



City of Sacramento City Council

915 I Street, Sacramento, CA, 95814
www.CityofSacramento.org

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Meeting Date: 5/17/2011

Report Type: Consent

Title: Contract Award for Sump 157 Trash Rack - North Channel Project (W14003300)

Report ID: 2011-00423

Location: District 2

Recommendation: Adopt a Resolution 1) approving the plans and specifications for the project, and awarding the contract to Westcon Construction Corp., for an amount not to exceed \$797,722.00; and 2) authorizing the transfer of \$80,000 from the Storm Drainage Fund (6011) from the Base CIP Reserve (W14000200) to the Sump 157 Trashracks Project (W14003300).

Contact: Bill Busath, Interim Engineering Manager, (916) 808-1434; Brett Grant, Supervising Engineer, (916) 808-1413 - Department of Utilities

Presenter: None

Department: Department Of Utilities

Division: Cip Engineering

Dept ID: 14001321

Attachments:

- 1-Description/Analysis
- 2-Background.doc
- 3-Sump 157 TR Location map
- 4-Resolution
- 5- UnExecuted Contract Cover
- 6-Sump 157 TR Bid & Specs

City Attorney Review

Approved as to Form
Joe Robinson
5/10/2011 10:49:34 AM

City Treasurer Review

Prior Council Financial Policy Approval or
Outside City Treasurer Scope
Russell Fehr
4/29/2011 4:06:26 PM

Approvals/Acknowledgements

Department Director or Designee: Mike Malone - 5/9/2011 11:49:10 AM

Assistant City Manager: John Dangberg - 5/9/2011 2:52:23 PM

Eileen Teichert, City Attorney

Shirley Concolino, City Clerk
William H. Edgar, Interim City Manager

Russell Fehr, City Treasurer



Description/Analysis

Issue: Staff has prepared construction plans and specifications to install a bridge and two automated trash racks in a drainage channel that is immediately upstream of the Sump 157 storm water pumping station. The project was formally advertised to solicit public bids and staff is recommending that Council award the construction contract to the lowest responsible and responsive bidder.

The Sump 157 storm water pumping station pumps runoff from the second largest watershed in the City and the station does not have automated trash racks to remove debris that flows to the station. Debris that accumulates on the existing stationary trash racks reduces pumping capacity and causes influent flows to back up, thereby risking flooding to upstream properties, and damage to the racks or pumping system. Currently debris must be removed during dry weather by dewatering the station forebay and using heavy equipment. This project is consistent with the criteria set forth in the City of Sacramento's Capital Improvement Program and the Department of Utilities' Asset Management Program, by preventing damage, maintaining full pumping capacity during storm events and significantly reducing flood risk.

Policy Considerations: The requested action is in conformance with City Code Section 3.60, Articles I and III, which provide for the award of competitively bid contracts to the lowest responsible and responsive bidder. This report's recommendation is consistent with the City's Strategic Plan goals of improving and expanding public safety and achieving sustainability and livability. Staff has verified or will verify prior to the Notice to Proceed, that the bonds and insurance required for this project are valid.

Environmental Considerations: The Community Development Department, Environmental Planning Services Division, has reviewed the proposed project and determined that it is categorically exempt from the provisions of the California Environmental Quality Act (CEQA), under CEQA Guidelines Class 3, Section number 15303, New Construction or Conversion of Small Structures. This project consists of the construction and location of limited numbers of new, small utility structures.

Sustainability: The project is consistent with the City's Sustainability Master Plan by reducing flood risk, which is one of the City's sustainability targets; and by improving reliability, which will reduce energy-intensive maintenance efforts.

Commission/Committee Action: Not applicable.

Rationale for Recommendation: The project was formally advertised to solicit public bids, and four bids were received and opened by the City Clerk on April 20, 2011. The lowest bid was submitted by T and S Construction, Inc., in the amount of \$738,000. However, the bid submitted by T and S Construction, Inc. is not a responsive bid because it did not meet the minimum Emerging and Small Business Enterprise (ESBE) participation level of 20%. City Code section 3.60.270 provides that "[n]o bidder ... on the contract ... shall be considered a responsive bidder ... unless its bid or proposal meets the minimum SBE,

EBE, local SBE, or local EBE participation level(s) established for the contract” In accordance with this City Code provision, the bid specifications for this contract established a minimum 20% participation level for ESBEs, and stated that “no bidder on this contract shall be considered a responsive bidder unless its bid meets or exceeds this minimum participation level.” The bid submitted by T and S Construction, Inc., indicates an ESBE participation level of 19.82%, which does not meet or exceed 20% ESBE participation. Pursuant to the bid specifications and the City Code, this renders the bid of T and S Construction, Inc., nonresponsive.

The second lowest bid was submitted by Westcon Construction Corp., in the amount of \$797,722. Staff has verified the validity of their bid bond, determined the bid to be responsive, and recommends that the contract be awarded to Westcon Construction Corporation as the lowest responsible and responsive bidder.

Financial Considerations: The Westcon Construction Corp. bid is for an amount not to exceed \$797,722. The total estimated project cost including design, construction, inspection, and contingency is estimated to be \$1,171,070. \$80,000 will be transferred from the Storm Drainage Fund 6011 in the Base CIP Reserve (W14000200) to the Sump 157 Trashracks Project (W14003300) to complete the project.

Emerging Small Business Development (ESBD): This project included a participation goal of 20% for emerging and small business enterprises (ESBEs) as required by Ordinance 99-007 and Resolution 99-055 relating to ESBD participation goals and policies, adopted by City Council on February 9, 1999. At 19.82% the low bidder, T and S Construction Inc., failed to meet the ESBE minimum participation level of 20%. The second low bidder, Westcon Construction Corp., exceeded the ESBE goal with a participation level of 93.69%.

Background

The Sump 157 storm drainage pumping station receives and pumps runoff from the second largest watershed in the City, approximately 1928 acres. The station collects runoff from areas north and south of Interstate 80. The facility is over 50 years old and was acquired by the City from the American River Flood Control District in 1995.

The portion of the Sump 157 drainage collection system that is north of Interstate 80 includes over four miles of open drainage channels that have historically transported significant amounts of green and solid waste during larger storm events. The debris clogs the existing stationary trash racks reducing pumping capacity and can damage the pumping system. Once at the station the debris cannot be safely or efficiently removed until after a storm event has ended. Currently debris removal is accomplished by dewatering the forebay and collecting the debris with heavy equipment.

This project consists of constructing a bridge across an existing drainage channel and installation of two automated trash racks. Consistent with the criteria set forth in the Department of Utilities' Infrastructure Replacement and Management Program, this project will ensure the availability of the maximum flood protection provided by this facility during future storm events.

The project was advertised and four (4) bids were received and opened on April 20, 2011. The bids are summarized below:

Contractor	Bid Amount
T & S Construction, Inc.*	\$ 738,000.00
Westcon Construction Corp.	\$ 797,722.00
United Building Contractors	\$ 858,637.00
Florez Paving	\$ 939,867.11

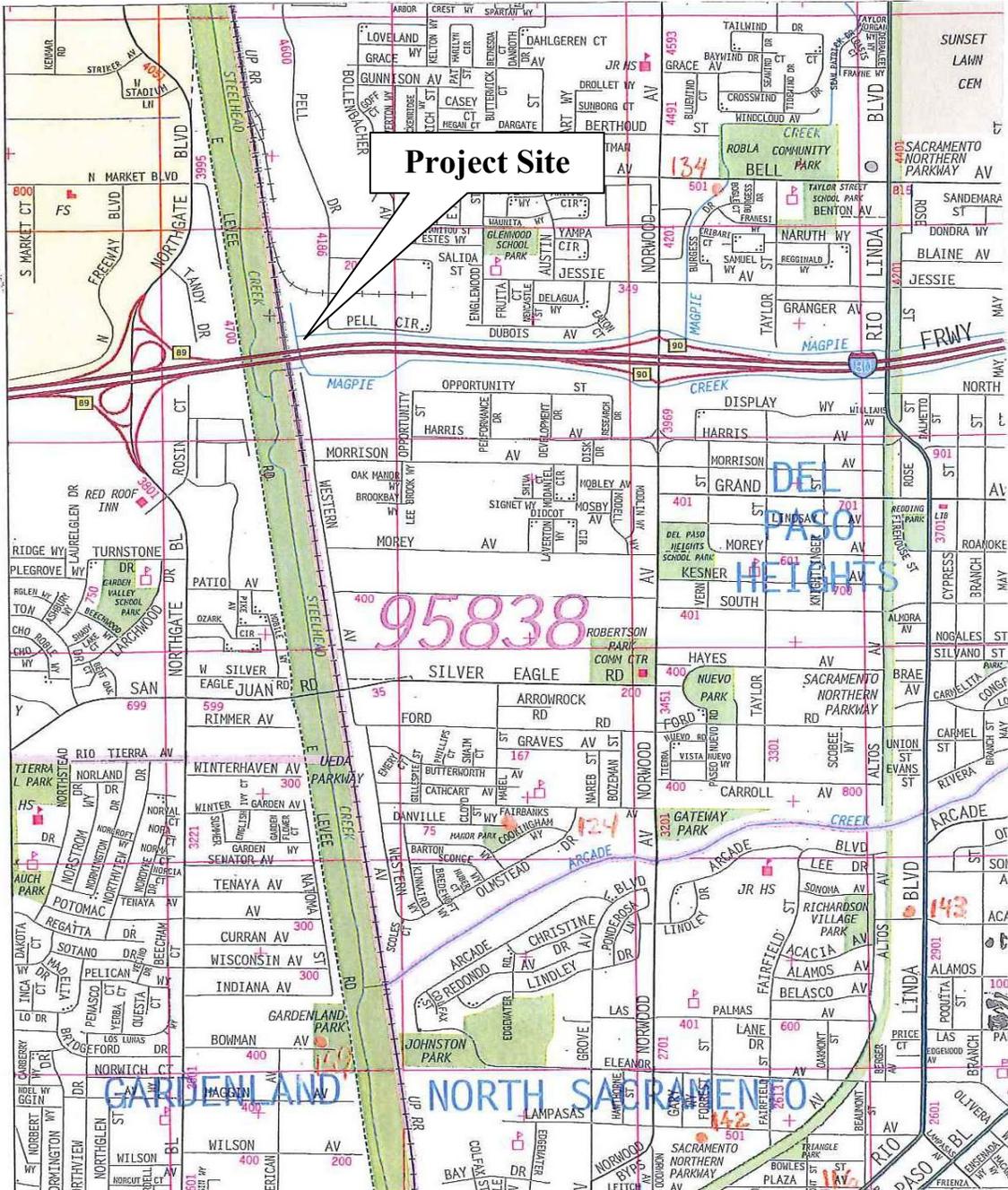
* As previously discussed, the bid submitted by T&S Construction, Inc., was not a responsive bid because it did not meet or exceed the 20% ESBE participation goal set forth in the bid specifications.

The engineer's construction estimate was \$750,000.



Sump 157 Trash Rack – North Channel

Project Location Map





RESOLUTION NO. 2011-

Adopted by the Sacramento City Council

May 17, 2011

AWARD CONTRACT FOR SUMP 157 TRASH RACK – NORTH CHANNEL PROJECT (W14003300)

BACKGROUND

- A.** The existing stationary trash racks at the Sump 157 storm water pumping station provide minimal protection from debris collecting on the racks, do not maintain maximum pumping capacity during storm events, and can only be cleaned during dry weather.
- B.** City staff prepared the plans and specifications for the Sump 157 Trash Rack - North Channel project, to construct a bridge across the north channel entering Sump 157 and to install two automated trash racks in the channel. The project was advertised and four bids were received on April 20, 2011.
- C.** The lowest bid was submitted by T and S Construction, Inc., in the amount of \$738,000. However, the bid submitted by T and S Construction, Inc. is not a responsive bid because it did not meet the minimum Emerging and Small Business Enterprise (ESBE) participation level of 20%. City Code section 3.60.270 provides that “[n]o bidder ... on the contract ... shall be considered a responsive bidder ... unless its bid or proposal meets the minimum SBE, EBE, local SBE, or local EBE participation level(s) established for the contract” In accordance with this City Code provision, the bid specifications for this contract established a minimum 20% participation level for ESBEs, and stated that “no bidder on this contract shall be considered a responsive bidder unless its bid meets or exceeds this minimum participation level.” The bid submitted by T and S Construction, Inc., indicated an ESBE participation level of 19.82%, which does not meet or exceed 20% ESBE participation. Pursuant to the bid specifications and the City Code, this renders the bid of T and S Construction, Inc., nonresponsive.
- D.** The lowest responsive bid was submitted by Westcon Construction Corp., in the amount of \$797,722, so that Westcon Construction Corp. is the lowest responsive and responsible bidder.
- E.** \$80,000 will be transferred from the Storm Drainage Fund 6011 in the Base CIP Reserve (W14000200) to the Sump 157 Trash Rack – North Channel project (W14003300) to complete the project.

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

- Section 1. The plans and specifications for the Sump 157 Trash Rack – North Channel contract (W14003300) are approved, and the contract is awarded to Westcon Construction, Corp. for an amount not to exceed \$797,722.00.
- Section 2. The City Manager is authorized to transfer \$80,000 from the Storm Drainage Fund (6011) from the Base CIP Reserve (W14000200) to the Sump 157 Trashracks Project (W14003300).



Unexecuted Contract/Agreements

- The Unexecuted Contract/Agreement is signed by the other party, is attached as an exhibit to the resolution, and is approved as to form by the City Attorney.
- The Unexecuted Contract/Agreement (Public Project) is NOT signed by the other party, is attached as an exhibit to the resolution, and is approved as to form by the City Attorney.
- The Unexecuted Contract is NOT included as an exhibit to the Resolution because the Agreement(s) is with other another governmental agency and it is not feasible to obtain the other agency's signature prior to Council action (be they denominated Agreements, MOUs, MOAs, etc.); however, the City Attorney approves the forwarding of the report to Council even though the signed agreement is not in hand yet.
- The Unexecuted Contract is NOT included as an exhibit to the resolution because, due to special circumstances, and the City Attorney confirms in writing that it is okay to proceed with Council action even though the signed agreement is not in hand yet.

All unexecuted contracts/agreements which are signed by the other parties are in the Office of the City Clerk before agenda publication.



CITY OF SACRAMENTO

DEPARTMENT OF UTILITIES

ENGINEERING SERVICES DIVISION



CONTRACT SPECIFICATIONS FOR

SUMP 157 TRASK RACK - NORTH CHANNEL

PN: W14003300

B113331018

Engineer's Estimate: \$750,000.00

Non-Refundable Fee

\$20.00

For Pre-Bid Information Call:

No Separate Plans

Mark Elliott
Associate Engineer
(916) 808-8894

Bid to be received before 2:00 PM
April 20, 2011
Historic City Hall, City Clerk's Office
915 I Street, 1st Floor
Sacramento, CA 95814

ESBE Program Goals

For information on meeting the City of Sacramento's Small Business Enterprise (SBE) and Emerging Business Enterprise (EBE) project goals, please contact Noreen James at (916) 808-5470, or visit the City of Sacramento's small business web site at: http://dev.cityofsacramento.org/econdev/business-open/Sub_small-business-certificaiton.cfm

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- Payment Bond
-

**EXCERPTS FROM THE CALIFORNIA LABOR CODE RELATING TO APPRENTICES ON
PUBLIC WORKS CHAPTER 1 OF DIVISION 2 ([HTTP://WWW.DIR.CA.GOV/DAS/DAS-10.PDF](http://www.dir.ca.gov/DAS/DAS-10.PDF))**

TAX FORMS (REQUIRED UPON AWARD)

W-9Page 1 of 1

CA Form 590Page 1 of 1

SPECIAL PROVISIONS

ESBD PRE-BID CONFERENCE

The City of Sacramento Code Section 3.60.270 requires all bidding contractors to meet or exceed the City's Emerging and Small Business Development (ESBD) participation goals established for this project in order to qualify as a responsible bidder. Attendance is recommended at the ESBD program meeting within 180 calendar days of the bid opening date.

Effective July 2010, the meetings are scheduled as requested:

For information on meeting the City of Sacramento's Small Business Enterprise (SBE) and Emerging Business Enterprise (EBE) project goals, please contact Noreen James at (916) 808-5470, or visit the City of Sacramento's small business web site at: http://dev.cityofsacramento.org/econdev/business-open/Sub_small-business-certificaiton.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, Historic City Hall, located at 915 I Street, 1st Floor, up to the hour of 2:00 p.m. on **April 20, 2011** and opened at 2:00 p.m. **April 20, 2011**, or as soon thereafter as business allows, in the Hearing Room, Historic City Hall, 2nd Floor, for construction of:

SUMP 157 TRASK RACK - NORTH CHANNEL

(PN: W14003300) (B113331018)

as set forth in the Construction Documents.

Proposals received and work performed thereunder shall comply with the requirement of Chapter 3 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 right to reject proposals or to waive any error or omission in any Bid Proposal received is reserved by the City. Signed proposals shall be submitted on the printed forms contained herein and enclosed in an envelope marked:

SEALED PROPOSAL FOR SUMP 157 TRASK RACK - NORTH CHANNEL

(PN: W14003300) (B113331018)

Copies of the contract documents are available at:

**Signature Reprographics
620 Sunbeam Avenue
Sacramento, CA 95814
(916) 454-0800**

A non-refundable fee of \$20.00 will be charged.

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. In accordance with the 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 Public Construction project of \$25,000 or less, or Public Maintenance project of \$15,000 or less. The City of Sacramento has an approved Labor Compliance Program. **Electronic Web submittal of Labor Compliance Reports is effective May 1, 2008.** Each contractor and every lower-tier subcontractor is required to submit certified payrolls and labor compliance documentation electronically at the discretion of and in the manner specified by the City of Sacramento.

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

This requirement will be "flowed down" to every lower-tier subcontractor and vendor required to provide labor compliance documentation.

All questions regarding the Labor Compliance Program should be directed to the Labor Compliance Section at (916) 808-5524.

Pursuant to Sacramento City Code Section 3.60.250, any agreement awarded pursuant to this Invitation to Bid shall contain a provision permitting the substitution of securities for any monies withheld to ensure performance under the Agreement. The terms of such provisions shall be according to the requirements and the form required by the City.

Bid protests must be filed and maintained in accordance with the provisions of Chapter 3.60.460 through 3.60.560 of the Sacramento City Code. Bid protests that do not comply with Chapter 3.60.040 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 to be considered valid in accordance with City of Sacramento Resolution No. 2003-231 dated April 29, 2003. As used herein, the term "bid protests" includes any bid protest that (1) claims that one or more bidders on this contract should be disqualified or rejected for any reason, or (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 Chapter 3.60.010 of the Sacramento City Code may be obtained from the Project Manager or from the Office of the City Clerk, located at 915 I Street, 1st Floor, Sacramento, CA 95814.

The right to reject any and all bids or to waive any informality in any bid received is reserved by the City Council.

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

Contractor's Name: _____
(Please print)

CITY OF SACRAMENTO

SEALED PROPOSAL

(MUST BE SIGNED BY BIDDER)

The Sealed Proposal will be received not later than **April 20, 2011**, at the Office of the City Clerk, Historic City Hall, at 915 I Street, 1st Floor, Sacramento, California and opened at 2:00 PM, or as soon thereafter as business allows, on **April 20, 2011**, by the Office of the City Clerk, 915 I Street, Historic City Hall, Hearing Room 2nd Floor, 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

SUMP 157 TRASH RACK - NORTH CHANNEL
(PN: W14003300) (B113331018)

in the City and County of Sacramento, California.

TOTAL BID: _____ (\$_____).

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	SUMP 157 TRASH RACK – NORTH CHANNEL	1	LS	\$ _____

TOTAL BID: \$ _____

If awarded the contract, the undersigned shall execute said contract and furnish the necessary bonds within ten (10) days after the notice of award of said contract and begin work within fifteen (15) days after the signing of the contract by the Contractor and the City or the Notice to Proceed has been prepared, whichever is applicable.

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 **two hundred (200) CALENDAR 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 **One thousand five hundred dollars (\$1,500.00) 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.

BID DEPOSIT ENCLOSED IN THE FOLLOWING FORM:

\$ _____ not less than ten (10) percent of amount bid.

___ CERTIFIED CHECK

___ MONEY ORDER

___ CASHIERS'S CHECK

___ BID BOND

FOR CITY USE ONLY

TYPE OF DEPOSIT

- Bid Bond
- Cashier/Certified Check
- Other _____

Reviewer's Initials: _____

CONTRACTOR

Addendum No. 1 _____

Addendum No. 2 _____ By: _____
(Signature)

Addendum No. 3 _____ Title: _____

Addendum No. 4 _____ Address: _____
No PO Box – Physical Address ONLY

_____ City STATE ZIIP Code

Telephone No. _____

Fax No. _____

Email _____

(Federal Tax ID # or Social Security #)

Under penalty of perjury, I certify that the Taxpayer Identification Number and all other information provided here are correct.

Valid Contractor's License No. _____, Classification _____ is held by the bidder.

Expiration date _____. Representation made herein are true and correct under penalty or perjury

PN: W14003300 (B113331018)

KNOW ALL MEN BY THESE PRESENTS,

That we, _____

as Principal, and _____

a corporation duly organized under the laws of the State of _____ 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 in the Office of the City Clerk, Historic City Hall, Hearing Room 2nd Floor, 915 I Street, Sacramento, California, on **April 20, 2011**, for the Work specifically described as follows:

SUMP 157 TRASK RACK - NORTH CHANNEL
(PN: W14003300) (B113331018)

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 _____ day of _____, 2011.

PRINCIPAL Seal
By: _____

Title

SURETY Seal
By _____

Title

Agent Name and Address

Agent Phone #

Surety Phone #

California License #

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: _____

BY: _____ Date: _____
Signature Title

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:**

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 _____, on _____.
(Location) (Date)

Signature: _____

Print name: _____

Title: _____

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 \$25,000.00. 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**

Name of Contractor

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.

Signature of Authorized Representative

Date

Print Name

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 | - Moving expenses |
| - Disability, life and other types of insurance | - Pension and retirement benefits |
| - Family medical leave | - Vacation |
| - Health benefits | - Travel benefits |
| - Membership or membership discounts | - 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.

Construction and Demolition (C&D) Debris Recycling Requirements

As a condition of receiving this Contract, Contractor agrees to fully comply with the requirements specified herein for all demolition projects, as well as projects with a valuation of \$250,000 or more:

1. **Definitions.** For purposes of this section, the following terms, words and phrases shall have the following meanings:

"Certified C&D sorting facility" means a facility that receives C&D debris and/or processes C&D debris into its component material types for reuse, recycling, and disposal of residuals and possesses a valid certificate as a C&D sorting facility from the Sacramento Regional County Solid Waste Authority.

"Construction and demolition debris" or "C&D debris" means used or commonly discarded materials resulting from construction, repair, remodel or demolition operations on any pavement, house, building, or other structure, or from landscaping that are not hazardous as defined in California Health and Safety Code section 25100 et seq. Such materials include, but are not limited to, concrete, asphalt, wood, metal, brick, dirt, sand, rock, gravel, plaster, glass, gypsum wallboard, cardboard and other associated packaging, roofing material, ceramic tile, carpeting, masonry, plastic pipe, trees, and other vegetative matter resulting from land clearing and landscaping.

"Divert" or "diversion" means to use materials for any purpose other than disposal in a landfill or transformation facility. Methods to divert materials include on-site reuse of the materials, delivery of materials from the project site to a certified C&D sorting facility or a recycling facility, or other methods as approved in regulations promulgated by the City Department of Utilities.

"Franchised waste hauler" means a person who possesses a valid commercial solid waste collection franchise issued by the Sacramento Regional County Solid Waste Authority.

"Mixed C&D debris" means loads that include commingled recyclable and non-recyclable C&D debris generated at a project site.

"Recyclable C&D debris" means C&D debris required to be diverted from landfills as specified in the Waste Management Plan and returned to the economic mainstream in the form of raw material for new, reused or reconstituted products that meet the quality standards necessary to be used in the marketplace.

"Recycling facility" means a facility or operation that receives, processes, and transfers source-separated recyclable materials.

"Source-separated C&D debris" means recyclable C&D debris that is separately sorted and containerized at the site of generation by individual material type and segregated from mixed C&D debris prior to collection and transporting.

"Waste log" means a record detailing the management of C&D debris generated by the covered project, including the date and weight/volume of material by type that was salvaged, reused, recycled or disposed.

2. **Waste Management Plan.** A completed WMP (see **Attachment 1**) must be submitted to and approved by the City prior to commencing any work on the project. The WMP must specify the types of C&D debris that will be generated from the project; the manner in which C&D debris will be managed and/or stored on the project site; the manner in which recyclable C&D debris generated from the project will be recycled or reuse; the person who will haul, collect or transport the recyclable C&D debris from the project site; and the certified C&D sorting facility or recycling facility where recyclable C&D debris will be delivered. The WMP must be approved by the City prior to commencing any work on the project.

3. Contractor shall be solely responsible for diverting the recyclable C&D materials specified on the WMP. Mixed C&D debris shall be delivered to a SWA-certified C&D sorting facility only. Only the permit holder, the person who generates the waste, a franchised waste hauler, or the City of Sacramento can transport or haul mixed C&D debris. Source-separated C&D debris may be delivered by any person to any recycling facility that accepts such materials. (See **Attachment 2** for list of C&D Debris Haulers and Facilities).

4. During the course of the project, Contractor shall maintain a waste log (see **Attachment 3**), and keep all weight tickets or weight receipts, for all C&D debris hauled away from the project. At a minimum, the waste log shall specify the C&D debris generated by the project; the manner in which C&D debris was recycled or re-used; and the facility where the C&D debris was delivered.

5. Within 30 days after submitting the project completion report, Contractor shall submit to the City a completed waste log, along with copies of supporting weight tickets. Contractor shall maintain and keep accurate and complete records of all bills, weight receipts or weight tickets that were issued for the collection, transport or disposal of C&D debris for a period of one-year after submittal of the waste log. The records shall be made available for inspection, examination and audit by the City during the one-year retention period to validate the information provided in the WMP and in the waste log. If the City determines noncompliance by the Contractor after an audit has been conducted, Contractor shall reimburse the City for all costs incurred in performing the audit.

6. Failure by Contractor to comply with any provisions specified herein will subject Contractor to possible suspension and/or termination of this Contract for cause; repayment of any or all of the Contract amount disbursed by the City; imposition of a penalty, payable to the City (\$50-\$250 for first offense, \$251-\$500 for second offense, and \$501-\$1500 for subsequent offenses); and/or submission of a performance security deposit fee when submitting a permit application to the City for a project within one year of imposition of the penalty.

For questions or to obtain more information about the Recycling Requirements for C&D debris, contact the City of Sacramento, Solid Waste Services Division, 2812 Meadowview Road, Building 1, Sacramento, CA 95832, or telephone (916) 808-4833, or email C&D@cityofsacramento.org

C&D Debris Waste Management Plan

C&D Debris Waste Management Plan
 City of Sacramento Solid Waste Services
 2812 Meadowview Road, Building 1
 Sacramento, CA 95832
 Phone: (916) 808-4839 / Fax: (916) 808-4999
 C&D@cityofsacramento.org

Form
submitted by:

Please attach a business card, or put your name with a phone number and/or an email address.

This Waste Management Plan (WMP) must be submitted and approved before work can begin. Only one WMP is required for each public construction project. The administration fee and, if applicable, a security deposit must be submitted with this form to be approved. Administration fee is 0.04% of project bid amount (min \$40, max \$800); security deposit, if applicable, is 1% of bid amount (max \$10,000). The accompanying Waste Log must be submitted within 30 days of the project completion report, or a penalty may be imposed.

A. Building Project Information:

Job Address: _____
 Contractor: _____
 Address: _____

Engineering
 Estimate: _____
 Phone: _____
 Email: _____

B. Briefly describe the project:

C. Materials Required to be Recycled

50% of all debris must be recycled if generated during the course of your project. You can either source-separate them, which may be hauled by anyone, or mix them in one container and send the mixed C&D debris load to a Certified Mixed C&D Sorting Facility. Mixed C&D loads can only be hauled by a franchised hauler or self-hauled. Please see the Definitions section, on the next page, for more information.



D. Material Management.

1. How will C&D debris will be stored on the project site: _____ Mixed C&D _____ Source-Separated
2. Company to haul away debris: _____
3. Facilities to receive debris: _____

C&D Debris Waste Management Plan

C&D Debris Waste Management Plan
City of Sacramento Solid Waste Services
2812 Meadowview Road, Building 1
Sacramento, CA 95832
Phone: (916) 808-4839 / Fax: (916) 808-4999
C&D@cityofsacramento.org

E. Definitions.

Please read and understand these terms. Call Solid Waste at (916) 808-4833 if these terms are not clear to you. More information is also available online at <http://www.cityofsacramento.org/utilities/>.

1. **Self-haul or self-hauling:** This is when the general contractor or a subcontractor who is doing work on the project hauls their own waste materials for recycling or disposal. Note that a jobsite cleanup crew is not doing other work on the project and is not self-hauling. Jobsite cleanup crews need to be franchised in order to haul mixed C&D debris away.
2. **Franchised hauler:** Check the Department of Utilities (DOU) website for a list of these haulers. Only these companies and the City of Sacramento can collect and haul mixed C&D debris generated within the City for a fee.
3. **Source separation:** This means keeping wood, metal, cardboard, or other recyclables in separate containers, and sending the materials to an authorized recycler. A list of authorized recyclers can be found on the DOU web site. Source-separated materials may be hauled by anyone.
4. **Mixed C&D debris:** This means putting all recyclable debris into one container. Mixed materials must be sent to a certified mixed C&D sorting facility. Mixed materials may be either self-hauled or hauled by a franchised hauler. If your job site is crowded, this option saves the most space.
5. **Certified Mixed C&D Sorting Facility:** See the DOU web site for a list. These facilities have been certified by the Sacramento Regional Solid Waste Authority (SWA) to extract recyclable materials from mixed C&D debris.

F. Terms and Conditions

- Your approved Waste Management Plan and Waste Log must be kept on the job site for the duration of the project.
- City of Sacramento Solid Waste Services staff may enter the jobsite to inspect waste collection areas.
- **ALL Clean Wood Waste** (unpainted, untreated lumber, plywood and OSB), **Inert Materials** (concrete, asphalt paving, brick, block, and dirt), **Wooden Pallets**, **Scrap Metal**, and **Corrugated Cardboard** must be recycled.
- Only SWA-Certified Mixed C&D Sorting Facilities may be used to recycle these materials if mixed with other materials.
- Only the City of Sacramento, SWA-Franchised Haulers, or self-haulers (as defined above) may collect and transport mixed C&D material from the jobsite.
- C&D Debris may not be burned or dumped illegally.
- Your Waste Log must be completed and submitted, with supporting weight tickets, within 30 days of submitting your project completion report. All waste hauling and disposal or recycling activity must be entered on the Waste Log, including information from any subcontractors who self-hauled their own debris off-site.
- You must keep all receipts or weight-tickets from your project for a period of one year from the submittal of your waste log.
- Failure to comply with these terms and conditions may result in a fine and payment of a security deposit on future projects

C&D Debris Haulers & Facilities

C&D Debris Waste Management Plan
City of Sacramento Solid Waste Services
2812 Meadowview Road, Building 1
Sacramento, CA 95832
Phone: (916) 808-4833 / Fax: (916) 808-4999
C&D@cityofsacramento.org

Certified Mixed C&D Facilities

Allied Waste / Elder Creek Transfer and Recovery	(916) 387-8425
Florin-Perkins Public Disposal	(916) 443-5120
L&D Landfill	(916) 737-8640
Waste Management / K&M Recycle America	(916) 452-0142

Franchised Haulers

ACES Waste Services, Inc.	(866) 488-8837	Elk Grove Waste Management, LLC	(916) 689-4052
Allied Waste Services	(916) 631-0600	Mini Drops, Inc.	(916) 686-8785
All Waste Systems, Inc.	(916) 456-1555	Norcal Waste Services of Sacramento	(916) 381-5300
Atlas Disposal Industries, LLC	(916) 455-2800	North West Recyclers	(916) 686-8575
California Waste Recovery Systems	(916) 441-1985	Waste Management of Sacramento	(916) 387-1400
Central Valley Waste Services, Inc.	(209) 369-8274	Waste Removal & Recycling	(916) 453-1400
City of Sacramento Solid Waste	(916) 808-4839	Western Strategic Materials, Inc.	(916) 388-1076

Recyclers*

Bell Marine	(916) 442-9089
C & C Paper Recycling	(916) 920-2673
EBI Aggregates	(916) 372-7580
International Paper	(916) 371-4634
Modern Waste Solutions	(916) 447-6800
PRIDE Industries, Inc.	(916) 640-1300
Recycling Industries, Inc.	(916) 452-3961
Sacramento Local Conservation Corps	(916) 386-8394
Smurfit-Stone Container Corporation	(916) 381-3340
Southside Art Center	(916) 387-8080
Spencer Building Maintenance, Inc.	(916) 922-1900

Recovery Stations & Landfills

Elder Creek Recovery & Transfer Station	(916) 387-8425
Kiefer Landfill	(916) 875-5555
L & D Landfill	(916) 383-9420
North Area Recovery Station	(916) 875-5555
Sacramento Recycling & Transfer Station	(916) 379-0500
Waste Management Recycle America	(916) 452-0142

More updated information can be found online at:
<http://www.cityofsacramento.org/utilities/>

* Please note that any facility may receive source-separated recyclable materials as long as it is authorized to do so by the State of California. This is not meant to be a complete list.

Voluntary Green Contracting Fleet Inventory List (On-Road Equipment)

In partnership with the City of Sacramento and the Sacramento Metropolitan Air Quality Management District

Green Contracting Survey (Voluntary)

The City of Sacramento and the Sacramento Metropolitan Air Quality District (SMAQMD) are conducting a joint pilot project to help meet Federal Clean Air Standards for the Sacramento region.

Attached is a Green Contracting Fleet Inventory Form. Please complete the form, remove it from the bid package and return it to SMAQMD in the postage paid envelope provided with the bid package. Please do not return the Green Contracting Fleet Inventory Form to the City of Sacramento with the bid documents or otherwise.

A limited amount of funds and other financial incentives may be available to qualified contractors participating in this joint project to assist qualified contractors with upgrading and/or replacing equipment and/or trucks.

Completing and returning the Green Contracting Fleet Inventory Form is strictly voluntary

Voluntary Green Contracting Fleet Inventory List (On-Road Equipment)

In partnership with the City of Sacramento and the Sacramento Metropolitan Air Quality Management District

Company Name: _____
 Contact Name: _____
 Company Address: _____
 City, State, ZIP: _____
 Company Phone: _____

City Bid Information
 Department _____
 Project # _____
 ESBE/SBE? _____

Please Submit To: _____

Instructions: a) Please enter the vehicle / equipment information for each unit used in

conjunction with your City of Sacramento Bid.

b) All fields are required for both on-road heavy-duty vehicles and off-road construction equipment over 50 HP.

c) Electronic version available at <http://www.airquality.org/ceqa/index.shtml>

d) For additional questions, please call (916) 874-4892

Kristian Damkier, P.E.
 Sacramento Metropolitan AQMD
 777 12th St, 3rd Floor
 Sacramento, CA 95814-1908

#	VIN	License Plate	Vehicle Information			Engine Information			Annual Usage (miles)	Received Funding	
			Make	Model	Year	Make	Model	Year			HP
(ex)	1XP5AAC35RG339402	1T45678	Kenworth	T-300	2002	Cummins	ISB	2002	250	35,000	No

Voluntary Green Contracting Fleet Inventory List (On-Road Equipment)
 In partnership with the City of Sacramento and the Sacramento Metropolitan Air Quality Management District

Company Name: _____
 Contact Name: _____
 Company Address: _____
 City, State, ZIP: _____
 Company Phone: _____

City Bid Information	
Department	_____
Project #	_____
ESBE/SBE?	_____

- Instructions:**
- a) Please enter the vehicle / equipment information for each unit used in conjunction with your City of Sacramento Bid.
 - b) All fields are required for both on-road heavy-duty vehicles and off-road construction equipment over 50 HP.
 Electronic version is available at <http://www.airquality.org/ceqa/index.shtml>
 - c) For additional questions, please call (916) 874-4892
 - d) _____

Please Submit To:

Kristian Damkier, P.E.
 Sacramento Metropolitan AQMD
 777 12th St, 3rd Floor
 Sacramento, CA 95814-1908

Equipment Serial Number	Equipment Information			Engine Information			Annual Usage (hours)		
	Make	Model	Type	Year	Make	Model		Year	HP
48W34456	Caterpillar	631G	Scraper	2003	Caterpillar	3408E	2003	485	1,600

Guidelines for City of Sacramento Boycott of Arizona and Arizona-Headquartered Businesses

Sacramento City Council Resolution No. 2010-346 calls for a boycott of the State of Arizona and businesses headquartered in Arizona. The boycott provisions prohibit employee travel to Arizona at City expense, and restrict the purchase of goods and services with Arizona headquartered businesses.

