

Meeting Date: 7/14/2015

Report Type: Consent

Report ID: 2015-00536

Title: Contract: Meter Shop Electrical Improvements Project

Location: District 5

Recommendation: Pass a Resolution 1) approving the contract plans and specifications for the Meter Shop Electrical Improvements Project; 2) awarding the contract to J.R. Sharp Construction, in an amount not-to-exceed \$99,000; and 3) authorizing budget transfers to fund the project.

Contact: Dan Sherry, Engineering & Water Resources Manager, (916) 808-1419; Dave Hansen, Supervising Engineer, (916) 808-1421, Department of Utilities

Presenter: None

Department: Department Of Utilities

Division: Electrical & Instrumentation

Dept ID: 14001361

Attachments:

1-Description/Analysis

2-Background

3-Location Map

4-Resolution

5-Meter Shop Electrical Improvements Project Contract

City Attorney Review

Approved as to Form

Joe Robinson

7/6/2015 3:00:06 PM

Approvals/Acknowledgements

Department Director or Designee: Bill Busath - 6/26/2015 11:30:07 AM

Description/Analysis

Issue Detail: The City of Sacramento water meter testing facility serves the City water distribution system by testing individual water meters. Presently the test facility cannot adequately service the present and future number of meters in the system. To meet the required testing criteria set forth by the American Water Works Association (AWWA), the testing facility needs to be upgraded to include increased meter testing (for both size and number), automation, and water conservation features. Upgrading this system will facilitate increased meter accuracy for billing of residential, commercial, industrial and wholesale customers.

The City purchased the mechanical equipment for testing meters from the MARS Company under a separate contract. The Meter Shop Electrical Improvements Project will install the electrical system that will provide power and complete the installation of the mechanical equipment.

Policy Considerations: This action is in conformance with City Code Chapter 3.60 Articles I and III, which provide that the City Council may award competitively bid contracts to the lowest responsible bidder.

Economic Impacts: This project is expected to create 0.67 total jobs (0.40 direct jobs and 0.27 jobs through indirect and induced activities) and create \$116,733 in total economic output (\$79,375 of direct output and another \$37,358 of output through indirect and induced activities).

The indicated economic impacts are estimates calculated using a calculation tool developed by the Center for Strategic Economic Research (CSER). CSER utilized the IMPLAN input-output model (2009 coefficients) to quantify the economic impacts of a hypothetical \$1 million of spending in various construction categories within the City of Sacramento in an average one-year period. Actual impacts could differ significantly from the estimates and neither the City of Sacramento nor CSER shall be held responsible for consequences resulting from such differences.

Environmental Considerations: The Community Development Department, Environmental Planning Services Division Manager has reviewed the proposed project and has determined that this project is exempt from the California Environmental Quality Act (CEQA), under CEQA Guidelines Section numbers 15301 and 15302(c). The project consists of the operation, repair and minor alteration of existing facilities and mechanical equipment used to provide public utility services involving negligible expansion of use, and the replacement of existing utility systems and facilities involving negligible or no expansion of capacity.

Sustainability: The project is consistent with the Sustainability Master Plan goals to help to improve water conservation awareness, by ensuring that the City's various water meters are accurately measuring the water use of our customers.

Commission/Committee Action: Not Applicable

Rationale for Recommendation: This project was advertised and six bids were received and opened on May 13, 2015. The bids are summarized below:

| | Name of Bidder | Location | Amount of Bid |
|----|------------------------------|----------------|---------------|
| 1. | Vasko Electric | Sacramento | \$ 78,890.00 |
| 2. | J.R. Sharp Construction Inc. | Grass Valley | \$ 99,000.00 |
| 3. | Mitchell Electric | Citrus Heights | \$128,000.00 |
| 4. | Elite Power | Sacramento | \$130,625.00 |
| 5. | Lords Electric, Inc. | Sacramento | \$134,760.00 |
| 6. | Allesandro Electric | Sacramento | \$158,629.00 |

The engineer's estimate was \$125,000.

The low bidder, Vasko Electric, discovered a mistake and withdrew its bid, pursuant to State law governing bid withdrawals. A bid protest was then filed by the third low bidder, Mitchell Electric, which contended that the second low bid submitted by J.R. Sharp Construction Inc. was not responsive, due to an omission on the Subcontractor Verification form included in the bid. Pursuant to the City's bid protest ordinance, staff investigated the bid protest and issued a written response determining that J.R. Sharp's bid was responsive and that the bid protest should be rejected. Mitchell Electric subsequently withdrew its bid protest. Staff recommends award of the contract to J.R. Sharp Construction Inc. as the lowest responsive and responsible bidder.

Financial Considerations: The total estimated project cost including design, construction, inspection and contingency is \$1,232,000 to upgrade the meter shop facilities. This figure includes all aspects of the project and not just the electrical portion. The project budget of \$1,070,000 does not provide sufficient funding to award the contract of \$99,000 and complete the overall project. Therefore, staff is requesting authorization to transfer water funds (Fund 6005) in the amount of \$162,000 from the Base CIP Contingency - Water Z14000700 fund 6005 to the Meter Shop Rehab Z14110800.

Local Business Enterprise (LBE): J.R. Sharp Construction Inc. is a LBE firm.

BACKGROUND

The City of Sacramento water meter test facility serves the City water distribution system by testing individual water meters. Presently the test facility cannot adequately service the present and future number of meters in the system. To meet the required testing criteria set forth by the American Water Works Association the testing facility needs to be upgraded to include increased meter testing (for both size and number), automation, and water conservation features.

To upgrade the testing facility the City has purchased the water meter test equipment from the MARS Company and the water tanks from Quality Stainless Steel Tanks on separate contracts. This equipment consists of the following:

- Three new water meter test benches to test various sizes of water meters.
- A 13,500 gallon recirculation water tank.
- A 11,500 gallon scaled/weighed water tank.
- Interconnecting piping.
- Three consoles for each of the three test benches.

The Meter Shop Electrical Improvements project will install the electrical system that will provide power and complete the installation of the new water meter test equipment.

This project is located within Building 8 at the 24th Avenue City Corporation Yard.

RESOLUTION NO. XXXX

Adopted by the Sacramento City Council

CONTRACT AWARD AND BUDGET AMENDMENT FOR THE METER SHOP ELECTRICAL IMPROVEMENTS PROJECT (Z14110800)

BACKGROUND

- A. The Meter Shop Electrical Improvements project will install the electrical system for the new meter shop test benches, which will allow the City to accurately test various water meters to ensure accuracy.
- B. The Meter Shop Electrical Improvements project was advertised and bids were received on May 13, 2015. J.R. Sharp Construction is the lowest responsive and responsible bidder.
- C. A budget augmentation of \$162,000 is required to provide sufficient funding to award the contract and complete the overall project.

BASED ON THE FACTS SET FORTH IN THE BACKGROUND, THE CITY COUNCIL RESOLVES AS FOLLOWS:

- Section 1. The contract plans and specifications for the Meter Shop Electrical Improvements Project are approved, and the contract is awarded to J.R. Sharp Construction in an amount not-to-exceed \$99,000.
- Section 2. The City Manager or City Manager's designee is authorized to transfer \$162,000 from the Base CIP Contingency - Water Z14000700 (Fund 6005) to the Meter Shop Rehab Project Z14110800.

ENGINEERING SERVICES DIVISION

CONTRACT SPECIFICATIONS
FOR
METER SHOP ELECTRICAL IMPROVEMENTS

PN: Z14110800

B15141321019

Engineer's Estimate: \$125,000

*Non- Mandatory Pre Bid Site Visit: Thursday, April 31, 2015 @ 10:00 AM
Pre Bid Site Visit Location: 5730 24th Street – City Corporation Yard, South
Sacramento, CA 95822*

For Pre-Bid Information Call:

Paul Barnes
Senior Engineer
(916) 808-1442

Separate Plans

Bid to be received before 2:00 PM
May 13, 2015
City Hall, Office of the City Clerk
915 I Street, 5th Floor, Public Counter
Sacramento, CA 95814

LBE PROGRAM PARTICIPATION

For information on meeting the City of Sacramento's Local Business Enterprise (LBE) project goals, please contact Veronica A. Smith at (916) 808-1046, or visit the City of Sacramento's small business web site at:
<http://www.cityofsacramento.org/econdev/business-open/small-business-certification.cfm>

Meter Shop Electrical Improvements

(PN: Z14110800)

ADDENDUM #1

April 22, 2015

To All Potential Bidders:

Attached hereto are addenda items, which shall be incorporated into the Plans and Specifications for the above noted project. These changes shall be considered as part of the original documents, as if they were originally provided therein, and as such shall be used as contractual documents. All other terms, conditions, and specifications of the bid remain unchanged. Bidders must acknowledge receipt of this addendum prior to the hour and date specified for bids to be received by one of the following methods:

- (a) By acknowledging receipt on the sealed proposal in the space provided.
- (b) By separate letter that includes a reference to the Project Name and the Addendum Number.

Failure to acknowledge receipt of this addendum in one of the above methods and cause acknowledgment to be received prior to the hour and date specified for receipt of proposals **may result in rejection of your proposal.** If by virtue of this addendum you decide to change a proposal already submitted, such change may be made by letter, provided such letter makes reference to the Project Name and this Addendum, and is received prior to the hour and date specified for receipt of proposals.

For any questions related to this addendum, contact the Project Manager, Paul Barnes at (916) 808-1442.

Sincerely,



Dave Hansen, Supervising Engineer

Addendum
Enclosure

cc: Distribution List
Planholders

ADDENDUM No. 1

Meter Shop Electrical Improvements

(PN: Z14110800)

- Item 1 **DELETE** the Non-Mandatory Pre Bid Site Visit date of April 31, 2015 on the cover page of the contract documents and **REPLACE** with the following date: *April 30, 2015*

Meter Shop Electrical Improvements

(PN: Z14110800)

ADDENDUM #2

May 1, 2015

To All Potential Bidders:

Attached hereto are addenda items, which shall be incorporated into the Plans and Specifications for the above noted project. These changes shall be considered as part of the original documents, as if they were originally provided therein, and as such shall be used as contractual documents. All other terms, conditions, and specifications of the bid remain unchanged. Bidders must acknowledge receipt of this addendum prior to the hour and date specified for bids to be received by one of the following methods:

- (a) By acknowledging receipt on the sealed proposal in the space provided.
- (b) By separate letter that includes a reference to the Project Name and the Addendum Number.

Failure to acknowledge receipt of this addendum in one of the above methods and cause acknowledgment to be received prior to the hour and date specified for receipt of proposals **may result in rejection of your proposal.** If by virtue of this addendum you decide to change a proposal already submitted, such change may be made by letter, provided such letter makes reference to the Project Name and this Addendum, and is received prior to the hour and date specified for receipt of proposals.

For any questions related to this addendum, contact the Project Manager, Paul Barnes at (916) 808-1442.

Sincerely,



Dave Hansen, Supervising Engineer

Addendum
Enclosure

cc: Distribution List
Planholders

ADDENDUM No. 2

Meter Shop Electrical Improvements

(PN: Z14110800)

Item 1 ADD the following notes to plan sheet E-4:

11. The contractor shall penetrate the existing metal building to extend conduits to the various devices and for the main power coming into the switchgear. All building penetrations shall be made water proof.
12. The contractor shall run conduits overhead to the various devices within building 8 using the appropriate galvanized hardware and hangers. Conduits shall be installed 11' above finished grade and coordinated with the new bridge crane. Bridge crane to be installed by others.

METER SHOP ELECTRICAL IMPROVEMENTS
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SPECIAL PROVISIONS

LBE INFORMATION

The City of Sacramento's Local Business Development program establishes an annual local business enterprise (LBE) participation goal for City contracts, and authorizes City departments to require minimum LBE participation levels in individual contracts. Under City Code section 3.60.270, all bidding contractors must meet or exceed the minimum LBE participation requirement specified in the contract's bid specifications to qualify as a responsive bidder.

For information on meeting the City of Sacramento's Local Business Enterprise (LBE) project goals, please contact Veronica A. Smith at (916) 808-1046, or visit the City of Sacramento's small business web site at: <http://www.cityofsacramento.org/econdev/business-open/small-business-certification.cfm>

NOTICE TO CONTRACTORS

CITY OF SACRAMENTO

Sealed Proposals will be received by the City Clerk of the City of Sacramento at the Office of the City Clerk, City Hall, located at 915 I Street, 5th Floor, Public Counter, up to the hour of 2:00 p.m. on **May 13, 2015** and opened at and read after 2:00 p.m. on **May 13, 2015**, or as soon thereafter as business allows, in the Hearing Room, 2nd Floor Room, in Historic City Hall, for construction of:

METER SHOP ELECTRICAL IMPROVEMENTS (PN: Z14110800) (B15141321019)

as set forth in the Contract Documents.

Proposals received and work performed thereunder shall comply with the requirements of Chapter 3.60 of the Sacramento City Code. Each Bid Proposal shall be accompanied by bid security of at least 10% of the sum the Bid Proposal. The City reserves the right to reject proposals or to waive any error or omission in any Bid Proposal received. Signed proposals shall be submitted on the printed forms contained herein and enclosed in an envelope marked:

SEALED PROPOSAL FOR METER SHOP ELECTRICAL IMPROVEMENTS (PN: Z14110800) (B15141321019)

You can view and download the plans and Contract Documents from:

PLANET BIDS

<http://www.planetbids.com/portal/portal.cfm?CompanyID=15300#>

The contractor and all subcontractors shall comply with the rates of wages currently established by the Director of Industrial Relations under provisions of Sections 1773 of the Labor Code of the State of California, a copy of which is on file in the office of the City Clerk and available to any interested party on request. In accordance with Sacramento City Code Section 3.60.180 and Section 1771.5 of the California Labor Code, the payment of the general prevailing rate of per diem wages or the general prevailing rate of per diem wages for holiday and overtime is not required for any construction project of \$25,000 or less, or an alteration, demolition, repair, and maintenance project of \$15,000 or less. The City of Sacramento has an approved Labor Compliance Program. **The City uses an electronic system for the submission of Labor Compliance Reports, which became effective May 1, 2007.** The contractor and every lower-tier subcontractor shall submit certified payrolls and labor compliance documentation electronically at the discretion of and in the manner specified by the City of Sacramento.

Electronic submittal is via a web-based system, accessed on the World Wide Web by a web browser. Each contractor and subcontractor is given a Log On identification and password to access the City of Sacramento's reporting system.

Use of the system may entail additional data entry of weekly payroll information including employee identification, labor classification, total hours worked and hours worked on this project, wage and benefit rates paid, etc.. The contractor's payroll and accounting software might be capable of generating a 'comma delimited file' that will interface with the software.

Department of Industrial Relations Registration and Reporting Requirements (SB 854)

Labor Code Section 1725.5 (enacted by SB 854) requires all contractors bidding on this contract, all subcontractors listed in a bid for this contract, and any contractor or subcontractor performing any work under this contract, to be currently registered with the California Department of Industrial Relations (DIR), as specified in Labor Code Section 1725.5. Labor Code Section 1771.1 (enacted by SB 854) provides that a contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal (subject to the requirements of Section 4104 of the Public Contract Code), or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. Every bidding contractor shall list the contractor's current DIR registration number, and the current DIR registration number of all listed subcontractors, on the Subcontractor and Local Business Enterprise (LBE) Participation Verification Form included in the contractor's bid.

Pursuant to Labor Code Section 1771.1(b): (1) any bid received from a contractor that is not currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5 **shall be rejected as non-responsive**; and (2) any bid listing one or more subcontractors on the bidder's Subcontractor and Local Business Enterprise (LBE) Participation Verification Form that are not currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5, **shall be rejected as non-responsive**, unless the listing was an inadvertent error and any of the conditions specified in Labor Code Section 1771.1(c) apply.

This contract also is subject to compliance monitoring and enforcement by the DIR. For all contracts awarded on or after April 1, 2015, California Labor Code Section 1771.4 (enacted by SB 854) requires the contractor and all subcontractors to furnish electronic payroll records directly to the Labor Commissioner (in addition to City staff via the City's electronic system).

A Fact Sheet summarizing the provisions of SB 854 is attached. This is provided solely for informational purposes, and does not in any way affect the contractor's and subcontractors' obligation to comply in all respects with the provisions of SB 854, including the provisions referenced above, as well as all other applicable laws and regulations.

The contractor shall disseminate these provisions to every lower-tier subcontractor and vendor required to provide labor compliance documentation.

All questions regarding the City's Labor Compliance Program should be directed to the Department's contracts staff or the Labor Compliance Officer at (916) 808-4011.

Pursuant to Sacramento City Code Section 3.60.190, all contractors and subcontractors shall comply with Section 1777.5 et seq., of the California Labor Code governing the employment of apprentices. Pursuant to Sacramento City Code Section 3.60.250 and Public Contract Code Section 22300, any contract awarded pursuant to this invitation to bid shall contain a provision permitting the substitution of securities for monies withheld to ensure performance under the contract, in accordance with the requirements and form specified by the City.

Bid protests must be filled and maintained in accordance with the provisions of Sections 3.60.460 through 3.60.560 of the Sacramento City Code. Bid protests that do not comply with Sections 3.60.460 through 3.60.560 of the Sacramento City Code shall be invalid and shall not be considered. A bid protest fee of \$750.00 is required at the time of filing. The term "bid protest" includes any bid protest that (1) claims that one or more bidders on this contract should be disqualified or rejected for any reason, (2) contests a City staff recommendation to award this contract to a particular bidder, or (3) contests a City staff recommendation to disqualify or reject one or more bidders on this contract. A copy of Sections 3.60.460 through 3.60.560 of the Sacramento City Code may be obtained from the Project Manager, or from the City Clerk, located at 915 I Street, 5th Floor, Sacramento, CA 95814.

The Project Manager's contact information is:

Paul Barnes, Department of Utilities, Engineering & Water Resource Division
1395 35th Avenue, Sacramento, CA 95822

Phone: (916) 808-1442 / Fax: (916) 808-1497/Email: PBarnes@cityofsacramento.org

NEW PUBLIC WORKS CONTRACTOR REGISTRATION LAW [SB 854] FACT SHEET

SB 854, a budget trailer bill that was signed into law on June 20, 2014, and became effective immediately, made several significant changes to laws pertaining to the administration and enforcement of prevailing wage requirements by the Department of Industrial Relations (DIR). Among other things, SB 854 established a new public works contractor registration program to replace prior Compliance Monitoring Unit (CMU) and Labor Compliance Program (LCP) requirements for bond-funded and other specified public works projects. The fees collected through this new program will be used to fund all of DIR's public works activities, including compliance monitoring and enforcement, the determination of prevailing wage rates, public works coverage determinations, and hearing enforcement appeals.

Essentials of public works contractor registration program:

- Contractors will be subject to a registration and annual renewal fee that has been set initially at \$300. The fee is non-refundable and applies to all contractors and subcontractors who intend to bid or perform work on public works projects (as defined under the Labor Code).
- Contractors will apply and pay the fee online and must meet minimum qualifications to be registered as eligible to bid and work on public works projects:
 - Must have workers' compensation coverage for any employees and only use subcontractors who are registered public works contractors.
 - Must have Contractors State License Board license if applicable to trade.
 - Must have no delinquent unpaid wage or penalty assessments owed to any employee or enforcement agency.
 - Must not be under federal or state debarment.
 - Must not be in prior violation of this registration requirement once it becomes effective. However, for the first violation in a 12 month period, a contractor may still qualify for registration by paying an additional penalty.
- The registration fee is not related to any project. It is more like a license that enables the registrant to bid on and perform public works.

- DIR will post a list of registered contractors and subcontractors on its website so that awarding bodies and contractors will be able to comply with requirements to only use registered contractors and subcontractors.
- Various protections are built in so that
 - A contractor won't be in violation for working on a private job that is later determined to be public work;
 - The inadvertent listing of an unregistered subcontractor on a bid won't necessarily invalidate that bid;
 - A contract with an unregistered contractor or subcontractor is subject to cancellation but is not void as to past work;
 - An unregistered contractor or subcontractor can be replaced with one who is registered;
 - A contractor whose registration lapses will have a 90 day grace period within which to pay a late fee and renew.
- Registrations will begin after July 1, 2014, once the registration system is ready to go online. The preferred method of payment will be by credit card.
- The requirement to list only registered contractors and subcontractors on bids becomes effective on March 1, 2015. The requirement to only use registered contractors and subcontractors on public works projects applies to all projects awarded on or after April 1, 2015.

Essentials of Public Works Enforcement Fund:

All contractor registration fees will go into the State Public Works Enforcement Fund and be used to fund the following items --

- administration of contractor registration requirement
- all DIR costs for administering and enforcing public works laws
- Labor Commissioner's enforcement of other Labor Code violations on monitored public works projects.

DIR will no longer charge awarding bodies for prevailing wage compliance monitoring and enforcement by the CMU. (*Note: DIR will continue to bill and collect fees from awarding agencies for CMU services provided through June 20, 2014.*)

Related changes in DIR's administration and enforcement of public works requirements:

- Requirements to use CMU or specified alternative (labor compliance program or project labor agreement) for state bond-funded and other specified projects have been eliminated and replaced by requirements that apply to all public works projects (as defined under the Labor Code).
- Awarding bodies are *now* required to submit PWC-100 (contract award notice) for all public works projects. (*This requirement previously applied to about 90% of all projects.*)
- Contractors and subcontractors on *all* public works projects will be required to submit certified payroll records (CPRs) to the Labor Commissioner unless excused from this requirement.
 - This requirement will be phased in as follows:
 - Applies immediately to public works projects that have already been under CMU monitoring, *i.e.* contractors on ongoing projects that have been submitting CPRs to the CMU will continue doing so
 - Will apply to any new projects awarded on or after April 1, 2015
 - May apply to other projects as determined by Labor Commissioner
 - Will apply to all public works projects, new or ongoing, on and after January 1, 2016
 - The Labor Commissioner may make exception to this requirement for
 - Projects covered by qualifying project labor agreement
 - Projects undertaken by one of four remaining awarding bodies with legacy LCPs (Caltrans, City of Los Angeles, County of Sacramento, and Los Angeles Unified School District), so long as those LCPs remain approved by DIR
 - CPRs will be furnished online (as is done currently for CMU). DIR intends to continue making improvements to this process, including creating a means for general contractors to have online access to the CPRs submitted by their subcontractors.
- Requirements for awarding bodies to adopt and enforce a DIR-approved LCP are now limited to: (1) public works projects awarded prior to January 1, 2012 that were under a preexisting LCP requirement; and (2) projects funded in whole or in part by Proposition 84.

THE FOLLOWING DOCUMENTS
ARE TO BE COMPLETED AND
SUBMITTED WITH THE BID PACKAGE

Contractor's Name: J.R. Sharp Construction, INC.
(Please print)

CITY OF SACRAMENTO

SEALED PROPOSAL

(MUST BE SIGNED BY BIDDER)

The Sealed Proposal will be received not later than **May 13, 2015**, at the Office of the City Clerk, New City Hall, at 915 I Street, 5th Floor, Public Counter, Sacramento, California and opened at **2:00 PM**, or as soon thereafter as business allows, on **May 13, 2015**, by the Office of the City Clerk, 915 I Street, Historic City Hall, 2nd Floor, Hearing Room, Sacramento, California.

TO THE HONORABLE CITY COUNCIL:

The undersigned hereby proposes and agrees to furnish any and all required labor, material, transportation, and services for

METER SHOP ELECTRICAL IMPROVEMENTS

(PN: Z14110800) (B15141321019)

in the City and County of Sacramento, California.

TOTAL BID: ninety nine thousand dollars (\$ 99,000⁰⁰).

The work herein described is to be performed in strict conformity with the Plans, City of Sacramento Standard Specifications (Resolution No. 89-216) and these Special Provisions, all as on file in the Office of the City Clerk, at the following unit prices.

| Item No. | Description | Estimated Quantity | Unit | Total |
|----------|------------------------------------|--------------------|------|-------------------------------|
| 1 | Meter Shop Electrical Improvements | 1 | LS | \$ <u>99,000⁰⁰</u> |

TOTAL BID: \$ 99,000⁰⁰

The undersigned agrees to execute the Agreement and provide City the executed Agreement, the required insurance certificates, endorsements, and waivers of subrogation, and the required surety bonds within ten (10) calendar days after the undersigned's receipt of the City's notice that the undersigned will be recommended for Contract award and prior to award of the Contract by the City Council.

In determining the amount bid by each bidder, City shall disregard mathematical errors in addition, subtraction, multiplication and division that appear obvious on the face of the Proposal. When such a mathematical error appears on the Proposal, the City shall have the right to correct such error and to compute the total amount bid by said bidder on the basis of the corrected figure or figures.

When the unit price of an item is required to be set forth in the Proposal, and the total for the item set forth separately does not agree with a figure derived by multiplying the item unit price times the Engineer's estimate of the quantity of work to be performed for said item, the item unit price shall prevail over the sum set forth as the total for the item unless, in the sole discretion of the City, such a procedure would be inconsistent with the policy of the City's bidding procedures. The total paid for each such item of work shall be based upon the item unit price and not the total price.

Should the Proposal contain only a total price for an item and the item unit price is omitted, the City shall determine the item unit price by dividing the total price of the item by the Engineer's estimate of the quantity of work to be performed for the item of work.

If the Proposal contains neither the item price nor the total price for the item, then it shall be deemed incomplete and the Proposal shall be disregarded.

It is understood that this bid is based upon completion of the work within a period of **one hundred (100) working days** commencing on the date specified in the Notice to Proceed.

The amount of liquidated damages to be paid by the Contractor for failure to complete the work by the completion date (as extended, if applicable) shall be **five hundred dollars (\$500.00) for each calendar day**, continuing to the time at which the work is completed. Such amount is the actual cash value agreed upon as the loss to the City resulting from the default of the Contractor.

The undersigned represents and warrants that he/she has examined the location of the proposed work and is familiar with the conditions at the place where the work is to be done. The undersigned further represents that he/she has reviewed and understands the Plans, Special Provisions, and other contract documents, and the undersigned is satisfied with all conditions for the performance of the work.

The undersigned has carefully checked all of the above figures and understands that the City of Sacramento will not be responsible for any errors or omissions on the part of the undersigned in making up this bid.

This proposal shall not be withdrawn for the time periods specified in Section 3-2 of the City of Sacramento Standard Specifications for award of contract to respective low bidders. This proposal is submitted in accordance with Chapter 3.60 of the Sacramento City Code and Sections 1, 2, and 3 of the City of Sacramento Standard Specifications.

In accordance with Standard Specification Section 3-2, the City shall award this contract to the lowest responsible bidder, if such award is made, within forty-five (45) working days after opening of the Proposals. The City reserves the right to reject any and all bids.

KNOW ALL MEN BY THESE PRESENTS,

That we, J R Sharp Construction, Inc.

as Principal, and The Guarantee Company of North America USA

a corporation duly organized under the laws of the State of Michigan and duly licensed to become sole surety on bonds required or authorized by the State of California, as Surety, are held and firmly bound unto the City of Sacramento, hereinafter called the City, in the penal sum of ten percent (10%) of the (BASE OR LUMP SUM) Proposal of the Principal above named, or other amount as set forth in the Invitation to Bidders, submitted by said Principal to the City for the Work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH

That whereas the Principal has submitted the above mentioned proposal to the City, for which Proposals are to be opened by the Office of the City Clerk, Historic City Hall, Hearing Room, 2nd Floor, 915 I Street, Sacramento, California, on **May 13, 2015**, for the Work specifically described as follows:

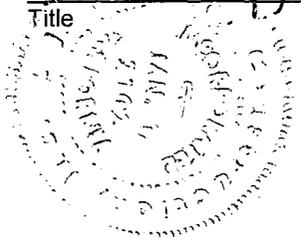
METER SHOP ELECTRICAL IMPROVEMENTS
(PN: Z14110800) (B15141321019)

NOW, THEREFORE, if the aforesaid Principal is award the Agreement and within the time and manner required under the Contract Documents, enters into a written Agreement, in the prescribed form, in accordance with the Proposal, and files two (2) bonds with the City, one to guarantee faithful performance and the other to guarantee payment for labor and materials, and files the required insurance policies with the City, all as required by the Contract Documents or by law, then the obligation shall be null and void; otherwise it shall be and remain in full force and effect.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court, which sums shall be additional to the principal amount of this bond.

IN WITNESS THEREOF, We have hereunto set our hands and seal this 27th day of April, 2015.

J R Sharp Construction, Inc.
PRINCIPAL Seal
By: *John R. Sharp*
John Sharp, President
Title



The Guarantee Company of North America USA
SURETY Seal
By: *Renee Ramsey*
Renee Ramsey, Attorney-In-Fact
Title
InterWest Insurance Services
Agent Name and Address
3636 American River Drive, 2nd Floor,
Sacramento, CA 95864
916-488-3100
Agent Phone #
925-566-6040
Surety Phone #
0B01094
California License #

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

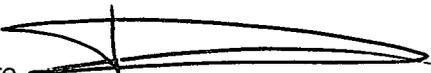
State of California
County of Sacramento)

On April 27, 2015 before me, Melissa D. Diaz, Notary Public
(insert name and title of the officer)

personally appeared Renee Ramsey,
who proved to me on the basis of satisfactory evidence to be the person(~~e~~) whose name(~~e~~) 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(~~e~~) on the instrument the
person(~~e~~), or the entity upon behalf of which the person(~~e~~) 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)





The Guarantee Company of North America USA
Southfield, Michigan

POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS: That THE GUARANTEE COMPANY OF NORTH AMERICA USA, a corporation organized and existing under the laws of the State of Michigan, having its principal office in Southfield, Michigan, does hereby constitute and appoint

Barbara Midstokke, Renee Ramsey, Richard W. Pratt, John Hopkins, Elizabeth Collodi, Bobbie Beeny, Nancy Luttenbacher
Phillip O. Watkins, Keith T. Schuler, Melissa D. Diaz, Shawna Johnson, Patricia M. Simas
Interwest Insurance Services, Inc.

its true and lawful attorney(s)-in-fact to execute, seal and deliver for and on its behalf as surety, any and all bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof, which are or may be allowed, required or permitted by law, statute, rule, regulation, contract or otherwise.

The execution of such instrument(s) in pursuance of these presents, shall be as binding upon THE GUARANTEE COMPANY OF NORTH AMERICA USA as fully and amply, to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at the principal office.

The Power of Attorney is executed and may be certified so, and may be revoked, pursuant to and by authority of Article IX, Section 9.03 of the By-Laws adopted by the Board of Directors of THE GUARANTEE COMPANY OF NORTH AMERICA USA at a meeting held on the 31st day of December, 2003. The President, or any Vice President, acting with any Secretary or Assistant Secretary, shall have power and authority:

- 1. To appoint Attorney(s)-in-fact, and to authorize them to execute on behalf of the Company, and attach the Seal of the Company thereto, bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof; and
2. To revoke, at any time, any such Attorney-in-fact and revoke the authority given, except as provided below
3. In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-in-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.
4. In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-in-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner - Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

Further, this Power of Attorney is signed and sealed by facsimile pursuant to resolution of the Board of Directors of the Company adopted at a meeting duly called and held on the 6th day of December 2011, of which the following is a true excerpt:

RESOLVED that the signature of any authorized officer and the seal of the Company may be affixed by facsimile to any Power of Attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, contracts of indemnity and other writings obligatory in the nature thereof, and each signature and seal when so used shall have the same force and effect as though manually affixed.



IN WITNESS WHEREOF, THE GUARANTEE COMPANY OF NORTH AMERICA USA has caused this instrument to be signed and its corporate seal to be affixed by its authorized officer, this 23rd day of February, 2012.

THE GUARANTEE COMPANY OF NORTH AMERICA USA

[Signature of Stephen C. Ruschak]

[Signature of Randall Musselman]

STATE OF MICHIGAN
County of Oakland

Stephen C. Ruschak, President & Chief Operating Officer

Randall Musselman, Secretary

On this 23rd day of February, 2012 before me came the individuals who executed the preceding instrument, to me personally known, and being by me duly sworn, said that each is the herein described and authorized officer of The Guarantee Company of North America USA; that the seal affixed to said instrument is the Corporate Seal of said Company; that the Corporate Seal and each signature were duly affixed by order of the Board of Directors of



Cynthia A. Takai
Notary Public, State of Michigan
County of Oakland
My Commission Expires February 27, 2018
Acting in Oakland County

IN WITNESS WHEREOF, I have hereunto set my hand at The Guarantee Company of North America USA offices the day and year above written.

[Signature of Cynthia A. Takai]

I, Randall Musselman, Secretary of THE GUARANTEE COMPANY OF NORTH AMERICA USA, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney executed by THE GUARANTEE COMPANY OF NORTH AMERICA USA, which is still in full force and effect.



IN WITNESS WHEREOF, I have thereunto set my hand and attached the seal of said Company this 27th day of April 2015

[Signature of Randall Musselman]

Randall Musselman, Secretary

City of SACRAMENTO

Subcontractor Verification Form For Public Projects under \$100,000 THIS FORM MUST BE SUBMITTED WITH THE SEALED BID PROPOSAL

To be eligible for award of this contract, the bidder shall list all subcontractors who perform work, labor, or render service in an amount in excess of one-half of 1 percent of the total bid amount. In the case of bids for the construction of streets and highways, including bridges, subcontractors whose subcontract value exceeds one-half of 1 percent of the total bid or ten thousand dollars (\$10,000), whichever is greater, shall be listed. Estimated dollar values shall be provided for **all** work/services/supplies listed. The inclusion of false information or the omission of required information will render the bid non-responsive.

| | |
|--|--|
| Prime Contractor Name | J.R. Sharp Construction INC |
| Prime Contractor Address | 20543 Gunstock Rd. Grass Valley, CA 95949 |
| (REQUIRED) Prime Contractor DIR Registration # | 1000012571 |

| | |
|------------|-------------------------|
| Date | May 13, 2015 |
| Bid Amount | \$ 99,000 ⁰⁰ |

| Business Name | Subcontractor DIR Registration # (subject to verification) | Type of Work, Services, or Supplies to be provided to complete contract | Estimated Dollar Value of Work, Services or Supplies to be Performed of Provided. |
|----------------|--|---|---|
| C.E.D. | | Supplier (LBE) | \$ 15,342.10 |
| Address | | | |
| Contact Person | | | |
| Telephone | | | |
| Email | | | |
| Business Name | | | |
| Address | | | |
| Contact Person | | | |
| Telephone | | | |
| Email | | | |
| Business Name | | | |
| Address | | | |
| Contact Person | | | |
| Telephone | | | |
| Email | | | |

COPY AND ATTACH ADDITIONAL SHEETS AS NECESSARY

I hereby certify that each subcontractor listed on this Subcontractor and LBE Participation Verification Form has been notified that it has been listed and has consented in writing to its name being submitted for this contract. Additionally, I certify that I shall notify each business entity listed on this Form, in writing, if the award is granted to my firm, and I shall make all documentation relevant to subcontractor and LBE participation available to the City of Sacramento upon request. I further certify that all information contained in this Form is true and correct and I acknowledge that the City will rely on the truth of the information in awarding the contract.

