 0.02 dB as a minimum. Singlemode fibers shall be tested at 1310 nm and 1550 nm. Attenuation readings for each direction shall be recorded on the cable data sheet.

The OTDR shall have a printer capable of producing a verifying test trace with fiber identification as shown in Appendix A "Link Loss Budget Work Sheet", numerical loss values, the date and the operator's name. It shall also have a DOS based 89 mm disk recording capability that has associated software to do comparisons and reproductions on 215 mm x 279 mm paper, via a personal computer.

### **OUTDOOR SPLICES**

At the conclusion of all outdoor splices at one location, and before they are enclosed and sealed, all splices shall be tested with the OTDR, in both directions. Splices in singlemode segments shall be tested at 1310 nm and at 1550 nm. Individual fusion splice losses shall not exceed 0.07 dB. Measurement results shall be recorded, dated, validated by the OTDR trace printout and filed with the records of the

respective cable runs. Copies of traces and test results shall be submitted to the Engineer. If the OTDR test results are unsatisfactory, the splice shall be unacceptable. The unsatisfactory splice shall be replaced at the Contractor's expense. The new splice shall then be tested to demonstrate acceptability. Copies of the test results shall be submitted to the Engineer.

## **DISTRIBUTION INTERCONNECT PACKAGE TESTING AND DOCUMENTATION**

All the components of the passive interconnect package (FDU), pigtails, jumpers, couplers and splice trays) shall comprise a unit from a manufacturer who is regularly engaged in the production of the fiber optic components described.

In developing the distribution interconnect package, each SC termination (pigtail or jumper) shall be tested for insertion attenuation loss with the use of an optical power meter and source. In addition, all singlemode terminations shall be tested for return reflection loss. These values shall meet the loss requirements specified earlier and shall be recorded on a tag attached to the pigtail or jumper.

Once assembly is complete, the manufacturer shall visually verify that all tagging, including loss values, is complete. Then as a final quality control measure, the manufacturer shall do an "end to end" optical power meter/light source test from pigtail end to jumper lead end to assure continuity and overall attenuation loss values.

The final test results shall be recorded, along with previous individual component values, on a special form assigned to each FDU. The completed form shall be dated and signed by the Manufacturer's Quality Control supervisor. One copy of this form will be attached in a plastic envelope to the assembled FDU unit. Copies will be provided separately to the Contractor and to the Engineer, and shall be also be maintained on file by the manufacturer or supplier.

The assembled and completed FDU unit shall then be protectively packaged for shipment to the Contractor for installation.

## **FIBER OPTIC SYSTEM GAIN MARGIN**

The installed system gain margin shall be at least 6 dB for each and every link. If the design system gain margin is less than 6 dB, the Engineer shall be notified and informed of the Contractor's plan to meet that requirement.

## **ACTIVE COMPONENT TESTING**

The transmitters and receivers shall be tested with a power meter and light source, to record the transmitter average output power (dBm) and receiver sensitivity (dBm). These values shall be recorded in the Link Loss Budget Worksheet shown in Appendix A.

## **SYSTEM VERIFICATION AT COMPLETION**

**OTDR Testing.**--Once the passive cabling system has been installed and is ready for activation, 100 percent of the fiber links shall be tested with the OTDR for attenuation. Test results shall be recorded, dated, compared and filed with previous copies. A hard copy printout and a electronic copy of the traces and test results along with a licensed copy of the associated software on a DOS based 89 mm disk shall be submitted to the Engineer. If the OTDR test results are unsatisfactory the link shall be

replaced at the Contractor's expense. The new link shall then be tested to demonstrate acceptability. Copies of the test results shall be submitted to the Engineer.

**Installed System Link Loss Budget.**--The Link Loss Budget Worksheet shown in Appendix A shall be completed for each link in the fiber optic system, using the data gathered throughout the installation process. The completed worksheets shall be included as part of the system documentation.

The Total System Gain shall be calculated by subtracting the measured Optical Receiver Sensitivity (line 1B on The Link Loss Budget Worksheet) from the measured Optical Transmitter Average Power (line 1A), which were obtained using a power meter and source. The resulting difference shall be the maximum allowable loss between the transmitter and the receiver, within 0 percent to +10 percent of the manufacturers specified loss budget for the transmitter/receiver pair. The Total System Gain shall be recorded on line 1C.

The Fiber Losses for a link shall be calculated by multiplying the length of the fiber link (line 2A) by the normalized cable attenuation (dB/km, line 2B) at the operating wavelength. The normalized attenuation for this calculation shall be the maximum value throughout the operating temperature range of the cable. The product shall be recorded on line 2C.