Resolution No. 2010-346 provides that “where **practicable** and where there is no **significant** additional cost to the City, the City of Sacramento shall not enter into any new, amended, extended or supplemental contracts to purchase or procure goods or services from any business or entity that is **headquartered** in Arizona ...”

The guidelines below are provided to city staff for implementing the Resolution.

● Definitions

- **Headquartered:** State in which a company is headquartered. This may be different than the state of incorporation, where subsidiaries are located. You may determine a company headquarters from the declaration provided in a solicitation response or by calling the company directly.
- **Practicable:** The proposed or existing vendor can be replaced without interruption to services and/or supplies, and the replacement of the vendor does not adversely affect the Sacramento economy. For example, excluding a company headquartered in Arizona, but with a Sacramento-area office would not be practicable, as it would adversely affect the local economy. The cost of transition should not be significant.
- **Significant:** Costs that exceed the following percentages or dollar thresholds:
 - For contracts valued \$250k and less – the lesser of 10% or \$25k
 - For contracts valued between \$250k and \$1m – the lesser of 10% or \$100k
 - For contracts valued between \$1m and 10m – the lesser of 8% or \$100k
 - For contracts valued at \$10m and more – the lesser of 6% or 100k
- **Related companies, subcontractors:** The policy applies only to the company with which the City enters into a contract.

● Exceptions Checklist

If the lowest bidder is headquartered in Arizona, in order to have a valid exception to the boycott Resolution, you must be able to answer yes to **at least** one of the following questions:

- Is the difference between the low bid and the second low bid “significant”? (see definitions) OR if the vendor has a current contract and we evaluating a renewal, is there a significant cost to switch vendors?
- Does the lowest bidder have a local office in Sacramento, providing benefit to the local economy, if awarded the contract?
- Is the vendor the sole-source for this particular service/commodity?
- Is the contract award or extension in the “best interest of the City” for reasons not listed above?

City of Sacramento Boycott of Arizona-Headquartered Businesses

On June 15, 2010, the Sacramento City Council adopted Resolution No. 2010-346 opposing two Arizona laws (SB 1070 and HB 2162) that will allow Arizona police to arrest individuals suspected of being unlawfully present in the United States and to charge immigrants with a state crime for not carrying immigration documents. Sacramento City Council Resolution No. 2010-346 also called for a boycott of the State of Arizona and businesses headquartered in Arizona until Arizona repeals or a court nullifies SB 1070 and HB 1262. Resolution No. 2010-346 provides, in pertinent part, that "where practicable and where there is no significant additional cost to the City, the City of Sacramento shall not enter into any new, amended, extended or supplemental contracts to purchase or procure goods or services from any business or entity that is headquartered in Arizona ..."

Pursuant to the provisions of Resolution No. 2010-346, the City may determine that a bid from a business or entity that is headquartered in Arizona is nonresponsive and the City may reject the bid on that basis.

Bidders that are headquartered in the United States shall certify in the space below the state where the bidder is headquartered:

State Where Firm is Headquartered

Signature of Authorized Representative

Date

Print Name

Title

This Page to be completed and submitted with bid proposal

ESBE REQUIREMENTS

(City Contracts no Federal Funds Used)

I. ESBE PARTICIPATION REQUIREMENT

On February 9, 1999, the Sacramento City Council adopted an Emerging and Small Business Development (ESBD) program to provide enhanced opportunities for the participation of small business enterprises (SBEs) and emerging business enterprises (EBEs) in the City's contracting and procurement activities. The ESBD program establishes an annual emerging and small business enterprise (ESBE) participation goal for the City's contracts, and authorizes City departments to require minimum ESBE participation levels in individual contracts so that the annual ESBE participation goal can be met. Under City Code section 3.60.270, when the bid specifications for a City contract establishes a minimum participation level for ESBEs, no bidder on the contract shall be considered a responsive bidder unless its bid meets the minimum ESBE participation level required by the bid specifications.

The City has established a **minimum 20% participation level for ESBEs on this contract**. Pursuant to City code Section 3.60.270, no bidder on this contract shall be considered a responsive bidder unless its bid meets or exceeds this minimum participation level.

Bidders shall include copies of their Certification as a SBE or EBE and the SBE or EBE Certifications for each subcontractor, trucker, material supplier, or other business entity listed on the forms submitted within two (2) working days of submitting the sealed proposal. Failure to submit the required ESBE information will be grounds for finding the bid non-responsive.

II. ESBE CERTIFICATION

- A. A SBE designated in the bid must be certified as such by the State of California, Department of General Services, or by the City, as defined herein, prior to the time bids are received.
- B. An EBE designated in the bid must be certified as such by the City, as defined herein, prior to the time bids are received.

III. DETERMINATION OF ESBE PARTICIPATION LEVEL

- A. The percent of ESBE participation shall be determined based on the dollar value of the work to be performed or supplies to be furnished by certified ESBEs designated in the bidder's Subcontractor and ESBE Participation Verification Form, relative to the total dollar amount of the bid.
- B. To receive credit for participation, an ESBE must perform a commercially useful function; i.e., must be responsible for the execution of a distinct element of the work and must carry its responsibility by actually performing, managing, or supervising the work.

- C. ESBE Bidders: The dollar value listed for an ESBE bidder on the bidder's Subcontractor and ESBE Participation Verification Form shall include only the amount of work to be performed by the ESBE bidder, and shall not include any amount to be paid by the ESBE bidder for the cost of materials or supplies.
- D. Suppliers: Credit for an ESBE vendor of materials or supplies is counted as one hundred (100) percent of the amount paid to the vendor for the material or supplies. To receive this credit, ESBE vendors of supplies and materials must be listed on the bidder's Subcontractor and ESBE Participation Verification Form.
- E. Truckers: Credit for an ESBE 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 or supplies being transported by the trucker.
- F. Subcontractors (including truckers): To receive credit for an ESBE subcontractor, the subcontractor must be listed on the bidder's Subcontractor and ESBE Participation Verification Form. The dollar value listed for a subcontractor on the bidder's Subcontractor and ESBE Participation Verification Form shall not include any amount to be paid to the subcontractor for the cost of materials or supplies.

IV. **ESBE REQUIREMENTS FOR CONTRACTOR**

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

Upon completion of 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 ESD program or these specifications.

- B. Reporting Requirements and Sanctions: Failure to provide specific information, records, reports, certifications, or any other documents required for compliance with these specifications shall be considered noncompliance with the contract. If the Contractor fails to correct a deficiency within fifteen (15) days after notification, a deduction may be made from the contract amount. The deduction shall be ten (10) percent of the estimated value of the work performed during the month, not to be less than \$1,000 nor exceed \$10,000 and shall be deducted from the next progress payment.
- C. Performance of ESBE Subcontractors and Suppliers: The ESBEs listed by the Contractor shall perform the work and supply the materials 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 from other sources. Reasons for requesting such authorization would include:

1. The listed ESBE fails to execute a written contract based upon the general terms, conditions, plans, and specifications for the project.
2. The listed ESBE becomes bankrupt or insolvent.
3. The listed ESBE subcontractor fails to meet the bond requirements of the Contractor.
4. The work performed by the listed ESBE subcontractor is unsatisfactory and/or is not in accordance with the plans and specifications, or the subcontractor fails to perform his/her obligations under the subcontractor contract.
5. It would be in the best interest of the City.

The Contractor shall not be entitled to any payment for such work or materials unless it is performed or supplied by the listed SBE or EBE or other forces (including those of the Contractor) authorized by the City in writing.

- D. Subcontractor Substitution: No substitution of an ESBE subcontractor shall be made at any time without compliance with the Subcontracting Listing Law and the written consent of the City. If an ESBE subcontractor is unable to perform successfully and is to be replaced, the Contractor will be required to make good faith efforts to replace the original ESBE subcontractor with another certified ESBE subcontractor. The new ESBE subcontractor must be certified at the time of substitution.

V. DEFINITIONS

- A. **Emerging Business Enterprise (EBE)**: The City shall certify EBEs utilizing the small business certification criteria and standards of the State of California, General Services Department, Office of Small Business Certification and Resources, that were in effect on December 1, 1998, provided that the size standard, industry by industry, shall be set at 50% of the State small business certification criteria and standards that were in effect on December 1, 1998.
- B. **Small Business Enterprise (SBE)**: The City shall certify SBEs utilizing the small business certification criteria and standards of the State of California, General Services Department, Office of Small Business Certification and Resources. The City will also accept State certified SBEs.
- C. **Contractor**: The individual, partnership, corporation, joint venture or other legal entity entering into a contract with the City of Sacramento.
- D. **Subcontractor**: The individual, partnership, corporation, or other legal entity entering into a contract with the prime contractor to perform a portion of the work.

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.

Bidder

BY: _____

Title: _____

Address: _____

Date: _____

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 _____, 20___, is made and entered into between the CITY OF SACRAMENTO, a municipal corporation ("City"), and _____
("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 Emerging and Small Business Enterprise (ESBE) 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.

4. SCOPE OF CONTRACT

Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor, material and transportation necessary to perform and complete in a good and workmanlike manner to the satisfaction of City, all the Work called for in the Contract Documents entitled:

SUMP 157 TRASK RACK - NORTH CHANNEL (PN:W14003300)

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 (90) 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 ten (10) 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 due and payable beginning thirty-five (35) days after completion and final acceptance of the Work by City; provided that the City may determine, in its sole discretion, to release up to fifty (50) % of such retention, in whole or in part, at any time. 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 Section 20104.50.

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 phrase "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 two hundred (200) CALENDAR 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;^{54 of 289}

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 one thousand five hundred dollars (\$1,500.00) 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 this Contract and until completion and final acceptance of the Work as provided in the Contract Documents, Contractor shall maintain in full force and effect the insurance coverage described in this section.

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 performance of the Work under the Contract. No additional compensation will be provided for Contractor's insurance premiums.

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 of or carried by the Contractor.

(A) Minimum Scope and 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, 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 on an occurrence basis 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 occurrence. The policy shall provide coverage for owned, non-owned and/or hired autos as appropriate to the operations of the Contractor.

(3) Workers' Compensation Insurance with statutory limits, and Employers' Liability Insurance with limits of not less than one million dollars (\$1,000,000). The Worker's Compensation policy shall include a waiver of subrogation.

(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, products and completed operations of Contractor, and premises owned, leased or used by Contractor. The general liability additional insured endorsement must be signed by an authorized representative of the insurance carrier.

If the policy includes a blanket additional insured endorsement or contractual additional insured coverage, the above signature requirement may be fulfilled by submitting that document with a signed declaration page referencing the blanket endorsement or policy form.

(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 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:V. Self-insured retentions, policy terms or other variations that do not comply with the requirements of this Section 19 must be declared to and approved by the City Risk Management Division in writing prior to execution of this Agreement.

(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 designated by City. 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) The City may withdraw its offer of contract or cancel the Contract if the certificates of insurance and endorsements required have not been provided prior to execution of this Agreement. The City may withhold payments to Contractor and/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

(A) Use Tax Direct Payment Permit For all leases and purchases of materials, equipment, supplies, or other tangible personal property used to perform the Contract 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 Contract.

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 _____

Print Name

Title

BY _____

Print Name

Title

Federal ID#

State ID#

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: Gus Vina, Interim City Manager

Original Approved As To Form:

Attest:

City Attorney

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

Bond #: _____
Premium: _____
Page 1 of 1

WHEREAS, the City of Sacramento, in the State of California, hereinafter called City has conditionally awarded to (*here insert full name and address of Contractor*):

as principal, hereinafter called Contractor, an agreement for construction of:

**SUMP 157 TRASK RACK - NORTH CHANNEL
(PN: W14003300) (B113331018)**

in accordance with the plans, specifications, drawings, conditions, and project manual prepared therefore, which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract; and

WHEREAS, under the terms of the Contract, 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*):

_____, 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 _____ DOLLARS \$ _____), 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 this obligation shall be null and void; otherwise shall be and remain in full force and effect. This obligation shall remain in full force and effect until (1) the date that the Contractor no longer has any remaining obligation of performance under the Contract, or (2) the date that is one year after the date that the work to be performed under the Contract is accepted as complete by the City, whichever occurs later.

As part of the obligation 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 obligation, all to be taxed as costs and included in any judgement 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 _____, 2011.

(Contractor) (Seal)
By _____
Title _____

(Surety) (Seal)
By _____
Title _____
Agent Name and Address _____

ORIGINAL APPROVED AS TO FORM:

City Attorney

Agent Phone # _____
Surety Phone # _____
California License # _____
Surety Email: _____

CITY OF SACRAMENTO
PAYMENT BOND
Department of Utilities

Bond No: _____
Premium: _____
Page 1 of 1

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

hereinafter called Contractor, an agreement for construction of:

SUMP 157 TRASK RACK - NORTH CHANNEL
(PN: W14003300) (B113331018)

in accordance with the plans, specifications, drawings, conditions, and project manual prepared therefor, which agreement is by reference made a part hereof, and is hereinafter referred to as the Contract; and

WHEREAS, under the terms of the Contract, Contractor is required to furnish a good and sufficient payment bond to secure the claims to which reference is made in Title 15(commencing with Section 3082) of Part 4 of Division 3 of the California Civil Code.

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

_____, 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 subcontractors, laborers, materialmen and other persons employed in the performance of the Contract and referred to in the aforesaid Civil Code in the sum of _____ DOLLARS (\$ _____), 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 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 and State agencies entitled to file claim under Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code, 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 _____, 2011.

(Contractor) (Seal)
By _____
Title _____

(Surety) (Seal)
By _____
Title _____
Agent Name and Address _____

ORIGINAL APPROVED AS TO FORM:

City Attorney

Agent Phone # _____
Surety Phone # _____
California License # _____
Surety Email: _____

**EXCERPTS FROM THE CALIFORNIA LABOR CODE RELATING TO
APPRENTICES ON PUBLIC WORKS
Chapter 1 of Division 2
APPRENTICES ON PUBLIC WORKS**

1773.3. An awarding agency whose public works contract falls within the jurisdiction of Section 1777.5 shall, within five days of the award, send a copy of the award to the Division of Apprenticeship Standards. When specifically requested by a local joint apprenticeship committee, the division shall notify the local joint apprenticeship committee regarding all such awards applicable to the joint apprenticeship committee making the request. Within five days of a finding of any discrepancy regarding the ratio of apprentices to journeymen, pursuant to the certificated fixed number of apprentices to journeymen, the awarding agency shall notify the Division of Apprenticeship Standards.

1776. (a) Each contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following: (1) The information contained in the payroll record is true and correct. (2) The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project.

(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis: (1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request. (2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations. (3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.

(c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.

(d) A contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.

(e) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated to prevent disclosure of an individual's name, address, and social security number. The name and address of the contractor awarded the contract or the subcontractor performing the contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a joint labor management committee established pursuant to the federal Labor Management Cooperation Act of 1978 (Section 175a of Title 29 of the United States Code) shall be marked or obliterated only to prevent disclosure of an individual's name and social security number. A joint labor management committee may maintain an action in a court of competent jurisdiction against an employer who fails to comply with Section 1774. The court may award restitution to an employee for unpaid wages and may award the joint labor management committee reasonable attorney's fee and costs incurred in maintaining the action. An action under this subdivision may not be based on the employer's misclassification of the craft of a worker on its certified payroll records. Nothing in this subdivision limits any other available remedies for a violation of this chapter.

(f) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

(g) The contractor or subcontractor shall have 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section.

(h) The body awarding the contract shall cause to be inserted in the contract stipulations to effectuate this section.

(i) The director shall adopt rules consistent with the California Public Records Act, (Chapter 3.5 (commencing with Section 6250), Division 7, Title 1, Government Code) and the Information Practices Act of 1977, (Title 1.8 (commencing with Section 1798), Part 4, Division 3, Civil Code) governing the release of these records, including the establishment of reasonable fees to be charged for reproducing copies of records required by this section.

(j) This section shall remain in effect only until January 1, 2003, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2003, deletes or extends that date.

1776. (a) Each contractor and subcontractor shall keep an accurate payroll record, showing the name, address, social security number, work classification, and straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her in connection with the public work.

(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis: (1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request. (2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations. (3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the request

payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.

(c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.

(d) Each contractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.

(e) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated to prevent disclosure of an individual's name, address, and social security number. The name and address of the contractor awarded the contract or performing the contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a joint labor-management committee established pursuant to the federal Labor Management Cooperation Act of 1978 (Section 175a of Title 29 of the United States Code) shall be marked or obliterated only to prevent disclosure of an individual's social security number.

(f) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

(g) The contractor shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects the contractor must comply with this section. In the event that the contractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

(h) The body awarding the contract shall cause to be inserted in the contract stipulations to effectuate this section. These stipulations shall fix the responsibility for compliance with this section on the prime contractor.

(i) The director shall adopt rules consistent with the California Public Records Act, (Chapter 3.5 (commencing with Section 6250), Division 7, Title 1, Government Code) and the Information Practices Act of 1977, (Title 1.8 (commencing with Section 1798), Part 4, Division 3, Civil Code) governing the release of these records, including the establishment of reasonable fees to be charged for reproducing copies of records required by this section.

(j) This section shall become operative January 1, 2003.

1777.5. (a) Nothing in this chapter shall prevent the employment of properly registered apprentices upon public works.

(b) Every apprentice employed upon public works shall be paid the prevailing rate of per diem wages for apprentices in the trade to which he or she is registered and shall be employed only at the work of the craft or trade to which he or she is registered.

(c) Only apprentices, as defined in Section 3077, who are in training under apprenticeship standards that have been approved by the Chief of the Division of Apprenticeship Standards and who are parties to written apprentice agreements under Chapter 4 (commencing with Section 3070) of Division 3 are eligible to be employed at the apprentice wage rate on public works. The employment and training of each apprentice shall be in accordance with either (1) the apprenticeship standards and apprentice agreements under which he or she is training or (2) the rules and regulations of the California Apprenticeship Council.

(d) When the contractor to whom the contract is awarded by the state or any political subdivision, in performing any of the work under the contract, employs workers in any apprenticeable craft or trade, the contractor shall employ apprentices in at least the ratio set forth in this section and may apply to any apprenticeship program in the craft or trade that can provide apprentices to the site of the public work for a certificate approving the contractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. However, the decision of the apprenticeship program to approve or deny a certificate shall be subject to review by the Administrator of Apprenticeship. The apprenticeship program or programs, upon approving the contractor, shall arrange for the dispatch of apprentices to the contractor. A contractor covered by an apprenticeship program's standards shall not be required to submit any additional application in order to include additional public works contracts under that program. "Apprenticeable craft or trade," as used in this section, means a craft or trade determined as an apprenticeable occupation in accordance with rules and regulations prescribed by the California Apprenticeship Council. As used in this section, "contractor" includes any subcontractor under a contractor who performs any public works not excluded by subdivision (o).

(e) Prior to commencing work on a contract for public works, every contractor shall submit contract award information to an applicable apprenticeship program that can supply apprentices to the site of the public work. The information submitted shall include an estimate of journeyman hours to be performed under the contract, the number of apprentices proposed to be employed, and the approximate dates the apprentices would be employed. A copy of this information shall also be submitted to the awarding body if requested by the awarding body. Within 60 days after concluding work on the contract, each contractor and subcontractor shall submit to the awarding body, if requested, and to the apprenticeship program a verified statement of the journeyman and apprentice hours performed on the contract. The information under this subdivision shall be public. The apprenticeship programs shall retain this information for 12 months.

(f) The apprenticeship program that can supply apprentices to the area of the site of the public work shall ensure equal employment and affirmative action in apprenticeship for women and minorities.

(g) The ratio of work performed by apprentices to journeymen employed in a particular craft or trade on the public work may be no higher than the ratio stipulated in the apprenticeship standards under which the apprenticeship program operates where the contractor agrees to be bound by those standards, but, except as otherwise provided in this section, in no case shall the ratio be less than one hour of apprentice work for every five hours of journeyman work.

(h) This ratio of apprentice work to journeyman work shall apply during any day or portion of a day when any journeyman is employed at the jobsite and shall be computed on the basis of the hours worked during the day by journeymen so employed. Any work performed by a journeyman in excess of eight hours per day or 40 hours per week shall not be used to calculate the ratio. The contractor shall employ apprentices for the number of hours computed as above before the end of the contract or, in the case of a subcontractor, before the end of the subcontract. However, the contractor shall endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the jobsite. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Chief of the Division of Apprenticeship Standards, upon application of an apprenticeship program, may order a minimum ratio of not less than one apprentice for each five journeymen in a craft or trade classification.

(i) A contractor covered by this section that has agreed to be covered by an apprenticeship program's standards upon the issuance of the approval certificate, or that has been previously approved for an apprenticeship program in the craft or trade, shall

employ the number of apprentices or the ratio of apprentices to journeymen stipulated in the applicable apprenticeship standards, but in no event less than the 1-to-5 ratio required by subdivision (g).

(j) Upon proper showing by a contractor that he or she employs apprentices in a particular craft or trade in the state on all of his or her contracts on an annual average of not less than one hour of apprentice work for every five hours of labor performed by journeymen, the Chief of the Division of Apprenticeship Standards may grant a certificate exempting the contractor from the 1-to-5 hourly ratio, as set forth in this section for that craft or trade.

(k) An apprenticeship program has the discretion to grant to a participating contractor or contractor association a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting the contractor from the 1-to-5 ratio set forth in this section when it finds that any one of the following conditions is met: (1) Unemployment for the previous three-month period in the area exceeds an average of 15 percent. (2) The number of apprentices in training in the area exceeds a ratio of 1 to 5. (3) There is a showing that the apprenticeable craft or trade is replacing at least one-thirtieth of its journeymen annually through apprenticeship training, either on a statewide basis or on a local basis. (4) Assignment of an apprentice to any work performed under a public works contract would create a condition that would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large, or the specific task to which the apprentice is to be assigned is of a nature that training cannot be provided by a journeyman.

(l) When an exemption is granted pursuant to subdivision (k) to an organization that represents contractors in a specific trade from the 1-to-5 ratio on a local or statewide basis, the member contractors will not be required to submit individual applications for approval to local joint apprenticeship committees, if they are already covered by the local apprenticeship standards.

(m) (1) A contractor to whom a contract is awarded, who, in performing any of the work under the contract, employs journeymen or apprentices in any apprenticeable craft or trade shall contribute to the California Apprenticeship Council the same amount that the director determines is the prevailing amount of apprenticeship training contributions in the area of the public works site. A contractor may take as a credit for payments to the council any amounts paid by the contractor to an approved apprenticeship program that can supply apprentices to the site of the public works project. The contractor may add the amount of the contributions in computing his or her bid for the contract.

(2) At the conclusion of each fiscal year, the California Apprenticeship Council shall distribute training contributions received by the council under this subdivision, less the expenses of the Division of Apprenticeship Standards for administering this subdivision, by making grants to approved apprenticeship programs for the purpose of training apprentices. The funds shall be distributed as follows: (A) If there is an approved multiemployer apprenticeship program serving the same craft or trade and geographic area for which the training contributions were made to the council, a grant to that program shall be made. (B) If there are two or more approved multiemployer apprenticeship programs serving the same craft or trade and geographic area for which the training contributions were made to the council, the grant shall be divided among those programs based on the number of apprentices registered in each program. (C) All training contributions not distributed under subparagraphs (A) and (B) shall be used to defray the future expenses of administering this subdivision. (3) All training contributions received pursuant to this subdivision shall be deposited in the Apprenticeship Training Contribution Fund, which fund is hereby created in the State Treasury. Notwithstanding Section 13340 of the Government Code, all money in the Apprenticeship Training Contribution Fund is hereby continuously appropriated for the purpose of carrying out this subdivision and to pay the expenses of the division in administering this subdivision.

(n) The body awarding the contract shall cause to be inserted in the contract stipulations to effectuate this section. The stipulations shall fix the responsibility of compliance with this section for all apprenticeable occupations with the prime contractor.

(o) This section does not apply to contracts of general contractors or to contracts of specialty contractors not bidding for work through a general or prime contractor when the contracts of general contractors or those specialty contractors involve less than thirty thousand dollars (\$30,000).

(p) All decisions of an apprenticeship program under this section are subject to Section 3081.

1777.6. It shall be unlawful for an employer or a labor union to refuse to accept otherwise qualified employees as registered apprentices on any public works, on the ground of the race, religious creed, color, national origin, ancestry, sex, or age, except as provided in Section 3077, of such employee.

1777.7. (a) (1) A contractor or subcontractor that is determined by the Chief of the Division of Apprenticeship Standards to have knowingly violated Section 1777.5 shall forfeit as a civil penalty an amount not exceeding one hundred dollars (\$100) for each full calendar day of noncompliance. The amount of this penalty may be reduced by the Chief if the amount of the penalty would be disproportionate to the severity of the violation. A contractor or subcontractor that knowingly commits a second or subsequent violation of Section 1777.5 within a three-year period, where the noncompliance results in apprenticeship training not being provided as required by this chapter, shall forfeit as a civil penalty the sum of not more than three hundred dollars (\$300) for each full calendar day of noncompliance.

Notwithstanding Section 1727, upon receipt of a determination that a civil penalty has been imposed by the Chief, the awarding body shall withhold the amount of the civil penalty from contract progress payments then due or to become due. (2) In lieu of the penalty provided for in this subdivision, the Chief may, for a first-time violation and with the concurrence of an apprenticeship program described in subdivision (d), order the contractor or subcontractor to provide apprentice employment equivalent to the work hours that would have been provided for apprentices during the period of noncompliance.

(b) In the event a contractor or subcontractor is determined by the Chief to have knowingly committed a serious violation of any provision of Section 1777.5, the Chief may also deny to the contractor or subcontractor, and to its responsible officers, the right to bid on or be awarded or perform work as a subcontractor on any public works Contract for a period of up to one year for the first violation and for a period of up to three years for a second or subsequent violation. Each period of debarment shall run from the date the determination of noncompliance by the Chief becomes a final order of the Administrator of Apprenticeship.

(c) (1) An affected contractor, subcontractor, or responsible officer may obtain a review of the determination of the Chief imposing the debarment or civil penalty by transmitting a written request to the office of the Administrator within 30 days after service of the determination of debarment or civil penalty. A copy of this report shall also be served on the Chief. If the Administrator does not receive a timely request for review of the determination of debarment or civil penalty made by the Chief, the order shall become the final order of the Administrator. (2) Within 20 days of the timely receipt of a request for review, the Chief shall provide the contractor, subcontractor, or responsible officer the opportunity to review any evidence the Chief may offer at the hearing. The Chief shall also promptly disclose any nonprivileged documents obtained after the 20-day time limit at a time set forth for exchange of evidence by the Administrator. (3) Within 90 days of the timely receipt of a request for review, a hearing shall be commenced before the

Administrator or an impartial hearing officer designated by the Administrator and possessing the qualifications of an administrative law judge pursuant to subdivision (b) of Section 11502 of the Government Code. The affected contractor, subcontractor, or responsible officer shall have the burden of providing evidence of compliance with Section

1777.5. (4) Within 45 days of the conclusion of the hearing, the Administrator shall issue a written decision affirming, modifying, or dismissing the determination of debarment or civil penalty. The decision shall contain a statement of the factual and legal basis for the decision and an order. This decision shall be served on all parties and the awarding body pursuant to Section 1013 of the Code of Civil Procedure by first-class mail at the last known address of the party that the party has filed with the Administrator. Within 15 days of issuance of the decision, the Administrator may reconsider or modify the decision to correct an error, except that a clerical error may be corrected at any time. (5) An affected contractor, subcontractor, or responsible officer who has timely requested review and obtained a decision under paragraph (4) may obtain review of the decision of the Administrator by filing a petition for a writ of mandate to the appropriate superior court pursuant to Section 1094.5 of the Code of Civil Procedure within 45 days after service of the final decision. If no timely petition for a writ of mandate is filed, the decision shall become the final order of the Administrator. The decision of the Administrator shall be affirmed unless the petitioner shows that the Administrator abused his or her discretion. If the petitioner claims that the findings are not supported by the evidence, abuse of discretion is established if the court determines that the findings are not supported by substantial evidence in light of the entire record. (6) The Chief may certify a copy of the final order of the Administrator and file it with the clerk of the superior court in any county in which the affected contractor or subcontractor has property or has or had a place of business. The clerk, immediately upon the filing, shall enter judgment for the state against the person assessed in the amount shown on the certified order. A judgment entered pursuant to this section shall bear the same rate of interest and shall have the same effect as other judgments and be given the same preference allowed by the law on other judgments rendered for claims for taxes. The clerk shall not charge for the service performed by him or her pursuant to this section. An awarding body that has withheld funds in response to a determination by the Chief imposing a penalty under this section shall, upon receipt of a certified copy of a final order of the Administrator, promptly transmit the withheld funds, up to the amount of the certified order, to the Administrator.

(d) If a subcontractor is found to have violated Section 1777.5, the prime contractor of the project is not liable for any penalties under subdivision (a), unless the prime contractor had knowledge of the subcontractor's failure to comply with the provisions of Section 1777.5 or unless the prime contractor fails to comply with any of the following requirements: (1) The contract executed between the contractor and the subcontractor or the performance of work on the public works project shall include a copy of the provisions of Sections 1771, 1775, 1776, 1777.5, 1813, and 1815.

(2) The contractor shall continually monitor a subcontractor's use of apprentices required to be employed on the public works project pursuant to subdivision (d) of Section 1777.5, including, but not limited to, periodic review of the certified payroll of the subcontractor.

(3) Upon becoming aware of a failure of the subcontractor to employ the required number of apprentices, the contractor shall take corrective action, including, but not limited to, retaining funds due the subcontractor for work performed on the public works project until the failure is corrected. (4) Prior to making the final payment to the subcontractor for work performed on the public works project, the contractor shall obtain a declaration signed under penalty of perjury from the subcontractor that the subcontractor has employed the required number of apprentices on the public works project.

(e) Any funds withheld by the awarding body pursuant to this section shall be deposited in the General Fund if the awarding body is a state entity, or in the equivalent fund of an awarding body if the awarding body is an entity other than the state.

(f) The Chief shall consider, in setting the amount of a monetary penalty, in determining whether a violation is serious, and in determining whether and for how long a party should be debarred for violating this section, all of the following circumstances: (1) Whether the violation was intentional. (2) Whether the party has committed other violations of Section 1777.5. (3) Whether, upon notice of the violation, the party took steps to voluntarily remedy the violation. (4) Whether, and to what extent, the violation resulted in lost training opportunities for apprentices. (5)

Whether, and to what extent, the violation otherwise harmed apprentices or apprenticeship programs. If a party seeks review of a decision by the Chief to impose a monetary penalty or period of debarment, the Administrator shall decide de novo the appropriate penalty, by considering the same factors set forth above.

(g) The interpretation of Section 1777.5 and this section shall be in accordance with the regulations of the California Apprenticeship Council. The Administrator may adopt regulations to establish guidelines for the imposition of monetary penalties and periods of debarment and may designate precedential decisions under Section 11425.60 of the Government Code.

**NOTE: THE ABOVE CALIFORNIA LABOR CODE SECTIONS ARE AVAILABLE FROM THE INTERNET @ www.dir.ca.gov/.
DAS 10 (Rev. 04-02)**

**Request for Taxpayer
Identification Number and Certification**

Give form to the requester. Do not send to the IRS.

Print or type See Specific Instructions on page 2.	Name (as shown on your income tax return)	
	Business name, if different from above	
	Check appropriate box: <input type="checkbox"/> Individual/Sole proprietor <input type="checkbox"/> Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Limited liability company. Enter the tax classification (D=disregarded entity, C=corporation, P=partnership) ▶ <input type="checkbox"/> Exempt payee <input type="checkbox"/> Other (see instructions) ▶	
	Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
	City, state, and ZIP code	
List account number(s) here (optional)		

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I Instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3. Note, if the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number
OR
Employer identification number

Part II Certification

Under penalties of perjury, I certify that:

- The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
- I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
- I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here	Signature of U.S. person ▶	Date ▶
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General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

- Certify that the TIN you are giving is correct (or you are waiting for a number to be issued).
- Certify that you are not subject to backup withholding, or
- Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

YEAR

Withholding Exemption Certificate

CALIFORNIA FORM

2011

(This form can only be used to certify exemption from nonresident withholding under California Revenue and Taxation Code (R&TC) Section 18662. Do not use this form for exemption from wage withholding.)

590

File this form with your withholding agent. (Please type or print)
Withholding agent's name _____

Payee's name _____		Payee's <input type="checkbox"/> SOS file no.	<input type="checkbox"/> SSN or ITIN
Address (number and street, PO Box, or P.M.B. no.) _____		<input type="checkbox"/> CA corp. no. <input type="checkbox"/> FEIN	
City _____		State _____	Apt. no./ Ste. no. _____
		ZIP Code _____	

Read the following carefully and check the box that applies to the payee.

I certify that for the reasons checked below, the payee named on this form is exempt from the California income tax withholding requirement on payment(s) made to the entity or individual.

- Individuals — Certification of Residency:**
I am a resident of California and I reside at the address shown above. If I become a nonresident at any time, I will promptly notify the withholding agent. See instructions for General Information D, Who is a Resident, for the definition of a resident.
- Corporations:**
The above-named corporation has a permanent place of business in California at the address shown above or is qualified through the California Secretary of State (SOS) to do business in California. The corporation will file a California tax return and withhold on payments of California source income to nonresidents when required. If this corporation ceases to have a permanent place of business in California or ceases to do any of the above, I will promptly notify the withholding agent. See instructions for General Information F, What is a Permanent Place of Business, for the definition of permanent place of business.
- Partnerships or limited liability companies (LLC):**
The above-named partnership or LLC has a permanent place of business in California at the address shown above or is registered with the California SOS, and is subject to the laws of California. The partnership or LLC will file a California tax return and will withhold on foreign and domestic nonresident partners or members when required. If the partnership or LLC ceases to do any of the above, I will promptly inform the withholding agent. For withholding purposes, a limited liability partnership (LLP) is treated like any other partnership.
- Tax-Exempt Entities:**
The above-named entity is exempt from tax under California Revenue and Taxation Code (R&TC) Section 23701 _____ (insert letter) or Internal Revenue Code Section 501(c) _____ (insert number). The tax-exempt entity will withhold on payments of California source income to nonresidents when required. If this entity ceases to be exempt from tax, I will promptly notify the withholding agent. Individuals cannot be tax-exempt entities.
- Insurance Companies, Individual Retirement Arrangements (IRAs), or Qualified Pension/Profit Sharing Plans:**
The above-named entity is an insurance company, IRA, or a federally qualified pension or profit-sharing plan.
- California Trusts:**
At least one trustee and one noncontingent beneficiary of the above-named trust is a California resident. The trust will file a California fiduciary tax return and will withhold on foreign and domestic nonresident beneficiaries when required. If the trustee becomes a nonresident at any time, I will promptly notify the withholding agent.
- Estates — Certification of Residency of Deceased Person:**
I am the executor of the above-named person's estate. The decedent was a California resident at the time of death. The estate will file a California fiduciary tax return and will withhold on foreign and domestic nonresident beneficiaries when required.
- Nonmilitary Spouse of a Military Servicemember:**
I am a nonmilitary spouse of a military servicemember and I meet the Military Spouse Residency Relief Act (MSRRA) requirements. See instructions for General Information E, MSRRA.

CERTIFICATE: Please complete and sign below.

