

NOTICE INVITING SEALED BIDS

The City of Alameda invites sealed bids for a contract for the “Project” entitled: **TRAFFIC SIGNAL CONTROLLER CABINETS**.

The contract will be used to procure an initial quantity as shown on the Bid Form, and then to procure an indefinite quantity on an as-needed basis for a period of two (2) years. The contract may be extended for one year up to two times.

1. **BID SUBMITTAL, WITHDRAWAL, IRREVOCABILITY:** Bids must be submitted on the bid forms supplied by the City. Bids must be received at: City of Alameda; PUBLIC WORKS DEPARTMENT, CITY HALL WEST, 950 W. MALL SQUARE, ROOM 110, ALAMEDA, CA 94501, not later than **January 28, 2021 at 2:30PM**.

Bids received after the time set for bid opening will not be considered. Bidders are solely responsible for the cost of preparing their bids. No bidder may withdraw its bid for a period **60 days** after the date set for bid opening, except pursuant to Public Contract Code Section 5101 *et seq.*

2. **PROJECT DESCRIPTION:** The project is more specifically defined in the Contract Documents, but generally includes the purchase of twelve (12) traffic signal controller cabinets. Beyond the initial purchase quantity, the contract shall be in effect for a period of two (2) years where the City may purchase additional quantity(ies) on an as-needed basis. The additional quantity(ies) are on an as-needed basis, so if the demand is not there, then additional quantity(ies) will not be requested. There is no guarantee for any additional quantity(ies) beyond the initial bid quantity. If agreed, the City and Contractor may choose to extend the contract for one year, up to two times.
3. **CONTRACT TIME; LIQUIDATED DAMAGES:** Required delivery times are detailed in contract documents. The City will assess liquidated damages in the amount of **\$250.00** for each and every calendar day of delay in meeting the delivery requirements in excess of the contract time.
4. **REQUIRED CONTRACTOR'S LICENSE(S):** Not applicable.
5. **REGISTRATION WITH THE DEPARTMENT OF INDUSTRIAL RELATIONS:** Not used.
6. **PRE-BID CONFERENCE:** None.
7. **CONTRACT DOCUMENTS:** Electronic specifications and bidder's forms for bidding this project can only be obtained at the City of Alameda website, <https://www.alamedaca.gov/BUSINESS/Bid-on-City-Contracts>, or by calling (510) 747-7900. There is no cost for the specifications. **It is the responsibility of each prospective bidder to check the website periodically for updates, such as Addenda.**

8. **PLAN HOLDERS LIST:** The City will not be tracking who downloads the documents. Therefore, there will be no plan holders list.
9. **SECURITIES SUBSTITUTION:** Pursuant to California Public Contract Code Section 22300, and at the request and expense of the Contractor to whom the Contract is awarded, securities in a form approved by the City shall be permitted in substitution for money withheld by the City to ensure performance under the Contract.
10. **PREVAILING WAGE:** Not used.
11. **DEPARTMENT OF INDUSTRIAL RELATIONS MONITORING/ENFORCEMENT:**
Not used.
12. **WAIVER OF IRREGULARITIES.** The City reserves the right, in its sole discretion, to reject any or all Bids, to waive minor irregularities or defects in bidding and to reject nonconforming, nonresponsive or conditional bids.
13. **INQUIRIES:** If any Bidder has questions regarding this Project, contact the Project Manager: **Donya Amiri, Principal Engineer, damiri@alamedaca.gov**. Bidder shall submit any questions addressing the interpretation or clarification of the Contract Documents in writing.

Donya Amiri

Project Manager

CITY OF ALAMEDA

CONTRACT DOCUMENTS

FOR

TRAFFIC SIGNAL CONTROLLER

CABINETS

Bid No. P.W. 12-20-44

SEALED BIDS ARE DUE AT 2:30 PM, JANUARY 28, 2021

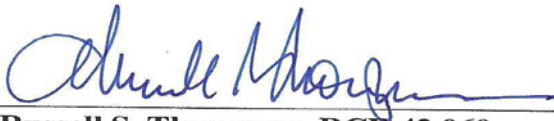
**LOCATION: PUBLIC WORKS DEPARTMENT
CITY HALL WEST
950 W. MALL SQUARE, ROOM 110
ALAMEDA, CA 94501**

NO MANDATORY PREBID MEETING

**CITY OF ALAMEDA
950 WEST MALL SQUARE #110
ALAMEDA, CA 94501
Project Manager: Donya Amiri
Email: damiri@alamedaca.gov**

CITY ENGINEER'S APPROVAL

THE PROJECT SPECIFICATIONS CONTAINED HEREIN, FOR TRAFFIC SIGNAL CONTROLLER CABINETS HAVE BEEN APPROVED BY THE CITY ENGINEER IN ACCORDANCE WITH CITY OF ALAMEDA ORDINANCE NO. 3154 AND CALIFORNIA GOVERNMENT CODE 830.6.



Russell S. Thompson, RCE 43,069
City Engineer / Coastland Civil Engineering Inc.



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GENERAL REQUIREMENTS

SECTION I. PROPOSAL AND CONTRACT REQUIREMENTS

A. GENERAL INFORMATION. The City of Alameda will receive sealed bid at the time and place specified in the advertisement calling for bids for:

TRAFFIC SIGNAL CONTROLLER CABINETS BID NO. P.W. 12-20-44

The contract will be used for the procurement of an initial twelve (12) traffic signal controller cabinets. Beyond the initial purchase quantity, the contract shall be in effect for a period of two (2) years where the City may purchase additional quantity(ies) per the contract price on an as-needed basis. The additional quantity(ies) are on an as-needed basis, so if the demand is not there, then additional quantity(ies) will not be requested. There is no guarantee for any additional quantity(ies) beyond the initial bid quantity. If agreed, the City and Contractor may choose to extend the contract for one year, up to two times.

Electronic specifications and bidder's forms for bidding this project can only be obtained at the City of Alameda website, <https://www.alamedaca.gov/BUSINESS/Bid-on-City-Contracts>, or by calling (510) 747-7900. There is no cost for the specifications. **It is the responsibility of each prospective bidder to check the website periodically for updates, such as Addenda.**

Please direct all your questions to Donya Amiri at damiri@alamedaca.gov.

The Project Manual (and any Addenda) is also available online at <https://www.alamedaca.gov/BUSINESS/Bid-on-City-Contracts>.

B. EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS AND SITE OF WORK. The bidder is required to examine carefully the site and the proposal, plans, specifications and contract forms for the work contemplated, and it will be assumed that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality and quantities of work to be performed and materials to be furnished, and as to the requirements of the specifications, the special provisions and the contract.

C. DESIGNATIONS. As used herein "City" shall mean the City of Alameda; "Council" or "City Council" shall mean the Council of the City; "City Manager" shall mean the City Manager of the City; "Engineer" or "City Engineer" shall mean the City Engineer or City Engineer's designee of the City; "Director" shall mean the Public Works Director of the City; and "Contractor" shall mean the bidder who is awarded the contract for the work.