The total connector losses shall be calculated by summing the individual attenuation values for each connector pair in the link, excluding the transmitter and receiver connectors. The sum shall be recorded on line 2D.

The total splice losses shall be calculated by summing the individual attenuation values for each splice in the link. The sum shall be recorded on line 2E.

The total of other losses shall be calculated by summing the individual attenuation values for each component in the link not previously addressed. The sum shall be recorded on line 2F. These items may include, but are not limited to, couplers, splitters, routers and switches.

The Total System Loss shall be recorded on line 2G of the Link Loss Budget Worksheet.

The Design System Gain Margin shall be calculated by subtracting the Total System Loss (line 2G) from the Total System Gain (line 1C). The resulting difference shall be recorded on line 3A. The Contractor's attention is directed to "F/O System Gain Margin," elsewhere in these special provisions.

**Power Meter and Light Source.**--At the conclusion of the final OTDR testing, 100 percent of all fibers shall be tested end to end with a power meter and light source, in accordance with EIA Optical Test Procedure 171 and in the same wavelengths specified for the OTDR tests. These tests shall be conducted in both directions. Test results shall be recorded, compared and proven to be within the design link loss budgets, and filed with the other recordings of the same links. Test results shall be submitted to the Engineer.

**Test Failures.**--If during any of these system verification tests, the results prove to be unsatisfactory, the F/O cable will not be accepted. The unsatisfactory segments of cable shall be replaced with a new segment of cable at the Contractor's expense. The new segment of cable shall undergo the same testing procedure to determine acceptability. Copies of the test results shall be submitted to the Engineer. The removal and replacement of a segment of cable shall be interpreted as the removal and replacement of a single contiguous length of cable connecting two splices, two connectors, or a splice and a connector. The removal of only the small section containing the failure and therefore introducing new unplanned splices, will not be allowed.

**APPENDIX A**  
**Cable Verification Worksheet**  
*End-to-End Attenuation (Power Meter and Light Source) Testing*  
*and OTDR Testing*

Contract No. \_\_\_\_\_ Contractor: \_\_\_\_\_

Operator: \_\_\_\_\_ Date: \_\_\_\_\_

Link Number: \_\_\_\_\_ Fiber Number: \_\_\_\_\_

Test Wavelength (Circle one): 1310 nm 1550 nm

Expected Location of fiber ends: End 1: \_\_\_\_\_ End 2: \_\_\_\_\_

**Power Meter and Light Source Test Results:**

Power In:	_____ dBm	1A
Output Power:	_____ dBm	1B
Insertion Loss [1A - 1B]:	_____ dB	1C

**OTDR Test Results:**

Forward Loss:	_____ dB	2A
Reverse Loss:	_____ dB	2B
Average Loss [(2A + 2B)/2]:	_____ dB	2C

-----  
To Be Completed by Caltrans:

Resident Engineer's Signature: \_\_\_\_\_

Cable Link Accepted: \_\_\_\_\_

## APPENDIX B

### Fiber System Performance Margin Calculations Worksheet

#### A. Calculate the Passive Cable Attenuation

1. Calculate Fiber Loss at Operating Wavelength: _____ nm	Cable Distance (times) Individual Fiber Loss (equal) @ 1310 nm (0.4 dB/km) @ 1550 nm (0.3 dB/km)	_____ km x _____ dB/km =
<b>Total Fiber Loss:</b>		_____ dB

#### B. Calculate the Total Connector/Splice Loss

2. Calculate Connectors/couplers Loss: (exclude Tx and Rx connectors)	Individual Connector Loss (times) Number of Connector Pairs (equal) <b>Total Connector Loss:</b>	0.4 dB x _____ = _____ dB
3. Calculate Splice Loss:	Individual Splice Loss (times) Number of Splices (equal) <b>Total Splice Loss:</b>	0.1 dB x _____ = _____ dB
4. Calculate Other Components Loss:	<b>Total Components:</b>	_____ dB
5. Calculate Total Losses:	Total Connector Loss (plus) Total Splice Loss (plus) Total Components (equal)	+ _____ dB + _____ dB + _____ dB =
<b>Total Connector/Splice Loss:</b>		_____ dB

#### C. Calculate Active Component Link Loss Budget

System Wavelength:	_____ nm
Fiber Type:	Singlemode
Average Transmitter Output (Launch Power):	_____ dBm
Receiver MAX Sensitivity (10 <sup>-9</sup> BER) (minus)	_____ dBm
Receiver MIN Sensitivity (equal)	- _____ dBm =
<b>Receiver Dynamic Range:</b>	
6. Calculate Active Component Link Loss Budget:	Average Transmitter Output (Launch Power) (minus) Receiver MAX Sensitivity (equal)
	_____ dBm - _____ dBm =
<b>Active Component Link Loss Budget:</b>	
	_____ dB