Under penalties of perjury, I hereby certify that the information provided in this document is, to the best of my knowledge, true and correct. If conditions change, I will promptly notify the withholding agent.

Payee's name and title (type or print) _____ Daytime telephone no. _____

Payee's signature _____ Date _____

SPECIAL PROVISIONS

**SPECIFICATIONS
FOR
SUMP 157 TRASH RACK
NORTH CHANNEL**

PN W14003300

March 2011

**CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES**

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APPENDIX

1. Streambed Alteration Agreement
2. Caltrans Right of Entry Agreement

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) and as noted otherwise.
 4. Technical Specifications

1.02 DEFINITIONS

- A. For definitions not found herein, refer to CSSS, Section 1.
- B. "Provide" shall mean furnish and install, in accordance with the contract documents.
- C. "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.

1.03 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 Contract Documents 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.

1.05 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.

1.06 FACILITY ACCESS

- A. The Contractor shall provide their own locks to be placed in series with City's locks for facilities access. The Contractor shall be responsible for securing the facility after each work day and at all times during the contract.
- B. In the summer of 2011 Caltrans is scheduled to begin construction activities to complete the Interstate 80 HOV Bridge Project which is located within the project area. Caltrans has entered into an agreement with the City to use the Sump 157 Pumping Station for access to their project. One component of the agreement stipulates that Caltrans shall not hinder or interfere with the City's efforts to complete the project. This agreement has been included in the Appendix of these Specifications.

1.07 CONSTRUCTION SCHEDULE

- A. Contractor shall submit a Construction Schedule for the entire project. The 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 shall be listed. 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.
- B. Contractor shall complete all work in the stream zone of the channel by November 15, 2011 as required in the Department of Fish and Game Streambed Alteration Agreement issued to the City for this project. A copy of the Agreement is included in the Appendix of these Specifications.

1.08 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 above. The Contractor is responsible to provide Plans and Special Provisions to subcontractors.

1.09 CONTRACTOR COMMUNICATIONS

- A. The Engineer will assign a Resident Construction Inspector(RCI). All official communications between the Contractor and the City shall be made through the RCI.

1.10 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 to 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. Spillage resulting from hauling operations along, or across, any public traveled way, is removed 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.

1.11 PERMITS

- A. Contractor may want to use private property beyond that already owned by the City for storage and/or access. Contractor shall be responsible to the individual owner(s) to obtain and pay for any private property easements and/or right of entry permit, and for repair of any associated damage.

- B. Contractor shall abide with all requirements within the Department of Fish and Game Streambed Alteration Agreement issued to the City for the project. A copy of the permit is provided in the Appendix of these Specifications. Construction activities in the stream zone are permitted from April 15 to November 15. The Contractor shall sign City's copy of this agreement prior to working within the stream zone. A copy of this agreement and a copy of the original notification, including the project description, as submitted to the Department, must be available upon request at the work site. The Contractor or a designated crew supervisor shall be on site the entire time a work crew is working near the stream zone. The supervisor shall be completely familiar with the terms and conditions of this agreement and shall ensure compliance with all terms and conditions.

1.12 PUBLIC SAFETY AND CONVENIENCE AND MAINTENANCE OF TRAFFIC

- A. Contractor's attention is directed to Sections 6-6, 6-7, 6-9 of the CSSS.
- B. Contractor shall furnish, install, and maintain temporary construction warning signs, flaggers, barricades, and other devices when necessary to safeguard the general public and the work, and to provide for the safe and proper routing of all vehicles within the limits of the project during the performance of the work.
- C. Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners

1.14 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 Pete Millino of the City of Sacramento at 808-5173 two (2) working days prior to performing excavation work within existing City facilities. The City will mark locations of existing City utilities.

1.16 MAINTAINING EXISTING DRAINAGE

- A. Contractor shall be responsible for maintaining existing drainage until new drainage improvements are complete and functioning. No additional compensation will be paid to the Contractor for said maintenance. The Contractor shall include the cost of this maintenance in the items of the bid as deemed appropriate.

- B. Contractor shall call City Utilities Operation Center at (916)808-5461 to report any pumping capacity change or pumping mode change during construction.
- C. Contractor shall be responsible for scheduling existing sump and equipment shutdowns necessary to complete the work. Obtain approval from the Engineer at least two(2) days prior to any proposed shutdown. Contractor shall submit to the Engineer the following information in order to schedule a shutdown:
 - 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 allow City O&M access to the facility 24 hours a day, 7 days a week.

1.17 WATER QUALITY CONTROL

Contractor's attention is directed to Section 16 of the CSSS, and the Streambed Alteration Agreement shown in the Appendix.

1.18 PROJECT SIGN(S)

- A. Prior to beginning any onsite work, the contractor shall install a total of one project sign. Sign(s) shall be supplied by the City and are approximately thirty (30) inches by fifty-four (54) inches. Location and height of sign installation shall be as directed by the Engineer. In general, the signs shall be installed a minimum of seven (7) feet and maximum of ten (10) feet above surrounding grade. If acceptable to the Engineer an existing sign post may be used, otherwise, the Contractor shall be required to install a new post for each sign. Signs shall be maintained in a good condition throughout construction, shall not be bent and shall remain legible to traffic. Any damage shall be repaired by the Contractor. The sign(s) and post(s) installed by the contractor shall be removed at the end of the project and the sign(s) returned to the City.

1.19 COMPLETION AND FINAL INSPECTION

- A. Determination of project completion and final payment shall proceed as stated in CSSS Section 8-4.

1.20 WARRANTY

- A. In accordance with Article 14 of the Agreement, 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 contract requires construction of bridge abutments, installation of a bridge across an existing drainage channel, purchase and installation of two automated trash rakes that will be supported by three concrete piers to be constructed in the drainage channel. The Contractor may select between one of two types of automated trash rakes, a catenary type rake or a mechanically raked bar screen. The bridge will consist of two railroad flatcars placed side by side. The flatcars have already been purchased by the City from Jim Dobbas Inc. and are currently being stored at 7920 Antelope North Rd., Antelope, CA. The work shall be in conformance with the Plans, CSSS, and these Technical Specifications including furnishing all material, labor, tools, equipment, appurtenances, and services necessary to complete this project.
- B. The project area is within and north of the Sump 157 storm water pumping station, and owned by the City of Sacramento. The project site is located on the north side of the Interstate 80 overcrossing on the east side of Steelhead Creek (#1 Morrison Avenue, Sacramento).
- C. Portions of the work will involve the following:
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: Per Section 02220, remove and dispose of indicated materials at an approved off-site recycling or disposal facility.
 4. Facility Construction: Construction of reinforced concrete footings and piers, walkway, stairway, bridge abutments, and catwalk; manufacture, painting and placement of bar screens; concrete bridge decking, guardrails; purchase and installation of two automated trash rakes; purchase and installation of two floating debris booms; unloading and placement of two 62' long railroad flatcars on top of the abutments; miscellaneous metal work and welding, electrical work, fencing, trenching,

water supply piping, shotcrete application, drainage channel demolition and reconstruction, grading, and site work.

Jim Dobbas Inc. will deliver the two railroad flatcars to the jobsite. The cost of flatcar delivery to the project site shall be paid by the Contractor. The flatcars will arrive painted with railings, abutment base plate assemblies, steel decking with Nelson studs, and an angle iron enclosure for the concrete deck. The concrete deck will be installed by the Contractor. Jim Dobbas Inc. will also provide material and onsite welding for the base plates, lap plate, railcar connections, and enclosing the end of each flatcar. Jim Dobbas Inc. has estimated the amount of time to complete these field tasks to be from 7 to 10 working days. The Contractor is responsible for unloading and final placement of each flatcar onto the abutments and shall coordinate delivery with the flatcar supplier, Jim Dobbas, Inc. (916-723-3939). Each flatcar weighs approximately 40,000 pounds.

5. Purchase and installation of two automated trash rakes.
6. Manufacture and placement of metal bar screens for the trash rakes and channel as depicted in the Plans.
7. Electrical and Trash Rake Controls: Installation of lighting, electrical conduit and wiring, controls. Construct conduits, wiring, light pole foundations, and finish electrical necessary to implement the electrical equipment per the Plans and Specifications.
8. Storage of Materials and Equipment: Provide necessary equipment to unload, and temporarily store materials and equipment, in accordance with the manufacturer's requirements.
8. Miscellaneous: Construction of asphalt pavements, trenching, water supply connections and piping, grading, placement and compaction of fill cleaning of all debris and sediment, concrete demolition, pavement saw cutting, grading, fencing removal and installation.
9. Maintain Drainage: Maintaining, and furnishing if necessary, pumping facilities necessary to pump water from, around, or through the site, the excavation, trenches.
10. Dewatering: Install, maintain, and operate facilities for dewatering operations, when required.
11. Supply temporary facilities as necessary.
12. Furnish, install, maintain, and remove when no longer required the

appropriate best available technologies for preventing storm water pollution. Abide with the requirements listed in the Streambed Alteration Agreement for the project

13. Test and make site ready for operation.
14. Coordinate work activities with appropriate jurisdictional agencies. In the summer of 2011 Caltrans is scheduled to begin construction activities to complete the Interstate 80 HOV Bridge Project which is located within the project area. Caltrans has entered into an agreement with the City to use the Sump 157 Pumping Station for access to their project. One component of the agreement stipulates that Caltrans shall not hinder or interfere with the City's efforts to complete the project. This agreement has been included in the Appendix of the Specifications.
15. Provide project supervision and management in order to meet the project schedule and required standards for quality control.

1.02 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. Information contained within the Plans is provided for the installation of a Catenary Trash Rake meeting the requirements of Section 11200 of these Special Provisions. **Alternatively, the Contractor may choose to install trash rakes meeting the specifications of Section 11331 (Mechanically Raked Bar Screen). If the Contractor chooses to install a trash rake meeting the requirements of Section 11331, the Contractor shall provide all adjustments to the trash rake structure such that the manufacturer's specifications, the CSSS, and these Specifications are fulfilled. The Contractor shall provide engineering drawings stamped and signed by a CA licensed civil and/or structural engineer showing all proposed structural, seismic, and civil engineering modifications. Construction of the trash rake structure shall not begin until approval of the modifications has been provided to the Contractor in writing by the Engineer. Companies who make automated trash rakes meeting the requirements of Section 11331 and Section 11200 of these Special Provisions include:**
 - E & I Corporation - Local Representative: Muniquip, (916) 787-5641
 - Duperon Corporation – Local Representative: JBI, (925) 426-9033

The equipment manufacturer's warranty shall pass to the City and shall extend a period of one year after project acceptance by the City.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials are specified in these Special Provisions, 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. 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 to these specifications the Contractor shall, within three days after being notified by the Engineer, remove the materials from the project site or storage area.

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 Owner 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.

- 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. 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 until completion and final acceptance of the work by the City.
- C. **Parking Facilities:** A parking area shall be designated by the Contractor and approved by the Owner.

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 and lighting required for the work under this Contract and shall maintain such service until the completion of the work.
 - 2. The Contractor shall attain approval from Tim Giffin of the City of Sacramento, (916) 808-7997, two (2) working days before installing the electrical equipment and connections that will provide power to the trash rake facility.
- B. **Sanitary Facilities:** The Contractor shall make arrangements for the maintenance of adequate toilet facilities at, or near, the work site and shall pay the costs thereof.
- C. **Temporary Heating:** The Contractor shall provide temporary heating, covering, and enclosures, as necessary, to protect all work and material against damage by dampness and cold and to facilitate completion of the work. The Contractor shall supply all the fuel, power, equipment, and materials required for temporary heating.

3.03 LANDS PROVIDED BY OWNER

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

3.04 FIELD ENGINEERING

- A. The Contractor shall provide and pay for the following field engineering services

required for this job:

1. Laying out the work.
- B. 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.
- C. The Contractor shall be responsible for the protection of all existing survey monuments or markers during construction.
- D. The Contractor shall be responsible for maintaining As-Built drawings for all work throughout the course of construction. Such drawing shall record the location and grade (City Datum) of all above ground and 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: Contractor to coordinate and accept deliveries of all materials and equipment.
- G. Security: Security of equipment stored by the Contractor is the Contractor's responsibility. All losses or damage shall be replaced or repaired at the Contractor's expense.

3.07 TESTING

- A. The Contractor will field test earth work and cast-in-place concrete materials and provide Owner with copies of all tests.
- 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 test. The Contractor shall perform all other testing, and submit written copies of all test results to the Engineer.
- 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 Owner.
- D. Operational Testing: Operational testing consists of electrical testing specified in Section 1750, **TESTING, TRAINING AND FACILITY START-UP**.
- E. Demonstration Testing: After all operational tests specified in Section 1750 are satisfactorily completed, the Contractor shall perform a demonstration test.

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 CONSTRUCTION INSPECTIONS

- A. Unless otherwise directed, Contractor shall contact the Utilities Department Construction Section at (916) 808-1413 two (2) working days in advance to schedule construction inspections. The Contractor shall also provide a scheduled date, start time, and estimated completion time at least one(1) working day in advance to the Utilities Construction Section for additional work approved under a time and materials basis by the City. Failure by the Contractor to provide verifiable notification to the Engineer will result in non-payment for the additional work performed.

****END OF SECTION****

SECTION 01150

FIELD ENGINEERING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The City will establish reference bench marks and control points for laying out the work.
- B. Contractor shall develop and make such additional surveys as are needed for construction, such as control lines, slope stakes, batter boards, offset stakes for structure location, and other working points, lines, and elevations as required to complete the construction. Survey work shall be performed under the supervision of a land surveyor or a registered civil engineer retained by the Contractor.
- C. Contractor shall reestablish reference bench marks and survey control monuments altered or destroyed by his operation at no cost to the City.

1.02 RELATED REQUIREMENTS

- A. Section 01110: Summary of Work

1.03 QUALIFICATIONS OF CONTRACTOR'S SURVEYOR OR ENGINEER

- A. A Professional Engineer or a Land Surveyor, either of which is registered by the State of California to perform surveys.

1.04 SURVEY REFERENCE POINTS

- A. Locate and protect control points prior to starting work, and preserve all permanent reference points during construction.
 - 1. Make no changes or relocations without prior written notice to Engineer.
 - 2. Report to Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
 - 3. Replace control points which may be lost or destroyed.
 - a. Establish replacements based on original survey control.

1.05 PROJECT SURVEY REQUIREMENTS

- A. CSSS Section 5-5 does not apply to this project. City will only provide reference benchmark and control point info for layout. Contractor shall develop and make such additional surveys as are needed for construction, such as control lines, slope stakes, batter boards, offset stakes for pipe and structure location and other working points, lines and elevations, as required for construction by instrumentation and similar appropriate means.
- B. Contractor shall be responsible to layout all work in advance of fabrication and to coordinate with all related work. Layout all new facilities and relocations based on the information provided and shown on the Plans.
- C. On request of the Engineer, submit documentation to verify accuracy of field surveys. Maintain a complete log of all control and survey work as it progresses.

1.06 SUBMITTALS

- A. Contractor to submit name and address of registered land surveyor or professional engineer that performs project surveying to the Engineer.
- B. For quality assurance purposes, provide copies of all field survey notes to the Engineer within forty-eight (48) hours of making field surveys.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

**** END OF SECTION ****

SECTION 01310
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Description of Work: Conduct and attend all project conferences and meetings for the purposes of addressing issues related to the Work, reviewing and coordinating progress of the Work, and other matters of common interest, as required.

PART 2 - PRODUCTS

2.01 PRECONSTRUCTION MEETING

A. Purpose

1. To designate responsible personnel and establish working understanding between parties
2. Status of insurance and bonds
3. Construction schedule and critical work sequences
4. Shop drawings and other submittals
5. Cost breakdown of major lump sum items
6. Field decisions and change orders
7. Maintaining record documents
8. Processing of submittals and applications for payment
9. Scope of work
10. Existing conditions
11. Equipment deliveries and priorities
12. All other essential matters pertaining to the satisfactory completion of the Project as required.

B. Attendance

1. The contractor's representatives at this conference shall include all major superintendents for the work and may include major subcontractors. Other attendees shall be:
 - a. Representatives of the City
 - b. Utility company representatives, as appropriate
 - c. Others as requested by the Contractor or City

2. The Engineer will preside at the pre-construction conference and will arrange for keeping and distributing the minutes to all persons in attendance. The Contractor shall plan on the conference taking no less than one hour.

C. Requirements

1. Once a fully executed contract is received and prior to the commencement of work, the Engineer will schedule and chair a pre-construction conference to be held at the office of the Engineer.
2. Prior to the pre-construction conference, the Engineer will develop the agenda for the meeting and meet with the project manager to review the agenda.
3. Notes of the conference will be maintained by the Engineer. After the meeting, the Engineer will transcribe the minutes of the meeting and discuss any issues that were raised.
4. The Contractor shall submit the following items to the Contractor at the preconstruction conference:
 - a. A preliminary schedule of shop drawings, samples and proposed substitutes ("or equal")
 - b. A list of all permits the Contractor shall obtain indicating the agency required to grant the permit, the expected date of submittal for the permit, and the required date for receipt of the permit
 - c. A 60-day plan of operation
 - d. A project overview schedule

2.02 PROGRESS MEETINGS

A. Purpose

1. To review progress of subcontractors or other organizations that are not meeting scheduled progress, resolve conflicts, and coordinate and expedite execution of the Work. Additionally, to review the progress of the Work Progress Schedule, narrative report, Project Partial Payment Form, record documents, and additional items of current interest that is pertinent to execution of the Work.

B. Attendance

1. The attendance of Contractor's superintendent and subcontractors who are actively involved in the work is required, as well as all others who are necessary to agenda. Additionally, the Engineer will invite the utility companies when the work affects their interests, and others necessary to agenda. The Engineer will preside at the meetings.

2.03 TAILGATE SAFETY MEETINGS

A. Purpose

1. Unless otherwise approved by the Engineer, Contractor shall hold weekly safety meetings with the Contractor's and Subcontractor's employees to discuss safety on the job. Contractor's safety plan shall identify who shall attend these meetings. City attendance is not required.

2.04 OTHER MEETINGS

- ### **A. The City and/or Contractor may request attendance at other at meetings as considered appropriate.**

PART 3 – EXECUTION(NOT USED)

**** END OF SECTION ****

SECTION 01330

SUBMITTALS

PART 1 - GENERAL

1.01 STANDARD COMPLIANCE

- A. Conform to CSSS Section 5-7, unless otherwise directed.
- B. 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.
- C. 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, five (5) 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 MANUALS

- A. Submit an operation and maintenance manual, an overhaul manual, and any other required documents needed to operate, service, and overhaul the stipulated systems and equipment. Three (3) approved copies of the manuals, 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 manuals 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 manuals shall be submitted for approval. Three (3) approved copies of the manuals 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 — Electrical Controls
Project: Sump 157 Trash Rack
Contractor: _____
Contract No.: _____
Date: _____

The contractor shall also provide the City with an electronic copy of each 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 copy these pre-printed instructions. Cross out all material which does not apply to the equipment furnished on this job.
- C. The operating, maintenance, and overhaul 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, the manufacturer's warranties, and the local spare parts warehouse address.
 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 01410
QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Cooperate with the Engineer's selected testing agency and all others responsible for testing and inspecting the work as described herein.
2. Provide such other testing and inspecting as are specified to be furnished by the Contractor in this section and/or elsewhere in the contract documents

B. Related Work

1. Requirements for testing may be described in various sections of these specifications and applicable codes.
2. Where no testing requirements are described but the Engineer decides that testing is required, the Engineer may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described in this section.

C. Work Not Included:

1. Selection of testing laboratory: The City will select a pre-qualified independent testing laboratory.
2. Payment for specified initial testing: The City will only pay for **initial** material strength testing of items described in Part 1.02 TESTING DESCRIPTION, subparagraph A.1, herein. Contractor shall be responsible to pay for all other testing.

1.02 TESTING DESCRIPTION

A. Material Strength:

1. The City will only pay for initial testing services for concrete strength and slump, soil compaction, and grout strength.
2. When initial tests indicate non-compliance with the Contract Documents, the costs of any additional tests required for determining compliance will

be deducted by the City from the Contract Sum as reflected in the progress payments due the Contractor.

- B. Operational Testing: All operational tests shall be paid for by the Contractor.

- C. Contractor's Convenience Testing:
 - 1. Inspecting and testing performed exclusively for the Contractor's convenience, such as determining grain size or index properties of material proposed for use as import, shall be the sole responsibility of the Contractor.
 - 2. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
 - 3. The City will provide initial testing for trench/structure backfill and embankment compaction.

1.03 REFERENCES

ANSI/ASTM D3740	Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
ANSI/ASTM E329	Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

1.04 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop Work.

1.06 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location adequate samples of materials proposed to be used which require testing, together with proposed mix designs.

- B. Cooperate with laboratory personnel, and provide access to Work and to manufacturer's facilities.
- C. Provide incidental labor and facilities to provide access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
- D. Notify laboratory twenty-four (24) hours prior to expected time for operations requiring inspection and testing services.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 COOPERATION WITH TESTING LABORATORY

- A. Representatives of the testing laboratory shall have access to the work at all times and at all locations where the work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

3.02 TAKING SAMPLES

- B. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

3.03 SCHEDULES FOR TESTING

- A. Establishing Schedule:
 - 1. By advance discussion with the testing laboratory selected by the City, determine the time required for the laboratory to perform its tests and to issue each of its findings.
 - 2. Provide all required time within the construction schedule.
- B. Revising Schedule: When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

- C. Adherence to Schedule: When the testing laboratory is ready to test according to the established schedule, and is prevented from testing or taking specimens due to incompleteness of the work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the City.

3.04 TESTING PROCEDURES

- A. Notification: As an exception to requirements that may be stated elsewhere in the contract, the Engineer shall be given three (3) working days notice prior to each test. The Contractor shall provide all test equipment and personnel and submit written copies of all test results.
- B. 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.
- C. Operational Testing: After all pre-operational tests are satisfactorily completed, Contractor shall perform an operational test. All mechanical and electrical equipment shall be tested by the Contractor to the satisfaction of the Engineer before any facility is put into operation. Tests shall be made to determine whether the equipment has been properly assembled, aligned, adjusted and connected. Any changes, adjustments or replacements required to make the equipment operate as specified shall be carried out by the Contractor as part of the work.

**** END OF SECTION ****

SECTION 01420

ABBREVIATIONS

PART 1 - GENERAL

1.01 SUMMARY

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

1.02 INTERPRETATIONS

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

1.02 ABBREVIATIONS

- A. Association and Reference Standard abbreviations:

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABPA	Acoustical and Board Products Association
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
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
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
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

CBC	California Building Code
CLFMI	Chain Link Fence Manufacturers Institute
CPSC	U.S. Consumer Product Safety Commission
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
FS	Federal Specifications
FTI	Facing Tile Institute
GA	Gypsum Association
IEEE	Institute of Electrical and Electronics Engineers
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
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
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
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
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	compact disc
cfm	cubic feet per minute
Ci	curie or curies
CLSM	Controlled Low Strength Material
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
Inc.	Incorporated
in.	inch, inches
in./sec	inches per second
J	joule or joules

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-ampere
kW	kilowatt or kilowatts
L	liter or liters
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
mm	millimeter or millimeters
mol wt	molecular weight
mol	mole

Mpa	megapascal or megapascals
mph	miles per hour
mR	milliroentgen or milliroentgens
Mrad	megarad or megarads
mV	millivolt or millivolts
MW	megawatt or megawatts
N	new, newton or newtons
No.	number
Nos.	numbers
NRC	noise reduction coefficient
OC	on center
OD	outside diameter
ORP	oxidation-reduction potential
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)
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
SST	stainless steel
STC	Sound Transmission Class
TDS	total dissolved solids
TKN	total Kjeldahl nitroen
TLM	median tolerance limit
TOC	total organic carbon
TOD	total oxygen demand
TS	total solids
TSS	total suspended solids
TVS	total volatile solids
U	U factor
U	Coefficient of Heat Transfer
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 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Requirements Included:

1. Electrical
2. Water
3. Sanitary Facilities
4. Construction Aids
5. Cleaning During Construction
6. Project Identification
7. Security
8. Safety
9. Noise Control

B. Related Requirements:

1. Section 01770: Contract Closeout: Final Cleaning.

1.02 WATER

- A. A single outdoor hose bib is available for use at the Sump 157 Pumping Station. Use of this water source by the Contractor shall be allowed provided it does not interfere with necessary City use at the station. Make additional provisions for water if necessary for construction operations and for testing. The Contractor shall be responsible for all associated costs.

1.03 SANITARY FACILITIES

- A. Sanitary Facilities: The Contractor shall make arrangements for the maintenance of adequate toilet facilities at or near the work site and shall pay the costs thereof.

1.05 CONSTRUCTION AIDS

- A. Provide and operate drainage and pumping equipment as required to maintain excavations and site free of standing water.

1.06 CLEANING DURING CONSTRUCTION

- A. Control accumulation of waste materials and rubbish; periodically dispose of off-site in a location approved by the Engineer.
- B. Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

1.07 TEMPORARY ELECTRICITY

Contractor shall provide temporary power to the worksite as required.
Temporary power shall not be provided by the City or from Sump 157 facility.

1.08 REMOVAL

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of two (2) feet, grade site as indicated. Restore existing facilities used during construction to specified, or to original, condition.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 CONTRACTOR'S PLANT AND EQUIPMENT

- A. **Security:** The Contractor shall be responsible for the security of his plant and equipment at all times. The City will not take responsibility for missing or damaged equipment, tools or personal belongings.
- B. **Workshop and Storage Facilities:** The Contractor shall provide storage facilities for the protection from weather materials and supplies and shall keep the facilities clean and in proper order at all times.
- C. **Parking Facilities:** Parking areas at the project location for the vehicles used by the Contractor's construction employees and his own vehicles shall be as approved by the Engineer.

3.02 GENERAL AND TRENCH SAFETY

- A. The Contractor shall execute and maintain his 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, adequate fume protection; adequate illumination for underground and night operations; instructions 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.

- B. Trench safety shall conform to the provisions of Section 6705 of the Labor Code of the State of California.
- C. 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 during the excavation of such trench. Such plan shall be submitted at least five (5) days before the Contractor intends to begin excavation for the trench and shall show the details of the design of shoring, bracing, sloping or other provisions to be made for worker protection during such excavation. 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, and 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.
- D. 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.

3.03 NOISE CONTROL

- A. Conform to City of Sacramento's Noise Ordinance. Section 66.203 of the ordinance exempts construction noise from the quantitative limits if the construction occurs between 7:00 am and 6:00 pm, Monday through Saturday, and/or between 9:00 am and 6:00 pm Sunday; Operation of internal combustion engines is not exempt pursuant to this subsection if engines are not equipped with suitable exhaust and intake silencers.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

**** END OF SECTION ****

SECTION 01510

MAINTAIN DRAINAGE SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Contractor shall furnish all labor, materials, equipment and incidentals necessary to maintain existing drainage during construction.

1.02 SUBMITTALS

- A. Submit for approval a complete drainage maintenance plan at least fourteen (14) days before starting work, including but not limited to:
1. Temporary drainage/pumping method and facilities schematic drawing
 2. Materials list
 3. Proposed pumping method, if applicable
 4. Proposed controls and pumps, if applicable
- B. The above submittals will be reviewed in accordance with Section 01330 - Submittals. No work shall be undertaken by the Contractor until approval by the Engineer is obtained.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The Contractor shall make all necessary arrangements for pumps, controls, and all necessary appurtenances as required.
- B. The existing drainage system may be used as a part of the temporary drainage system if necessary arrangements are made and submittals approved in accordance with these special provisions.

PART 3 - EXECUTION

3.01 Existing Conditions

- A. The Contractor shall not disrupt the everyday operation of the existing pump station without prior approval by the engineer. The Contractor shall be responsible for maintaining drainage at all times throughout construction. Temporary drainage system shall be in keeping with the requirements of Section 1105, Paragraph 3.06 Erosion and Sediment Control Plan.

3.02 Contractor's Responsibilities

- A. The Contractor shall provide the Engineer with the names and telephone numbers of at least two (2) persons who will be available twenty-four (24) hours each and every day to repair and maintain the temporary pumping system and facilities throughout the Construction.
- B. The Contractor shall defend and indemnify the City from any and all claims resulting from failure of the temporary drainage system.
- C. **Any and all costs incurred by the City or other parties as a result of failure to fulfill the obligations under 3.02, Contractor's Responsibilities, will be charged to the Contractor and shall be withheld from payments due.**

**** 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. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
3. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
4. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.
5. After installation, provide coverings to protect products from damage from traffic and construction operations, remove when no longer needed.
6. 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.
 - d. Products Specified by Naming Several Manufacturers: Products of named manufacturers meeting specifications; no options, no substitutions allowed.
 - e. 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.
 - e. 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.
 - f. Engineer will determine acceptability of proposed substitution, and will notify Contractor of acceptance or rejection in writing within a

reasonable time.

- g. 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.
- h. 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

2.01 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: 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 an 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. 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, 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 01750

TESTING, TRAINING, AND FACILITY START-UP

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Equipment and system testing and start-up, services of manufacturer's representatives, training of City personnel, and final testing requirements for the completed facility.

1.02 CONTRACT REQUIREMENTS

- A. Testing, training, and start-up are requisite to the satisfactory completion of the Contract. Complete testing, training, and start-up within the Contract Time. Allow realistic time frame for testing, training, and start-up activities. Furnish labor, power, chemicals, tools, equipment, instruments, and services required for and incidental to completing functional testing, performance testing, and operational testing. Provide competent, experienced technical representatives of equipment manufacturers for assembly, installation and testing guidance, and operator training.

1.03 START-UP PLAN

- A. Submit start-up plan for each piece of equipment and each system not less than three (3) weeks prior to planned initial equipment or system start-up.
 - 1. Provide detailed information and schedule for the following activities:
 - a. Manufacturer's services
 - b. Installation certifications
 - c. Operator training
 - d. Completion of Operation and Maintenance Manual
 - e. Functional testing
 - f. Performance testing
 - g. Operational testing
- B. Provide testing plan with test logs for each item of equipment and each system when specified. Include testing of alarms, control circuits, capacities, speeds, flows, pressures, vibrations, sound levels, and other parameters.
- C. Provide summary of shutdown requirements for existing systems which are necessary to complete start-up of new equipment and systems.
- D. Revise and update start-up plan based upon review comments, actual progress,

or to accommodate changes in the sequence of activities.

1.04 PERFORMANCE TESTING

- A. Test equipment for proper performance at point of manufacturer of assembly when specified.
- B. When Source Quality Control Testing is specified:
 - 1. Demonstrate equipment meets specified performance requirements.
 - 2. Provide certified copies of test results.
 - 3. Do not ship equipment until certified copies have received written acceptance from Engineer. Written acceptance does not constitute final acceptance.

1.05 GENERAL START-UP AND TESTING PROCEDURES

- A. Mechanical Systems:
 - 1. Remove rust preventives and oils applied to protect equipment during construction.
 - 2. Flush lubrication systems and dispose of flushing oils. Recharge lubrication system with lubricant recommended by manufacturer.
 - 3. Install and adjust packing, mechanical seals, O-rings, and other seals. Replace defective seals.
 - 4. Remove temporary supports, bracing, or other foreign objects installed to prevent damage during shipment, storage, and erection.
 - 5. Check rotating machinery for correct direction of rotation and for freedom of moving parts before connecting driver.
 - 6. Perform cold alignment and hot alignment to manufacturer's tolerances.
 - 7. Adjust v-belt tension and variable pitch sheaves.
 - 8. Inspect hand and motorized valves for proper adjustment. Tighten packing glands to insure no leakage, but permit valve stems to rotate without galling. Verify valve seats are positioned for proper flow direction.
 - 9. Tighten leaking flanges or replace flange gasket. Inspect screwed joints for leakage.
 - 10. Install gratings, safety chains, handrails, shaft guards, and sidewalks prior to operational testing.
- B. Electrical Systems: As specified in Division 16.
- C. Instrumentation Systems: As specified in Division 16.

1.06 FUNCTIONAL TESTING

- A. Functionally test mechanical and electrical equipment for proper operation after

general start-up and testing tasks have been completed.

- B. Verify compatibility of new equipment with existing: Demonstrate proper rotation, alignment, speed, flow, pressure, vibration, sound level, adjustments, and calibration.
- C. The Contractor shall provide the services of a factory-trained, start-up technician for a minimum of two (2) consecutive, eight (8) hour days. The first day will be testing and shall consist of thoroughly checking and inspecting the Trash Rakes after installation; place the units in operation; make necessary adjustments. The second day of testing shall consist of running the Trash Rakes for four (4) hours continuously. Replace parts which operate improperly.
- D. Demonstrate proper operation of each instrument loop function as specified in Division 16 - Electrical.
- E. Vibration testing shall be conducted by the Engineer while the Trash Rake is being operationally tested by Contractor. The drive motor, gear reducer, and sprocket bearing shall be measured for vibration in the X, Y, and Z axis. Maximum allowable vibration shall not exceed a displacement of 0.05 mils peak to peak and velocity of 0.08 inch/second peak.
- F. After completion of installation, the Contractor shall provide for testing of the Trash Rakes to demonstrate that the equipment will pick up and deposit the types of material that will be expected to be screened from the canal.

1.07 CERTIFICATION OF PROPER INSTALLATION

- A. At completion of functional testing, furnish written report prepared and signed by manufacturer's authorized representative, certifying equipment:
 - 1. Has been properly installed, adjusted, aligned, and lubricated.
 - 2. Is free of any stresses imposed by connections or anchor bolts.
 - 3. Is suitable for satisfactory full-time operation under full load conditions.
 - 4. Operates within the allowable limits for vibration.
 - 5. Controls, protective devices, instrumentation, and control panels are properly installed, calibrated, and functioning, as designed.
 - 6. Control logic for start-up, shutdown, sequencing, interlocks, and emergency shutdown have been tested and are functioning, as designed.
- B. Contractor shall co-sign the certification report along with the manufacturer's representative.

1.08 TRAINING OF OWNER'S PERSONNEL

- A. Provide at least four (4) hours of training, at agreed upon times, to designated

Owners personnel in operation, adjustment, and maintenance of products, mechanical, electrical, instrumentation equipment, and installed items. Utilize manufacturer's representatives to conduct training sessions.

- B. Provide operation, maintenance, and overhaul manuals for specific pieces of equipment or systems two (2) weeks prior to training session for that piece of equipment or system.
- C. Satisfactorily complete functional testing before training Owner's personnel.
- D. Schedule training sessions during the hours of Monday – Friday: 7 a.m. to 12 p.m.; and/or 1 p.m. to 3:30 p.m.

1.09 OPERATIONAL TESTING

- A. Conduct operational test of the entire facility after completion of operator training. Demonstrate satisfactory operation of equipment and systems in actual operation. Conduct operational test for continuous seven (7) day period.
- B. Immediately correct defects in material, workmanship, or equipment which became evident during operational test.
- C. Repeat operational test when malfunctions or deficiencies cause shutdown or partial operation of the facility or results in performance that is less than specified.

1.10 RECORD KEEPING

- A. Maintain and submit following records generated during start-up and testing phase of project:
 - 1. Daily logs of equipment testing identifying all tests conducted and outcome.
 - 2. Logs of time spent by manufacturer's representatives performing services on the job site.
 - 3. Equipment lubrication records.
 - 4. Electrical and instrumentation test results as required in Division 16.

**** END OF SECTION ****

SECTION 01780

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 DESCRIPTION

A. Requirements Included:

1. Compilation of product data and related information required for maintenance of products.
2. Preparation of operation and maintenance data and instructions for systems and equipment.

B. Related Requirements:

1. Section 01330 Submittals: Submittals procedures.
2. Section 01770 Contract Closeout: Closeout procedures.
3. Section 01781 Warranties and Bonds.
4. Individual Specifications Sections: Specific requirements for operation and maintenance, and overhaul data.

1.02 QUALITY ASSURANCE

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.03 FORMAT

- A. Prior to system and equipment tests, one (1) complete, bound copy of the data in the form of an instructional manual shall be submitted for approval. Provide six (6) copies of the manual, with all applicable test forms completed, prior to the completion of the contract. One of the six copies shall contain the original documentation/manuals and not photocopies.
- B. Binders: Commercial quality, 8-1/2 X 11 inch three-ring binders with hardback, cleanable, plastic covers; two inch (2") maximum ring size equal to Avery D-Ring

binder model number AVY79-799. When multiple binders are used correlate data into related and consistent groupings. (Fill binders no more than 3/4 full.)