D. PROPOSAL FORM. All bids must be made upon blank forms which are included in these specifications (Exhibit A). **All bids must include all items in Exhibit A. All bidders must have completed at least three projects of similar nature and dollar value equivalent to or exceeding this project. Furnish details of those projects on the Reference Form included in Exhibit A.**

All bids must give the prices proposed. Bids must be signed by the Bidder. If the proposal is signed by an individual, that individual's name and business address must be shown. If made by a firm or partnership, the name and the post office address of each member of the firm or partnership must be shown. If made by a corporation, the proposal must show the name of the state under the laws of which the corporation was chartered and the names, titles, and business addresses of the president, secretary and treasurer.

E. PRESENTING AND MARKING OF BIDS. Bids must be presented to the Public Works Department, 950 W. Mall Square, Room 110, Alameda, California, under sealed cover, plainly marked on the outside,

(NAME OF BIDDER)

Bid for TRAFFIC SIGNAL CONTROLLER CABINETS

Bids must be received by the Public Works Department by **2:30 p.m.** on the date set forth in the following paragraph.

Bids must be submitted on the bid forms supplied by the City. Bids must be received, no later than January 28, 2021 at 2:30PM. **City will review all submittals and award the contract within 90 days of the Bid Due Date.**

F. BIDDER'S GUARANTY. All bids shall be accompanied by one of the following forms of bidder's guaranty: cash, a cashier's check, a certified check, or a bidder's bond executed by an admitted surety insurer, made payable to the City of Alameda. The security shall be in an amount equal to at least ten percent (10%) of the amount bid. A bid shall not be considered unless one of the forms of bidder's security is enclosed with it. If, in lieu of depositing cash, a cashier's check, or a certified check, the bidder submits a bidder's bond, the said bond shall, in form, be satisfactory to the City Attorney of the City of Alameda. A Bid Bond form is provided in Exhibit A.

Said bidder's guaranty which is submitted according to the above paragraph shall, in the event of the failure, for any reason, of the successful bidder or bidders to execute the contract as awarded, be deemed to be liquidated damages to be retained in full by the City of Alameda, but shall not be construed as a penalty for failure to execute said contract. The full amount of the said bidder's guaranty shall also be retained in full by the City of Alameda as consideration payable to the City of Alameda for engineering, accounting and clerical services in formulating specifications for such bid or bids, for advertising costs to the City of Alameda in connection with such bid or bids, and further, as consideration for the award of such contract to such bidder or bidders.

Any bid bond submitted under this Section shall incorporate therein by reference, or otherwise, all of the provisions of Section I, Item F, of these specifications.

G. RETURN OF BIDDER'S GUARANTIES. Within ten (10) days after the award of the contract, the Public Works staff will return the proposal guaranties accompanying the bids which are not to be considered in making the award. All other proposal guaranties will be held until the contract has been finally executed, after which they will be returned to the respective bidders whose bids they accompanied.

H. TAXES. Bids must include all local, state and federal taxes applicable to the transaction.

I. DELIVERY. Bids must include all packaging, boxing, crating, handling, insurance, transportation, loading, and unloading to the delivery point identified by the City. Unless otherwise specifically identified, all shipments shall be FOB to the Destination identified by the City, inside delivery. The delivery location shall be: Alameda Maintenance Service Center, 1616 Fortmann Way, Alameda, CA 94501. The City reserves the right to direct delivery to an alternate location within the City of Alameda.

J. REJECTION OR RETURN OF BIDS. Bids may be rejected if they show any alterations of form, additions not called for, conditional or alternative bids, incomplete bids, erasures or irregularities of any kind. The right is reserved to reject any and all bids. The City reserves the right to return bids unopened.

K. BID PROTEST. Any bid protest must be submitted in writing to the Public Works Director, City of Alameda Public Works Department, City Hall West, 950 West Mall Square, Room 110, Alameda, CA 94501 before 5:00 p.m. of the 10th business day following bid opening.

1. The initial protest document shall contain a complete statement of the basis for the protest.
2. The protest shall refer to the specific portion of the document which forms the basis for the protest.
3. The protest shall include the name, address, and telephone number of the person representing the protesting party.
4. The party filing the protest shall concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the outcome of the protest. Such parties shall include all other Bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
5. The Public Works Director will issue a decision on the protest. If the Public Works Director determines that a protest is frivolous, the party originating the protest may be determined to be irresponsible and that party may be determined to be ineligible for future contract awards.
6. The procedure and time limits set forth in this paragraph are mandatory and are the Bidder's sole and exclusive remedy in the event of Bid protest and failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.

L. AWARD OF CONTRACT. The award of contract, if it be awarded, will be to the responsible bidder who submits the lowest and best bid and whose proposal complies with all requirements described herein. The award, if made, will be made within ninety (90) days after the opening of the bids. All bids will be compared on the basis of the Engineer's estimate of quantities of work to be done. In the event of a delay, the City reserves the right to hold the Bidder to its bid for 90 days from the date the contract is awarded.

Bid protests, contracts, bonds, insurance, and other documents identified in these specifications and these special provisions are to be delivered to the following City address: City of Alameda, City Hall West, Public Works Department, 950 West Mall Square, Room 110, Alameda, CA 94501.

SECTION II. LEGAL RELATIONS AND RESPONSIBILITIES

A. LAWS TO BE OBSERVED. The Contractor shall keep himself fully informed of all existing and future state and federal laws and all municipal ordinances and regulations of the City of Alameda which in any manner affect those engaged or employed in the work, or 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.

B. RESERVED

C. DEPARTMENT OF INDUSTRIAL RELATIONS COMPLIANCE AND PREVAILING WAGE REQUIREMENTS ON PUBLIC WORKS PROJECTS.

1. Effective January 1, 2015, no Contractor or Subcontractor may be listed on a bid proposal for a public works project (submitted after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5 (with the limited exceptions from this requirement for bid purposed only under Labor code Section 1771.1(a)). Register at <https://efiling.dir.ca.gov/PWCR>

2. No Contractor or Subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code Section 1725.5.

3. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

4. The Prime Contractor is required to post job site notices prescribed by regulations. See 8 Calif. Code Regulation §16451(d).

5. Effective April 1, 2015, All Contractors and Subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner at: <https://apps.dir.ca.gov/ecpr/das/altlogin>

D. PREVAILING WAGES:

1. The Contractor is aware of the requirements of California Labor Code sections 1720 et seq. and 1770 et seq., as well as California Code of Regulations, Title 8, section 16000 et seq. ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on certain "public works" projects. Since this Project involves a "public work" project, as defined by the Prevailing Wage Laws, Contractor shall fully comply with such Prevailing Wage Laws. Contractor's failure to comply with the Prevailing Wage Law may constitute a default under the contract for performance of the work which would entitle the City to rescind the contract or exercise other remedies as provided by law or the contract.

2. The Contractor shall obtain a copy of the prevailing rates of per diem wages at the commencement of this contract from the website of the Division of Labor Statistics and Research of the Department of Industrial Relations located at <http://www.dir.ca.gov/dlsr/>. In the alternative,

the Contractor may view a copy of the prevailing rates of per diem wages at the City's Public Works Department, Building 1, 950 W. Mall Square, Room 110, Alameda. The Contractor shall make copies of the prevailing rates of per diem wages for each craft, classification or type of worker needed to perform work on the Project available to interested parties upon request, and shall post copies at the Contractor's principal place of business and at the Project site. The Contractor shall defend, indemnify, and hold the City, its elected officials, officers, employees, volunteers, and agents free and harmless from any claims, liabilities, costs, penalties or interest arising out of any failure or alleged failure to comply with the Prevailing Wage Laws and/or the City's Labor Compliance Program (hereinafter referred to as "LCP"), if any.