PRINCIPAL OF FIRM:

| | | |
|--|------------------------|--------------------------|
|  Signature | Title <u>President</u> | Date <u>May 13, 2015</u> |
|--|------------------------|--------------------------|

DRUG-FREE WORKPLACE POLICY AND AFFIDAVIT

BID MAY BE DECLARED NONRESPONSIVE IF THIS FORM (COMPLETED) IS NOT ATTACHED.
Pursuant to City Council Resolution CC90-498 dated 6/26/90 the following is required.

The undersigned contractor certifies that it and all subcontractors performing under this contract will provide a drug-free workplace by:

1. Publishing a "Drug-Free Workplace" statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Establishing a Drug-Free Awareness Program to inform employees about:
 - a. The dangers of drug abuse in the workplace.
 - b. The contractor's policy of maintaining a drug-free workplace.
 - c. Any available drug counseling, rehabilitation, and employee assistance program.
 - d. The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.
3. Notify employees that as a condition of employment under this contract, employees will be expected to:
 - a. Abide by the terms of the statement.
 - b. Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace.
4. Making it a requirement that each employee to be engaged in the performance of the contract be given a copy on the "Drug-Free Workplace" statement.
5. Taking one of the following appropriate actions, within thirty (30) days of receiving notice from an employee or otherwise receiving such notice, that said employee has received a drug conviction for a violation occurring in the workplace:
 - a. Taking appropriate disciplinary action against such an employee, up to and including termination; or
 - b. Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement or other appropriate agency.

* I certify that no person employed by this company, corporation, or business has been convicted of any criminal drug statute violation on any job site or project where this company, corporation, or business was performing work within three years of the date of my signature below.

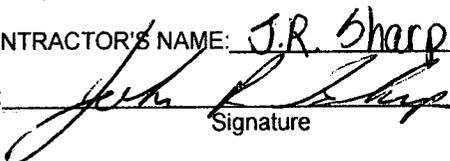
EXCEPTION:

| Date | Violation Type | Place of Occurrence |
|--|----------------|---------------------|
| If additional space is required use back of this form. | | |

*The above statement will also be incorporated as a part of each subcontract agreement for any and all subcontractors selected for performance on this project.

IN THE EVENT THIS COMPANY, CORPORATION, OR BUSINESS IS AWARDED THIS CONSTRUCTION CONTRACT, AS A RESULT OF THIS BID; THE CONTRACTOR WITH HIS/HER SIGNATURE REPRESENTS TO THE CITY THAT THE INFORMATION DISCLOSED IN THIS DOCUMENT IS COMPLETE AND ACCURATE. IT IS UNDERSTOOD AND AGREED THAT FALSE CERTIFICATION IS SUBJECT TO IMMEDIATE TERMINATION BY THE CITY.

The Representations Made Herein On This Document Are Made Under Penalty Of Perjury.

CONTRACTOR'S NAME: J.R. Sharp Construction, INC
BY:  Signature President Title Date: May 13, 2015

Effects of violations: a. Suspension of payments under this contract. b. Suspension or termination of the contract. c. Suspension or debarment of the contractor from receiving any contract from the City of Sacramento for a period not to exceed five years.
FM 681 7/10/9

MINIMUM QUALIFICATIONS QUESTIONNAIRE

Sacramento City Code Section 3.60.020 authorizes the Sacramento City Council to adopt standard minimum qualifications for bidders on competitively bid public works construction projects, and requires, among other provisions, that a bidder meet such minimum qualifications at the time of bid opening in order to bid. On July 31, 2007, the City Council adopted Resolution No. 2007-574 establishing these standard minimum qualifications. Pursuant to City Code section 3.60.020, a bidder failing to meet these minimum qualifications at the time of bid opening shall not be considered a responsible bidder for purposes of bidding on the subject project.

All bidders must demonstrate compliance with the minimum qualifications established by Resolution No. 2007-574 by completing all of the questions contained in this questionnaire. Bidder responses shall be limited to those operating business units, offices, branches and/or subsidiary divisions of the bidder that will be involved with the performance of any project work if awarded the contract. If a bidder answers "yes" to any single question, fails to submit a fully completed questionnaire, or submits false information, this will result in a determination that the minimum qualifications are not met, and the bidder shall not be considered a qualified bidder for purposes of bidding on this contract. If two or more entities submit a bid on a contract as a Joint Venture, each entity within the Joint Venture must separately meet these minimum qualifications for the Joint Venture to be considered a qualified bidder.

The City of Sacramento ("City") shall make its determination on the basis of the submitted questionnaire, as well as any relevant information that is obtained from others or as a result of investigation by the City. While it is the intent of this questionnaire to assist the City in determining whether bidders possess the minimum qualifications necessary to submit bids on the City's competitively bid public works construction contracts, the fact that a bidder submits a questionnaire demonstrating that it meets these minimum qualifications shall not in any way limit or affect the City's ability to: (1) review other information contained in the bid submitted by the bidder, and additional relevant information, and determine whether the contractor is a responsive and/or responsible bidder; or (2) establish pre-qualification requirements for a specific contract or contracts.

By submitting this questionnaire, the bidder consents to the disclosure of its questionnaire answers: (i) to third parties for purposes of verification and investigation; (ii) in connection with any protest, challenge or appeal of any action taken by the City; and (iii) as required by any law or regulation, including without limitation the California Public Records Act (Calif. Gov't Code sections 6250 et seq.). Each questionnaire must be signed under penalty of perjury in the manner designated at the end of the form, by an individual who has the legal authority to bind the bidder submitting the questionnaire. If any information provided by a bidder becomes inaccurate, the bidder shall immediately notify the City and provide updated accurate information in writing, under penalty of perjury.

QUESTIONNAIRE

NOTICE: For firms that maintain other operating business units, offices, branches and/or subsidiary divisions that will not be involved with the performance of any project work if the firm is awarded the contract, references hereafter to "your firm" shall mean only those operating business units, offices, branches and/or subsidiary divisions that will be involved with the performance of any project work.

All of the following questions regarding "your firm" refer to the firm (corporation, partnership or sole proprietor) submitting this questionnaire, as well as any firm(s) with which any of your firm's owners, officers, or partners are or have been associated as an owner, officer, partner or similar position within the last five years

The firm submitting this questionnaire shall not be considered a responsible bidder if the answer to any of these questions is "yes", or if the firm submits a questionnaire that is not fully completed or contains false information.

1. **Classification & Expiration Date(s) of California Contractor's License Number(s) held by firm:**
A: C10 EXP 09/31/2010 812273
2. Has a contractor's license held by your firm and/or any owner, officer or partner of your firm been revoked at anytime in the last five years?
 Yes No
3. Within the last five years, has a surety firm completed a contract on your firm's behalf, or paid for completion of a contract to which your firm was a party, because your firm was considered to be in default or was terminated for cause by the project owner?
 Yes No
4. At the time of submitting this minimum qualifications questionnaire, is your firm ineligible to bid on or be awarded a public works contract, or perform as a subcontractor on a public works contract, pursuant to either California Labor Code section 1777.1 (prevailing wage violations) or Labor Code section 1777.7 (apprenticeship violations)?
 Yes No
5. At any time during the last five years, has your firm, or any of its owners, officers or partners been convicted of a crime involving the awarding of a contract for a government construction project, or the bidding or performance of a government contract?
 Yes No

6. Answer either subsection A or B, as applicable:

A. Your firm has completed three or more government construction contracts in Sacramento County within the last five years: Within those five years, has your firm been assessed liquidated damages on three or more government construction contracts in Sacramento County for failure to complete contract work on time?

NOTE: If there is a pending administrative or court action challenging the assessment of liquidated damages on a government contract within the last five years, you need not include that contract in responding to this question.

Yes No Not applicable

OR

B. Your firm has not completed at least three government construction contracts in Sacramento County within the last five years: Within the last three years, has your firm been assessed liquidated damages on three or more government construction contracts for failure to complete contract work on time?

NOTE: If there is a pending administrative or court action challenging an assessment of liquidated damages on a government contract within the last three years, you need not include that contract in responding to this question.

Yes No Not applicable

7. In the last three years has your firm been debarred from bidding on, or completing, any government agency or public works construction contract for any reason?

NOTE: If there is a pending administrative or court action challenging a debarment, you need not include that debarment in responding to this question.

Yes No

8. Has CAL OSHA assessed a total of three or more penalties against your firm for any "serious" or "willful" violation occurring on construction projects performed in Sacramento County at any time within the last three years?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

Yes No

9. Answer either subsection A or B, as preferred:

A. In the last three years has your firm had a three year average Workers' Compensation experience modification rate exceeding 1.1?

Yes

No

OR

B. In the last three years has your firm had a three-year average incident rate for total lost workday cases exceeding 10?

NOTE: Incident rates represent the number of lost workday cases per 100 full-time workers and is to be calculated as: $(N/EH) \times 200,000$, where

N = number of lost workday cases (as defined by the U.S. Dept. of Labor, Bureau of Labor Statistics)
EH = total hours worked by all employees during the calendar year
200,000 = base for 100 equivalent full-time working (working 40 hours per week, 50 weeks per year)

Yes

No

10. In the past three years, has the federal EPA, Region IX or a California Air Quality Management District or Regional Water Quality Control Board assessed penalties three or more times, either against your firm, or against the project owner for a violation resulting in whole or in part from any action or omission by your firm on a project on which your firm was a contractor in Sacramento County?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

Yes

No

11. In the past three years, has the federal EPA, Region IX or a California Air Quality Management District or Regional Water Quality Control Board assessed a single penalty of \$100,000 or more, either against your firm, or against the project owner for a violation resulting in whole or in part from any action or omission by your firm on a project on which your firm was the contractor in Sacramento County?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

Yes No

12. In the past three years, have civil penalties been assessed against your firm pursuant to California Labor Code 1777.7 for violation of California public works apprenticeship requirements, three or more times?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

Yes No

13. In the past three years, has a public agency in California withheld contract payments or assessed penalties against your firm for violation of public works prevailing wage requirements, three or more times?

NOTE: If there is a pending administrative or court action appealing a withholding or penalty assessment, you need not include that withholding or penalty assessment in responding to this question.

Yes No

14. Has your firm been assessed penalties for violation of public works prevailing wage requirements in California, in an aggregate amount for the past three years of \$50,000 or more?

NOTE: If there is a pending administrative or court action appealing a penalty assessment, you need not include that penalty assessment in responding to this question.

Yes No

VERIFICATION AND SIGNATURE

I, the undersigned, certify and declare that I have read all the foregoing answers to this Minimum Qualifications Questionnaire, and know their contents. The matters stated in these Questionnaire answers are true of my own knowledge and belief, except as to those matters stated on information and belief, and as to those matters I believe them to be true. I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Signed at 20543 Gunstock Rd. Grass Valley CA, on May 13, 2015
(Location) ⁹⁵⁹⁴⁹ (Date)

Signature: 

Print name: John R. Sharp

Title: President

NOTE: If two or more entities submit a bid on a contract as a Joint Venture, each entity within the Joint Venture must submit a separate Minimum Qualifications Questionnaire.

REQUIREMENTS OF THE NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

INTRODUCTION

The Sacramento Non-Discrimination In Employee Benefits Code (the "Ordinance"), codified as Sacramento City Code Chapter 3.54, prohibits City contractors from discriminating in the provision of employee benefits between employees with spouses and employees with domestic partners, and between the spouses and domestic partners of employees.

APPLICATION

The provisions of the Ordinance apply to any contract or agreement (as defined below), between a Contractor and the City of Sacramento, in an amount exceeding \$100,000.00. The Ordinance applies to that portion of a contractor's operations that occur: (i) within the City of Sacramento; (ii) on real property outside the City of Sacramento if the property is owned by the City or if the City has a right to occupy the property; or (iii) at any location where a significant amount of work related to a City contract is being performed.

The Ordinance does not apply: to subcontractors or subcontracts of any Contractor or contractors; to transactions entered into pursuant to cooperative purchasing agreements approved by the Sacramento City Council; to legal contracts of other governmental jurisdictions or public agencies without separate competitive bidding by the City; where the requirements of the ordinance will violate or are inconsistent with the terms or conditions of a grant, subvention or agreement with a public agency or the instructions of an authorized representative of any such agency with respect to any such grant, subvention or agreement; to permits for excavation or street construction; or to agreements for the use of City right-of-way where a contracting utility has the power of eminent domain.

DEFINITIONS

As set forth in the Ordinance, the following definitions apply:

"Contract" means an agreement for public works or improvements to be performed, or for goods or services to be purchased or grants to be provided, at the expense of the City or to be paid out of moneys deposited in the treasury or out of the trust money under the control or collected by the City. "Contract" also means a written agreement for the exclusive use ("exclusive use" means the right to use or occupy real property to the exclusion of others, other than the right reserved by the fee owner) or occupancy of real property for a term exceeding 29 days in any calendar year, whether by singular or cumulative instrument, (i) for the operation or use by others of real property owned or controlled by the City for the operation of a business, social, or other establishment or organization, including leases, concessions, franchises and easements, or (ii) for the City's use or occupancy of real property owned by others, including leases, concessions, franchises and easements.

"Contract" shall not include: a revocable at-will use or encroachment permit for the use of or encroachment on City property regardless of the ultimate duration of such permit; excavation, street construction or street use permits; agreements for the use of City right-of-way where a contracting utility has the power of eminent domain; or agreements governing the use of City property that constitute a public forum for activities that are primarily for the purpose of espousing or advocating causes or ideas and that are generally protected by the First Amendment to the United States Constitution or that are primarily recreational in nature.

"Contractor" means any person or persons, firm partnership or corporation, company, or combination thereof, that enters into a Contract with the City. "Contractor" does not include a public entity.

"Domestic Partner" means any person who has a currently registered domestic partnership with a governmental entity pursuant to state or local law authorizing the registration.

"Employee Benefits" means bereavement leave; disability, life, and other types of insurance; family medical leave; health benefits; membership or membership discounts; moving expenses; pension and retirement benefits; vacation; travel benefits; and any other benefit given to employees. "Employee benefits" shall not include benefits to the extent that the application of the requirements of this chapter to such benefits may be preempted by federal or state.

CONTRACTOR'S OBLIGATION TO PROVIDE THE CITY WITH DOCUMENTATION AND INFORMATION

Contractor shall provide the City with documentation and information verifying its compliance with the requirements of the Ordinance within ten (10) days of receipt of a request from the City. Contractors shall keep accurate payroll records, showing, for each City Contract, the employee's name, address, Social Security number, work classification, straight time pay rate, overtime pay rate, overtime hours worked, status and exemptions, and benefits for each day and pay period that the employee works on the City Contract. Each request for payroll records shall be accompanied by an affidavit to be completed and returned by the Contractor, as stated, attesting that the information contained in the payroll records is true and correct, and that the Contractor has complied with the requirements of the Ordinance. A violation of the Ordinance or noncompliance with the requirements of the Ordinance shall constitute a breach of contract.

EMPLOYER COMPLIANCE CERTIFICATE AND NOTICE REQUIREMENTS

- (a) All contractors seeking a Contract subject to the Ordinance shall submit a completed Declaration of Compliance Form (attachment "A"), signed by an authorized representative, with each proposal, bid or application. The Declaration of Compliance shall be made a part of the executed contract, and will be made available for public inspection and copying during regular business hours.
- (b) The Contractor shall give each existing employee working directing on a City contract, and (at the time of hire), each new employee, a copy of the notification provided as attachment "B."
- (c) Contractor shall post, in a place visible to all employees, a copy of the notice provided as attachment "C."

**DECLARATION OF COMPLIANCE
Equal Benefits Ordinance**

J.R. Sharp Construction, INC
Name of Contractor

20543 Gunstock Rd. Grass Valley CA 95949
Address

The above named contractor ("Contractor") hereby declares and agrees as follows:

1. I have read and understand the Requirements of the Non-Discrimination In Employee Benefits Code (the "Requirements") provided to me by the City of Sacramento ("City") in connection with the City's request for proposals or other solicitations for the performance of services, or for the provision of commodities, under a City contract or agreement ("Contract").
2. As a condition of receiving the City Contract, I agree to fully comply with the Requirements, as well as any additional requirements that may be specified in the City's Non-Discrimination in Employee Benefits Code codified at Chapter 3.54 of the Sacramento City Code (the "Ordinance").
3. I understand, to the extent that such benefits are not preempted or prohibited by federal or state law, employee benefits covered by the Ordinance, are any of the following:
 - a. Bereavement Leave
 - b. Disability, life, and other types of insurance
 - c. Family medical leave
 - d. Health benefits
 - e. Membership or membership discounts
 - f. Moving expenses
 - g. Pension and retirement benefits
 - h. Vacation
 - i. Travel benefits
 - j. Any other benefit offered to employees

I agree that should I offer any of the above listed employee benefits, that I will offer those benefits, without discrimination between employees with spouses and employees with domestic partners, and without discrimination between the spouses and domestic partners of such employees.

4. I understand that I will not be considered to be discriminating in the provision or application of employee benefits under the following conditions or circumstances:
 - a. In the event that the actual cost of providing a benefit to a domestic partner or spouse, exceeds the cost of providing the same benefit to a spouse or domestic partner of an employee, I will not be required to provide the benefit, nor shall it be deemed discriminatory, if I require the employee to pay the monetary difference in order to provide the benefit to the domestic partner or to the spouse.
 - b. In the event I am unable to provide a certain benefit, despite taking reasonable measures to do so, if I provide the employee with a cash equivalent, I will not be deemed to be discriminating in the application of that benefit.
 - c. If I provide employee benefits neither to employee's spouses nor to employee's domestic partners.
 - d. If I provide employee benefits to employees on a basis unrelated to marital or domestic partner status.
 - e. If I submit, to the Program Coordinator, written evidence of making reasonable efforts to end discrimination in employee benefits by implementing policies which are to be enacted before the

first effective date after the first open enrollment process following the date the Contract is executed with the City.

I understand that any delay in the implementation of such policies may not exceed one (1) year from the date the Contract is executed with the City, and applies only to those employee benefits for which an open enrollment process is applicable.

- f. Until administrative steps can be taken to incorporate, in the infrastructure, nondiscrimination in employee benefits

The time allotted for these administrative steps will apply only to those employee benefits for which administrative steps are necessary and may not exceed three (3) months from the date the Contract is executed with the City.

- g. Until the expiration of a current collective bargaining agreement(s) where, in fact, employee benefits are governed by a collective bargaining agreement(s).
- h. I take all reasonable measures to end discrimination in employee benefits by either requesting the union(s) involved agree to reopen the agreement(s) in order for me to take whatever steps are necessary to end discrimination in employee benefits or by my ending discrimination in employee benefits without reopening the collective bargaining agreement(s).
- i. In the event I cannot end discrimination in employee benefits despite taking all reasonable measures to do so, I provide a cash equivalent to eligible employees for whom employee benefits (as listed previously), are not available.

Unless otherwise authorized in writing by the City Manager, I understand this cash equivalent must begin at the time the union(s) refuse to allow the collective bargaining agreement(s) to be reopened or no longer than three (3) months from the date the Contract is executed with the City.

- 5. I understand that failure to comply with the provisions of Section 4. (a) through 4. (i), above, will subject me to possible suspension and/or termination of this Contract for cause; repayment of any or all of the Contract amount disbursed by the City; debarment for future contracts until all penalties and restitution have been paid in full; deemed ineligible for future contracts for up to two (2) years; the imposition of a penalty, payable to the City, in the sum of \$50.00 for each employee, for each calendar day during which the employee was discriminated against in violation of the provisions of the Ordinance.
- 6. I understand and do hereby agree to provide each current employee and, within ten (10) days of hire, each new employee, of their rights under the Ordinance. I further agree to maintain a copy of each such letter provided, in an appropriate file for possible inspection by an authorized representative of the City. I also agree to prominently display a poster informing each employee of these rights.
- 7. I understand that I have the right to request an exemption to the benefit provisions of the Ordinance when such a request is submitted to the Procurement Services Division, in writing with sufficient justification for resolution, prior to contract award.

I further understand that the City may request a waiver or exemption to the provisions or requirements of the Ordinance, when only one contractor is available to enter into a contract or agreement to occupy and use City property on terms and conditions established by the City; when sole source conditions exist for goods, services, public project or improvements and related construction services; when there are no responsive bidders to the Ordinance requirements and the contract is for essential goods or services; when emergency conditions with public health and safety implications exist; or when the contract is for specialized legal services if in the best interest of the City.

8. In consideration of the foregoing, I shall defend, indemnify and hold harmless, the City, its officers and employees, against any claims, actions, damages, costs (including reasonable attorney fees), or other liabilities of any kind arising from any violation of the Requirements or of the Ordinance by me.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am authorized to bind the Contractor to the provisions of this Declaration.

John R. Sharp
Signature of Authorized Representative

May 13, 2015
Date

John R. Sharp
Print Name

President
Title



YOUR RIGHTS UNDER THE CITY OF SACRAMENTO'S
NON-DISCRIMINATION IN EMPLOYEE BENEFITS BY CITY CONTRACTORS ORDINANCE

On (date), your employer (the "Employer") entered into a contract with the City of Sacramento (the "City") for (contract details), and as a condition of that contract, agreed to abide by the requirements of the City's Non-Discrimination In Employee Benefits By City Contractors Ordinance (Sacramento City Code Section 3.54).

The Ordinance does not require the Employer to provide employee benefits. The Ordinance does require that if certain employee benefits are provided by the Employer, that those benefits be provided without discrimination between employees with spouses and employees with domestic partners, and without discrimination between the spouse or domestic partner of employees.

The Ordinance covers any employee working on the specific contract referenced above, but only for the period of time while those employees are actually working on this specific contract.

The included employee benefits are:

- Bereavement leave
- Disability, life and other types of insurance
- Family medical leave
- Health benefits
- Membership or membership discounts
- Moving expenses
- Pension and retirement benefits
- Vacation
- Travel benefits
- Any other benefits given to employees

(Employee Benefits does not include benefits that may be preempted by federal or state law.)

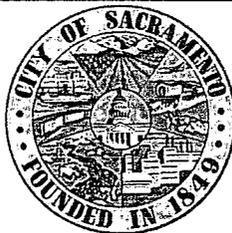
If you feel you have been discriminated or retaliated against by your employer in the terms and conditions of your application for employment, or in your employment, or in the application of these employee benefits, because of your status as an applicant or as an employee protected by the Ordinance, or because you reported a violation of the Ordinance, and after having exhausted all remedies with your employer,

You May . . .

- Submit a written complaint to the City of Sacramento, Contract Services Unit, containing the details of the alleged violation. The address is:

City of Sacramento
Contract Services Unit
915 I St., 2nd Floor
Sacramento, CA 95814

- Bring an action in the appropriate division of the Superior Court of the State of California against the Employer and obtain the following remedies:
 - Reinstatement, injunctive relief, compensatory damages and punitive damages
 - Reasonable attorney's fees and costs



YOUR RIGHTS UNDER THE CITY OF SACRAMENTO'S

NON-DISCRIMINATION IN EMPLOYEE BENEFITS BY CITY CONTRACTORS ORDINANCE

If your employer provides employee benefits, they must be provided to those employees working on a City of Sacramento contract without discriminating between employees with spouses and employees with domestic partners.

The included employee benefits are:

- Bereavement leave
- Disability, life and other types of insurance
- Family medical leave
- Health benefits
- Membership or membership discounts
- Moving expenses
- Pension and retirement benefits
- Vacation
- Travel benefits
- Any other benefits given to employees

If you feel you have been discriminated against by your employer . . .

You May . . .

- o Submit a written complaint to the City of Sacramento, Contract Services Unit, containing the details of the alleged violation. The address is:

City of Sacramento
Contract Services Unit
915 I St., 2nd Floor
Sacramento, CA 95814
- o Bring an action in the appropriate division of the Superior Court of the State of California against the employer and obtain reinstatement, injunctive relief, compensatory damages, punitive damages and reasonable attorney's fees and costs.

Discrimination and Retaliation Prohibited.

If you feel you have been discriminated or retaliated against by your employer in the terms and conditions of your application for employment, or in your employment, because of your status as an applicant or as an employee protected by the Ordinance, or because you reported a violation of this Ordinance . . .

You May Also . . .

Submit a written complaint to the City of Sacramento, Contract Services Unit, at the same address, containing the details of the alleged violation.

**LOCAL BUSINESS ENTERPRISE (LBE)
PARTICIPATION REQUIREMENTS
FOR PUBLIC PROJECTS OF \$100,000 OR MORE**
(City Contracts no Federal Funds Used)

I. LBE PARTICIPATION REQUIREMENT

On April 3, 2012, the Sacramento City Council adopted a Local Business Enterprise (LBE) Preference Program to provide enhanced opportunities for the participation of local business enterprises (LBEs) in the City's contracting and procurement activities. On November 19, 2013, the City Council increased the LBE preference percentage and authorized City departments to require minimum LBE participation levels in specific contracts. Under City Code section 3.60.270, when the bid specifications for a City contract establish a minimum participation level for LBEs, no bidder on the contract shall be considered responsive unless its bid meets the minimum LBE participation level required by the bid specifications.

The City has established **a minimum 5% participation level for LBEs on this contract.** Pursuant to City Code Section 3.60.270, no bidder on this contract shall be considered responsive unless its bid meets or exceeds this minimum participation level.

Bidder and any other business entity listed on the LBE forms submitted shall comply with all applicable laws relating to licensing, permitting, and payment of taxes and fees in the City of Sacramento or County of Sacramento; and shall not be in arrears to the City of Sacramento or County of Sacramento, upon award of a contract.

II. LBE QUALIFICATION

- A. A LBE designated in the bid must be qualified as a LBE prior to the time set for submission of bids.
- B. Local Business Enterprise means a business enterprise, including but not limited to, a sole proprietorship, partnership, limited liability company, corporation, or other business entity that has a legitimate business presence in the City or unincorporated county of Sacramento. Proof of legitimate business presence in the City or unincorporated county of Sacramento shall include:
 - 1. Having a current City of Sacramento Business Operation Tax or County of Sacramento Business License for at least twelve (12) consecutive months prior to submission of bid; and
 - 2. Having either of the following types of offices or workspace operating legally within the City or unincorporated county of Sacramento for at least twelve (12) consecutive months prior to submission of bid:
 - a. The LBE's principle business office or workspace; or
 - b. The LBE's regional, branch or satellite office with at least one full time employee located in the City or unincorporated county of Sacramento.

- C. A LBE must provide a physical address for the basis of location. This excludes P.O. Box addresses.
- D. A LBE must provide a current copy of the City of Sacramento Business Operations Tax Certificate or County of Sacramento Business License.

III. DETERMINATION OF LBE PARTICIPATION LEVEL

- A. LBE Participation: The percentage of LBE participation is determined based on the dollar value of the work to be performed or supplies to be furnished by certified LBEs designated in the bidder's Subcontractor and LBE Participation Verification Form, relative to the total dollar amount of the bid.
- B. Participation Credit: To receive credit for participation:(1) a LBE subcontractor must be responsible for the execution of a distinct element of the work, must possess any license or certification required for the work, and must actually perform, manage, or supervise the work without subcontracting or otherwise shifting any portion of the work to another subcontractor; and (2) a LBE supplier must furnish materials, equipment, or supplies that the supplier sells as a recurring, although not necessarily primary, part of its business, and that are necessary for performance of the work.
- C. Suppliers: Credit for a LBE supplier of materials, equipment, or supplies is counted as one hundred (100) percent of the amount paid to the supplier for the material, equipment, or supplies. To receive this credit, LBE suppliers must be listed on the bidder's Subcontractor and LBE Participation Verification Form.
- D. Subcontractors (including truckers): To receive credit for a LBE subcontractor, the subcontractor must be listed on the bidder's Subcontractor and LBE Participation Verification Form.
 - Truckers: Credit for a LBE trucker is counted as one hundred (100) percent of the amount paid to the trucker for trucking services, not including any amount paid to the trucker for the cost of any materials, equipment, or supplies being transported by the trucker.

IV. LBE REQUIREMENTS FOR CONTRACTOR

- A. LBE Records: The Contractor shall maintain records of all subcontracts with verified LBE subcontractors and records of materials purchased from verified LBE suppliers for one (1) year after receiving final payment from the City. Such records shall show the name and business address of each LBE subcontractor or supplier and the total dollar amount actually paid each LBE subcontractor or supplier.

Not later than 30 days after completion of the work performed under the contract, a summary of these records shall be prepared, certified correct by the Contractor's authorized representative and furnished to the City. The Contractor shall provide such other information, records, reports, certifications or other documents as may

be required by City, to determine compliance with any provision of the LBE program or these specifications.

- B. Performance of LBE Subcontractors and Suppliers: The LBEs listed by the Contractor shall perform the work and supply the materials, equipment, and supplies for which they are listed unless the Contractor has received prior written authorization from the City to perform the work with other forces or to obtain the material, equipment, or supplies from other sources. Reasons for requesting such authorization would include:
1. The listed LBE fails to execute a written contract based upon the general terms, conditions, plans, and specifications for the project.
 2. The listed LBE becomes bankrupt or insolvent.
 3. The listed LBE subcontractor fails to meet the bond requirements of the Contractor.
 4. The work performed or the materials/equipment/supplies provided by the listed LBE are unsatisfactory or are not in accordance with the plans and specifications, or the listed LBE fails to perform its contractual obligations.
 5. It would be in the best interest of the City.
- C. Subcontractor Substitution: No substitution of a LBE subcontractor shall be made at any time without compliance with the Subletting and Subcontracting Fair Practices Act. If a LBE subcontractor is unable to perform successfully and is to be replaced, the Contractor shall make reasonable efforts to replace the original LBE subcontractor with another verified LBE subcontractor. The new LBE subcontractor must be verified at the time of substitution.
- D. Reporting and Utilization Requirements and Sanctions: Failure to provide specific information, records, reports, certifications, or any other documents required for compliance with these specifications, or failure to utilize one or more LBEs in substantial compliance with the LBE utilization indicated in the Contractor's bid (unless otherwise authorized by City as provided herein, or when such failure results from changes to the work approved by the City), shall be considered a breach of the contract, and a deduction may be made from the contract amount. The deduction shall be not more than ten (10) percent of the value of the work or materials/equipment/supplies that the subject LBE(s) were listed to perform/provide in the Contractor's bid, and shall be deducted from any payment due to the Contractor. This is in addition to any deduction that may be made under any other provision of the contract, the Sacramento City Code, or State law.
- E. Hearing and Review of Division Manager Decision: Prior to making a deduction pursuant to Section IV (D), above, the City shall provide written notice of the proposed deduction to the Contractor, and the Contractor may, not later than five (5) working days after receiving such notice, provide a written request to City for a hearing to contest the proposed deduction. Upon receipt of a timely written

request from the Contractor, the City shall schedule a hearing before the Division Manager (as defined in the City's Standard Specifications for Public Construction), and written notice of the date, time and location of the hearing shall be provided to the Contractor not less than five (5) working days prior to the date of the hearing. The hearing shall be conducted in the manner specified in Section 4-8 of the Standard Specifications, and the Division Manager shall prepare and forward to the Contractor a written decision as soon as practicable after the hearing. The Division Manager's decision shall be subject to review in accordance with the provisions of Section 4-9 of the Standard Specifications. Failure to request such review in compliance with the requirements set forth in Section 4-9 shall constitute acceptance of the Division Manager's decision by the Contractor.

The written notices and requests described above shall be provided by registered or certified mail (return receipt requested), by telecopy, by personal delivery, or by any other method that provides reliable evidence of the date of receipt. Written notice provided by telecopy shall be deemed received on the date that it is transmitted and transmission is confirmed by the transmitting machine. Written notice provided by personal delivery shall be deemed received on the date of delivery.

V. DEFINITIONS

- A. Local Business Enterprise (LBE): A business enterprise, including but not limited to, a sole proprietorship, partnership, limited liability company, corporation, or any other business entity that has a legitimate business presence in the City of Sacramento or unincorporated county of Sacramento.
- B. Contractor: The sole proprietorship, partnership, limited liability company, corporation, or any other business entity entering into a contract with the City of Sacramento.
- C. Subcontractor: The sole proprietorship, partnership, limited liability company, corporation, or other business entity entering into a contract with the prime contractor to perform a portion of the work.
- D. Supplier: The sole proprietorship, partnership, limited liability company, corporation, or other business entity to provide materials, equipment, or supplies necessary for performance of the work.
- E. Proposal: Any response to a City solicitation for Proposals or Qualifications.
- F. Bid: Any response to a City solicitation for bids.

FOLLOWING FORMS TO BE FILLED OUT AND SIGNED

ONLY

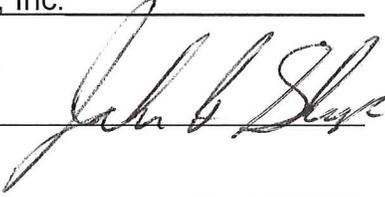
IF AWARDED CONTRACT

WORKER'S COMPENSATION INSURANCE CERTIFICATION

TO THE CITY OF SACRAMENTO:

The undersigned does hereby certify that he is aware of the provisions of Section 3700 et seq. of the Labor Code which require every employer to be insured against liability for worker's compensation claims or to undertake self-insurance in accordance with the provisions of said Code, and that he/she will comply with such provisions before commencing the performance of the work on this contract.

J.R. Sharp Construction, Inc.
Bidder

BY: John R. Sharp 

Title: president

Address: 20543 Gunstock Road

Grass Valley, CA 95949

Date: 5-29-15

PLEASE READ CAREFULLY BEFORE SIGNING

To be signed by authorized corporate officer or partner or individual submitting the bid. If bidder is: (example)

1. An individual using a firm name, sign: "John Doe, and individual doing business as Blank Company".
2. An individual doing business under his own name, sign: Your name only.
3. A co-partnership, sign: "John Doe and Richard Doe, co-partners doing business as Blank Company, by, John Doe, Co-Partner".
4. A corporation, sign: "Blank Company, by John Doe, Secretary". (Or other title)

AGREEMENT
(Construction Contract over \$25,000)

THIS AGREEMENT, dated for identification **June 23, 2015** is made and entered into between the CITY OF SACRAMENTO, a municipal corporation ("City"), and **J.R. Sharp Construction, LLC, 20543 Gunstock Road, Grass Valley, CA 95949** ("Contractor").