- C. Spine and Cover: Identify each binder with typed or printed title "OPERATION AND MAINTENANCE INSTRUCTIONS": List title of Project and identify subject matter of contents on each.
- D. Arrange content by systems, under section numbers and sequence of Table of Contents of this Project Manual.
- E. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- F. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages. Also include electronic copy of drawings (preferably in latest version of AutoCAD).
- H. Provide one (1) copy of the manual in the listed or newer electronic format. (Text: Microsoft Word/Office 2007 or Adobe format (PDF), and Drawings: AutoCAD/Release 2004 or Adobe format (PDF), all on CD.)

1.04 CONTENTS, EACH VOLUME

- A. Provide a Table of Contents: Provide title of Project; names, contract number, addresses, and telephone numbers of Design Engineer and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
- B. Each Product or System: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Mark each sheet to clearly highlight and identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- F. Warranties and Bonds: Bind in copy of each.

G. Date system or equipment installed.

1.05 MANUAL FOR MATERIALS AND FINISHES

- A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture-protection and Weather-exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: As Specified in individual Specifications sections.
- E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Provide operation and maintenance, and overhaul manuals in conformance with Section 01330 and the requirements herein. Include instruction for all seasonal maintenance.
- B. Use operation and maintenance manuals as basis for training of Owner's personnel.
- C. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during any training of Owner's personnel.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)

**** 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, storage, and disposal 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. Protect trees and plants from damage.

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 PREPARATION

- A. Contractor shall hold a field meeting at the existing sump site prior to beginning demolition work. Meeting shall cover the Contractors procedures for removal and transportation of salvaged items. Attendees shall include as a minimum: Tim Giffin (916) 808-7997, Vernon Fields (916) 808-5542, and Bruce Baker (916) 808-5651 of the Department of Utilities, Plant Services Division. Contractor shall give attendees forty-eight (48) hours notice in advance of said field meeting.
- B. If required, remove items scheduled to be salvaged for City and place in designated storage area.

3.03 DEMOLITION

- A. Concrete to be removed shall include all existing channel lining as shown in the Plans. Break all concrete to be removed into sections less than three feet (3') in any dimension.
- B. Protect adjacent fencing exposed by demolition work. Match existing fence when placing new fence.
- C. Make neat saw cuts a minimum of one inch (1") in depth, around perimeter of Portland cement concrete or asphaltic concrete to be removed, where remaining

concrete surface is to be incorporated into new work. Where new asphalt paving is to match existing asphalt paving, sawcut existing pavement to a neat straight line and apply a tack coat of asphaltic emulsion to the surface of the existing pavement prior to placing new asphalt paving.

3.04 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 8:00AM and 3:00 PM. The Contractor shall contact Tim Giffin at (916) 808-7997 or Vern 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.

3.05 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.
- B. Debris Control: Debris shall be removed and transported in a manner as to prevent spillage on streets or adjacent areas. Local regulations regarding hauling and disposal apply.

**** END OF SECTION ****

SECTION 02240
CONTROL OF WATER

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope: This section provides specifications for dewatering systems and appurtenances to be used during construction including those for maintaining drainage flows throughout the project.
1. Contractor shall furnish, install, operate, and maintain sufficiently sized water control equipment that will maintain excavations free of water, regardless of source, until backfilled to final grade or relined with concrete(drainage channel).
 1. The Contractor shall comply with all federal, state, and local laws and regulations concerning environmental pollution arising from construction activities.

1.02 SUBMITTALS

- A. Before any diversion and/or dewatering is commenced, the Contractor shall submit the methods, installation, and details of the proposed systems for review and approval. Groundwater dewatering to construct the pier mattress footing in the channel is not expected to be required. Should dewatering become necessary, a plan shall be submitted to the City for approval and should contain the following information:
1. Sizes of pumps, discharge piping, and piping appurtenances.
 2. The personnel responsible for monitoring the dewatering system and dewatered excavations.
 3. Provisions to confine fuel and oil spills in the event of their occurrence.
 4. Plans to segregate construction water (contaminated with form oils, concrete residues, etc.) from clean water.
 2. Plans to dispose of the construction water and residue solids.
 3. Supporting design documentation.

PART 2 – PRODUCTS(NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall furnish, install, operate, and maintain all machinery, appliances, and equipment to maintain all excavations free from water during construction, and shall dewater and dispose of the water so as not to cause injury to public or private property, or to cause a nuisance or menace to the public.
- B. The control of groundwater shall be such that softening of the bottom of excavations, or formation of "quick" conditions or "boils," does not occur. Dewatering systems shall be designed and operated so as to prevent removal of the natural soils. Dewatering shall allow the required compaction of the subgrade to the values specified.
- C. Dewatering systems shall operate continuously until backfill has been completed to one foot (1') above the normal groundwater level and all sources of water entering the excavation have stopped and all water has been removed.
- D. Contractor shall be fully responsible and liable for damages which may result from failure to adequately keep excavations dewatered or to maintain drainage flows.

3.02 DISPOSAL OF WATER

- A. Contractor shall dispose of water resulting from the dewatering operation in a suitable manner without damage to adjacent property. Only clean, uncontaminated water resulting from the dewatering operation shall be pumped into any existing waterway.

**** END OF SECTION ****

SECTION 02250

SHEETING, SHORING AND BRACING

PART 1 - GENERAL

1.01 SCOPE

- A. This section specifies requirements for sheeting, shoring and bracing of trenches and excavations greater than five feet (5') in depth.

1.02 REFERENCES

- A. This section references the following documents. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
CAL OSHA	<i>State of California Construction Safety Orders California State Labor Code</i>

1.03 DESIGN REQUIREMENTS

- A. The Contractor shall design sheeting, shoring, and bracing in accordance with Article 6 of *CAL OSHA* and the *California State Labor Code*. The standards of design referred to in the Labor Code shall be those of CAL OSHA. The shoring procedure designed by the Contractor shall be suitable for the site subsurface conditions and project operational constraints.

1.04 SUBMITTALS

- A. Contractor shall submit information required by Section 6705 of the California State Labor Code to the Engineer in accordance with Section 01330, Submittals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Construction of sheeting, shoring and bracing shall not disturb the state of soil adjacent to or below the trench or excavation.

**** END OF SECTION ****

SECTION 02315

EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Contractor shall furnish all labor, materials, equipment and incidentals necessary to perform all excavation, backfill, grading, and compaction, regardless of type or class, that is required to complete the work shown on the drawings and specified herein. The work shall include, but not necessarily be limited to: clearing; excavation for structures, footings, fence posts, hand holes, pull boxes, duct, conduit, pipe, and paving; backfilling; filling; embankment construction; grading; disposal of surplus and unsuitable materials; and all related work such as dust control, sheeting, shoring, bracing, and control of water.
- B. Related Work:
1. Section 01410 - Quality Control
 2. Section 02240 - Control of Water
 3. Section 02250 - Sheeting, Shoring, and Bracing
 4. Section 02740 - Paving and Gravel Surfacing

1.02 DEFINITIONS

- A. Relative compaction: The measured field dry density divided by the maximum dry density determined in accordance with ASTM D1557, expressed as a percentage.
- B. Prepared Subgrade: Any excavated or graded surface formed as the result of work by the Contractor upon which any fill, aggregate base, sand, gravel, structure, or other material is to be placed.

1.03 REFERENCE 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. Unless otherwise indicated, the latest edition of referenced publications in effect at the time of the bid shall govern.

American Society of Testing Materials (ASTM)	
ASTM D1557	Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using a 10-lb Rammer and 18-inch Drop
ASTM D2487	Test Method for Classification of Soils for Engineering Purposes
ASTM D2922	Density of Soil and Soil Aggregate in place by Nuclear Methods
ASTM D3017	Moisture Content of Soil and Soil Aggregate in Place by Nuclear Methods
ASTM D4318	Liquid Limit, Plastic Limit and Plasticity Index of Soils
State of California - Department of Transportation	
Caltrans	1992 Standard specifications
City of Sacramento	
CSSS	Standard Specifications, latest edition

1.04 SUBMITTALS:

A. Submit the following for approval in accordance with Section 01330, SUBMITTALS:

1. Test Reports of measured fill/ backfill/ or embankment density, moisture, and relative compaction.
2. Samples and index property test results indicating conformance with the specifications of each imported material and any embankment fill material proposed for use. Contractor shall notify the Engineer of the source of the material and shall furnish for approval to the inspector a representative sample weighing approximately 50 pounds, at least 10 calendar days prior to the date of anticipated use of such material.

PART 2 - PRODUCTS

2.01 GENERAL

A. Materials shall be furnished as required from on site sources or hauled to the site from offsite sources.

2.02 ENGINEERED FILL

A. Engineered fill shall be used for general structural backfill, channel bottom, and trench backfill. Material shall consist of soil excavated on site or hauled in from

offsite sources. Material shall be substantially well graded from coarse to fine with no gap or uniform grading of any particular size particle, and shall be free of organic material, wood, trash, peat and other objectionable material which cannot be compacted properly. Engineered fill shall not contain stones, broken concrete, masonry, rubble or other similar material larger than 2-inches in any dimension. Material used must be acceptable to the Engineer.

2.03 EMBANKMENT FILL

- A. Embankment fill shall be used for structural backfill for each bridge abutment and raising the access road grade to meet the elevation of the asphalt paving at the bridge entry point. Material shall consist of soil excavated on site or hauled in from offsite sources. Material shall be classified as either an SM, SC, ML, CL, or mixtures thereof per ASTM D 2487. Material shall contain not less than 15 nor more than 45 percent by weight passing the No. 200 mesh sieve, and, per ASTM D 4318, a plasticity index of not less than 7 and a liquid limit of not more than 45. Embankment fill shall not contain stones, broken concrete, masonry, rubble or other similar material larger than 1-inch in any dimension. Submit sample and index test results for approval. Material used must be acceptable to the Engineer.

2.04 SAND

- A. Sand shall be used for handholes, pull boxes, duct and pipe bedding in conformance with applicable sections of the CSSS and the details on the drawings.
- B. Sand shall be unwashed river-type, clean and free of organic material, trash, peat, and other objectionable material conforming to the following gradation:

Sieve Size	% Passing
No. 4	100
No. 8	80 - 100
No. 100	0 - 35
No. 200	0 - 8

2.05 PEA GRAVEL

- A. Pea gravel may be used as an alternative to sand for bedding and cover, provided that it is clean, free-draining, and conforms to the following gradation:

Sieve Size	% Passing
1/2 inch	100
3/8 inch	80 - 100
No. 200	0 - 5

2.06 DRAIN ROCK

- A. Drain rock shall be 1-inch maximum, clean, free draining gravel or crushed rock conforming to the following gradation:

Sieve Size	% Passing
3/4 inch	90 - 100
1/2 inch	30 - 60
3/8 inch	0 - 20
No. 4	0 - 5
No. 200	0 - 2

- B. Drain rock shall have a minimum sand equivalent of 50, and the material retained on the 3/8 inch sieve shall contain at least 50% of particles having three or more fractured faces.

2.07 CRUSHED ROCK

- A. Crushed rock shall meet the specifications for course crushed screenings as described in Caltrans Section 37-1.02, and the following gradation:

Sieve Size	% Passing
3/4 inch	100
1/2 inch	95 - 100
3/8 inch	50 - 80
No. 4	0 - 15
No. 8	0 - 5
No. 200	0 - 2

- B. Crushed rock shall have a minimum sand equivalent of 30.

2.08 AGGREGATE BASE

- A. Conform to the requirements for Class II aggregate base, 3/4" maximum aggregate size in accordance with CSSS Section 10-7.

PART 3 - EXECUTION

3.01 GENERAL EARTHWORK REQUIREMENTS

- A. Perform clearing, grubbing, and tree removal in accordance with CSSS Section 12. Construction, including excavation, backfill, compaction, dewatering, and bracing systems, shall conform to the plans and these specifications.
- B. Neither the elevation of the bottom of any completed excavation nor the top layer of any compacted graded surface material shall vary more than +0.08 or -0.08 feet respectively from the elevations indicated in these specifications or on the drawings.
- C. Control water in accordance with Section 02240 of these specifications. If in the opinion of the Engineer, the surface of the prepared subgrade is not in suitable condition at any time due to failure of the Contractor to properly care for, dewater, or otherwise conduct earthwork operations properly, then the Contractor shall remove the unsuitable material and replace it with material compacted to at least 90 percent relative compaction at his own expense. The condition of the prepared subgrade shall meet with approval of the Engineer before any work is placed thereon.

During earthwork operations, surface grades shall be maintained in such condition that work areas, as much as practicable, will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the prosecution of the work.

3.02 EXCAVATION

- A. Excavate to the lines and grades shown or required to complete the construction. Make allowance for forms, supports, etc. If over-excavation occurs due to Contractor error, at any foundation, or where proposed structures will bear thereon, or at the bottom of any channel, over-excavated areas will be filled to finish subgrade with Controlled Density Fill, properly leveled to finish lines and grades.
- B. Side slopes of excavations shall be no steeper than the safe stable slope for the soils encountered. Refer to Section 02250, SHEETING, SHORING, AND BRACING. If at the time of excavation it is not possible to place material in its

intended permanent location, then the material shall be stockpiled in approved areas for later use. No extra payment will be considered for stockpiling or double handling of excavated material.

3.03 TRENCH EXCAVATION AND BACKFILL

- A. Trench excavation and backfill for laying pipe shall be in accordance with Section 26 of CSSS and these specifications. Excavation for all trenches required for the installation of ducts and handholes shall be made to the depths indicated on the Drawings.
- B. Shape excavated trench bottom to assure uniform contact with the full length of the installed line and remove any sharp edged materials that might damage the line. Compaction shall be maintained beneath the line. Place initial backfill by hand placement around the utility to just over half depth, and compact in a manner to insure against lateral or vertical displacement. Place initial backfill to 6 inches above the utility line by hand placement. Compact backfill above the initial backfill to at least 90 percent relative compaction.

3.04 PLACEMENT OF GEOTEXTILE FABRIC

- A. Refer to Section 02620, GEOTEXTILES. Where geotextile fabrics are placed under aggregate beneath structures, unless otherwise directed, the geotextile shall extend up the sides of the excavation and wrap atop the aggregate, and be extended at least one foot back under the bottom of the structural slab so as to encase the aggregate.

3.05 PLACEMENT OF ENGINEERED FILL AND EMBANKMENT FILL

- A. Engineered fill shall be spread in layers and shall have a uniform moisture content that will provide the specified dry density after compaction. Embankment fill shall be placed at a moisture content at least 2 percent wet of optimum. If necessary to obtain uniform distribution of moisture, water shall be added to each layer by sprinkling and the soil disced, harrowed, or otherwise manipulated after the water is added. The loose layer thickness of the fill material shall not exceed eight inches and each layer shall be compacted with suitable compaction equipment to provide the specified dry densities.
- B. No fill shall be placed during weather conditions for which the Contractor cannot insure the specified compaction. After placing operations have been stopped because of adverse weather conditions, no additional fill material shall be placed until the last layer compacted has been checked and found to be compacted to the specified density.
- C. Independent testing may be made on each layer to assure adequate compaction throughout the entire area. If the dry densities are not satisfactory to the

Engineer, the Contractor will be required to increase the weight of the compactor or the number of passes as required to produce the specified densities.

- D. Backfill shall not be placed against walls until the concrete has obtained a compressive strength equal to the specified 28 day compressive strength. Where backfill is to be placed on both sides of the wall, the backfill shall be placed simultaneously on both sides to prevent differential pressures. The Contractor shall submit a schedule of wall shoring, bracing, and backfilling that is coordinated with the concrete curing, test cylinder reports, and the design assumptions, and obtain approval from the Engineer prior to proceeding.

3.06 COMPACTION:

- A. Embankment Fill, Engineered Fill, Backfill, and Trench Backfill shall be compacted to at least 90 percent relative compaction.
- B. The uppermost 0.5-feet of the prepared subgrade beneath all paving and/or gravel surfacing placed this contract, whether in an excavated, original grade, filled, or backfilled area, shall be compacted to at least 95 percent relative compaction.
- C. Do not place any form work, concrete, or surfacing material until underlying compaction tests are satisfactory to the Engineer.

3.07 GRADING AND SURFACE FINISH WORK:

- A. Grading shall be performed at such places as are required to obtain the final lines, grades and elevations shown on the Drawings. All unacceptable material encountered, of whatever nature within the limits of grading, shall be removed and disposed off site.
- B. All fill slopes shall be compacted by slope rolling and trimming, or shall be overfilled and trimmed back to planned grade, to expose a firm, smooth surface free of loose material.
- C. Prepare landscaped areas for proper planting of previously removed plants or new plants. Remove trench and backfill materials from adjacent areas to permit unhindered growth of plants. Replace all damaged existing plant material to original or better condition. Planted areas that do not reestablish at the commencement of the next growing season shall be replaced at Contractor's cost.
- D. Cleanup: Prior to final inspection and acceptance, remove all rubbish and excess material for disposal as approved, and leave area in a neat, satisfactory condition.

3.08 DISPOSAL

- A. All surplus excavated and imported material not utilized in the construction shall be removed and disposed of offsite.

3.09 DUST CONTROL

- A. Contractor shall provide dust control during excavation and backfill operations. At least one mobile unit with 1,000 gallon capacity shall be available for applying water or dust palliative in accordance with Section 18 of the Caltrans Standard Specifications. Dust control mobile unit shall have a positive shut off valve, and shall apply water or palliative with pressure type distribution nozzles to insure uniform application. The amount of dust control shall be to the satisfaction of the Engineer.

3.10 TESTING:

- A. Refer to Section 01410, Quality Control. The City will pay for initial compaction testing during placement of embankment and backfill materials, but the Contractor shall pay for all additional tests required until compliance is obtained. Remove surface material at locations designated by the Inspector and provide such assistance as necessary for sampling and testing by the testing laboratory.

****END OF SECTION****

SECTION 02740

PAVING AND GRAVEL SURFACING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work

Contractor shall furnish all labor, materials, equipment, and incidentals necessary to construct all paving and gravel surfacing shown on the drawings, and/or specified herein. The work shall include, but not necessarily be limited to preparing the subgrade, placing and compacting aggregate base, saw cutting existing pavement, applying paint binder, placing and compacting asphalt concrete, applying seal coats, and all related work.

Areas to receive gravel surfacing shall be prepared, then aggregate base material placed and compacted as specified herein for paving, except that no paint binder or paving shall be placed.

Related Work Specified In Other Sections

1. Section 01410 - Quality Control
- Section 02315 - Earthwork

1.02 SUBMITTALS

A. The following information shall be submitted for approval in accordance with the General Conditions and Section 01330, SUBMITTALS.

1. Manufacturer's Data:
 - a. Aggregate base
 - b. Paint binder
 - c. Asphalt concrete mix design

A certificate of compliance, signed by the manufacturer, shall be furnished prior to the use of any project site asphalt materials. The certificate shall state that the furnished materials will comply with the requirements of these Specifications.

A delivery ticket that clearly identifies the product and quantity of each lot of material shall accompany each load delivered to the site. Unless requested earlier by the Engineer, retain the delivery tickets until the end of the job.

1.03 REFERENCE PUBLICATIONS

Caltrans (State of California, Department of Transportation):	
--	Standard Specifications (July 1992)
--	Standard Plans (July 1992)
American Society for Testing and Materials (ASTM):	
D 1557	Test Methods for Moisture-Density Relations of Soil and Soil-Aggregate Mixtures
D 2041	Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.
D 2922	Density of Soil and Soil Aggregate In-Place by Nuclear Methods
D 3017	Moisture Content of Soil and Soil Aggregate In-Place by Nuclear Methods

PART 2 – PRODUCTS

2.01 ENGINEERED FILL

Engineered fill shall be as specified in Section 02315 of these Specifications.

2.02 AGGREGATE BASE

Aggregate base shall be as specified in Section 02315 of these Specifications.

2.03 PAINT BINDER

Paint binder (tack coat) shall meet all the requirements of Caltrans Specification Section 94.

2.04 ASPHALT CONCRETE

- A. Asphalt concrete shall be commercially available material that meets the performance and grading requirements for Type A Asphalt Concrete (½ inch maximum, medium grading) as specified in Caltrans Standard Specification Section 39-2. Unless otherwise approved, the bitumen content shall be between 4.8 and 7.0 percent. A job mix formula will not be required provided that the

material conforms to the requirements herein, and the mix design to be used has been approved by the City, County of Sacramento, or Caltrans, for placement on any project constructed within the last three years in Sacramento County.

- B. Asphalt shall conform to the requirements of Caltrans Standard Specification Section 92-1.02 for viscosity grade AR 4000 steam-refined paving asphalt.

2.05 HEADER BOARD

Header board, where installation is required, shall consist of continuous pressure treated douglas fir 2 x 4 attached to 18-inch pressure treated douglas fir 2 x 4 stakes at 4 feet on center.

2.06 SLURRY SEAL

Slurry seal shall conform to CSSS Section 23-3.

PART 3 – EXECUTION

3.01 SUBGRADE PREPARATION

- A. The uppermost 0.50 feet of all existing subgrade that will underlie aggregate base placed this contract, shall be cleared and stripped, and then scarified to a depth of at least six (6) inches, moisture conditioned as required, and compacted to a relative compaction of not less than ninety-five percent (95%) in accordance with Section 02315.
- B. Wherever engineered fill material is to be placed under paved or gravel surfaced areas, it shall be placed and compacted to a relative compaction of not less than ninety percent (90%) to within the top six (6) inches and ninety-five percent (95%) for the top six (6) inches in accordance with Section 02315.

3.02 CLASS 2 AGGREGATE BASE

- A. Class 2 aggregate base shall be placed to a depth as shown on the Plans and in these Specifications. Placement, moisturizing, spreading, and compaction of Class 2 aggregate base shall meet all requirements of Caltrans Standard Specification Sections 26-1.03 through 26-1.05, CSSS Specification Section 17-1, and the details on the drawings. Class 2 aggregate base shall be compacted to not less than ninety –five percent (95%) of maximum dry density.

3.03 PRIME COAT AND PAINT BINDER (TACK COAT)

- A. After the sub-base and aggregate base are placed, compacted, and tested, to the satisfaction of the Engineer, the prime coat and tack coat shall be applied in accordance with Caltrans Standard Specification Section 39-4.02. Prime coat shall not be required atop aggregate base unless specifically called for on the plans.

3.04 ASPHALT CONCRETE

- A. Place asphalt concrete where shown on the drawings, and to at least the minimum thicknesses indicated. Storing, proportioning, mixing, spreading, and compacting asphalt concrete shall conform to the requirements of Caltrans Standard Specification Sections 39-3 through 39-7, and CSSS Section 22.

3.05 SLURRY SEAL

- A. Place slurry seal where shown on the drawings in accordance with CSSS Section 23.

3.06 HEADER BOARD

- A. Header board shall not be required unless specifically called for in the Plans. Place header board at the limit of paving not abutting a concrete structure or saw cut line where it is specifically shown or called for on the drawings.

3.07 FINAL GRADING

- A. The final grade of asphalt concrete and gravel surfacing shall vary not more than ± 0.05 foot from the elevations indicated on the drawings, and shall conform to the requirements of Caltrans Standard Specification Section 39-6. All areas shall be graded to drain.

3.08 TESTING

- A. The City will perform the initial field testing for density, moisture, and compaction of asphalt and aggregate base. The Contractor shall pay for re-testing of locations failing to meet the specified compaction in the initial test.

**** END OF SECTION ****

SECTION 02820

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included

1. Chain Link Fence Fabric and Posts
2. Excavation for Post Bases
3. Concrete Anchorage for Posts
4. Chain Link Gates and Related Hardware

B. Related Work

1. Section 01330: Submittals
2. Section 03300: Cast-in-Place Concrete

1.02 REFERENCE 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. Chain Link Fence Manufacturers Institute (CLFMI) Product Manual.
2. ASTM A120 - Black and Hot Dip Zinc Coated (Galvanized) Welded and Seamless Steel Pipe.
3. ASTM A121 - Specification for Galvanized Steel Barbed Wire
4. ASTM C94 - Ready - Mixed Concrete.
5. ASTM C150 - Specification for Portland Cement.
6. ASTM A386 - Zinc coating (Hot-Dip) on Assembled Steel Products.
7. ASTM A123 - Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, and Bars, and Strip.
8. ASTM A392 - Specification for Zinc-coated Steel Chain Link Fence Fabric.
9. CSSS Sections 31 and 10-38 Fencing, Chain Link.
10. ASTM F537 - Specification for Design, Fabrication, and Installation of Fences Constructed of Wood and Related Materials.
11. ASTM F567 - Standard Practice for Installation of Chain-Link Fence.
12. State spec. Section 80-4 - Chain Link Fence.

1.03 SUBMITTALS

- A. Submit for approval in accordance with Section 01330: SUBMITTALS.
- B. Erector Qualifications
 - 1. List of ten chain link fence installations in Northern California. Include job location, name and phone number of Owner's project administrator.
- C. Manufacturer's Data
 - 1. Framework (rail, post and gate).
 - 2. Chain Link Mesh and vinyl slats.
 - 3. Barbed wire and support arms.
 - 4. Gate hardware.

PART 2 - PRODUCTS

2.01 CHAIN LINK MATERIALS

- A. Conform to CSSS Section 10-38, except as modified herein. For associated items not specified, conform to State spec. Section 80-4, and/or the requirements for Standard Industrial Chain-Link fence in accordance with the CLFMI Product Manual and ASTM F 567.
- B. Fabric: Selvage shall be twisted top and knuckled bottom.
- C. Cap and Support Arm: Combination post cap and barbed wire support arm shall be hot dip galvanized steel sized to post dimension, retained to the posts with powder actuated Hilti or comparable stainless steel fasteners.
- D. Barb Wire: Provide class 3 zinc coated 12.5 gage wire with four point round 14 gage barbs at 5-inch spacing in accordance with ASTM A121.

2.02 CONCRETE MIX

- A. Concrete: Conform to the requirements of ASTM C94, normal Portland cement, 2000 psi @ 28 days, 3 inch maximum slump.

PART 3 - EXECUTION

3.01 CHAIN LINK INSTALLATION

- A. Chain link fence shall be constructed as shown on the Plans and in accordance with City Standard Detail CE 11 and Section 31, except as modified herein. Unless otherwise directed in writing by the Engineer, chain link fences shall be constructed with 72-inch high fabric topped with three stands of equally spaced barbed wire attached to 45-degree post top mounted breakaway arms for a total fence height of seven (7) feet. Provide standard commercial grade locking

latches for use with padlocks on all gates, and provide 3/8" diameter U-bolts welded (1/4" fillet weld) to gate posts and gate frame for backup chain and lock. For items not specified herein or in CSSS Section 31, conform to the applicable requirements from State spec. Section 80-4, and/or the requirements for Standard Industrial Chain-Link fence in accordance with the CLFMI Product Manual and ASTM F 567.

- B. All chain link fence fabric shall be supported with a bottom rail, and a top tension wire.
- C. Set post to within 6 inches from bottom of concrete footing. Set top of footing at post 2 inches above finished grade. Slope top of concrete for water runoff.
- D. Unless otherwise approved, fabric is to be fastened to line posts and rails with 9 gauge galvanized tie wires, and to tension wires with 9 gauge hog rings spaced approximately fourteen inches (14") apart.
- E. Position bottom of fabric 2 inches above finished grade.
- F. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
- G. Install gates using fabric to match fence. Install 3 hinges per leaf, latch, catches, foot bolts and sockets, retainer and locking clamp. Provide concrete center rest and drop bolt retainers at center of double gate openings.
- H. Install center brace rail on all gate leaves.

****END OF SECTION****

SECTION 03200
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 DESCRIPTION: Provide reinforcing steel as shown on the Plans.

A. Related Work:

1. Section 01330 - Submittals
2. Section 03100 - Concrete Formwork.
3. Section 03300 - Cast-in-Place Concrete.

1.02 REFERENCE 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 publications at the time of bid shall govern.

B. American Concrete Institute (ACI) Standard

ACI 318	Building Code Requirements for Reinforced Concrete.
ACI SP-66	ACI Detailing Manual.

C. American Welding Society (AWS):

AWS D 12.1	Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction.
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D. City of Sacramento Standard Specifications (CSSS):

Section 10-23	Reinforcing Steel
Section 21	Placing Steel Reinforcement

E. Concrete Steel Reinforcing Institute (CRSI):

1MSP	Manual of Standard Practice(1997)
1SPLBK	Reinforcement Anchorages and Splices(1997)
1DET	Reinforcing Bar Detailing(2000)

1.03 SUBMITTALS

A. Shop Drawings:

1. Reinforcing Steel: Before starting concrete work, submit shop drawings in accordance with Section 01330-SUBMITTALS. Comply with requirements of ACI 318, ACI SP-66, CRSI 1MSP, CRSI 1SPLBK, and CRSI 1DET. Show bar size, dimensions, bends, placing, and construction joint details. Submit drawing showing locations of any construction joints not shown on the plans. Maximum submittal drawing size shall be 22-inches by 34-inches. Submit type, size, and location of all slab and bar supports. Hooks, lap splices, bends and offsets shall be in accordance with the drawings. Obtain approval before shop fabrication.

B. Certificates of Compliance:

1. Submit Certificate of Compliance stating that reinforcement complies with specified requirements. Reinforcing steel shall be properly identified. Contractor shall bear costs for test of steel by an approved laboratory if the reinforcing steel is not properly identified.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Conform to CSSS Section 10-23 except as modified herein. All materials covered by this Section shall be manufactured in the United States.
- B. Supports for reinforcing bars: Galvanized steel chairs and accessories or plastic coated units for work exposed to view, weather, or moisture so that finished surfaces will not be marred or stained; use precast concrete only (no metal), suitably sized for load distribution, in slabs-on-grade. Use no supports of wood or other cellulose material. Do not expose supports or accessories to view in architectural concrete.

PART 3 - EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Prior to installation of reinforcing steel work, Contractor shall inspect surfaces to receive work, and arrange for satisfactory correction of defects in workmanship and material that could have adverse affect on reinforcing steel work.

3.02 FABRICATION AND DELIVERY

- A. General: Conform to CSSS Section 21 except as modified herein.
- B. Bending and Forming: Fabricate indicated size bars into shapes and lengths shown on approved shop drawings by methods not injurious to materials. Do not heat reinforcement for bending. Bars with kinks or bends not in schedule will be rejected.
- C. Marking and shipping: Bundle reinforcement and tag with suitable identification to facilitate sorting and placing, and transport and store at site so as not to damage material.

3.03 INSTALLATION

- A. General: Conform to CSSS Section 21, CRSI 1MSP, and CRSI 1PLACE except as modified herein.
- B. Reinforcement Welding: Where reinforcement welding is approved by the Engineer, perform welding by direct electric arc process, with trained and experienced certified operators. Conform to AWS D12.1. Use low-hydrogen electrodes. Do not tack weld reinforcing bars.
 - 1. Preparation: Clean surfaces to be welded of loose scale and all foreign material. Clean welds each time electrode is changed. Chip burned edges clean before welds are deposited.
 - 2. Characteristics of welds: When brushed with wire brushes, completed welds shall exhibit uniform section, smoothness of welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion with penetration into base metal. Cut out welds, or parts of welds found defective, and replace with proper welds.
- C. Concrete pours: At each location during concrete placing, inspect reinforcement and maintain bars in correct positions. Templates to maintain the correct position of reinforcing may be required. Contractor shall install templates, if required by the inspector, at no additional cost to the City.
- D. Contractor shall receive approval in writing from the Engineer of all reinforcing work prior to ordering concrete for placement.

****END OF SECTION****

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Scope of Work:

1. Unless otherwise directed, provide concrete as specified herein.
2. The flatcars will be delivered with a 3/8" steel decking, Nelson Studs, and an angle iron enclosure installed for placement of the concrete surface to be placed by the Contractor.

B. Related Work:

1. Section 01330 - Submittals
2. Section 03200 - Concrete Reinforcement.

1.02 REFERENCE 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 publications in effect at the time of bid shall govern.

B. American Concrete Institute (ACI) Standard:

ACI SP-15	Field Reference Manual: Standard Specifications for Structural Concrete with Selected ACI and ASTM references.
ACI 211	Recommended Practice for Selecting Proportions for Concrete.
ACI 301	Structural Concrete for Buildings.
ACI 302	Guide for Concrete Floor and Slab Construction.
ACI 304	Recommended Practice for Measuring, Mixing and Placing Concrete.
ACI 305	Hot Weather Concreting.
ACI 306	Cold Weather Concreting.
ACI 309	Consolidation of Concrete.

ACI 318	Building Code Requirement for Reinforced Concrete, with Commentary.
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C. American Society for Testing and Materials (ASTM) Standards:

ASTM C 31	Method of Making and Curing Concrete Test Specimens.
ASTM C 33	Concrete Aggregates.
ASTM C 39	Compressive Strength of Cylindrical Concrete Specimens.
ASTM C 94	Ready Mixed Concrete.
ASTM C 143	Slump of Portland Cement Concrete.
ASTM C 150	Portland Cement.
ASTM C 171	Sheet Materials for Curing Concrete.
ASTM C 172	Method of Sampling Freshly Mixed Concrete.
ASTM C 192	Making and Curing Concrete Test Specimens in the Laboratory.
ASTM C 227	Test for Potential Alkali Reactivity of Cement-Aggregate Combinations.
ASTM C 231	Air Content of Freshly Mixed Concrete by the Pressure Method.
ASTM C 260	Air Entraining Admixture for Concrete.
ASTM C 289	Test of Potential Reactivity of Aggregates.
ASTM C 295	Petrographic Examination of Aggregates.
ASTM C 309	Liquid Membrane Forming Compounds for Curing Concrete.

ASTM D 98	Calcium Chloride.
ASTM D 1785	Poly (Vinyl Chloride) PVC Plastic Pipe, Schedules 40, 80 and 120.

D. City of Sacramento Standard Specification (CSSS):

Section 10	Construction Materials.
Section 20	Concrete in Structures.

1.03 CONDITIONS

- A. Notes: Notes pertaining to concrete on the Plan sheets are a part of these Specifications.
- B. Testing: Comply with the General and Special Conditions.

1.04 SUBMITTALS

A. MANUFACTURER'S DATA

- 1. Proposed mix designs, including admixtures
- 2. Curing Material

B. Certificates:

- 1. Submit Certificate of Compliance that concrete meets the specified requirements.
- 2. Delivery tickets for all concrete delivered to the project site.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Portland cement: ASTM C150, Type II or Type III.

- 1. Concrete: Standard gray cement. Use same brand for surfaces not to be painted.

B. Water: Clean and free of substances injurious to concrete.

C. Aggregate:

- 1. Do not use aggregates that are alkali reactive when tested by ASTM

C227, C289, or C295.

2. Unless otherwise noted, maximum coarse aggregate size shall be 1½-inches for walls and slabs greater than or equal to 12-inches thick, and 1-inch for walls and slabs less than 12 inches thick.
 3. Provide hard, washed, fine and coarse aggregates conforming to ASTM C33, including requirements for sampling and testing, except that loss after 500 revolutions in Los Angeles machine shall not exceed 40%. Limit material finer than No. 200 sieve to a maximum of 3% of the fine aggregate.
- D. Non-shrink grout: Master Builders premixed "Embeco", Burke's "Metallic Grouting Compound"; Sonneborn-Desoto "Ferrolith-G", or approved equal.
- E. Curing materials:
1. Liquid curing compound: ASTM C309, Type 1 (Clear) containing a fugitive dye.
 2. Sheet material: Double-layered, reinforced, stain proof, waterproofed Kraft paper, ASTM C171, regular type.
- F. Admixtures:
1. General: Provide only as indicated below. Submit manufacturer's data for admixtures, and use only those approved by Engineer. Use shall be in accordance with the manufacturer's recommendations.
 2. Water reducing: "Plastocrete", Sika Chemical Corporation; "WRDA with Hycol", W.R. Grace, or approved equal. Conform to ASTM C49A, Type A. Use in all mixes.
 3. Retarding: "Plastiment", Sika Chemical Corporation, or approved equal. Use for hot weather concreting only.
- G. Concrete overlay bonding materials: Burke Acrylic Bondcrete or equal.
- H. Preformed expansion joint filler: Conform to CSSS 10-4.