3. If this project is funded in whole or in part with Federal monies and subject to the provisions of the Davis-Bacon Act, the successful bidder shall pay not less than the wage rates determined by the Secretary of Labor. The Federal wage rates shall apply unless the State wage rates are higher. The Federal Wage Rates applicable to the contract are those current within ten (10) days of the bid due date.

4. The Contractor and all subcontractors shall pay and shall cause to be paid each worker engaged in work on the Project not less than the general prevailing rate of *per diem* wages determined by the Director, regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor and such workers.

5. The Contractor and all subcontractors shall pay and shall cause to be paid to each worker needed to execute the work on the Project travel and subsistence payments, as such travel and subsistence payments are defined in the applicable collective bargaining Contracts filed with the Department of Industrial Relations in accordance with Labor Code § 1773.8.

6. If during the period any bid for work on this Project remains open, the Director of Industrial Relations determines that there has been a change in any prevailing rate of *per diem* wages in the locality in which this public work is to be performed, such change shall not alter the wage rates in the Notice calling for Bids or the contract subsequently awarded.

7. Pursuant to Labor Code §1775, the Contractor shall as a penalty to the City, forfeit Fifty Dollars (\$50.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing rate of *per diem* wages, determined by the Director, for such craft or classification in which such worker is employed for any public work done under the Contract by the Contractor or by any Subcontractor under it. The amount of the penalty shall be determined by the Labor Commission. In addition, the difference between such prevailing rate of *per diem* wage and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing rate of *per diem* wage shall be paid to each work by the Contractor.

8. Any worker employed to perform work on the Project, which work is not covered by any craft or classification listed in the general prevailing rate of *per diem* wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the craft or classification which most nearly corresponds to the work on the Project to be performed by them, and such minimum wage rate shall be retroactive to time of initial employment of such person in such craft or classification.

9. For those crafts or job classifications requiring special prevailing wage determinations, please contact the Division of Labor Statistics and Research, Prevailing Wage Unit, P.O. Box 420603, San Francisco, CA 94142-0603, (415) 703-4774 or check out the web site at <http://www.dir.ca.gov>.

- E. HOURS OF LABOR. Not used.
- F. CERTIFIED PAYROLL. Not used.
- G. APPRENTICES. Not used.
- H. LABOR DISCRIMINATION. Not used.
- I. REGISTRATION OF CONTRACTORS. Not used.
- J. PERMITS AND LICENSES. The Contractor shall procure all permits and licenses, including City of Alameda business licenses, pay all charges and fees. The cost for a City of Alameda business license is not reimbursable. Each Subcontractor shall have a current City of Alameda business license.

The following permit(s) and/or license(s) are required for this project:

1. **A City of Alameda Business License**

A City of Alameda business license can be obtained at the following address

City of Alameda
Finance Department,
2263 Santa Clara Avenue, Room 220
Alameda, CA 94501
<http://www.alamedaca.gov/BUSINESS/Business-Licensing-Permits>

- K. PATENTS. The Contractor shall assume all costs arising from the use of patented materials, equipment, devices or processes used on or incorporated in the work, and agrees to indemnify and hold harmless the City of Alameda, its officers, employees and agents from all suits at law or actions of any nature, damages, royalties and costs on account of the use of any patented materials, equipment, devices or processes.
- L. RESPONSIBILITY FOR DAMAGES. Not used.
- M. CONTRACTOR'S RESPONSIBILITY FOR THE WORK. Not used.
- N. SAFETY PROVISIONS. Not used.
- O. NO PERSONAL LIABILITY. Neither the City Council, City Manager, the City Engineer, nor any other City officer, authorized assistant or agent shall be personally responsible for any liability arising under this contract.
- P. RESPONSIBILITY OF CITY. The City of Alameda shall not be held responsible for the care or protection of any material or parts of the work prior to final acceptance, except as expressly provided in these specifications.

- Q. PUBLIC CONVENIENCE AND SAFETY. Not used.
- R. NOTICES TO CONTRACTOR. Any notice required to be given to the Contractor by the City of Alameda or by the City Engineer or by any officer of said City may be given to said Contractor at the address shown in the Contractor's proposal. Such notice may be given by mailing a copy of said notice to the Contractor to such address by United States certified mail. Evidence of such mailing shall be deemed the equivalent of personal services of said notice.
- S. UTILITIES. Not used.
- T. SOUND CONTROL REQUIREMENTS. Not used.
- U. CONSTRUCTION SITE CONTROLS. Not used.
- V. RESERVED.
- W. RESERVED.
- X. CLEAN AIR ACT OF 1970, ET SEQ. AND FEDERAL WATER POLLUTION CONTROL ACT AS AMENDED BY THE CLEAN WATER ACT OF 1977. Not used.
- Y. SUBMITTALS AND REQUEST FOR INFORMATION (RFI'S). The Contractor shall submit an RFI within five (5) business days of an event or question of fact arising under the Contract. The Engineer in charge of the project shall have ten (10) business days to respond to an RFI or any Submittal required to be made under the Contract.
- Z. COMPLIANCE WITH THE CITY'S INTEGRATED PEST MANAGEMENT POLICY:
Not used.
- AA. ENVIRONMENTAL PROTECTION AGENCY (EPA) REQUIRES CONTRACTORS TO BECOME CERTIFIED LEAD RENOVATORS. Not used.

SECTION III. SCOPE OF WORK

A. WORK TO BE DONE. In general, the work is related to supplying traffic signal controller cabinets conforming to the technical requirements. The scope of work includes, but is not limited to performing the following work:

1. Furnishing traffic signal controller cabinets,
2. Furnishing associated documentations including technical drawings (i.e., cabinet wiring diagram) and product manuals, and
3. Packaging, shipping, and delivery of the traffic signal controller cabinets to the City.

Beyond the initial purchase quantity, the contract shall be in effect for a period of two (2) years where the City may purchase additional quantity(ies) per the contract price on an as-needed basis. The additional quantity(ies) are on an as-needed basis, so if the demand is not there, then additional quantity(ies) will not be requested. There is no guarantee for any additional quantity(ies) beyond the initial bid quantity. If agreed, the City and Contractor may choose to extend the contract for one year, up to two times.

- B. ALTERATIONS. Not used.
- C. REMOVAL OF OBSTRUCTIONS. Not used.
- D. CLEAN UP. Not used.

SECTION IV. CONTROL

A. AUTHORITY OF THE ENGINEER. The Engineer shall decide all questions which may arise as to the quality or acceptability of materials furnished and work performed; the manner of performance and rate of progress of the work; the interpretation of the plans and specifications; the acceptable fulfillment of the contract on the part of Contractor; and all questions as to claims and compensation.

The Engineer's decision shall be final and he/she shall have executive authority to enforce and make effective such decisions and orders that the Contractor fails to carry out promptly.