The City and Contractor hereby mutually agree as follows:

1. CONTRACT DOCUMENTS

The Contract Documents, sometimes also referred to as the "Contract," consist of the following items, which are hereby incorporated by reference as if set forth in full in this Agreement:

- The Notice to Contractors
- The Proposal Form submitted by the Contractor
- The Instructions to Bidders
- The Local Business Enterprise (LBE) Requirements
- The Requirements for the Non-Discrimination in Employee Benefits by City Contractors Ordinance and the Declaration of Compliance
- The City's Reference Guide for Construction Contracts
- The Addenda, if any
- This Agreement
- The Standard Specifications
- The Special Provisions
- The Plans and Technical Specifications
- The drawings and other data and all developments thereof prepared by City pursuant to the Contract any modifications of any of the foregoing made or approved by City, including but not limited to duly authorized change orders.

Unless specifically noted otherwise, references to the "Standard Specifications" shall mean and refer to the Standard Specifications for Public Construction of the City of Sacramento approved by the Sacramento City Council on June 4, 2007 (Resolution No. 2007-350), and any subsequent amendments thereto approved by the Sacramento City Council or the Sacramento City Manager. Work called for in any one Contract Document and not mentioned in another is to be performed and executed as if mentioned in all Contract Documents. The table of contents, titles and headings contained in the Contract Documents are provided solely to facilitate reference to various provisions of the Contract Documents and in no way affect or limit the interpretation of the provisions to which they refer.

2. DEFINITIONS

Unless otherwise specifically provided herein, all words and phrases defined in the Standard Specifications shall have the same meaning and intent in this Agreement.

3. AGREEMENT CONTROLS

In the event of a conflict between any of the terms and conditions set forth in this Agreement and the terms and conditions set forth in other Contract Documents, the terms and conditions set forth in this Agreement shall prevail, except that the provisions of any duly authorized change order shall prevail over any conflicting provisions of this Agreement.

Including the Work called for in the following alternative bid items described in the Proposal Form:

Contractor agrees to perform such Work in the manner designated in and in strict conformity with the Contract Documents.

5. CONTRACT AMOUNT AND PAYMENTS

City agrees to pay and Contractor agrees to accept, as complete payment for the above Work, in accordance with the schedule and procedures set forth in the Contract Documents and subject to deductions, withholdings and additions as specified in the Contract Documents, a total sum that shall not exceed the total bid amount set forth in Contractor's Proposal Form. In addition, subject to deductions, withholdings and additions as specified in the Contract Documents, payment for individual items of the Work shall be computed as follows:

- A. For items of the Work for which a lump sum price is specified in Contractor's Proposal Form, Contractor shall be paid the lump sum price(s) specified in Contractor's Proposal Form; and
- B. For items of the Work for which a unit price is specified in Contractor's Proposal Form, Contractor shall be paid the sum computed at such unit price, or computed at a different price if such different price is determined by City in accordance with the Standard Specifications, based on the actual amount of each such item performed and/or furnished and incorporated in the Work; provided that in no event shall the total sum for a unit price item exceed the total bid amount set forth for such item in the Contractor's Proposal Form, unless authorized by Change Order.

6. PROGRESS PAYMENTS

Subject to the terms and conditions of the Contract, City shall cause payments to be made upon demand of Contractor as follows:

- A. On or about the first of the month, the Engineer shall present to the Contractor a statement showing the amount of labor and materials incorporated in the Work through the twentieth (20) calendar day of the preceding month. After both Contractor and Engineer approve the statement in writing, and the City's labor compliance officer provides written approval, the City shall issue a certificate for ninety-five (95) percent of the amount it shall find to be due, subject to any deductions or withholdings authorized or required under the Contract or any applicable Laws or Regulations.
- B. No inaccuracy or error in said monthly estimates shall operate to release Contractor from damages arising from such Work or from enforcement of each and every provision of the Contract Documents, and City shall have the right subsequently to correct any error made in any estimate for payment.
- C. Contractor shall not be paid for any defective or improper Work.
- D. The remaining five (5) percent of the value of the Work performed under the Contract, if unencumbered and subject to any deductions or withholdings authorized or required under the Contract or any applicable Laws or Regulations, shall be released not later than sixty (60) days after completion and final acceptance of the Work by City. Acceptance by Contractor of the final payment shall constitute a waiver of all claims against the City arising under the Contract Documents, except for disputed claims in stated amounts that the Contractor specifically reserves in writing, but only to the extent that the Contractor has complied with all procedures and requirements applicable to the presentation and processing of such claim(s) under the Contract Documents. Contractor shall be entitled to substitute securities for retention or to direct that payments of retention be made into escrow, as provided in Public Contract Code Section 22300, upon execution of the City's Escrow Agreement for Security Deposits in Lieu of Retention.

E. The parties agree that, for purposes of the timely progress payment requirements specified in Public Contract Code Section 20104.50, the date that the City receives a statement jointly approved by the Contractor and the Engineer as provided above shall be deemed to constitute the date that City receives an undisputed and properly submitted payment request from the Contractor. Progress payments not made within 30 days after this date may be subject to payment of interest as provided in Public Contract Code Section 20104.50.

F. This Contract is subject to compliance monitoring and enforcement by the California Department of Industrial Relations, as specified in California Labor Code section 1771.4.

7. RETENTION OF SUMS CHARGED AGAINST CONTRACTOR

When, under the provisions of this Contract or any applicable Laws or Regulations, City is authorized or required to withhold, deduct or charge any sum of money against Contractor, City may deduct and retain the amount of such charge from the amount of the next succeeding progress estimate(s), or from any other moneys due or that may become due Contractor from City. If, on completion or termination of the Contract, sums due Contractor are insufficient to pay City's charges, City shall have the right to recover the balance from Contractor or its Sureties.

8. COMMENCEMENT AND PROSECUTION OF WORK

Contractor shall commence the Work not later than fifteen (15) working days after the date of the written Notice to Proceed from City to Contractor and shall diligently prosecute the Work to final completion. The phase "commence the Work" means to engage in a continuous program on-site including, but not limited to, site clearance, grading, dredging, land filling and the fabrications, erection, or installation of the Work. The Notice to Proceed shall be issued within fifteen (15) calendar days following execution of the Agreement by the City and the filing by Contractor of the required Bonds and proof of insurance, provided that the Engineer may delay issuance of the Notice to Proceed if the Engineer determines in the Engineer's sole discretion that conditions on the site of the Work are unsuitable for commencement of the Work. After the Notice to Proceed is issued, the continuous prosecution of Work by Contractor shall be subject only to Excusable Delays as defined in this Agreement.

9. TIME OF COMPLETION

The entire Work shall be brought to completion in the manner provided for in the Contract Documents on or before **One hundred (100) working** days from the date of the Notice to Proceed (hereinafter called the "Completion Date") unless extensions of time are granted in accordance with the Contract Documents.

Failure to complete the entire Work by the Completion Date and in the manner provided for in the Contract Documents shall subject Contractor to liquidated damages as provided in this Agreement. Time is and shall be of the essence in the performance of the Contract and the Work.

10. PAYMENTS DO NOT IMPLY ACCEPTANCE OF WORK

The payment of any progress payment, or the acceptance thereof by Contractor, shall not constitute acceptance of the Work or any portion thereof and shall in no way reduce the liability of Contractor to replace unsatisfactory work or material, whether or not the unsatisfactory character of such work or material was apparent or detected at the time such payment was made.

11. ACCEPTANCE NOT RELEASE

Contractor shall correct immediately any defective or imperfect work or materials that may be discovered before final acceptance of the entire Work, whether or not such defect or imperfection was previously noticed or identified by the City. The inspection of the Work, or any part thereof, shall not relieve Contractor of any of its obligations to perform satisfactory work as herein specified.

Failure or neglect on the part of City or any of its officers, employees or authorized agents to discover, identify, condemn or reject defective or imperfect work or materials shall not be construed to imply an acceptance of such work or materials, if such defect or imperfection becomes evident at any time prior to final acceptance of the entire Work, nor shall such failure or neglect be construed as barring City from enforcing Contractor's warranty(ies) or otherwise recovering damages or such a sum of money as may be required to repair or rebuild the defective or imperfect work or materials whenever City may discover the same, subject only to any statutes of limitation that may apply to any such claim.

12. CITY'S RIGHT TO TAKE POSSESSION OF THE WORK IN WHOLE OR IN PART

The City shall have the right at any time to enter upon the Work and perform work not covered by this Contract, or to occupy and use a portion of the Work, prior to the date of the final acceptance of the Work as a whole, without in any way relieving Contractor of any obligations under this Contract.

13. NO WAIVER OF REMEDIES

Neither the inspection by City, its officers, employees or agents, nor any certificate or other approval for the payment of money, nor any payment for, nor acceptance of the whole or any part of the Work by City, nor any extensions of time, nor any position taken by City, its officers, employees or its agents shall operate as a waiver of any provision of the Contract Documents nor of any power herein reserved to City or any right to damages herein provided, nor shall any waiver of any breach of this Agreement be held to be a waiver of any other or subsequent breach. All remedies provided in the Contract Documents shall be taken and construed as cumulative; in addition to each and every other remedy herein provided, the City shall have any and all equitable and legal remedies that it would in any case have.

14. WARRANTY

Except as otherwise expressly provided in the Contract Documents, and excepting only items of routine maintenance, ordinary wear and tear and unusual abuse or neglect by City, Contractor warrants and guarantees all Work executed and all supplies, materials and devices of whatsoever nature incorporated in or attached to the Work, or otherwise provided as a part of the Work pursuant to the Contract, to be absolutely free of all defects of workmanship and materials for a period of one year after final acceptance of the entire Work by the City. Contractor shall repair or replace all work or material, together with any other work or material that may be displaced or damaged in so doing, that may prove defective in workmanship or material within this one year warranty period without expense or charge of any nature whatsoever to City.

In the event that Contractor shall fail to comply with the conditions of the foregoing warranty within ten (10) days after being notified of the defect in writing, City shall have the right, but shall not be obligated, to repair, or obtain the repair of, the defect and Contractor shall pay to City on demand all costs and expense of such repair. Notwithstanding anything herein to the contrary, in the event that any defect in workmanship or material covered by the foregoing warranty results in a condition that constitutes an immediate hazard to public health or safety, or any property interest, or any person, City shall have the right to immediately repair, or cause to be repaired, such defect, and Contractor shall pay to City on demand all costs and expense of such repair. The foregoing statement relating to hazards to health, safety or property shall be deemed to include both temporary and permanent repairs that may be required as determined in the sole discretion and judgment of City.

In addition to the above, the Contractor shall make a written assignment of all manufacturer's and other product warranties to the City, prior to completion and final acceptance of the Work by City.

The Contractor's Performance Bond shall secure the performance of the Contractor's obligations under this Section 14, and the Contractor and its Surety shall be jointly and severally liable for these obligations.

15. LIQUIDATED DAMAGES IF WORK NOT COMPLETED ON TIME

- A. The actual fact of the occurrence of damages and the actual amount of the damages that City would suffer if the entire Work, and/or any specified portion thereof, were not completed within the time(s) specified herein are dependent upon many circumstances and conditions that could prevail in various combinations, and for this reason, it is impracticable and extremely difficult to fix the actual damages. Damages that City would suffer in the event of such delay include: loss of the use of the project; expenses of prolonged assignment to the project of an architectural and/or engineering staff; prolonged costs of administration, inspection, and supervision; increased operational expenses and/or impaired operation of other facilities dependent upon completion of the project; and the loss and inconvenience suffered by the public within the City of Sacramento by reason of the delay in the completion of the project or portion thereof. Accordingly, the parties agree, and by execution of this Agreement, Contractor acknowledges that it understands and agrees, that the amount(s) set forth herein as liquidated damages reflect the parties' best efforts at the time of entering into the Contract to estimate the damages that may be incurred by City and the public due to the Contractor's delay in completion of the Work and/or any specified portion thereof, and shall be presumed to be the amount of damages sustained by the failure of Contractor to complete the entire Work and/or any specified portion thereof within the time(s) specified herein.
- B. Contractor shall pay liquidated damages to City for failure to complete the entire Work by the Completion Date (as extended in accordance with the Contract Documents, if applicable) in the amount of **Five hundred dollars (\$500.00)** for each calendar day after the Completion Date (as extended in accordance with the Contract Documents, if applicable), continuing to the time at which the entire Work is completed. Such amount is the actual cash value agreed upon by the City and Contractor as the loss to City and the public resulting from Contractor's default.

The parties agree, and by execution of this Agreement, Contractor acknowledges that it understands and agrees, that the foregoing provisions provide for the imposition of liquidated damages from the Completion Date (as extended in accordance with the Contract Documents, if applicable) until the date of completion of the entire Work as determined by the Engineer in accordance with Section 8-4 of the Standard Specifications, whether or not the Work or any portion thereof is claimed or determined to be substantially complete prior to such date of completion.

- C. In the event Contractor shall become liable for liquidated damages, City, in addition to all other remedies provided by law, shall have the right to withhold any and all payments that otherwise would be or become due Contractor until the liability of Contractor under this section is finally determined. City shall have the right to use and apply such payments, in whole or in part, to reimburse City for all liquidated damages due or to become due to City. Any remaining balance of such payments shall be paid to Contractor only after discharge in full of all liability incurred by Contractor under this section or otherwise under any provision of the Contract Documents or any applicable Law or Regulation. If the sum so retained by City is not sufficient to discharge all such liabilities of Contractor, Contractor shall continue to remain liable to City until all such liabilities are satisfied in full. No failure by City to withhold any payment as specified above shall in any manner be construed to constitute a release of any such liabilities nor a waiver of the City's right to withhold payment for such liabilities.

16. INDEMNITY AND HOLD HARMLESS

- A. Contractor shall defend, hold harmless and indemnify the City, its officers, employees, and agents, and each and every one of them, from and against any and all actions, damages, costs, liabilities, claims, demands, losses, judgments, penalties, costs and expenses of every type and description, whether arising on or off the site of the Work, including, but not limited to, any fees and/or costs reasonably incurred by City's staff attorneys or outside attorneys and any fees and expenses incurred in enforcing this provision (hereafter collectively referred to as "Liabilities"), including but not limited to Liabilities arising from personal injury or death, damage to personal, real or intellectual property or the environment, contractual or other economic damages, or regulatory penalties, arising out of or in any way connected with performance of or failure to perform the Work by the Contractor, any subcontractor or agent,

anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, whether or not (i) such Liabilities are caused in part by a party indemnified hereunder, or (ii) such Liabilities are litigated, settled or reduced to judgment; provided that the foregoing indemnity does not apply to liability for damages for death or bodily injury to persons, injury to property, or other loss, damage or expense to the extent arising from (i) the sole negligence or willful misconduct of, or defects in design furnished by, City, its agents, servants, or independent contractors who are directly responsible to City, or (ii) the active negligence of City.

- B. The existence or acceptance by City of any of the insurance policies or coverages described in this Agreement shall not affect or limit any of City's rights under this Section 16, nor shall the limits of such insurance limit the liability of Contractor hereunder. The provisions of this Section 16 shall survive any expiration or termination of the Contract.

17. **CONTRACTOR SHALL ASSUME RISKS**

Until the completion and final acceptance by City of all Work under this Contract, the Work shall be under Contractor's responsible care and charge, and Contractor, at no cost to City, shall rebuild, repair, restore and make good all injuries, damages, re-erections, and repairs occasioned or rendered necessary by accidental causes of any nature, to all or any portions of the Work.

18. **GENERAL LIABILITY OF CONTRACTOR**

Except as otherwise herein expressly stipulated, Contractor shall perform all the Work and furnish all the labor, materials, tools, equipment, apparatus, facilities, transportation, power and light, and appliances, necessary or proper for performing and completing the Work herein required in the manner and within the time herein specified. The mention of any specific duty or liability of Contractor shall not be construed as a limitation or restriction of any general liability or duty of Contractor, and any reference to any specific duty or liability shall be construed to be solely for the purpose of explanation.

19. **INSURANCE**

During the entire term of the Contract, Contractor shall maintain the insurance coverage described in this Section 19.

Full compensation for all premiums that Contractor is required to pay for the insurance coverage described herein shall be included in the compensation specified for the Work performed by Contractor under this Contract. No additional compensation will be provided for Contractor's insurance premiums. Any available insurance proceeds in excess of the specified minimum limits and coverages shall be available to the City.

It is understood and agreed by the Contractor that its liability to the City shall not in any way be limited to or affected by the amount of insurance coverage required or carried by the Contractor in connection with this Contract.

A. Minimum Scope & Limits of Insurance Coverage

- (1) Commercial General Liability Insurance providing coverage at least as broad as ISO CGL Form 00 01 on an occurrence basis for bodily injury, including death, of one or more persons, property damage, and personal injury, arising out of activities performed by or on behalf of Contractor and its subcontractors, products and completed operations of Contractor and its subcontractors, and premises owned, leased, or used by Contractor and its subcontractors, with limits of not less than one million dollars (\$1,000,000) per occurrence. The policy shall provide contractual liability and

products and completed operations coverage for the term of the policy.

- (2) Automobile Liability Insurance providing coverage at least as broad as ISO Form CA 00 01 for bodily injury, including death, of one or more persons, property damage, and personal injury, with limits of not less than one million dollars (\$1,000,000) per accident. The policy shall provide coverage for owned, non-owned, and/or hired autos as appropriate to the operations of the Contractor.

No automobile liability insurance shall be required if Contractor completes the following certification:

“I certify that a motor vehicle will not be used in the performance of any work or services under this agreement.” _____ (Contractor initials)

- (3) Workers’ Compensation Insurance with statutory limits, and Employers’ Liability Insurance with limits of not less than one million dollars (\$1,000,000). The Workers’ Compensation policy shall include a waiver of subrogation in favor of the City.

No Workers’ Compensation insurance shall be required if Contractor completes the following certification:

“I certify that my business has no employees, and that I do not employ anyone. I am exempt from the legal requirements to provide Workers' Compensation insurance.” _____ (Contractor initials)

B. Additional Insured Coverage

- (1) Commercial General Liability Insurance: The City, its officials, employees, and volunteers shall be covered by policy terms or endorsement as additional insureds as respects general liability arising out of: activities performed by or on behalf of Contractor and its subcontractors; products and completed operations of Contractor and its subcontractors; and premises owned, leased, or used by Contractor and its subcontractors.
- (2) Automobile Liability Insurance: The City, its officials, employees, and volunteers shall be covered by policy terms or endorsement as additional insureds as respects auto liability.

C. Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

- (1) Contractor’s insurance coverage, including excess insurance, shall be primary insurance as respects City, its officials, employees, and volunteers. Any insurance or self-insurance maintained by City, its officials, employees, or volunteers shall be in excess of Contractor’s insurance and shall not contribute with it.
- (2) Any failure to comply with reporting provisions of the policies shall not affect coverage provided to City, its officials, employees, or volunteers.
- (3) Coverage shall state that Contractor’s insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer’s liability.
- (4) City will be provided with thirty (30) days written notice of cancellation or material

change in the policy language or terms.

D. Acceptability of Insurance

Insurance shall be placed with insurers with a Bests' rating of not less than A:VI. Self-insured retentions, policy terms or other variations that do not comply with the requirements of this Section 3 must be declared to and approved by the City in writing prior to execution of this Contract.

E. Verification of Coverage

(1) Contractor shall furnish City with certificates and required endorsements evidencing the insurance required. The certificates and endorsements shall be forwarded to the City representative named in Exhibit A. Copies of policies shall be delivered to the City on demand. Certificates of insurance shall be signed by an authorized representative of the insurance carrier.

(2) For all insurance policy renewals during the term of this Contract, Contractor shall send insurance certificates reflecting the policy renewals directly to:

City of Sacramento

c/o Ebix RCS

Reference #: (This number will be provided by EBIX after Contract approval.)

PO Box 257

Portland, MI 48875-0257

Insurance certificates also may be faxed to (770) 325-3340, or e-mailed to:

CertsOnly-Portland@ebix.com

(3) The City may withdraw its offer of contract or cancel this Contract if the certificates of insurance and endorsements required have not been provided prior to execution of this Contract. The City may withhold payments to Contractor or cancel the Contract if the insurance is canceled or Contractor otherwise ceases to be insured as required herein.

F. Subcontractors

Contractor shall require and verify that all subcontractors maintain insurance coverage that meets the minimum scope and limits of insurance coverage specified in subsection A, above.

20. **FAILURE TO MAINTAIN BONDS OR INSURANCE**

If, at any time during the performance of this Contract, Contractor fails to maintain any item of the bonds and/or insurance required under the Contract in full force and effect, Contractor shall immediately suspend all work under the Contract and notify City in writing of such failure. After such notice is provided, or if City discovers such failure and notifies Contractor, the City thereafter may withhold all Contract payments due or that become due until notice is received by City that such bonds and/or insurance have been restored in full force and effect and that the premiums therefor have been paid for a period satisfactory to the Division of Risk Management. Contractor shall not resume work until notified by City to do so, and the City shall have no responsibility or liability for any costs incurred by Contractor as a result of such suspension of Work.

In addition to the foregoing, any failure to maintain any item of the required bonds and/or insurance at any time during the performance of this Contract will be sufficient cause for termination of the Contract by City.

The Contractor shall be solely responsible for, and shall defend, indemnify and hold harmless the City, its officers, employees and agents against and from, any and all damages, claims, losses, actions, costs or other expenses of any kind incurred by any party as a direct or indirect result of any suspension of Work or termination of the Contract under the provisions of this Section.

21. EXCUSABLE DELAYS

For the purpose of these Contract Documents, the term "Excusable Delay" shall mean, and is limited to, delay caused directly by: acts of God; acts of a public enemy; fires; inclement weather as determined by the Engineer; riots; insurrections; epidemics; quarantine restrictions; strikes; lockouts; sitdowns; acts of a governmental agency; priorities or privileges established for the manufacture, assemble, or allotment of materials necessary in the Work by order, decree or otherwise of the United States or by any department, bureau, commission, committee, agent, or administrator of any legally constituted public authority; changes in the Work ordered by City insofar as they necessarily require additional time in which to complete the Work; the prevention of Contractor from commencing or prosecuting the Work because of the acts of others, excepting Contractor's subcontractors or suppliers; or the prevention of Contractor from commencing or prosecuting the Work because of a Citywide failure of public utility service.

The term "Excusable Delay" shall specifically not include: (i) any delay that could have been avoided by the exercise of care, prudence, foresight and diligence on the part of Contractor; (ii) any delay in the prosecution of any part of the Work that does not constitute a Controlling Operation, whether or not such delay is unavoidable; (iii) any reasonable delay resulting from time required by City for review of any Contractor submittals and for the making of surveys, measurements and inspection; and, (iv) any delay arising from an interruption in the prosecution of the Work on account of reasonable interference by other Contractors employed by City that does not necessarily prevent the completion of the entire Work within the time specified. Excusable Delays, if any, shall operate only to extend the Completion Date (not in excess of the period of such delay as determined by City) and shall not under any circumstances increase the amount City is required to pay Contractor except as otherwise provided in these Contract Documents.

22. CONTRACTOR TO SERVE NOTICE OF DELAYS

Whenever Contractor foresees any delay in the prosecution of the Work, and in any event as soon as possible (not to exceed a period of ten (10) calendar days) after the initial occurrence of any delay that Contractor regards as or may later claim to be an Excusable Delay, the Contractor shall notify the Engineer in writing of such delay and its cause, in order that the Engineer: (i) may take immediate steps to prevent if possible the occurrence or continuance of the delay; or (ii) if this cannot be done, may determine whether the delay is to be considered excusable, how long it continues, and to what extent the prosecution and completion of the Work are delayed thereby. Said written notice shall constitute an application for an extension of time only if the notice requests such an extension and sets forth the Contractor's estimate of the additional time required together with a full description of the cause of the delay relied upon.

After the completion of any part or whole of the Work, the Engineer, in estimating the amount due Contractor, will assume that any and all delays that may have occurred in its prosecution and completion were not Excusable Delays, except for such delays for which the Contractor has provided timely written notice as required herein, and that the Engineer has found to be excusable. Contractor shall not be entitled to claim Excusable Delay for any delay for which the Contractor failed to provide such timely written notice.

23. EXTENSION OF TIME

If the Contractor complies with Section 22, above, and the Engineer finds a delay claimed by the Contractor to be an Excusable Delay, the Contractor shall be allowed an extension of time to complete the Work that is proportional to the period of Excusable Delay determined by the Engineer, subject to the approval by City of a change order granting such time extension. During a duly authorized extension for an Excusable Delay, City shall not charge liquidated damages against the Contractor for such delay.

If the City extends the time to complete the Work as provided herein, such extension shall in no way release any warranty or guarantee given by Contractor pursuant to the provisions of the Contract Documents, nor

shall such extension of time relieve or release the sureties of the Bonds provided pursuant to the Contract Documents. By executing such Bonds, the Sureties shall be deemed to have expressly agreed to any such extension of time. The granting of any extension of time as provided herein shall in no way operate as a waiver on the part of City of its rights under this Contract, excepting only extension of the Completion Date for such period of Excusable Delay as may be determined by the Engineer and approved by a duly authorized change order.

24. NO PAYMENT FOR DELAYS

No damages or compensation of any kind shall be paid to Contractor or any subcontractor because of delays in the progress of the Work whether or not such delays qualify for extension of time under this Agreement; except that this provision shall not preclude the recovery of damages for a delay caused by the City that is unreasonable under the circumstances and that is not within the contemplation of the parties, provided that the Contractor timely submits all such written notice(s) and fully complies with such other procedures as may be specified in the Contract Documents or any Laws or Regulations for Contractor to claim damages for such delay.

25. CHANGES IN THE WORK

Changes in the Work authorized or directed in accordance with the Contract Documents and extensions of time of completion made necessary by reason thereof shall not in any way release any warranty or guarantee given by Contractor pursuant to the provisions of the Contract Documents, nor shall such changes in the Work relieve or release the Sureties on Bonds provided pursuant to the Contract Documents. By executing such Bonds, the Sureties shall be deemed to have expressly agreed to any such change in Work and to any extension of time made by reason thereof.

26. TERMINATION AFTER COMPLETION DATE

In addition to any other rights City may have, if any services or work required under the Contract (including but not limited to punch list items) are not completed as of the Completion Date (as adjusted by any extensions of time for Excusable Delays granted pursuant to the Contract Documents), City may terminate the Contract at any time after the Completion Date (as adjusted by any extensions of time for Excusable Delays granted pursuant to the Contract Documents), by providing a written notice to Contractor specifying the date of termination. Such notice also may specify conditions or requirements that Contractor must meet to avoid termination of the Contract on such date. If Contractor fails to fulfill all such conditions and requirements by such termination date, or, if no such conditions or requirements are specified, Contractor shall cease rendering services and performing work on such termination date, and shall not be entitled to receive any compensation for services rendered or work performed after such termination date. In the event of such termination, Contractor shall remain liable to City for liquidated damages incurred for any period of time prior to the termination date.

In addition to any other charges, withholdings or deductions authorized under the Contract or any Laws or Regulations, if City terminates the Contract pursuant to this section, City may withhold and deduct from any payment and/or retention funds otherwise due Contractor any sum necessary to pay the City's cost of completing or correcting, or contracting for the completion or correction of, any services or work under the Contract that are not completed to the satisfaction of the City or that otherwise are deficient or require correction as of such termination date, including but not limited to incomplete punch list items. Such costs shall include all of the City's direct and indirect costs incurred to complete or correct such services or work, including the City's administrative and overhead costs. If the amount of payment(s) and/or retention funds otherwise due the Contractor are insufficient to pay such costs, City shall have the right to recover the balance of such costs from the Contractor and/or its Surety(ies).

27. TERMINATION FOR CONVENIENCE

Upon written notice to the Contractor, the City may at any time, without cause and without prejudice to any other right or remedy of the City, elect to terminate the Contract for the convenience of City. In such case, the Contractor shall be paid (without duplication of any items, and after deduction and/or withholding of

any amounts authorized to be deducted or withheld by the Contract Documents or any Laws or Regulations):

- A. For Work executed in accordance with the Contract Documents prior to the effective date of termination and determined to be acceptable by the Engineer, including fair and reasonable sums for overhead and profit on such Work;
- B. For reasonable claims, costs, losses, and damages incurred in settlement of terminated contracts with subcontractors, suppliers, and others; and
- C. For reasonable expenses directly attributable to termination.

Contractor shall not be paid for any loss of anticipated profits or revenue for any Work not performed prior to termination, nor for any economic loss arising out of or resulting from such termination, except for the payments listed in this section. Contractor's warranty under Section 14 of this Agreement shall apply, and Contractor shall remain responsible for all obligations related to such warranty, with respect to all portions of the Work performed prior to the effective date of the termination for convenience pursuant to this section. The City shall be entitled to have any or all remaining Work performed by other contractors or by any other means at any time after the effective date of a termination for convenience pursuant to this section.

28. TERMINATION FOR BREACH OF CONTRACT

If Contractor abandons the Work under this Contract, or if the Contract or any portion of the Contract is sublet or assigned without the consent of the City, or if the Engineer determines in the Engineer's sole discretion that the conditions of the Contract in respect to the rate of progress of the Work are not being fulfilled or any part thereof is unnecessarily delayed, or if Contractor violates or breaches, or fails to execute in good faith, any of the terms or conditions of the Contract, or if Contractor refuses or fails to supply enough properly skilled labor or materials or refuses or fails to make prompt payment to subcontractors for material or labor, or if Contractor disregards any Laws or Regulations or proper instruction or orders of the Engineer, then, notwithstanding any provision to the contrary herein, the City may give Contractor and its Sureties written notification to immediately correct the situation or the Contract shall be terminated.

In the event that such notice is given, and, in the event such situation is not corrected, or arrangements for correction satisfactory to the City are not made, within ten (10) calendar days from the date of such notice or within such other period of time as may be specified by the City in the notice, the Contract shall upon the expiration of said period cease and terminate. In the event of any such termination, City may take over the Work and prosecute the Work to completion, or otherwise, and the Contractor and its Sureties shall be liable to City for any cost occasioned City thereby, as hereinafter set forth.

In the event City completes the Work, or causes the Work to be completed, no payment of any kind shall be made to Contractor until the Work is complete. The cost of completing the Work, including but not limited to, extra costs of project administration and management incurred by City, both direct or indirect, shall be deducted from any sum then due, or that becomes due, to Contractor from City. If sums due to Contractor from City are less than the cost of completing the Work, Contractor and its Sureties shall pay City a sum equal to this difference on demand. In the event City completes the Work, and there is a sum remaining due to Contractor after City deducts the costs of completing the Work, then City shall pay such sum to Contractor. The Contractor and Contractor's Sureties shall be jointly and severally liable for all obligations imposed on Contractor hereunder.

No act by City before the Work is finally accepted, including, but not limited to, exercise of other rights under the Contract, actions at law or in equity, extensions of time, payments, assessments of liquidated damages, occupation or acceptance of any part of the Work, waiver of any prior breach of the Contract or failure to take action pursuant to this section upon the happening of any prior default or breach of Contractor, shall be construed to be a waiver or estoppel of the City's right to act pursuant to this Section upon any subsequent event, occurrence or failure by Contractor to fulfill the terms and conditions of the Contract. The rights of City to terminate the Contract pursuant to this Section and pursuant to Sections 26

and 27 are cumulative and are in addition to all other rights of City pursuant to the Contract and at law or in equity.

29. CONTRACTOR BANKRUPT

If Contractor should commence any bankruptcy proceeding, or if Contractor is adjudged a bankrupt, or if Contractor makes any assignment for the benefit of creditors, or if a receiver is appointed on account of Contractor's insolvency, then the City may, without prejudice to any other right or remedy, terminate the Contract and complete the work by giving notice as provided in Section 28 above.

30. SURETIES' OBLIGATIONS UPON TERMINATION

If the City terminates the Contract pursuant to Section 28 or Section 29 above:

- A. The Surety under Contractor's performance bond shall be fully responsible for all of the Contractor's remaining obligations of performance under the Contract as if the Surety were a party to the Contract, including without limitation Contractor's obligations, as provided in the Contract Documents, to complete and provide a one-year warranty of the entire Work, pay liquidated damages and indemnify, defend and hold harmless City, up to the full amount of the performance bond.
- B. The Surety under Contractor's payment bond shall be fully responsible for the performance of all of the Contractor's remaining payment obligations for work, services, equipment or materials performed or provided in connection with the Work or any portion thereof, up to the full amount of the payment bond.

31. ACCOUNTING RECORDS OF CONTRACTOR

During performance of the Contract and for a period of three (3) years after completing the entire Work, Contractor shall maintain all accounting and financial records related to the Contract and performance of the Work in accordance with generally accepted accounting practices, and shall keep and make such records available for inspection and audit by representatives of the City upon reasonable written notice.

32. USE TAX REQUIREMENTS

During the performance of this Agreement, CONTRACTOR, for itself, its assignees and successors in interest, agrees as follows:

- A. Use Tax Direct Payment Permit: For all leases and purchases of materials, equipment, supplies, or other tangible personal property used to perform the Agreement and shipped from outside California, the Contractor and any subcontractors leasing or purchasing such materials, equipment, supplies or other tangible personal property shall obtain a Use Tax Direct Payment Permit from the California State Board of Equalization ("SBE") in accordance with the applicable SBE criteria and requirements.
- B. Sellers Permit: For any construction contract and any construction subcontract in the amount of \$5,000,000 or more, Contractor and the subcontractor(s) shall obtain sellers permits from the SBE and shall register the jobsite as the place of business for the purpose of allocating local sales and use tax to the City. Contractor and its subcontractors shall remit the self-accrued use tax to the SBE, and shall provide a copy of each remittance to the City.
- C. The above provisions shall apply in all instances unless prohibited by the funding source for the Agreement.

IN WITNESS WHEREOF, the parties hereto have signed this Agreement on the date set for opposite their names.

CONTRACTOR

Under penalty of perjury, I certify that the taxpayer identification number and all other information provided here are correct.