2.02 DESIGN OF MIXES

- A. General: The Contractor shall be responsible to design concrete mixtures resulting in the required 28-day compressive strength and other required characteristics. An approved laboratory shall design all mixes. Comply with ACI 211 "Recommended Practice for Selecting Proportions for Concrete" and ACI 304 "Recommended Practice for Measuring, Mixing and Placing Concrete" to

produce plastic, workable mixture suitable for concrete work indicated, which will develop required compressive strengths, as indicated.

- B. Mix for conduit encasement: Concrete mix shall be Class D and contain a minimum of 5 sacks (470 pounds) of Portland cement per cubic yard. The maximum water/cement ratio shall be 0.50. The Contractor shall add red oxide, in the amount of 5 lbs. per cubic yard, to all concrete used for conduit encasement.
- C. Mix for structures, antenna foundations, generator pads, building foundations and housekeeping pads, retaining walls, bridge decks, and footings: Concrete mix shall be Class B and contain a minimum of 6 sacks (564 pounds) of Portland cement per cubic yard. The compressive strength at 28 days shall be 4,000 psi. The maximum water/cement ratio shall be 0.50.
- D. The maximum slump for concrete shall be 4 inches. Not including the concrete for the bridge deck, a tolerance of one inch above the maximum slump will be allowed, provided that the average of all batches is less than the specified maximum slump. Batches of concrete with slumps in excess of those specified will be rejected if their frequency of occurrence is excessive or the Contractor fails to take corrective action to reduce their occurrence. No water shall be added to the approved mix after batching except as approved by the Engineer.
- E. Batching and mixing: Use transit-mixed concrete from approved batch plant. Batching, mixing, and transportation of concrete shall conform to ASTM C94.

PART 3 - EXECUTION

3.01 GENERAL

- A. Conform to CSSS Section 20, unless otherwise directed. There will be no separate payment for concrete in structures.

3.02 REPAIRS AND PATCHING

- A. General: Patch defective areas immediately following form removal. Remove honeycombed and other defective concrete to sound concrete, but not less than 1" deep. Make the walls of the cut area perpendicular to the surface. Do not feather out the edges. Dampen the patch area and the adjacent area six (6) inches around the patch area.
- B. Exposed concrete: For exposed concrete prepare a patching mortar of one part portland cement adjusted to match the color of the surrounding concrete and 2-1/2 parts sand with the least water required to produce a workable mass. Rework this mortar until it is the stiffest consistency that will permit placing.

Brush the patch area with a bond of neat cement and water paste and apply patching mortar when the water sheen is off the bond. Strike off the mortar slightly higher than the surrounding surface, let set for one hour and finish flush with the surrounding surface. Tie holes shall be cleaned, dampened and filled solid with the above specified patching mortar.

3.03 CURING AND PROTECTING

- A. General: Do not use any curing method which will be incompatible with the specified applied finishes.
- B. Conform to CSSS Section 20-13. Unless otherwise directed, curing compound may be used on concrete exposed to the air. Avoid curing compound runoff into flowing water in the adjacent drainage channel.

****END OF SECTION****

SECTION 03370

AIR-BLOWN MORTAR (SHOTCRETE)

PART 1 - GENERAL

1.01 DESCRIPTION

A. SCOPE OF WORK:

1. The Contractor shall furnish all materials, labor, equipment, and all incidentals necessary to construct the air-blown mortar channel lining as indicated on the drawings and specified herein.

B. RELATED WORK:

1. Section 01330: SUBMITTALS
2. Section 02315: EXCAVATION AND BACKFILL
3. Section 03300: CAST-IN-PLACE CONCRETE

1.02 REFERENCES

- A. City of Sacramento Department of Public Works: City Standard Specifications (CSSS).

1.03 SUBMITTALS

- A. The following shall be submitted: Data on the type of cement, proportion of cement and sand, and the method of mixing and placing the mortar.

PART 2 - MATERIALS

2.01 GENERAL

- A. Materials shall be per Section 33 of the CSSS. Reinforcement shall be as indicated on the drawings.

PART 3 - EXECUTION

3.01 GENERAL

- A. Air-blown mortar placement and curing shall be per Section 33 of the CSSS and as specified herein.

3.02 PLACEMENT AND THICKNESS

- A. Lining shall be placed to the limits indicated on the drawings and the appearance shall be neat and uniform.

- B. The surfaces of those areas to be lined shall be evenly graded to the lines and grade and sections as indicated on the drawings. The surfaces shall be moistened thoroughly to prevent moisture from being drawn from the freshly placed lining. All surfaces on which lining is to be placed shall be free from water, mud and debris, and shall be firm enough to prevent contamination of the fresh lining by earth or other foreign material.

3.03 REINFORCEMENT

- A. The welded wire fabric reinforcement (6 x 6 10/10 gauge minimum) shall be embedded in the concrete so that it will be a minimum of one inch clear from either face of the concrete unless otherwise noted. Concrete dobies shall be used to maintain the correct height of the reinforcement during shotcrete application.

3.04 CONSTRUCTION JOINTS

- A. Construction joints shall be square, and shall be edged with a 1/4-inch radius edging tool. The edge shall be thoroughly wetted before the next section of lining is place. Construction joints shall be constructed whenever the operation is halted for a period exceeding thirty (30) minutes. Welded wire fabric reinforcing shall extend through the construction joint.

3.05 EXPANSION JOINTS

- A. Transverse expansion joints shall be constructed at intervals of twenty (20) feet and as located on the drawings. Expansion joints shall be filled with premolded expansion joint filler material. The material shall have a minimum thickness of 3/8 inch and shall conform to ASTM Designation D1751. Expansion joints shall be edged with a 1/4-inch radius edging tool.

3.06 CONTRACTION JOINTS

- A. Transverse contraction joints shall be constructed at intervals of ten (10) feet and shall be scored by troweling a groove 5/8 inch in depth and 1/4 inch in width. All joints shall be true to a uniform line and neat in appearance.

3.07 FINISHING

- A. Air-blown mortar channel lining shall be placed as early as practicable to prevent damage to the lining subgrade material. The fresh surface shall be checked with a minimum ten (10) foot length straight-edge, and all low spots or depressions shall be filled to finish grade. The finished surface shall be smooth and uniformly constructed with a finish equivalent to a broomed concrete surface.

****END OF SECTION****

SECTION 05080

MECHANICAL ZINC COATING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section specifies mechanically applied zinc coating. This coating shall be used on steel fasteners including brackets, bolts, screws, nuts and washers. Electroplated corrosion protection is not an acceptable substitute for mechanical zinc coating.

1.02 QUALITY ASSURANCE

- A. ZINC COATING THICKNESS: Coating thickness shall be Class 50 as specified in ASTM B695.

1.03 REFERENCES

- A. This section contains references to the following documents. They are a part of this section as specified and modified. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

References	Title
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM B695	Coatings of Zinc Mechanically Deposited on Iron and Steel

1.04 SUBMITTAL

- A. Submittals shall be provided in accordance with Section 01330, and shall include the following information.
1. Describe materials and method of coating used.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The coating material shall be as specified in ASTM A153.

PART 3 - EXECUTION

3.01 FIELD REPAIR

- A. Damaged surfaces of zinc coated metals shall be repaired as specified in Section 05910.

****END OF SECTION****

SECTION 05090

WELDING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Unless otherwise approved or directed, perform all required project welding as specified herein.
- B. Related Work:
1. Section 05505: Miscellaneous Metal Work
- C. Definitions:
1. Definitions shall be in accordance with AWS A3.0.
 2. Symbols shall be in accordance with AWS A2.4 for welding and nondestructive testing, respectively, unless otherwise indicated.

1.02 REFERENCES

- D. The following references are a part of this section as specified and modified. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

AISC - 1999	LRFD Specification for Structural Steel for Buildings (with Commentary & Errata Incorporated as of September 4, 2001)
ANSI Z49.1-1973	Safety in Welding and Cutting
AWS A2.4-79	Symbols for Welding and Nondestructive Testing
AWS A3.0-80	Welding Terms and Definitions
AWS A5.18-69	Specifications for Carbon Steel Filler Metals for Gas Shielded Arc Welding
AWS D1.1-82	Structural Welding Code - Steel
MIL-W-8611A	Welding, Metal Arc and Gas, Steels and Corrosion and Heat Resistant Alloys
MIL-STD-1261A	Welding Procedures for Constructional Steels
MIL-STD-248C	Qualification Tests for Welders (Other than Aircraft Weldments)
MIL-STD-22D	Welded Joint Design

1.03 QUALITY ASSURANCE

A. Erector/Fabrication Qualification

1. Each welder and welding operator assigned to work on this contract shall be qualified in accordance with the applicable requirements of AWS D1.1, MIL-STD-248C and as specified herein. Welders and welding operators who make acceptable procedure qualifications test welds will be considered qualified for the welding procedure used.
2. Each welder or welding operator shall be assigned an identifying number, letter or symbol which shall be used to identify all welds made by him.
 - a. The Engineer may, at his discretion, require welders and welding operators assigned to the project to identify their completed weldments with their identifying number, letter or symbol.
 - b. For identification of welds, either written records indicating the location of welds made by each welder, welding operator or tacker shall be submitted or each welder, welding operator or tacker shall apply his symbol adjacent to the weld by means of a rubber stamp or felt-tipped marker and waterproof ink or other methods that do not result in an indentation in the metal.
 - c. In the case of seam welds, the identification mark shall be adjacent to the weld at three (3) foot intervals. Identification by the use of die stamps or electric etchers shall not be allowed.
3. Re-qualification of a welder or welding operator shall be required under any of the following conditions:
 - a. The welder or welding operator has not used the specific welding process for which he is qualified for a period exceeding six (6) months.
 - b. There is specific reason to question his ability to make welds that meet the requirements of these specifications.
 - c. The welder or welding operator was qualified by an employer other than those firms performing work under this contract and a qualification test has not been taken within the preceding twelve (12) months.

B. Welding Operations:

1. This section covers structural welding and mechanical welding. Welding

shall be performed where indicated on the contract drawings, on approved shop drawings, and in other sections of the specifications. Unless otherwise indicated on the drawings or in other sections of the specifications, the design of welded connections shall conform to the applicable requirements of AISC Specification for the nondestructive Design, Fabrication and Erection of Structural Steel for Buildings.

2. Material with welds will not be accepted unless the welding is specified or indicated on the drawings or otherwise approved. Welding shall be in accordance with the requirements are shown on the drawings or are specified in other sections.
3. Welding shall not be started until welding procedures, welders, welding operators have been qualified as specified herein. Qualification testing shall be performed at or near the work site. Each Contractor performing welding shall maintain records, readily available for examination by the Inspector, of the test results obtained in welding procedure, welder, welding operator performance qualifications.
4. Welding procedures, welders, welding operators previously qualified by test may, at the discretion of the Engineer, be accepted for this contract without re-qualification provided that all of the following conditions are fulfilled:
 - a. Copies of the welding procedure specifications, the procedure qualification test records, and the welder and welding operator qualification test records are submitted and approved by the Engineer in accordance with the requirements for shop drawings.
 - b. Testing was performed by an approved testing laboratory, technical consultant, or the Engineer's approved quality control organization.
 - c. The qualified welding procedure conforms to the applicable requirements of this specification and is applicable to welding conditions encountered under this contract.
 - d. The welder and welding operator qualification tests conform to the requirements of this specification and are applicable to welding conditions encountered under this contract.
 - e. Renewal of Qualification shall be met. Records showing period of employment, name of employer where welder or welding operator was last employed, and the process for which qualified shall be submitted as evidence of conformance.

C. Allowances Tolerances:

1. Dimensional tolerances for welded construction and quality of welds shall be in accordance with the applicable requirements of the AWS D1.1 and the contract drawings, and to the satisfaction of the Engineer.
2. Welding miscellaneous steel supports is structural welding and shall be subject to ten percent (10%) random inspection.
3. Structural welding shall be subject to twenty percent (20%) nondestructive inspection.

D. Source Quality Control:

1. The Contractor shall be responsible for the quality of all welding and joint preparation. Each person responsible for inspection and testing shall be qualified in accordance with this section as applicable and shall be knowledgeable of the specification requirements.
2. The services of a qualified commercial inspection or testing laboratory or technical consultant, approved by the Engineer shall be employed by the Contractor for the purpose of making twenty percent (20%) nondestructive inspection of all structural and mechanical welding, ten percent (10%) random inspection, of the structural welds on miscellaneous steel supports. Unacceptable welds shall be repaired by the Contractor at no additional expense to the Owner.
3. Prior to assigning any welder or welding operator tacker to work under this contract, the Contractor shall submit the names of the welders and welding operators to be employed on the work together with certification that each individual is qualified as specified herein. The certification shall state the type of welding and positions for which he is qualified, and the firm and individual certifying the qualification tests.

1.04 SUBMITTALS

A. Shop Drawings:

1. Submit a complete list of equipment and materials, including manufacturer's descriptive and technical literature, catalog cuts, and erection installation details.
2. Shop drawings shall show sizes, arrangement and methods of fabrication and installation.
3. Furnish equipment layout showing structural members and points of welding. Also furnish any other details required to demonstrate that the system has been coordinated and will properly function.

B. Welders Certificates:

1. Current welders certificates for each welder on this job.

C. Manufacturer Data: Weld filler metal.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Comply With Pertinent Parts of the General and Special Conditions:

1. Delivery of steel shall be made in accordance with ASTM A 700.
2. All equipment placed in storage shall be protected from the weather, humidity and temperature variations, dirt, dust, and other contaminants.
3. Items deformed so as to preclude satisfactory assembly shall not be used, and upon rejection, shall be removed for the site and replaced with acceptable items at the expense of the Contractor.

PART 2 - PRODUCTS

2.01 WELDING MATERIALS

C. All items of equipment for welding, electrodes, welding wire, and fluxes shall be capable of producing satisfactory welds when used by a qualified welder or welding operator using qualified welding procedures. All welding materials shall comply with the applicable requirements of AWS D1.1.

2.02 WELD FILLER METAL

B. Shall conform with AWS A5.18.

PART 3 - EXECUTION

3.01 WELDING OPERATIONS

A. Workmanship and techniques for welded construction shall be in conformance with the applicable requirements of the AISC-1999 LRFD Specification for Structural Steel for Buildings, and of AWS D1.1. In case of conflict between AWS D1.1 and the AISC specification, the requirements of AWS D1.1 shall govern.

B. When inspection or testing indicated defects in the weld joints, the welds shall be repaired by the Contractor using a qualified welder or welding operator. Corrections shall be in accordance with the applicable requirements of AWS D1.1 and as herein specified.

**** END OF SECTION ****

SECTION 05100
STRUCTURAL METALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. This Section specifies structural metals consisting of standard shapes, fasteners, rods and plates that are used in structural supports and connections.

B. Related Work Specified in Other Sections

Section 01330: Submittals
Section 05090: Welding

1.02 REFERENCE PUBLICATIONS

- A. This section contains references to the following documents. They are a part of this section as specified and modified. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section shall prevail.

Reference	Title
AISC	American Institute of Steel Construction, Manual of Steel Construction, Load & Resistance Factor Design
ASTM A36/A36M	Structural Steel
ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
ASTM A283/A283M	Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars
ASTM A307	Carbon Steel Externally Threaded Standard Fasteners
ASTM A320/A320M	Alloy-Steel Bolting Materials for Low Temperature Service
ASTM A500	Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A666	Austenitic Stainless Steel, Sheet, Strip, Plate and Flat Bar for Structural Applications
AWS-B3.0	Welding Procedures and Performance Qualifications
AWS-D1.1	Structural Welding Code--Steel

1.03 QUALITY ASSURANCE

A. General

1. Structural assemblies and shop and field welding shall meet the requirements of the AISC Manual of Steel Construction.
2. The use of salvaged, reprocessed or scrap materials shall not be permitted.

1.04 SUBMITTALS

- A. Submittals shall be provided in accordance with Section 01330 SUBMITTALS.
- B. Detailed shop drawings of steel frame component parts of all structures. Submittals shall include the location, type and size of all bolts and welds. All welds shall be indicated by standard welding symbols of the AWS. The member cambers shall be indicated on the drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Steel

- 1. Materials for structural metals shall be as specified below.

Material	Specification
Standard rolled steel sections	ASTM A36
Pipe columns	ASTM A53, Grade B
Structural steel tubing	ASTM A500, Grade B
Structural bars, plates, and similar items	ASTM A36 or A283
Stainless steel	ASTM A666, Grade A, type 304 or Type 316
Stainless steel bolts, nuts, and washers	ASTM A320, type 316
Steel bolts	ASTM A307, Grade A

2.02 FABRICATION

- 1. Fabrication shall be in accordance with the AISC Manual of Steel Construction.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General

1. Measurements shall be verified at the job.
2. Holes shall be punched 1/16 inch larger than the nominal size of the bolts, unless otherwise specified. Whenever needed, because of the thickness of the metal, holes shall be subpunched and reamed or drilled. No drifting of bolts or enlargement of holes will be allowed to correct misalignment. Mismatched holes shall be corrected with new material.
3. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings or isolators. Aluminum in contact with concrete or grout shall be protected with a heavy coat of bituminous paint.
4. Metalwork to be embedded in concrete shall be as specified in Section 03300. Metalwork shall be placed accurately and held in correct position while the concrete is placed or, if specified, recesses or blockouts shall be formed in the concrete after design strength is attained, and the metalwork shall be grouted in place in accordance with Section 03300. The surfaces of metalwork in contact with or embedded in concrete shall be thoroughly cleaned.
5. Structural steel completely encased in concrete shall not be painted, and shall have a clean surface for bonding to concrete. Metalwork which is bent, broken or otherwise damaged shall be repaired or replaced by the Contractor.

B. Welding

1. Welding shall conform to Section 05090, Welding.

C. Bolted Connections

1. Bolted connections shall conform to AISC Framed Beam Connections and shall be bearing type connections with threads excluded from shear planes.

3.02 CORROSION PROTECTION

- A. Unless otherwise specified, all structural metal and structural steel, including that used in the fabrication of process equipment, shall be coated in accordance with Section 09900. Surface preparation shall be as specified in Section 09900 and shall include the following operations:
 - B. Grind the exterior and interior edges of all flame-cut plates or members to a smooth

surface.

- C. Grind all sharp edges off of sheared plates and punched holes.
- D. Grind uneven or rough welds with high beads to a smooth finish.

3.03 CLEANING

- A. After installation, damaged surfaces of shop primed metals shall be cleaned and touched up with the same material used for the shop coat. Damaged surfaces of galvanized metals shall be repaired as specified in Section 05910 Hot-Dipped, Zinc-Coated.

**** END OF SECTION ****

SECTION 05451

ANCHOR BOLTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section specifies anchor bolts complete with washers and nuts. Unless otherwise specified, anchor bolts shall be hot-dip galvanized or type 304 stainless steel and shall conform to the equipment manufacturer's recommendations.

1.02 REFERENCES

- A. This section contains references to the following documents. They are a part of this section as specified and modified. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ANSI A58.1	Minimum Design Loads for Buildings and Other Structures
ASTM A36/A36M	Structural Steel
ASTM A307	Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
ASTM A320/A320M	Alloy-Steel Bolting Materials for Low Temperature Service
UBC-97	Uniform Building Code

1.03 SUBMITTALS

- A. Submittals shall be provided in accordance with Section 01330 for all bolt systems not cast-in-place and shall include the following information:

1. Data indicating load capacities.
2. Chemical resistance.
3. Temperature limitations.
4. Installation instructions.
5. Evaluation Report for expansion and wedge type anchors as specified in paragraph 3.04.
6. Design calculations in accordance with Paragraph 2.03.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Anchor bolt holes in equipment support frames shall not exceed the bolt diameters by more than 25 percent, up to a limiting maximum oversizing of 1/4 inch. Unless otherwise specified, minimum anchor bolt diameter shall be 1/2 inch.
- B. Tapered washers shall be provided where mating surface is not square with the nut.
- C. Expansion, wedge, or adhesive anchors set in holes drilled in the concrete after the concrete is placed will not be permitted in substitution for anchor bolts except where otherwise specified. Upset threads shall not be acceptable.

2.02 MATERIALS

- A. Anchor bolt materials shall be as specified below.

Material	Specification
Steel bolts	ASTM A307, Grade A
Fabricated steel bolts	ASTM A36
Stainless steel bolts, nuts, washers	ASTM A320, Type 304 ^a
Expansion anchors	HILTI-BOLT, McCulloch Industries, or equal
Wedge anchors	ITT, Phillips Drill Co., or equal.
Adhesive anchors	HILTI-HVA, PARABOND Capsule, or equal
Headed anchor stud	Nelson Stud or equal ^a Use Type 316 where specified.

2.03 DESIGN

- A. Anchor bolts for equipment frames and foundations shall be designed in accordance with UBC for seismic zone 3, I = 1.5.

PART 3 - EXECUTION

3.01 GENERAL

- A. Fieldwork, including cutting and threading, shall not be permitted on galvanized items. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings or isolators. Grouting of anchor bolts with nonshrink or epoxy grouts shall be in accordance with the bolt manufacturer's recommendations.

3.02 CAST-IN-PLACE ANCHOR BOLTS

- A. Anchor bolts to be embedded in concrete shall be placed accurately and held in correct position while the concrete is placed or, if specified, recesses or blockouts shall be formed in the concrete and the metalwork shall be grouted in place in accordance with Section 03300. The surfaces of metalwork in contact with concrete shall be thoroughly cleaned.

- B. After anchor bolts have been embedded, their threads shall be protected by grease and the nuts run on.

3.03 ADHESIVE ANCHOR BOLTS

- A. Use of adhesive or capsule anchors shall be subject to the following conditions:
 - 1. Approval from Engineer for specific application and from supplier of equipment to be anchored, if applicable.
 - 2. Anchor diameter and grade of steel shall be per contract documents or per equipment supplier specifications. Anchor shall be threaded or deformed full length of embedment and shall be free of rust, scale, grease, and oils.
 - 3. Adhesive capsules of different diameters may be used to obtain proper volume for the embedment, but no more than two capsules per anchor may be used. When installing different diameter capsules in the same hole, the larger diameter capsule shall be installed first. Any extension or protrusion of the capsule from the hole is prohibited.
 - 4. All installation recommendations by the anchor system manufacturer shall be followed carefully, including maximum hole diameter.
 - 5. Holes shall have rough surfaces, such as can be achieved using a rotary percussion drill.
 - 6. Holes shall be blown clean with compressed air and be free of dust or standing water prior to installation.
 - 7. Anchor shall be left undisturbed and unloaded for full adhesive curing period.
 - 8. Concrete temperature (not air temperature) shall be compatible with curing requirements of adhesives per adhesive manufacturer. Anchors shall not be placed in concrete below 25 degrees F.

3.04 EXPANSION ANCHORS

- A. Use of expansion or wedge type anchors shall be subject to subparagraph conditions 1, 2, 4, 5, and 6 as specified in Paragraph 3.03A hereinbefore.
- B. The Contractor shall supply the Engineer with the current evaluation report from the International Conference of Building Officials for the particular brand of expansion anchors to be used.

**** END OF SECTION ****

SECTION 05505

MISCELLANEOUS METALS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Furnish all labor, materials, equipment and incidentals required and install all miscellaneous metals as shown on the drawings and specified herein.

B. Related Work:

1. Section 01330: Submittals
2. Section 05090: Welding
3. Section 05100: Structural Metals
4. Section 09900: Painting

1.02 COORDINATION

- A. The work of this section shall be completely coordinated with the work of other sections. Verify at the site both the dimensions and work of other trades adjoining items of work in this section before fabrication and installation of items herein specified.
- B. Furnish to the pertinent trades all items included under this section that are to be built into the work of other sections.

1.03 SUBMITTALS

- A. Manufacturer's certificate of compliance shall be submitted for approval on all materials and manufactured products provided under this specification.
- B. Shop drawings shall be submitted for approval in accordance with Section 01330: SUBMITTALS. Also submit for approval catalog cuts, templates and erection and installation details, as appropriate, for all miscellaneous metal items. Submittals shall be complete in detail; shall indicate thickness, type grade, class of metal and dimensions; and shall show construction details, reinforcement, anchorage and installation with relation to the structure of which they are part.

1.04 REQUIREMENTS

- A. General: The Contractor shall verify all measurements and shall take all field

measurements necessary before fabrication. Welding to or on structural steel shall be in accordance with Section 05090: WELDING. Items specified to be galvanized, shall be hot-dip processed after fabrication. Galvanizing shall be in accordance with ASTM A123, A153, A386 and A525, as applicable.

- B. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included.
- C. All bolts, anchors, supports, braces, connection and other items necessary for completion of the miscellaneous metal work shall be provided. Necessary lugs and brackets shall be provided so that the work can be assembled in a neat and substantial manner. Holes for bolts and screws shall be drilled or punched. Burning of holes is prohibited. Poor matching of holes shall be cause for rejection. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall give ample strength and stiffness. Joints exposed to the weather shall be formed to exclude water.
- D. Dissimilar Materials: Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, the surfaces shall be protected with a coat of bituminous paint conforming to MIL-C 18484 or to TT-V-51 or a coat of zinc chromate primer conforming to TT-P 645 to prevent galvanic or corrosive action.
- E. Workmanship: Miscellaneous metal work shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean, true lines and surfaces. Welding shall be continuous along the entire area of contact (except where tack welding is specifically shown on the drawings). Exposed connections of work in place shall not be tack welded. Exposed welds shall be ground smooth. Exposed surfaces for work in place shall have a smooth finish, and exposed riveting shall be flush. Where tight fits are required, joints shall be milled to a close fit. Corner joints shall be coped or mitered, well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Work shall be executed and finished in accordance with approved drawings, cuts and details.
- F. Qualifications of Welders: Welding to or on structural steel or miscellaneous items of structural steel such as lintels and ladders shall be performed by certified welders qualified in accordance with Section 05090: WELDING using procedures, materials and equipment of the type required for the work.
- G. Anchorage: Anchorage shall be provided where necessary for fastening miscellaneous metal items securely in place. Anchorage not otherwise specified or indicated shall include slotted inserts or expansion shields; toggle bolts and

through bolts for masonry; machine and carriage bolts for steel; through bolts, lag bolts, and screws for wood. Slotted inserts shall be of types required to engage with the anchors. Do not use power driven fasteners on this job.

- H. Galvanized Materials: Unless otherwise indicated or approved, all exposed ferrous metal and structural steel shall be hot-dipped galvanized. Fabricated items shall be ground smooth at welded joints, edges, and corners and galvanized after fabrication.

Other items to be galvanized shall include, but not necessarily be limited to, the following:

1. All steel hardware, nuts, bolts, washers, anchors, and threaded rods, except as noted, or which are of stainless steel material.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Conformance to Requirements: Materials shall conform to the requirements specified for the particular item; and where these requirements are not specified in detail, the materials shall be suitable for the intended usage of the item. The materials listed below shall conform to the respective specifications and other requirements as designated below:

1. Stainless steel bars, plates, bolts and nuts shall conform to ASTM A193 Type 316.
2. Structural carbon steel for riveted, bolted, or welded work shall conform to ASTM A36.
3. Steel pipe for structural use shall conform to ASTM A53.
4. Structural steel tubing for riveted, bolted or welded work shall conform to ASTM A500 or A501.
5. Cover plates shall be raised pattern A36 steel, galvanized after fabrication.
6. Steel nuts and bolts shall conform to ASTM A307.
7. Washers: Circular washers shall be flat and smooth and conform to ANSI B27.2, Type A. Beveled washers for American Standard beams and channels shall be square or rectangular, shall taper in thickness and shall be smooth. Washers shall conform to FF-W-84. Flat washers shall be suitable for the use intended.

2.02 FABRICATED ITEMS

- A. Miscellaneous Plates and Shapes: Miscellaneous plates and shapes for items that do not form a part of the structural steel framework, such as miscellaneous mountings, base plates and frames, shall be provided to complete the work.

2.03 CASTINGS

- A. All casting shall be sound and free from shrinkage cracks, blow holes and other defects. All fins and burnt sand must be removed. Excessive porosity and spongy surfaces will constitute causes for rejection. The Engineer shall be final judge as to whether the defects present are sufficient to cause rejection.
- B. No welding or patching of defects in castings will be permitted unless authorized by the Engineer. Any such welding or patching done without the Engineer's consent shall be cause for rejection.
- C. All casting shall be true to form and dimensions shown on the drawings. After inspection and prior to shipping, all machined surfaces shall be coated with a blue rust inhibitive lacquer, or other approved materials which can be easily removed, unless otherwise specified.
- D. The dimensions of the finished castings shall not be less than the specified dimensions. Castings shall not be more than seven and one-half (7-1/2) percent overweight. Large casting shall be suspended and hammered over their entire area. No cracks, flaws, or other defects shall appear after such hammering.
- E. Castings shall be provided with adequate, continuous fillets cast in place in all re-entrant angles. The radius of curvature of the exposed surface of a fillet shall define the size of the fillet. The size of fillets shall not be less than one-half (1/2) of the thickness of the thinnest adjoined member nor less than one-half (1/2) inch long.
- F. Iron castings shall be dipped or painted with asphalt, which will form a tough, tenacious, non-scaling coating which does not have a tendency to become brittle when cold or sticky when hot.

PART 3 - EXECUTION

3.01 FABRICATION

- A. All miscellaneous metal work shall be formed true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture and free from defects impairing strength of durability.

3.03 SHOP CLEANING

- A. Steel and iron work shall be cleaned by power wire brushing, or other approved manual or mechanical means, for removal of all rust, loose paint, scale and deleterious substances. Cleaned surfaces which become contaminated with rust, dirt, oil, grease or other foreign matter, shall be washed with solvents until thoroughly clean. The cleaning of steel to be embedded in concrete shall not be required.

3.04 PAINTING

- A. Painting shall conform to the requirements of Section 09900.

3.05 GALVANIZING

- A. All steel is to be galvanized unless indicated otherwise. Galvanizing shall be performed by the hot-dip process after fabrication into the largest practical sections. The galvanizing shall conform to the requirements of ASTM A123. Fabrication shall include all operations such as shearing, punching, forming, bending, welding, riveting, etc. When it is necessary to straighten any sections after galvanizing, such work shall be performed without damage to the spelter coating. For those parts to be painted after galvanizing, do not apply any after galvanizing treatment.
- B. Small structural steel or cast steel articles, such as bolts, nuts, washers, and similar articles that are to be galvanized, shall be galvanized after fabrication in accordance with the requirements of ASTM A153.

3.06 INSTALLATION

- A. Contractor shall be responsible for installation of all miscellaneous metalwork. Items to be attached to concrete after such work is completed shall be installed in accordance with the details shown. All dimensions shall be verified at the site before fabrication is started. All installation shall be done in a workmanlike manner and be set true and plumb and in accordance with the Drawings and this specification.

****END OF SECTION****

SECTION 05520

HANDRAILING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section specifies prefabricated welded galvanized steel handrailing.

1.02 QUALITY ASSURANCE

A. GENERAL:

1. Handrailing shall conform to the standards of the Occupational Safety and Health Administration (OSHA) and the Uniform Building Code.

- B. REFERENCES: This section contains references to the following documents. They are a part of this section as specified and modified. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Reference	Title
ASTM A320/	Alloy-Steel Bolting Materials for A320M Low-Temperature Service
ASTM A53	Pipe, Steel, Black and Hot-Dipped Zinc Coated (Galvanized) Welded and Seamless, for Ordinary Uses

1.03 SUBMITTAL

- A. GENERAL: The following information shall be submitted for review in accordance with Section 01330:

B. MANUFACTURER'S DATA

1. Handrail tubing, fittings and fasteners
2. Handrail installation instructions

C. SHOP DRAWINGS

1. Handrail erection drawings, indicating component details, materials, finishes, connection and joining methods, and the relationship to adjoining work.

PART 2 - PRODUCTS

2.01 MATERIALS

	Material	Component
1.	Steel, ASTM A53	ASTM A53-88a
2.	Bolts, nuts and washers	ASTM A320, type 304 or 305

2.02 FABRICATION

A. GENERAL:

1. Pipe cuts shall be clean, straight, square and accurate for minimum joint gap. Work shall be done in conformance with the handrail manufacturer's instructions. Work shall be free from blemishes, defects, and misfits of any type which can affect durability, strength, or appearance.
2. Handrailing shall be connected by screws or bolts. Holes shall be punched 1/16 inch larger than the nominal size of the bolts, unless otherwise specified. Wherever needed because of the thickness of the metal, holes shall be subpunched and reamed or drilled. Handrail components with mismatched holes shall be replaced. No drifting of bolts nor enlargement of holes will be allowed to correct misalignment.

B. STEEL HANDRAILS

1. Steel handrails shall be 1-1/2 inch black steel pipe made by welding. Rails, posts, stanchions, and specials shall be hot-dipped galvanized and painted after fabrication.
2. Toeboards shall be provided where specified on the drawings. Toeboards shall be three inch (3") steel channel with a minimum thickness of 3/16 inch and shall be bolted to the vertical railing supports. Toeboards shall be designed to allow for thermal contraction and expansion.

PART 3 - EXECUTION

- A. Handrailing shall be as specified on the drawings. Measurements for railings shall be field-verified before fabrication.
- B. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings, or isolators. Aluminum in contact with concrete or grout shall be protected with a heavy coat of bituminous paint.

- C. Metal to be embedded in concrete shall be placed accurately and held in correct position while the concrete is placed. Recesses or blockouts shall be formed in the concrete, and the metalwork shall be grouted in place after concrete has attained its design strength in accordance with Section 03300: Cast-In-Place Concrete.

****END OF SECTION****

SECTION 05525

METAL STAIRS AND SAFETY TREADS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured steel stairs.
2. Handrails and railings attached to metal stairs.
3. Metal safety treads.

B. Related Sections:

1. Section 03300, "Cast-in-Place Concrete" for concrete fill
2. Section 05520, "Handrailing"
3. Section 05090, Welding
4. Section 09900, "Painting"

1.2 REFERENCES

- A. ASTM A36/A36M-96: Specification for Carbon Structural Steel
- B. ASTM A53-96: Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- C. ASTM A123-89a: Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- D. ASTM A153/A153M-95: Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- E. ASTM A366/A366M-96: Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality
- F. ASTM A500-93: Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
- G. ASTM A563-94: Specification for Carbon and Alloy Steel Nuts
- H. ASTM A569/A569M-96: Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip, Commercial Quality
- I. ASTM A570/A570M-95: Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality

- J. ASTM A611-94: Specification for Steel, Sheet, Carbon, Cold-Rolled, Structural Quality
- K. ASTM A653/A653M-96: Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- L. ASTM A786/A786M-93: Specification for Rolled Steel Floor Plates
- M. ASTM B633-85 (Reapproved 1994): Specification for Electrodeposited Coatings of Zinc on Iron and Steel
- N. ASTM C1107-91a: Specification for Packaged Dry, Hydraulic-Cement Grout (Nonsrink)
- O. ASTM E488-96: Test Method for Strength of Anchors in Concrete and Masonry Elements
- P. ASTM E894-88 (Reapproved 1993): Test Method for Anchorage of Permanent Metal Railing Systems and Rails for Buildings
- Q. ASTM E935-93: Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings
- R. ASTM E985-96: Specification for Permanent Metal Railing Systems and Rails for Buildings
- S. AWS D1.1-96: Structural Welding Code--Steel
- T. AWS D1.3-89: Structural Welding Code--Sheet Steel

1.3 PERFORMANCE REQUIREMENTS

- A. Performance requirements: Stair manufacturer shall engineer and fabricate stairs and railings to comply with requirements of the following, when installed:
- B. Structural Performance: Provide metal stairs and railings capable of withstanding the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections.
 - 1. Treads and Platforms:
 - a. Uniform load of 200 lbf/sq. ft.
 - b. Concentrated load of 500 lbf on an area of 4 sq. in.
 - 2. Stair Framing:
 - a. Tread and platform loads
 - b. Railing system loads.

