

1300



**WATER**  
**HETCH HETCHY**  
**WATER & POWER**  
**CLEAN WATER**

**GAVIN NEWSOM**  
 MAYOR

**RICHARD SKLAR**  
 PRESIDENT

**ANN MOLLER CAEN**  
 VICE PRESIDENT

**E. DENNIS NORMANDY**  
**ADAM WERBACH**  
**RYAN L. BROOKS**

**SUSAN LEAL**  
 GENERAL MANAGER

# **SAN FRANCISCO PUBLIC UTILITIES COMMISSION**

Infrastructure Resource Management

Contract Services

1145 Market Street, Suite 100 • San Francisco, California • 94103

415-554-3497 • Fax 415-554-3225



October 26, 2005

Mr. Guilaine Roussel  
 Senior Vice President  
 U R S Corporation  
 221 Main Street, #600  
 San Francisco, CA 94105

RE: 1) Notice of Contract Amendment Certification— Conceptual Engineering Report for Calaveras Dam (CS-716)  
 2) Transmittal-Executed Amendment #01 to the Master Agreement between the City and County of San Francisco Public Utilities Commission and URS Corporation.

Dear Mr. Roussel:

This letter provides **notification of amendment certification** for Extension of term and Contract Value of the contract as follows:

**DOCUMENT REF. No.:** BPUC04000193 (COSF06006740)—*Work may not be charged against this blanket purchase order number.*

**SCOPE:** As per attached First Amendment.

**CONTRACT DURATION:** September 11, 2003 through September 10, 2009

**CONTRACT VALUE:** Total value of contract has been increased by **\$8,000,000.00** for a total budgeted amount not to exceed \$12,000,000.00.

Should you have any questions, please do not hesitate to contact me at (415) 554-3190.

Sincerely,

Wendy Iwata  
 Manager-Contract Services

Enclosure: Executed Amendment#01

cc: David Rogers

File/tlt-CS-716amend#01

**Tina, Teresita**

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**From:** Rogers, David  
**Sent:** Tuesday, November 15, 2005 1:11 PM  
**To:** Tina, Teresita  
**Cc:** Iwata, Wendy; Hallowell, Prince; Tang, Gilbert  
**Subject:** FW: Officer For Calaveras Dam Project

Please note the change.

Dave

-----Original Message-----

From: Noel\_Wong@URSCorp.com [mailto:Noel\_Wong@URSCorp.com]  
Sent: Tuesday, November 15, 2005 11:52 AM  
To: DRogers@sfgwater.org  
Cc: Edgar\_Johnson@URSCorp.com; John\_Bischoff@URSCorp.com;  
Laly\_Flores@URSCorp.com; Michael\_Forrest@URSCorp.com  
Subject: Officer For Calaveras Dam Project

Dave,

Thanks for your message. I have actually instructed our San Francisco office to be on the look out for the contract and the NTP. Sorry that they were returned back to you. Let's make the change from Guilaine Roussel to John Bischoff. For all contract matters related to Calaveras, please contact

John A. Bischoff, P.E.  
Senior Vice President  
URS Corporation  
1333 Broadway, Suite 800  
Oakland, CA 94612

Tel. (510) 874-1701

Thanks.

Noel C. Wong, P.E.  
URS Corporation  
1333 Broadway, Suite 800  
Oakland, CA 94612  
Direct: 510-874-3112  
Mobile: 510-508-3112  
Fax: 510-874-3268  
E-mail: noel\_wong@urscorp.com

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# CITY AND COUNTY OF SAN FRANCISCO

OFFICE OF CONTRACT ADMINISTRATION  
PURCHASING DIVISION

## FIRST AMENDMENT

THIS AMENDMENT ("Amendment") is made as of **July 26, 2005**, in San Francisco, California, by and between **URS Corporation** ("the Consultant"), and the **City and County of San Francisco**, a municipal corporation ("the City"), acting by and through its Public Utilities Commission.

### RECITALS

WHEREAS, the City and the Consultant have entered into the Agreement (CS-716) dated September 11, 2003 for the furnishing of conceptual engineering services for the Calaveras Dam;

WHEREAS, the City and the Consultant desire to modify the Agreement on the terms and conditions set forth herein;

WHEREAS, approval for this Amendment was obtained from the San Francisco Public Utilities Commission, Resolution No. 05-0120 on July 26, 2005;

WHEREAS, approval for this Amendment was obtained from the Civil Services Commission on September 6, 2005 through a Notice of Action for Contract No. CS-716;

WHEREAS, approval for this Amendment was obtained from the Board of Supervisors on September 20, 2005, File No. 05136;

NOW, THEREFORE, the Consultant and the City agree as follows:

**1. Definitions.** The following definitions shall apply to this Amendment:

(a) **Agreement.** The term "Agreement" shall mean the Agreement dated September 11, 2003 between the Consultant and the City, pursuant to SFPUC Resolution No.03-0117.

(b) **Other Terms.** Terms used and not defined in this Amendment shall have the meanings assigned to such terms in the Agreement.

**2. Modifications to the Agreement.** The Agreement is hereby modified as follows:

(a) **Section 2. Definitions.**

*Section 2.19 Other Definitions is hereby added to the Agreement, as follows:*

**Detailed Design.** The term "Detailed Design" shall mean the Detailed Design Documents prepared by Consultant and developed to 35%, 65%, and 95% stages of the Design Development phase of the project design, also known as Phase II.

**Final Design.** The term "Final Design" shall mean the Construction Documents prepared by the Consultant at the 100% completion of the Final Design phase of the project design, also known as Phase III.

**Design Drawings.** The term "Design Drawings" shall mean drawings prepared by the Consultant and provided to the general engineering contractor so that the constructed dam, spillway, inlet structure and other appurtenant structures would operate and function entirely as intended.

**Technical Specifications.** The term "Technical Specifications" shall mean written descriptions prepared by the Consultant of materials, processes, equipment, systems, standards, and desired quality of workmanship for the project. In a contract with design drawings, the technical specifications complement the design drawings. With design drawings and the technical specifications, the general engineering contractor should be able to provide the desired product, which operates, and functions as intended. Technical specifications will include specifications that are unique to the project as well as standard specifications.

**Standard Specification.** The term "Standard Specification" shall mean an adopted, published specification that may be used in multiple applications, with or without revisions.

**Project Manual.** The term "Project Manual" shall mean the bid documents prepared and assembled by the Consultant consisting of an Invitation to Bid, contracting requirements, bidding forms, agreement forms, general conditions, special conditions, general requirements, and the technical specifications. The design drawings for the contract are appended to and incorporated into the Project Manual. The Project Manual, together with the design drawings and all addenda issued prior to bid are the basis for the construction contract.

**Engineer's Cost Estimate.** The term "Engineer's Cost Estimate" shall mean the complete construction cost estimate prepared by the Consultant for final design in accordance with the Association for the Advancement of Cost Engineering International Recommended Practice No. 18R-97, Cost Estimate Classification System. The engineer's cost estimate shall be a Level 1, suitable for bidding.

**(b) Section 1.1. Description.**

*Section 1.1.A. Description of Phases II and III is hereby added to the Agreement, as follows:*

**1.1.A. Description of Phases II and III**

The City does hereby engage the Consultant to furnish, under the terms and conditions in this Agreement and Amendment, geotechnical and design engineering professional services to complete the Detailed Design (Phase II) and Final Design (Phase III) for the Calaveras Dam Replacement Project (the "Project"), as described in the Final Conceptual Engineering Report dated October 14, 2005. The Consultant shall assist the City's environmental representative and Environmental Review consultant in evaluating the potential impacts of the construction of the Project. This Amendment initiates and completes the Detailed Design and Final Design phases of replacing Calaveras Dam to the historic nominal storage of 96,850 acre feet. During the Detailed Design and Final Design phases the Consultant shall participate in value engineering sessions conducted by the City and other independent consultants. The Consultant shall prepare design drawings, technical specifications, standard specifications, and an engineer's cost estimate during the Final Design stage. The object of the Detailed Design and Final Design phases is to produce a dam design that is acceptable to the Division of Safety of Dams (DSOD), which can then be advanced with certainty through the preparation of the Project Manual, Invitation for Bids, and award of one or more construction contracts

(c) **1.2. Agreement Date and Term of the Agreement.**

Section 1.2 of the Agreement currently reads as follows:

The effective date of this Agreement is the date of its certification by the Controller. The term of this agreement shall be **forty-eight (48) months** from the effective date. The Conceptual Engineering shall be completed within the first **eighteen (18) months** from the effective date; during the remaining term of the agreement, the Consultant shall provide engineering and technical support for the completion of the environmental review process (CEQA/NEPA).