B. PLANS. Not used.

C. CONFORMITY WITH PLANS AND ALLOWABLE DEVIATION. Not used.

D. COORDINATION OF PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS. Not used.

E. INTERPRETATION OF PLANS AND SPECIFICATIONS AND ADDENDA THERETO. Not used.

F. SUPERINTENDENCE. Not used.

G. STRIPING LAYOUT. Not used.

H. INSPECTION. The Engineer will inspect all materials supplied by the Contractor to ensure that all parts and required quantities are provided, that materials are in working order and not damaged, and that the materials meets the technical requirements.

The inspection of the work shall not relieve the Contractor of any of his/her obligations to fulfill the contract as prescribed. Defective work shall be made good and unsuitable materials may be rejected, notwithstanding the fact that such defective work and unsuitable materials have been previously overlooked by the Engineer and accepted or estimated for payment.

I. REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK. All work and materials which are defective in its construction or deficient in any of the requirements of these specifications shall be remedied, or removed and replaced by the Contractor in an acceptable manner and no compensation will be allowed for such correction.

Upon failure on the part of the Contractor to comply forthwith with any order of the Engineer made under the provisions of this article, the Engineer shall have the authority to cause defective work and materials to be remedied, or removed and replaced, and unauthorized work and materials to be removed, and to deduct the cost thereof from any monies due or to become due the Contractor.

J. FINAL INSPECTION. Whenever the work and materials provided and contemplated by the contract shall have been satisfactorily completed, the Engineer will make the final inspection.

K. FINAL GUARANTEE. It is understood that the Contractor is skilled in the trade or calling necessary to perform the work set forth within the specifications, and that the City of Alameda, not being skilled in such matters, relies upon the Contractor to do and perform all work, acts, and things necessary to carry out the contract in the most skilled and desirable manner, and the Contractor guarantees the workmanship and materials to be the best of their kind. As such, the Contractor shall provide a warranty for materials and workmanship of all supplied materials as required in the technical requirements.

SECTION V. CONTROL OF MATERIAL

A. SAMPLES AND TESTS. At the option of the Engineer, the source of supply of each of the materials shall be approved by the Engineer before delivery is started and before such material is used in the work. Representative preliminary samples of the character and quality prescribed shall be submitted by the Contractor or producer of all materials to be used in the work for testing or examination as desired by the Engineer.

All tests of materials furnished by the Contractor shall be made in accordance with commonly recognized standards of national organizations and such special methods and tests as are prescribed in these specifications.

The Contractor shall furnish such samples of materials as are requested by the Engineer without charge. No material shall be used until it has been approved by the Engineer. Samples will be secured and tested whenever necessary to determine the quality of material.

B. DEFECTIVE MATERIALS. All materials not conforming to the requirements of these specifications shall be considered as defective, and all such materials, whether in place or not, shall be rejected.

Upon failure on the part of the Contractor to comply with any order of the Engineer made under the provisions of this article, the Engineer shall have the authority to remove and replace defective material and to deduct the cost of removal and replacement from any monies due or to become due the Contractor.

SECTION VI. PROSECUTION AND PROGRESS

- A. PROGRESS OF THE WORK AND TIME FOR COMPLETION. The Contractor shall deliver the first traffic signal controller cabinet within 60 calendar days after contract award for the Engineer's inspection, testing, and acceptance. The Contractor shall make minor alterations and adjustments to the layout of cabinet components and equipment as directed by the Engineer. The Contractor shall make and complete such minor alterations and adjustments within 30 calendar days. Upon the Engineer's notice of acceptance of the first traffic signal controller cabinet, the Contractor shall deliver all remaining cabinets within 60 calendar days. The Contractor shall not deliver, and the City will not accept, any traffic signal controller cabinets until the first cabinet has been accepted by the Engineer.
- B. SUBLETTING AND ASSIGNMENT. Not used.
- C. CHARACTER OF WORKER. Not used.
- D. TEMPORARY SUSPENSION OF WORK. Not used.
- E. TIME OF COMPLETION AND LIQUIDATED DAMAGES. It is agreed by the parties to the contract that in case all the work called for is not completed within the number of calendar days stated in Section A Progress of the Work and Time of Completion, damage will be sustained by the City of Alameda, and that it is and will be impracticable to determine the actual damage which the City will sustain in the event of and by reason of such delay; and it is therefore agreed that the Contractor will pay to the City of Alameda the sum of \$250 per day for each and every day's delay beyond the time prescribed to complete the work; and the Contractor agrees to pay such liquidated damages as herein provided, and in case the same are not paid, agrees that the City of Alameda may deduct the amount thereof from any money due or that may become due the Contractor under the contract.

It is further agreed that in case the work called for is not finished and completed in all parts and requirements within the time specified, the City Council shall have the right to extend the time for completion or not, as may seem best to serve the interest of the City; and if it decides to extend the time limit for the completion of the contract, it shall further have the right to charge the Contractor and to deduct from the final payment for the work, all or any part, as it may deem proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the contract, and which accrue during the period of such extensions.

- F. SUSPENSION OF CONTRACT. If, at any time, in the opinion of the City Council, the Contractor has failed to supply an adequate working force, or material of proper quality, or has failed in any other respect to prosecute the work with the diligence and force specified and intended in and by the terms of the contract, notice thereof in writing will be served upon him; and shall he neglect or refuse to provide means for a satisfactory compliance with the contract, as directed by the Engineer, within the time specified in such notice, the City Council in any such case shall have the power to suspend the operation of the contract. Upon receiving notice of such suspension, the Contractor shall discontinue said work, or such parts of it as the City Council may designate. Upon such suspension, the Contractor's control shall terminate, and thereupon the City Council or its

duly authorized representative may take possession of all or any part of the Contractor's materials, tools, equipment and appliances upon the premises, and use the same for the purpose of completing said contract, and hire such force and buy or rent such additional machinery, tools, appliances, and equipment, and buy such additional materials and supplies at the Contractor's expense as may be necessary for the proper conduct of the work and for the completion thereof; or may employ other parties to substitute other machinery or materials, and purchase the materials contracted for, in such manner as the City Council may deem proper; or the City Council may annul and cancel the contract and relet the work or any part thereof. Any excess of cost arising therefrom over and above the contract price will be charged against the Contractor, who will be liable therefor. In the event of such suspension, all monies due the Contractor or retained under the terms of this contract shall be forfeited to the City; but such forfeiture shall not release the Contractor from liability for failure to fulfill the contract. The Contractor will be credited with the amount of money so forfeited toward any excess of cost over and above the contract price, arising from the suspension of the operations of the contract and the completion of the work by the City as above provided; the Contractor will be so credited with any surplus remaining after all just claims for such completion have been paid.

In the determination of the question whether there has been any such noncompliance with the contract as to warrant the suspension or annulment thereof, the decision of the City Council shall be binding on all parties to the contract.

G. RIGHT-OF-WAY. Not used.

SECTION VII. GENERAL MEASUREMENTS AND PAYMENT

A. MEASUREMENTS AND PAYMENT. Payment will be made to the Contractor for all commodities delivered by the Contractor pursuant to this Contract. The basis of payment will be per traffic signal controller cabinet delivered and accepted, with all required components as outline in the technical specifications. Payment of each traffic signal cabinet shall be full compensation for furnishing all labor, materials, tools and equipment and doing all the work necessary to furnish the item for which payment is being made, including all applicable taxes, packaging, handling and shipping/delivery costs.