DATE _____

BY John R. Sharp (JR Sharp Construction, Inc)
John R. Sharp

Print Name _____

Title president

BY _____

Print Name _____

Title _____

Federal ID# 30-0010022

State ID# 44717882

128114

City of Sacramento Business Operation Tax Certificate No. (City will not award contract until Certificate Number is obtained)

Type of Business Entity (check one):
 Individual/Sole Proprietor
 Partnership
 Corporation
 Limited Liability Company
 Other (please specify: _____)

CITY OF SACRAMENTO
a municipal corporation

DATE _____

BY _____
For: John F Shirey, City Manager

Original Approved As To Form:

Attest:

City Attorney

City Clerk

Premium subject to adjustments based on final contract price

"Issued in Duplicate Original"

**CITY OF SACRAMENTO
PERFORMANCE BOND**
Department of Utilities

Bond No.: 12120836
Premium: \$1,980.00

WHEREAS, the City of Sacramento, State of California, hereinafter called City, has conditionally awarded to

**J.R. Sharp Construction, Inc.
20543 Gunstock Road
Grass Valley, CA 95949**

as principal, hereinafter called Contractor, a contract for construction of:

**Meter Shop Electrical Improvements
(PN: Z14110800) (B15141321019)**

which contract is by reference incorporated herein and made a part hereof as if the Surety named below were a party to the contract, and is hereinafter referred to as the Contract; and

WHEREAS, under the terms of the contract, the contractor is required to furnish a bond for the faithful performance of the contract.

NOW, THEREFORE, we the Contractor and *(here insert full name and address of Surety)*
The Guarantee Company of North America USA, One Towne Square, #1470, Southfield, Michigan 48076

a corporation duly authorized and admitted to transact business and issue surety bonds in the State of California, hereinafter called Surety, are held and firmly bound unto the City, as obligee, in the sum of: **Ninety Nine Thousand Dollars and No Cents (\$99,000.00)** for the payment of which sum well and truly to be made, we the Contractor and Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally. The condition of this obligation is such that, if the Contractor, Contractor's heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and fully perform all covenants, conditions and agreements required to be kept and performed by Contractor in the Contract and any changes, additions or alterations made thereto, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meanings, and shall indemnify and save harmless the City, its officers, employees and agents, as therein provided, then the Surety's obligations under the Contract and this bond shall be null and void; otherwise they shall be and remain in full force and effect. This obligation shall remain in full force and effect through the end of the Contract warranty period, which will expire one year after the completion of work date specified in the Notice of Completion filed for the above-named project.

As part of the obligations secured hereby and in addition to the sum specified above, there shall be included all costs, expenses and fees, including attorney's fees, reasonably incurred by City in successfully enforcing such obligations, all to be taxed as costs and included in any judgment rendered.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or to the specifications accompanying the same shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by authorized representatives of the Contractor and Surety.
SIGNED AND SEALED on May 21, 2015.

J.R. Sharp Construction, Inc.

(Contractor) (Seal)
By *[Signature]*
Title president

ORIGINAL APPROVED AS TO FORM:

City Attorney

The Guarantee Company of North America USA

(Surety) (Seal)
By *[Signature]*
Title Renee Ramsey, Attorney In Fact
Agent Name and Address InterWest Insurance Services, LLC
3636 American River Dr 2nd Flr, Sacramento, CA 95864
Agent Phone # 916-488-3100
Surety Phone # 925-566-6040
California License # 0B01094
Surety Email: Kchambers@gcna.com

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Sacramento)

On May 21, 2015 before me, Melissa D. Diaz, Notary Public
(insert name and title of the officer)

personally appeared Renee Ramsey,
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)





POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS: That THE GUARANTEE COMPANY OF NORTH AMERICA USA, a corporation organized and existing under the laws of the State of Michigan, having its principal office in Southfield, Michigan, does hereby constitute and appoint

Barbara Midstokke, Renee Ramsey, Richard W. Pratt, John Hopkins, Elizabeth Collodi, Bobbie Beeny, Nancy Luttenbacher
Phillip O. Watkins, Keith T. Schuler, Melissa D. Diaz, Shawna Johnson, Patricia M. Simas
Interwest Insurance Services, Inc.

its true and lawful attorney(s)-in-fact to execute, seal and deliver for and on its behalf as surety, any and all bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof, which are or may be allowed, required or permitted by law, statute, rule, regulation, contract or otherwise.

The execution of such instrument(s) in pursuance of these presents, shall be as binding upon THE GUARANTEE COMPANY OF NORTH AMERICA USA as fully and amply, to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at the principal office.

The Power of Attorney is executed and may be certified so, and may be revoked, pursuant to and by authority of Article IX, Section 9.03 of the By-Laws adopted by the Board of Directors of THE GUARANTEE COMPANY OF NORTH AMERICA USA at a meeting held on the 31st day of December, 2003. The President, or any Vice President, acting with any Secretary or Assistant Secretary, shall have power and authority:

- 1. To appoint Attorney(s)-in-fact, and to authorize them to execute on behalf of the Company, and attach the Seal of the Company thereto, bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof; and
- 2. To revoke, at any time, any such Attorney-in-fact and revoke the authority given, except as provided below
- 3. In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-in-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.
- 4. In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-in-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner – Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

Further, this Power of Attorney is signed and sealed by facsimile pursuant to resolution of the Board of Directors of the Company adopted at a meeting duly called and held on the 6th day of December 2011, of which the following is a true excerpt:

RESOLVED that the signature of any authorized officer and the seal of the Company may be affixed by facsimile to any Power of Attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, contracts of indemnity and other writings obligatory in the nature thereof, and such signature and seal when so used shall have the same force and effect as though manually affixed.



IN WITNESS WHEREOF, THE GUARANTEE COMPANY OF NORTH AMERICA USA has caused this instrument to be signed and its corporate seal to be affixed by its authorized officer, this 23rd day of February, 2012.

THE GUARANTEE COMPANY OF NORTH AMERICA USA

Stephen C. Ruschak

Randall Musselman

STATE OF MICHIGAN
County of Oakland

Stephen C. Ruschak, President & Chief Operating Officer

Randall Musselman, Secretary

On this 23rd day of February, 2012 before me came the individuals who executed the preceding instrument, to me personally known, and being by me duly sworn, said that each is the herein described and authorized officer of The Guarantee Company of North America USA; that the seal affixed to said instrument is the Corporate Seal of said Company; that the Corporate Seal and each signature were duly affixed by order of the Board of Directors of



Cynthia A. Takai
Notary Public, State of Michigan
County of Oakland
My Commission Expires February 27, 2018
Acting in Oakland County

IN WITNESS WHEREOF, I have hereunto set my hand at The Guarantee Company of North America USA offices the day and year above written.

Cynthia A. Takai

I, Randall Musselman, Secretary of THE GUARANTEE COMPANY OF NORTH AMERICA USA, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney executed by THE GUARANTEE COMPANY OF NORTH AMERICA USA, which is still in full force and effect.



IN WITNESS WHEREOF, I have thereunto set my hand and attached the seal of said Company this 21st day of May, 2015

Randall Musselman

Randall Musselman, Secretary

CITY OF SACRAMENTO
PAYMENT BOND
Department of Utilities

"Issued in Duplicate Original"

Bond No.: 12120836
Premium: included in Performance bond
subject to adjustments based on final contract price

WHEREAS, the City of Sacramento, in the State of California, hereinafter called City, has conditionally awarded to:

J.R. Sharp Construction, Inc.
20543 Gunstock Road
Grass Valley, CA 95949

Herein after called Contractor, a contract for construction of:

Meter Shop Electrical Improvements
(PN: Z14110800) (B15141321019)

Which contract is by reference incorporated herein and made a part hereof, and is hereinafter referred to as the Contract; and

WHEREAS, under the terms of the Contract and pursuant to Chapter 5 of Title 3 of Part 6 of Division 4 of the California Civil Code (commencing with Civil Code Section 9550), Contractor is required to furnish a good and sufficient payment bond to secure payment of the claims to which reference is made in Civil Code Section 9554.

NOW, THEREFORE, we the Contractor and (*here insert full name and address of Surety*):

The Guarantee Company of North America USA, One Towne Square, #1470, Southfield, Michigan 48076, a corporation duly authorized and admitted to transact business and issue surety bonds in the State of California, hereinafter called Surety, are held and firmly bound unto the City, and unto all persons or entities entitled to assert a claim against a payment bond under any of the aforesaid Civil Code provisions in the sum of **Ninety Nine Thousand Dollars and No Cents (\$99,000.00)** on the condition that if Contractor shall fail to pay for any materials or equipment furnished or used in performance of the Contract, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, or for any amounts required to be deducted, withheld, and paid over to the Franchise Tax Board or the Employment Development Department from the wages of employees of the Contractor and all subcontractors with respect to such work or labor, then the Surety shall pay the same in an amount not exceeding the sum specified above. If suit is brought upon this bond, Surety shall pay, in addition to the above sum, all costs, expenses and fees, including attorney's fees, reasonably incurred by any party in successfully enforcing the obligation secured hereby, all to be taxed as costs and included in any judgment rendered. Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect, and shall bind Contractor, Surety, their heirs, executors, administrators, successors and assigns, jointly and severally.

It is hereby stipulated and agreed that this bond shall inure to the benefit of all persons, companies, corporations, political subdivisions, State agencies and other entities entitled to assert a claim against a payment bond under any of the aforesaid Civil Code provisions, so as to give a right of action to them or their assigns in any suit brought upon this bond. The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or to the specifications accompanying the same shall in any way affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by authorized representatives of the Contractor and Surety. SIGNED AND SEALED on May 21, 2015.

J.R. Sharp Construction, Inc.
By [Signature] (Contractor) (Seal)
Title president

The Guarantee Company of North America USA
By [Signature] (Surety) (Seal)
Title Renee Ramsey, Attorney In Fact

ORIGINAL APPROVED AS TO FORM:

Agent Name and Address InterWest Insurance Services, LLC
3636 American River Dr 2nd Flr, Sacramento, CA 95864
Agent Phone # 916-488-3100
Surety Phone # 925-566-6040
California License # 0B01094
Surety Email: Kchambers@gcna.com

City Attorney

Effective 7-1-12

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Sacramento _____)

On May 21, 2015 before me, Melissa D. Diaz, Notary Public
(insert name and title of the officer)

personally appeared Renee Ramsey,
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)





POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS: That THE GUARANTEE COMPANY OF NORTH AMERICA USA, a corporation organized and existing under the laws of the State of Michigan, having its principal office in Southfield, Michigan, does hereby constitute and appoint

Barbara Midstokke, Renee Ramsey, Richard W. Pratt, John Hopkins, Elizabeth Collodi, Bobbie Beeny, Nancy Luttenbacher
Phillip O. Watkins, Keith T. Schuler, Melissa D. Diaz, Shawna Johnson, Patricia M. Simas
Interwest Insurance Services, Inc.

its true and lawful attorney(s)-in-fact to execute, seal and deliver for and on its behalf as surety, any and all bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof, which are or may be allowed, required or permitted by law, statute, rule, regulation, contract or otherwise.

The execution of such instrument(s) in pursuance of these presents, shall be as binding upon THE GUARANTEE COMPANY OF NORTH AMERICA USA as fully and amply, to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at the principal office.

The Power of Attorney is executed and may be certified so, and may be revoked, pursuant to and by authority of Article IX, Section 9.03 of the By-Laws adopted by the Board of Directors of THE GUARANTEE COMPANY OF NORTH AMERICA USA at a meeting held on the 31st day of December, 2003. The President, or any Vice President, acting with any Secretary or Assistant Secretary, shall have power and authority:

- 1. To appoint Attorney(s)-in-fact, and to authorize them to execute on behalf of the Company, and attach the Seal of the Company thereto, bonds and undertakings, contracts of indemnity and other writings obligatory in the nature thereof; and
- 2. To revoke, at any time, any such Attorney-in-fact and revoke the authority given, except as provided below
- 3. In connection with obligations in favor of the Florida Department of Transportation only, it is agreed that the power and authority hereby given to the Attorney-in-Fact includes any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts required by the State of Florida Department of Transportation. It is fully understood that consenting to the State of Florida Department of Transportation making payment of the final estimate to the Contractor and/or its assignee, shall not relieve this surety company of any of its obligations under its bond.
- 4. In connection with obligations in favor of the Kentucky Department of Highways only, it is agreed that the power and authority hereby given to the Attorney-in-Fact cannot be modified or revoked unless prior written personal notice of such intent has been given to the Commissioner – Department of Highways of the Commonwealth of Kentucky at least thirty (30) days prior to the modification or revocation.

Further, this Power of Attorney is signed and sealed by facsimile pursuant to resolution of the Board of Directors of the Company adopted at a meeting duly called and held on the 6th day of December 2011, of which the following is a true excerpt:

RESOLVED that the signature of any authorized officer and the seal of the Company may be affixed by facsimile to any Power of Attorney or certification thereof authorizing the execution and delivery of any bond, undertaking, contracts of indemnity and other writings obligatory in the nature thereof, and such signature and seal when so used shall have the same force and effect as though manually affixed.



IN WITNESS WHEREOF, THE GUARANTEE COMPANY OF NORTH AMERICA USA has caused this instrument to be signed and its corporate seal to be affixed by its authorized officer, this 23rd day of February, 2012.

THE GUARANTEE COMPANY OF NORTH AMERICA USA

STATE OF MICHIGAN
County of Oakland

Stephen C. Ruschak, President & Chief Operating Officer

Randall Musselman, Secretary

On this 23rd day of February, 2012 before me came the individuals who executed the preceding instrument, to me personally known, and being by me duly sworn, said that each is the herein described and authorized officer of The Guarantee Company of North America USA; that the seal affixed to said instrument is the Corporate Seal of said Company; that the Corporate Seal and each signature were duly affixed by order of the Board of Directors of



Cynthia A. Takai
Notary Public, State of Michigan
County of Oakland
My Commission Expires February 27, 2018
Acting in Oakland County

IN WITNESS WHEREOF, I have hereunto set my hand at The Guarantee Company of North America USA offices the day and year above written.

I, Randall Musselman, Secretary of THE GUARANTEE COMPANY OF NORTH AMERICA USA, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney executed by THE GUARANTEE COMPANY OF NORTH AMERICA USA, which is still in full force and effect.



IN WITNESS WHEREOF, I have thereunto set my hand and attached the seal of said Company this 21st day of May, 2015

Randall Musselman, Secretary



**SHARP
CONSTRUCTION
INC.**

CL 812273 (530) 346-6016

CONTACT LIST

May 20th, 2015

**City of Sacramento
1395 35th Ave.
Sacramento, CA 95822**

List of Employees & Contact Information:

Rosa M Sharp

Office Manager

Office#(530)346.6016

John R Sharp

President

Cell#(530)263.9974

John M. Sharp

Superintendent

Cell#(530)263.9961

Jeffery A. Sharp

Electrical Apprentice/ Field Worker

Cell#(530)263.9962

CALIFORNIA LABOR CODE RELATING TO APPRENTICES ON PUBLIC WORKS PROJECTS

See following links: www.dir.ca.gov and/or www.leginfo.ca.gov

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS
(WITH LIMITED COMPLETED OPERATIONS COVERAGE)**

This endorsement modifies insurance provided under the following:

**COMMERCIAL GENERAL LIABILITY COVERAGE PART
BUSINESSOWNERS COVERAGE FORM**

SCHEDULE

NAME OF PERSON OR ORGANIZATION

Any person or organization to whom or to which the named insured is obligated by a virtue of a written contract to provide insurance that is afforded by this policy. Where required by contract, the officers, officials, employees, directors, subsidiaries, partners, successors, parents, divisions, architects, surveyors and engineers are included as additional insureds. All other entities, including but not limited to agents, volunteers, servants, members and partnerships are included as additional insureds, if required by contract, only when acting within the course and scope of their duties controlled and supervised by the primary (first) additional insured. If an Owner Controlled Insurance Program is involved, the coverage applies to off-site operations only. If the purpose of this endorsement is for bid purposes only, then no coverage applies.

the qualifying language above because of payments we make for injury.

LOCATION OF JOB:

The job location must be within the State of domicile of the named insured, or within any contiguous State thereto.

DESCRIPTION OF WORK:

The type of work performed must be that as described under classifications in the CGL Coverage Part Declarations.

WHO IS AN INSURED: (Section II)

This section is amended to include as an insured the person or organization within the scope of the qualifying language above, but only to the extent that the person or organization is held liable for your acts or omissions in the course of "your work" for that person or organization by or for you. The "products-completed operations hazard" portion of the policy coverage as respects the additional insured does not apply to any work involving or related to properties intended for residential or habitational occupancy (other than apartments). This clause does not affect the "products-completed operations" coverage provided to the named insured(s).

PRIMARY CLAUSE:

When this endorsement applies and when required by written contract, such insurance as is afforded by the general liability policy is primary insurance and other insurance shall be excess and shall not contribute to the insurance afforded by this endorsement.

EXCLUSION

This insurance provided to the additional insured does not apply to "bodily injury", "property damage" or "personal and advertising injury" arising out of an architect's, engineer's or surveyor's rendering or failure to render any professional services, including:

1. The preparing, approving, or failing to prepare or approve, maps, designs, shop drawings, opinions, reports, surveys, field orders, change orders, or drawings and specifications; and
2. Supervisory, inspection, architectural or engineering activities.

WAIVER OF SUBROGATION:

We waive any right of recovery, when required by written contract, that we may have against the person or organization within the scope of

Endorsement EFFECTIVE DATE: SEE DEC

Endorsement EXPIRATION DATE: SEE DEC

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY**BUSINESS AUTO ELITE COVERAGE ENDORSEMENT**

This endorsement modifies insurance provided under the following:

PREMIUM 150

BUSINESS AUTO COVERAGE FORM

With respect to coverage provided by this endorsement, the provisions of the Coverage Form apply unless modified by this endorsement.

SECTION II - LIABILITY COVERAGE - Amendments**WHO IS AN INSURED**

The following are added to WHO IS AN INSURED:

BLANKET ADDITIONAL INSUREDS

Any person or organization with whom you agreed, pursuant to a written contract, to provide insurance such as is afforded under this Coverage Part, but only to the extent that the person or organization is held liable for your acts or omissions with respect to your ownership, maintenance or use of a covered "auto." This provision only applies if the written contract has been executed prior to the "bodily injury" or "property damage."

This coverage shall be primary and not contributory with respect to the person or organization included as an "insured" under this section. Any other insurance that person or organization has shall be excess and not contributory with respect to this insurance, but this provision only applies if it is required in the written contract, identified in this section, and is permitted by law.

BROAD FORM NAMED INSURED

Any business entity newly acquired or formed by you, other than a partnership, joint venture or limited liability company during the policy period provided you own 50% or more of the business entity and the business entity is not separately insured for Business Auto Coverage. Coverage is extended up to a maximum of 180 days following acquisition or formation of the business entity.

EMPLOYEES AS INSURED - HIRED AUTOS

Any "employee" of yours is an "insured" while operating an "auto" hired or rented under a contract or agreement in that "employee's" name, with your permission, while performing duties related to the conduct of your business.

EMPLOYEES AS INSURED - NONOWNED AUTOS

Any "employee" of yours is an "insured" while using a covered "auto" you don't own, hire or borrow in your business.

COVERAGE EXTENSIONS - SUPPLEMENTARY PAYMENTS

Supplementary Payments is amended as follows:

We will pay up to \$3,000 for cost of bail bonds (including bonds for related traffic law violations) required because of an "accident" we cover. We do not have to furnish these bonds.

We will pay all reasonable expenses incurred by the "insured" at our request, including actual loss of earnings up to \$300 a day, because of time off from work.

SECTION III - PHYSICAL DAMAGE COVERAGE - Amendments**AUDIO, VISUAL, AND DATA ELECTRONIC EQUIPMENT COVERAGE EXTENSION**

Any reference to equipment for the reproduction of sound also includes video and global positioning systems.

EXPANDED TOWING COVERAGE

In addition to the towing and labor limit shown in the Declarations for private passenger type "autos," we will pay up to \$75 for towing and labor costs incurred each time the covered "auto" is disabled. However, the labor must be performed at the place of disablement.

This coverage applies only to an "auto" covered on this policy for other physical damage coverage.

EXPANDED TRANSPORTATION EXPENSE

Coverage Extensions - Transportation Expenses is deleted and replaced by the following:

We will pay up to \$60 per day to a maximum of \$1,800 for temporary transportation expense incurred by you because of the total theft of a covered "auto" of the private passenger type. We will pay only for those covered "autos" for which you carry either Comprehensive or Specified Causes of Loss Coverage. We will pay for temporary transportation expenses incurred during the period beginning 48 hours after

the theft and ending, regardless of the policy's expiration, when the covered "auto" is returned to use or we pay for its "loss."

EXTRA EXPENSE – STOLEN AUTOS

We will pay up to \$1,000 for the expense of returning a stolen covered "auto" to you. We will pay only for those covered "autos" for which you carry Comprehensive or Specified Causes of Loss Coverage.

HIRED CAR PHYSICAL DAMAGE COVERAGE

For purposes of this section, the term "auto" is redefined to mean a land motor vehicle, "trailer" or semitrailer with a gross vehicle weight under 20,000 pounds designed for travel on public roads, but does not include "mobile equipment."

If Comprehensive, Specified Causes of Loss or Collision coverage is provided to all owned autos by this policy, you may extend that coverage to apply to Physical Damage "loss" to hired "autos." We will provide coverage equal to the minimum coverage available to any covered "auto" shown in the Declarations. But, the most we will pay for "loss" to a hired "auto" in any one "accident" is the lesser of:

1. \$50,000; or
2. The actual cash value of the damaged or stolen property as of the time of the "loss;" or
3. The actual cost of repairing or replacing the damaged or stolen property with other property of like kind or quality. A part is of like kind and quality when it is of equal or better condition than the pre-accident part. We will use the original equipment from the manufacturer when:
 - a) The operational safety of the vehicle might otherwise be impaired;
 - b) Reasonable and diligent efforts to locate the appropriate rebuilt, aftermarket or used part have been unsuccessful;
 - c) A new original equipment part of like kind and quality is available and will result in the lowest overall repair cost;
 - d) For vehicles insured under policies written on or before December 31, 2003, the vehicle has been used no more than 15,000 miles unless the pre-accident condition warrants otherwise; or
 - e) For vehicles insured under policies written on or after January 1, 2004, the vehicle has been used no more than 20,000 miles unless the pre-accident condition warrants otherwise.

FPIC0200 (12-11)

For each hired "auto" our obligation to pay "loss" will be reduced by a deductible equal to the highest deductible applicable to any owned "auto" for that coverage. No deductible will be applied to "loss" caused by fire or lightning. We will also pay up to \$500 per "accident" for loss of use of the hired "auto" if it results from an "accident" for which you are legally liable. The lessor must suffer an actual financial "loss" for this coverage to apply.

Hired Car Physical Damage Coverage provided by this extension is excess over any other collectible insurance.

LOAN/LEASE GAP COVERAGE

For purposes of this section, the term "auto" is redefined to mean a land motor vehicle, "trailer" or semitrailer with a gross vehicle weight under 20,000 pounds designed for travel on public roads, but does not include "mobile equipment."

If a long-term leased or financed "auto" is a covered "auto" for the Physical Damage Coverage applicable to a total "loss," and the lessor or financial institution is an additional insured under this Coverage Part, we will pay up to a maximum of \$15,000 the difference between amounts you owe the lessor or financial institution under the lease or loan terms and the amount of insurance paid the lessor or financial institution for the total "loss" of the covered "auto" minus: any payments overdue at the time of the loss; any financial penalties imposed due to wear and tear, high mileage or similar charges; any security deposits not refunded by the lessor or financial institution; any costs for credit life, health and accident, or disability insurance; any costs for extended warranties; or any carry-over balances from previous leases or loans. You are responsible for the deductible applicable to the "loss" for the covered "auto". This coverage is excess insurance over any other collectible insurance or lease provision.

PERSONAL EFFECTS COVERAGE

We will pay up to \$400 for "loss" to wearing apparel and other personal effects, which are:

1. Owned by an "insured;" and
2. In or on your covered "auto;" in the event of a total theft "loss" of your covered "auto."

No deductibles apply to Personal Effects Coverage.

RENTAL REIMBURSEMENT COVERAGE

1. We will pay for rental reimbursement expenses incurred by you for the rental of an "auto" because of "loss" to a covered "auto." Payment applies in addition to the otherwise applicable amount of each coverage you have on a covered "auto." No deductibles apply to Rental Reimbursement Coverage.

- 2. We will pay only for those expenses incurred during the policy period beginning 24 hours after the "loss" and ending, regardless of the policy's expiration, with the lesser of the following number of days:
 - a) The number of days reasonably required to repair or replace the covered "auto." If "loss" is caused by theft, this number of days is added to the number of days it takes to locate the covered "auto" and return it to you.
 - b) The number of days shown in the Schedule.
- 3. This coverage applies only to a covered "auto" for which there is Comprehensive, Specified Causes of Loss or Collision Coverage provided on this covered "auto." If there is no Collision Coverage for a covered "auto," then Rental Reimbursement Coverage will not apply to a Collision loss involving that covered "auto."
- 4. Our payment is limited to the lesser of the following amounts:
 - a) Necessary and actual expenses incurred.
 - b) \$75 for any one day or for a maximum of 30 days.
- 5. This coverage does not apply while there are spare or reserve "autos" available to you for your operations.
- 6. If "loss" results from the total theft of a covered "auto" of the private passenger type, we will pay under this coverage only that amount of your rental reimbursement expenses which is not already provided for under the PHYSICAL DAMAGE COVERAGE Coverage Extension.
- 7. Coverage does not apply to any covered "auto" for which coverage is provided by endorsement form CA 9923 on this policy.

WAIVER OF DEDUCTIBLE – GLASS

Deductible is amended by adding the following:

No deductible for a covered "auto" will apply to glass damage if the glass is repaired rather than replaced.

SECTION IV – BUSINESS AUTO CONDITIONS – Amendments

LOSS CONDITIONS

KNOWLEDGE OF ACCIDENT, CLAIM, SUIT OR LOSS

The requirements for reporting and sending claim or "suit" information to us, including provisions related to the

subsequent investigation of such claims or "suits", under DUTIES IN THE EVENT OF ACCIDENT, CLAIM, SUIT OR LOSS, do not apply until the "accident" or "loss" is known to:

- 1. You, if you are an individual;
- 2. A partner, if you are a partnership;
- 3. An executive officer or insurance manager, if you are a corporation;
- 4. Your members, managers or insurance manager, if you are a limited liability company;
- 5. Your elected or appointed officials, trustees, board members, or your insurance manager, if you are an organization other than a partnership, joint venture, or limited liability company.

But, this section does not amend the provisions relating to notification of police, protection or examination of the property, which was subject to the "loss."

BLANKET WAIVER OF SUBROGATION

Transfer Of Rights Of Recovery Against Others To Us is deleted and replaced by the following:

We waive any right of recovery we may have against any person or organization to the extent required of you by a written contract executed prior to any "accident" or "loss," provided that the "accident" or "loss" arises out of the operations contemplated by such contract. The waiver applies only to the person or organization designated in such contract.

GENERAL CONDITIONS

UNINTENTIONAL ERRORS OR OMISSIONS

Concealment, Misrepresentation Or Fraud is amended by adding the following:

The unintentional omission of, or unintentional error in, any information given by you shall not prejudice your rights under this insurance. However, this provision does not affect our right to collect additional premium or exercise our right of cancellation or non-renewal.

SECTION V – DEFINITIONS - Amendment

MENTAL ANGUISH

The definition of "bodily injury" is amended to include mental anguish resulting from any "bodily injury," sickness or disease sustained by a person.

SPECIAL PROVISIONS

METER SHOP ELECTRICAL IMPROVEMENTS

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ITEMS OF THE PROPOSAL

All Items shall be constructed as shown on the Plans in accordance with the Special Provisions whether or not they are included in the following list of bid items. There will be no separate compensation for items shown on the Plans or where Contractor is directed in the Special Provisions but not included in the following list of bid items and the price thereof shall be included in whatever bid items the Contractor deems appropriate.

Item No. 1 - Install Electrical Improvements at Building 8

The work to be performed for this item includes, but is not limited to, furnishing and installing all necessary equipment and materials for the switchgear, conduits, conductors, flow meter, and all appurtenances at Building 8 as indicated on the Plan sheets and called for in these Special Provisions.

Payment shall be at the lump sum price bid and shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in furnishing and installing the switchgear, conduits, conductors, flow meter, and all appurtenances in accordance with the Plans and these Special Provisions.

SECTION 01105

GENERAL INFORMATION AND REQUIREMENTS

PART 1 - GENERAL

1.01 GOVERNING DOCUMENTS

- A. All work performed under this Contract shall be in accordance with the following General Conditions:
1. Sealed Proposal
 2. Agreement
 3. City of Sacramento Standard Specifications, June 2007 (hereinafter CSSS) Sections 1 through 8 and as noted otherwise.
- B. All work performed under this Contract, unless noted otherwise, shall be in accordance with the following:
1. Technical Specifications
 2. Contract Drawings
 3. CSSS - Sections 10 through 38
 4. Payment Bond
 5. Performance Bond
 6. California Labor Code, Chapter 4 of Division 3.
- C. In the event of a conflict in the Contract Documents, priorities, as appropriate, set forth below shall govern:
1. General Conditions
 2. Technical Specifications
 3. Drawings
 4. CSSS
 5. Conflicts
 - a. In case of conflict between drawings and Special Provisions, the drawings shall govern in matters of quantity and the Special Provisions shall govern in matters of quality.
 - b. In case of conflict within the drawings involving quantities, furnish the greater quantity.
 - c. In case of conflict within the Special Provisions involving quality of material or procedure, furnish the higher quality material and procedure.
 - d. Where provisions of codes, safety orders, Contract Documents,

referenced manufacturer's specifications or industry standards are in conflict, the more restrictive and higher quality shall govern.

1.02 DEFINITIONS

- A. For definitions not found herein, refer to CSSS, Section 1.
- B. "City" shall mean the City of Sacramento.
- C. "Engineer" shall mean the director of Utilities or his designated representative.
- D. "Calendar Day" shall mean every day shown on the calendar, Sundays and holidays included.
- E. "Working Day" see CSSS, Section 1, definition 1-34, page 1(4).
- F. "Contract Documents" shall mean the General Conditions identified in Paragraph 1.01.A and the Special Provisions identified in Paragraph 1.01.B of this Section.
- G. "Drawings" shall mean the Contract Drawings.
- H. "Provide" shall mean furnish and install, in accordance with the contract documents.
- I. "Addenda" shall mean a written or graphic instrument issued prior to the execution of the Contract, which modify or interpret the Contract Documents, Drawings, and Specifications, by additions, deletions, clarifications, or corrections.
- J. "Proposed Change Order" shall mean a written request for the Contractor's Cost and Time Estimate covering an addition, deletion, or revision in the work, within the General Scope of the Contract.
- K. "Change Order" shall mean a written order to the Contractor authorizing an addition, deletion, or revision in the work, within the General Scope of the Contract Documents, or authorizing an adjustment in the Contract Price or Contract Time.
- L. "Field Order" shall mean a written order from the Engineer to the Contractor, directing an addition or revision in the work.

1.03 CSSS CHANGES

- A. All references in Section 8 of the Standard Specifications to actions by the "City Council" shall be amended to read action by the "City".
- B. Wherever reference is made to City Manager, Director of Utilities, Engineer, Finance Director, Inspector, or other specifically identified individuals, it shall include their designated representative.

1.04 EXCAVATIONS AND TRENCHING

- A. Excavations or trenches crossing roadways, walks, or traffic ways shall be provided with suitable traffic bearing steel plate or wood planking temporary covers. Contractor shall verify location of all underground facilities prior to excavating and shall perform the work to avoid damage to existing underground facilities. Contractor shall repair at no additional cost to the City and to prior condition, any existing utility damaged due to work of this contract.
- B. If unusual amounts of bone, stone or artifacts are uncovered, work within 50 meters of the area shall cease immediately and a qualified archaeologist shall be consulted to develop, if necessary, mitigation measure to reduce any archaeologist impact to a less than significant effect before construction resumes in the area.

1.05 SPECIFICATIONS

- A. The specifications are those bound and enumerated in the Table of Contents. The bidding Requirements, "Items of the Proposal", General Conditions, and Division 1 of the specifications apply to all work of this contract.

1.06 HOURS OF WORK

- A. Contractor shall perform the work of this contract on normal work days and within normal work hours, except after hours work, and work on Saturdays, Sundays, and holidays may be permitted if prior approval is obtained from the City. Overtime pay required to perform the work shall be included in the Contractor's bid prices, and no additional compensation to the Contractor will be made for overtime work.

1.07 CONTRACTOR'S SET OF PLANS AND SPECIFICATIONS

- A. City Furnished Plans and Specifications:

Upon award of contract, the City will provide plans and specifications as follows:

- 1. Plans: 5 sets
 - 2. Specifications: 5 sets
- B. The Contractor is responsible for providing copies of the plans and specifications to all subcontractors as required for construction. Additional Sets of the plans and specifications may be obtained from the City. The cost charged the Contractor for additional copies obtained from the City shall cover all associated City procurement costs. City will not be responsible for incomplete information in the event partial sets are ordered.

1.08 INTERPRETATION OF DRAWINGS

- A. The Contract Drawings consist of all of the plan sheets.
- B. The data given herein, and on the drawings, are as exact as could be secured, but their absolute accuracy is not guaranteed. The Technical Specifications and drawings are for

the assistance and guidance of the Contractor; exact locations, distance, elevation, etc., will be governed by the various structures, and Contractor shall use same with this understanding.

- C. The drawings are diagrammatic, but shall be followed as closely as existing conditions will permit. Prior to submitting their sealed Proposal, the Contractor shall inspect the site and verify all measurements and conditions and shall be responsible for the correctness of same. No extra compensation will be allowed because of differences between work shown on the drawings and measurements at the site.
- D. Catalog numbers on the drawings and in the Technical Specifications are from the best available information and are for guidance and assistance. The Contractor shall verify all catalog numbers and install only suitable materials.

1.09 REFERENCED PUBLICATIONS

- A. The publications referred to hereinafter form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of referenced publications in effect at the time of the bid shall govern.

1.10 QUESTIONS PRIOR TO BID OPENING

- A. Prior to the opening of the sealed proposals, all questions concerning the Contract Documents shall be directed to Paul Barnes, (916) 808-1442, or facsimile (916) 808-1497.