*Such section is hereby amended in its entirety to read as follows:*

**1.2 Agreement Date and Term of the Agreement**

The effective date of this Agreement is the original date of its certification by the Controller. The term of this agreement shall be **seventy-two (72) months** from the effective date. The Conceptual Engineering shall be completed within the first **eighteen (18) months** from the effective date. During the remaining term of the agreement, the Consultant shall complete and provide **Detailed Design and Final Design, as well as** engineering and technical support for the completion of the environmental review process (CEQA/NEPA).

(d) **3.1 Basic Services.** *Section 3.1.A. Basic Services for Phases II and III is hereby added to the Agreement as follows:*

**3.1.A Basic Services for Phases II and III**

The Consultant shall provide as its Basic Services all Detailed Design Phase II and Final Design Phase III and related technical services as required to carry out the Project described in Article 1. Portions of Basic Services shall not become part of the Contract until authorized by the City as described more fully in subsections 3.2 – Task Orders. Basic Services shall include, without limitation, the following:

- a. Confirm that the scope of work as described in Revised Attachment 2 dated August 18, 2005 – Services to be Provided, which is hereby incorporated by reference during the agreement period as negotiated with the City, is complete.
- b. Provide qualified personnel to perform work as described in the tasks of Revised Attachment 2 dated August 18, 2005 – Services to be Provided. The City reserves the right to change the approach proposed for the Tasks presented in Revised Attachment 2 – Services to be Provided, in response to new or differing information that is uncovered or developed over the course of the Project.
- c. Ensure timely delivery of quality services within proposed budget. The budget to complete each task is included in Revised Attachment 3 dated August 18, 2005 – Projected Task Budget, which is hereby incorporated by reference, and the corresponding project schedule is included in Revised Attachment 4 – Preliminary Project Schedule dated August 18, 2005 which is hereby incorporated by reference.
- d. Contract for or employ, at the Consultant's expense within the Basic Services fee, the normal consulting services as may be necessary or required. The Consultant shall submit for approval by the City and the Human Rights Commission any changes in the subconsultants listed in Revised Attachment 1 – Calculation of Charges dated August 18, 2005, which is hereby incorporated by reference.

- e. Designate John A. Bischoff as Principle-in-Charge, Noel C. Wong as Project Manager, whose roles shall be as defined in the RFP submittal produced by URS. The representatives of the Consultant shall, so long as their respective performances continue to be acceptable to the City, remain in charge of the Consultant's services for the Project. Any changes in assignment or replacement of the Consultant's Project Representative or of any other personnel of the Consultant or, of any of the Consultant's subconsultants listed in Attachment 1 – Calculation of Charges, whether or not as a result of death, disability, or otherwise, may be done only with the prior written consent of the City, which consent may be given or withheld in the sole, subjective (but not arbitrary) discretion of the City.
- f. Meet regularly with the City's Project Manager and Review Team at reasonable frequencies to be determined by the City's Project Manager so as to keep the design on the desired track. The City's Review Team includes the City's consultants and City staff assigned to work on this project as described in Section 3.1(b) of this agreement.
- g. Comply with requirements of codes, regulations, and current written interpretation thereof published and in effect during the Consultant's services. In the event of changes in such codes, regulations or interpretations during the course of the Project that were not and could not have been anticipated by the Consultant and which result in a substantive change to the drawings, the Consultant shall not be held responsible for the resulting additional costs, fees or time, and shall be entitled to reasonable additional compensation for the time and expense of responding to such changes.
- h. Assist in establishing a means of electronic communication and fully participate in the City's effort to develop an electronic file for this project of all correspondence with related attachments.
- i. Attend meetings with the Project Manager, City and State of California agencies, commissions and committees, and other appropriate authorities as described in this Agreement in connection with the Project. Such meetings shall be held at reasonable times and frequencies and with proper notice. It is anticipated that the following meetings and reviews will be required:
  - 1. Project Manager Meetings: Weekly, or as often as necessary, through the completion of Detailed Design, Final Design, and preparation of the Engineer's Cost Estimate.
  - 2. Board of Supervisors and Committees of the Board of Supervisors. Not less than (2), but no more than (4). The purpose of these meetings will be to assist the Project Manager to present design concepts and answer questions.
  - 3. SFPUC. Not less than (10), but no more than (14). The purpose of these meetings will be to assist the Project Manager to present design concepts and answer questions.
  - 4. Others: To be determined.
  - 5. Partnering: If implemented at the discretion of the City, meet as reasonably required by the partnering program



developed by the City through the design and construction phases.

6. Community or Environmental Groups: anticipate not less than three (4), no more than six (8) presentations to other community or environmental protection groups.
7. State Authorities including, but not limited to, the State Fire Marshall: not less than three (4) meetings, no more than five (6) meetings.
8. Division of Safety of Dams: As necessary.

(e) 4. **Compensation.** Section 4 Compensation (first paragraph) currently reads as follows:

In no event shall the amount of this Agreement exceed **Four Million Dollars (\$4,000,000)**. No charge shall be incurred under this Agreement nor shall any payments become due to Contractor until reports, documents or services as required under this Agreement are received from the Consultant and approved by the City as being in accordance with this Agreement, or until the City agrees that services covered under the payment request have been satisfactorily performed.

*Said paragraph of said section is hereby amended in its entirety to read as follows:*

#### 4. **Compensation**

Compensation shall be made in monthly payments on or before the first day of each month for work, as set forth in Section 4 of this Agreement, that the General Manager, in his or her sole discretion, concludes has been performed as of the last day of the immediately preceding month. **In no event shall the amount of this Agreement exceed Twelve Million Dollars (\$12,000,000), which sum includes Four Million Dollars (\$4,000,000) for the Conceptual Engineering phase.** The breakdown of costs associated with this Agreement appears in Appendix B, "Calculation of Charges," attached hereto and incorporated by reference as though fully set forth herein.

No charges shall be incurred under this Agreement nor shall any payments become due to the Consultant until reports, services, or both, required under this Agreement are received from the Consultant and approved by SFPUC as being in accordance with this Agreement. The City may withhold payment to the Consultant in any instance in which the Consultant has failed or refused to satisfy any material obligation provided for under this Agreement.

In no event shall the City be liable for interest or late charges for any late payments.

The Controller is not authorized to pay invoices submitted by the Consultant prior to the Consultant's submission of HRC Form 7, "Prime Contractor/Joint Venture Partner(s) and Sub-contractor Participation Report." If HRC Form 7 is not submitted with the Consultant's invoice, the Controller will notify the department, the Director of HRC and the Consultant of the omission. If the Consultant's failure to provide HRC Form 7 is not explained to the Controller's satisfaction, the Controller will withhold 20% of the payment due pursuant to that invoice until HRC Form 7 is provided.

Following City's payment of an invoice, the Consultant has ten days to file an affidavit using HRC Form 9, "Sub-Contractor Payment Affidavit," verifying that all subcontractors have been paid and specifying the amount.

**(f) 9. Notices.** Section 9 of the Agreement currently reads as follows:

Any notice may be served effectively upon the City by delivering it in writing or by telegram, or by depositing it in a United States mail deposit box with postage thereon fully prepaid and addressed to the City at the address set forth below; and in the case of the Consultant, may be served effectively upon the Consultant by delivering it in writing or by telegram, or by depositing it in a United States mail deposit box with postage thereon fully prepaid and addressed to the Consultant at the address as set forth below. In addition, any notice may be served effectively by delivering or mailing it, as in this paragraph provided, addressed to any other place or places at the City or the Consultant, by written notice served upon the other, from time to time may designate.