B. PROGRESS PAYMENTS. Not used.

C. NOTICE OF COMPLETION. Not used.

D. PAYMENT OF THE RETENTION. Not used.

BID DOCUMENTS

Exhibit A

BIDDER'S PROPOSAL

Instructions to Bidders

Bidder's Proposal Form

Proposed Subcontractor Form

Security for Compensation Certificate

Project Reference Form

Bidder's Bond

IMPORTANT INSTRUCTIONS

1. Any erasure or interlineation may invalidate bid.
2. If corporation is bidder, affix seal of corporation.
3. If bidder is:
 - (a) An individual doing business under his own name, sign his own name only.
 - (b) An individual using a firm name, sign: Example, "John Doe, an individual doing business as Blank Company."
 - (c) A co-partnership, sign: Example, "Blank Company, by John Doe, President" (or other title).
4. If a firm or co-partnership, give the names of all individual co-partners composing the firm. If a corporation, state legal name of corporation; also name of president, secretary and treasurer thereof.
5. If a bid is sent by mail, write the word "Proposal" plainly on the envelope.

BIDDER’S PROPOSAL

Bid Schedule for TRAFFIC SIGNAL CONTROLLER CABINETS

Proposal to the City Council of the City of Alameda:

The undersigned declares that he has carefully examined the Specifications referred to herein, and hereby proposes to furnish all labor, materials, machinery, tools and equipment required to perform the work, and to do all the said work, in accordance with said Specifications and Special Provisions for the unit prices set forth in the following bid schedule:

Notes:

1. Blank cells in the "Unit Price" and "Extension" columns and the Total Bid line are to be filled out by the Contractor.
2. The Unit Price cost shall include all applicable taxes and delivery costs.

Bid Item #	Item Description	Unit	Quantity	Unit Price	Extension
1	Traffic Signal Controller Cabinet (Type P, NEMA TS2)	EA	5	\$	\$
2	Traffic Signal Controller Cabinet (Type P, NEMA TS2, with Variation 1 Detector Configuration)	EA	5	\$	\$
3	Traffic Signal Controller Cabinet (Hybrid NEMA TS2)	EA	1	\$	\$

TOTAL BID: _____

BIDDER: _____

TRAFFIC SIGNAL CONTROLLER CABINET CONTRACT

PROPOSED SUBCONTRACTOR FORM

The Bidder shall list the name, address, license number and Department of Industrial Relations number of each subcontractor to whom the Bidder proposes to subcontract portions of the work, as required by the provisions in Section 2-1.01, "General," and Section 2-1.10, "Subcontractor List," of the Standard Specifications. **If no subcontractors are proposed in the performance of this contract, write "None" in the first cell.**

COMPANY NAME	CA LICENSE NO.	BUSINESS ADDRESS	DESCRIPTION OF WORK	DIR NO.

(This form may be duplicated if necessary to list additional subcontractors)

BIDDER: _____

EXHIBIT A
TRAFFIC SIGNAL CONTROLLER CABINET

SECURITY FOR COMPENSATION CERTIFICATE

(Required by Paragraph 1861, California Labor Code)

To: _____

I am aware of the provisions of Section 3700 of the Labor Code of the State of California which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract.

(Signature of Bidder)

Business Address

Proposal for TRAFFIC SIGNAL CONTROLLER CABINET

PROJECT REFERENCE FORM

The Bidder must have completed at least three projects of similar nature and dollar value equivalent to or exceeding this project. Details of those projects must be provided below.

1. Project Name: _____
Owner: _____

Construction Cost: \$ _____

Construction Time: _____ Calendar Days

Owner's Representative: _____

Owner's Telephone No.: _____

Date of Substantial Completion: _____

2. Project Name: _____
Owner: _____

Construction Cost: \$ _____

Construction Time: _____ Calendar Days

Owner's Representative: _____

Owner's Telephone No.: _____

Date of Substantial Completion: _____

3. Project Name: _____
Owner: _____

Construction Cost: \$ _____

Construction Time: _____ Calendar Days

Owner's Representative: _____

Owner's Telephone No.: _____

Date of Substantial Completion: _____

BIDDER: _____

TRAFFIC SIGNAL CONTROLLER CABINET CONTRACT

BIDDER’S BOND

We,

as Principal, and as Surety are bound unto the _____, hereafter referred to as “obligee”, in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly, and severally, **THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:**

WHEREAS, the Principal is submitted to the Obligee, for

(Copy here the exact description of work, including locations as it appears on the proposal)

for which bids are to be opened per Section 1 Proposal and Contract Requirements, Paragraph E, Presenting and Marking of Bid.

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to Contractor for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with Obligee, one to guarantee faithful performance of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in full force.

In the event suit is brought upon this bond by the Obligee and judgement is recovered, the Surety shall pay all cost incurred by the Obligee in such suite, including a reasonable attorney’s fee to be fixed by the court.

The surety; for value received, hereby stipulates and agrees that the obligations of said Surety and its Bond shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

Dated: _____, 2021.

Principal

Surety

By:

CERTIFICATE OF ACKNOWLEDGMENT

State of California
County of Alameda

On this _____ day of _____ in the year 2021 before me
_____, a Notary Public, personally appeared _____

Attorney-in-fact

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (Seal)

Notary Public

TECHNICAL REQUIREMENTS

1 NEMA TS2 TRAFFIC SIGNAL CONTROLLER CABINET

This specification sets forth the minimum requirements for a Type P NEMA TS 2 Type 1 traffic-actuated controller cabinet assembly with a 16 position load bay (eight vehicle phase, four pedestrian phase, and four overlaps) and fully operational with all components and plug-ins including the malfunction management unit, bus interface units, cabinet power supply, load switches, flash transfer relays, flashers, and detectors. The controller cabinet assembly shall meet all applicable sections of the NEMA Standards Publication TS 2-2003 and Caltrans Standard Specifications and Standard Plans.

Cabinet

The controller cabinet shall be a new fully-wired Type P-44 (44"W x 24" D x 55" H) aluminum cabinet, TS 2 Type 1. The cabinet shall conform to Caltrans Standard Specifications and Standard Plans. The interior of the cabinet shall be painted powder coat white. The exterior of the cabinet shall be painted using Tiger Drylac Polyester TGIC RAL 6005 (dark green) or equivalent. The exterior of the cabinet shall then be treated with an anti-graffiti coating. The anti-graffiti coating shall be a clear material and shall not distort or change the exterior painted color of the cabinet. The anti-graffiti coating shall be TCI Anti-graffiti Clear #9810-0231 or equivalent. Follow the manufacturer's direction regarding the need to place in an oven to fully cure the coating.

The cabinet shall be wired to provide both a 10-pin "A" connector and a 55-pin "A" connector for interface to the controller unit. Either one will then be used to interface with the controller unit providing flexibility on the controller unit type (NEMA TS2-Type 1 or a NEMA TS2-Type 2 controller unit) to be used in the cabinet.

Test switches shall be provided to place test calls for each of the four pedestrian phases, the four emergency vehicle preemption channels, and all detection channels. Toggle switches placed on any panels located on the cabinet door or within the cabinet shall be protected against accidental contact and switching. In particular, the toggle switches for Auto/Flash, Controller On/Off, and Auto Stop Time/Manual Stop Time shall be protected using a toggle switch cover.