#### D. Verify Performance

7. Calculate System Performance Margin to Verify Adequate Power:	Active Component Link Loss Budget [C] (minus) _____ dB Passive Cable Attenuation [A] (minus) - _____ dB Total Connector/Splice Loss [B] (equal) - _____ dB =
<b>System Performance Margin:</b>	
_____ dB	



**APPENDIX C****Optical Modem Test****Worksheet**

Contract No. \_\_\_\_\_

Contractor: \_\_\_\_\_

Operator: \_\_\_\_\_

Date: \_\_\_\_\_

Location: \_\_\_\_\_

DS-1 Optical Modem, Modem No. :	_____ dB	3A
Optical Receiver Power (max) into modem (10 9 BER)	_____ dB	3B
Optical Receiver Level (minimum) into modem	_____ dB	3C
Receiver Dynamic Range (3A-3B):		

DS-1 Optical Modem, Modem No. :	_____ dB	4A
Optical Receiver Power (max) into modem (10 9 BER)	_____ dB	4B
Optical Receiver Level (minimum) into modem	_____ dB	4C
Receiver Dynamic Range (4A-4B):		

DS-1 Optical Modem, Modem No. :	_____ dB	5A
Optical Receiver Power (max) into modem (10 9 BER)	_____ dB	5B
Optical Receiver Level (minimum) into modem	_____ dB	5C
Receiver Dynamic Range (5A-5B):		

DS-1 Optical Modem, Modem No. :	_____ dB	6A
Optical Receiver Power (max) into modem (10 9 BER)	_____ dB	6B
Optical Receiver Level (minimum) into modem	_____ dB	6C
Receiver Dynamic Range (6A-6B):		

**SECTION 10-3. SIGNALS, LIGHTING AND ELECTRICAL SYSTEMS****10-3.01 DESCRIPTION**

[Fiber optic system and traffic operation system](#) shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

**10-3. CONDUIT**

Conduit to be installed underground [and in a foundation](#) shall be Type 3 unless otherwise specified.

Conduit sizes shown on the plans and specified in the Standard Specifications and these special provisions are referenced to metallic type conduit. When rigid non-metallic conduit is required or allowed, the nominal equivalent industry size shall be used as shown in the following table:

Size Designation for Metallic Type Conduit	Equivalent Size for Rigid Non-metallic Conduit
21	20
27	25
41	40
53	50
63	65
78	75
103	100

Conduit runs shown on the plans to be located behind curbs may be installed in the [paved shoulder, including freeway shoulders](#), within 0.9-m of, and parallel with the face of the curb, by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications. [Unless the trenching is within an area to receive a pavement overlay, the Trenching in pavement method shall be modified as shown on the plans with the T-Trench Detail.](#) Pull boxes shall be located behind the curb or at the locations shown on the plans.

After conductors have been installed, the ends of [all](#) conduits shall be sealed with an approved type of sealing compound.

At those locations where conduit is required to be installed under pavement and existing underground facilities require special precautions in conformance with the provisions in "Obstructions" of these special provisions, conduit shall be placed by the "Trenching in Pavement Method" in conformance with the provisions in Section 86-2.05C, "Installation," of the Standard Specifications. [Trenching in pavement method required due to the existence of high risk facilities, not in areas to receive a pavement overlay, shall be modified as shown on the plans with the T-Trench Detail.](#)

At other locations where conduit is required to be installed under pavement and if a delay to vehicles will not exceed 5 minutes, conduit may be installed by the "Trenching in Pavement Method." [Unless the trenching is within an area to receive a pavement overlay, the Trenching in pavement method shall be modified as shown on the plans with the T-Trench Detail.](#)

**10-3. PULL BOXES**

Pull boxes shall be the non-PCC type when not in a concrete surface, asphalt concrete surface, or where the pull box is not adjacent to a standard.

A pull box marker shall be placed at each pull box not in a concrete surface, asphalt concrete surface, or where the pull box is not adjacent to a standard. Markers shall comply with Class 2 metal post as shown on Standard Plan Sheet A73C except no reflectorization will be required. A State-furnished non-reflective green identification strip shall be applied to each metal post.