CITY'S ADDRESS:

Barbara Palacios  
SFPUC  
1155 Market Street, 6<sup>th</sup> Floor  
San Francisco, CA 94103

CONSULTANT' ADDRESS:

Noel Wong  
URS Corporation, Inc.  
500 12<sup>th</sup> Street, Suite 200  
Oakland, CA 94607-4014

*Such section is hereby amended in its entirety to read as follows:*

**9. Notices**

Any notice may be served effectively upon the City by delivering it in writing or by telegram, or by depositing it in a United States mail deposit box with postage thereon fully prepaid and addressed to the City at the address set forth below; and in the case of the Consultant, may be served effectively upon the Consultant by delivering it in writing or by telegram, or by depositing it in a United States mail deposit box with postage thereon fully prepaid and addressed to the Consultant at the address as set forth below. In addition, any notice may be served effectively by delivering or mailing it, as in this paragraph provided, addressed to any other place or places at the City or the Consultant, by written notice served upon the other, from time to time may designate.

CITY'S ADDRESS:

David Rogers  
SFPUC  
1155 Market Street, 6<sup>th</sup> Floor  
San Francisco, CA 94103  
DRogers@sfgwater.org

CONSULTANT'S ADDRESS:

Noel Wong  
URS Corporation, Inc.  
1333 Broadway, Suite 800  
Oakland, CA 94612  
Noel\_Wong@URSCorp.com

**(g) 10. Insurance**

*Section 10.1.d is hereby amended in its entirety to read:*

Without in any way limiting the Consultant's liability pursuant to the "indemnification" section of the Agreement, the Consultant must maintain in force, during the full term of the Agreement, insurance in the following amounts and coverages:

- (1) Workers' Compensation, in statutory amounts, with Employers' Liability Limits not less than \$1,000,000 each accident;
- (2) Comprehensive General Liability Insurance with limits not less than \$5,000,000 each occurrence Combined Single Limit for Bodily Injury and Property Damage, including Contractual Liability, Personal Injury, Products and Completed Operations;
- (3) Commercial Automobile Liability Insurance with limits not less than \$5,000,000 each occurrence Combined Single Limit for Bodily Injury and Property Damage, including Owned, Non-owned and Hired auto coverage, as applicable.
- (4) Professional liability insurance with limits not less than \$10,000,000 each claim with respect to negligent acts, errors or omissions in connection with professional services to be provided under this Agreement and any deductible not to exceed \$50,000 each claim.

(1) Name as Additional Insured the City and County of San Francisco, its Officers, Agents, and Employees.

(2) That such policies are primary insurance to any other insurance available to the Additional Insureds, with respect to any claims arising out of this Agreement, and that insurance applies separately to each insured against whom claim is made or suit is brought.

(3). All policies shall provide thirty days' advance written notice to City of cancellation mailed to the following address:

City And County of San Francisco

San Francisco Public Utilities Commission

Contract Services

1145 Market Street, 1<sup>st</sup> Floor

San Francisco, CA 94103

(4). Should any of the required insurance be provided under a claims-made form, Contractor shall maintain such coverage continuously throughout the term of this Agreement and, without lapse, for a period of three years beyond the expiration of this Agreement, to the effect that, should occurrences during the contract term give rise to claims made after expiration of the Agreement, such claims shall be covered by such claims-made policies.

(5). Should any of the required insurance be provided under a form of coverage that includes a general annual aggregate limit or provides that claims investigation or legal defense costs be included in such general annual aggregate limit, such general annual aggregate limit shall be double the occurrence or claims limits specified above.

(6). Should any required insurance lapse during the term of this Agreement, requests for payments originating after such lapse shall not be processed until the City receives satisfactory evidence of reinstated coverage as required by this Agreement, effective as of the lapse date. If insurance is not

reinstated, the City may, at its sole option, terminate this Agreement effective on the date of such lapse of insurance.

(7). Before commencing any operations under this Agreement, Contractor shall do the following: (a) furnish to City certificates of insurance, and additional insured policy endorsements with insurers with ratings comparable to A-, VIII or higher, that are authorized to do business in the State of California, and that are satisfactory to City, in form evidencing all coverages set forth above, and (b) furnish complete copies of policies promptly upon City request.

(8) Approval of the insurance by City shall not relieve or decrease the liability of Contractor hereunder.

**(h) Attachment One**

*Attachment One of the Agreement is replaced in its entirety by the Attachment One to Amendment One, dated July 26, 2005, attached hereto and fully incorporated herein.*

**(i) Attachment Two**

*Attachment Two of the Agreement is replaced in its entirety by the Attachment Two to Amendment One, dated July 26, 2005, attached hereto and fully incorporated herein.*

**(j) Attachment Three**

*Attachment Three of the Agreement is replaced in its entirety by the Attachment Three to Amendment One, dated July 26, 2005, attached hereto and fully incorporated herein.*

**(k) Attachment Four**

*Attachment Four of the Agreement is replaced in its entirety by the Attachment Four to Amendment One, dated July 26, 2005, attached hereto and fully incorporated herein.*

**(l) Limitations on Contributions. Section 56 is hereby replaced in its entirety as follows:**

**56. Limitations on Contributions**

Through execution of this Agreement, the Consultant acknowledges that it is familiar with section 1.126 of the City's Campaign and Governmental Conduct Code, which prohibits any person who contracts with the City for the rendition of personal services or for the furnishing of any material, supplies or equipment to the City, whenever such transaction would require approval by a City elective officer or the board on which that City elective officer serves, from making any campaign contribution to the officer at any time from the commencement of negotiations of the contract until the later of either (1) the termination of negotiations for such contract or (2) three months after the date the contract is approved by the City elective officer or the board on which that City elective officer serves.



**(m) Preservative-treated Wood Containing Arsenic.** *Section 53 is hereby replaced in its entirety, as follows:*

**53. Preservative-treated Wood Containing Arsenic**

The Consultant may not purchase preservative-treated wood products containing arsenic in the performance of this Agreement unless an exemption from the requirements of Chapter 13 of the San Francisco Environment Code is obtained from the Department of the Environment under Section 1304 of the Code. The term "preservative-treated wood containing arsenic" shall mean wood treated with a preservative that contains arsenic, elemental arsenic, or an arsenic copper combination, including, but not limited to, chromated copper arsenate preservative, ammoniacal copper zinc arsenate preservative, or ammoniacal copper arsenate preservative. The Consultant may purchase preservative-treated wood products on the list of environmentally preferable alternatives prepared and adopted by the Department of the Environment. This provision does not preclude the Consultant from purchasing preservative-treated wood containing arsenic for saltwater immersion. The term "saltwater immersion" shall mean a pressure-treated wood that is used for construction purposes or facilities that are partially or totally immersed in saltwater.

**(n) Supervision of Minors.** *Section 57 is hereby added to the Agreement, as follows:*

**57. Supervision of Minors**

The Consultant, and any subconsultants, shall comply with California Penal Code section 11105.3 and request from the Department of Justice records of all convictions or any arrest pending adjudication involving the offenses specified in Welfare and Institution Code section 15660(a) of any person who applies for employment or volunteer position with the Consultant, or any subconsultant, in which he or she would have supervisory or disciplinary power over a minor under his or her care.

If the Consultant, or any subconsultant, is providing services at a City park, playground, recreational center or beach (separately and collectively, "Recreational Site"), Contractor shall not hire, and shall prevent its subcontractors from hiring, any person for employment or volunteer position to provide those services if that person has been convicted of any offense that was listed in former Penal Code section 11105.3 (h)(1) or 11105.3(h)(3).

If the Subconsultant, or any of its subconsultants, hires an employee or volunteer to provide services to minors at any location other than a Recreational Site, and that employee or volunteer has been convicted of an offense specified in Penal Code section 11105.3(c), then the Consultant shall comply, and cause its subconsultants to comply with that section and provide written notice to the parents or guardians of any minor who will be supervised or disciplined by the employee or volunteer not less than ten (10) days prior to the day the employee or volunteer begins his or her duties or tasks. The Consultant shall provide, or cause its subconsultants to provide City with a copy of any such notice at the same time that it provides notice to any parent or guardian.

The Consultant shall expressly require any of its subconsultants with supervisory or disciplinary power over a minor to comply with this section of the Agreement as a condition of its contract with the subcontractor.

The Consultant acknowledges and agrees that failure by the Consultant or any of its subconsultants to comply with any provision of this section of the Agreement shall constitute an Event of Default.

**(o) Conflict of Interest.** *Section 18 is hereby replaced in its entirety to read as follows:*

## **18. Conflict of Interest**

Through its execution of this Agreement, the Consultant acknowledges that it is familiar with the provision of Section 15.103 of the City's Charter, Article III, Chapter 2 of the City's Campaign and Governmental Conduct Code, and Section 87100 et seq. and Section 1090 et seq. of the Government Code of the State of California, and certifies that it does not know of any facts which constitutes a violation of said provisions and agrees that it will immediately notify the City if it becomes aware of any such fact during the term of this Agreement.