1.11 START OF WORK

- A. The Contractor shall commence work on the day the NOTICE TO PROCEED is issued.
- B. Any work performed by the Contractor in advance of receipt of the NOTICE TO PROCEED shall be considered as having been done by him at his own risk and as a volunteer unless NOTICE TO PROCEED is issued by the Owner.

1.12 FACILITY ACCESS

- A. The City will provide one (1) set of combination padlocks with an agreed upon combination. Contractor shall be responsible for all subsequent replacements. The Contractor shall be responsible for securing the facility after each work day and at all times during the contract.

PART 2 - PRODUCTS

2.01 CONSTRUCTION SCHEDULE

- A. Contractor shall submit a Construction Schedule for the entire project. Construction Schedule shall be in the Critical Path Method (CPM) format. The proposed dates of commencement and completion of each of the various subdivisions of work required under these Specifications. Include submittals, procurement, disposal, delivery, installation, testing, and final inspection. CPM shall be arranged in work weeks and shall show manpower. No Progress Payments will be made until the CPM schedule has been received and approved by the Engineer.

PART 3 - EXECUTION

3.01 PRE-JOB CONFERENCE

- A. The Contractor, after delivery of the Contract and at least three (3) days before beginning work, shall notify Renee Graves at (916) 808-1465 and arrange a pre-job conference. At this conference, the Contractor shall deliver appropriate submittals and a Construction Schedule as detailed below. The Contractor is responsible to provide plans and special provisions to subcontractors.

3.02 CONTRACTOR COMMUNICATIONS

- A. All official communications between the Contractor and the City of Sacramento shall be made through the Engineer.

3.03 SUPERINTENDENT

- A. Contractor shall assign a Superintendent to supervise all work and to represent the Contractor on site. Superintendent shall cooperate with the Owner and shall provide assistance at all times for inspection of the work including: removing covers, operating machinery, or performing any reasonable work which, in the opinion of the Engineer, is necessary to determine the quality or adequacy of the work. Superintendent shall also furnish material shipping labels and packing slips to the Engineer to verify that the material conforms with approved submittals and Specifications.
- B. Contractor shall lay out all work in advance of fabrication and shall be responsible for coordination of all related work.
- C. Contractor shall be responsible for scheduling sump and equipment shutdowns necessary to complete the work. Two (2) days prior to the proposed shutdown, the Superintendent shall obtain approval for the shutdown from the Engineer. The Engineer shall be given the following information:
1. Date and time of shutdown
 2. Work to be accomplished during shutdown
 3. Number of persons working during shutdown
 4. Time of re-energization
- D. Contractor shall monitor and assure that:
1. Shall remove spillage resulting from hauling operations along, or across, any public traveled way, at least daily, at Contractor's expense.
 2. Conduct construction operations in such a manner as to cause as little inconvenience as possible to abutting property owners.
 3. Water or dust palliative shall be applied, if ordered by the Engineer, for the alleviation or prevention of dust nuisance and shall be done at Contractor's expense.
 4. Contractor shall contact the Engineer for a visual inspection 48 hours prior to covering any underground conduit.

5. Full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work involved maintenance of traffic and public safety shall be considered as included in the prices paid for various Contract items of work, and no additional compensation will be allowed, therefore.

3.04 PERMITS

- A. The City is in the process of obtaining a building permit for this project and will obtain all permits for this project. If the building permit is issued in time the permit will be sent out as an addendum to this contract.

3.05 TRENCH SAFETY

- A. Contractor's work shall conform to the provisions of Section 6705 of the Labor Code of the State of California.
- ~~B. Excavation for any trench five (5) feet, or more, in depth shall not begin until the City has received the Contractor's detailed plan for worker protection from the hazards of caving ground in and around trenches. Such plan shall be submitted at least five (5) days before the Contractor intends to begin trench excavation. Show details of the design of shoring, bracing, sloping, or other provisions to be made for worker protection. No such plan shall allow the use of shoring, sloping, or a protective system less effective than that required by the Construction Safety Orders of the Division of Industrial Safety. If such plan varies from the shoring system standards established by the Construction Safety Orders, the plan shall be prepared and signed by an engineer who is registered as a Civil or Structural Engineer in the State of California.~~
- C. In addition, the Contractor shall obtain, pay for, and comply with all provisions of the permit required by Section 6500 of the California Occupational Safety and Health Act of 1973.

3.06 PUBLIC SAFETY AND CONVENIENCE AND MAINTENANCE OF TRAFFIC

- A. Contractor's attention is directed to Sections 6-6, 6-7, 6-8, and 6-9 of the CSSS.
- B. Contractor shall be responsible for traffic control and public safety at all times. Vehicle and pedestrian traffic must be allowed to traverse all streets and alleys.
- C. Contractor shall furnish, install, and maintain temporary construction warning signs, flaggers, barricades, and other devices necessary to safeguard the general public and the work, and to provide for the safe and proper routing of all vehicular and pedestrian traffic within, and through, the limits of the project during the performance of the work.
- D. Maintenance of traffic shall apply continuously, and shall not be limited to normal working hours. The use of flaggers, barricades, and construction warning signs shall comply with the current edition of "Work Area and Traffic Control Handbook" (WATCH), available for review at the City of Sacramento, Department of Transportation, Traffic Engineering Division, located at 915 I Street in Sacramento.
- E. All lanes of traffic on adjacent street(s) shall remain open at all times during the course of construction unless otherwise approved in writing by the Engineer.

- F. Contractor shall be required to establish traffic scheduling and control measures acceptable to the Engineer prior to starting any work. The Contractor shall submit to the Engineer for review and approval a plan showing proposed traffic control measures and/or detours for vehicles and pedestrians affected by the construction work. This plan shall be submitted a minimum of ten (10) working days prior to the scheduled commencement of any work by the Contractor. **Contractor will not be allowed to begin work until an approved plan is on file with the Engineer.** All advance warning and traffic delineation shall conform to the latest edition of "Work Area and Traffic Control Handbook", (WATCH). The approved traffic control plan shall be made available to the Engineer on site at all times.
- G. Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners.

3.07 PRE-CONSTRUCTION PHOTOGRAPHS

- A. Pre-construction photographs shall be provided and shall conform to Section 11 of the Standard Specifications.

3.08 EXISTING UTILITIES

- A. Locations of both underground and overhead utilities are shown on the drawings to the extent known. The actual location and elevation of the utilities may vary from the locations shown. Unless the drawings or specifications identify that the Contractor is responsible for relocating utilities, utilities requiring relocation will be by the governing agency or their representatives. The Contractor shall coordinate relocations requested for the Contractor's convenience with the Engineer and the owner of the utility. The Contractor will cooperate with the relocation and/or protection of existing utilities.
- B. The Contractor shall contact the City inspector Pete Kroger of the City of Sacramento at 916-808-5597 two (2) working days prior to performing excavation work within existing City facilities. The City will mark locations of existing City utilities.

3.09 COMPLETION AND FINAL INSPECTION

- A. The work shall be so performed, that upon Contract completion, the project shall be ready for use. Included in the work shall be the furnishing of all labor, materials, tools, equipment, and incidentals necessary for completing the work, in accordance with the Contract Documents.
- B. Contractor shall notify the Engineer when the project is completed. Following notification, City representatives will perform a walk through and, if required, develop and list of deficient work items.
- C. Contractor shall then correct all noted deficiencies to the satisfaction of the Engineer, after which a final walk through will be scheduled with City Operation and Maintenance personnel. During the walk through, the City will develop a final punch list of deficient work items and present it to Contractor after the walk through.
- D. Following correction of all deficiencies to the satisfaction of the Engineer, a completion report will be prepared by the Engineer.

3.10 WARRANTY

- A. The term of the Contractor's warranty shall begin upon the date the job is accepted by the City.

**** END OF SECTION ****

SECTION 01110

SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Meter Shop Electrical Improvements project consists of installing new switchgear, conduits, conductors, and all the appurtenances as shown on the plans and in these special provisions. The City has hired the Mars Company to install three water meter test benches within the meter shop for testing water meters. This project will install the electrical infrastructure in order to provide power to the water meter test benches and associated equipment. The work shall be in conformance with the plans and specifications hereinafter identified; including furnishing all material, labor, plant, tools, equipment, and services necessary to complete this project.

The contractor shall coordinate all work with the City of Sacramento and will be required to work with the Mars Company during installation of the electrical work. There may be instances when Mars representatives and the electrical contractor are on site at the same time.

The City will obtain all building permits for this project.

The contractor will only be allowed to work between the hours of 7:00am to 3:30pm Monday through Friday. The City will issue temporary ID cards to allow access into the Corporation Yard and then into building 8. The contractor will not be allowed to work on Saturdays, Sundays, or any City holidays.

There is a non-mandatory job walk on April 30th, 2015 at 10:00 AM. The purpose of the job walk is to allow the contractor to see the meter shop and discuss the project prior to the date bids are due. We will met in the City Corporation Yard parking lot and then enter the meter shop. The City Corporation Yard is located at 5730 24th Street, Sacramento, CA 95822. For more information please contact Paul Barnes at 916-808-1442.

- B. The meter shop is operated by the City of Sacramento to test existing water meters and is located at the City Corporation Yard which is located at 5730 24th Street, Sacramento, CA.
- C. Portions of the work will involve the following, for which no separate payment will be made, except as provided for in the items of the bid:

1. Mobilization: Supply and transport of construction equipment, materials, supplies, appurtenances, etc., to perform the work.
2. Demobilization: Demobilization of construction plant and equipment, removal thereof and final cleanup and restoration of the site.
3. Demolition: Remove and dispose of indicated materials at an approved off-site recycling or disposal facility.
4. Electrical: Installation of new switchgear, conduit, and conductors.
5. Storage of Materials and Equipment: Provide necessary equipment to unload, and temporarily store materials and equipment, in accordance with the manufacturer's requirements.
6. Miscellaneous: Construction of a concrete house-keeping pad.
7. Test and make site ready for operation.
8. Coordinate work activities with the City.
9. Provide project supervision and management in order to meet the project schedule.

1.02 BID ITEMS

- A. See "Items of the Proposal" in the Bid Proposal Package of these Contract Documents.

1.03 CONTRACTOR'S BID STRUCTURE AND SCOPE OF THE WORK

- A. Payment for this work will be made on a lump sum basis and/or unit price basis, as indicated in the proposal.
- B. The Scope of Work is defined in the Technical Specifications, the drawings, and the referenced publications that are made a part hereto.
- C. The Contractor shall be reimbursed for all work in the Contract Documents, in accordance with the bid Proposal prepared by the Contractor.

1.04 MEASUREMENT AND PAYMENT

- A. Full compensation for furnishing all labor, materials, tools, equipment and incidentals and for doing all work involved in each item of the proposal as

described in these Specifications, as shown on the drawings and/or as required for a complete and operational facility, shall be considered as included in the bid price and no additional compensation will be made therefor.

- B. Quantities shown on the City's estimate are approximate. The City does not expressly or by implication agree that actual quantity of work will correspond therewith, but reserves the right to increase or decrease quantities of any item or to omit portions of the work as may be deemed necessary or advisable by the City; also to make such alternatives or deviations, additions to, or omissions from the Plans and Specifications as may be determined during progress of work to be necessary and advisable for proper completion.
- C. The total bid amounts shall include, without limitation, all the work shown on the drawings and as described elsewhere in these Specifications. If a specific activity of work is not called out in the bid proposal, the Contractor shall include the cost for such work in the bid item that is deemed appropriate to the Contractor as indicated in Section 8 of the CSSS.
- D. Progress Payments for the work shall be made as provided in Section 8 of the CSSS.

1.05 WORK NOT INCLUDED

- A. The following work is NOT included in this contract.
 - 1. Work shown, but marked "NIC" (Not In Contract) or shown as Existing (E).
 - 2. Any work otherwise designated to be done by others.

1.06 CONTRACTOR FURNISHED EQUIPMENT AND MATERIALS

- A. All equipment and materials furnished by the Contractor that are to remain a part of the constructed facility shall be new and unused and shall conform to the requirements of these specifications. Where manufactured materials and equipment are specified, the same brand manufacturer for each class of material or equipment shall be used wherever possible.
- B. The manufacturer's warranty shall pass to the City and shall extend for a period of one year after project acceptance by the City.

1.07 POWER DISRUPTIONS

- A. No long term electrical disruptions shall be permitted by the City during Contractor's performance of the work without prior written approval of the City. The Contractor shall furnish, install, and operate all resources required for

temporary power. All short term outages necessary for change over to temporary power, to make connection, or other activity shall be scheduled with the City at least three weeks in advance and will be subject to cancellation at any time by the City.

1.08 PROSECUTION AND PROGRESS OF THE WORK:

- A. The Contractor shall be responsible for planning, scheduling, and reporting the progress of the work so as to ensure timely completion of the work called for in the contract. The Contractor shall prepare and submit a detailed plan as specified.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials are specified in these Technical Specifications, and in Sections 10 through 38 of the CSSS.
- B. Submit and obtain approval for all Submittals before commencing fabrications or moving construction materials onto the job site.
- C. All equipment shall be complete, ready for installation, and tested to the satisfaction of the Engineer at the time of acceptance of the work.
- D. Unless specifically excluded in the Contractor's Proposal, all incidental parts which are not shown on the Plans, or specified herein, and which are necessary in order to have complete and operable facilities shall be furnished by the Contractor.
- E. Manufactured articles, material, and equipment shall be applied, installed, connected, erected, adjusted, tested, used, cleaned, and conditioned as recommended by the manufacturer unless specified to the contrary. Copies of the manufacturer's installation instructions and procedures shall be submitted prior to the installation of manufacturer's articles, material, and equipment.
- F. Materials and equipment shall be stored so as to insure the preservation of their quality and fitness for the work. Stores of equipment and materials shall be located to facilitate inspection. The Contractor shall be responsible for all damages that occur in connection with the care and protection of all materials and equipment until the completion of work and final acceptance by the City.
- G. If any material does not conform with these specifications the Contractor shall, within three days after being notified by the Engineer, remove the materials from the project site or storage area.

2.02 MATERIAL PROVIDED BY THE CITY

- A. Equipment that is not specifically identified as being provided by the City will be provided and installed by the Contractor.

2.03 CONTRACTOR ESTIMATES

- A. Contractor shall provide a written estimate for all proposed changes to the work. The estimate shall be on tabular pre-printed estimating sheets. The estimate shall list all items of deletion and addition to the Contract. Each item shall have material, equipment, and labor units extended and summed. Contractor shall apply the allowable overhead and profit (CSSS 8-16) for a total estimated cost of the proposed change order.

PART 3 - EXECUTION

3.01 CONTRACTOR'S PLANT AND EQUIPMENT

- A. **Security:** The Contractor shall, at all times, be responsible for the security of their plant and equipment. The City will not take any responsibility for missing or damaged equipment, tools, or personal belongings. The Contractor shall provide temporary security fencing and otherwise provide for the security of the existing facilities. These sites are particularly subject to vandalism. Materials left on-site are at the Contractor's risk and, if lost, at the Contractor's expense. The Contractor shall be responsible for the salvaged materials and equipment owned by the City and removed, or relocated, until the City has taken possession of such materials and equipment.
- B. **Workshop and Storage Facilities:** The Contractor shall provide storage facilities for the protection from weather of materials and supplies, and shall keep the facilities clean and in proper order at all times. The project site has limited space for a storage yard. Additional property may need to be leased, at the Contractor's expense, for storage facilities. Materials and equipment shall be stored so as to insure the preservation of their quality and fitness for the work and located so as to facilitate inspection. The Contractor shall be responsible for all damages that occur in connection with the care and protection of all materials and equipment, including existing equipment, until completion and final acceptance of the work by the City.
- C. **Parking Facilities:** Parking areas at the project location are limited for the automobiles used by the Contractor's construction employees and Contractor's own vehicles. A parking area shall be designated by the Contractor and approved by the Engineer.

3.02 CONTRACTOR'S UTILITIES

A. Electrical Power

1. General: The Contractor shall provide and make arrangements for temporary electric service for all required power required for the work under this Contract and shall maintain such service until the completion of the work. The contractor may elect to use any 120 V outlet within the meter shop.
2. ~~The Contractor shall attain approval from Tim Giffin of the City of Sacramento, (916) 808-7997, two (2) working days before installing the new switchgear and motor control centers.~~
3. Power outage requests shall be made 48 hours in advance and shall be approved by the Engineer before proceeding.

B. Sanitary Facilities: The Contractor may use the existing restrooms located within the meter shop.

3.03 LANDS PROVIDED BY CITY

- A. ~~Any additional land required for the construction of the work under this Contract, except that already owned by the City, shall be the Contractors responsibility to obtain.~~

3.04 FIELD ENGINEERING

- A. The Contractor is responsible for determining the exact location of all existing utilities and for the protection of and repair of damage to them. Contact Underground Service Alert at 1-800-227-2600, 48 hours before work is to begin. Contractor shall also contact the City Department of Utilities Plant Services Division, Pete Millino at (916) 808-5173 to identify City underground facilities on site.
- B. The Contractor shall be responsible for the protection of all existing survey monuments or markers during construction.
- C. The Contractor shall be responsible for maintaining As-Built drawings for all underground work throughout the course of construction. Such drawing shall record the location and grade (City Datum) of all underground improvements constructed and shall be delivered to the construction inspector prior to, and, in consideration of the City's acceptance of work.

3.05 SHIPPING AND PROTECTION OF EQUIPMENT

- A. Definition: For the purpose of this paragraph, "equipment" means: all mechanical devices, all electrical devices, all items supplied by the City, all items removed by Contractor for later reinstallation, and all items with one or more moving parts.
- B. Packing and Markings: All equipment shall be adequately and effectively protected against damage from moisture, dust, handling or other cause during transport from manufacturer's or supplier's premises to job site. Each item or package shall be clearly marked with a fitting or distinguishing mark, which shall be shown on the packing list. Stiffeners shall be used, where necessary, to maintain shapes and to give rigidity. Parts of equipment shall be delivered in assembled or sub-assembled units, where possible.
- C. Identification of Equipment: Each item of equipment shall have firmly affixed to it a nameplate, label, or tag with its equipment number or other discrete identifying mark.
- D. Storage of Equipment: Contractor shall provide storage for equipment for the entire interval between receiving and installation, and for the entire interval between being removed and reinstalled. Equipment shall be stored in a enclosed space affording protection from weather, dust, and mechanical damage and providing favorable temperature, humidity and ventilation conditions, as required, to ensure against equipment deterioration. For equipment that is not intended and prepared for outdoor installation, the storage container shall be heated above dew point temperature.
- E. Protection of Equipment After Installation: After installation, all equipment shall be protected, as required. During construction, and until final acceptance by the City, all equipment that may be affected must be completely covered. All equipment shall be cleaned and vacuumed inside and outside prior to acceptance.
- F. Delivery of Equipment: City personnel will not accept materials or equipment deliveries for the Contractor.
- G. Security: Security of equipment stored by the Contractor is the Contractors responsibility. All losses or damage shall be replaced or repaired at the Contractor's expense.

3.07 TESTING

- A. ~~The City will field test earth work and cast-in-place concrete materials.~~
- B. Notification: As an exception to requirements that may be stated elsewhere in the Contract, the Engineer shall be given two (2) working days notice prior to each electrical test.
- C. Failure to Meet Test: Any system material or workmanship which is found defective, on the basis of acceptable tests, shall be reported to the Engineer. Contractor shall replace the defective material or equipment and have test repeated until test proves satisfactory to the Engineer, without additional cost to the City.
- D. Operational Testing: Operational testing consists of electrical testing specified in Section 16950, OPERATIONAL TESTING.

3.08 SAFETY

- A. Contractor shall execute and maintain all work so as to avoid injury or damage to any person or property. All work shall be done in conformance with the State of California, Division of Industrial Safety and OSHA Standards. Safety precautions, as applicable, shall include, but not be limited to, confined space procedures, adequate fume protection; adequate illumination for underground and night operation; instruction in accident prevention for all employees; such machinery guards, walkways, scaffolds, ladders, bridges, and other safety devices, equipment and wearing apparel as are necessary or lawfully required to prevent accidents or injuries; and the proper inspection and maintenance of all safety measures. Contractor shall have emergency phone numbers and addresses posted on the job site.

3.09 PROTECTION OF EXISTING IMPROVEMENTS

- A. The provisions of this Section shall supplement the provisions of CSSS Section 13.
- B. Existing facilities, utilities, and property shall be protected from damage resulting from the Contractor's operations. All trees, shrubbery, fences, walls, asphalt, and other improvements, including existing pavements, sidewalks, street improvements, and underground utilities, and other improvements not shown on the drawings shall be protected from damage by the Contractor throughout the construction period. Existing roadways and other improved surfaces shall be protected from damage by vehicles with tracks or lugs.

- C. Any damage resulting from the Contractor's operations shall be repaired by the Contractor to the condition which existed prior to the damage, and to the satisfaction of the Engineer, at no additional cost to the City.
- D. The Engineer may deduct from payments otherwise due the Contractor, the estimated cost of repairing any damage created by the Contractor's operation, until such time that repairs are made by the Contractor to the Engineer's satisfaction.

3.10 MATERIAL NONCONFORMANCE

- A. If any material does not conform to these Specifications, the Contractor shall, within three (3) days after being notified by the Engineer, remove the materials from the project site or storage area.

3.11 RESTORATION OF STRUCTURES AND SURFACES

- A. Structures, Equipment and Pipework: The Contractor shall remove such existing structures, equipment, and pipework as may be necessary for the performance of the work, and shall rebuild, or replace, the items thus removed in as good a condition as found. Contractor shall repair any existing structures which may be damaged as a result of the work.
- B. Curbs, Gutters, Driveways and Sidewalks: All curbs, gutters, driveways, sidewalks, and similar structures that are broken or damaged by the installation of the work shall be reconstructed by the Contractor. Reconstruction shall be of the same kind of materials with the same finish and in not less than the same dimensions as the original work. Repairs shall be made by removing and replacing the entire portions between joints or scores, and not merely refinishing any damaged part. All work shall match the appearance of the existing improvements, as nearly as possible.
- C. Roads and Streets: All roads and streets in which the surface is removed, broken, or damaged, or in which the ground has caved, or settled, due to work under this Contract, shall be completely resurfaced and brought to the original grade and crown section, unless otherwise indicated. Before resurfacing material is placed, edges of pavements shall be trimmed back far enough to provide clean, solid, vertical faces, and shall be free of any loose material. Roadways used by the Contractor for hauling materials, equipment, supplies, etc., shall be cleaned and repaired if the condition of the roadway is damaged, or otherwise affected, due to the Contractor's operations.
- D. Cultivated Areas and Other Surface Improvements: All cultivated and natural areas, either agricultural or lawns, and other surface improvements which are damaged by actions of the Contractor shall be restored, including roadside

drainage ditches, as nearly as possible, to their original condition.

3.12 CONSTRUCTION INSPECTIONS

- A. Unless otherwise directed, Contractor shall contact the Utility Department Construction Section at (916) 808-1411 two (2) working days in advance to schedule construction inspections.

****END OF SECTION****

SECTION 01330

SUBMITTALS

PART 1 - GENERAL

1.01 STANDARD COMPLIANCE

- A. When materials or equipment must conform to the standards of organizations such as, but not limited to, the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL) documents showing, or proving, conformance shall be submitted.
- B. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual Sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable tests, and is approved by the City. The certificate shall state that the item has been tested in accordance with the specified organization's standard. For materials and equipment whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for approval. The certificate shall identify the manufacturer, the product, and the referenced standard and shall state that the manufacturer certifies that the product conforms to all requirements of the project Specification and of the referenced standards listed.

1.02 REVIEW OF CONTRACTOR'S INFORMATION

- A. When review and checking for acceptance is required of any drawing, or information regarding materials and equipment, the Contractor shall prepare or secure, and submit for review, four (4) copies. The Engineer, after taking appropriate action, will return two (2) marked copies to the Contractor.

Within a reasonable time after receipt of said submittal copies, the Engineer will return the marked copies indicating one of the following four (4) actions:

1. If review and checking indicates no exceptions, copies will be returned marked "NO EXCEPTIONS TAKEN" and work may begin immediately on incorporating the material and equipment covered by the submittal into the work.
2. If review and checking indicates limited corrections are required, copies will be returned marked "MAKE CORRECTIONS NOTED". Work may begin immediately on incorporating into the work the material and equipment covered by the corrected submittal.
3. If review and checking indicates insufficient, or incorrect data, has been submitted, copies will be returned marked "REVISE AND RESUBMIT". No work may begin on incorporating the material and equipment covered by this submittal

into the work until the submittal is revised, resubmitted, and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED".

4. If review and checking indicates the material and equipment submittal is unacceptable, copies will be returned marked "REJECTED". No work may begin on incorporating the material and equipment covered by this submittal into the work until a new submittal is made and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED".
- B. Approval of the submittal by the Engineer shall not relieve the Contractor from responsibility for any errors or omissions in such submittals nor from responsibility for complying with the requirements of this Contract.
 - C. If Shop Drawings show variations from Contract requirements, Contractor shall describe such variations in writing, separate from the drawings, at time of submission. All such variations must be approved by the Engineer.

PART 2 - PRODUCTS

2.01 MANUFACTURER'S DATA

- A. Submittals for each manufactured item shall be comprised of manufacturer's descriptive literature, drawings, diagrams, performance and characteristic curves, and catalog cuts. Manufacturer's name, trade name, model or catalog number, nameplate data, size, layout dimensions, capacity, project specification references, and any other additional information necessary to establish contract compliance shall be clearly indicated for each item submitted. Contractor shall identify items submitted for approval using an arrow or yellow highlighter. All submittals that fail to properly identify items will be returned to the Contractor.

2.02 SHOP DRAWINGS

- A. Shop Drawings shall show types, sizes, accessories, elevations, floor plans, sectional views, installation details, elementary control diagrams, and wiring diagrams. Wiring diagrams shall identify circuit terminals and shall indicate the internal wiring for each item of equipment. Drawings shall also indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. If any equipment is disapproved, the drawings shall be revised to show acceptable equipment and be resubmitted. **Contractor shall provide a hard copy and electronic copy of all shop drawings. The electronic copies shall be in Adobe format (Portable Document Format) and shall be provided on a CD. Contractor shall use latest version of Adobe.**

2.03 OPERATION AND MAINTENANCE MANUAL

- A. Submit an operation and maintenance manual covering the stipulated systems and equipment. Three (3) approved copies of the manual, bound in Avery D - Ring binder model number AVY79-799 or approved equal, shall be furnished to the City. **One (1) of the three copies of the operation and maintenance manual shall contain original documentation/manuals and not photocopies.** Each binder shall be no more than 75% full. Prior to system and equipment tests, one (1) complete, bound copy of the manual shall be submitted for approval. Three (3) approved copies of the manual each

for this project, with all applicable test forms completed, shall be furnished to the City before completion of the Contract. The following identification shall be inscribed on the cover and spine of the binders:

Operation and Maintenance Manual
Project: Meter Shop Electrical Improvements
Contractor: _____
Contract No.: _____
Date: _____

The contractor shall also provide the City with an electronic copy of each O&M manual. The electronic copies shall be in Adobe format (Portable Document Format) and shall be provided on a CD. Contractor shall use the latest version of Adobe.

- B. Provide a table of contents and tab sheets to identify discrete subjects. Instruction sheets shall be legible and easily understood with large sheets and drawings folded in. Use manufacturer's original pre-printed instructions when available, do not xerox these pre-printed instructions. Cross out all material which does not apply to the equipment furnished on this job.
- C. The operating and maintenance instruction shall include, as a minimum, the following data for each item of mechanical and electrical equipment:
1. Name and location of the manufacturer, the manufacturer's local representative, the nearest supplier and spare parts warehouse.
 2. Approved submittals applicable to operation and maintenance.
 3. Recommended installation, adjustment, start-up, calibration, and troubleshooting procedures.
 4. A control sequence describing start-up, operation, and shutdown
 5. Detailed description of the function of each principal component of the systems.
 6. Recommended lubrication and an estimate of yearly quantity needed.
 7. Recommended step-by-step procedures for all modes of operation.
 8. Complete internal and connection wiring diagrams.
 9. Complete printed circuit board schematic and assembly drawings.
 10. Recommended preventive maintenance procedures and schedule.
 11. Complete parts lists, by generic title and identification number, with exploded views of each assembly.
 12. Recommended spare parts.
 13. Disassembly, overhaul, and reassembly instructions.

- 14. All completed test forms.
 - 15. Provide ISA (International Society for Measurement and Control) S-20 forms for all instrumentation devices.
 - 16. As built single line drawings of the entire electrical system including motor control drawings of each motor. Autocad files of both single line and motor control drawings on a CD.
- D. Contractor is not required to provide manuals for equipment supplied by the City. However, any manuals provided to the Contractor by the City shall be returned in a condition acceptable to the Engineer, or replaced at no cost to the City.

2.04 PROJECT RECORD DRAWINGS

- A. The Contractor shall maintain a neatly and accurately marked set of record drawings showing the elementary control diagrams, wiring diagrams, and final locations and layout of all mechanical, electrical, and instrumentation equipment; piping and conduit; structures; and other facilities. Drawings shall be kept current weekly, with all work instructions and change orders; mechanical, electrical, and instrumentation equipment accommodations; and construction adjustment. Drawings shall be subject to the inspection of the Engineer at all times, and progress payments, or portions thereof, may be withheld if drawings are not accurate and current. Prior to acceptance of the work, the Contractor shall deliver to the Engineer two (2) sets of neatly marked record drawings, accurately showing all the information required above.

PART 3 - EXECUTION

3.01 SUBMITTAL PROCEDURE

- A. At least thirty (30) days prior to the Contractors need for approval, Contractor shall forward to the Engineer all submittals required by the individual Sections of the Specifications. The Engineer may require that the Contractor submit a legible reproducible mylar for the City's use in lieu of multiple prints of a single drawing.
- B. Identify all submittals by submittal number on letter of transmittal. Specification number shall be identified on the letter of transmittal. Submittals shall be numbered consecutively and resubmittals shall have a letter suffix. For example:
 - 1. 1st submittal: 2
 - 2. 1st resubmittal: 2A
 - 3. 2nd resubmittal: 2B, etc.

3.02 INFORMATION TO BE SUBMITTED FOR REVIEW

- A. Information on items to be submitted for review are specified in the individual Sections of these Specifications. Submittals for each Section shall be bound together in one book. Book shall have numbered tab dividers for each item. Submittals that are related to, or affect, each other shall be forwarded simultaneously as a package to facilitate coordinated review. Uncoordinated submittals will be rejected. Do not combine unrelated materials in the same submittal. Submittals shall be arranged in same order

as they appear in the Specification Section. Items shall be highlighted and clearly marked with the same identification number as indicated on the drawings. The Contractor shall include submittal time appropriate within each item of work on the Construction Schedule. The City will receive submittals at the preconstruction meeting as specified in Section 01105, General Information and Requirements.

**** END OF SECTION ****

SECTION 01420

ABBREVIATIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Abbreviations and meanings. Refer to the Drawings for additional abbreviations.

1.02 INTERPRETATIONS

- A. Interpret abbreviations by the context in which abbreviations are used.