**10-3. CONDUCTORS AND WIRING**

Splices shall be insulated by "Method B" The minimum insulation thickness, at any point, for Type USE, RHH or RHW wire shall be 1.0 mm for conductor sizes No. 14 to No. 10, inclusive, and 1.3 mm for No. 8 to No. 2, inclusive. The minimum insulation thickness, at any point, for Type THW and TW wires shall be 0.69 mm for conductor sizes No. 14 to No. 10, inclusive, 1.02 mm for No. 8, and 1.37 mm for No. 6 to No. 2, inclusive.

Conductors shall be pulled into conduit by hand by means of a pull rope, and the use of winches or other power actuated pulling equipment will not be permitted. The pull rope shall consist of a flat, woven, lubricated, soft-fiber polyester tape with a minimum tensile strength of 8000 N and shall have printed sequential measurement markings at least every meter.

**TESTING**

State-furnished equipment or existing facilities that fail during the functional test period will be replaced or repaired by the State or, if directed by the Engineer, by the Contractor, and such work will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

Successfully completed functional testing prior to any failure of State-furnished equipment or an existing facility will be credited to the total required test period.

Before the final insulation resistance test is performed, water shall be added to the conduit system as directed by the Engineer.

**10-3. BONDING AND GROUNDING**

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

Bonding jumpers in standards with handholes and traffic pull box lid covers shall be attached by a UL listed lug using 4.5-mm diameter or larger brass or bronze bolts and shall run to the conduit or bonding wire in the adjacent pull box. The grounding jumper shall be visible after the standard has been installed and the mortar pad and cap have been placed on the foundation.

For slip base standards or slip base inserts, bonding shall be accomplished by jumpers attached to UL listed ground clamps on each anchor bolt, or a UL listed lug attached to the bottom slip base plate with a 4.5-mm diameter or larger brass or bronze bolt.

Equipment bonding and grounding conductors are required in conduits, except when the conduits contain only combinations of fiber optic cable, or signal interconnect cable. A No. 8 minimum, bare copper wire shall run continuously in circuits, except for series lighting circuits, where No. 6 bare copper wire shall run continuously. The bonding wire size shall be increased

to match the circuit breaker size in conformance with the Code, or shall be as shown on the plans. Conduits to be installed for future conductors, may omit the copper wire.

Bonding of metallic conduits in metal pull boxes shall be by means of bonding bushings and bonding jumpers connected to the bonding wire running in the conduit system.

### **10-3. FIBER OPTIC SYSTEM CONDUIT**

#### **INTERNAL TRENCH MARKERS**

Fiber optic trench marker tape shall be placed in all trenches containing fiber optic cable. The tape shall be at least 75 mm wide and shall be placed as shown on the plans.

#### **EXTERNAL TRENCH MARKERS**

A marker shall be placed at 100-meter increments and at each vault. Markers shall comply with Class [2 metal post](#), Flexible Post Delineators as shown on Standard Plan Sheet A73C. In the reflectorized portion there shall be placed the letters “FO”.

Full compensation for furnishing and installing pull box markers and applying “FO” markings shall be considered as included in the contract lump sum price paid for the fiber optic system and no separate payment will be made therefore.

#### **TRENCH TRACER WIRE**

A #8 copper tracer wire shall be installed in all trenches containing fiber optic cable. The wire shall be placed as shown on the plans. Each tracer wire shall have continuity between adjacent vaults and controller cabinet, and must terminate inside each vault and controller cabinet with 150 mm of wire extending into the vault.

#### **FIBER OPTIC CONDUIT**

Conduit shall be installed by the trenching in pavement method described in the standard specifications except as modified by the details on the plans.

#### **CONDUIT MATERIAL**

High Density polyethylene (HDPE) with a minimum sidewall rating of SDR 11 or Type 3. All ducts for fiber optic cable located on or inside bridges or other highway structures, or conduit that is exposed in any way to the elements (not buried in a trench), shall be composed of UVB resistant, bulletproof fiberglass, rated for – 40 degrees C to + 275 degrees C operation, and capable of withstanding a direct hit from a .45 caliber pistol at not less than 6 meters. Exposed conduits shall be black in color. Bulletproof conduits shall have a minimum inside diameter of 100 mm, and have 4 inner-ducts having an inside diameter of not less than 32 mm. The same material shall be used for all conduits between vaults located at the ends of bridges or other structures. No conversion from one type of conduit to another in between vaults is permitted.

#### **CONDUIT BENDS**

The minimum bend radius for all fiber optic conduits shall be 1200 mm.

### **CONDUIT TESTING**

After conduit installation, trench backfill, and conduit termination into vaults at each end, each conduits and inner-duct used shall be tested for uniformity over the entire length between adjacent vaults by pulling or blowing a non-deforming mandrel through the entire length of the conduit. The mandrel shall have a minimum diameter of 25.4-mm. The mandrel may be pulled or blown simultaneously with fiber or pull tape.