The cabinet shall also be provided with the following:

- Two (2) shelves that run along the entire width of the cabinet. The shelves shall be adjustable to vary in height placement relative to the bottom of the cabinet.
- Roll out aluminum document drawer mounted and centered under the second/bottom shelf. This drawer shall have a hinged top cover, and it shall be of sufficient size (minimum 14" wide x 11" deep) and strength to serve as a working surface and to hold a complete set of cabinet wiring drawings and equipment programming manuals for all modules applicable to the cabinet. When the cover is closed, the drawer shall double as a resting place for documents or a laptop computer. The surface of the lid shall have a rubber non-slip surface.
- Plastic document pouch attached to the cabinet door. The document pouch shall be sized to accommodate the storage of paper documents such as the cabinet wiring diagram, signal timing sheets, product manuals, etc.

- Thermostatically controlled ventilation fan system per Caltrans Standard Specifications.
- Two (2) LED lighting panels. One mounted with the fan housing on the inside top of the cabinet near the front edge. The second mounted under the document drawer. A door switch shall turn on power to both light panels when the door is open and turn off power to both light panels when the door is closed.
- Police panel and technician test panel.
- A removable fiberglass air filter to cover the louvered opening on the front cabinet door. The air filter shall be non-corrosive, vermin, and insect-proof.
- The cabinet shall be equipped with surge protection and line filtering. Line filters shall be Eaton Aegis series ITCF12060-RJ/430-0601-IT.
- The cabinet shall include a 120 VAC power strip with surge suppression mounted to the cabinet wall (left side at the mid-shelf level) for use by ancillary cabinet equipment such as communication equipment. The power strip shall have a minimum of six outlets. The power strip shall be hard-wired to the cabinet's electrical service.

Detector Rack and Panel

Base Detector Configuration

The cabinet shall be supplied with one detector rack with eight (8) detector card positions with each position supporting two channels of detection. When fully loaded with 2-channel detectors, there shall be 16 channels of detection. The detector rack shall meet all applicable sections of the NEMA TS 2 standards. In addition, there shall be two (2) additional slot positions, located to the right of the detector slots, wired for use with the GTT Opticom model 764 phase selector module. The detector rack shall be mounted to the top shelf against the left edge of the cabinet interior.

The detector panel for termination of field detector lead-in cables (DLCs) shall be wired and sized to accommodate at least 32 channels of detection.

Variation 1 Detector Configuration

The following serves as a variation to the base detector configuration. This configuration will be provided as a replacement to the Base Detector Configuration when noted in the requirements.

The cabinet shall be supplied with one detector rack with four (4) detector card positions with each position supporting two channels of detection. When fully loaded with 2-channel detectors, there shall be 8 channels of detection. The detector rack shall meet all applicable sections of the NEMA TS 2 standards. In addition, there shall be two (2) additional slot positions, located to the right of the detector slots, wired for use with the GTT Opticom model 764 phase selector module. The detector rack shall be mounted to the top shelf against the left edge of the cabinet interior.

The detector panel for termination of field detector lead-in cables (DLCs) shall be wired and sized to accommodate at least 32 channels of detection.

Loadbay

The loadbay shall be wired for full traffic-actuated 8-phase operation and shall accommodate a minimum of 16 loadswitch positions. At a minimum, there shall be eight positions for the vehicle phase (positions 1 to 8), four positions for the pedestrian phase (positions 9 to 12), and four

positions for the overlap phase (positions 13-16). The loadbay shall incorporate a swing down design to facilitate ease of maintenance and repair. It shall also have service loops with sufficient slack to allow for the loadbay to swing down without any of the harnesses being unsecured. The loadbay shall also be wired to support a 16-channel malfunction management unit.

The cabinet shall be wired to flash All-Red.

Emergency Vehicle Preemption

The cabinet shall be wired to support the installation of an emergency vehicle preemption (EVP) system. The cabinet shall be wired to support four multimode (GPS and optical-based) EVP channels through the provision of rack positions for insertion of one four-channel EVP card module (GTT Opticom 764 phase selector). The rack position shall be incorporated as a position within the detector rack as noted in Detector Rack. EVP wiring within the cabinet shall allow the user to select any of the six preemption channels within TS 2 to be used. The City's standard reserves preemption channels 1 and 2 for railroad and channels 3 through 6 for emergency vehicle.

The cabinet shall be fully prewired with one GTT Model 768 interface panel. All green sensing wires shall be terminated on the load switch side of the field terminal blocks. The neutral wires shall be terminated on the cabinet neutral bus.

Other than the interface panel as noted, no other EVP equipment needs to be provided as part of this item.

Bus Interface Unit (BIU)

The BIU shall meet all applicable sections of the NEMA TS 2 specification. The BIU shall be rack-mountable and solid-state. Four BIUs shall be provided.

Cabinet Power Supply

The cabinet power supply shall meet all applicable sections of the NEMA TS 2 specification. One power supply unit shall be provided.

Load Switch

The load switch shall be solid state and meet all applicable sections of the NEMA TS 2 specification. The load switch shall have indicator lights that show the output side of the relay for the red, yellow, and green indications. Sixteen (16) load switch units shall be provided.

Flasher

The flasher shall be solid state and meet all applicable sections of the NEMA TS 2 specification. It shall have indicator lights that show the output side of the relay. Two (2) flasher units shall be provided.

Flash Transfer Relays

The flash transfer relay shall be solid state and meet all applicable sections of the NEMA TS 2 specification. Six (6) flash transfer relay unit shall be provided.

Inductive Vehicle Detectors

All detectors shall be configured as a rack mounted printed circuit board for insertion into a NEMA TS 2 detector rack. Detector units shall be in full compliance with NEMA TS 2 specifications. Detectors shall be a two-channel programmable card with front LCD display. Detectors shall be EDI Oracle/2, Reno A&E Model C, or approved equal. Four (4) two-channel detector units shall be provided.

Malfunction Management Unit

The MMU shall meet all applicable sections of the NEMA TS 2 specifications. The MMU shall be shelf-mountable, 16 channel solid-state, support NEMA and MUTCD flashing yellow arrow, and equipped with an Ethernet port for IP-based communications. The MMU shall be an EDI MMU2-16LEip or equivalent. One MMU shall be provided.

Fiber Optic Termination Panel

The cabinet shall include a wall-mount style fiber termination panel, dedicated for the termination of a fiber optic cable. The termination panel shall be designed for storage and protection of 12 single-mode optical fiber connections. The dimensions of the unit shall measure no greater than 10”H x 9”W x 4”D.

The termination panel shall consist of one or more connector panels with back-to-back connectors to provide an interconnection point between a 12-strand branch fiber optic cable and fiber optic end equipment inside the controller cabinet. The termination panel shall accept two six-position connector panels. The termination panel shall be of steel construction and shall be loaded to provide 12 LC optical fiber connections.

The panel shall be securely mounted to the right interior sidewall of the cabinet at the mid-shelf level (same level as where the controller would sit). It shall be mounted such that the fibers and connections are accessible, protected and do not interfere with access to other cabinet equipment. Any doors on the termination unit must be able to fully open without interfering with other equipment in the cabinet. The panel shall be mounted on the sidewall of the cabinet using the existing C-channels along the cabinet wall. No modifications to the cabinet sidewall will be allowed in mounting the termination panel such as drilling holes in the cabinet wall.