1.03 ABBREVIATIONS

A. Association and Reference Standard abbreviations:

| | |
|--------|---|
| AA | Aluminum Association |
| AAMA | Architectural Aluminum Manufacturers Association |
| AAN | American Association of Nurserymen |
| AASHTO | American Association of State Highway and Transportation Officials |
| ABC | Associated Air Balance Council |
| ABPA | Acoustical and Board Products Association |
| ACI | American Concrete Institute |
| ACIL | American Council of Independent Laboratories |
| ADC | Air Diffusion Council |
| AFBMA | Anti-Friction Bearing Manufacturers' Association, Inc. |
| AGA | American Gas Association |
| AGC | Associated General Contractors |
| AGMA | American Gear Manufacturers |
| AI | Asphalt Institute |
| AIA | American Institute of Architects |
| AIMA | Acoustical and Insulating Materials Association |
| AISC | American Iron and Steel Institute |
| AITC | American Institute of Timber Construction |
| AMCA | Air Moving and Conditioning Association |
| AMG | Arizona Masonry Guild |
| ANSI | American National Standards Institute |
| APA | American Plywood Association |
| API | American Petroleum Institute |
| ARI | Air Conditioning and Refrigeration Institute |
| ASAHC | American Society of Architectural Hardware Consultants |
| ASHRAE | American Society of Heating, Refrigeration and Air Conditioning Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| AWI | Architectural Woodwork Institute |

| | |
|--------|---|
| AWPA | American Wood Preservers Association |
| AWPI | American Wood Preservers Institute |
| AWS | American Welding Society |
| AWSC | American Welding Society code |
| AWWA | American Water Works Association |
| BHMA | Builders Hardware Manufacturers Association |
| BIA | Brick Institute of America |
| BSI | Building Stone Institute |
| CLFMI | Chain Link Fence Manufacturers Institute |
| CPSC | U.S. Consumer Product Safety Commission |
| CRA | California Redwood Association |
| CRI | Carpet and Rug Institute |
| CRSI | Concrete Reinforcing Steel Institute |
| CS | Commercial Standards |
| CSI | Construction Specifications Institute |
| CSSS | City of Sacramento Standard Specifications |
| CTI | Ceramic Tile Institute |
| DHI | Door and Hardware Institute |
| EIFS | Exterior Insulation and Finish System |
| EJCDC | Engineers Joint Contract Documents Committee |
| FGMA | Flat Glass Marketing Association |
| FIA | Factory Insurance Association |
| FM | Factory Mutual |
| FS | Federal Specifications |
| FTI | Facing Tile Institute |
| GA | Gypsum Association |
| ICBO | International Conference of Building Officials |
| IEEE | Institute of Electrical and Electronics Engineers |
| MIA | Marble Institute of America |
| ML/SFA | Metal Lath/Steel Framing Association |
| MS | Military Specifications |
| NAAMM | National Association of Architectural Metal Manufacturers |
| NAPA | National Asphalt Pavement Association |
| NBHA | National Builders Hardware Association |
| NCMA | National Concrete Masonry Association |
| NEC | National Electrical Code |
| NECA | National Electrical Contractors Association |
| NETA | International Electrical Testing Association |
| NEMA | National Electrical Manufacturers Association |
| NFPA | National Fire Protection Association |
| NFPA | National Forest Products Association |
| NIST | National Institute of Standards and Technology |
| NMWIA | National Mineral Wood Insulation Association |
| NPCA | National Paint and Coatings Association |
| NRCA | National Roofing Contractors Association |
| NTMA | National Terrazzo and Mosaic Association |
| NWMA | National Woodwork Manufacturer's Association |
| PCA | Portland Cement Association |
| PCI | Prestressed Concrete Institute |

| | |
|---------|---|
| PDCA | Paint and Decorating Contractors of America |
| PDI | Plumbing and Drainage Institute |
| PEI | Porcelain Enamel Institute |
| PS | Product Standard |
| RTI | Resilient Tile Institute |
| SAE | Society of Automotive Engineers |
| SCPA | Structural Clay Products Association |
| SDI | Steel Door Institute |
| SIGMA | Sealed Insulating Glass Manufacturers Association |
| SJI | Steel Joist Institute |
| SMACCNA | Sheet Metal and Air Conditioning Contractors National Association |
| SSPC | Steel Structures Painting Council |
| TCA | Tile council of America |
| UBC | Uniform Building Code |
| UL | Underwriters Laboratories, Inc. |
| USDA | United States Department of Agriculture |
| VA | Vermiculite Association |
| WCLA | West Coast Lumberman's Association |
| WCLIB | West Coast Lumberman's Inspection Bureau |
| WPA | Western Pine Association |
| WPOA | Western Plumbing Officials Association |
| WRC | Welding Research Council |
| WSCPA | Western States Clay Products Association |
| WWPA | Western Wood Products Association |

B. Miscellaneous Abbreviations:

| | |
|---------|-------------------------------|
| a | year or years (metric unit) |
| A | Ampere or amperes |
| am | ante meridian (before noon) |
| ac | alternating current |
| ac-ft | acre-foot or acre-feet |
| atm | atmosphere |
| AWG | American Wire Gauge |
| bbf | barrel or barrels |
| bd | board |
| bhp | brake horsepower |
| bil gal | billion gallons |
| BOD | biochemical oxygen demand |
| Btu | British thermal unit or units |
| Btuh | British thermal unit per hour |
| bu | bushel or bushels |
| C | degrees Celsius |
| Cal | calorie or calories |
| cap | capita |
| cd | cabdeka or cabdekas |
| cfm | cubic feet per minute |
| Ci | curie or curies |

| | |
|-----------------|---------------------------------|
| cm | centimeter or centimeters |
| cmu | concrete masonry unit |
| CO | carbon monoxide |
| Co. | Company |
| CO ₂ | carbon dioxide |
| COD | chemical oxygen demand |
| Corp. | Corporation |
| counts/min | counts per minute |
| cu | cubic |
| cu cm | cubic centimeter or centimeters |
| cu ft | cubic foot or feet |
| cu ft/day | cubic feet per day |
| cu ft/hr | cubic feet per hour |
| cu ft/min | cubic feet per minute |
| cu ft/sec | cubic feet per second |
| cu in | cubic inch or inches |
| cu m | cubic meter or meters |
| d | day (metric units) |
| day | day (English units) |
| db | decibels |
| DB | dry bulb (temperature) |
| dc | direct current |
| diam | diameter |
| DO | dissolved oxygen |
| DS | dissolved solids |
| emf | electromotive force |
| fpm | feet per minute |
| F | degrees Fahrenheit |
| ft | feet or foot |
| fc | foot-candle or foot candles |
| ft/day | feet per day |
| ft/hr | feet per hour |
| ft/min | feet per minute |
| ft/sec | feet per second |
| g | gram or grams |
| G | gravitational force |
| gal | gallon or gallons |
| gal/day | gallons per day |
| gal/min | gallons per minutes |
| gal/sec | gallons per second |
| g/L | grams per liter |
| gpd | gallons per day |
| gpd/ac | gallons per acre per day |
| gpd/cap | gallons per day per capita |
| gpd/sq ft | gallons per day per square foot |
| gph | gallons per hour |
| gpm | gallons per minute |
| gps | gallons per second |
| h | hour or hours (metric unit) |

| | |
|---------------|---------------------------------------|
| ha | hectare or hectares |
| hp | high point |
| hp | horse power |
| hp-hr | horse power-hour or horse power-hours |
| hr | hour or hours (English units) |
| Hz | hertz |
| ID | inside diameter |
| lhp | indicated horsepower |
| Inc. | Incorporated |
| in. | inch, inches |
| in./sec | inches per second |
| J | joule or joules |
| JTU | Jackson turbidity unit or units |
| k | kips |
| K | kelvin |
| K | thermal conductivity |
| kcal | kilocalorie or kilocalories |
| kcmil | thousand circular mils |
| kg | kilogram or kilograms |
| km | kilometer or kilometers |
| kN | kilonewton or kilonewtons |
| kPa | kilopascal or kilopascals |
| ksi | kips per square inch |
| kV | kilovolt-ampere or kilovolt-amperes |
| kW | kilowatt or kilowatts |
| L | liter or liters |
| lb/1000 cu ft | pounds per thousand cubic foot |
| lb/acre-ft | pounds per acre-foot |
| lb/ac | pounds per acre |
| lb/cu ft | pounds cubic foot |
| lb/day/cu ft | pounds per day per cubic foot |
| lb/day/acre | pounds per day per acre |
| lb/sq ft | pounds per square foot |
| lin | linear, lineal |
| LF | linear foot or feet |
| lm | lumen or lumens |
| log | logarithm (common) |
| ln | logarithm (natural) |
| lx | lux |
| m | meter or meters |
| M | molar (concentrations) |
| mA | milliampere or milliamperes |
| max | maximum |
| mCi | millicurie or millicuries |
| meq | milliequivalent |
| uF | microfarad or microfarads |
| MFBM | thousand feet board measure |
| mg | milligram or milligrams |
| mgd/ac | million gallons per day per acre |

| | |
|----------|--|
| mgd | million gallons per day |
| mg/L | milligrams per liter |
| mg/L | parts per million |
| ug/L | micrograms per liter |
| um | micrometer or micrometers |
| MG | million gallons |
| min | minimum |
| min | minute or minutes |
| MLSS | mixed liquor suspend solids |
| MLVSS | mixed liquor volatile suspended solids |
| mm | millimeter or millimeters |
| mol wt | molecular weight |
| mol | mole |
| Mpa | megapascal or megapascals |
| mph | miles per hour |
| MPN | most probable number |
| mR | milliroentgen or milliroentgens |
| Mrad | megarad or megarads |
| mV | millivolt or millivolts |
| MW | megawatt or megawatts |
| N | newton or newtons |
| No. | number |
| Nos. | numbers |
| NRC | noise reduction coefficient |
| OC | on center |
| OD | outside diameter |
| ORP | oxidation-reduction potential |
| OT | ortho-tolidine |
| OTA | ortho-tolidine-arsenite |
| oz | ounce or ounces |
| oz/sq ft | ounce per square foot |
| Pa | pascal or pascals |
| pl | plate or property line |
| pm | post meridian (afternoon) |
| ppb | parts per billion |
| ppt | parts per thousand |
| pr | pair |
| psf/hr | pounds per square foot per hour |
| psi | pounds per square inch |
| psia | pounds per square inch absolute |
| psig | pounds per square inch gauge |
| PVC | polyvinyl chloride |
| qt | quart or quarts |
| R | radius |
| R | roentgen or roentgens |
| rad | radiation absorbed dose |
| RH | relative humidity |
| rpm | revolutions per minute |
| rps | revolutions per second |

| | |
|--------------------------|----------------------------------|
| s | second (metric units) |
| S | Siemens (mho, or inverse ohm) |
| SDI | sludge density index |
| SI | International System of Units |
| sp | static pressure |
| sp gr | specific gravity |
| sp ht | specific heat |
| sq | square |
| cm ² or sq c | square centimeter or centimeters |
| sq ft | square feet or foot |
| sq in | square inch, square inches |
| km ² or sq km | square kilometer or kilometers |
| m ² or sq m | square millimeter or millimeters |
| sq yd | square yard or yards |
| SS | suspended solids |
| STC | Sound Transmission Class |
| SVI | sludge volume index |
| TDS | total dissolved solids |
| TKN | total Kjeldahl nitrogen |
| TLM | median tolerance limit |
| TOC | total organic carbon |
| TOD | total oxygen demand |
| TOW | top of weir |
| TS | total solids |
| TSS | total suspended solids |
| TVS | total volatile solids |
| U | U factor |
| U | Coefficient of Heat Transfer |
| U | heat transfer coefficient |
| US | United States |
| V | volt or volts |
| VA | volt-ampere or volt-amperes |
| W | watt or watts |
| WB | wet bulb |
| wg | water gauge |
| wk | week or weeks |
| wt | weight |
| yd | yard or yards |
| yr | year or years (English unit) |

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

****END OF SECTION****

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. Requirements Included:

1. Products.
2. Transportation and Handling.
3. Storage and Protection.
4. Substitutions and Product Options.

B. Related Requirements:

1. Section 01330: Submittals: Submittal of Manufacturers' Certificates.

1.02 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Manufacturer's Recommendations:

1. Except as otherwise approved by the Engineer, determine and comply with manufacturer's recommendations on product handling, storage and protection.
 - a. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - b. Promptly remove damaged materials and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the City.
2. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to manufacturer, grade, quality, and other pertinent information.

3. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

1.04 JOB CONDITIONS

A. Storage and Protection:

1. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
2. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
3. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.
4. After installation, provide coverings to protect products from damage from traffic and construction operations, remove when no longer needed.
5. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

B. Repairs and Replacements:

1. In event of damage, promptly make replacements and repairs to the approval of the Engineer and at no additional cost to the City.
2. Additional time required to secure replacements and to make repairs will not be considered to justify an extension in the Contract Time of Completion.

1.05 ALTERNATIVES

A. Product Options:

1. Within ten (10) days after date of Contract, submit complete list of major products proposed, with name of manufacturer, trade name, and model.
2. Options:
 - a. Products Specified by Reference Standards or by Description Only:
Any product meeting those standards.
 - b. Products Specified by Naming One (1) or More Manufacturers with

a Substitute Paragraph: Submit a request for substitution for any manufacturer not specifically named.

c. Products Specified by Naming Several Manufacturers: Products of named manufacturers meeting specifications; no options, no substitutions allowed.

d. Products Specified by Naming Only One (1) Manufacturer: No options, no substitutions allowed.

B. Substitutions:

1. Within ten (10) calendar days after date of Contract, Contractor shall submit requests to the Engineer for consideration of substitutions.
2. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
3. Request constitutes a representation that Contractor:
 - a. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
 - b. Will provide the same warranty for substitution as for specified product.
 - c. Will coordinate installation and make other changes that may be required for Work to be complete in all respects.
 - d. Waives claims for additional costs that may subsequently become apparent.
4. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.
5. Engineer will determine acceptability of proposed substitution, and will notify Contractor of acceptance or rejection in writing within a reasonable time.
6. The Engineer can, at his option, require as a condition of acceptance of a substitution that the Contractor provide a credit to the City for the difference in cost of product(s) or components, or systems proposed as a substitution.

7. If, upon Engineer's review of a substitution, it is determined by the Engineer that the substitution is not acceptable, for whatever reason, the Contractor shall supply the specified product or products.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 SHIPPING AND PROTECTION OF EQUIPMENT

- A. Definition: For the purpose of this article, "equipment" means all mechanical devices, all electrical devices, all electronic devices, and all items with one or more moving parts.
- B. Packing and Marking: All equipment shall be adequately and effectively protected against damage from moisture, dust, handling or other cause during transport from manufacturer's or supplier's premises to site. Each item or package shall be clearly marked with a fitting or distinguishing mark that shall be shown on the packing lists. Stiffeners shall be used where necessary to maintain shapes and to give rigidity. Parts of equipment shall be delivered in assembled or sub-assembled units where possible.
- C. Identification of Equipment: Each item of equipment shall have firmly affixed to it a nameplate, label or tag with its equipment number or other discrete identifying mark.
- D. Storage of Equipment: The equipment shall remain in its shipping package until installation.
- E. Protection of Equipment After Installation: After installation, all equipment shall be protected as required. During construction, including finishing, all equipment that may be affected must be completely covered.
- F. Delivery of Equipment: City personnel will not accept materials or equipment deliveries for the Contractor.
- G. Security: Security of equipment stored by the Contractor is his responsibility. All losses or damage shall be replaced or repaired at the Contractor's expense.

**** END OF SECTION ****

SECTION 02220

DEMOLITION AND SALVAGE OF MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: The work includes demolition, removal, and salvage where specified of all items indicated on the drawings, or specified herein.
- B. All materials resulting from demolition work, except as otherwise indicated on the drawings or specified herein for re-use by the Contractor or re-use by the City shall become the property of the Contractor.

1.02 AVAILABILITY OF WORK AREAS

- A. Subject to all related Contract stipulations, the contract area will be released to the Contractor, at one time, upon issuance of the Notice-to-Proceed. Unless otherwise directed, the Contractor shall maintain access to and shall not begin demolition of the existing sump electrical facilities until authorized in writing by the Engineer.

1.03 SUBMITTALS

- A. The procedures proposed for the accomplishment of demolition and storage of salvaged materials shall be submitted for approval. The procedures shall provide for safe performance of work, careful removal and disposition of materials specified to be stored, protection of property which is to remain undisturbed, and coordination with other work in progress. The procedures shall include a detailed description of the methods and equipment to be reused for each operation, and the sequence of operations.
- B. Submit schedule for demolition activities.

1.04 SAFETY PROCEDURES AND WORKER PROTECTION

- A. Take all precautions and measures required to protect employees, related trade employees, City employees, residents, and the general public from exposure to energized parts.
 - 1. All personnel authorized for entry into work areas shall be instructed in the proper procedures for high voltage work. In instances where off-line equipment may require removal from high voltage installations, personnel will be instructed and properly supervised for working in the vicinity of high-voltage equipment.

2. All electrical equipment upon which activities are to be performed shall be de-energized and permanently disconnected from any power source prior to commencing any work.
- B. Erect barriers, fences, guard rails, enclosures, chutes, and shoring to protect personnel, structures, and utilities remaining intact.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that areas to be demolished are unoccupied and no longer are in use.
- B. Do not commence work until conditions are acceptable to the City.

3.02 DEMOLITION

- A. The Contractor shall remove the existing 200 A main breaker and 300 A generator breaker as identified on the plans sheets.
- B. Remove existing exposed conduit and electrical wiring and conduit to be abandoned to structural surface, cut flush, and finish to match existing surfaces.

3.03 SALVAGE

- A. The Contractor shall deliver any item to be salvaged to the City's Combined Sewage Treatment Plant, located at 1391 35th Avenue between the hours of 8:00 AM and 3:00 PM. The Contractor shall contact Tim Giffin at (916) 808-7997 or Vernon Fields at (916) 808-5542 to coordinate delivery of these items. All removed conduit and conductors shall become property of the Contractor, unless otherwise directed by the Engineer.

3.04 CLEAN-UP

- A. Debris and Rubbish: Debris and rubbish shall be removed from the limits of work daily to a location approved in advance by the Engineer. Do not allow to accumulate on-site.

**** END OF SECTION ****

SECTION 16010

ELECTRICAL WORK

PART 1 - GENERAL

1.01 SCOPE

- A. This Specification Section covers all electrical work, which consists of furnishing all labor, equipment and materials required for the complete electrical system as specified and as shown on the Plans.
- B. Work Included:
 - 2. Equipment and materials to be furnished and installed by the Contractor under Division 16 shall include the following:
 - a. Seismic Restraint for Electrical Equipment (16012)
 - b. Electrical Studies (16013)
 - c. Raceway Systems (16110)
 - d. Wire and Cable (16120)
 - e. Low Voltage Switchgear (16480)
 - f. Operational Testing (16950)
 - g. Flow Measuring Systems (17102)

1.02 SUBMITTALS

- A. Descriptive literature for all materials furnished under this section shall be submitted in accordance with Section 01330 **SUBMITTALS** of these specifications.

1.03 CONSTRUCTION POWER

- A. The Contractor shall provide his own temporary construction lighting and electrical power as required in areas where work is being performed. In addition, the Contractor may elect to use any existing 120V electrical outlet not being used by the City within the meter shop.

1.04 DRAWINGS

- A. The Contractor shall verify all conditions at the meter shop and review all measurements to insure adequate space for installation of equipment.
- B. The locations of conduit and equipment, as indicated on the drawings, are in the desired locations. However, locations may be adjusted to meet the electrical and structural conditions as required.

- C. The drawings are essentially diagrammatic to the extent that offsets, bends, pull boxes, conduits, special fittings and the exact locations may not be completely indicated. Furnish and install all conduit and equipment in available locations as required by conditions found at the site and as approved by the Engineer. Carefully study the drawings and premises in order to determine the best methods, exact locations, routes, noting the building obstructions, and etc. for conduit and equipment installation.

1.05 ELECTRICAL WORK CLOSEOUT

- A. Prepare the following items and submit to the Engineer before final acceptance:
 - 1. Copies of all test results as required under this Section 16950.
 - 2. Copies of as-built record drawings and O&M manuals as required under section 01330.
 - 3. Notify the Engineer in writing when installation is complete and that a final inspection of this work can be performed. In the event defects or deficiencies are found during this final inspection they shall be corrected to the satisfaction of the Engineer before final acceptance can be issued.
- B. Electrical and control equipment shall be cleaned both inside and outside.

1.06 COORDINATION WITH SUB-CONTRACTORS

- A. General contractor shall be responsible to provide all sub-contractors with all specifications and drawings that pertain to their work on this project.

1.07 INTERRUPTION OF SERVICES

- A. All electrical services in all facilities of the contract work are to remain operational during the entire contract period. Any interruption of electrical power for the performance of this work shall be made only after consultation with the City and the Superintendent of Plant Operations.
- B. The contractor shall be responsible for coordination with the City for all power requirements.

PART 2 - PRODUCTS

2.01 REFERENCES STANDARDS

- A. Work installed or material used shall comply with latest version of NEC, UL, and other applicable rules and standards of the industry.
- B. Equipment Anchors: Securely anchor electrical equipment. Anchoring shall have

the capability of withstanding seismic forces per the 1994 California Code of Regulations, Title 24, Part 2, Section 2312, Seismic Zone 3, with $C_p = 1.0$ and $I = 1.5$. C_p may be two-thirds of the value specified for components mounted on foundations at grade or on floor slabs on earth grade.

2.02 MISCELLANEOUS EQUIPMENT/MATERIALS

- A. The Contractor shall include in his work furnishing and installing of the following:
1. Warning Signs: Unless otherwise shown on the plans, use signs of standard manufacture, #18 gauge minimum steel, baked enamel finish, red letters on white background. Provide warning signs per Title 24, CAC.
 2. Fuses: Furnish and install fuses of proper type and rating suitable for equipment protected. Upon acceptance of installation, all fusible disconnect switches shall be equipped with correct fuses.

2.03 SWITCHBOARDS, MOTOR CONTROL CENTERS, AND PLC CABINET INTERNAL WIRING

- A. Interior wiring shall conform to the following:
1. Rubber grommets shall be used where wiring passes through holes in sheet metal unless indicated on the drawing.
 2. Wiring shall not be tapped or spliced except at device terminals or on terminal blocks.
 3. No more than two terminations shall be made at any one terminal.
 4. Each terminal connection shall have a pre-insulated ring-tongue, crimp-type connector, and applied to the wire end with a ratchet type or pneumatic operated power tool.
 5. B8, Class B minimum stranding and the wire shall have copper conductors and shall be minimum #16 for control and minimum #12 for power circuits. Hinge wiring shall be Class D minimum stranding. Solid wire is not allowed on this project.
 6. All MCC and PLC cabinet wiring shall be TEW or MTW, unless otherwise specified. All switchboard wiring shall be SIS, unless otherwise specified.

Switchboard wire color shall be gray.

Switchgear wiring colors shall be as follows:

| | |
|----------------------------|--------|
| Neutral | White |
| Fused Control Power | Red |
| 24 Volt Circuits | Blue |
| External 120 Volt Circuits | Yellow |
| Power Circuits before CPT | Black |

7. All wiring shall be marked using tags with like numbers on both ends with wire numbers shown on the drawings. Tags using adhesives, tapes, or markers are not acceptable.
8. Tags shall be white heat-shrinkable with thermal transfer printing, three to one shrink ratio, 2 inches long and shall meet UL 224. Raychem Tyco shrink mark heat shrinkable sleeves or equal. Labels shall be readable after heat shrinking.

2.04 NAMEPLATES

- A. Indoor: Laminated phenolic plastic, black front and back, white core, engraved to show white lettering. Use 3/16" high lettering at push button stations, thermal overload switches, receptacles, wall switches, and similar devices, where nameplate is attached to device plate. Use 1/4" high lettering at all other locations, unless otherwise specified or detailed. Engraved lettering shall be uniform block style all upper case.

Nameplates up to 1 1/2 inches high shall be 1/16" thick. Nameplates larger than 1 1/2" high shall be 1/8" thick. Edges of nameplates shall be beveled. Nameplates shall be fastened using nickel plated brass, cadmium plated steel or stainless steel screws. Attachment of nameplates with adhesive is not acceptable.

- B. Outdoor: Engraved or embossed stainless steel.
- C. Inscription: If detailed on plans, use inscription exactly as shown; otherwise, describe adequately the function or use of equipment involved.

2.05 PAINTING AND FINISHES

- A. Boxes factory finished as follows:
 - A. Surface Mounted Boxes: One prime coat over galvanizing, one coat of light gray synthetic enamel or lacquer.
 - B. Flush Mounted Boxes: Galvanized only.
- B. A three coat finish consisting of primer, undercoat, and alkyd enamel finish of light gray, ANSI No. 61, shall be applied to all electrical enclosures unless otherwise

specified.

2.06 HOUSE KEEPING PAD

- A. The switchgear shall be placed on a 3 ½" thick concrete house-keeping pad as directed by the Engineer. The pad shall be so constructed that after the installation of the panel there shall be 3" in the front and on both sides of the panel and 2" on the back of the panel.
- B. The pad shall contain a formed raceway for conduits.

2.07 INDICATING LIGHTS, PUSH BUTTONS, AND TERMINAL STRIPS

- A. Indicating lights shall be industrial, weatherproof NEMA 4/4X, transformer type, with LED type lamps, and push to test. Push buttons and terminal strips shall be NEMA style.

2.08 SPARE PARTS

- A. Fuses: 1 carton (3 fuses, minimum) of each fuse used on this project.

2.09 RELAYS, TIMERS, AND SWITCHES

- A. Contacts for all relays, timers, and switches shall be rated for 10 A minimum.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All equipment installed by the Contractor shall operate to the Engineer's satisfaction. The Contractor shall be responsible for, and shall correct by repair or replacement, at his own expense, equipment which, in the opinion of the Engineer has been damaged by faulty mechanical or electrical assembly by the Contractor.
- B. The Engineer reserves the right to require changes in equipment location without incurring additional costs.
- C. Outdoor steel items on this job shall be manufactured from cold rolled low carbon steel. Outdoor steel mounting holes and cutting shall all be finished and then the item shall be hot dipped galvanized conforming with ASTM A123 and A153. Outdoor hardware on this job shall be #316 stainless steel.

END OF SECTION

SECTION 16012

SEISMIC RESTRAINT FOR ELECTRICAL EQUIPMENT

PART 1 - GENERAL

1.01 SCOPE

- A. Work Included.
 - 1. Seismic restraint for new electrical equipment.
- B. Related Work
 - 1. The provisions of Section 16010 of these Specifications shall apply, unless otherwise specified.

1.02 SUBMITTALS

- A. Submit in accordance with Section 01330 **SUBMITTALS** of these specifications.
- B. Submit seismic anchoring calculations with equipment and raceway submittals. Calculations shall be performed by a licensed civil or structural engineer employed by the equipment manufacturer and registered in the State of California.
- C. Submit equipment anchoring methods. Include anchoring locations, anchor types and minimum anchor embedment depths.

PART 2 - MATERIALS

2.01 SEISMIC ANCHORING AND RESTRAINTS

- A. Equipment Anchors: Securely anchor electrical equipment. Anchoring shall have the capability of withstanding seismic forces per the 1994 California Code of Regulations, Title 24, Part 2, Section 2312, Seismic Zone 3, with $C_p = 1.0$ and $I = 1.5$. C_p maybe be two-thirds of the value specified for components mounted on foundations at grade or on floor slabs on earth grade.

PART 3 - EXECUTION

3.01 EQUIPMENT AND RACEWAYS

- A. Install equipment anchors and raceway supports in accordance with the final shop drawings and manufacturer's recommendations. Properly torque all bolts to the required values.

END OF SECTION

SECTION 16013
ELECTRICAL STUDIES

PART 1 - GENERAL

1.01 SUMMARY OF WORK

A. The Contractor shall provide the following electrical power system studies for the project job:

1. Short Circuit Study
2. Protective Device Evaluation
3. Coordination Study
4. Arc Flash Hazard Analysis

The content of each study is specified in Part 3 of this specification.

B. The City will provide the contractor with the information from the utility such as: transformer data, utility contribution, and transformer fuse data. The Contractor shall be responsible for supplying all remaining information and data required for the study.

C. If during the study, the Contractor finds any inadequacies in the equipment or protective devices, they shall make recommendations for improvements as soon as they are identified.

D. The Contractor shall provide the City with an electronic copy of the short circuit study, protective device evaluation, coordination study, and arc flash hazard analysis on a CD. **In addition, the CD shall include all SKM files used to create the study.**

E. The study and analysis shall be performed using the latest version of the SKM Systems Analysis Power Tools for Windows (PTW) software program.

1.02 SUBMITTALS

A. Submit a draft of the final report for review by the Engineer. The report shall include the following as further described in Part 3:

1. Summary of the results of the short circuit study, the protective device evaluation and coordination studies for each scenario.

2. Description, purpose, basis and scope of the study.
 3. Single line diagram for each scenario with the incident energy shown at each bus.
 4. Tabulations of electrical capacities and characteristics of the equipment and protective devices.
 5. Table comparing the calculated short circuit and the equipment ratings for each scenario.
 6. Coordination curves showing the proposed settings with the characteristics of the equipment and protective devices shown graphically on industry standard graph paper for each scenario.
 7. Arc Flash Hazard Analysis to include computed incident energy levels and flash protection boundary distances at each bus for each scenario.
 8. Summary showing the settings of all protective devices.
- B. Submit the final report after receiving comments by the Engineer.

1.03 QUALIFICATIONS

- A. The short-circuit, protective device evaluation, protective device coordination and arc flash hazard analysis studies shall be conducted under the supervision and approval of a Registered Professional Electrical Engineer skilled in performing and interpreting the power system studies.
- B. The Registered Professional Electrical Engineer shall be a full-time employee of the approved engineering firm.
- C. The Registered Professional Electrical Engineer shall have a minimum of five (5) years of experience in performing power system studies.
- D. The engineering firm shall demonstrate experience with Arc Flash Hazard Analysis by submitting names of at least ten actual arc flash hazard analysis it has performed in the last two years.

PART 2 - PRODUCTS

2.01 REFERENCES

- A. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
1. IEEE 141 – Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems
 2. IEEE 242 – Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems
 3. IEEE 399 – Recommended Practice for Industrial and Commercial Power System Analysis
 4. IEEE 241 – Recommended Practice for Electric Power Systems in Commercial Buildings
 5. IEEE 1015 – Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.
 6. IEEE 1584 - Guide for Performing Arc-Flash Hazard Calculations
- B. American National Standards Institute (ANSI):
1. ANSI C57.12.00 – Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
 2. ANSI C37.13 – Standard for Low Voltage AC Power Circuit Breakers Used in Enclosures
 3. ANSI C37.010 – Standard Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
 4. ANSI C 37.41 – Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories. C. The National Fire Protection Association (NFPA)
 1. NFPA 70 - National Electrical Code, latest edition
 2. NFPA 70E – Standard for Electrical Safety in the Workplace

2.02 DATA COLLECTION

- A. The Contractor shall provide all input data for the facility excluding the data from the utility.
- B. Input data for the study shall include, but not be limited to the following:
1. Feeder input data including feeder type (cable or bus), size, length, number per phase, conduit type (magnetic or non-magnetic) and

- conductor material (copper or aluminum).
2. Transformer input data, including winding connections, secondary neutral-ground connection, primary and secondary voltage ratings, kVA rating, impedance, % taps and phase shift.
 3. Reactor data, including voltage rating, and impedance.
 4. Generation contribution data, (synchronous generators and Utility), including short-circuit reactance (X''_d), rated MVA, rated voltage, three-phase and single line-ground contribution (for Utility sources) and X/R ratio.
 5. Motor contribution data (induction motors and synchronous motors), including short-circuit reactance, rated horsepower or kVA, rated voltage, and X/R ratio.
 6. Utility minimum and maximum contribution data.
 7. Capacitor data.

2.03 FINAL REPORT

- A. The results of the short-circuit study, protective device evaluation study, protective device coordination and arc flash hazard analysis studies shall be summarized in a final report. Three copies of the final report shall be submitted to the City.
- B. If applicable, include fault contribution of existing motors in the study. The Contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.
- C. The report shall include the following sections:
 1. Executive Summary.
 2. Descriptions, purpose, basis and scope of the study
 3. Tabulations of circuit breaker, fuse and other protective device ratings versus calculated short circuit duties for the scenario that produces the worst three phase fault currents.
 4. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip unit settings for each scenario.
 5. Fault current calculations including a definition of terms and guide for interpretation of the computer printout for each scenario.
 6. Details of the incident energy and flash protection boundary calculations for each scenario.
 7. Recommendations for reducing the amount of incident energy and/or improving system coordination for each scenario.
 8. One-line diagram for each scenario
 9. All requirements under section 1.02-Submittals.
- D. The Short-Circuit study shall include, but not be limited to the following reports:

1. Low Voltage Fault Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
 - a. Voltage
 - b. Calculated fault current magnitude and angle
 - c. Fault point X/R ratio
 - d. Equivalent impedance

2. Momentary Duty Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
 - a. Voltage
 - b. Calculated symmetrical fault current magnitude and angle
 - c. Fault point X/R ratio
 - d. Calculated asymmetrical fault currents:
 1. Based on fault point X/R ratio
 2. Based on calculated symmetrical value multiplied by 1.6
 3. Based on calculated symmetrical value multiplied by 2.7
 - e. Equivalent impedance

3. Interrupting Duty Report shall include a section for three-phase and unbalanced fault calculations and shall show the following information for each applicable location:
 - a. Voltage
 - b. Calculated symmetrical fault current magnitude and angle
 - c. Fault point X/R ratio
 - d. No AC Decrement (NACD) Ratio
 - e. Equivalent impedance
 - f. Multiplying factors for 2, 3, 5 and 8 cycle circuit breakers rated on a symmetrical basis
 - g. Multiplying factors for 2, 3, 5 and 8 cycle circuit breakers rated on a total basis

E. Provide Recommended Protective Device Settings:

1. Phase (50/51) and Ground (50/51) Relays:
 - a. Current transformer ratio
 - b. Inverse current setting
 - c. Inverse current curve setting
 - d. Inverse current time setting
 - e. Instantaneous current setting
 - f. Instantaneous current time setting
 - g. Recommendations on improved relaying systems, if applicable.

2. Circuit Breakers:
 - a. Adjustable pickups and time delays (long time, long time delay, short time, short time delay, ground pickup, and ground delay)
 - b. Adjustable time-current characteristic
 - c. Adjustable instantaneous pickup
 - d. Recommendations on improved trip systems, if applicable.
- F. Provide Incident energy and flash protection boundary calculations
 1. Arcing fault magnitude
 2. Protective device clearing time
 3. Duration of arc
 4. Arc flash boundary
 5. Working distance
 6. Incident energy
 7. Hazard Risk Category
 8. Recommendations for arc flash energy reduction
- G. Provide a hard copy of the arc flash labels.
- H. **The Contractor shall provide the City with an electronic copy of the software program files used to create the short circuit study, protective device evaluation, coordination study, and arc flash hazard analysis on a CD. These program files shall be the actual SKM program files.**
- I. For medium voltage facilities provide the following relay settings for all relays:
 1. Instantaneous overcurrent (relay 50 & 50G or 50N)
 2. AC time overcurrent (relay 51, 51V, & 51G or 51N)
 3. For motor relays also provide thermal overload curve & settings if applicable.
 4. All other relay settings will remain.

PART 3 – EXECUTION

3.01 ELECTRICAL POWER SYSTEM STUDIES

- A. The study shall be performed starting at the utility transformer that feeds the corporation yard and end at Building 8. The study shall include the following scenarios:
 1. Facility fed from utility power using the utility normal available fault current from the utility with all loads on.

2. Facility fed from utility power using the utility alternate available fault current from the utility with all loads on.
3. Facility fed from the existing 175KW facility generator with all loads on.

A short-circuit analysis, protective device evaluation study, protective device time-current coordination analysis, and an arc flash hazard analysis shall be performed for each scenario. Each scenario shall be labeled separately within the final report.

Each scenario shall model the utility, utility cut outs and/or transformer fuses, utility transformer, and the entire City facility.

B. Short-Circuit Analysis

1. Calculate the maximum rms symmetrical three-phase short-circuit current at each bus and significant locations in the electrical system.
2. Appropriate motor short-circuit contribution shall be included at the appropriate locations in the system so that the computer calculated values represent the highest short-circuit current the equipment will be subjected to under fault conditions.
3. A tabular computer printout shall be included which lists the calculated short-circuit currents, X/R ratios, source impedance, equipment short-circuit interrupting or withstand current ratings, and notes regarding the adequacy or inadequacy of the equipment.
4. The study shall include a computer printout of input circuit data including conductor lengths, number of conductors per phase, conductor impedance values, insulation types, transformer impedances and X/R ratios, motor contributions, and other circuit information as related to the short-circuit calculations.
5. The system one-line diagram shall be computer generated and will clearly identify individual equipment buses, bus numbers used in the short-circuit analysis, cable and bus connections between the equipment, calculated maximum short-circuit current at each bus location and other information pertinent to the computer analysis.
6. The computer printout shall identify the maximum available short-circuit current in rms symmetrical amperes and the X/R ratio of the fault current for each bus/branch calculation.
7. A comprehensive discussion section evaluating the adequacy or inadequacy of the equipment must be provided and include recommendations as appropriate for improvements to the system.