**(p) Prohibition on Political Activity with City Funds.** *Section 52 is hereby replaced in its entirety to read as follows:*

### **52. Prohibition on Political Activity with City Funds**

In accordance with San Francisco Administrative Code Chapter 12.G, the Consultant may not participate in, support, or attempt to influence any political campaign for a candidate or for a ballot measure (collectively, "Political Activity") in the performance of the services provided under this Agreement. The Consultant agrees to comply with San Francisco Administrative Code Chapter 12.G and any implementing rules and regulations promulgated by the City's Controller. The terms and provisions of Chapter 12.G are incorporated herein by this reference. In the event the Consultant violates the provisions of this section, the City may, in addition to any other rights or remedies available hereunder, (i) terminate this Agreement, and (ii) prohibit the Consultant from bidding on or receiving any new City contract for a period of two (2) years. The Controller will not consider the Consultant's use of profit as a violation of this section.

**(q) 58. Nondisclosure of Private Information.** Section 58 is hereby added to the Agreement, as follows:

As of March 5, 2005, the Consultant agrees to comply fully with and be bound by all of the provisions of Chapter 12M of the San Francisco Administrative Code (the "Nondisclosure of Private Information Ordinance"), including the remedies provided. The provisions of the Nondisclosure of Private Information Ordinance are incorporated herein by reference and made a part of this Agreement as though fully set forth. Capitalized terms used in this section and not defined in this Agreement shall have the meanings assigned to such terms in the Nondisclosure of Private Information Ordinance. Consistent with the requirements of the Nondisclosure of Private Information Ordinance, the Consultant agrees to all of the following:

(a) Neither the Consultant nor any of its Subconsultants shall disclose Private Information obtained from the City in the performance of this Agreement to any other Subcontractor, person, or other entity, unless one of the following is true:

(i) The disclosure is authorized by this Agreement;

(ii) The Contractor received advance written approval from the Contracting Department to disclose the information; or

(iii) The disclosure is required by law or judicial order.

(b) Any disclosure or use of Private Information authorized by this Agreement shall be in accordance with any conditions or restrictions stated in this Agreement. Any disclosure or use of Private

Information authorized by a Contracting Department shall be in accordance with any conditions or restrictions stated in the approval.

(c) Private Information shall mean any information that: (1) could be used to identify an individual, including without limitation, name, address, social security number, medical information, financial information, date and location of birth, and names of relatives; or (2) the law forbids any person from disclosing.

(d) Any failure of the Consultant to comply with the Nondisclosure of Private Information Ordinance shall be a material breach of this Agreement. In such an event, in addition to any other remedies available to it under equity or law, the City may terminate this Agreement, debar the Consultant, or bring a false claim action against the Consultant.

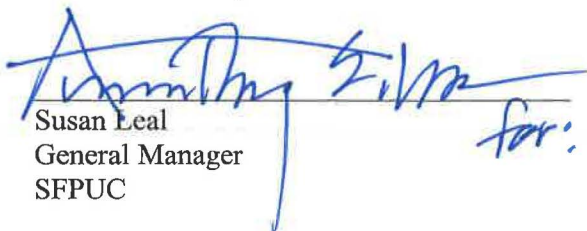
**3. Effective Date.** Each of the modifications set forth in Section 2 shall be effective on and after [specify either "the date of this Amendment" or other effective date(s)].

**4. Legal Effect.** Except as expressly modified by this Amendment, all of the terms and conditions of the Agreement shall remain unchanged and in full force and effect.

IN WITNESS WHEREOF, the Consultant and City have executed this Amendment as of the date first referenced above.

**CITY**

Recommended by:


  
Susan Leal  
General Manager  
SFPUC

Approved as to Form:

Dennis J. Herrera  
City Attorney

By   
Deputy City Attorney

Approved:

  
Naomi Little  
Director of Office of Contract Administration/  
Purchaser

**CONTRACTOR**

URS Corporation

By 

Print Name Louis Armstrong

Title Vice Pres. DENT

**Attachment 1 (Revised for Amendment No. 1)**  
**Calculation of Charges**  
**July 26, 2005**

The consultant shall submit, in detail, proposed costs and fees for requested task(s). The consultant will be required to define the detailed scope for the task under this agreement. All costs associated with the development of the scope of work shall be borne by the Consultant.

Eligibility of project costs, direct and overhead, will be determined per the Code of Federal Acquisition Regulations (FAR)--Title 48, Volume I, Parts 1-51 and other appropriate financial standards.

**1. Fees:**

- Direct Labor is limited to actual salaries of project personnel
- Direct fee shall be 10% or less
- Total compensation multiplier not-to-exceed 3.0

**2. Maximum Billing Rates:**

- Maximum hourly compensation shall not exceed \$180/hour, which may be adjusted annually in accordance with Section 7. Exceptions to this rate will be considered on a case-by-case basis and subject to written pre-authorization by the SFPUC Project Manager and Bureau/Division Manager.
- Hourly billing rates shall be calculated as follows by multiplying the actual hourly salary rate of an employee by the multiplier, which includes all the rates for direct rate, overhead (including other direct and miscellaneous costs), salary burden, fringe benefits and profit.
- Clerical and administrative costs shall be included as part of the overhead rate. The only exception to this provision shall be clerical and administrative time utilized in the production of a specific deliverable.

Prime Consultant Personnel	Classification	Actual Hourly Rate	Overhead Rate	Total Compensation Multiplier	Billing Rate
<b>URS Corporation</b>					
Noel Wong	Principal / Proj. Mngr.			capped <sup>1</sup>	197.29
Mike Forrest	Sr. Consultant	63.64		2.82	179.46
Mark Schmoll	Consultant	51.48		2.82	145.17
Greg Reichert	Sr. Consultant	60.66		2.82	171.06
John Bischoff	Principal-in-charge			capped <sup>1</sup>	291.87
Denise Heick	Sr. Consultant			capped <sup>1</sup>	181.89
Lelio Mejia	Sr. Consultant			capped <sup>1</sup>	199.83
David Hughes	Sr. Project Engineer	49.26		2.82	138.91
Ted Feldsher	Sr. Project Engineer	42.94		2.82	121.09
John Roadifer	Sr. Project Engineer	42.08		2.82	118.67
Dave Simpson	Consultant	47.12		2.82	132.88
Phil Respass	Sr. Project Geologist	36.60		2.82	103.21
Tom Kolbe	Sr. Project Geologist	36.68		2.82	103.44
S. Salah-Mars	Sr. Consultant	67.54		capped <sup>2</sup>	180.00
Robert Green	Sr. Consultant	51.02		2.82	143.88
Ivan Wong	Sr. Consultant	59.96		2.82	169.09

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Attachment 1 (Revised for Amendment No. 1)

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Prime Consultant Personnel	Classification	Actual Hourly Rate	Overhead Rate	Total Compensation Multiplier	Billing Rate
<b>URS Corporation</b>					
T. MacDonald	Sr. Consultant	61.34		2.82	172.98
Anne Connell	Consultant	52.88		2.82	149.12
Dave Harder	Sr. Consultant	60.10		2.82	169.48
Tracy Johnson	Consultant	53.80		2.82	151.72
George Chiu	Sr. Project Engineer	41.98		2.82	118.38
Chris Mueller	Sr. Consultant	67.78		capped <sup>2</sup>	180.00
Galen Nagle	Consultant	49.46		2.82	139.48
Ken Eichstaedt	Consultant	54.58		2.82	153.92
S. Bertolucci	Sr. Project Engineer	45.68		2.82	128.82
Seth Gentzler	Project Engineer	39.84		2.82	112.35
John Paxton	Sr. Project Engineer	41.38		2.82	116.69
Shel Coudray	Sr. Consultant	55.00		2.82	155.10
Doug Wright	Project Scientist	35.68		2.82	100.62
Steve Leach	Consultant	50.82		2.82	143.31
Lois Autie	Sr. Project Engineer	45.90		2.82	129.44

1 Capped per Billing Rate set in Original Contract of September 2003.

2 Capped per Maximum Billing Rate of \$180.

Subconsultant Personnel	Classification	Actual Hourly Rate	Overhead Rate	Total Compensation Multiplier	Billing Rate
<b>Camp Dresser &amp; McKee Inc.</b>					
CDM is not scheduled to provide any services under basic tasks for Amendment No. 1. If and when their services are required, their updated rates will be submitted to SFPUC for review and approval.					
Subconsultant Personnel	Classification	Actual Hourly Rate	Overhead Rate	Total Compensation Multiplier	Billing Rate
<b>Dan B. Steiner Consulting Engineer</b>					
Dan Steiner is not scheduled to provide any services under Amendment No. 1. If and when their services are required, their updated rates will be submitted to SFPUC for review and approval.					
Subconsultant Personnel	Classification	Actual Hourly Rate	Overhead Rate	Total Compensation Multiplier	Billing Rate
<b>Michael A. Stevens Consulting Engineer</b>					
Michael A. Stevens	Consulting Engineer	125.00			125.00
Subconsultant Personnel	Classification	Actual Hourly Rate	Overhead Rate	Total Compensation Multiplier	Billing Rate
<b>Engineering/Remediation Resources Inc.</b>					
ERRI is not scheduled to provide any services under Amendment No. 1. If and when their services are required, their updated rates will be submitted to SFPUC for review and approval.					