### **SEALING CONDUITS**

After verification of uniformity throughout the length of each conduit, unused conduits shall be watertight plugged with devices installable with hand tools. Conduits with fiber optic cable installed shall have watertight sealing plugs installed around the cable at both ends.

### **CONDUIT SPLICING**

Conduits shall be spliced with couplings rated at 869 kPa and installable with hand tools.

## Appendix 3 Work Authorization & Completion Form

Agreement Number \_\_\_\_\_

*This section to be completed by Caltrans Contract Manager*

Authorizing Authority: \_\_\_\_\_  
*Print Name*

District: \_\_\_\_\_

\_\_\_\_\_ *Address*

Date Service Ordered: \_\_\_\_\_

\_\_\_\_\_ *City, State Zip Code*

Requested Completion Date: \_\_\_\_\_

\_\_\_\_\_ *Phone Number*

Location of Work Site: \_\_\_\_\_

Known Problem: \_\_\_\_\_

Requested Service: \_\_\_\_\_

Specialized Tools or Vehicles Required: \_\_\_\_\_

Known Site Technical Information (i.e. circuit ID, element ID, etc): \_\_\_\_\_

*This section to be completed by Contractor*

\_\_\_\_\_  
*Technician Name*

On Site Arrival Time: \_\_\_\_\_

Departure Time: \_\_\_\_\_

Date and Time of \_\_\_\_\_

Completion: \_\_\_\_\_

Type of Service: \_\_\_\_\_

Billable Vehicle Used: \_\_\_\_\_

Billable Materials Used: \_\_\_\_\_

Work Performed: \_\_\_\_\_

Status of Repair (i.e.  
completed, awaiting  
material, etc): \_\_\_\_\_

If not completed, estimated  
date of completion: \_\_\_\_\_

Recommended Action (long term solution): \_\_\_\_\_

Type of Comm Equipment at Work Site (include serial #, model # and circuit ID): \_\_\_\_\_

*The information contained on this form is certified to be true and accurate to the best of my knowledge.*

\_\_\_\_\_  
*Technician Signature*

\_\_\_\_\_  
*CCM Signature*

*Distribution:*

*White - Vendor*

*Blue - Caltrans Contract Manager (CCM)*

*Yellow - Pending Order CMC*

Contractor's Name:

Contractor's Address:

Week Beginning:

Week Ending:

Employee Name:

Contract Number:

District Number:

Appendix 3.a

Agreement Number 56A0343

Page 1 of 1

Work Date	Billable Hours	Billable Mileage	Task Order Date	Task Order Number	Location Description ( include GPS reading )	Work Performed	Status
SUNDAY							
MONDAY							
TUESDAY							
WEDNESDAY							
THURSDAY							
FRIDAY							
SATURDAY							
<b>TOTALS:</b>	0.00	0.00					

Employee Name: \_\_\_\_\_

(Print)

Signature: \_\_\_\_\_

Caltrans Supervisor: \_\_\_\_\_

(Print)

Signature: \_\_\_\_\_

\_\_\_\_\_  
Status Legend

TC ----- Ticket Closed

P/M --- Pending on Material

P/U - Pending on Utility Co.

Timesheet Instructions

1. Work Date – format: MM/DD/YYYY
2. Billable Hours – Hours work charged to Caltrans
3. Billable Mileage – Mileage traveled in excess of 50 miles from the office of the designated Caltrans district contract manager.
4. Task Order Date – Date Task Order is created. Format: MM/DD/YYYY
5. Task Order Number – Number assigned by Caltrans
6. Location Description: Route, Direction, Post-mile, GPS Reading, Nearest Interchange, etc.
7. Work Performed – Brief description of work performed
8. Status – Current status of the Ticket : T/C – Ticket Closed; P/M – Pending/waiting on Material; P/U – Pending/waiting on Utility Company to fix service line; P/O – Pending – waiting on third party i.e. Construction, Maintenance Crew, etc.
9. Editing Custom Center Header ( Hidden text )– Click File; Select Page Setup; Click Header/Footer button; Click Custom Header button; Edit the Center Section to enter : Week Ending, Employee Name, Contract Number and District Number.



**ATTACHMENT 10**  
**Invitation for Bid No. 56A0343**

**QUOTES FROM SB OR DVBE SUBCONTRACTORS**

Bidder shall attach copies of **SB OR DVBE SUBCONTRACTORS** quotes from any SB or DVBE subcontractors listed in the form GSPD-05-105. Refer to instructions in IFB Section D), Items 1 C and 2 A 2).