Documentation

All cabinet wiring shall be incorporated into one schematic drawing. Each cabinet shall be provided with three schematic drawings. Drawings shall indicate the intersection name and phasing.

Operational/repair manuals for each component and plug-in shall be provided with each cabinet.

Testing

Each controller assembly shall be tested by the manufacturer, or by an independent testing lab, prior to delivery. The controller cabinet shall be tested as a complete unit (including all plug-ins

provided) under a continuous signal load for a minimum of 72 hours. The cabinet shall be tested for all phases (8 vehicles, 4 peds, and 4 overlaps) and all detection channels. Each cabinet assembly shall be delivered with a signed certification by the manufacturer or testing lab with a checklist detailing the results of the test performed on the cabinet assembly.

Warranty

The controller assembly including all the supplied components shall be warranted by the manufacturer against mechanical and electrical defects for a minimum period of 2 years. The manufacturer's warranty shall be supplied in writing with the cabinet.

Any defects in design, workmanship or material shall be corrected by the supplier during the warranty period at no cost to the City of Alameda. All cost of labor, parts and transportation to and from the vendor shall be borne by the vendor for the duration of the warranty period. The vendor shall provide all revisions to any equipment furnished under these specifications, at no cost to the City of Alameda.

2 HYBRID NEMA TS2 TRAFFIC SIGNAL CONTROLLER CABINET

This specification sets forth the minimum requirements for a NEMA TS 2 Type 1 traffic-actuated controller assembly housed within a Model 332 cabinet with a 16 position load bay (eight vehicle phase, four pedestrian phase, and four overlaps) and fully operational with all components and plug-ins including the malfunction management unit, bus interface units, cabinet power supply, load switches, flash transfer relays, flashers, and detectors. The controller cabinet assembly shall meet all applicable sections of the NEMA Standards Publication TS 2-2003, Caltrans TEES, and Caltrans Standard Specifications and Standard Plans.

Cabinet

The cabinet enclosure shall be a Model 332 aluminum housing meeting Caltrans TEES requirements. The cabinet enclosure shall include, but not be limited to, enclosures, doors, hinges, gasketing, ventilation, latches, locks, police panel, cage supports, and mounting devices. The cabinet shell shall be a dual door enclosure with front and rear doors. The cabinet height shall not exceed 67" overall including a minimum of 4 inches of clearance below the rack assembly.

The cabinet shall conform to Caltrans Standard Specifications and Standard Plans. The interior of the cabinet shall be painted powder coat white. The exterior of the cabinet shall be painted using Tiger Drylac Polyester TGIC RAL 6005 (dark green) or equivalent. The exterior of the cabinet shall then be treated with an anti-graffiti coating. The anti-graffiti coating shall be a clear material and shall not distort or change the exterior painted color of the cabinet. The anti-graffiti coating shall be TCI Anti-graffiti Clear #9810-0231 or equivalent. Follow the manufacturer's direction regarding the need to place in an oven to fully cure the coating.

A standard Electronic Industries Alliance (EIA) 19-inch rack cage rails shall be installed inside the housing for mounting of the controller unit and cabinet assemblies. The EIA rack portion of the cage shall consist of 2 pairs of continuous adjustable equipment mounting angels. The angles shall be tapped with 10-32 threads with EIA universal spacing. The angle shall comply with standard EIA-310-B and shall be supported at the top and bottom by either welded or bolted support angels to form a cage.

The cabinet shall also be provided with the following:

- The cabinet ventilation shall include an intake, exhaust, filtration, fan assembly, and environmental controls. Each electric fan shall be equipped with a ball or roller bearing and have a capacity of minimum 100 Cubic Feet per Minimum (cfm). The fan shall be mounted with the housing and be vented. The fan shall be thermostatically controlled and shall be manually adjustable between 80-150 degrees Fahrenheit.
- A pullout aluminum document drawer shall be provided in the cabinet. The dimensions shall not exceed 1"H X 16"D X 13"D. The drawer shall be hinged at the top and sliding tracks shall be capable of holding 40 pounds when extended. The drawer shall be located so that access to the front panel of the controller is not restricted when a laptop computer is in use on the computer shelf. The drawer shall open to the front of the cabinet rack assembly. The surface of the lid shall have a rubber non-slip surface.

EXHIBIT B

- Plastic document pouch attached to the cabinet door. The document pouch shall be sized to accommodate the storage of paper documents such as the cabinet wiring diagram, signal timing sheets, product manuals, etc.
- LED lighting shall be incorporated into the rack assembly in both front and rear as to illuminate all of the rack mounted assemblies. There shall be door control switch for the lighting incorporated into the lighting circuit for both doors of the cabinet assembly.
- Police panel and technician test panel with the following switches: auto/flash, signal on/off, and auto/manual.
- A removable fiberglass air filter to cover the louvered opening on the cabinet doors. The air filter shall be non-corrosive, vermin, and insect-proof.

Loadbay

The output load bay assembly shall be a 19” rack mounted assembly used to house the load switches, flash transfer relays, connectors, terminal blocks, and other control devices so that complete connections can be established between the controller outputs and the field terminals. The 16-position output panel is mounted on the rear of the assembly and angled for ease of access to the field terminals from the rear door of the cabinet assembly. The terminals and facilities shall have the minimum configuration:

- Sixteen (16) load switch sockets, eight (8) flash transfer relay sockets, two (2) flasher sockets, two (2) terminals and facilities Bus Interface Units (BIU), two (2) sixteen channel detector racks with one (1) BIU each, and one Type 16 MMU A dual-row, 64-pin female DIN 41612 Type B connector shall be provided for both edges of the BIU. Two of the terminal and facilities BIU shall be an integral part of the output load bay assembly.
- All BIU rack connectors shall have pre-wired address pins corresponding to the requirements of the TS2 specification. The address pins shall control the BIU mode of operation. BIUs shall be capable of being interchanged with no additional programming. BIUs shall be half-width BIUs.
- The 16-load switch position output load bay assembly shall have all field wires accessible from the rear of rack assembly.
- All field input/output (I/O) terminals shall be identified by permanent alphanumerical labels. All labels shall use standard nomenclature per the NEMA TS2 specification.
- It shall be possible to flash either the yellow, red or NO indications on any vehicle movement by means of Molex Flash Plugs.
- Two (2) flasher sockets shall be located in the power distribution assembly and shall be capable of operating a 15amp, 2-pole, NEMA solid-state flasher. The flasher shall be well supported in the assembly.
- One RC network shall be wired in parallel with each group of three flash transfer relays and any other relay coils.
- All logic level NEMA controller and MMU input and output terminations on the output load bay assembly shall be permanently labeled.
- Terminations shall be provided as part of the output load bay assembly to provide access to the controller units programmable and non-programmable I/O when needed.

All terminals and facilities configurations shall be provided with sufficient RS-485 Port 1

communication cables to allow for the intended operation of that cabinet. Each communication cable connector shall be a 15-pin metal shell D subminiature type. The cable shall be a shielded cable suitable for RS-485 communications. Each cable shall have a Port 12 connector on each end. This will allow that no hardwiring of cables is necessary and cables can be removed without the use of hand tools.