<b>Subconsultant Personnel</b>	<b>Classification</b>	<b>Actual Hourly Rate</b>	<b>Overhead Rate</b>	<b>Total Compensation Multiplier</b>	<b>Billing Rate</b>
<b>ENTRIX</b>					
Entrix is not scheduled to provide any services under Amendment No. 1. If and when their services are required, their updated rates will be submitted to SFPUC for review and approval.					
<b>Subconsultant Personnel</b>	<b>Classification</b>	<b>Actual Hourly Rate</b>	<b>Overhead Rate</b>	<b>Total Compensation Multiplier</b>	<b>Billing Rate</b>
<b>Hydroconsult Engineers, Inc.</b>					
HEI is not scheduled to provide any services under Amendment No. 1. If and when their services are required, their updated rates will be submitted to SFPUC for review and approval.					
<b>Subconsultant Personnel</b>	<b>Classification</b>	<b>Actual Hourly Rate</b>	<b>Overhead Rate</b>	<b>Total Compensation Multiplier</b>	<b>Billing Rate</b>
<b>Merritt Smith Consulting</b>					
Merritt Smith Consulting is not scheduled to provide any services under Amendment No. 1. If and when their services are required, their updated rates will be submitted to SFPUC for review and approval.					
<b>Subconsultant Personnel</b>	<b>Classification</b>	<b>Actual Hourly Rate</b>	<b>Overhead Rate</b>	<b>Total Compensation Multiplier</b>	<b>Billing Rate</b>
<b>Robert Y. Chew Geotechnical, Inc.</b>					
Robert Chew	Principal Engineer	65.38	136%	2.893	180.00
Mark McKee	Senior Engineer	39.28	163%	2.893	113.64
Eric Ntambakwa	Project Engineer	28.61	163%	2.893	82.77
Stephen Njoloma	Staff Engineer	25.00	163%	2.893	72.33
<b>Subconsultant Personnel</b>	<b>Classification</b>	<b>Actual Hourly Rate</b>	<b>Overhead Rate</b>	<b>Total Compensation Multiplier</b>	<b>Billing Rate</b>
<b>Telamon Engineering Consultants, Inc.</b>					
Mennor Chan	Principal	45.00	188%	2.95	132.75
Mennor Chan	Project Manager	41.00	188%	2.95	120.95
Stella Chiu	Engineer III	28.84	188%	2.95	85.08
Edmundo Salgado	Engineer I	18.49	188%	2.95	54.55
Irene Liu	CAD Drafter II	25.00	188%	2.95	76.67
Angeles Cortez	Administration	27.00	188%	2.95	79.65
Denmark Manansala	Word Processor	12.00	188%	2.95	35.40

<b>Subconsultant Personnel</b>	<b>Classification</b>	<b>Actual Hourly Rate</b>	<b>Overhead Rate</b>	<b>Total Compensation Multiplier</b>	<b>Billing Rate</b>
<b>William Lettis &amp; Associates, Inc.</b>					
William R. Lettis	Principal Geologist	76.02	163%	2.8952	180.00
Keith I. Kelson	Principal Geologist	61.37	163%	2.8952	177.68
Jeffrey L. Bachhuber	Principal Engineering Geologist	59.71	163%	2.8952	172.87
John N. Baldwin	Senior Geologist	48.65	163%	2.8952	140.85
Steve C. Thompson	Project Geologist	33.17	163%	2.8952	96.03
Sean T. Sunderman	Senior Staff Geologist	29.30	163%	2.8952	84.83
Robert W. Givler	Staff Geologist	28.47	163%	2.8952	82.43
Jason F. Holmberg	Graphics	28.47	163%	2.8952	82.43
Julie M. Bradaric	Technical Typing	32.34	163%	2.8952	93.63
<b>Subconsultant Personnel</b>	<b>Classification</b>	<b>Actual Hourly Rate</b>	<b>Overhead Rate</b>	<b>Total Compensation Multiplier</b>	<b>Billing Rate</b>
<b>YEI Engineers, Inc.</b>					
Douglas Yung	Principal	56.26	153%	2.78	156.55
Dennis Dias	Project/Lead Engineer	50.73	153%	2.78	141.16
Patrick Mallillin	Project/Lead Engineer	46.69	153%	2.78	129.92
Lawrence Lam	Senior Engineer	50.16	153%	2.78	139.57
George Cheung	Senior Engineer	46.21	153%	2.78	128.58
Marcus Tam	Senior Engineer	31.13	153%	2.78	86.62
Richard Dong	Engineer	30.08	153%	2.78	83.70
Sandy Ao	Engineer	21.16	153%	2.78	58.88
Karen Schwartz	Engineer	29.21	153%	2.78	81.28
Hubert Hidalgo	Engineer	29.93	153%	2.78	83.28
Shew Ho	Designer/Technician	23.43	153%	2.78	65.20
Paul Wingerd	Auto Cad/Technician	18.50	153%	2.78	51.48
Carol Knight	Administrative Support	26.49	153%	2.78	73.71
Sonia Siu	Administrative Support	20.98	153%	2.78	58.38

3. **Staff Changes:** The SFPUC Project Manager must approve the assignment of staff prior to beginning a task order as well as any staff changes proposed by Consultant.
4. **Additional Subcontractors:** Second-tier and pass-through subcontracting is prohibited. However, in the event that the prime contractor and its approved subcontractors lack the necessary skills or expertise to perform requested services that are within the scope of the contract, additional subcontractors may be added to the contractor team. In such circumstances, the SFPUC or HRC Compliance Officer may suggest firms

capable of performing the work and submit a proposal to the contractor. Subcontracting for *non-professional services* required for field investigations and preparation of topographic surveys will be treated as Other Direct Costs and are exempted from this requirement.

**5. Other Direct Costs (ODC):**

All ODCs are subject to pre-approval in writing by the SFPUC Project Manager and Bureau/Division Manager.

- ODCs are limited to out-of-town travel (outside nine Bay Area counties), specialty printing, use of specialty computer hardware, software and project equipment not provided by the SFPUC.
- Vehicle mileage within the San Francisco Bay Area may be reimbursed at .365 cents per mile for travel from consultant's home office to SFPUC facilities only. Standard commute costs are not reimbursable.
- ODCs shall not include any labor charges or *pass-throughs*.
- ODCs shall not include labor or costs that should be included in the firm's overhead (e.g. telephone calls and faxes originating in the firm's home office, standard computer use charges, computer hardware or software, communication devices, electronic equipment, etc.)
- Meals including refreshments and working lunches with SFPUC staff will not be reimbursed.
- No equipment to be used by SFPUC staff will be purchased through this Agreement. Any equipment purchased to be used by Contractor or its subcontractors will not be directly charged to this Agreement. Such purchases will be included in the appropriate firm's overhead.
- All ODCs will be reimbursed at actual cost--no mark up shall be included.