3. Limit deflection of stair members to L/240.
4. Top Rail:
 - a. Concentrated load of 200 lbf applied at any point and in any direction.
 - b. Uniform load of 40 lbf/ft. applied horizontally and concurrently with uniform load of 40 lbf/ft applied vertically downward.
5. Handrails:
 - a. Concentrated load of 200 lbf applied at any point and in any direction.
 - b. Uniform load of 40 lbf/ft. applied horizontally and concurrently with uniform load of 40 lbf/ft. applied vertically downward.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data substantiating compliance with drawings and specifications.
- B. Shop Drawings: Submit shop drawings for stairs and railings. Include plans, sections, elevations and details. Show connection and accessory items, indicate field welds. Show locations for anchor and bolt installation.
 1. Include design loads, structural calculations and material properties. Shop drawings shall be signed and sealed by a Professional Engineer licensed in California.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have produced the types of stair and railing systems required for not less than ten (10) years, with not less than five (5) similar projects that have been in successful use for not less than five (5) years.
- B. Manufacturer Qualifications: A firm experienced in manufacturing metal stairs similar to those indicated for this project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Installer Qualifications: Minimum five (5) years experience in the successful installation of steel stair and railing systems of the type indicated for this project.
- D. Applicable Standards:
 1. NAAMM Stair Standard: "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual,"
 2. AWS D1.1 "Structural Welding Code - Steel", AWS D1.3 "Structural Welding Code – Sheet Steel" and AWS "Welding Procedure and Performance Qualification".
 3. NOMMA "Guideline 1 - Joint Finishes", December 1994.

1.6 WARRANTY

- A. Provide manufacturer's written warranty that its standard products are free from defects in material and workmanship for the life of the facility and agreeing to repair or replace items, proven to be defective, or refund the purchase price of the item.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. **Acceptable Manufacturers:** Drawings and specifications are based on products of American Stair Corporation. Provide the specified products included in this specification.
- B. **Substitutions:** For use of other potentially equivalent products, Contractor shall submit information to the Engineer per the requirements of Section 01330 of these Special Provisions.

2.2 MATERIALS

- A. **Steel Plates, Shapes, and Bars:** ASTM A36.
- B. **Steel Tubing:** Cold-formed steel tubing complying with ASTM A500.
- C. **Galvanized Steel Sheet:** ASTM A653, G90 coating, either commercial quality or structural quality, Grade 33.
- D. **Welding Rods and Bare Electrodes:** Select according to AWS specifications for metal alloy welded.
- E. **Bitumastic Coating:** Material shall be Kop-coat, bitumastic black solution, Porter, Tarmastic No. 100, Tnemec 449 heavy-duty black, or equal.

2.3 FASTENERS

- A. Provide zinc-plated fasteners with coating complying with ASTM B633, Class Fe/Zn 25 for exterior use, and Class Fe/Zn 5 for other applications. Provide fastener type, grade, and class required and recommended by stair manufacturer.

2.4 FABRICATION

- A. **Exposed Work:** True to line and level with accurate angles and surfaces and with straight sharp edges. Use only smooth materials free from burrs, pitting and other marks.
 - 1. **Fastener Connections:** provide flush hairline joints at exposed connections.
 - 2. **Welded Connections:** Exposed welds to have finished appearance in accordance with NOMMA "Guideline 1 - Joint Finishes" for Finish #3.

3. Holes shall be punched 1/16 inch larger than the nominal size of the bolts, unless otherwise specified. Whenever needed, because of the thickness of the metal, holes shall be subpunched and reamed or shall be drilled. Cutting, drilling, punching, threading and tapping shall be performed prior to hot-dip galvanizing.
- B. Provide complete stair and landing systems including stringers, landing framing, treads, landings, connections and other components necessary for the support and installation of stairs and landings.
- C. Comply with NAAMM "Metal Stairs Manual" requirements for the following Class:
 1. Industrial Class Stairs
- D. Stringers:
 1. Galvanized steel channels as required for compliance with performance requirements.
- E. Treads:
 1. Bar Grating: Welded steel bar grating with integral steel plate nosing and welded steel angel bracket, complying with NAAMM "Metal Bar Grating Manual".
 - a. Product: Welded Steel Bar Grating; American Stair Corporation or equal.
- F. Risers:
 1. Open risers.
- G. Stair Unit Connections: Provide angle brackets, bolts, expansion anchors, weld plates and other connection devices as recommended by stair manufacturer for substrates indicated.

2.5 RAILINGS AND HANDRAILS

- A. General: Maintain uniform curvature and cylindrical cross-section at each bend.
 1. Number of Strands: As required for compliance with specified performance requirements.
 2. Number of Pickets: As required for compliance with specified performance requirements.
 3. Vertical Posts: Space posts as required for compliance with specified performance requirements.
 - a. Round 1-1/2" Schedule 40 galvanized steel tubing welded to stringers

B. Railing Design:

1. Picket Railing: Railing with 1-1/2" Schedule 40 galvanized steel tubular top and bottom members, with 1-1/2" Schedule 40 galvanized steel round vertical pickets.
 - a. Top and Bottom Rails: Round tubular, continuously curved at landings.

C. Galvanizing: Hot dip galvanize stairs and railings after fabrication in accordance with ASTM A-123.

1. Galvanizing Repair Paint: ASTM A-780.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install stairs and railings in accordance with manufacturer's instructions and approved shop drawings and to comply with specified performance requirements when installed.
- B. Fit exposed connections accurately together to form tight hairline joints.
- C. Provide anchorage devices and fasteners for securing stairs and railings to in-place construction.
- D. Weld connections which cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat.
- E. Clean field welds, bolted connections and abraded areas and prime with same material used for shop priming.
- F. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.
- G. Fieldwork shall not be permitted on galvanized items. Drilling of bolts or enlargement of holes to correct misalignment will not be allowed.
- H. Dissimilar metals shall be protected from galvanic corrosion by means of pressure tapes, coatings or isolators. Aluminum in contact with concrete shall be protected by a heavy coat of bituminous paint.
- I. Metalwork to be embedded in concrete shall be placed accurately and held in correct position while the concrete is placed or, if specified, recesses or blockouts shall be formed in the concrete after it has attained its design strength and the metalwork grouted in place as specified in Section 03300. The surfaces of

metalwork in contact with or embedded in concrete shall be thoroughly cleaned. If accepted, recesses may be neatly cored in the concrete.

3.2 TOUCH UP

- A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint per Section 09900 of these Special Provisions.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

END OF SECTION

SECTION 05910

HOT-DIP ZINC COATING

PART 1 - GENERAL

1.01 SUMMARY

- A. Description of Work: This section specifies hot-dip zinc coating.
- B. Related Documents: The General and Supplemental Conditions, and the applicable sections of Division 1, form a part of this section.

1.02 REFERENCE DOCUMENTS

- A. This section references the following documents. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

ASTM A123	Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A143	Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
ASTM A153	Zinc Coating (Hot Dip) on Iron and Steel Hardware
ASTM A384	Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
ASTM A780	Providing High-Quality Zinc Coatings (Hot-Dip)
ASTM A780	Repair of Damaged Hot-dip Galvanized Coatings
MILSPEC DOD-P-21035	Paint, High Zinc Dust Content

1.03 SUBMITTALS

- A. General: Submittals shall be provided in accordance with Section 01300: SUBMITTALS and shall include the following information: Zinc dust-zinc oxide coating manufacturer's product data showing conformance to the specified product. Manufacturer's recommendation for application of zinc dust-zinc oxide coating. Coating applicator's Certificate of Compliance that the hot-dip galvanized coating meets or exceeds the specified requirements of ASTM A123 or A153, as applicable.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Zinc Coating: Zinc coating material shall be as specified in ASTM A153. Zinc Dust-Zinc Oxide Coating: Zinc dust-zinc oxide coating shall conform to MILSPEC DOD-P-21035. Coating shall be as manufactured by Z.R.C. Chemical Products Cp., Galvicon Co., or equal.

2.02 FABRICATION REQUIREMENTS

- A. Fabrication practices for products to be galvanized shall be in accordance with applicable portions of ASTM A143, A384 and A385.

PART 3 - EXECUTION

3.01 APPLICATION

- A. Steel members, fabrications and assemblies shall be galvanized after fabrication in accordance with ASTM A123. Unless otherwise specified, steel items weighting 100 pounds or less shall not be hot-dip zinc coated. Anchor bolts and nuts 5/8 inch and larger shall be hot-dip zinc coated in accordance with ASTM A153. Anchor bolts and nuts smaller than 5/8 inch and all other bolts, screws, nuts, washers and other minor steel fasteners shall be mechanically zinc coated as specified in Section 05080: Mechanical Zinc Coating.

3.02 COATING REQUIREMENTS

- A. Coating weight shall conform with paragraph 5.1 of ASTM A123 or Table 1 of ASTM A153, as appropriate.

3.03 REPAIR OF DEFECTIVE GALVANIZED COATING

- A. Where zinc coating has been damaged after installation, substrate surface shall be first cleaned and then repaired with zinc dust-zinc oxide coating in accordance with ASTM A780. Application shall be as recommended by the zinc dust-zinc oxide coating manufacturer. Coating shall consist of multiple coats to dry film thickness of 8 mils. Items not physically damaged, but which have insufficient or deteriorating zinc coatings, and items damaged in shipment or prior to installation, shall be removed from the project site for repair by the hot-dip zinc coating method.

**** END OF SECTION ****

SECTION 09900

PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: Contractor shall furnish all labor, materials, equipment, and incidentals necessary to perform all painting as shown on the drawings, and as specified herein, including, but not limited to:
1. Exposed electrical conduit and exposed galvanized iron pipe.
 2. The term "paint", as used herein, includes enamels, sealers, stains, epoxies, and other coatings, whether used as prime, intermediate, or finish coats.

1.02 REFERENCE PUBLICATIONS

- A. REFERENCES: This section contains references to the following documents. They are a part of this section as specified and modified. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

Federal Specifications:	
FS TT-E-529G	Enamel, Alkyd, Semi-Gloss (For Exterior and Interior Surfaces)
FS TT-P-645B	Zinc-Molybdate, Alkyd Type Primer.
The Society for Protective Coatings (SSPC) Specifications:	
SSPC SP-1	Solvent Cleaning
SSPC SP-6	Commercial Blast Cleaning
SSPC PAINT25	Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel
SSPC-Paint 5	Zinc Dust, Zinc Oxide, and Phenolic Varnish Paint
American Society for Testing and Materials:	
ASTM A780	Repair of Damaged & Uncoated Areas of Hot-Dip Galvanized Coatings

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Glidden, Ameritone, Fuller-O'Brien, Rust-Oleum, H&C (a Division of Sherwin Williams), Monopole, Frazee, Dunn Edwards, or approved equal.

2.02 MATERIALS

- A. General: Materials shall conform to the requirements of the Specifications listed herein, and the **PAINTING SCHEDULE**.
- B. Semi-Gloss alkyd enamel shall conform to Federal Specification TT-E-529G. The associated Primer, unless otherwise approved, shall conform to either Federal Specification TT-P-645B, or SSPC Paint 25. Finish coats shall be the color selected by the Engineer.
- C. Zinc dust-zinc oxide primer coatings for repair of galvanized surfaces shall conform to SSPC-Paint 5, ASTM A780, and shall contain at least 65% zinc dust by weight when dried.
- D. Polyamide Epoxy shall be a two component semi-gloss pigmented system with separately packaged base and curing agent. Solids content of the finish coat material shall be at least 55% by volume. Provide Sherwin Williams Tile-Clad High Solids, or Porter Coatings' PorterGlaze 4400 HB Semi-Gloss Epoxy, or approved equal finish coat. Use finish coat manufacturer's recommended primer.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

- A. Deliver paint materials in sealed, original labeled containers, bearing manufacturer's name, type of paint, brand name, color designation, and instructions for mixing and/or reducing.
- B. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45 degrees F in well ventilated areas.
- C. Take precautionary measures to prevent fire hazards and spontaneous combustion.

3.02 ENVIRONMENTAL CONDITIONS

- A. Ensure surface and surrounding air temperatures are at least 60 °F, unless a higher temperature is recommended by the manufacturer, before applying paint.

3.03 PROTECTION

- A. Adequately protect other surfaces from preparation and paint damage. Repair damage and remove all splattered paint as a result of inadequate or unsuitable protection.

- B. Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or droppings from fouling surfaces not being painted and, in particular, surfaces within storage and preparation area.
- C. Place cotton waste, clothes, and material which may constitute a fire hazard in closed metal containers and remove daily from site.

3.04 INSPECTION

- A. Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Report in writing to the Engineer any condition that may potentially affect proper application. Do not commence until such defects have been corrected.

3.05 PREPARATION OF SURFACES

- A. Preparation of metallic surfaces shall be conducted in accordance with the applicable portion of the latest surface preparation specifications of the SSPC, and the coating manufacturer's recommendations. Any sharp or rough areas shall be ground or filed smooth prior to initiation of surface preparation for painting.
- B. Blast cleaning shall conform to SSPC SP-6 "Commercial Blast Cleaning".
- C. Solvent cleaning shall conform to SSPC SP-1 "Solvent Cleaning".
- D. Pressure washing shall be performed using commercial machines operating with a nozzle pressure of at least 1000 psi, unless otherwise approved.
- E. Surfaces to be painted shall be clean before applying paint or surface treatments. Oil and grease shall be removed with clean cloths and cleaning solvents prior to mechanical cleaning. Cleaning solvents shall be of low toxicity with a flashpoint in excess of 100 degrees F. Cleaning shall be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces.
- F. Remove mildew by scrubbing with solution of trisodium phosphate and bleach. Rinse with clean water and allow surface to dry completely.
- G. Remove dirt, powdery residue, and foreign matter from piping and metals designated for finishing.
- H. Remove grease, rust, scale, dirt, and dust from steel and iron surfaces. Where heavy coatings of scale are evident remove by wire brushing, sandblasting, or any other approved method.
- I. Sand and scrape shop primed steel surfaces to remove loose primer and rust. Feather-out edges to make touch-up patches inconspicuous. Clean surfaces with solvent.
- J. Shop painted ferrous surfaces shall be protected from corrosion by treating and touching-up corroded areas immediately upon detection.
- K. Concrete masonry and concrete floors shall be cleaned and cured as specified in Sections 03300, CAST-IN-PLACE CONCRETE and 04220, CONCRETE MASONRY UNITS, then prepared as specified by the coating manufacturer.

3.06 APPLICATIONS

- A. General: All painting shall conform to the coating manufacturer's submitted, and approved, technical data and recommendations, and to the following general conditions:
1. Thickness of coating in mils shall mean the dry film thickness. The number coats specified shall mean the minimum number of coats to be used. Additional coatings shall be required if necessary to obtain the specified film thickness.
 2. Prime coats, where called for, shall be provided as part of the painting system. Shop prime coats shall conform to the specified painting system for the given item. It shall be the responsibility of the Contractor to coordinate work so that factory primed items are primed or painted with a coating compatible with the specified painting system.
- B. Paint may be applied by brush, roller, or spray except as hereinafter specified. At time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be applied so finished surfaces shall be free from runs, drops, ridges, waves, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete. Each coat shall be applied as a film of uniform thickness.
- C. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated. Special attention shall be given to insure that all surfaces, including edges, corners, crevices, welds, and rivets receive a film thickness equivalent to that of adjacent painted surfaces. Adequate ventilation shall be provided during paint application. Respirators shall be worn by all persons engaged in spray painting. Adjacent areas shall be protected by the use of drop cloths or other approved precautionary measures shall be taken.
- D. The first coat shall include repeated touching-up of suction spots or overall applications of primer or sealer to produce a uniform color and gloss. Paint shall be applied only to surfaces that are completely free of surface moisture, as determined by sight or touch.
- E. Coating Progress: Sufficient time shall elapse between successive coats to permit proper drying. This period shall be modified, as necessary, to suit adverse weather conditions. Oil base or oleoresinous solvent-type paints shall be considered dry for recoating when the paint feels firm, does not deform or feel sticky under moderate pressure of the thumb, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- F. Metal Surfaces: Apply all coats by spray, unless otherwise approved.
- G. All galvanized metal surfaces shall be painted, unless specified otherwise.
- H. Time Between Surface Preparation and Painting: Surfaces that have been cleaned, pretreated, and otherwise prepared for painting shall be given a coat of the specified first coat as soon as practicable after such pretreatment has been completed, but prior to any deterioration of the prepared surface.

3.07 MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Do not paint over nameplates or other identification plates.
- B. Do not paint flexible conduit or wiring.

3.08 CLEANING

- A. As work proceeds, and upon completion, promptly remove paint where spilled, splashed or spattered.
- B. During progress of work keep premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris.
- C. Upon completion of work leave premises neat and clean, to the satisfaction of the Engineer.

3.09 PAINTING SCHEDULE

- A. The following table prescribes the surfaces to be painted, required surface preparation, and the number and types of coats of paint to be applied. Applied dry film thicknesses per coat shall conform to the manufacturer's recommended thicknesses.

Surface	Surface Preparation	1st Coat	2 nd Coat	3 rd Coat
Exterior galvanized surfaces touch-up	Touch-up damaged coatings per paragraph 2.02.C.			
Trash rake structure. Exposed conduit.	Solvent Clean, and prepare per paragraph 3.05	One coat of industrial grade primer per TT-P-645B, SSPC Paint 25, or approved equal.	Two coats of "City of Sacramento - Centari Brown" alkyd enamel from Spectra-Tone Paints (916) 722-7454, per TT-E-529G, or approved equal.	
Galvanized surface Repair	Solvent Clean, per paragraph 3.05	Apply one coat SSPC-Paint 5	Apply two coats per TT-E-529G, or as approved.	
Channel Slope Bar Screens	SSPC SP-6	Primer per paint manufacturer	Epoxy paint per paragraph 2.02 D	

****END OF SECTION****

SECTION 11200

CATENARY TRASH RAKES

PART 1 - GENERAL

1.01 DESCRIPTION

A. SCOPE OF WORK: The Contractor shall furnish all materials, equipment, and labor necessary to place in operation two (2) each, heavy-duty, continuous traveling, Catenary type trash rake assemblies, including all auxiliary equipment and accessories as shown on the drawings and as specified herein.

B. RELATED WORK

1. Section 01300: Submittals
2. Section 11000: General Requirements for Equipment
3. Section 11050: Equipment Mounting

1.02 QUALITY ASSURANCE

A. All equipment furnished under this Section shall be of a single manufacturer who has been regularly engaged in the design and manufacture of the equipment and demonstrates, to the satisfaction of the Engineer, that the quality is equal to equipment made by those manufacturers specifically named herein. The rake manufacturer shall have supplied complete units that have been in successful operation, at similar installations, for at least five (5) years.

B. Rake manufacturer shall have a factory authorized service center or service personnel located within 500 miles from the project site. Supervisory personnel of the service center or service personnel shall have a minimum of five (5) years experience in repair of comparable sized equipment. Documentation shall be submitted to assure the City that the service center, or personnel, are capable of providing such service and is currently in business as an authorized representative of the rake manufacturer.

C. Welding and welding repair shall be performed in accordance with the manufacturer's written procedures. All welding shall be performed by Certified Code Welders AWS Test Standards.

1.03 SUBMITTALS

A. SUBMITALLS required under this Section shall be as required under the product review category of Shop Drawings, in accordance with the General Conditions and Section 01330: SUBMITTALS. The City assumes no responsibility for any

items assembled or manufactured prior to Engineer's approval of a submittal for the item or items.

B. SHOP DRAWINGS:

1. Submit Shop Drawings for approval of the Catenary Rakes, and related equipment, as required herein. Include sufficient data to show that equipment conforms to Specification requirements and will fit the structure as shown on the Drawings. Also provide any test results, performed by the manufacturer, to demonstrate compliance with these Specifications.
2. Submit dimensioned assembly drawings with plans, elevations, sections, details, and anchors, including specifically: the arrangement of the components parts, parts list, material designations and finishes.
3. Complete installation drawings of the equipment and accessory items.
4. **MANUFACTURER'S DATA:** Provide manufacturer's data indicating all descriptive information required for installation, operation and maintenance, including, but not limited to, lubricants, performance levels, ratings, capacities, and nominal torque values for all bolted connections.
5. **MANUALS:** Furnish four (4) complete copies of the manufacturer's installation, lubrication, operation and maintenance manuals, bulletins, and parts lists. Manuals shall provide all the information required to install, operate and maintain the equipment in accordance with the standard provisions of all the manufacturer's warranty provisions. Manuals shall also comply with all the provisions of Section 01330: Submittals.
6. **AFFIDAVITS:** At completion of Catenary Rake installation, furnish affidavits stating that the equipment has been properly installed, adjusted, and tested and is ready for full-time operation.
7. Documentation listing at least five (5) complete rake units, manufactured and installed, which have been in successful operation for at least five (5) years.
8. Documentation verifying that the service center or service personnel are an authorized manufacturer's representative who is capable of servicing the trash rake.

PART 2 - PRODUCTS

2.01 CATENARY TRASH RAKE

A. CONSTRUCTION:

1. Materials for the Catenary Rake and related equipment shall be as

specified herein, and as shown on the Drawings. The Catenary Rake manufacturer may propose alternative materials that, in his experience, are more suited to the specified service. The alternative materials shall be subject to approval. When two, or more, materials are specified for a component, or part, the Catenary Rake manufacturer shall choose among them.

2. When the material is not specified, it shall be selected by the manufacturer and clearly stated in his proposal.

B. TYPES

1. The units shall be of the Catenary type, with front leaning rake beams that return along a guided path in front of the trashrack after dumping the trash near the top of their travel. The raking mechanism shall be capable of handling large quantities of leaves, tree limbs, and other related debris associated with storm water drainage without appreciable loss of head at the bar racks. The rake beams shall come into contact with the bottom section of rack and shall bear on the full width of the rake the entire height. The edge of the rake beam shall clear the bottom by approximately four (4) inches vertical height. The rake shall be designed to operate outdoors under adverse weather conditions. The travel speed of the raking units shall be approximately five (5) feet per minute. The unit shall be capable of removing from the channel, and discharging, a simultaneous load of at least one thousand (1000) pounds per rake flight.
2. Manufacturers who make Catenary Trash Rakes comparable to the unit specified include:

E & I Corporation: Local Representative, Muniquip (916) 787-5641

C. MATERIAL:

1. Rakes: Each trash rake unit shall consist of multiple rakes constructed of W8 X 28 minimum wide flange structural steel beams with a six inch (6") X four inch (4") X ½ " structure angle, with saw teeth on four (4) inch centers cut in the outstanding leg, welded to the top flange of the beam to form lifting lips. The rakes shall be mounted between two strands of steel roller chain with the rakes equally spaced at approximately ten (10) foot intervals so that they all travel parallel to each other at right angles to the trash screens. Each rake shall have steel counterweights welded to both sides of the web of the beam to provide a total rake weight of approximately ninety-six (96) pounds per foot. The rake beams shall be attached to the chain with eighteen (18) Grade 8 316 stainless steel bolts, nuts and washers. Suitable bumpers, or guards, shall be attached to each end of the rake beams for protection against adjacent concrete surfaces.

Total rake length shall be such as to provide a one inch end clearance with each bay wall.

2. Rake Chains: The rake chains shall be the "Non Lube" type suitable for the intended application. The chain shall be of the steel thimble roller type having 2" x 3/8" medium high carbon steel side bars, heat hardened stainless steel pins, heat treated stainless steel bushings having non metallic liners and heat treated stainless steel rollers. The pins shall be held in place with stainless steel pins. Chain shall have a minimum average ultimate strength of 41,000 PSI and a working load of 5,150 pounds. The chain shall have attachments that match the rake mounting hole pattern.
3. Shafts: The drive shaft and idler shaft assemblies shall be solid cold rolled steel or of the torque tube type. The torque tube type shafting shall have as a minimum six (6) inch schedule 80 seamless steel pipe with the ends fitted with solid steel shafting, welded to the pipe. To maintain concentricity, the ends of the pipe shall be machined to accept the solid shafts. All shafting shall be a minimum, C-1018 cold rolled steel press fitted and assembled to the pipe ends with three (3) one inch (1") diameter by ten inch (10") long fitted 316 stainless steel bolts.
4. Sprockets: The chain sprockets shall be split type, cast iron with chilled teeth having a Brinell hardness of three hundred seventy-five (375) for a chill depth of not less than 3/16". Drive shaft sprockets shall be key seated and set screwed, and idler shaft sprockets shall be fitted, one to run loose collared and one key seated and set screwed.
5. Shaft Bearings: All shaft bearings shall be double row tapered roller bearings with seals and lubrication fittings. For the convenience of maintenance, the bearings shall be fitted with grease lines routed to a convenient place on the head frame. The grease lines and fittings shall be a minimum 304 stainless steel.
6. Chain Guides: Horizontal chain track guides shall be provided to guide and support the rakes and chains between the idler shaft and the drive shaft. The guides shall be a minimum of 7 inch x 12.25 lb. steel channels suitably braced and supported from the concrete or head frame structure. Vertical chain return guides shall support the chain and rakes and be a minimum of 7 inch x 12.25 lb. steel channels suitably braced and supported from the concrete walls. The attachment arms of these lower runway channels shall be slotted to allow for a minimum of four inch (4") horizontal adjustment.
7. Motor: The drive unit shall mount to the screen head shaft and be a helical-bevel gear reducer running in an oil bath. The reducer shall have a service factor of 1.25 for 24-hour operation. The drive motor shall be a high efficiency NEMA, Design B, totally enclosed, fan cooled. The motor shall

operate on 460 volts, 3 phase, 60 hertz, and be not less than 1/2 horsepower, and shall be provided with a shear pin device to protect the unit in case of any overload. The drive unit shall attach to the drive shaft via a flanged connection. Motor shall be manufactured by U.S. Motors, General Electric, Westinghouse, Reliance, or approved equal.

8. Overload Protector: Drive unit overload protection shall consist of a mechanical shear pin and an electrical switch. Shear pin shall snap at one hundred twenty-five percent (125%) of rated motor/reducer running torque. The electrical switch shall be an adjustable roller lever arm limit switch. The limit switch shall detect a sheared pin condition and open a contact for motor shutdown. Contacts shall be silver oxide rated ten (10) amp continuous at one hundred twenty (120) volts.
9. Anchor Bolts: Anchor bolts shall be hot dipped galvanized, in accordance with ASTM A386, or be ASTM A193-Type 316 stainless steel.
10. Bar Rack: Extending from the channel invert to the operating deck shall be a series of 3/8 inch x 3.0 inch carbon steel bars providing a clear opening of 2.0 inches. The Bar Rack shall be made in panels, covering the full width of the channel and supported by structural steel members anchored to the channel walls.
11. Painting: All structural steel shall be commercially sandblasted and shop primed with 3 to 5 mils (dry) Tnemec #66-1211 or equal. Bearing surfaces and shafts shall be grease coated and chains shall be dipped in or sprayed with rust inhibiting slushing compound.
12. Acoustic Performance: Sound levels from the rake shall not exceed 75dB(A), with allowance of +2dB, when measured at three (3) feet distance from the prime mover at rated speed and load.
13. Electrical Controls: All electrical controls shall be provided by the electrical contractor or equipment manufacturer and shall be for both automatic and manual operation. They shall consist of a magnetic starter with hand-off-automatic selector switch in the cover, a separate stop-start pushbutton station, an adjustable timer with a range of 2-1/2 minutes to 5 hours for both on and off cycles. All controls shall be in a NEMA 4X enclosure.

2.02 TOOLS

- A. Furnish one complete set of all the special tools required for installation and maintenance of the rakes.

2.03 LUBRICANTS

- A. The Contractor shall provide all mechanical equipment with a sufficient supply of correct lubricant for starting, testing and initial thirty (30) day operation period. All

lubricants shall be of types recommended by the applicable equipment manufacturer. The Contractor, subject to the approval of the equipment manufacturers, shall limit lubricants to the least number or types required for normal maintenance of all equipment. Not less than ten (10) days before the date scheduled for testing of equipment the Contractor shall submit for approval a listing indicating all lubricants required for each item of mechanical equipment.

2.04 CONTROL

- A. Trash rake assembly shall be operated as indicated on electrical drawings to be furnished by the Contractor. Operation shall include manual control utilizing a manual control station located at the trash rake, and automatic operation. Manufacturer shall provide torque/overload limit switches as specified herein.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All equipment shall be installed in strict conformance with the manufacturer's installation instructions, as submitted with the Shop Drawings, manufacturer's torque values, and as indicated on the Drawings, secure in position and neat in appearance. Installation shall include setting chain guides, lubricating and performing adjustments, and other tasks specified by the manufacturer.

3.02 SURFACE PREPARATION AND FINISH

- A. The following items shall be hot-dipped galvanized, in accordance with ASTM A123, and touch-up painted with cold galvanizing paint, brush applied, that conforms to ASTM A-780.
 - 1. Rakes
 - 2. Rake attachments and supporting steel work
 - 3. Slide bars
 - 4. Dead plates
 - 5. Vertical chain guides
- B. The following items shall be sandblasted, shop painted, and field painted with brown gloss alkyd enamel, per Section 09900: PAINTING.
 - 1. Horizontal chain guides
 - 2. Chain guard

- C. Reducer, motor, pillow blocks, sprockets, and collars shall have manufacturer's standard finish. All chains shall be dipped in rust inhibitive slushing compound. All shafts shall be grease coated.
- D. Field painting shall be applied at the job, per Section 09900: PAINTING.

3.03 TORQUING

- A. During installation 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. All electrical, mechanical, and structural threaded connections shall be torqued. The Contractor shall torque connections to the value recommended by the trash rake Manufacturer. If they are not available, the following torques will be used in the installation:

Nominal Torque Requirements for Bolted Bonds

Bolt Size	Threaded/Inch	Torque in/Lbs	Torque Ft/Lbs
#8	32	18	—
	36	20	—
#10	24	23	—
	32	32	—
1/4 inch	20	80	6
	28	100	8
5/16 inch	18	140	11
	20	150	12
3/8 inch	16	250	20
	24	275	22
7/16 inch	14	400	33
	20	425	35
1/2 inch	13	550	45
	20	575	47
5/8 inch	11	920	76
3/4 inch	10	1400	116
7/8 inch	9	1950	162
1 inch	8	2580	215

**** END OF SECTION ****

SECTION 11332

MECHANICALLY RAKED BAR SCREEN

PART 1 - GENERAL

1.01 SUMMARY

- A. Description of Work: Furnish and install a mechanically cleaned Trash Rake and appurtenances as shown on the Drawings and as specified herein. Design lifting capacity of furnished unit shall be at least 3,000 pounds.
- B. Related Sections:
1. Section 01330 - Submittals.
 2. Section 05100 - Structural Metals.
 3. Section 15010 - General Equipment and Mechanical Requirements.
 4. Section 16010 - Electrical Work.
 5. Section 16480 - Low Voltage Motor Control Center.

1.02 REFERENCES

- A. REFERENCES: This section contains references to the following documents. They are a part of this section as specified and modified. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

American Society for Testing and Materials (ASTM):	
ASTM A 36	Structural Steel
ASTM A 48	Cast Iron Castings
ASTM A 193	Stainless Steel Bolting Materials
ASTM A 307	Carbon Steel Bolts and Studs, 60,000 psi Tensile
ASTM A 325	Structural Steel Bolts, Heat Treated, Minimum 120ksi Tensile
ASTM A 575	Steel Bars, Carbon, Merchant Quality

1.03 SUBMITTALS

- A. Shop Drawings: Trash Rake shop drawings shall include the information listed below. Submit all items in one package.
1. Model designation.
 2. Specifications and fabrication drawings.
 3. Electric Motor information.

4. Seismic anchorage details, including design calculations signed and stamped by a California registered Civil or Structural engineer.
 5. Manufacturer's complete installation, lubrication, operation and maintenance manuals, bulletins, instructions, and parts lists.
- B. Design Data: Submit the following to verify performance and structural strength requirements of these Specifications.
1. Structural calculations and details, including hydraulic and seismic loadings.
 2. Mechanical calculations and details, including maximum lift and motor rating calculations.
- C. Testing: Submit detailed Operational Testing procedures for 1,000 pound field load test. Measure motor current draw during load test.
- D. Certificates: Manufacturer shall certify that the equipment furnished under this Section has been properly installed, adjusted and tested, and is ready for full time operation in accordance with the manufacturer's warranty requirements.
- E. Operational Testing: Submit field operational test results for installed Trash Rake.

1.04 QUALITY ASSURANCE

- A. All equipment furnished under this Section shall be of a single manufacturer who has been regularly engaged in the design and manufacture of the type equipment specified herein. Alternate manufacturers shall demonstrate to the satisfaction of the Engineer, that the quality and performance of alternate equipment is equal to that of the equipment manufacturer specifically named herein. The manufacturer of alternative equipment shall have supplied trash raking equipment that has been in successful operation, at similar installations, for at least five years.

1.05 INSTRUCTION OF OWNER'S PERSONNEL

- A. Obtain the services of a qualified representative of the manufacturer to instruct the Owner's operation and maintenance personnel in the proper procedures for operation, troubleshooting, and preventive/corrective maintenance.

PART 2 - PRODUCTS

2.01 SYSTEM DESCRIPTION AND MANUFACTURER

- A. The equipment furnished shall remove debris from the channel flow by means of a bar screen to retain debris, and traveling lifting cars to clean the bar screen. The cleaning system shall be a front cleaning, rear chain return, electric motor driven trash rake assembly. Lifting cars, attached to a chain drive system, shall move from the bottom of the rake towards the top carrying debris up the front face of the bar screen.

- B. Provide a Duperon Self-Cleaning Trashrack system, as manufactured by Duperon Corporation, 5693 Becker Road, Saginaw, MI (517) 754-8800, with all associated controls and appurtenances, or approved equal.
- C. Named supplier shall still be required to meet or exceed the specification requirements herein.

2.02 DESIGN REQUIREMENTS

A. General:

1. Equipment shall be suitable for exposure to the weather.
2. The mechanism shall be designed so that no drive shaft, moving guide, or electrical components are submerged.
3. The equipment shall be amply proportioned for stresses which might occur during fabrication, erection, or operation. Duplicate parts shall be interchangeable.
4. The geometry of the trash rake shall conform to the dimensions shown on the plans, and the following:
 - a. Upstream-downstream maximum water surface differential: 1.5 feet
 - b. Clear space between bars: 2-inches, nominal, 3-inches maximum.
 - c. Minimum bar screen member size: 3/8 inches by 4 inches.
 - d. High water loadings on the rake shall be based on an inlet water surface depth of at least 7.54 feet above the trash rake toe plate.
 - e. The bar screen rack shall span the full width and extend the full depth of the channel, as well as extend above the channel top as shown. The trash rake shall be bolted to the inlet structure per the approved shop drawings.
 - f. Provide heavy duty rubber panels, or approved equal, located behind the top of the trash rake to strip debris from the lifting cars.
 - g. Provide a full width hinged deflector plate at the bottom of the top stripper assembly that may be positioned manually to divert material into a bin. Reinforce the deflector plate as required to support the design weight.
 - h. Provide one set of cast polyethylene bar cleaning slides, configured to wipe both sides of each bar once per revolution.
 - i. Provide cast iron lifting cars, riding on two adjacent screen bars, attached to the drive chains, at maximum 10-foot spacings, each fitted with a minimum 1/2" diameter stainless steel pin approximately 8-inches long. Attachment shall permit backwards rotation of the lifting car, when the design lifting capacity due to an oversized obstruction is exceeded, with immediate resetting of the car once the oversized obstruction is passed.

- j. Drive motor shall be a totally enclosed fan cooled (TEFC) 1 horsepower or larger, single phase, 60 hz, 240 volt gear motor. Drive shaft bearings shall be unisphere spherical roller bearing, self aligning types, with a radial load rating of 7310 lbs at 50 rpm, and 100,000 hours of rated life.
- k. All fasteners shall be galvanized steel, or stainless steel.
- l. Drive chain spacing shall not exceed 10.5-inches across the bar screen width. Drive chains shall operate at a rate of seven (7) feet per minute, and the breaking strength of each chain shall be at least 16,000 pounds.