All output load bay assemblies shall be pre-wired for a Type-16 Malfunction Management Unit.

The grounding system in the cabinet shall be divided into three separate circuits (AC Neutral, Earth Ground, and Logic Ground). These ground circuits shall be connected together at a single point.

The output load bay assembly shall incorporate a relay to remove +24 VDC from the common side of the load switches when the intersection is placed into mechanical flash. The relay shall have a momentary push button to apply power to the load switch inputs for ease of troubleshooting.

All pedestrian push button inputs from the field to the controller shall be Opto-isolated through the BIU. Pedestrian phases shall be wired on outputs 9 thru 12. Overlap phases shall be wired on outputs 13 to 16.

Power Distribution Assembly

The power distribution assembly shall consist of a separate rack mountable module. The power distribution panel shall be wired to provide the necessary filtered power to the load switches, flasher, and cabinet power supply. The power distribution assembly shall be supplied with and house the following components:

- One (1) NEMA Rack Mounted cabinet power supply. The cabinet power supply shall meet the functional requirements of the current NEMA TS2 Standard. The cabinet power supply shall be a plug-in cabinet power supply, Model 1133-42 device and shall plug into the power distribution assembly.
- One (1) 16-channel rack mounted TS2 MMU unit. The MMU shall meet all applicable sections of the NEMA TS 2 specifications. The MMU shall support NEMA and MUTCD flashing yellow arrow, and equipped with an Ethernet port for IP-based communications. The MMU shall be an EDI MMU2-16LEip or equivalent.
- One (1) NEMA TYPE 5-20R GFI utility outlet
- Two (2) flasher sockets
- Internal to the PDA Assembly is the Solid State Signal Bus relay.
- Four (4) 12-position feed thru terminal blocks shall be located on a fold down door on the rear of the PDA assembly and contain terminals for all power requirements within the NEMA TS2 cabinet environment.

The hinged door on the rear of the assembly will allow for access to the MMU Interface Board (MIB). All power supply connections on the rear of the PDA assembly will be protected from accidental human contact when the hinged door is closed.

The rear of the power distribution assembly shall contain access to the MMU connections and power supply connection with plug-in devices that will interface with the terminals and facilities as required by the NEMA specification.

The rear of the power distribution assembly shall contain a minimum of five (5) power plug connectors for supplying power to existing and future cabinet assemblies for ease of connection and disconnection.

There will be an SDLC Hub assembly located on the rear of the PDA for a common connection of all SDLC connecting cables. Other hub assemblies may be located in other areas of the cabinet for additional connection of SDLC based equipment.

Detector Rack and Panel

The cabinet shall be supplied with one detector rack with eight (8) detector card positions with each position supporting two channels of detection. When fully loaded with 2-channel detectors, there shall be 16 channels of detection. In addition, there shall be two (2) additional slot positions, wired for use with the GTT Opticom model 764 phase selector module.

The detector panel for termination of field detector lead-in cables (DLCs) shall be wired and sized to accommodate at least 32 channels of detection. Each interface panel shall provide a 10-position terminal block to terminate the field wires for up to two (2) 2-channel preemption devices.

Emergency Vehicle Preemption

The cabinet shall be wired to support the installation of an emergency vehicle preemption (EVP) system. The cabinet shall be wired to support four multimode (GPS and optical-based) EVP channels through the provision of rack positions for insertion of one four-channel EVP card module (GTT Opticom 764 phase selector). The rack position shall be incorporated as a position within the detector rack as noted in Detector Rack. EVP wiring within the cabinet shall allow the user to select any of the six preemption channels within TS 2 to be used. The City's standard reserves preemption channels 1 and 2 for railroad and channels 3 through 6 for emergency vehicle.

The cabinet shall be fully prewired with one GTT Model 768 interface panel. All green sensing wires shall be terminated on the load switch side of the field terminal blocks. The neutral wires shall be terminated on the cabinet neutral bus.

Other than the interface panel as noted, no other EVP equipment needs to be provided as part of this item.

Bus Interface Unit (BIU)

The BIU shall meet all applicable sections of the NEMA TS 2 specification. The BIU shall be rack-mountable and solid-state. Four BIUs shall be provided.

Load Switch

The load switch shall be solid state and meet all applicable sections of the NEMA TS 2 specification. The load switch shall have indicator lights that show the output side of the relay for the red, yellow, and green indications. Sixteen (16) load switch units shall be provided.

Flasher

The flasher shall be solid state and meet all applicable sections of the NEMA TS 2 specification. It shall have indicator lights that show the output side of the relay. Two (2) flasher units shall be provided.

Flash Transfer Relays

The flash transfer relay shall be solid state and meet all applicable sections of the NEMA TS 2 specification. Six (6) flash transfer relay unit shall be provided.

Inductive Vehicle Detectors

All detectors shall be configured as a rack mounted printed circuit board for insertion into a NEMA TS 2 detector rack. Detector units shall be in full compliance with NEMA TS 2 specifications. Detectors shall be a two-channel programmable card with front LCD display. Detectors shall be EDI Oracle/2, Reno A&E Model C, or approved equal. Four (4) two-channel detector units shall be provided.

Fiber Optic Termination Panel

The cabinet shall include a rack-mount style fiber termination panel, dedicated for the termination of a fiber optic cable. The termination panel shall be designed for storage and protection of 12 single-mode optical fiber connections. The dimensions of the unit shall be full width of the rack and one rack-unit in height.

The termination panel shall consist of one or more connector panels with back-to-back connectors to provide an interconnection point between a 12-strand branch fiber optic cable and fiber optic end equipment inside the controller cabinet. The termination panel shall accept two six-position connector panels. The termination panel shall be of steel construction and shall be loaded to provide 12 LC optical fiber connections.

The panel shall be securely rack-mounted above the controller unit. It shall be mounted such that the fibers and connections are accessible, protected and do not interfere with access to other cabinet equipment. Any doors on the termination unit must be able to fully open without interfering with other equipment in the cabinet.

Documentation

All cabinet wiring shall be incorporated into one schematic drawing. Each cabinet shall be provided with three schematic drawings. Drawings shall indicate the intersection name and phasing.

Operational/repair manuals for each component and plug-in shall be provided with each cabinet.

Testing

Each controller assembly shall be tested by the manufacturer, or by an independent testing lab, prior to delivery. The controller cabinet shall be tested as a complete unit (including all plug-ins provided) under a continuous signal load for a minimum of 72 hours. The cabinet shall be tested for all phases (8 vehicles, 4 peds, and 4 overlaps) and all detection channels. Each cabinet assembly shall be delivered with a signed certification by the manufacturer or testing lab with a checklist detailing the results of the test performed on the cabinet assembly.

Warranty

The controller assembly including all the supplied components shall be warranted by the manufacturer against mechanical and electrical defects for a minimum period of 2 years. The manufacturer's warranty shall be supplied in writing with the cabinet.

Any defects in design, workmanship or material shall be corrected by the supplier during the warranty period at no cost to the City of Alameda. All cost of labor, parts and transportation to and from the vendor shall be borne by the vendor for the duration of the warranty period. The vendor shall provide all revisions to any equipment furnished under these specifications, at no cost to the City of Alameda.