**6. Subconsultant Fees:**

- Subject to above restrictions
- Shall be subject to written pre-approval by the SFPUC Project Manager
- Subconsultant administration markup is limited to actual cost not to exceed 5%

7. **Direct Labor Rates:** Direct labor payroll rates can be adjusted annually. The amount of the adjustment will be limited to a maximum of the CPI (San Francisco Bay Area for wages) for the previous year. Adjustments for individual Consultant employees may exceed the maximum provided that the total adjustment dollars for Consultant employees dedicated to this contract does not exceed the maximum dollars based on the total direct salary paid on the contract for the previous year plus the CPI. Any adjustment would be made once per year and the first adjustment shall not be made any earlier than six months after the execution of this Agreement.
8. **Retention:** five percent (5%) of each invoice payment will be withheld for each task order. When the work for the task order or defined critical milestones has been completed to the satisfaction of the SFPUC Project Manager and all work products have been received and approved by the SFPUC Project Manager, the Consultant may request that the retention be released. In lieu of money retention, an irrevocable letter of credit acceptable to the City will be accepted.
9. **Relocation Costs:** The SFPUC will not pay relocation costs for Consultant staff assigned to the contract on a full-time or on-going basis. During the project, if staff with special skills is needed for specific tasks and those skills are not available from Consultant staff in the San Francisco Bay Area, travel and temporary housing costs may be charged to the contract if those charges are pre-approved by the SFPUC. Any travel and temporary housing costs will be reimbursed at cost or the Federal Government's CONUS standards, whichever is lower.
10. **Invoice Requirements:** The consultant shall submit one original invoice package with the appropriate HRC reporting forms and supporting documentation to substantiate the time, mileage and Other Direct Costs for the prime and subconsultants. A standard invoice format shall be developed by the consultant anticipating project complexity and used thereafter. Each invoice must be with an HRC form seven (7) to identify the participation and amount payable to the subconsultants. Timesheets, cards or logs must include a brief



description of when and what work was performed memorializing the day's progress. Mileage logs must include the beginning and ending mileage to substantiate the variable portal-to-portal distance and local driving required while performing the work. Any "Other Direct Costs" must be substantiated with receipts including a brief description for each receipt memorializing the purpose. Complete invoice packages should be sent directly to the SFPUC Project Manager.

HRC form nine (9) must be sent to the Project Manager within ten (10) days of receiving payment for each invoice to document the subcontractor's payment by the prime contractor.

HRC form eight (8) must be sent to the Project Manager with the final invoice for each task order to authenticate the total subcontractor participation and close out the Purchase Order Release.

11. **Audit:** All costs submitted for payment by Consultant are subject to audit.

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**Calaveras Dam Replacement Project**

**Agreement No. CS-716**

**Amendment No. 1**

**Detailed Design and Final Design**

Conceptual engineering and design studies were initiated to address alternatives for remediating the existing dam or construction of a new replacement or enlarged dam and appurtenances to restore the reservoir to its original intended function or to provide for an enlarged reservoir. Based on the results of an alternatives analysis, the preferred alternative is a replacement earthfill dam located downstream of the existing dam with an open chute spillway. The dam design includes the ability for enlargement for future generations.

The conceptual engineering design for a dam located downstream of the existing Calaveras Dam was presented in a Conceptual Engineering report (CER). The dam would replace the existing dam and would restore the maximum reservoir level to a pre-2001 DSOD restriction level of elevation 756.2 feet. The recommended Calaveras Dam Replacement Project includes the following:

- Replacement of the existing dam with a new dam located downstream of the existing dam.
- The new dam would have a nominal reservoir storage of 96,850 acre-feet (normal maximum water surface elevation, NMWS, elevation = 756.2 feet).
- The new dam would accommodate enlargement up to 386,000 acre-feet<sup>1</sup> (NMWS elevation = 890 feet<sup>2</sup>).
- The project will include new outlet works for seismic safety, improved operations and maintenance, and accommodations for releases for environmental purposes.
- At this time the project does not include design of a second pipeline<sup>3</sup> to convey water from the new dam to the SVWTP. This feature, or others to improve conveyance reliability in the event of a Hetch-Hetchy outage, are being reviewed and may be implemented as a project separate from the Calaveras Replacement Dam Project. However, the scope presented herein does include an allowance to permit the continued evaluation of how best to proceed with this project.

One of the design parameters calls for the potential inclusion of the dam in a larger dam in the future. This concept resulted from the realization that costs to achieve this purpose are minimal compared with costs to construct a replacement dam that does not have the ability to be enlarged. In order to address this in the design, an upper limit on the size of a future reservoir had to be identified. Since there is no knowledge of whether there will be a future need for Calaveras Reservoir to be larger than the proposed 96,850 acre-feet (and if there will be a need, what size it would be), an engineering solution to the question of reservoir size was evaluated. It was determined that a reasonable upper limit on the elevation of a future reservoir would be 890 feet, which is the elevation of the Alameda Creek Diversion Tunnel intake. This is the highest reservoir elevation that would not require modification of the diversion facilities. If a

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<sup>1</sup> Core and filter dimensions within the new dam will be constructed to accommodate enlargement of the dam to 386,000 acre-feet.

<sup>2</sup> Approximate invert elevation of the Alameda Creek Diversion Tunnel.

<sup>3</sup> Alternatively, replace the existing pipeline with a new and larger pipeline.

## Attachment 2 to Amendment No. 1

### Services to be Provided

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reservoir at elevation 890 were to be built in the future, it would have a storage capacity of approximately 386,000 acre-feet.

This attachment covers the scope of work, budget and schedule for developing the detailed and final design of the Calaveras Dam Replacement Project. The scope and budgets are developed based on the estimated levels of effort required to design the project to facilitate the review and approval of the DSOD and to competitively bid the construction work. It does not include engineering services during construction or start-up and commissioning. The scope of work is divided into the following task groups:

- Task Group A: Project Management
- Task Group B: Field Investigations
- Task Group C: Engineering Studies
- Task Group D: Design Package
- Task Group E: Permitting Support
- Task Group F: Pre-construction CM Interaction
- Task Group G: Project Meetings
- Task Group H: Phase 5 – Bid Period Services

Tasks for which SFPUC will be the lead and URS will provide support are designated within the Scope of Work section of this attachment. In addition, responsibilities are outlined for those tasks where URS will take the lead, but the SFPUC Engineering Design Bureau (EDB) will be performing portions of the design. Finally, there are a number of optional tasks that would be initiated, if needed, and authorized by SFPUC's Project Manager.

The project schedule is shown on Attachment 4 and the proposed geotechnical investigation plan is presented on Figure 1. The cost estimate for URS' services is presented in Attachment 3. Appendix A presents additional scope information for the spillway hydraulic model testing.

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**CALAVERAS REPLACEMENT DAM  
DETAILED DESIGN AND FINAL DESIGN  
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**CALAVERAS REPLACEMENT DAM  
DETAILED DESIGN AND FINAL DESIGN  
SCOPE OF WORK**

**TASK GROUP A – PROJECT MANAGEMENT**

**Task 1 – Project Management Plan – Design Phase**

***Objectives***

Prepare a project specific Project Management Plan that defines roles and responsibilities of all team members for tasks assigned to URS as the task leader, including subconsultants subcontractors and SFPUC staff assigned to the task; task scope, budgets, and schedules; and staff contact information.

***Approach***

- Upon Notice to Proceed, URS will develop a Project Management Plan (PMP) to serve as the roadmap for the team in carrying out our work under the contract. The PMP will be developed from the PMP used for the CER and will be prepared in accordance with the most recent WSIP procedures.
- The PMP will include invoicing and progress reporting procedures, document control procedures, filing and documentation, drafting standards, and communication distribution lists (including address/phone/fax/e-mail) and procedures.

***Assumptions***

- SFPUC will provide any provisions that are desired to be included in the PMP.

***Deliverables***

Project Management Plan <sup>4</sup>

**Task 2 – Project Goals and Design Criteria Memorandum**

***Objectives***

The objectives for this task are to establish project goals and develop design criteria for final design of the replacement dam, spillway and outlet works.

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<sup>4</sup> General notes on Deliverables for all tasks:

- Consultant will submit one draft and one final version of each deliverable unless specifically stated otherwise.
- Consultant will provide 20 hard copies and one electronic copy on a CD for each draft and final deliverable unless specifically stated otherwise.
- SFPUC will consolidate and provide Consultant with all review comments of draft submittals in a summary table format.

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***Approach***

Develop design criteria that will include:

- Basis for dam and foundation material properties for analysis
- Stability factors of safety
- Seismic design criteria (ground motion parameters)
- Structural design requirements
- Design storm and flood
- Freeboard requirements
- Outlet works hydraulic and operation criteria, including reservoir emptying criteria, water quality and fish protection requirements at the intake tower and requirements for stream maintenance releases into Calaveras Creek.
- Standards from various agencies such as the US Bureau of Reclamation, Army Corps of Engineers, and applicable codes, and regulatory requirements that are acceptable to DSOD.