8. Use actual conductor impedances if known. If unknown, use typical conductor impedances based on IEEE Standard 141-1993.
9. Transformer design impedances shall be used when test impedances are not available.
10. Calculate short-circuit momentary and interrupting duties for a three-phase bolted fault at each:
 - a. Electric utility's supply termination point
 - b. Incoming switchgear
 - c. Unit substation primary and secondary terminals
 - d. Low voltage switchgear
 - e. Motor control centers
 - f. Standby generators and automatic transfer switches
 - g. Branch circuit panelboards
 - h. Other significant locations throughout the system.
11. For grounded systems, provide a bolted line-to-ground fault current study for areas as defined for the three-phase bolted fault short-circuit study.

C. Protective Device Evaluation Study

1. Evaluate protective devices interrupt ratings to the short circuit calculations performed from the short circuit analysis to determine if all protective devices are rated to withstand the calculated short circuits.
2. Evaluate the adequacy of switchgear, motor control centers, and panel board bus bars to withstand short-circuit stresses
3. Provide a report showing the calculated fault current at each protective device versus the protective devices interrupt rating.

D. Protective Device Time-Current Coordination Analysis

1. The time-current coordination analysis shall include the determination of phase and ground settings, ratings, or types for all protective devices at the facility.
2. Where necessary, an appropriate compromise shall be made between system protection and service continuity with system protection and service continuity considered to be of equal importance. In addition, breaker and/or relay settings shall be adjusted to reduce the amount of incident energy while providing proper coordination.

3. Provide computer generated log-log plots that indicate the degree of system protection and coordination by displaying the time-current characteristics (TCC) of series connected overcurrent devices and other pertinent system parameters for each motor. The motor starting curve and overload device shall also be shown on this TCC. If an MCP and overload device are used in combination then the MCP curve shall be cut off where it intercepts the overload curve.
4. Provide a TCC for the main breaker that shows the arcing current on the bus adjacent to the main breaker (load side) for the worst case of incident energy for scenario one or two. Provide a TCC for the generator breaker that shows the arcing current on the bus adjacent to the generator breaker (load side) for scenario three. These TCCs will be used to show that the breaker has been set properly to clear the arcing fault and to reduce the incident energy on the load side of the main and generator breakers.
5. Computer printouts shall accompany the log-log plots and will contain descriptions for each of the devices shown, settings of the adjustable devices, the short-circuit current availability at the device location when known, and device identification numbers to aid in locating the devices on the log-log plots and the system one-line diagram.
6. The study shall include a separate, tabular computer printout containing the suggested device settings of all adjustable overcurrent protective devices, the equipment where the device is located, and the device number corresponding to the device on the system one-line diagram.
7. A computer generated system one-line diagram shall be provided which clearly identifies individual equipment buses, bus numbers, device identification numbers and the maximum available short-circuit current at each bus when known.
8. A discussion section which evaluates the degree of system protection and service continuity with overcurrent devices, along with recommendations as required for increasing system protection or device coordination.
9. Significant deficiencies in protection and/or coordination shall be called to the attention of the engineer and recommendations made for improvements as soon as they are identified. Report shall also include suggestions to:
 - a. Improve coordination between upstream and downstream devices.
 - b. Reduce fault current clearing times of upstream devices.
 - c. Identify equipment protection boundary and inrush current conflicts.
10. Each TCC shall show the SKM datablock for each protective device shown.
11. Provide adequate time margins between device characteristics such that

selective operation is provided, while providing proper protection and reducing levels of incident energy.

12. Include on each TCC graph, a complete title and one-line diagram with legend identifying the specific portion of the system covered.
13. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.
14. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.
15. Plot the following characteristics on the TCC graphs, where applicable:
 - a. Electric utility's overcurrent protective device
 - b. Medium voltage equipment overcurrent relays
 - c. Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands
 - d. Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands
 - e. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves
 - f. Conductor damage curves
 - g. Ground fault protective devices, as applicable
 - h. Pertinent motor starting characteristics and motor damage points, where applicable
 - i. Pertinent generator short-circuit decrement curve, generator damage point, and generator overload curve.
 - j. The largest feeder circuit breaker in each motor control center and applicable panelboard.
16. For medium voltage motor starters with vacuum contactors and relays the contractor shall take into account the vacuum contactor interrupt rating and drop out time when setting the relay.
17. For low voltage motor starters the contractor shall plot the MCP and overload curves. The MCP curve shall be terminated where it intercepts the overload curve.

E. Arc Flash Hazard Analysis

1. The arc flash analysis shall be performed according to the IEEE Std. 1584.1 – 2013, "IEEE Guide for the Specification of Scope and Deliverable Requirements for an Arc-Flash Hazard Calculation Study in Accordance with IEEE Std 1584™". The proposal shall contain language on how this

requirement will be full filled and what are the deliverables.

2. Provide a detailed arc-flash hazard analysis report with computed incident energy levels (Calories per square centimeters) and flash protection boundary distances (inches) at each bus in the electrical system. The electrical system shall contain a bus on the line and load side for each main breaker or switch.
3. The Arc-Flash Hazard Analysis shall include all significant locations in 240 volt and 208 volt systems fed from transformers equal to or greater than 125 kVA where work could be performed on energized parts.
4. The contractor shall analyze and adjust if necessary the setting of the protective devices in order to reduce the incident levels to a level less than dangerous if possible while maintaining proper coordination.
5. Safe working distances shall be based upon the calculated arc flash boundary considering using an incident energy level of 1.2 cal/cm^2 .
6. When performing incident energy calculations on the line side of a main and/or generator breaker, the line side and load side contributions must be included in the fault calculation.
7. The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios must be compared and the greatest incident energy must be uniquely reported for each equipment location. Calculations must be performed to represent the maximum and minimum contributions of fault current magnitude for all normal and emergency operating conditions. The minimum calculation will assume that the utility contribution is at a minimum and will assume a minimum motor contribution (all motors off). Conversely, the maximum calculation will assume a maximum contribution from the utility and will assume the maximum amount of motors to be operating. Calculations shall take into consideration the parallel operation of synchronous generators with the electric utility, where applicable.
8. The incident energy calculations must consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators should be decremented as follows:
 - a. Fault contribution from induction motors should not be considered beyond 3-5 cycles.

- b. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g. contributions from permanent magnet generators will typically decay from 10 per unit to 3 per unit after 10 cycles).
9. Arc Flash calculations shall be based on actual overcurrent protective device clearing time. Maximum clearing time will be capped at 2 seconds based on IEEE 1584-2002 section B.1.2. Where it is not physically possible to move outside of the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.
10. When appropriate, the short circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit and coordination study model. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations
11. For each equipment location with a separately enclosed main device (where there is adequate separation between the line side terminals of the main protective device and the work location), calculations for incident energy and flash protection boundary shall include both the line and load side of the main breaker.
12. Mis-coordination should be checked amongst all devices within the branch containing the immediate protective device upstream of the calculation location and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.

3.02 ARC FLASH WARNING LABELS

- A. Arc Flash Hazard warning stickers shall be sized 4" x 6". These labels shall be 3 mil matted vinyl film with a pressure sensitive adhesive and be resistive to moisture, solvents, and UV light. The label shall include the following information, at a minimum:
 1. Bus location designation which shall be easily identified from the single line drawing.
 2. Nominal voltage
 3. Flash protection boundary in inches
 4. Hazard risk category
 5. Incident energy in cal/cm²
 6. Working distance in inches
 7. Name of City facility and date.

- B. All labels will be based on recommended overcurrent device settings and will be provided after the results of the analysis have been presented to the City and after any system changes, upgrades or modifications have been incorporated in the system.
- C. Labels shall be machine printed, with no field markings.
- D. Arc flash labels should be similar to the labels shown in appendix A except sized 4" x 6". Labels for dangerous conditions shall also state the following:
 - 1. "No Safe PPE Exists"
 - 2. "Energized Work Prohibited"
 - 3. "Do Not Work On Live"
- D. Arc flash labels shall be provided in the following manner and all labels shall be based on recommended overcurrent device settings for the worst case scenario:
 - 1. For each 600 V, 480 V, 240 V, and 208 V panel boards or distribution panels, one arc flash label shall be provided.
 - 2. For each motor control center, one arc flash label shall be provided.
 - 3. For each low voltage main switchgear section, one arc flash label shall be provided.
 - 4. For each automatic and/or manual transfer switch, one arc flash label shall be provided.
 - 5. For each medium voltage main switchgear section, provide one arc flash label for each breaker and/or switch.
 - 6. For each facility transformer provide an arc flash label for the primary side and another label for the secondary side.
 - 7. Disconnect switches and remote motor starters.
 - 8. Medium voltage disconnect switches and sectionalizing terminal cabinets.
 - 9. For each main and feeder breaker one arc flash label shall be provided.
- E. For facilities containing generators provide the following arc flash labels:
 - 1. One arc flash label for each generator.
 - 2. One arc flash label for each generator breaker, line side.
 - 3. One arc flash label for each ATS.
- F. City staff will install all arc flash labels.

APPENDIX A SAMPLE ARC FLASH LABELS

| DANGER | |
|----------------------------------|------------------------------------|
| NO SAFE PPE EXISTS | |
| ENERGIZED WORK PROHIBITED | |
| 502 in | Flash Hazard Boundary |
| 232 cal/cm ² | Flash Hazard at 36 in |
| Dangerous! | DO NOT WORK ON LIVE! |
| 21600 VAC | Shock Hazard when cover is removed |
| 3 | Glove Class |
| 72 in | Limited Approach |
| 31 in | Restricted Approach |
| 10 in | Prohibited Approach |
| June 08, 2014 | |
| Location: BUS-4 | |

| WARNING | |
|-----------------------------------|------------------------------------|
| Arc Flash and Shock Hazard | |
| Appropriate PPE Required | |
| 57 in | Flash Hazard Boundary |
| 1.9 cal/cm ² | Flash Hazard at 36 in |
| Level 1 | Arc-rated FR Shirt & Pants |
| 4160 VAC | Shock Hazard when cover is removed |
| 1 | Glove Class |
| 60 in | Limited Approach |
| 28 in | Restricted Approach |
| 7 in | Prohibited Approach |
| June 06, 2014 | |
| Location: Main Switchgear | |

| WARNING | |
|--|------------------------------------|
| Arc Flash and Shock Hazard | |
| Appropriate PPE Required | |
| 52 in | Flash Hazard Boundary |
| 6.9 cal/cm ² | Flash Hazard at 18 in |
| Level 2 | Arc-rated FR SHIRT & PANTS |
| 480 VAC | Shock Hazard when cover is removed |
| 00 | Glove Class |
| 42 in | Limited Approach |
| 12 in | Restricted Approach |
| 1 in | Prohibited Approach |
| June 06, 2014 | |
| Location: Low Voltage Feeder CB | |

| WARNING | |
|-------------------------------------|------------------------------------|
| Arc Flash and Shock Hazard | |
| Appropriate PPE Required | |
| 57 in | Flash Hazard Boundary |
| 1.9 cal/cm ² | Flash Hazard at 36 in |
| Level 1 | Arc-rated FR Shirt & Pants |
| 4160 VAC | Shock Hazard when cover is removed |
| 1 | Glove Class |
| 60 in | Limited Approach |
| 26 in | Restricted Approach |
| 7 in | Prohibited Approach |
| June 06, 2014 | |
| Location: Medium Voltage MCC | |

| WARNING | |
|-----------------------------------|------------------------------------|
| Arc Flash and Shock Hazard | |
| Appropriate PPE Required | |
| 26 in | Flash Hazard Boundary |
| 2.1 cal/cm ² | Flash Hazard at 18 in |
| Level 1 | Arc-rated FR Shirt & Pants |
| 480 VAC | Shock Hazard when cover is removed |
| 00 | Glove Class |
| 42 in | Limited Approach |
| 12 in | Restricted Approach |
| 1 in | Prohibited Approach |
| June 06, 2014 | |
| Location: Low Voltage MCC | |

| WARNING | |
|-----------------------------------|------------------------------------|
| Arc Flash and Shock Hazard | |
| Appropriate PPE Required | |
| 198 in | Flash Hazard Boundary |
| 6.3 cal/cm ² | Flash Hazard at 36 in |
| Level 2 | Arc-rated FR Shirt & Pants |
| 4160 VAC | Shock Hazard when cover is removed |
| 1 | Glove Class |
| 60 in | Limited Approach |
| 26 in | Restricted Approach |
| 7 in | Prohibited Approach |
| June 06, 2014 | |
| Location: Utility CB | |

END OF SECTION

SECTION 16110

RACEWAY SYSTEMS

PART 1 - GENERAL

1.01 SCOPE

- A. This Specification Section covers the furnishing, installing and testing of all wireway, conduit, fittings, boxes, and supports as specified herein, as shown on the Drawings, and as required for a complete electrical installation.
- B. The provisions of Section 16010 of these Specifications shall apply, unless otherwise specified in this Section.
- C. The raceway system shall consist of the types and sizes as required and shall include all rigid steel conduit, flexible conduit, non-metallic conduit, wireway and accessories as required for the embedded and exposed raceway systems.
- D. Conduit accessories shall include Condulet type fittings, expansion and deflection couplings, chase nipples, locknuts, grounding bushings, flexible conduit fittings, supports, materials for sealing openings, and all other devices and materials required to complete the electrical raceway system.

1.02 SUBMITTALS

- A. Descriptive literature for all materials furnished under this section shall be submitted in accordance with Section 01330 **SUBMITTALS** of these specifications.
- B. Submittals for the material and equipment for the Raceway Systems shall include, but shall not be limited to, the following:
 - 1. Catalog cuts showing manufacturer, catalog numbers, dimensions, weights and material for all raceway and accessories, specific items shall be identified on all catalog cuts.
 - 2. Dimensioned shop drawings.
 - 3. Certified test reports prepared by manufacturer.

PART 2 - PRODUCTS

2.01 REFERENCE STANDARDS

- A. Raceway systems supplied under this contract shall be designed, manufactured,

and tested in accordance with the latest version of the following standards:

| American National Standards Institute (ANSI) Publications: | |
|---|---|
| C33.92 | Flexible Liquid-tight Metal Conduit |
| C80.1 | Rigid Steel Conduit |
| C80.4 | Rigid Steel Conduit Fittings |
| National Electrical Manufacturers Association (NEMA) | |
| FB 1 | Fittings and Supports for Conduit Cable Assemblies |
| TC-2 & TC-3 | Non-metallic Conduit and Fittings |
| RN 1 | Rigid Steel Conduit PVC jacketed |
| Underwriters Laboratories Inc. | |
| UL 514A | Metallic Outlet Boxes, Electrical |
| UL-870 | Wireways, Auxiliary Gutters and Associated Fittings |
| UL-6 | Rigid Metal Electrical Conduit |
| UL 651 | Schedule 40 and 80 Rigid PVC Conduit |

2.02 CONDUIT AND CONDUIT FITTINGS

A. Material for the conduit system shall conform to the following:

1. **Steel Conduit:** Steel conduit, couplings, bends and nipples shall be in accordance with ANSI C80.1 and UL-6, hotdip galvanized inside and outside after fabrication and then coated with a bichromate finish. Conduit sizes shall be not less than 1/2 inch IPS. All fittings shall be listed per UL 514.
2. **Flexible Liquid-tight Metal Conduit:** Flexible liquid-tight metal conduit shall be in accordance with ANSI C33.92 and shall be galvanized steel core with a copper bonding conductor between the spiral segments and an extruded synthetic jacket overall to insure a liquid-tight conduit. The conduit shall be 3/4 inch American Brass sealtight Flexible conduit, or equal. Flexible conduit fittings shall be the grounding type and a design approved by the manufacturer for this type of flexible conduit.
3. **Rigid Galvanized Steel Conduit PVC Bonded (RGS/PVC):** Conduit shall conform to the requirements of NEMA RN1, type A40. Plastic coated conduit shall be rigid galvanized steel conduit to which an epoxy acrylic primer and a 40 mil thick polyvinyl chloride coating has been bonded. Bond strength shall

exceed the tensile strength of the plastic coat. All elbows shall be factory made and PVC coated. All fittings used with plastic coated conduit shall be similarly coated with not less than 40 mils of polyvinyl chloride and shall be provided with type #316 stainless steel hardware. Furnish Occidental Coating Company -type OCAL 40, Robroy Industries - type PLASTIBOND, or approved equal. For factory coated conduit, use overlapping PVC sleeves. Sleeves shall extend beyond end of fitting minimum distance equal to nominal diameter of conduit, and shall fit tightly over conduit coating to form a watertight joint. Joints and fittings shall be made tight with strap wrenches. All damage to PVC jacket shall be repaired with four separate applications of PVC paint. Finished patch shall be 0.040 inch minimum thickness. Conduit sizes shall be not less than 3/4 inch IPS.

4. Rigid Polyvinyl Chloride (PVC) conduit: PVC conduit shall be manufactured in accordance with UL 651. PVC conduit shall be Schedule 40 or Schedule 80 high impact polyvinyl chloride, UL listed for direct burial. Minimum size shall be 3/4 inch. Fittings used with PVC conduit shall be PVC solvent weld type.
5. Fittings: Fittings for rigid steel conduit shall be threaded type and shall conform to the requirements of ANSI C80.4. Locknuts shall be extra heavy galvanized steel. Bushings shall be galvanized malleable iron with insulating collars. Grounding bushings shall be locking type and shall be provided with feed-through compression lugs.
6. Locknuts shall be extra heavy electrogalvanized steel for sizes through 2 inches. Locknuts larger than 2 inches shall be electrogalvanized malleable iron. Furnish allied tube and conduit type GRC, Triangle PWC, Inc., type GRS or approved equal.

2.03 SUPPORTS

A. General Requirements:

1. Inserts, hangers, brackets and miscellaneous supports for electrical equipment and conduits must be designed with minimum safety factor of 4, based on ultimate strength of material used. For empty conduits, include weight of 4 Type XHHW copper wires of maximum permissible size.
2. Secure hangers, brackets, conduit straps, supports and electrical equipment by means of toggle bolts on hollow masonry; expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces; wood screws on wood construction. Wood or fiber plugs or concrete nails, are not acceptable.
3. All channels, fittings, clamps and accessories shall be hot dipped galvanized

after fabrication for outdoor installations, and electro-galvanized for dry indoor installations. In wet or corrosive areas, such as wet wells and sumps, all channels, fittings, clamps and accessories shall be 316 stainless steel.

- B. Support channels steel shall conform to the requirements of ASTM A570. These shall be nominal 1 5/8" x 1 5/8" roll formed low carbon 12 gauge steel. One side of the channel shall have a continuous slot with inturned lips. Double strut shall be two of these welded back to back. Support channels shall be filled with styrofoam to inhibit concrete seepage.
- C. Conduit Supports:
1. Single Conduit Hangers: Steel City #C-149, Elcen Figure 13, Unistrut #J1205 through J1260, or equal, with 3/8" minimum diameter steel rod.
 2. Trapeze Hangers: Steel City #B-900, Elcen Figure 600, Unistrut #P-1000, or equal, channel with 3/8" minimum diameter steel rods and with conduit clamps, as specified below.
 3. Trapeze Conduit Clamps: Steel City #C-105, Elcen Figure 650, Unistrut #P-J111 through P-1124, or equal, for rigid conduit.
 4. Riser Supports: Steel City #C-210, Elcen Figure 39, Unistrut #U991-7 through U991-60, or equal.
 5. Finish
 - a. Hangers, channels, clamps, supports and rods, galvanized, cadmium plated or standard factory paint finish.
 - b. Conduit straps and single hole clamps, galvanized or cadmium plated.
 - c. Steel bolts, screws, nuts and washers, galvanized or cadmium plated.
 6. All conduit supports and hardware mounted inside the wet well shall be 316 stainless steel.

2.04 DUCT AND CONDUIT CAULKING COMPOUND

- A. Compounds for sealing ducts and conduit shall have a putty like consistency workable with the hands at temperatures as low as 35 degrees F. and shall not slump at a temperature of 300 degrees F or harden materially when exposed to the air. Compounds shall readily calk or adhere to lean surfaces of asbestos cement, fiber, or plastic duct; metallic conduits or conduit coatings; concrete masonry, or lead; any cable sheaths, jackets, covers, or insulation materials; and the common metals. Compounds shall form a seal without dissolving, noticeable changing

characteristics, or removing any of the ingredients. Compounds shall have no injurious effect upon the hands of workmen or upon materials. Contractor shall apply duct seal to all conduits entering the wet well or as directed by the Engineer.

2.05 BOXES AND CONDULET

- A. Boxes and Condulet shall be cast ferrous steel Form 7 with gasketed weatherproof covers and #316 stainless steel hardware for all indoor and outdoor applications. NEMA 4X boxes shall be cast nonmetallic screw hub type with gasketed watertight covers and #316 stainless steel hardware. Each box shall be large enough to accommodate the required number and sizes of conduits, conductors, splices and devices per the NEC. Flush boxes shall have the front edge of box or ring flush with wall or ceiling finish.

2.06 WIREWAY

- G. Surface metal raceway shall be constructed in accordance with Underwriters' Laboratories Standards UL 870 for Wireways, Auxiliary Gutters and Associated Fittings. Every component including lengths, connectors and fittings shall be UL listed.
- B. Surface metal raceway shall be suitable for "lay-in" of conductors.
- C. All sheet metal parts shall be provided with a rust inhibiting phosphatizing coating and gray baked enamel finish. All hardware shall be plated to prevent corrosion. All screws installed toward the inside shall be protected by spring nuts or otherwise guarded to prevent wire insulation damage.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. General Requirements:
 - 1. Install an accessible raceway system for connection of all boxes, panelboards, cabinets, and equipment.
 - 2. All raceway shall be the type and size as shown on the Plans.
 - 3. Make bends for exposed conduit stub-ups completely below the surface. Make stubs vertical and arrange neatly.
 - 4. Where conduits turn up in accessible floor areas or under removable partitions, install coupling flush with finish floor surface (exclusive of floor covering). Provide flush threaded plug in this coupling where conduit is not to be extended.

5. Spare Conduits: For flush mounted panels, run empty conduits from panel to accessible spaces above and below, unless otherwise shown. Install minimum of two 3/4" conduits (one up and one down) for every 3 single pole spare circuit breakers or spaces, or fraction thereof.
6. Running Threads: Running threads shall not be acceptable.
7. All bends and offsets, where required, shall either be made with factory made bends or shall be field bends made with a conduit bender designed specifically for use with the type of conduit to be bent.
8. Minimum size of conduit shall be 1/2 inch. In no case shall the conduit size be smaller than that shown on the drawings.
9. The entire electrical raceway system shall be bonded and form a continuous metallic electrical conductor from service point to every box and shall be terminated with ground bushings connected to the ground bus per NEC.
10. All conduits which are installed shall be capped during construction to prevent the entrance of foreign material.
11. All conduit installed by the Contractor shall be of the type listed in the Conduit Installation Table, at end of this section.
12. The maximum number of conduit bends shall be as follows: 90 degrees of conduit bends for up to 300 feet of conduit, 180 degrees of conduit bends for up to 200 feet of conduit, 270 degrees of conduit bends for up to 100 feet of conduit, 360 degrees of conduit bends for 50 feet of conduit or less.
13. Conduit terminating at floors or in cabinets, cubicles, and walls shall be identified by metal tags bearing the conduit number. The tags shall be securely attached to the conduit directly under the terminating bushing on both ends of the conduit.

B. Exposed Conduit:

1. All exposed conduits shall be run in straight lines parallel to column lines, walls or beams. Where conduits are grouped, the bends and fittings shall be installed so as to present an orderly appearance. Unnecessary bending or offsets shall not be acceptable. Conduits shall be kept at least 12 inches away from heating devices or similar equipment.
2. Supports for exposed conduit shall be in accordance with Title 24, CAC.
3. Supports and all hardware shall be galvanized steel.

4. Support conduits as close to 8 feet intervals as possible and within 1 foot of boxes or changes in direction. Use riser supports with clamps for vertical conduit risers.
5. For single conduit runs, use conduit straps with backplates or suspend from ceiling with single conduit hangers. Single hole malleable iron clamps may be used for horizontal runs on vertical surfaces. Perforated strap (plumber's tape), not acceptable.
6. For multiple conduit runs, group conduits together and support from ceiling by means of trapeze hangers. Wall brackets may be used for conduit runs on vertical surfaces. Clamp each conduit to trapeze or bracket, using conduit clamp.
7. Fasten hanger rods to structural steel members with beam clamps or to concrete inserts set flush with surface. Install reinforcing rod through opening in concrete insert.
8. Exposed conduit shall be tightened securely and shall be supported rigidly in place, and all connections to outdoor boxes shall be watertight. All exposed conduit shall include, where required, the drilling of holes in the bottom and top of enclosures or plates and in the sides of enclosures of switchgear and other electrical equipment. The Contractor shall drill all holes in concrete for installation of expansion anchors for exposed conduit runs.

C. Conduits in Concrete Slabs:

1. Conduits in concrete slabs shall be rigid galvanized steel and may be installed in structural slabs, or in slabs on fill, having a minimum thickness of 4" of concrete around the entire conduit.
2. Conduits will not be permitted to interfere with proper placement of principal reinforcement steel and must be located as directed. In structural slabs, place conduits carefully between upper and lower layers of steel. In prestressed concrete slab construction, place conduits in center of slab and do not support from prestressed steel.
3. Space conduits 8" minimum on centers, except place as wide as possible where they converge at panels or junction boxes.
4. Place conduits running parallel to slab supports (beams, columns, walls, etc.) not less than 12" from such supports.

D. Underground Conduits:

1. Buried Conduit:

- a. Buried conduits shall be a minimum of 24 inches below grade on runs not exposed to vehicular traffic and a minimum of 36 inches below grade when exposed to vehicular traffic. Buried conduits shall be installed per the Conduit Installation Table, see end of section for table. Backfill shall be compacted to 95%. Paved surfaces disturbed during trenching shall be repaired to pre-construction condition after installation is complete.
- b. All conduits entering or leaving the ground shall be sealed to prevent condensation of moisture inside the conduit. Conduit entrances in the bottom of switchgear, power distribution panels, switchboards, etc., shall project into the enclosure a minimum of three inches to prevent water from entering conduits.
- c. Concrete shall be Class D PCC in accordance with section 10-5 of the City of Sacramento Standard Specifications and shall have a compressive strength of 3000 PSI. A red oxide in the amount of 5 lbs. per cubic yard shall be mixed uniformly throughout the concrete.
- d. Contractor to place a 6" wide electrical caution warning tape in trench 12" above concrete as directed by the Engineer.

2. Duct Lines:

- a. Duct lines shall have a continuous slope downward toward pull boxes and away from switchgear with a pitch not less than 4 inches in 100 feet. Install end bells at duct terminations in handholes. Except at conduit risers, changes in direction or more than 5 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet, sweep bends may be made up of one or more manufacturer's 30 degree curved sections and straight sections. Manufactured risers shall have a minimum radius of 18 inches. The joints of the conduits shall be staggered by rows and layers so as to provide a duct line having the maximum strength. All duct runs shall be placed on an undisturbed excavated soil base wherever possible. Where duct runs pass through backfilled areas, the soil base shall be compacted to 95%.
- b. Duct joints shall be made by brushing a plastic solvent cement on insides of plastic coupling fittings and the outside of duct ends. Each duct and fitting shall then be slipped together with a quick one-quarter turn twist and held in to set the joint tightly.

- c. Plastic spacers as manufactured by the conduit supplier shall be used and shall be located five feet on centers. These spacers shall provide for conduit separation by a minimum of two inches between and four inches on the top, bottom and sides. Wire ties shall be made at each spacer location and shall be securely anchored to prevent conduit flotation during pouring. Duct runs shall be watertight.
 - d. All ducts shall be inspected by the Engineer prior to pouring concrete. He shall inspect for backfill compaction, drainage slope, spacers, flotation ties and conduit condition, joints, and end bells. Concrete shall not be poured until this inspection is complete.
 - e. Conduits shall be thoroughly swabbed immediately upon completion of pouring.
 - f. After the concrete has set, but before backfilling, a mandrel having a diameter the nominal conduit inside diameter, minus 1/4 inch, and not less than 8 inches long, shall be pulled through each conduit. The mandrel shall be lead covered or painted white to give indication of any protrusion on the inside of the conduit, which might injure the cable sheath. The ends of all conduits shall be suitably plugged, capped and protected from damage during construction.
 - g. Ducts shall be stored to avoid warping and deterioration with ends plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.
 - h. Concrete shall be Class D PCC in accordance with section 10-5 of the City of Sacramento Standard Specifications and shall have a compressive strength of 3000 PSI. A red oxide in the amount of 5 lbs. per cubic yard shall be mixed uniformly throughout the concrete.
 - i. Contractor to place a 6" wide electrical caution warning tape in trench 12" above concrete as directed by the Engineer.
3. Conduit in Structural Concrete:

Runs of conduit to be embedded in concrete shall be rigidly supported in their proper positions while concrete is being placed. Ends of conduits shall be suitable plugged or capped during construction to prevent the entrance of concrete or other foreign matter. Connections shall be checked for tightness before being embedded.

4. Vertical Penetration of Grade:
 - a. All risers penetrating ground shall extend 6 inches above grade.
 - b. Conduit entrances in the bottom of switchgear, power distribution panels, switchboards, etc., shall project into the enclosure a minimum of three inches to prevent water from entering conduits.
5. Conduits Crossing Expansion and/or Contraction Joints:

Expansion couplings used in conduit runs crossing expansion or contraction joints in concrete shall be zinc coated and watertight.

E. Workmanship and Installation Requirements:

1. Where field changes are required, every precaution shall be taken to insure that the change is coordinated with other conduit, structural, and plumbing and piping work. Information shall be obtained regarding the completed raceway runs to insure that there will be no interference when the raceway run is extended or revised. A complete record of such changes shall be made on the Drawings.
2. Conduits shall be cut square, threaded and reamed to remove sharp or rough edges and burrs. No running threads will be allowed. Conduit joints and connections shall be made waterproof and rustproof by application of a non-insulating thread compound, such as white lead or graphite, and zinc sealing material. Each threaded joint shall be thoroughly cleaned to remove cutting oil before the compound is applied.
3. Metallic conduits shall be bent cold to prevent damage to the protective coating. All bending shall be gradual and be done smoothly to permit the pulling on insulated electrical wires and cables without incurring damage to the insulation or sheath. Radius of curvature shall be not less than that permitted by NEC. The number of bends shall not exceed four 90 degree bends between pull points.
4. Conduit shall be rigidly secured to panels and other electrical equipment terminal boxes with locknuts and grounding bushings in such a manner that each system shall be electrically continuous throughout unless otherwise shown on the Drawings.
5. The raceway system shall be installed complete before conductors are installed. Concrete shall be removed from the inside of pull boxes after the forms are removed, and the threads for attaching devices and covers shall be cleaned. As soon as practicable after conduits are installed, conduits shall be swabbed with clean dry rags to show they are clean and dry.

6. To reduce damage to the zinc coating, only strap type wrenches shall be used. All places where the zinc coating is damaged shall be repaired with zinc-rich galvanizing repair compound.
7. Pull boxes, sized in accordance with NEC, shall be installed wherever necessary to avoid overly long straight runs or an excessive number of bends.
8. Raceway shall be installed with necessary fittings and supports.
9. Pull-tape shall be a made out of woven aramid yarns and contain a silicon lubricate. The pull-tape shall have sequential footage markings and have a minimum tensile strength of 2500 lbs. Furnish and install pull-tape in all empty raceways, unless otherwise noted. Pull-tape shall be Dandy-Line or approved equal.
10. All underground conduits shall be inspected by the Engineer before backfilling the trench.

3.02 OUTLET, DEVICE, PULL AND JUNCTION BOXES

- A. Boxes shall be installed as follows:
 1. NEMA 3R Indoor and outdoor areas
 2. NEMA 4X Where specifically shown on the plans and corrosive areas
- B. Set boxes in a rigid manner and support independently of conduit by bar hangers in metal studs, or to solid blocking in frame construction, or fasten directly with wood screws on solid wood framing, bolts and expansion shields on concrete or brick, toggle bolts on hollow masonry units, and machine screws or welded threaded studs on steel work. Do not use powder actuated fasteners on this job. All junction boxes shall be installed with covers accessible after installation.
- C. Pull boxes shall be located every 400 feet for straight pulls, 300 feet with every 90 degrees of conduit bends, 200 feet with 180 degrees of conduit bends, 100 feet with 270 degrees of conduit bends and every 50 feet with 360 degrees of conduit bends.

CONDUIT INSTALLATION TABLE

| <u>CONDUIT INSTALLATION</u> | <u>CONDUIT TYPE</u> |
|---|--|
| Exposed Indoor/Outdoor Conduit | Rigid galvanized steel conduit. |
| Conduit in Concrete Slab: | Rigid galvanized steel conduit. |
| Top or Side of Switchgear, Distribution Panel, & etc: | Rid galvanized steel conduit. |
| Motor Conduit Box to Rigid Wireway System: | Flexible liquid tight metal conduit. |
| Risers or Conduit Stubs Rising Up From Concrete Duct Bank: | Rigid galvanized steel PVC coated conduit. |
| Equipment Subject to Vibration | Flexible liquid tight metal conduit. |

Notes

1. All acceptable conduit materials are specified in specification 16110 section 2.02 A.
2. Any conduit not covered in the above categories shall be Rigid Galvanized Steel PVC coated.
3. All underground PVC conduits shall be encased in red concrete.
4. All conduit fittings shall be rigid galvanized steel.
5. Use water tight fittings on all flexible liquid tight metal conduit.

END OF SECTION

SECTION 16120

LOW VOLTAGE WIRE AND CABLE

PART 1 - GENERAL

1.01 SCOPE

- A. This Specification Section covers the furnishing, installing and testing of all wire and Cable required to complete the installation of equipment as specified herein and as shown.
- B. The provisions of Section 16010 of these specifications shall apply, unless otherwise specified in this Section.

1.02 SUBMITTALS

- A. Descriptive literature for all materials furnished under this section shall be submitted in accordance with Section 01330 **SUBMITTALS** of these specifications.
- B. Submittals for the wire and Cable shall include, but shall not be limited to, the following:
 - 1. Submittals will include product data sheets for all cables, of each type and voltage rating, on which work is to be performed under this contract.
 - 2. Certified test reports prepared by manufacturer.