2.03 MATERIALS

- A. Bars, plates, and support members: ASTM A36 structural steel, or ASTM A575.
- B. Drive chain: 16,000 pound test.
- C. Sprockets, lifting cars, and bottom guide: Cast Iron per ASTM A48.
- D. Bolts and Fasteners: ASTM A307, A325, or A193(SST).

2.04 FINISHES

- A. Standard Coating: All steel bar screen components shall be coated with a urethane moisture-cure primer and top coat paint system in accordance with the manufacturer's standard specifications. Material shall meet all state and federal VOC and other regulatory requirements.

2.05 CONTROLS

- A. The trash rake shall operate locally from a field mounted start-stop lockout switch. A field mounted terminal box shall be used to disconnect the equipment for removal.
- B. The manufacturer of the Trash Rake shall provide the local control switches and enclosure. Control voltage shall be 120 volt, single phase, unless otherwise approved. Enclosure for the electrical control device located in the inlet area shall be NEMA 4 or better, suitable for exposure to the weather and elements.
- C. Provide Duperon Corporation standard control package outfitted with the following features and as shown on the plans, or approved equal:

Feature	Feature
Hand/Off/Automatic Selector Switch	Fault reset pushbutton
Forward pushbutton	Running pilot light
Stop pushbutton	Internal panel heater
Jog reverse pushbutton	Torque overload cutout circuit

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING

- A. The trash rake shall be factory assembled and tested before shipment to ensure proper operation of the mechanism.

3.02 INSTALLATION

- A. Equipment furnished shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with approved shop drawings, specifications, engineering data, and recommendations furnished by the equipment manufacturer.
- B. Installation shall utilize standard torque values and be installed secure in position and neat in appearance. Installation shall include any site preparation tasks; such as de-watering and clearing the channel of debris, pre-installation tasks as determined by the manufacturer; such as unloading, touch-up painting, etc. and any other installation tasks and materials such as wiring, conduit, controls stands, as determined by the customer and/or specified by the manufacturer.
- C. The services of a factory trained representative of the manufacturer shall be provided for a period of 2 days to inspect the installation of the equipment, make any necessary adjustments, place it in initial trouble-free operation, and instruct City personnel in its operation and maintenance.
- D. The factory trained representative shall be responsible for providing both classroom and "hands-on" instruction to Operations and Maintenance personnel. The classroom instruction shall cover specific operation and maintenance topics and procedures.
- E. After completion of installation, Contractor shall provide a 24 hour continuous test. Testing shall demonstrate that the equipment is operational, and free from excessive vibration.

3.03 WARRANTY

- A. Provide warranty from date of acceptance by the City to guarantee that there shall be no defects in material or workmanship in any item supplied for a period of two (2) years.

****END OF SECTION****

SECTION 15010

GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work Included: The provisions of this Section includes all materials, labor and services necessary to furnish, install and conduct specified tests under actual operating conditions for Mechanical Work shown on the plans and/or wherever specifically required in these specifications.

1.02 QUALITY ASSURANCE

- A. Equipment, piping, wiring and supports shall be provided to produce complete, operable systems with all elements properly interconnected as shown in schematic diagrams, as shown on the approved shop drawings, and/or as required to provide specified operations. If a specific dimensioned location is not shown for interconnections or smaller system elements, the Contractor shall select appropriate locations and show them on Shop Drawings submitted for review.
- B. Equipment and materials shall be erected in a neat and workmanlike manner; aligned, leveled, cleaned and adjusted for satisfactory operation; installed in accordance with the recommendations of the manufacturers and the best standard practices for this type of work so that connecting and disconnecting of piping, equipment and accessories can be readily made, and all parts are easily accessible for inspection, operation, maintenance, and repair.

1.02 MANUFACTURER'S INSTRUCTIONS

- A. The recommendations and instructions of the manufacturers of products used in the work are hereby made part of these Specifications, except as they may be superseded by other requirements of these Specifications.
- B. During the initial operation of the equipment, where specified, the manufacturers' representatives shall stay at the equipment site until proper operation is attained, unless other arrangements have been made with the Engineer. See the specific Equipment Specifications for recommended supervision periods. Contractor shall have the sole responsibility for proper functioning of the equipment.

1.04 SUBMITTALS

- A. Each piece of equipment, for which certified witnessed or non-witnessed

performance tests are required, shall be accompanied by a completed form which will contain at least the following information:

1. Owner's name and location of project.
2. Contractor's name and subcontractor if applicable.
3. Name of item being submitted.
4. Specification reference by section, paragraph and page.
5. Data on item (manufacturer, general descriptive data, dimensions, size of connections, speeds, performance curves, serial number).
6. Motor data, type, voltage, frequency, phase, full load amperes, starting method, frame sizes, enclosure insulation type (NEMA Code letter), dimensions, service factor, efficiency, serial number.
7. Date and signature of person certifying the performance.

1.03 COVERING WORK

- A. No work shall be covered or enclosed until it has been tested and inspected and then approved by the Engineer. Any work covered prior to such inspection, test, or approval shall be uncovered, if so requested, and after approval, covered again without cost to the City.

PART 2 - PRODUCTS

2.01 DESIGN

- A. General: All equipment shall be designed for the service intended, shall be of rugged construction, of ample strength for all stresses which may occur during fabrication, transportation, erection and during continuous or intermittent operation, shall be adequately stayed, braced and anchored, and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details. Materials of construction shall be cathodically compatible.
- B. Seismic: All equipment shall be anchored to resist the seismic forces as determined by application of the 2007 CBC, Section 1613(Site Classification D, $S_s = 0.561$, $F_a = 1.352$, $S_1 = 0.237$, $F_v = 1.926$). This requirement applies, but is not limited to light fixtures, guardrailing, electrical and instrumentation panels, piping, generators, motors, cabinets. The design of the anchoring system shall be the responsibility of the manufacturer or supplier. Anchorage shall be made to structural elements only, and shall be so designed and installed that the resisting capabilities of the structural elements are not exceeded. If, in the opinion of the manufacturer or Contractor, the available structural elements are incapable of resisting the seismic anchorage forces, the Engineer shall be notified in writing. The Engineer will provide the equipment manufacturer with

instructions for procedures to be followed.

- C. Controls: Unless noted otherwise, the design of the electric control of any equipment system and/or equipment package shall be the responsibility of the manufacturer of the equipment system and/or equipment package. The elementary control diagrams as shown on the Drawings are illustrative of control and monitoring requirements pertaining to various equipment of this project. The manufacturers shall design their own functional electric control devices and circuitry, in consultation with the specific elementary control diagrams and other project specifications, to meet the equipment control requirements. All such systems and package controls shall be furnished by the equipment manufacturer, except that controls shown in motor control centers and process controllers, remote control devices, and their interconnecting wiring (other than 24 volt heating, ventilating and air conditioning circuits) shall be provided under Division 16.

2.02 EQUIPMENT CONSTRUCTION

- A. General: All equipment shall be designed for the service intended, shall be of rugged construction, of ample strength for all stresses which may occur during fabrication, transportation, erection and during continuous or intermittent operation, shall be adequately stayed, braced and anchored, and shall be installed in a neat and workmanlike manner. Appearance and safety, as well as utility, shall be given consideration in the design of details. Materials of construction shall be cathodically compatible.
- B. Equipment, in general, shall be free-standing and shall be designed to be anchored to the floor structural bases and supports unless otherwise shown. Anchorage that restricts passageways or prevents operating and maintenance access shall not be acceptable.

2.03 MATERIALS AND STANDARDS

- A. Materials: Design, fabricate and assemble equipment and systems with new materials and in accordance with acceptable modern engineering and shop practices. Manufacture individual parts to standard sizes and gauges so repair parts can be installed in the field. Make like parts of duplicate units interchangeable. Do not place equipment in service at any time prior to delivery except as required for factory or shop tests.
- B. Uniformity: Unless otherwise specified, equipment or material of the same type or classification used for the same purpose shall be the product of the same manufacturer and shall be the same model.

2.04 LIFTING EYES

- A. All equipment weighing over 100 pounds shall be supplied with lifting eyes. Parts of equipment assemblies which are normally serviced separately, such as motors, shall have lifting eyes of their own in accordance with this section.

2.05 NAMEPLATES

- A. Equipment nameplates shall be engraved or stamped of stainless steel and fastened to the equipment in an accessible, conspicuous location with oval head stainless steel screws or drive pins. Identify equipment with symbols shown on drawings.

2.06 TOOLS AND SPARE PARTS

- A. All special tools required for exclusive operation and maintenance of respective items of equipment shall be furnished for those items of equipment by the manufacturer. This includes special tools, instruments, accessories required for proper "in-plant" adjustment, maintenance, overhaul and operation. Tools shall be high-grade, smooth, forged, alloy tool steel. Instruments or accessories shall be of top quality.
- B. All tools and spare parts shall be carefully packed in wood or metal chests or containers labeled with indelible markings and shall be adequately treated for a long period of storage. Complete ordering information including manufacturer, part number, part name and equipment name and number(s) for which the part is to be used shall be supplied with the required spare parts. The tools and spare parts shall be delivered and stored in a location directed by the Engineer. Storage method and material shall be submitted for Engineer's approval.
- C. Spare parts for equipment provided have been specified in the pertinent sections of the Specifications. The Contractor shall collect and store all spare parts so required in an area to be designated by the Engineer. In addition, the Contractor shall furnish the Engineer an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each item. Copies of actual invoice for each item shall be furnished with inventory to substantiate the delivery.

2.07 PROTECTION AGAINST ELECTROLYSIS

- A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjacent surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers or other approved materials. Connections of dissimilar piping materials shall utilize dielectric unions, flanges, couplings or bushings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation shall be as shown by skilled mechanics in strict accordance with the

respective manufacturer's instruction and recommendations and in the locations shown on the drawings.

- B. Contractor shall be responsible for the coordination of installation with the requirements of equipment manufacturers and all related work in conformance with the drawings and specifications.
- C. Installation and testing of piping and all equipment shall be as specified under the respective sections for the different types of pipe and equipment.

3.02 EQUIPMENT MOUNTS, GROUTING AND VIBRATION ISOLATION

- A. Equipment mountings shall be as shown. Where a steel or cast base is shown between the equipment and a concrete pedestal, it shall be painted after fabrication in conformance with applicable provisions of Section 09900: PAINTING. It also shall be equipped with drain pans and drain connections, where applicable.
- B. Unless shown otherwise, all concrete plan dimensions for bases or pedestals shall be at least two (2) inches larger in each dimension than the steel or cast base installed thereon. Conduits, piping connections, drains, etc., shall be installed as shown on the drawings, and/or standard mechanical details.
- C. The Contractor shall furnish all necessary materials and construct suitable raised concrete foundations for all equipment installed by him, even though such foundations may not be indicated on the drawings. The tops of foundation shall be at such elevation as will permit grouting as specified below.
- D. In setting pumps, motors and other items of equipment customarily grouted, the Contractor shall make an allowance of at least one inch for grout under the equipment bases. All shims shall be removed. All grout used for setting equipment shall be an approved non-shrink type grout. All pumps, fans, engines installed in the station shall be vibration isolated.
- E. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamfer around the top edge of the finished foundation.
- F. Where such procedure is impracticable, the method of placing grout shall be as approved. After the grout has hardened sufficiently, all forms, hoppers and excess grout shall be removed, and all exposed grout surfaces shall be patched in an approved manner, if necessary, given a burlap-rubbed finish, and painted with at least two coats of an approved paint.

3.03 PAINTING

- A. Unless otherwise specified herein or elsewhere in these specifications:
1. All motors hoists, drives, pumps and other similar manufactured items shall be shop primed and provided with manufacturer's standard synthetic or baked-on enamel finish paint. The shop-painted finish coated surface shall be of comparable type as specified in Section 09900: PAINTING.
 2. Shop Priming: All items constructed of shop or field fabrication steel shall have surface preparation and prime painting performed in the shop by the Contractor in conformance with Section 09900: PAINTING.
- B. Galvanizing shall conform to Section 05505: MISCELLANEOUS METALS. Galvanized steel or aluminum equipment and appurtenances shall not be shop primed or painted unless specified otherwise.

3.04 EQUIPMENT START-UP, TESTING, AND ADJUSTMENT

- A. Conform to Section 16950.
- B. Each facility shall be demonstrated to be in full operating order prior to acceptance. Should any equipment or part thereof fail to operate as intended, it shall be immediately removed and replaced, all at the Contractor's expense. .

****END OF SECTION****

SECTION 15060

EQUIPMENT MOUNTING

PART 1 - GENERAL

1.01 SCOPE

- A. This section includes mounts, supports, and the anchorage for equipment, piping, and accessories.

1.02 QUALITY ASSURANCE

- A. Support, anchorage, and mounting of all piping, and equipment shall be provided by the Contractor according to manufacturer's recommendations, 2007 CBC (Site Class D seismic zone), and industry standards requirements unless otherwise specified. All elements required to resist the calculated forces described herein or required by the equipment manufacturer shall be provided by the Contractor.
- B. Inasmuch as all anchorage of equipment is to be made of poured-in-place concrete elements, it is imperative that types of anchorage be coordinated with the concrete subcontractor so that anchorage may be installed at time of pouring.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Equipment mountings shall be as shown. All equipment located on floor slabs shall be mounted on concrete pads.

2.02 ANCHOR BOLTS

- A. Anchor and assembly bolts shall be of ample size and strength for the purposes intended as determined by the equipment manufacturer in accordance with the requirements of this section. Anchor bolt material shall be as specified in the individual equipment specifications.

2.03 CONCRETE PEDESTALS

- A. Concrete pedestals shall be at least three inches (3") larger than the steel or cast base and shall be adequately doweled into the floor slab. All conduits, piping connections, drains, etc. shall be enclosed by the concrete base. Unless otherwise shown or specified, no related conduits, piping connections, drains, etc. that rise directly from the floor shall be accepted.

PART 3 - EXECUTION

3.01 INSTALLATION

A. EQUIPMENT

1. Each piece of equipment shall be anchored to resist a minimum lateral force required by the latest edition of the 2007 California Building Code, the manufacturer of the equipment, or a lateral seismic force of sixty percent (60%) of the operating weight of the equipment, whichever is greater. This force shall be considered acting at the center of gravity of the piece under consideration. No equipment shall be anchored to vertical structural elements without written approval of the Engineer.
2. Equipment that is not vibration isolated shall be anchored directly to the supporting floor system. In addition to the anchorage, all such equipment shall be internally designed so that all static and moving parts are anchored to the supporting framework to resist the imposed seismic force. All forces must be transmitted to the base in order to be anchored as required. Vibration isolated equipment shall be specially designed to meet these same requirements.

B. PIPING

1. All piping, raceways, accessories, and appurtenances furnished with equipment shall be anchored to resist a lateral seismic force of 60% of its operating weight without excessive deflection. This force shall be considered acting at the center of gravity of the piece under consideration. Piping with flexible connections and/or expansion joints shall be anchored such that the intended uses of these joints are maintained in the piping system.

**** END OF SECTION ****

SECTION 15140

WATER SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Furnish and install all materials and perform all labor necessary for the complete installation of the water system as shown on plans and specified herein, to provide a complete functional system.

B. Related work:

1. Section 09970: Metal Coatings.

1.02 REFERENCE PUBLICATIONS

A. This section contains references to the following documents. They are a part of this section as specified and modified. The latest edition of referenced publications in effect at the time of the bid shall govern. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.

American Society for Testing and Material (ASTM)	
ASTM B32-76	Solder Metals
ASTM B88	Specifications for Seamless Copper Water Tube
ASTM B260	Solder Metals
ASTM A120	Pipe, Steel, Black and Hot-Dipped-Zinc-Coated (Galvanized) Welded and Seamless, for Ordinary uses
ASTM D-1785	Schedule 80 PVC

1.03 QUALITY ASSURANCE

A. All welding shall be performed by Certified Code Welders in accordance with Section 05090: WELDING.

B. Arrange for and conduct all field tests required by local authorities for permits or certification.

1.04 SUBMITTALS

- A. Submittals required under this section shall be in accordance with Section 01330: SUBMITTALS. The City assumes no responsibility for any items assembled or manufactured prior to approval of a submittal for the item or items.
- B. Certification: At completion of installation, furnish reports and all operational test data certifying that the equipment has been properly installed, adjusted and tested and is ready for full time operation.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS

- A. Unless specifically noted otherwise, pipe sizes shown are nominal inside diameter.
- B. Pipe and Fitting Types: Water Piping:
 - 1. Below Ground: Where shown, type L Copper tubing hard temper connection to water stub per ASTM B88, with wrought copper shown on civil plans, or cast brass solder type fittings, otherwise TypeK below grade; and Schedule 80 PVC per ASTM D-1785; and hot-dipped-zinc-coated (Galvanized) welded and seamless .
 - 2. Above Ground: Where shown, Type L Copper tubing hard temper per ASTM B88, with wrought copper or cast brass solder type fittings, and hot-dipped-zinc-coated (Galvanized) welded and seamless.

2.02 BALL VALVES

- A. Bronze ball valves shall have a bronze body, ball, and stem and shall be Nibco full port, stainless steel stem and ball, solder ends, T/S-585-70-66 or approved equal.

2.03 UNIONS AND FLANGES

- A. Provide types as follows:

Type of Pipe	Union
2" & Smaller	Mueller Co., brass, or approved equal, ground joint seat, sweat connections.
Type "L" Copper Tubing	150 lbs. cast bronze, flat faced flange 2-1/2" and larger with silver brazing threadless ends.

2.04 MISCELLANEOUS VALVES & PIPING ACCESSORIES

- A. Hose Bibs: one inch outlet, rough brass finish with vacuum breaker and loose key. Install twelve inches (12") above the top of the south facing wall of the west abutment retaining immediately adjacent to the bridge guardrail.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PLUMBING SYSTEM LAYOUT

- A. Lay out the plumbing system in careful coordination with the drawings, determining proper elevations for all components of the system and using only the minimum number of bends to produce a satisfactorily functioning system.
- B. Exposed piping at the pump station shall be Type L copper, and painted galvanized steel at the west bridge abutment. Freeze protection shall be provided for all exposed pipe. 20 mil PVC pipe tape shall be used to wrap the buried section of galvanized steel pipe.
- B. Follow the general layout shown on the drawings in all cases except where other work may interfere.
- C. Lay out piping to fall within partitions, walls, or roof cavities such that no furring other than as shown on the drawings will be required.

3.03 EXCAVATING AND BACKFILLING

- A. General: Excavate, trench and backfill for installation of work, in accordance with Section 02315: EXCAVATION AND BACKFILL and as specified herein.

- B. Safety Precautions: Provide safety shoring, bracing, or bulkheading to support excavations and maintain warning signs and barricades. Provide suitable temporary wood or steel plate covers over excavations crossing roadways or walks when so directed. Keep excavations free of water. Safeguard public health in disposal of water and prevent injury to public or private property.
- C. Excavations: Excavations of open vertical construction of sufficient width to provide free working space around work installed and provide sufficient space for back-filling and tamping.
- D. Where invert elevations are not shown, provide minimum 24 inches fill above top of pipe or conduit from adjoining finished grade for outside runs. Excavate trench minimum four inches (4") below required pipe grade for a minimum four inches (4") bed of sand, to provide a uniform grade and bearing throughout the length of pipe.
- E. Backfill: Do not place backfill until work has been inspected and tested by the Engineer.
 - 1. Backfill to twelve inches (12") above top of pipe with sand or engineered fill free from large rocks or lumps. Use sand only to minimum four inches (4") above top of pipe for piping with protective wrap or non-metallic pipe. Place even lifts both sides of pipe and compact to not less than ninety-five percent (95%) compaction with manual tamper; except compact sand backfill by flooding or jetting.
 - 2. Backfill remainder with six inches (6") layers of engineered fill, except under walks, roads or slabs. Tamp by hand or pneumatic tamper to not less than ninety-five percent (95%) compaction, except do not use machine tamping on non-metallic pipe.
 - 3. Backfill for excavations under proposed pavement, walks, roads, or new slabs on grade with clean sand compacted by flooding.
- F. Surface Work
 - 1. Paved Surfaces: Replace to match existing.
 - 2. Subsidence: Bring to grade any backfill which subsides or settles below adjacent ground level during guarantee period.
- G. Remove from site all surplus earth or material remaining after backfill.

3.04 INSTALLATION OF PIPING

- A. General

1. Install and test piping per latest edition of Uniform Plumbing Code and California Administrative Code, Title 24 "Building Standards", with any additional requirements specified.
 2. Install piping parallel to walls. Clear all obstructions, and keep openings and passage ways clear whether shown or not. Constantly check with other work to avoid interference.
 3. Make exposed polished or enameled connections to fixtures or equipment with special care, showing no tool marks or threads at fittings.
 4. Carry piping in chases or recesses in walls where provided, through openings in floors, and in furred ceilings; otherwise, as exposed pipes as directed. Do not run piping in floorfill, except as shown on Plans or as directed.
 5. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used. Use eccentric reducing fittings wherever necessary to provide free drainage of lines.
 6. Cap or plug ends of pipe immediately after installation to prevent entrance of foreign matter and leave in place until removal is necessary for completion of installation.
 7. Anchor piping subject to expansion or contraction in a manner permitting strains to be evenly distributed, and alleviated by swing joints or expansion loops which shall consist of plates welded to pipe and encased in concrete.
- B. Water Piping: All water piping shall be run generally level, free of traps or unnecessary bends, arranged to conform to the building requirements, and to suit the necessities of clearance for other mechanical work such as ducts, flues, conduits, and other work. No piping shall be installed so as to cause an unusual noise from the flow of water therein under normal conditions.
- C. Thoroughly flush, blow out, and prove clean each piping system before connecting to apparatus.

3.05 SLEEVES & OPENINGS

- A. Sleeves: Install sleeves of sufficient size to allow for free motion of pipe.
1. Where pipes penetrate walls or slabs, install permanent sleeves of Schedule forty (40) galvanized steel pipe. Finish flush when in walls and extend minimum two inches (2") above floor when passing through floor

slabs.

2. Caulk annular space between pipe or conduit and sleeves through floor slabs and outside walls with oakum and mastic and make watertight; or use Link Seal Modular Wall and Casing Seal with hole size as recommended by manufacturer. No visible leakage at sleeves will be permitted and shall be repaired.
3. Whenever a pipe line of any material terminates at, or extends through a structural wall or sump, the Contractor shall install in advance of pouring of concrete the fittings or special casting required for the particular installation. Unless otherwise specifically detailed on the Plans, or herein specified when a pipe passes from concrete to earth, or from concrete to any other rigid material, including another non-monolithic concrete member, provision shall be made for a reasonable relative movement without damaging the pipe. Such provision may consist of wrapping the pipe with one inch (1") fiberglass insulating material for at least two inches (2") from edge of concrete prior to pouring, or "canning" an opening two inches (2") larger in diameter and caulking the space around pipe with Thiokol mastic, or other approved methods. In the case of walls or slabs twelve inches (12") or less in thickness, the wrapping or canning shall extend the full thickness. Method of providing the flexibility shall be approved by the Engineer in advance. Above does not apply to walls retaining liquids.

3.06 PIPE JOINTS AND CONNECTIONS

- A. Cutting: Cut pipe and tubing with a power hacksaw, circular cutting machine using an abrasive wheel, or on a square end sawing vise by means of a hand hacksaw.
- B. Threaded Pipe: Make up joints in threaded piping in accordance with the following service schedules:
 1. Other Services: Armite Joint Seal Compound No. 250, Enterprise Commercial Thred-Seal, or approved equal.
 2. Place joint compound carefully and smoothly on male thread and not in fittings.
 3. Make threaded joints tight with togs or wrenches, caulking of any kink will not be permitted. Remake leaky joints with new materials.
 4. Use of thread cement or caulking to make end joint tight is absolutely prohibited.

5. Use only American Standard Pipe Threads. Cut all thread accurately, with not more than two threads showing beyond fitting.
- C. Copper and Brass Pipe and Tubing: Make up all joints in copper and brass pipe and tubing for all installations with silver brazing alloy, eleven hundred degrees (1100°F) melting point or greater, ASTM B260.

Plumbing piping above ground may be made up with 95-5 tin-antimony, ASTM B32-76, solder.

1. Surfaces to be jointed shall be cleaned of oil, grease, rust, and oxides. Remove grease from fittings by applying carbon tetrachloride with a brush.
2. Clean socket of fitting and end of pipe thoroughly with crocus cloth to remove rust and oxides.
3. After cleaning and before assembly or heating, apply Handy or Aircosil Flux to each joint surface and spread evenly. Apply heat with an oxyacetylene torch.
4. Make joints in accordance with instructions in Bulletin 17, published by Handy and Harmon Company, or Air Reduction Catalog No. 925.
5. Exercise extreme care to prevent overheating of pipe and fittings.
6. Do not use sharp-tooth wrench in making up brass pipe.
7. Use friction wrenches exclusively when erecting plated, polished, or soft-metal piping.

3.07 HANGERS & SUPPORTS

A. General:

1. Support all piping so that it is firmly held in place by approved iron hangers and supports, in accordance with best practice recommendations of pipe hanger institute.
2. Rigidly fasten hose faucets and similar items at ends of pipe branches to building construction near point of connection.
3. Do not install hanger material until approved.
4. Do not support piping by any wire, rope, wood, or other makeshift devices.
5. Do not burn or weld any structural member unless approved by the Engineer.

6. Insulate copper tubing from ferrous material and hangers with two thicknesses of three inch (3") wide strip of ten (10) mil polyvinyl tape wrapped around pipe.
 7. Do not use any valve or piece of equipment to support the weight of any pipe.
- B. Point of Support Connectors: Provide rigid connectors for stationary piping. For all piping subject to movement, all insulated piping and off-level structural conditions, provide swivel connectors.

3.08 CATHODIC PROTECTION

- A. Provide cathodic protection shown and at the following locations:
1. In metallic water service connection into building within five (5) feet of building wall. Install adjacent to shut-off valve or cock, and above ground where possible.
 2. In water service connections in ground at point where new metallic lines connect to existing metallic lines.
 3. At points of connection where copper water lines connect to ferrous piping.

3.09 VALVES & UNIONS

- A. Provide valves in water systems. Locate and arrange so as to give complete regulation of apparatus, equipment, and fixtures.
- B. Provide valves in at least the following locations:
1. On both sides of apparatus and equipment
 2. For flushing and sterilizing the system
 3. Where shown on the drawings
- C. Locate valves for easy accessibility and maintenance.
- D. Unions: Provide a union where shown and at each threaded or soldered connection to valves. Dielectric unions shall be furnished and installed at points of connection between piping of dissimilar metals.

3.10 PIPE MARKERS

- A. Use pressure sensitive tape markers designating flow direction on lower half of pipe lines where view is unobstructed from floor. Locate in straight runs, at intersections or changes of direction, at each isolated valve, and immediately adjacent to both sides of floor or wall penetrations.
- B. Where pipes are too small or not readily accessible for such application, a brass identification tag will be securely fastened at appropriate locations. Tags will be at least 1-1/2 inches in diameter, with depressed black characters 1/2 inch high.

3.11 CONCRETE

- A. Provide concrete required for the work of this section in accordance with provisions of Section 03300: CAST-IN-PLACE CONCRETE.

3.12 DISINFECTION OF WATER SYSTEM

- A. Clean and disinfect domestic cold water systems connected to domestic water systems, prior to final inspection per AWWA Standard Procedures for Disinfecting Water Mains.
- B. With all fixtures connected and operable and ready for use and when, by test, system is proved to be free from leaks, thoroughly flush by fully opening every outlet and operating every fixture until clear water flows from all outlets and fixtures.
- C. Fill system completely full of water and inject disinfectant slowly and continuously at an even rate (not in slugs) until an orthotolidin test at each outlet shows a chlorine residual concentration of at least fifty (50) parts per million (ppm).
- D. Maintain condition for twenty-four (24) hours with chlorine residual of fifty (50) ppm retained in system for this twenty-four (24) hour period. If, after twenty-four (24) hours, orthotolidin tests indicate that chlorine residual concentration has decreased below fifty (50) ppm, then disinfection procedure must be repeated until an approved result is obtained.
- E. When the above procedure has been completed, flush out entire system with fresh water until an orthotolidin test at any outlet shows a residual of not more than 0.2 ppm.

3.13 TESTING OF PIPING

- A. All piping shall be tested at completion of roughing in, in accordance with the following schedule and show no loss in pressure or visible leaks after a minimum duration of four (4) hours at the test pressures indicated.

TEST SCHEDULE		
System Tested	Test Pressure psig	Test With
Cold Water	150 lbs.	Water

- B. Pipe wrap test: All piping to have protective wrapping, shall have holiday detector test performed to locate any holidays in the pipe wrapping. No holidays shall be permitted.
- C. Where tests show materials or workmanship to be deficient, replace or repair as necessary, and repeat the test until the specified standards are achieved.

3.14 TESTING

- A. At the completion of installation provide sufficient quantity of water to fill the containment structure to test drainage into sump pit.
- B. Open and close drainage valve to ensure flow and shutoff is acceptable. Verify operation of post indicator.
- C. Test all control valves, solenoid valves, and hose bibs to ensure proper operation.
- D. Retest and adjust as required to suit jobsite conditions.

3.15 EQUIPMENT FURNISHED BY OTHERS

- A. Connect all equipment requiring plumbing system connections, rough-in and connect -- R.I. & C. -- all fixtures and/or equipment furnished by others. Provide all traps, supplies, etc., required for connection and provide trim where indicated on drawings or where required.

3.16 PAINTING AND PROTECTIVE COATING

- A. All exposed materials, including supports, which have not been shop painted shall be shop primed suitable for field painting as specified in Section 09970: METAL COATINGS. Shop painted items which have damage to the shop coatings shall be touched up as specified in said painting and protective coating section.

****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 necessary labor, equipment and materials required for the complete electrical system as specified and as shown on the Plans.
- B. Work Included:
 - 1. Equipment and materials to be furnished and installed by the Contractor under Division 16 shall include the following:
 - a. Raceway System (16110)
 - b. Low Voltage Main Switchboard(16430)
 - c. Miscellaneous Equipment(16922)
 - d. Existing RTU System (16921)
 - e. Operational Testing (16950)
 - f. Trash Rack Control Panel(16480)
 - g. Low Voltage Main Switchboard(16430)
 - h. Lighting(16530)
 - i. Low Voltage Wire & Cable(16120)

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.

1.04 DRAWINGS

- A. The Contractor shall verify all conditions at site, 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. Carefully study the drawings and premises in order to determine the best methods, exact locations, routes, noting the building obstructions, etc., and furnish and install all conduit and equipment in available locations and as required by conditions found at the site.

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 occupied 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, and shall be only at such a time and of such duration as directed.
- B. The contractor shall be responsible for coordination with SMUD 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 2007 California Building Code Section 1613, Site Class D.

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 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. MCC 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 1 1/2 inches high and smaller 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:
 1. Surface Mounted Boxes: One prime coat over galvanizing, one coat of light gray synthetic enamel or lacquer.
 1. 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. Free standing equipment and panels shall be placed on a 3 ½" thick house-keeping pad or on a channel steel base as directed by the Engineer.
- 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 caused 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 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 16110
RACEWAY SYSTEMS

PART 1 - GENERAL

1.01 SCOPE

- B. 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.
- C. 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 3/4 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 inturred 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 drainage channel 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

- A. 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 3/4 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 panelboard 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 inside sump area shall be stainless steel.
4. Support conduits as close to 8 foot 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), is 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.

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 Conduit (indoor & outdoor):	Rigid galvanized steel conduit.
Conduit in Concrete Slab:	Rigid galvanized steel conduit.
Underground Conduit:	Rigid galvanized steel PVC coated conduit where the conduit is directly in contact with the earth or schedule 40 PVC conduit with concrete encasement minimum of 4" all around for horizontal runs only.
Conduit in Duct Bank:	Schedule 40 PVC conduit with concrete encasement minimum of 4" all around for horizontal runs only.
Vertical or horizontal sweeps, risers, or stubs into underground boxes:	Rigid galvanized steel PVC coated conduit for entire sweep, underground runs 5' prior to riser or stub, and 6" above finished grade. Conduit 6" above finished grade shall be installed as exposed conduit.
Bottom Entrance of Switchgear, Distribution Panel, MCC, & etc:	Rigid galvanized steel PVC coated conduit.
Side or Top Entrance of Switchgear, Distribution Panel, MCC, & etc:	Rigid galvanized steel conduit.

CONDUIT INSTALLATION

CONDUIT TYPE

Motor Conduit Box to Rigid Wireway System:

Flexible liquid tight metal conduit.

Door Switch Sensor to Rigid Wireway System:

Flexible liquid tight metal conduit.

Conduit From Junction Box to Outside Building Lights:

Rigid galvanized steel conduit.

Conduit From Junction Box to Trash Rack Lights:

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. Contractor shall place a 6" wide electrical caution warning tape in all trenches 12" above concrete or as directed by the Engineer.

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 has 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
Grounding	All	TW or bare
Feeders	No. 6 and above	THHN/THWN
Cords	No. 12	SO
Wet Locations	All	THWN
Corrosive Locations	All	THHN/THWN
VFD Feed to Motor	All	VFD rated, blended composite semiconductive, tray cable rated, UL type TC 90C. 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. RS-485 Application: tinned copper, polyethylene insulated, twisted pair. Overall aluminum-polyester shield. 24 AWG stranded tinned copper drain wire. Overall tinned copper braid shield. Chrome PVC jacket. The cable shall be Belden 9842, or equal.
- I. 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

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 2002 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 conductors at each unconnected outlet. The free ends of conductors shall be coiled neatly in the outlet box.

B. Splicing and Termination of Conductors:

1. Conductors #10 AWG and smaller:
 - a. Twist 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.
 - f. 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 embedded 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 required to ensure 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 16430

LOW VOLTAGE MAIN SWITCHBOARD

PART 1 - GENERAL

1.01 SCOPE

- A. The Main Switchboard and SMUD electric service is existing.
- B. Adding a disconnect switch, a back-up power receptacle and associated interlocks.
- C. The provisions of Sections 16010 and 16120 of these specifications shall apply unless otherwise specified in this Section.

1.02 ELECTRIC SERVICE

- A. The existing SMUD electric service is 3-phase, 4-wire, 480/277 V.

1.03 SUBMITTALS

- A. Submittals for the Disconnect Switch, power receptacle and others shall include, but shall not be limited to, the following:
 - 1. Catalog cuts showing and identifying manufacturer, catalog numbers, dimensions, weights and material.
 - 2. Assembly drawings of the equipment.
 - 3. Operating and Maintenance Manuals as specified in Section 01330.
 - 4. Dimensioned "as-built" drawings.
 - 5. Single line drawing.
 - 6. Certified test reports prepared by manufacturer.

1.04 QUALITY ASSURANCE

- A. The manufacturer has been fabricating and assembling similar equipment for a minimum of five (5) years.

PART 2 - PRODUCTS

2.01 DISCONNECT SWITCH

A. CONSTRUCTION

The Disconnect Switch shall be enclosed in a NEMA 12 rated enclosure with gasket and shall be rated 600V. It shall be designed for both bottom and top entry conduits. The Disconnect Switch shall be inter-lockable with keys as shown on the plan. The Disconnect Switch shall be factory assembled, tested, and subsequently shipped to the job site as a complete operational assembly.

- B. The Disconnect Switch shall be General Electric, Square D, Cutler-Hammer or equal.

2.02 BACK-UP POWER GENERATOR CONNECTOR

- A. For services at 100 A or less and 480 V provide a Hubbell Circuit-Lock model number 4100M17WR. Install per Plans.

2.03 INTER-LOCK KEYS

- A. Provide mechanical interlock key sets at the existing switchboard and at the new disconnect switch as indicated on the Plans.

PART 3 - EXECUTION

3.01 FACTORY TESTING

- A. All products 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.

3.02 INSTALLATION AND TESTS

- A. Contractor shall furnish all material and labor including, but not limited to, transportation, loading, lifting, jacking, wiring to completely install all items as shown on the drawings and shall conform with the National Electric Code (NEC).
- B. Refer to Section 16950 for all the testing requirements.