Work with SFPUC Planning and EIR consultants to understand potential environmental constraints.

***Assumptions***

- SFPUC will identify and facilitate the coordination with the various SFPUC representatives and/or consultants.

***Deliverables***

- Design Criteria Memorandum, which will include a summary of applicable codes, regulatory requirements, and local and state ordinances.

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**Task 3 – Operations Review (SFPUC Lead)<sup>5</sup>**

**Task 4 – Quality Assurance Audits (SFPUC Lead)**

**Task 5 – Health and Safety Review (SFPUC Lead)**

**Task 6 – Value Engineering (SFPUC Lead)**

**Task 7 – Constructability Review (SFPUC Lead)**

**Task 8 – Risk Management Review (SFPUC Lead)**

**Task 9 – Hazards Operations Analysis and Risk Management (SFPUC Lead)**

**Task 10 – Capitalization Plan – Financing and Accounting (SFPUC Lead)**

***Objectives***

The objective of Tasks 3 to 10 is to support SFPUC on an as-needed basis.

***Approach***

URS will attend meetings and provide memoranda to support SFPUC.

***Assumptions***

The budgets shown for these tasks are allowances for URS' services to be provided on an as-needed basis and as permissible by the allocated budget allowance.

***Deliverables***

Meeting summaries, memoranda, and comments on SFPUC's products for these tasks.

**Task 11 – Work Plan for Phases 6 and 7**

***Objectives***

The objective of this task is to prepare the work plan (scope, schedule and budget) for future Phase 6 – Engineering Services during Construction and future Phase 7 – Engineering Services during Start-up and Commissioning.

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<sup>5</sup> SFPUC has a lead role and URS has a support role.

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**Approach**

Outlines of the scope and approach for future Phase 6 – Engineering Services during Construction and future Phase 7 – Engineering Services during Start-up and Commissioning will be developed during Final Design.

**Deliverables**

- Work plans (scope, schedule and budget) for future Phase 6 – Engineering Services during Construction and future Phase 7 – Engineering Services during Start-up and Commissioning.

**Task 12 – URS Project Management (Design Phase)**

**Objectives**

Manage the progress and quality of all related project tasks through close coordination with SFPUC, discuss project status, progress and forthcoming work, discuss issues to be resolved and proposed solutions through completion within estimated schedule and cost.

**Approach**

- Upon Notice to Proceed, URS will prepare a project specific Quality Assurance Plan that defines independent technical reviews and detail checking of all draft and final work products. Subcontractors will also be required to comply with the requirements of the QA Plan, which will be monitored by our designated QA/QC Officer. The QA Plan will include all required QA forms and guidance documents. The SFPUC will provide input to the QA Plan to govern staff assigned to perform portions of the design work under a URS task leader.
- Attend bi-monthly meetings with SFPUC. Current key issues and future issues will be discussed at each meeting. Proposed resolution of issues will also be discussed.
- Prepare monthly progress reports to discuss work completed for the month, work to be completed for the next month, schedule status, budget status, and issues for resolution. Budget status will be evaluated by earned value to estimate percent complete for each task for comparison with the amount spent.
- Prepare a site-specific Health and Safety Plan for the URS project team, including procedures for handling of potential hazardous materials encountered during field investigations. The SFPUC will retain responsibility for the Health and Safety of its staff assigned to perform portions of the design work under a URS task leader.

**Assumptions**

- SFPUC will provide any provisions that are desired to be included in the QA Plan.

**Deliverables**

- Quality Assurance Plan (included as a section of the Project Management Plan (see Task A1)).



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- Health and Safety Plan.
- Meeting summaries on project status and work to be done for preparation for the next meeting. Decision and action items will be summarized in each meeting summary.
- Monthly progress reports, invoices and HRC Forms

## **TASK GROUP B – FIELD INVESTIGATIONS**

### **Task 1 – Geotechnical Investigation Work Plan**

#### ***Objectives***

Prepare Work Plan for the proposed field investigations ready for SFPUC, CTAP and DSOD review, that clearly states objectives of all investigation work.

#### ***Approach***

A draft Work Plan will be prepared that is based on the work plan prepared for the conceptual investigation in 2003, for review by SFPUC, CTAP, and DSOD. In general, the work will be performed in a two-groups. Group I will include first priority investigations that can be accomplished with a Categorical Exclusion; and Group II will include second priority investigations and that will require further environmental clearances.

- The roles and responsibilities of field personnel, including requirements for QA/QC procedures in the field, will be defined. Coordination with the design engineers will be required so that geotechnical evaluations can be made as the work progresses.
- A schedule of the field investigations will be included, which will be updated weekly during the fieldwork to keep SFPUC and DSOD apprised of work status and upcoming specific investigation work.
- Inputs from the environmental clearance work performed under Task 3 and comments from the resource agencies will be incorporated into the Work Plan.
- Table 1 in this attachment will be updated to include descriptions of the geologic mapping, drilling, test pits, rock mechanics testing, and geophysical methods that will be used for the site investigations, along with the purpose of each activity.
- Figure 1 in this attachment will be updated to include access roads, temporary core storage and drill rig storage areas, borings, geophysical surveys, and test pits.
- Standard procedures including ASTM guidelines for sampling, rock coring and packer testing will be included.
- A list of planned geotechnical laboratory testing with ASTM testing procedures will be included.
- Avoidance and minimization of impacts on biological and cultural resources, and any requirements from resource agencies will be incorporated in the Work Plan. The intent is to minimize ground disturbance and restoration needs.

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- Boring abandonment and site restoration procedure will be described.

### **Assumptions**

- Consultant expects that permitting agencies will not require significant changes of the proposed field investigation program. If changes are required that will impact the approved budgets, Consultant will submit such changes for review and approval of additional scope and budget in writing by the SFPUC Project Manager prior to beginning the work.

### **Deliverables**

- Field investigation Work Plan for foundation and borrow areas.

## **Task 2 – Environmental Clearance and Permitting**

### **Objectives**

The proposed geotechnical investigations will require environmental review and permitting to comply with federal and state environmental laws and SFPUC requirements. This task includes preparation of required documentation and agency coordination associated with the following environmental clearance and permitting requirements:

- SFPUC Land and Resources Management Section (LMRS)
- California Environmental Quality Act (CEQA) review by the City of San Francisco Planning Department;
- U.S. Fish and Wildlife Service (USFWS) Endangered Species Act informal coordination;
- California Department of Fish and Game (CDFG) 1600 notification;
- U.S. Army Corps of Engineers (ACOE) Nationwide Permit notification;
- San Francisco Bay Regional Water Quality Control Board Water Quality Certification; and
- State Water Resources Control Board SWPPP notification.

### **Approach**

URS will coordinate environmental compliance for proposed geotechnical investigation sites to comply with the following federal and State laws:

- Federal Clean Water Act (Section 404 and Section 401);
- California Environmental Quality Act; and
- California Fish and Game Code (Section 1600).

The proposed geotechnical investigation work sites will require different levels of environmental compliance. The environmental compliance requirements are:

- **Minimal Impact** – Sites with no potential for significant environmental impacts;

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- **Potentially Significant Impact** – Sites that may require mitigation to avoid potentially significant environmental impacts. This group can be further divided into two subgroups:
  - CEQA Review Only – Sites that only require CEQA review and do not require other resource agency permits or formal review; and
  - CEQA Review and Resource Agency Permitting – Sites that will require CEQA review and also require permits or other review prior to initiating ground-disturbing work.

URS will implement the following steps to facilitate the environmental review:

- Field review of the proposed geotechnical investigation sites to determine whether the work would potentially affect historic or prehistoric cultural resources, special status species, sensitive natural communities, wetlands, non-wetland aquatic habitats regulated under the Clean Water Act, or bed and bank areas regulated under the California Fish and Game Code. Sites that require CEQA review and additional permitting would be identified during the field review.
- Transmittal of data to support the CEQA-review process. URS will provide the results of the field review to the City of San Francisco to support the CEQA review.
- Preparation of permit applications for submittal to the ACOE, RWQCB, CDFG, and the USFWS for sites that would affect resources regulated by these agencies.
- Coordination with City and agency staff to facilitate the application reviews and implementation of mitigation measures required by the CEQA document and final permits from the resource agencies.