1.03 QUALITY ASSURANCE

- A. Wire and cable of the type and voltage rating shown on the contract drawings shall be of a design which has been in satisfactory use for not less than three years in a minimum of 20 installations. For purposes similar to those intended herein.
- B. Manufacturer shall provide certification that the manufacturer has been fabricating and assembling specified equipment (as described in A above) in his current facility for a minimum of five (5) years.
- C. All materials selected for the manufacture of the hardware shall be the best available for the purpose for which they are used, considering strength, ductility, durability and the best engineering practice.
- D. All cable shall have been manufactured within one year of installation.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Wire and cable shall be delivered complete, in manufacturer's original, unopened protective packaging. Packing materials shall be such as to prevent damage to the materials during transportation and handling.
- B. Wire and cable shall be handled in a manner to prevent damage to the coverings and conductor.
- C. Maintain protective coverings until ready for installation.

PART 2 - PRODUCTS

2.01 REFERENCE STANDARDS

- A. Wire and cable supplied under this contract shall be designed, manufactured, and tested in accordance with the latest version of the following standards:

| American Society Testing Materials (ASTM) | |
|--|---|
| B-8 | Concentric-Lay-Stranded Copper Conductors |

| Insulated Cable Engineers Association (ICEA) | |
|---|--------------------------------------|
| S-68-516 | Ethylene Propylene Rubber Insulation |

| Underwriters Laboratory (UL) | |
|-------------------------------------|------------------------------------|
| UL 20 | General Use Snap Switches |
| UL 486A | Wire Connectors and Soldering Lugs |
| UL 83 | Thermoplastic Insulated Wires |
| UL 510 | Insulating Tape |
| UL 1072 | Medium Voltage Cable |

| National Electrical Manufacturers Association (NEMA) | |
|---|--------------------------------|
| WD-1 | General Purpose Wiring Devices |

National Electrical Code (NEC)

Institute of Electrical and Electronic Engineers (IEEE)

California Administrative Code (CAC) Title 24

2.02 LOW VOLTAGE WIRING

- A. Low voltage wiring shall be of the size and number shown and shall have the following characteristics. Sizes are indicated by American Wire Gauge (AWG) and minimum size shall be No. 12 AWG for power wiring and No. 14 AWG for control wiring, unless otherwise indicated.
- B. Voltage: 600 V.
- C. Conductors: Annealed copper 98% conductivity. Aluminum conductors are not acceptable.
- D. Conductor Stranding: All Conductors shall be stranded. Solid wire is not acceptable.
- E. Insulation: Thermoplastic insulated wires and cables shall be listed in UL 83. They shall be delivered to the job site in the manufacturer's unopened boxes or reels. Insulation for conductors and cables shall be rated 600 volts and shall be as follows:

| Item | Sizes | Insulation |
|---------------------|------------------|---|
| Branch | No. 12 to No. 10 | THHN/THWN-2 |
| Grounding | All | TW or bare |
| Feeders | No. 6 and above | THHN/THWN-2 |
| Cords | No. 12 | SO |
| Wet Locations | All | THWN |
| Corrosive Locations | All | THHN/THWN-2 |
| VFD Feed to Motor | All | VFD rated, blended composite semiconductive, tray cable rated, UL type TC 90°C. 100% shielding with foil tape & tinned copper braid |

- F. Insulation Colors: Insulation shall be continuously colored for the entire conductor length; except that feeders can be phased taped and all insulated grounding conductors must be green.

- G. Instrumentation/Telemetry Cable: Instrumentation and Telemetry Cable shall be multiple-pair, #16 AWG, twisted, overall shielded with PVC jacket. Shield shall be 100% and include #20AWG stranded, tinned copper drain wire. The conductors shall be polyethylene insulated. Manufacturer shall be Belden or equal.
- H. Telephone Cable: Telephone cable shall be 6 twisted pair with standard color code, #22 AWG, solid copper, polyethylene or polypropylene insulation, twisted pairs shall have varying lays, 100% shielded with .008" corrugated aluminum tape with ethylene copolymer coating on both sides, polyethylene jacket, filled with petrolatum-polyethylene gel filling compound, Clifford type BJFA, or equal.
- I. RS-485 Cable: RS-485 cables shall be tinned copper, polyethylene insulated, twisted pair, aluminum-polyester shield. 24 AWG stranded tinned copper drain wire, tinned copper braid shield and a chrome PVC jacket. The cable shall be Belden 9841, or equal.
- J. Ethernet Cables: Ethernet cables shall be CAT-6 compliant Belden model number 7940A or approved equal. Ethernet cables shall not exceed 90 meters in length under any circumstances. Ethernet cables shall be tested by an independent testing company to verify the integrity of the cable and terminations. The Ethernet cables shall be tested for the following:
1. Attenuation (dB/100m)
 2. Power sum near-end crosstalk (dB)
 3. Power sum attenuation to crosstalk ratio (dB/100m)
 4. Power sum equal level crosstalk (dB/100m)
 5. Return loss (dB)

All tests shall be conducted at the following frequencies: 1 MHz, 4 MHz, 10 MHz, 25 MHz, 100 MHz, 200 MHz, and 250 MHz. The test results shall be printed out and submitted to the Engineer. All tests shall be compared to the specifications for the Belden 7940A cable. If any cable fails to meet these specifications the Contractor shall remove and replace the cable at their expense and retest the cable. All Ethernet cables shall meet the specifications of the Belden 7940A CAT 6 cable.

- K. VFD rated cable: UL 44, XHHW-2, 600 V conductors, the cable shall have three symmetrically placed grounds to reduce problems associated with Pulse-Width Modulated AC drives. Continuous corrugated aluminum sheath 99.5% shall be applied over the assembly. The continuous sheath will be impervious to moisture, liquids, and gases. The cable shall have black PVC jacket, sunlight and oil resistant, per UL 1569. The VFD cable shall be Beldon 295XX or approved equal.

2.03 COLOR CODE

- A. Color code for three phase circuits shall be ph-A, ph-B, ph-C front to back, left to

right and top to bottom. Color code for three phase circuits are listed in phase order. Color code shall be as follows:

| 120/240 volt power wiring | |
|----------------------------------|-------|
| Phase A | Black |
| Phase B | Red |
| Phase C | Blue |
| Neutral | White |
| Ground | Green |

| 480/277 volt power wiring | |
|----------------------------------|--------|
| Phase A | Brown |
| Phase B | Orange |
| Phase C | Yellow |
| Neutral | White |
| Ground | Green |

| Miscellaneous | |
|----------------------|--------|
| Control wiring | Purple |
| DC Power Wiring | Blue |

| Signal wiring | |
|----------------------|-------|
| Positive (+) | Red |
| Negative(-) | Black |

2.04 GROUND CONDUCTOR

- A. Grounding electrode conductors shall be sized per NEC 2008 edition, table 250.66, unless otherwise noted on the Plans.
- B. Raceway and equipment grounding conductors shall be sized per NEC 2008 edition, table 250.122, unless otherwise noted on the Plans.

2.05 GROUND RODS

- A. Provide copper encased steel ground rods at least 3/4 inch in diameter and 10 feet long unless otherwise indicated. Die stamp each near the top with the name or trademark of the manufacturer and the length of the rod in feet. The rods shall have a hard, clean, smooth, continuous surface throughout the length of the rod. Ground rods shall be provided with precast ground wells.

2.06 WIRING MATERIALS

- A. Compression Connectors: Connectors shall be for use with copper conductors and shall conform to the requirements of UL 486A. Control and signal connectors shall be copper compression type nylon self insulated grip locking spade lugs. Power and grounding lugs and connectors for conductors No. 6 and larger shall be compression types of one piece tubular construction. These power compression connectors shall be copper long barrel terminals with corrosion resistant tin plating. Connectors shall be marked externally with wire size and type. Power connectors shall have NEMA configuration bolt holes on the pad. Connectors shall also have the proper mating compression die index and color code marked on the barrel. Furnish ILSCO #CRA/B-L series or approved equal.
- B. Splice Waterproofing Kits: Splice waterproofing shall be in kit form. Kit shall contain low viscosity polyurethane sealing and insulating material. The component materials of the insulation shall be in exact mixing ratio packages. Kit shall employ a gravity poured method of a pressure injected method. Molds shall be flexible plastic with porous webbing. Molds shall be capable of accommodating odd shape splices. Kit shall be rated 600 V and water submersible. Furnish 3M Scotch cast 2104 and 85 series, or approved equal.
- C. Electrical Tapes: Tapes shall conform to the requirements of UL 510 and be rated: 105 degrees C, 600 V, flame retardant, hot and cold weather resistant. Vinyl plastic electrical tape shall be 7 mil black. Phase tape shall be 7 mil vinyl plastic, color code as specified. Electrical insulation putty shall be rubber based, elastic putty in tape form. Varnished cambric shall be 9 mil cotton tape impregnated with yellow insulating varnish and adhesive backed.
- D. Wire and Cable Markers: Every control and signal conductor shall be tagged with a permanently machine imprinted plastic nylon clip sleeve heat shrinkable or adhesive backed strip type labels protected with a clear plastic heat shrinkable tubing.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Wire and cable shall not be installed in conduit until the raceway system has been completed and cleaned. The equipment and methods for the installation of wire and

cable shall insure that no cuts or abrasions in the insulation or protective covering or kinks in the conductors occur. Cables shall be pulled down grade with the feed in point at point of the highest elevation.

- B. The Contractor shall pull wire and cable into the conduit with sufficient length remaining at the ends to conveniently make connections to all equipment or devices.
- C. Where practicable, the minimum radius to which an insulated conductor shall be bent, whether permanently or temporarily during installation, shall be ten times the diameter over the outer covering for rubber and thermoplastic insulated cable.
- D. Where a lubricant is needed as an aid in pulling wire or cable, a nonconducting lubricant or cable-pulling compound approved by the wire and cable manufacturer and that is not injurious to the sheath or insulation shall be used. 600 V cable lubricants shall be soapstone, graphite or talc which shall be UL listed for thermoplastic insulation. Oil or grease shall not be used for lubrication. Excessive pulling stresses will not be permitted.
- E. Wire and cable shall be continuous, with no splices permitted except in enclosed steel boxes provided for the purpose, or in manholes. Shipping length of power cable shall be equal to a circuit length or summation of various circuit lengths to minimize cable waste.

3.02 INSTALLATION - LOW VOLTAGE WIRING

A. General Requirements:

- 1. Do not use blocks, tackle, or other mechanical means to pull in wires #8 AWG, or smaller. Cable pulling tensions shall not exceed the maximum pulling tension for stranded copper.
- 2. See section 16110 for pull rope/tape requirements.
- 3. Unless otherwise specified or shown, leave at least 9" of free conductor length at each unconnected outlet. The free ends of conductors shall be coiled neatly in outlet box.

B. Splicing and Termination of Conductors:

- 1. Conductors #10 AWG and smaller:
 - a. Twist & solder conductors together to be electrically and mechanically secure.
 - b. Insulate splices, joints and free ends of conductors with insulation

equivalent to that of conductors by taping with varnish-cambridge rubber tapes, or with high dielectric strength plastic tape.

2. Conductors #8 AWG and larger:
 - a. Splice and terminate conductors by use of connectors and terminal lug.
 - b. Do not use split bolt type connectors.
 - c. After initial set has been taken, re-tighten all pressure type connectors and lugs.
 - d. Insulate all splices, joints, and free ends of conductors as specified above.
 - e. Where aluminum lug is bolted with steel or copper bolt, use Belleville spring washer and flat washer. Belleville washer, either hardened and tempered steel, tin plated, or stainless steel. Flat washer, mild steel, tin plated, and slightly larger than Belleville washer.
3. Low Voltage Control Wiring: Splice by twisting conductors together so as to be electrically and mechanically secure. Other methods may be used if specifically approved by Engineer.
4. Underground Splices: Conductor and cable splices installed underground in manholes, pullholes and similar locations, shall be made watertight. Install waterproofing after insulating with tape on all splices in junction boxes or handholes. Follow manufacturer's written instructions. As a minimum molds shall be fitted uniformly webbed around the spliced conductors. Insulating and waterproofing material shall then be poured or injected into the mold. Do not allow cables to move until after material has cured one hour at 70 degrees F or eight hours below 70 degrees F.

C. Marking:

1. In addition to color coding, identify circuits as follows:
 - a. The Contractor shall assign to each wire or cable a unique identification number unless a number has been pre-assigned on the Plans.
 - b. Where an identification number has been pre-assigned on the Plans the Contractor shall use that number.
 - c. The same identification number shall be used for conductors having

common terminals.

- d. Identification numbers shall be shown on all As-Built drawings.
 - e. Identification numbers shall be located within 3" of wire terminations and shall not be located such that they are concealed in any raceway.
2. Each multiconductor cable shall be assigned a unique identification number. It is required that this cable number shall form part of the individual wire identification number for each conductor in the cable. Cable markers shall be attached to each cable at stub-up locations and at all intermediate pull box locations.

3.03 GROUNDING

- A. Permanently and effectively ground noncurrent metal parts of conduit systems, supports, cabinets, switchboards, equipment cases, motor frames, etc., and system neutral conductors per NEC. Install metal raceway couplings, fittings and terminations secure and tight to insure good ground continuity. Provide grounding bushing and bonding jumper where conduits enter any panel or device, panels with open bottom or where shown on the drawings. Install a ground conductor in each raceway system. Contractor to install Ufer ground per NEC section 250.
- B. Grounding details shown on plans are minimum. If additional equipment, such as ground rods, clamps, conductors, etc., is required, furnish and install same without additional cost to City.
- C. Use ground clamps specifically designed for grounding purposes. Where ground conductor is in conduit, use ground clamp which grounds both conductor and conduit.
- D. Shielded instrumentation cable shall be grounded at one end of circuit only unless explicitly required by manufacturer of instrument or device to be grounded at multiple locations. Single ground point in each circuit shall be at the receiving end of the signal carried by the cable.

3.04 PREPARATION FOR OPERATION

- A. The wire and cable shall be properly installed, connected and tested by the Contractor before such equipment will be taken over for operational service.
- B. Identification markers and nameplates shall be properly and accurately installed.
- C. Torquing: Every worker assigned to tightening bolted connections on this job shall be required to have either a torque screwdriver or a torque wrench on site in their tool box. Each crew shall have one of each. All electrical, mechanical and

structural threaded connections shall be torqued. Torque connections to the value recommended by the equipment manufacturer. If they are not available, see Section 16950 for torque requirements.

3.05 TESTS AND INSPECTIONS

- A. Insulated wire and Cable Dielectric Tests: After the wiring is installed and all taps and splices are completed, but before making connections to equipment terminals, the cable shall be given insulation tests in accordance with Section 16950 and NEMA and ICEA Standards.
- B. Continuity Tests:
 - 1. After wiring connections to equipment and devices have been made, the circuits shall be tested for continuity. The Contractor shall be responsible for notifying the City Resident Inspector when the wire or cable is ready to be tested, and the Contractor shall conduct the tests as instructed by the Engineer.
 - 2. If a failure is detected, the Contractor shall locate and determine the trouble, make necessary corrections to the installation and retest without additional cost to the City.
 - 3. Connection of the wiring to equipment or device terminal blocks or other connection points and furnishing and installing conductor identification tags at terminals or other connections shall be included as part of the equipment's installation.
- C. All tests shall insure the satisfactory installation, adjustment, operation and performance of all equipment and materials erected and installed under this specification, shall be the responsibility of the Contractor.
- D. The Contractor shall also responsible for furnishing all electrical test equipment, meters, instruments and miscellaneous equipment and perform all work required for the tests.
- E. Test Reports: The Contractor shall furnish the Engineer three copies of certified test reports showing the results of all tests specified herein.

3.06 DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS

- A. Demonstration of the operation of segments of systems shall not be construed as acceptability of the complete system. Acceptance will only be made on satisfactory demonstration of the complete operation of the system as a whole.
- B. If, in the opinion of the Engineer, test results show improper adjustment, operation,

or performance of any equipment, and these deficiencies are due to negligence or unsatisfactory installation by the Contractor, the Contractor shall remedy the situation at no additional cost to the city.

END OF SECTION

SECTION 16480

LOW VOLTAGE SWITCHGEAR

PART 1 -- GENERAL

1.01 SCOPE

- A. This Specification Section covers the furnishing, installing and testing of the low voltage switchgear as specified herein, as shown on the Drawings, and as required for a complete electrical installation.
- B. The provisions of Sections 16010 and 16120 of these specifications shall apply unless otherwise specified in this Section.

1.02 SUBMITTALS

- A. Submittals for the low voltage switchgear shall include, but shall not be limited to, the following:
 - 1. Catalog cuts showing and identifying manufacturer, catalog numbers, dimensions, weights, nameplate data, and material of all components.
 - 2. Assembly drawings with front, side, section views and uprights. Drawings to show location of all accessories.
 - 3. Catalog cuts of specified components.
 - 4. Operating and Maintenance Manuals as specified in Section 01330.
 - 5. Dimensioned as-built drawings.
 - 6. Certified test reports prepared by the manufacturer.
 - 7. Control diagrams

1.03 QUALITY ASSURANCE

- A. The manufacturer has been fabricating and assembling similar equipment for a minimum of five (5) years.
- B. The low voltage switchgear shall be built and labeled by a manufacturer with a UL file listing. The low voltage switchgear shall meet UL 845.

PART 2 -- PRODUCTS

2.01 MATERIAL AND EQUIPMENT

- A. The low voltage switchgear shall be a 3 phase, 3 wire, 480 volt, free standing, dead front enclosure with either NEMA Class I or II designation and NEMA Type B or Type C-S wiring. The low voltage switchgear shall contain the proper clearances and space for safe operation of the equipment therein. In addition, the low voltage switchgear shall be service entrance rated.

The switchgear supplier shall provide the following conductors/feeders:

1. Between the distribution panel breaker and the distribution panel.
2. Between the distribution panel and the lighting panel transformer.
3. Between the lighting panel transformer and the lighting panel lighting panel breaker.
4. Between the lighting panel breaker and the lighting panel.

The low voltage switchgear shall be manufactured by Allen-Bradley, Eaton, General Electric, Square D, or approved equal.

- B. The main, feeder, and 100hp pump circuit breakers shall be operated by a toggle type handle and shall have a quick-make, quick-break, over-center switching mechanism that is mechanically trip-free from the handle so that the contacts cannot be held closed against short circuits and abnormal currents. Tripping due to overload or short-circuit shall be clearly indicated by the handle automatically assuming a position midway between the manual ON and OFF positions.

Contacts shall be of non-welding silver alloy.

Each pole shall provide inverse time delay and instantaneous circuit protection, and the minimum interrupting rating shall be as shown on the Plans.

The main, feeder, and 100hp pump circuit breakers shall have **adjustable** short time pickup, short time delay, long time pickup, and long time delay settings. **The main breaker shall be a Cutler Hammer HKD or equal. The feeder and 100hp pump breaker shall be a Cutler Hammer HFDE or equal.**

The main and feeder circuit breakers shall be pad-lockable as specified in the current edition of the EUSERC standards.

The circuit breaker shall be General Electric, Square D, Cutler Hammer or equal and shall be NEMA rated.

- C. **Circuit Breakers: Circuit Breaker shall be molded case and NEMA rated.** The circuit breakers shall conform to the requirements of NEMA ABI and UL 489 and shall be trip-free, thermal magnetic bolt-on type; connect breakers in uniform phase sequence starting at the top left phase bus; provide full busing and all necessary mounting hardware; use common trip devices not handle ties. Two or three pole breakers shall be common trip units. Each breaker pole shall provide inverse time delay and instantaneous circuit protection. Breakers shall have toggle, quick make, and quick break operating mechanisms. Trip position of the breakers shall be clearly indicated by movement of the operating handles to the center position. Circuit breakers rated to IEC standards shall not be acceptable.
- D. **Panel board:** Each panel board shall conform to the requirements of NEMA PB-12 and UL-67. Bus shall be copper. Provide quantity and size of branch breakers and spare spaces as shown on the Drawings.
- E. **Station Service Transformer:** transformer shall be dry type and sized per Plans. All windings of the transformer shall be copper. The transformer shall have a NEMA energy efficiency rating.
- F. **Busses:**
1. The grounding bus shall be 1/4" by 1" copper, hard connected, running the full width of the MCC and located near bottom. Grounding bus shall be bolted to the frame of the MCC and include lugs for equipment grounding conductors.
 2. The main horizontal bus shall be silver or tin plated copper located within an isolated compartment. The bus shall be rated as shown on the Plans.
 3. The vertical bus in each section shall consist of a single silver or tin plated copper conductor per phase with a current capacity of not less than 600 amperes. The vertical bus shall be completely isolated and insulated with a labyrinth bus barrier, and shall extend the full height of the section wherever possible. The bus shall be rated as shown on the Plans.
- G. **Wireways:** A separate vertical wireway shall be provided adjacent to each vertical unit, and shall be covered by a hinged door. Each individual unit compartment shall be provided with a side barrier to permit pulling wire in the vertical wireway without disturbing adjacent unit components.
- H. **Buckets:** Buckets shall be removable from the low voltage switchgear as a unit and have pull apart terminal blocks to allow removal of individual buckets without disconnecting control and instrumentation wiring.
- I. **Distribution Panel:** Distribution panel shall be UL listed. Bus shall be copper. Provide quantity and size of breakers and spare spaces as shown on the Drawings.

PART 3 -- EXECUTION

3.01 FACTORY TESTING

- A. The low voltage switchgear and their components shall be given manufacturer's standard electrical and mechanical production tests and inspections. The tests shall include electrical continuity check, dielectric tests for each circuit, and inspection for proper functioning of all components including controls, protective devices, metering, and alarm devices. The manufacturer shall submit five copies of the test reports to the Engineer for review.

3.02 INSTALLATION

- A. Contractor shall furnish all material and labor including, but not limited to, transportation, loading, lifting, jacking, wiring to completely install the low voltage switchgear as shown on the drawings and shall conform with the National Electrical Code (NEC).

END OF SECTION

SECTION 16950

OPERATIONAL TESTING

PART 1 - GENERAL

1.01 SCOPE

A. General

1. Independent test company preoperational testing.
2. Contractor operational testing.

1.02 GENERAL REQUIREMENTS

- A. The Contractor shall engage and pay for the services of an approved independent testing company for the purpose of performing inspections and electrical preoperational tests as specified. The testing company shall provide all material, equipment, labor and technical supervision to perform such tests and inspections. The Contractor shall also perform all mechanical preoperational tests as herein specified.
- B. These tests shall assure that all equipment is operational within industry and manufacturer's tolerances and is installed in accordance with design plans and specifications. The tests and inspections shall determine the suitability for energization and the suitability for Owner acceptance of the Contractor's work.

1.03 FAILURE TO MEET TEST

- A. Contractor shall replace the defective material or equipment and have tests repeated until test proves satisfactory to the Engineer without additional cost to the Owner.

1.04 SUBMITTALS

- A. The Contractor shall submit the following tests to the Engineer:
1. Grounding resistance preoperational test.
 2. Phase rotation preoperational test.
 3. Circuit breaker preoperational test.
 4. Switchgear preoperational test.
 5. 600 volt conductor test.

6. Wiring test.
- B. Three copies of each test mentioned above shall include the following data and be submitted with the Operation and Maintenance Manual:
1. Summary of project, construction contract numbers
 2. Description of equipment tested
 3. Description of test
 4. Test personnel
 5. List of test equipment used and calibration date
 6. Test results, date and weather conditions
 7. Conclusions and recommendations
 8. Appendix, including all test forms

PART 2 - PRODUCTS

2.01 TESTING COMPANY

- A. The testing company shall meet federal OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907. Membership in the International Electrical Testing Association constitutes proof of meeting such criteria. The testing shall be performed by Electro Test, Apparatus Unlimited, Power Systems Testing, Hart Testing, or approved equal.

2.02 TESTING

- A. California Electrical Safety Orders (ESO) and Occupational Safety and Health Act (OSHA): The Contractor is cautioned that testing and equipment shall comply with ESO and OSHA as to safety, clearances, padlocks and barriers around electrical equipment energized during testing.

PART 3 - EXECUTION

3.01 PREOPERATIONAL TESTING

- A. All testing shall conform to International Electrical Testing Association (NETA) Maintenance and Acceptance specifications and shall utilize manufacturer's instruction manuals applicable to each particular apparatus.
- B. Upon completion of the test and inspections noted in these specifications, a label shall be attached to all serviced devices. These labels will indicate date serviced and the service company responsible.

3.02 GROUND RESISTANCE PREOPERATIONAL TEST

- A. Test the entire ground system for ground resistance value. Perform fall of potential method with ground test instrument. Record weather and soil conditions at the time measurements are made. Make ground resistance measurements in normally dry weather, not less than 48 hours after rainfall. The current reference rod shall be driven at least 100 feet from the ground rock or grid under test, and the measurements shall be made at 10 foot intervals beginning 25 feet from the test electrode and ending 75 feet from it, all in direct line between the ground rod, or center of grid and the current reference electrode.
- B. Grounds and grounding systems shall have a resistance to solid earth ground not exceeding 5 ohms.

3.03 PHASE ROTATION PREOPERATIONAL TEST

- A. Check connections to all equipment for proper phase relationship. During this test, disconnect all devices which could be damaged by the application of voltage or reversed phase sequence. Three phase equipment shall be tested for the phase sequence and shall match the electrical provider phase sequence and meet Mar's requirements.

3.04 CIRCUIT BREAKER PREOPERATIONAL TEST

- A. All circuit breakers shall be checked for proper mounting, conductor size and feeder designation.
- B. Only breakers 100 amp and above shall be tested. Time current characteristic tests shall be performed bypassing three hundred percent (300%) rated current through each pole separately. Trip time shall be determined. Instantaneous pickup current shall be determined by run up or pulse method. Clearing times should be within 4 cycles or less.
- C. Contact and Insulation Resistance: Contact resistance shall be measured and be compared to adjacent poles and similar breaker. Deviations of more than 50% shall be rejected. Insulation resistance shall be measured and shall not be less than 50 megohms. All trip times shall fall within NETA table values. Instantaneous pickup current levels should be within 20% of manufacturer's published values.
- D. Circuit breakers with adjustable settings shall have all of the settings tested and test results shall be submitted to the engineer. The following settings shall be tested: long time pickup, long time delay, short time pickup, short time delay, and the instantaneous settings.

- E. Circuit breakers with ground fault protection shall be performance tested and test results shall be submitted to the engineer. The testing agency shall verify that the ground protection is connected properly per the manufacturer's recommendations. The testing agency shall test the ground fault pickup and ground delay and submit the test results to the Engineer.

3.05 SWITCHGEAR PREOPERATIONAL TEST

A. Visual and Mechanical Inspection:

1. Inspect for physical damage, proper anchorage and grounding.
2. Compare equipment nameplate data with design plans and starter schedule.
3. Compare overload heaters with motor full load current for proper size.
4. Check torque of bolted connections. Torque connections shall be per manufacturers recommendation or use the following table if the manufactures data is not available:

NOMINAL TORQUE REQUIREMENTS FOR BOLTED BONDS

| BOLT SIZE | THREADS /INCH | TORQUE IN/LBS | TORQUE FT/LBS |
|-----------|---------------|---------------|---------------|
| #8 | 32 | 18 | |
| | 34 | 20 | |
| #10 | 24 | 23 | |
| | 32 | 32 | |
| 1/4" | 20 | 80 | 6 |
| | 28 | 100 | 8 |
| 5/16" | 18 | 140 | 11 |
| | 20 | 150 | 12 |
| 3/8" | 16 | 250 | 20 |
| | 24 | 275 | 22 |
| 7/16" | 14 | 400 | 33 |
| | 20 | 425 | 35 |
| 1/2" | 13 | 550 | 45 |
| | 20 | 575 | 47 |
| 5/8" | 11 | 920 | 76 |

| | | | |
|------|----|-------|-----|
| 3/4" | 10 | 1,400 | 116 |
| 7/8" | 9 | 1,950 | 162 |
| 1" | 8 | 2,580 | 215 |

3.06 600 VOLT CONDUCTOR TEST

- A. Megger and record insulation resistances of all 600 volt insulated conductors using a 500 volt megger for thirty seconds. Make tests with circuits installed in conduit and isolated from source and load. Each conductor shall be meggered conductor to conductor and conductor to ground. These tests shall be made on cable after installation with all splices made up and terminators installed but not connected to the equipment.

3.07 WIRING TEST

- A. Verify all wire connections/terminations are per contact drawings or approved changes. Check for proper termination of all wires.

3.08 OPERATIONAL TESTING

- A. After preoperational tests are complete, the City will conduct overall operational testing of the water meter test bench facilities to ensure that the system operates as designed.

END OF SECTION

SECTION 17102

FLOW MEASURING SYSTEMS

PART 1 - GENERAL

1.01 SCOPE

- A. This Section covers the furnishing, installation, and testing of one magnetic flow measuring system as specified herein, as shown on the Drawings, and as required for a complete installation. **The contractor shall install a new 10" magnetic flow measuring system as shown on the plans.**

1.02 REFERENCE PUBLICATIONS

- A. The equipment covered under this contract shall be designed, manufactured, and tested in accordance with the latest version of the applicable industrial standards.

1.03 SUBMITTALS

- A. Provide submittals in accordance with Section 01330. Submittals shall be approved by the Engineer prior to manufacture and shipment.
- B. Provide Operations and Maintenance Manuals as specified in Section 01330.

1.04 QUALITY ASSURANCE

- A. The manufacturer shall verify that they have been fabricating and assembling similar equipment for a minimum of five (5) years.

PART 2 - PRODUCTS

2.01 MAGNETIC FLOW MEASURING SYSTEMS

- A. General: Magnetic flow measuring systems shall measure volumetric flow rate by detecting the velocity of a conductive liquid that passes through a magnetic field. The flowtube shall be installed in-line with the process piping. Coils located on opposite sides of the flowtube shall create a magnetic field. As the conductive fluid moves through this field, a voltage shall be generated that is linearly proportional to the flow. The transmitter shall condition this voltage and produce output signals that are proportional to the velocity of the fluid being metered.

Each magnetic flow measuring system shall include a flowtube, signal cable, transmitter, and grounding rings. Each system shall be FM approved and

intrinsically safe.

B. Flowtube:

1. **Flanged Type:** In-line flow element with no constrictions in flow of fluid through meter consisting of metallic tube with ANSI B16.5, Class 150 bolt pattern. Flange material shall be compatible with the piping material and corrosion resistant. This flowtube will be installed in an area subject to periodic submergence and shall be I.P. 68 rated.
2. **Electrode and Liner Materials:** Shall be fully compatible with the process fluid. Refer to the chart below for electrode and liner material requirements. The liner shall meet the current requirements of the NSF/ANSI Standard 61. Provide written certification of the NSF/ANSI Standard 61 for each meter.

| Process Fluid | Liner | Electrode |
|----------------------|--------------|---------------------|
| Drinking Water | Polyurethane | 316 Stainless Steel |

4. **Grounding Rings:** 316L SST, with an external tab to attach ground wiring. Contractor shall connect the grounding rings per the manufacturer's recommendations.

C. Transmitter:

1. Transmitter shall be remote mount.
2. Transmitter shall contain a backlit LCD display used for programming as well as for simultaneous display of flow rate and total flow in user-selectable engineering units, and readout of diagnostic error messages
3. Shall be furnished with local flow rate indication and local flow totalization indication, and scaled in user selectable engineering units.
4. Diagnostics shall include self-test, transmitter faults, tunable empty pipe parameter, reverse flow testing, coil circuit fault, electronics temperature monitoring, magnetic field strength, ground wiring fault, high process noise analysis, and shall provide for calibration verification. Diagnostics shall be the heartbeat verification and monitoring package per E&H or equal.
5. Power Supply: 120 VAC.
6. System Accuracy +/- 0.25% of rate from 1.0 to 30 feet per second.

7. Provide the manufacturer's cable(s) to be installed between the transmitter and the flowtube.
8. Housing shall be rated NEMA 4X.
9. Operating range shall be from -5 to 140 degrees Fahrenheit and 0 to 100 percent relative humidity.
10. Local confirmation and diagnostic capability by a handheld communicator or software.

D. Signal Converter/Transmitter Output:

1. **Ethernet IP or Modbus TCP/IP communication protocol.**
2. Shall be capable of indicating reverse flow and zero flow.
3. Security lockout to prevent unwanted or unintentional changes.
4. **The transmitter shall have an Ethernet port and built-in webserver for easy data access and configurations.**

E. Factory Calibration:

1. Flowtube shall be hydraulically calibrated to within 0.2% at a facility, which is traceable to internationally recognized Calibration Standards. The calibrations procedure shall conform to the requirements of (ISO) 10012- 1, and "Quality Assurance Requirements for Measuring Equipment". A real-time computer generated printout of the actual calibration data indicating a three point calibration of the entire operating range shall be submitted to the ENGINEER prior to shipment of the meters to the project site. The calibration sheet shall also be filed with the O&M manual.

F. Approved Manufacturers

1. Endress & Hauser Promag L 400
2. Approved equal.

PART 3 - EXECUTION

3.01 SHIPPING, HANDLING, AND DELIVERY

- A. The flowmeters and associated equipment shall be protected for shipment by the manufacturer. The manufacturer shall take pictures of the flowmeter(s) and associated equipment before and during the crating process. The pictures shall be

submitted to the Engineer. The manufacturer's Local Representative shall be present at the delivery of each flow meter to the job site.

- B. The Engineer as well as the manufacturer's local representative must be on-site to witness the Contractor's unloading of the flow meter(s) and associated equipment. The manufacturer's local representative shall witness the uncrating of each meter and then inspect, verify, and certify in a written inspection report to the Engineer that all flowmeters and associated equipment have been inspected, are present, damage free, and ready for installation.

3.02 FLOWMETER AND ASSOCIATED EQUIPMENT INSTALLATION

- A. The flow meter(s) shall be installed per the manufacturer's recommendation and as shown on the Plans.
- B. The work to install the flow meters shall consist of cutting the existing water pipe and welding matching steel flanges on the pipe side. The contractor shall paint the flanges with two coats of paint. The contractor shall also provide stainless steel bolts, nuts, the pipe seals, and ground rings.

3.03 STARTUP ASSISTANCE BY MANUFACTURER'S LOCAL REPRESENTATIVE

- A. The manufacturer shall provide delivery inspection, technical advice, startup inspection, Job-site operational diagnostics and calibration, approve/certify for operation, operational assistance, and one 2-hour Operation and Maintenance training class.

PART 4 - WARRANTY

4.01 MANUFACTURER'S ORIGINAL WARRANTY AND EXTENDED WARRANTY

- A. The manufacturer shall provide a one year warranty that covers parts, labor and travel. The warranty period shall start of the day the City accepts the project.

END OF SECTION