END OF SECTION

SECTION 16480

TRASH RACK CONTROL PANEL

PART 1 - GENERAL

1.01 SCOPE

- A. This Specification section covers the furnishing, installing and testing of the trash rack control panel 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 trash rack control panel 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, uprights, and showing the locations 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 panel shall be built and labeled by a manufacturer with a UL file listing. It shall meet UL 845.

PART 2 -- PRODUCTS

2.01 MATERIAL AND EQUIPMENT

- A. The control panel shall be a 3 phase, 3 wire, 480 volt, free standing, dead front enclosure with NEMA Class II Type C wiring. The enclosure shall be stainless steel NEMA 4X rated. The panel shall contain the proper clearances and space for safe operation of the equipment therein. Control voltage shall be 120 VAC.
- B. Motor Circuit Protector (MCP) shall be molded case quick make quick break, adjustable instantaneous trip from 700 percent to 1300 percent of motor full load amperes. The motor circuit protector shall be rated 600 volts with adjustable trip settings. MCP shall be General Electric "map break", Cutler-Hammer "MCP", or approved equal. The operating handle shall close the MCP when placed in the upward position and open the MCP in the downward position. The handle shall accept multiple padlocks to lock the MCP in the open position. MCP 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. Magnetic starters shall have auxiliary contacts as required by the Plans including N-O and N-C contacts as indicated on the Plans, plus one each spare N-O and N-C contact. The combination motor starters shall be drawout-type for size 5 and below. The fixed-type unit assembly shall be constructed so that it can be easily removed from its panel using pull apart terminal strips to the terminal block and withdrawing from the primary bus. Removal of a unit assembly shall be possible without rear access and without disturbing any other unit in the motor control center.
- E. Each starter unit shall have its own 480 V - 120 V AC control power transformer. It shall have a 120 volt grounded secondary. One secondary fuse and 2 primary fuses shall be provided. Control power transformers shall be sized to accommodate the control devices indicated or as shown on the Plans.
- F. Full voltage motor starters shall be sized as indicated on the Plans. The starters shall have the same interrupting capacity as the circuit breakers and power busses.

- G. Motor starters shall be designed to NEMA ratings only. Starters designed to IEC ratings shall not be acceptable.
- H. Elapsed Time Meter: Elapsed time meter shall be large panel mounted, non-reset type, capable of reading 99,999.9 hours to the nearest 1/10 hour, rated 120 volts, 60 Hz. Elapsed time meter shall be mounted on the exterior of the section door between 40" and 60" from the bottom of the panel. Elapsed Time Meters shall be Eagle Signal Controls Model # HK410A6 or Engineer approved equal. Meters using push on retaining clips shall not be acceptable.
- I. Indicating Lights and Lenses: Indicating lights shall be industrial, waterproof NEMA 4/4X, transformer type, with LED type lamps, and push to test. Lights shall be by Cutler-Hammer, A-B or approved equal. Mount all indicating lights on front panel of motor control center.

Unless otherwise specified, indicating lights shall be equipped with colored lenses in accordance with the following schedule:

COLOR	FUNCTION	EXAMPLE
White or Clear	Normal Condition	Control power on, status OK
Red	Run, valve closed	Motor running, end of cycle
Green	Ready, valve open	Equipment ready, operating
Amber or Yellow	Abnormal condition	Failure of equipment or status abnormal, fault condition

- J. Control and Protective Equipment: Control relays, timers, switches (including contactor auxiliary switches), indicating lights, push buttons, overload relays, fuses, control transformers, terminal blocks and wiring shall be furnished and installed as shown on the drawings. Overload relays shall be sized to trip according to NEC as per data on the motor nameplate and shall be NEMA style. Push buttons shall be NEMA style. Contractor shall test each back spin relay and set per Engineer's requirements.
- K. Station Service Transformer: transformer shall be dry type and sized per Plans. All windings of the transformer shall be copper. The transformer shall have NEMA energy efficiency rating.
- L. Provide 150 W electric resistance type strip heater in each vertical section. Voltage shall be 120 V, single phase. Furnish thermostats to control heaters with one thermostat per heater located in its respective section. Thermostats shall have a range of 40 to 80 degrees F and shall have contacts rated 120 volts, 10 amperes continuous, 60 Hz. Provide expanded metal shield for each heater.

M. Busses:

1. **Grounding Bus:** Grounding bus shall be 1/4" by 1" copper, hard connected running full width of MCC and located near bottom. Grounding bus shall be bolted to the frame of the MCC and include lugs for equipment grounding conductors.

PART 3 -- EXECUTION

3.01 FACTORY TESTING

A. The control panel and its 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 control panel as shown on the drawings and shall conform with the National Electrical Code (NEC).

END OF SECTION

SECTION 16530

LIGHTING

PART 1 - GENERAL

1.01 SCOPE

- A This specification section covers the furnishing, and installing of lighting fixtures, wiring devices, poles, conduit, wiring and other material for the complete indoor and outdoor lighting as shown on the drawings. Lighting fixtures and hardware shall be installed as shown on the Plans.

1.02 SUBMITTALS

- A. Catalog cuts showing manufacturer, catalog numbers, dimensions, weights and material for fixtures and poles shall be submitted to the Engineer for review in accordance with Section 01330.

PART 2 - PRODUCTS

2.01 REFERENCE STANDARDS

- A. Materials and equipment supplied under this contract shall be designed, manufactured, and tested in accordance with the latest version of the following standard:
1. National Electrical Manufacturers Association (NEMA).
 2. Underwriters Laboratories Inc.
 3. National Electrical Code.

2.02 LIGHTING FIXTURES, DEVICES, AND POLES

- A. Lighting Fixtures shall be complete with ballast, mounting brackets and hardware, lamps, lenses, fixtures wire, and all required accessories as specified and as required by NEC. The lighting fixtures and fixture accessories shall be as shown on the drawings, or approved equal.
- B. Ballasts for high pressure sodium lamps shall be capable of starting and operating the lamp from a nominal 120 volts AC, 60 Hz power source within the limits specified by the lamp manufacturer. The ballast, including the starting aid, shall protect itself against normal lamp failure modes. The ballast shall be capable for operating for six months with the lamp in an open or short circuit

condition without significant loss of ballast life. The lamp ballast system power factor shall not drop below 85 percent for plus or minus ten percent variation in line voltage.

- C. Light Poles shall be anchor base, round, tapered steel, hot dipped galvanized, height as indicated, complete with handhole and gasketed cover, anchor bolts with leveling and locking screws and cover, and grounding connection.
- D. Interior Lighting Fixtures: Fluorescent light fixtures shall be manufactured in accordance with UL standard 935. Ballasts for fluorescent fixtures shall be integral with fixture, high power factor, and electronic.
- E. Light Switches: Switches shall be single pole, specification grade, 277 volt, 3 wire, 20 ampere A.C., ivory in color with stainless steel cover plates. Furnish Hubbell 1221, Leviton 1201-2, or approved equal. **Light switches shall be labeled with nameplates per section 16010.**
- F. GFCI Receptacles shall be ivory, 20 A, NEMA 5-20R furnished with stainless steel plates. Receptacles shall be Leviton #6899, G.E. #TGTR115, Square D #GFDR120, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All lighting poles and fixtures shall be directly grounded to the site grounding system by means of a conductor of a size not less than that required by NEC. If insulated, the ground conductor insulation shall be colored green.
- B. The Contractor shall install all lighting fixtures in accordance with the manufacturer's instructions and recommendations.
- C. All exterior fixtures shall be aligned and directed as shown on the Plans and as directed by the Engineer in order to illuminate the desired area properly. Fixtures shall be directly and rigidly mounted on Contractor provided supporting structures.
- D. Unless otherwise noted on the plans: general use receptacles shall be mounted 18" above the finish floor to device centerline, light switches shall be mounted 48" above finish floor to device centerline.
- E. Prior to acceptance by the City the Contractor shall thoroughly clean the fixtures and lamps.

END OF SECTION

SECTION 16921

EXISTING RTU SYSTEM

PART 1 - GENERAL

1.01 SCOPE

- A. This Section covers the control wirings from the new trash rack control panel to the existing Remote Telemetry Unit (RTU) system, and other appurtenances necessary for a complete and operating system.
- B. The RTU panel is existing as shown on the Plans. The Contractor shall make all the new connections per Plans. The City will verify Contractor made RTU interconnection wiring, perform software upgrade, display screen upgrade, communication re-establishment and testing.
- C. The Contractor shall cooperate with the City during testing and start up. The Contractor shall have electrical personnel present during City's RTU point-to-point testing and start-up.

PART 2 - PRODUCTS

2.01 RTU

- A. Existing.

2.02 RTU ACCESSORIES

- A. The Contractor shall furnish the following RTU accessories and deliver them to the City Inspector:

Modbus RS485 Com Base	170ADM540 80	Modicon	1	Each
Interbus S Com Module	170INT11000	Modicon	1	Each
Interbus S Com Cable	170MCI00700	Modicon	1	Each

The Contractor may contact Controlco's Sacramento sales office at (916) 927-5599, Fax: (916) 927-5599.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The Contractor shall be responsible for pulling all the cables and wires and make all the connections as shown on the Plans or as directed by the Engineer. The RTU system shall be installed in accordance with manufacturer's written instructions. The City will conduct tests to determine its acceptability..
- B. The City will perform the following work:
 - 1. Verify the correct installation of the RTU system and operator interface panel.
 - 2. Verify the correct installation, type, and size of wiring terminated from field devices, operator interface panel, and to the RTU system.
 - 3. Verify the correct connection of all power sources supplied to and from the PLC system.
 - 4. Verify I/O terminations and proper device calibrations.
- C. If deficiencies are found in section "B" items 1 through 4 above, the Contractor shall immediately correct the problem at no additional cost to the City.

3.02 FIELD TESTING

- A. After finishing all the connections, The Contractor shall perform a point to point test of all the PLC functions that are transmitted back to Control 12 at the CWTP. Verify that all data points are transmitted back to Control 12. The Contractor shall coordinate these tests with the City.
- A. Point to point testing shall consist of the following tasks to be executed jointly between the City and the Contractor.
 - 1. Analog testing of all analog devices from the field to the PLC. Digital input testing of all digital devices from the field to the PLC.
 - 2. Digital input testing of all digital devices from the field to the PLC.
 - 2. Digital output testing of outputs from the PLC to the field device controlled.
- B. Point to point test forms will be provided by the City and will require sign off at each point tested by the City and the Contractor's assigned representative.

END OF SECTION

SECTION 16922

MISCELLANEOUS EQUIPMENT

PART 1 - GENERAL

1.01 SCOPE

- A. This Section covers the furnishing and installation of the following equipment:
Submersible Level Transducer.

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. Manufacturers' Data:
 - 1. Submersible Level Transducer
- B. Shop Drawings.
- C. 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 SUBMERSIBLE LEVEL TRANSDUCER

- A. The Contractor shall provide the submersible level transducers as shown on the Plans. The submersible level transducer shall provide a 4-20ma output signal and be manufactured from stainless steel. The Contractor shall provide each submersible level pressure transducer with a gland cable seal, aneroid bellows with lightning arrester, and polyurethane cable. Install the aneroid bellows with lightning arrester inside the control panel per the manufacturer's directions.

- B. The Contractor shall order enough cable so there are no splices between each submersible level transducer and the RTU as shown on the plans.
- C. The range of the submersible level transducer shall be set to read 0 to 20 feet of water column (ft H₂O). The engineered units shall read 0 feet to +20 feet.
- D. The submersible level transducer shall be Esterline Series 705 or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The Contractor shall be responsible for the installation of the equipment specified and shall pull all the cables and wires and make all the connections as shown on the Plans. The City will conduct tests to determine its acceptability.

3.02 FIELD TESTING

- A. After finishing all the connections, the Contractor shall cooperate with City during the testing.

END OF SECTION

SECTION 16950
OPERATIONAL TESTING

PART 1 - GENERAL

1.01 SCOPE

A. General

1. Independent test company pre-operational 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 pre-operational 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. Phase rotation test.
 2. MCC device test including MCP and breaker test.
 3. Ground system test.
 4. Generator receptacle 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.

- C. 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 "ABC" front to back, left to right and top to bottom.

3.04 MOTOR CIRCUIT PROTECTOR (MCP) AND CIRCUIT BREAKER PREOPERATIONAL TEST

- A. All MCPs and circuit breakers shall be checked for proper mounting, conductor size and feeder designation.
- B. All MCPs and 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.

3.05 SWITCHBOARD & MCC 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 manufacturer's 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

B. Electrical Tests:

1. Measure insulation resistance of starter phase to phase and phase to ground with the starter contacts closed and the protective device open. Test voltage and minimum acceptable values shall conform to NETA Section 3 "Test Values." Measure insulation resistance of each control circuit with respect to ground.
2. Motor overload units shall be tested by injecting primary current through overload unit and monitoring trip time.
3. Perform control functional tests by initiating control devices to affect proper operation with motor feeder disconnected.

3.05 WIRING TEST

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

3.06 OPERATIONAL TESTING

- A. After preoperational tests are complete, the Contractor shall conduct overall operational testing of the plant which shall be witnessed by the Engineer and other City personnel. City O&M personnel will assist the Contractor during operational testing.

END OF SECTION

APPENDIX

1. Streambed Alteration Agreement
2. Caltrans Right of Entry Agreement

AGREEMENT REGARDING PROPOSED STREAM ALTERATION

THIS AGREEMENT, entered into between the State of California, Department of Fish and Game, hereinafter called the Department, and City of Sacramento, State of California, hereafter called the City, is as follows:

WHEREAS, pursuant to California Fish and Game Code, Section 1602, the City, on June 12, 2009, notified the Department that it intends to substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed of, the following water: Magpie Creek, in the County of Sacramento, State of California, Latitude 38.64162, Longitude -121.47123.

WHEREAS, the Department, represented by Gary Hobgood, has determined that such operations may substantially adversely affect existing fish and wildlife resources including: various life stages of fish, other forms of vertebrate and invertebrate aquatic life, amphibians, reptiles and nesting birds and riparian plant species.

THEREFORE, the Department hereby proposes measures to protect fish and wildlife during the City's work. The City hereby agrees to accept the following recommendations as part of his work:

Project Description: The City of Sacramento proposes to construct a bridge across the Magpie Creek with the use of two 62' long railroad flatcars placed side by side. The bridge will be used to deposit trash and debris collected by two automated trash rakes placed in the channel at the upstream side of the bridge. The trash rakes will be supported and separated by three concrete piers that will be constructed in the channel.

Stream Zone Defined: The stream zone is that portion of the stream channel that restricts lateral movement of water. For this project, the stream zone is delineated at the top of the bank.

1. The notification, together with all supporting documents submitted with the notification, is hereby incorporated into this agreement to describe the location and features of the proposed project. The City agrees that all work shall be done as described in the notification and supporting documents, incorporating all project modifications, wildlife resource protection features, mitigation measures, and provisions as described in this agreement. Where apparent conflicts exist between the notification and the provisions listed in this agreement, the City shall comply with the provisions listed in this agreement. The City further agrees to notify the Department of any modifications made to the project plans submitted to the Department. At the discretion of the Department, this agreement will be amended to accommodate modifications to the project plans submitted to the Department and/or new project activities. Please see the current fee schedule to determine the appropriate amendment fee.
2. Documents, plans, surveys, notifications, and requests pertaining to this project or required by this agreement may be sent via email to Gary Hobgood at

ghobgood@dfg.ca.gov or delivered to the Department of Fish and Game at 1701 Nimbus Road, Suite A, Rancho Cordova, CA 95670. Refer to Notification Number 1600-2009-0114-R2 when submitting documents to the Department.

3. The time period for completing the work within the stream zone of Magpie Creek shall be restricted to periods of low stream flow and dry weather and shall be confined to the period of April 15 to November 15. Construction activities shall be timed with awareness of precipitation forecasts and likely increases in stream flow. Construction activities within the stream zone shall cease until all reasonable erosion control measures, inside and outside of the stream zone, have been implemented prior to all storm events.
4. If the City finds more time is needed to complete the authorized activity, the City shall submit a written request for a work period time extension to the Department. The work period extension request shall provide the following information: 1) Describe the extent of work already completed; 2) Provide specific detail of the activities that remain to be completed within the stream zone; and 3) Detail the actual time required to complete each of the remaining activities within the stream zone. The work period extension request should consider the effects of increased stream conditions, rain delays, increased erosion control measures, and limited access due to saturated soil conditions. Photographs of the work completed and the proposed work areas are helpful in assisting the Department in its evaluation. Time extensions are issued at the discretion of the Department. The Department will review the written request to work beyond the established work period. The Department will have ten calendar days to approve the proposed work period extension. The Department reserves the right to require additional measures designed to protect natural resources.
5. The City is responsible for obtaining all required permits and authorizations from local, state and federal agencies. The City shall notify the Department where conflicts exist between the provisions of this agreement and those imposed by other regulatory agencies. Unless otherwise notified, the City shall comply with the provision that offers the greatest protection to water quality, species of special concern and/or critical habitat.
6. If a private contractor is used for this project, the contractor shall sign City's copy of this agreement prior to working within the stream zone. A copy of this agreement and a copy of the original notification, including the project description, as submitted to the Department, must be available upon request at the work site. The contractor or a designated crew supervisor shall be on site the entire time a work crew is working near the stream zone. The supervisor shall be completely familiar with the terms and conditions of this agreement and shall ensure compliance with all terms and conditions. The Department reserves the right to inspect the project site to ensure that there is compliance with the terms/conditions of this Agreement.
7. The City shall notify the Department within two working days of beginning work within the stream zone of Magpie Creek. Upon completion of the project activities described in this agreement, the work area within the stream zone shall be digitally photographed. Photographs shall be submitted to the Department within two days of completion. Photographs and project commencement notification shall be submitted as instructed in

item number 2 above.

8. When work in a flowing stream is unavoidable, the entire stream flow shall be diverted around or through the work area during the excavation and/or construction operations. Stream flow shall be diverted using gravity flow through temporary culverts/pipe's or pumped around the work site with the use of hoses. When any dam or other artificial obstruction is being constructed, maintained, or placed in operation, sufficient water shall at all times be allowed to pass downstream to maintain aquatic life below the dam pursuant to Fish and Game Code section 5937. Any temporary dam or other artificial obstruction constructed shall only be built from clean materials such as sandbags, gravel bags, water dams, or clean/washed gravel which will cause little or no siltation.
9. Precautions to minimize turbidity/siltation shall be taken into account during project planning and implementation. This may require the placement of silt fencing, coir logs, coir rolls, straw bale dikes, or other siltation barriers so that silt and/or other deleterious materials are not allowed to pass to downstream reaches. Passage of sediment beyond the sediment barrier(s) is prohibited. If any sediment barrier fails to retain sediment, corrective measures shall be taken. The sediment barrier(s) shall be maintained in good operating condition throughout the construction period and the following rainy season. Maintenance includes, but is not limited to, removal of accumulated silt and/or replacement of damaged silt fencing, coir logs, coir rolls, and/or straw bale dikes. The City is responsible for the removal of non-biodegradable silt barriers (such as plastic silt fencing) after the disturbed areas have been stabilized with erosion control vegetation (usually after the first growing season). Upon Department determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation shall be halted until effective Department approved control devices are installed or abatement procedures are initiated.
10. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances which could be hazardous to aquatic life, resulting from project related activities, shall be prevented from contaminating the soil and/or entering the waters of the state. Any of these materials, placed within or where they may enter a stream or lake by the City or any party working under contract or with the permission of the City, shall be removed immediately. The Department shall be notified immediately by the City of any spills and shall be consulted regarding clean-up procedures.
11. During construction, the contractor shall not dump any litter or construction debris within the stream zone. All construction debris and associated materials shall be removed from the work site upon completion of this project.
12. This agreement is not valid and work may not begin until the agreement is signed by a representative of the Department of Fish & Game. Stream alteration work authorized by this agreement expires on December 31, 2013. This agreement shall remain in effect for that time necessary to satisfy all required mitigation and monitoring measures.
13. Requests for Extensions (agreement renewal), Minor Amendments, and Major

Amendments must be submitted in writing prior to expiration of the agreement or commencement of work on modified project plans. Extensions and Amendments are issued at the discretion of the Department. Please see the current fee schedule to determine the appropriate fee.

14. The Department may take enforcement action and reserves the right to suspend and/or revoke this agreement if the Department determines that the circumstances warrant. The circumstances that could require these Department actions include, but are not limited to, the following: A) Failure to comply with the terms/conditions of this agreement. B) The information provided by the City in support of the agreement/notification is determined by the Department to be incomplete, or inaccurate. C) When new information becomes available to the Department representative(s) that was not known when preparing the original terms/conditions of this agreement. D) The project as described in the notification, agreement, or amendment has changed, or conditions affecting fish and wildlife resources change.
15. If, in the opinion of the Department, conditions arise or change in such a manner as to be considered deleterious to aquatic life, operations shall cease until corrective measures are taken.
16. It is understood that the Department enters into this agreement for purposes of establishing protective features for fish and wildlife, in the event that a project is implemented. The decision to proceed with the project is the sole responsibility of the City, and is not required by this agreement. It is agreed that all liability and/or incurred costs related to or arising out of the City's project and the fish and wildlife protective conditions of this agreement, remain the sole responsibility of the City. The City agrees to hold harmless and defend the State of California and the Department of Fish and Game against any related claim made by any party or parties for personal injury or other damage.

SIGNATURE PAGE

The City, as designated by the signature on this agreement, shall be responsible for the execution of all elements of this agreement. A copy of this agreement must be provided to contractor and subcontractors and must be in their possession at the work site.

Failure to comply with the provisions of this agreement and with other pertinent Code Sections, including but not limited to Fish and Game Code Sections 5650, 5652 and 5948, may result in prosecution.

Nothing in this agreement authorizes the City to trespass on any land or property, nor does it relieve the City of responsibility for compliance with applicable federal, state, or local laws or ordinances.

This agreement is not valid and work may not begin until the agreement is signed by a representative of the Department of Fish & Game.

City
Representative: _____
Please print and sign name

Date _____

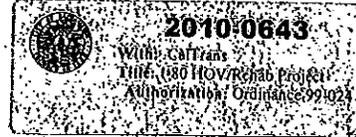
Contractor: _____ Date _____

Title: _____

Company: _____

Department
Representative: _____ Date _____
Sandra Morey, Regional Manager

Caltrans Right of Entry Agreement – Sump 157



RIGHT OF ENTRY AGREEMENT

THIS AGREEMENT is made and entered into as of 7/29, 2010, by and between the CITY OF SACRAMENTO, a California Municipal Corporation (hereinafter "City"), and the STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION (hereinafter "Licensee").

IT IS MUTUALLY AGREED BY AND BETWEEN THE PARTIES HERETO AS FOLLOWS:

1. DEFINITION OF LICENSEE.

For purposes of this Agreement, all references in this Agreement to the Licensee shall include the Licensee's contractors, subcontractors, officers, agents and employees, and others acting under its or their authority.

2. RIGHT GRANTED; PURPOSE.

The City hereby grants to the Licensee the right, during the term hereinafter stated and upon and subject to each and all of the terms, provisions and conditions herein contained, to enter upon and have ingress to and egress from those portions of real property in the County of Sacramento, State of California, located on Assessor's Parcel No.: 237-0031-003, commonly known as Sump 157, which is shown on Exhibit "A" attached hereto (hereinafter referred to as the "Premises"); to construct the decking/median widening of the Natomas East Canal Bridge and Overhead Work, which consist of 8 pairs of new bridge columns, seismically retrofit existing bridge columns by installing infill walls between the existing bridge columns, widening the abutments, and reconstruction of the outside bridge rails as part of the transportation project identified as Sac 80 HOV/Rehab Project, and for such other incidental purposes as may be required to perform such work, subject to the terms and conditions contained herein.

3. NO INTERFERENCE.

No work performed by Licensee shall cause any interference with the constant, continuous and uninterrupted use of the Premises and adjacent City property by City, its officers, agents, contractors, lessees, licensees or others. Nothing shall be done or suffered to be done by Licensee at any time that would cause damage or destruction of the facilities, equipment, or other property or appurtenances of City, its lessees or licensees. Licensee agrees to reimburse City for any such damage or destruction, or upon mutual agreement to replace or restore said facilities, equipment, or other property to City's satisfaction.

4. ALL EXPENSES TO BE BORNE BY LICENSEE; CITY REPRESENTATIVE.

The Licensee shall bear any and all costs and expenses associated with any work performed by the Licensee, or any costs or expenses incurred by the City relating to this Agreement. All work performed by Licensee on City's property shall be performed in a manner satisfactory to the City Engineer or authorized representative (hereinafter the "City Representative") as set forth in Section 16 of this Agreement.

5. TERM; TERMINATION.

A. The grant of rights herein made to Licensee shall commence on January 1, 2011 and expire on December 31, 2013, unless sooner terminated as herein provided, or at such time.

as Licensee has completed its work, whichever is earlier. Licensee agrees to notify the City Representative in writing when it has completed its work.

B. This Agreement may be terminated by either party for cause on thirty (30) days written notice to the other party.

6. PAYMENT.

Licensee shall pay a one time fee of Two Thousand Five Hundred Dollars (\$2,500.00) as ground rent for use of the Premises for the term specified herein. Such payment shall be made payable to the City of Sacramento and forwarded to:

City of Sacramento
Facilities & Real Property Management
5730 24th Street, Bldg. 4
Sacramento, CA 95822
Attn: Asset Manager

7. INSURANCE.

Self-Insurance: Licensee hereby affirms that it is self-insured as authorized by Government Code Section 11007.4 et seq. Licensee shall provide the City's Risk Management Division for review and approval a letter of self-insurance demonstrating that Licensee's self-insurance program adequately protects against liabilities and claims arising out of the performance of this Agreement. Failure to obtain Risk Management approval of self-insurance as required above is a material breach of contract and is grounds for termination of this Agreement.

Insurance Correspondence: All insurance correspondence shall be directed to:

City of Sacramento
Risk Management Division
915 "I" Street, 4th Floor
Sacramento, CA 95814

8. PERMITS.

Prior to beginning any work, the Licensee, at its sole expense, shall obtain all necessary permits to perform any work contemplated by this Agreement.

9. MECHANICS' LIENS.

The Licensee shall pay in full all persons who perform labor or provide materials for the work to be performed by Licensee. The Licensee shall not permit or suffer any mechanics' or materialmen's liens of any kind or nature to be enforced against any property of the City for such work performed. The Licensee shall indemnify and hold harmless the City from and against any and all liens, claims, demands, costs or expenses of whatsoever nature in any way connected with or growing out of such work done, labor performed, or materials furnished.

10. COMPLIANCE WITH LAWS.

In the prosecution of the work covered by this Agreement, the Licensee shall comply with all applicable federal, state and local laws, regulations and enactments affecting the work. The Licensee shall use only such equipment as is consistent with safety, both as concerns the Licensee, the Licensee's agents and employees, the officers, agents, employees and property of the City and the public in general. The Licensee (without limiting the generality of the foregoing) shall comply with all applicable state and federal occupational safety and health acts and regulations. If any failure by the Licensee to comply with any such laws, regulations, and enactments, shall result in any fine, penalty, cost or charge being assessed, imposed or charged against the City, the Licensee shall reimburse and indemnify the City for any such fine, penalty, cost or charge, including without limitation, attorney's fees, court costs and expenses.

11. WAIVER OF BREACH.

The waiver by the City of the breach of any condition, covenant or agreement herein contained to be kept, observed and performed by the Licensee shall in no way impair the right of the City to avail itself of subsequent breach thereof.

12. ASSIGNMENT - SUBCONTRACTING.

Except as provided in this paragraph, the Licensee shall not assign, sublet or subcontract this Agreement, or any interest therein, without the written consent of City and any attempt to so assign, sublet or subcontract without the written consent of City shall be void. If City gives the Licensee permission to subcontract all or any portion of the work herein described, the Licensee is and shall remain responsible for all work of subcontractors and all work of subcontractors shall be governed by the terms of this Agreement. This Agreement shall bind the successors of either party in the same manner as if they were expressly named. The parties acknowledge that Licensee will subcontract the work to be performed under this Agreement.

13. ENFORCEABILITY; CHOICE OF LAW; CHOICE OF FORUM.

This Agreement shall be governed, construed, and enforced in accordance with the laws of the State of California. Litigation arising out of or connected with this Agreement may be instituted and maintained in state or federal courts located in the State of California only, and the venue for any such litigation shall be in Sacramento County. The parties consent to jurisdiction over their person and over the subject matter of any such litigation, in those courts, and consent to service of process issued by such courts.

14. INDEMNITY.

To the extent allowed by law, Licensee shall indemnify and hold harmless City and its officers, employees and agents, from and against any and all claims, actions, penalties, losses, liabilities, damages, or expenses of any nature, including payment of reasonable attorney's fees, whether for outside counsel or the City Attorney, whether for personal injury, property damage, economic losses or violation of any law or regulation, arising out of or in any way directly or indirectly related to or resulting from the operations or work of Licensee or operation of Licensee's equipment on the property which is the subject of this Agreement, or any action or activity of Licensee or its officers, employees, agents or contractors, relating to the performance of the terms of this Agreement.

15. HAZAROUS MATERIALS.

Licensee shall not use, store, release or otherwise introduce on the property that is the subject of this Agreement, any substance, chemical, waste or other material that is identified as hazardous, toxic or dangerous on any Federal, State or local law or regulation (hereafter referred to "hazardous material"), nor shall Licensee damage, alter or otherwise affect any hazardous material containment system, cap or other facility present on the property, if any. Licensee shall be solely responsible for the complete cost of removal and/or remediation of any hazardous material so used, stored, released or otherwise introduced on the property, and Licensee shall defend and indemnify City, its officers and employees from and against all claims or other liabilities therefore, in accordance with the provisions of Section 14 above to the extent allowed by law.

16. SPECIAL CONDITIONS. In return for granting permission to enter the Premises, Licensee will:

a. Provide at least 72 hours notice prior to access or use of the Premises. Such notice shall be provided to the City Representative for this Agreement:

City of Sacramento, Department of Utilities
1395 35th Avenue
Sacramento, CA 95822
Attn: Bill Busath, Supervising Engineer
(916) 808-1434
bbusath@cityofsacramento.org

- b. Agree that only the work described above is authorized.
- c. Agree that the project access area shall be restored to at least the same condition that existed prior to commencement of work.
- d. Agree that this Agreement does not relieve Licensee of the responsibility to obtain authorization from all concerned federal, State and local agencies; or to satisfy any California Environmental Quality Act (CEQA) requirements.
- e. Assure that construction material, such as packaging material; wood scrap(s) and general construction-related debris, does not foul any of the screens in the Sump 157 forebay.
- f. Assure that the City's property is kept clean and free of debris and litter.
- g. Reimburse the City for the cost to clean up or mitigate any pollutants discharged by Licensee or its contractors into the forebay of Sump 157.
- h. Not interfere with the construction of the City' Sump 157 trash rack project scheduled for construction in 2011.

- i. Ensure that all gates are securely and properly locked at the end of business each day. The manner and placement of any lock(s) on the initial bar gate will be coordinated with the City Representative.
 - j. Provide the City Representative a 24-hour contact list of persons with authority and resources to respond to an unexpected after-hours situation including, but not limited to, an unexpected storm event.
 - k. Provide an emergency pumping plan as it relates to the Sac 80 HOV/Rehab Project in the event of an unexpected storm or other event that might obstruct the water flow in the canal.
 - l. Notify the City Representative of any activities that might obstruct the water flow in the canal.
 - m. Coordinate any planned power outages with the City Representative.
 - n. Agree that the Licensee is hereby advised of the existence of an unauthorized cement wash out near the gate by the building and that said wash out is not to be used for any activities allowed under this Agreement.
 - o. Assure that the access route from the gate at Morrison Ave. to Western Ave. to the intersection of the north canal (with the forebay) is accessible at all times for a dump truck sized vehicle.
 - p. Monitor the following for damage during each construction season and make repairs, if necessary:
 - 1. Fencing and gates
 - 2. Pavement within Sump 157 and the entry road from Morrison Avenue
 - 3. Access ramp north of the station into the forebay
 - 4. Concrete lined canal
 - 5. Pumps (due to construction materials in wet well)
 - 6. Discharge piping
 - 7. Air release valves and railings on top of levee
 - 8. Electrical pull boxes, conduits, conductors, and lighting
 - 9. Grading and condition of access road to the future trash rake project area behind the station
 - 10. Water pipelines
 - q. Place road plates over all discharge piping behind Sump 157 and on top of levee.
 - r. Provide City a preconstruction video of Sump 157, the items listed in Section 16, p. above, and the project site.
 - s. Immediately after each construction season, and with City staff in attendance, conduct a site inspection that shall include but not be limited to the items listed in Section 16, p. above.
-

- t. Provide and implement a City approved corrective action plan for any deficiencies discovered during each post construction season site inspection.
- u. Upon completion of each construction season provide a video inspection of the discharge piping from Sump 157.

17. NUISANCE

Licensee shall at all times conduct its use of the premises in such a manner that it shall not constitute a public or private nuisance.

18. ENTIRE AGREEMENT- MODIFICATION

This Agreement and the exhibits attached hereto constitute the entire agreement between the parties concerning the subject matter thereof. No alteration, modification, or variation of the terms of this Agreement shall be valid unless made in writing and executed by both parties.

19. NOTICES

Any and all notices or demands by or from either party shall be in writing, and shall be served either personally or by mail. If served personally, service shall be conclusively deemed made at the time of service. If served by mail, service of notices or demands shall be conclusively deemed made as of the time of deposit in the United States mail, postage paid.

Any notice or demand may be given to:

CITY:
 Facilities and Real Property Mgmt.
 5730 24th Street, Bldg. 4
 Sacramento, CA 95822
 Attn: Facilities Manager

LICENSEE:
 State of California
 Department of Transportation
 73 B St./ P.O. Box 911
 Marysville, CA 95901
 Attn: Steve Matto

with a copy to:

City of Sacramento
 Department of Utilities
 1395 35th Avenue
 Sacramento, CA 95822
 Attn: Bill Busath

20. ATTORNEY'S FEES AND COSTS

Any party may bring a suit or proceeding to enforce or require performance of the terms of this Agreement, and the prevailing party in such suit or proceeding shall be entitled to recover from the other parties reasonable costs and expenses, including attorney's fees, whether for outside counsel or the City Attorney.

21. COUNTERPARTS.

This Agreement may be executed in any number of counterparts and by different parties hereto on separate counterparts; each of which, when so executed and delivered, shall be an original, but all such counterparts shall together constitute but one and the same instrument.

IN WITNESS WHEREOF, City and Licensee have executed this Agreement on the date herein above first written.

RECOMMENDED FOR APPROVAL:

By: *Steve Mallos*
Steve Mallos, Associate Right of Way Agent
Marysville

ACCEPTED:
State of California,
Department of Transportation

By: *Kimberly Y. Garfinkle*
Kimberly Y. Garfinkle, Senior Right of Way Agent
Project Delivery
North region

RECOMMENDED FOR APPROVAL

By: _____
Bill Busath, Supervising Engineer
Department of Utilities

ACCEPTED:
City of Sacramento, a municipal corporation

By: _____
John Dangberg, Assistant City Manager
for: Gus Vine, Interim City Manager

By: _____
Rhonda R. Lake, Asset Manager
Department of General Services

APPROVED AS TO FORM:

By: _____
Joe Robinson, Senior Deputy City Attorney

ATTEST:

By: _____
City Clerk

Signed in Counterpart

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IN WITNESS WHEREOF, City and Licensee have executed this Agreement on the date herein above first written.

RECOMMENDED FOR APPROVAL:

By: Steve Matlos, Associate Right of Way Agent
Marysville

ACCEPTED:
State of California,
Department of Transportation

By: Kimberly Y. Gamble, Senior Right of Way Agent
Project Delivery
North region

RECOMMENDED FOR APPROVAL

By: Bill Bueh, Supervising Engineer
Department of Utilities

ACCEPTED:
City of Sacramento, a municipal corporation

By: John Dangberg, Assistant City Manager
for: Gus Vina, Interim City Manager

By: Rhonda R. Lako, Asset Manager
Department of General Services

APPROVED AS TO FORM:

By: Joe Robinson, Senior Deputy City Attorney

ATTEST:

By: Dawn Hillenbrand
City Clerk
7-28-10