### **Assumptions**

- Field review of proposed geotechnical sites would require three days.
- SFPUC will make all necessary arrangements for URS access to the watershed as needed.
- No formal surveys or delineations of wetlands or waters are required – wetlands and other waters or special status species will be evaluated based on visual assessment of the proposed investigation sites.
- The City of San Francisco will conduct the CEQA review for the geotechnical investigation.
- Consultation with the USFWS can be completed informally and will not require a habitat conservation plan under Section 10 or formal Section 7 consultation as defined by the federal Endangered Species Act.
- Mitigation measures can be developed that would avoid take of federal or state listed species.
- The City of San Francisco will be responsible for any permit application fees.
- The ACOE will authorize the proposed geotechnical investigation sites under Nationwide Permit #6 for Survey Activities with no additional Section 106 compliance for cultural resources.

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- One round of client review for each deliverable.
- A conceptual mitigation plan would be developed that will adequately address the mitigation requirements of the ACOE, the RWQCB, CDFG and the USFWS. Development of a detailed mitigation and monitoring plan would require a separate scope and cost estimate.
- Cultural resources documentation would be incorporated into an addendum to the previous survey report prepared for the first round of geotechnical investigation by URS.
- SFPUC will conduct any monitoring of geotechnical investigation work that is required to comply with the terms and conditions of the environmental permits.
- Maximum of one archeological site identified and recorded. Site evaluation (testing) would require a separate scope and cost estimate.

### ***Deliverables***

- Draft Field Review Technical Memorandum to summarize field observations and proposed measures to avoid or minimize potentially significant impacts identified during the field review.
- Final Field Review Technical Memorandum to incorporate changes to the draft report based on one round of review by the client.
- Draft and Final letter to the ACOE to confirm authorization under Nationwide Permit #6. This letter will summarize the proposed activities within ACOE jurisdiction and request verification that the activities are authorized under Nationwide Permit #6.
- Draft and final application to the Regional Water Quality Control Board for a Section 401 water quality certification.
- Draft and final notification and project questionnaire for submittal to the California Department of Fish and Game Streambed Alteration Agreement program.

## **Task 3 – Supporting Work Plans**

### ***Objectives***

The objective of this task is to develop the Stormwater Pollution Prevention Plan (SWPPP) and State Water Resources Control Board Notification for the geotechnical investigation.

### ***Approach***

URS will revise the SWPPP prepared for the geotechnical investigation performed for the CER in 2003-2004 to address the proposed final design investigation. The SWPPP will include best management practices (BMPs) for both wet and dry season work.

### ***Assumptions***

- URS will prepare one draft and one final version of the SWPPP based upon one round of review by the SFPUC.

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- SFPUC will conduct monitoring of geotechnical investigation work that is required to comply with the terms and conditions of the SWPPP.

### ***Deliverables***

SWPPP and notification to the State Water Resources Control Board.

## **Task 4 – Reservoir and Calaveras Road Topographical Maps**

### ***Objectives***

The objective for this task is to generate a topographical maps of the reservoir area and the portion of Calaveras Road north of the damsite that will require improvement for heavy equipment access.

### ***Approach***

- Standard ground checked aerial photograph-based topographical mapping techniques will be utilized to create the topographic map of the reservoir area above the water line. This map will be combined with bathymetric survey data from the 2003-2004 investigation and the topographic data of the reservoir prior to dam construction. The coverage area will be 20,000 feet north to south and 10,000 feet east to west. The map scale will be 1" = 200 feet and the contour interval will be 2 feet.
- The road will cover an area of 2500 feet square and will include the two sharp turns about ½ mile north of the gate to the site. The map scale will be 1" = 100 feet and the contour interval will be 2 feet.

### ***Deliverables***

- Topographic maps (base maps) of the reservoir and road relocation areas.
- Stereo photographs will cover the reservoir area
- Survey data and survey field notes.

## **Task 5 – Field Investigation**

### ***Objectives***

The objective for this task is to characterize the geologic and geotechnical conditions in the proposed dam, spillway, outlet tower, appurtenant works, and borrow areas.

### ***Approach***

The approach will be to perform drilling (rock core, rotary wash, and bucket auger), water pressure testing, geophysical surveys, test pits, and laboratory analysis of samples obtained during the field investigation. The investigation will be conducted in the grouped approach as described in Task B1: Task B5.1 (Group I) is the first priority investigation and Task B5.2 (Group II) is the second priority investigation. Task B5.2 will

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be directed to investigating specific project components, if needed. This task is consistent with Comment 6 in the May 11, 2005, CTAP #4 Report.

For final design, geotechnical investigations will be needed to confirm design assumptions and to refine the design. The investigations in the dam and spillway foundation, new inlet tower, and borrow areas will be conducted to supplement the data gathered for conceptual engineering. The investigation program will be designed to:

- Obtain data to evaluate the required depth and extent of the concrete cutoff or grout curtain in Temblor Sandstone. This will include an evaluation of the spatial trends of hydraulic conductivities in the Temblor Sandstone.
- Evaluate foundation excavation depths required in the Franciscan Complex and Temblor Sandstone.
- Characterize the strengths of the Franciscan mélange shale.
- Characterize the extent and depth of the right abutment landslide to evaluate stabilization and removal alternatives.
- Characterize the hydraulic conductivities of the Temblor Sandstone/Franciscan Complex contact
- Evaluate the earthfill properties of the Temblor Sandstone for use as shell zone materials and alluvium in Borrow Area E for use in the core zone.
- Evaluate potential sources of gravels in the vicinity of Borrow Area E.
- Characterize existing dam fill at the downstream toe of the cofferdam.

The geotechnical investigation program will involve similar types of work as were performed for conceptual engineering. These would include the following:

- Field geologic mapping and preparing geologic maps;
- Conducting seismic refraction surveys;
- Drilling bucket auger borings;
- Excavating test pits;
- Drilling rock core borings and conducting packer tests;
- Performing downhole acoustic televiewer and other geophysical logging; and
- Performing downhole rock mechanics tests in the mélange shale to evaluate deformation moduli and strength using a pressuremeter and/or dilatometer in four or five selected core borings.

The Final Investigation Plan is shown on Figure 1 and summarized in Table 1. This table indicates the estimated depths, access, goals, and proposed in-situ testing at each investigation location. Access to investigation sites will make use of existing roads to the maximum practicable extent. Sites that are not accessible via existing roads will require the use of skid rigs or helicopter transport of drill rigs and equipment. Helicopter transport will be used where skid rigs are not allowed due to environmental constraints and where skid rigs cannot be used due to topographical constraints.



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**Assumptions**

- SFPUC will provide 1 to 2 full-time staff for field coordination activities and technology transfer, similar to what was done for the investigation for the conceptual engineering phase.
- Field investigation is planned to be carried out under normal average weather conditions from about November 2005 to April 2006. If worse than average weather conditions occur (as defined by the monthly rainfall data maintained by the National Weather Service Mt. Hamilton site in Livermore), additional mobilization and demobilization, or additional environmental mitigations to remain in compliance with any permit or schedule requirements may be necessary and approval by SFPUC for extra services will be required.
- Table 1 indicates the assumptions for access to the various investigation locations.

**Deliverables**

No separate deliverables will be prepared for this task. The work products will be included in Task B9, Geotechnical Data Report.

**Task 6 – Laboratory Testing**

**Objectives**

The objective for this task is to develop laboratory test data to assist in the:

- characterization of the geologic and geotechnical conditions in the dam and spillway foundation and abutments,
- characterization of the cyclic resistance and pore pressure generation characteristics of the dam construction materials, and
- development of material properties for use in the static and dynamic analyses of the dam embankment.

**Approach**

Static and cyclic triaxial tests will be performed on laboratory-reconstituted samples of sandstone and alluvial clay compacted to the field densification requirements that will be specified for the shell and core zones of the embankment fill. The samples will be tested under unconsolidated, isotropically and anisotropically consolidated conditions, with effective cell pressures that will encompass the full range of stresses within the dam. Undrained (UU, ICU & ACU) and strain-rate-controlled drained tests (CD) [alluvium only] will be run for use in immediate post construction, rapid-drawdown and long-term stability analyses.

The Temblor Sandstone (shell) will be assumed to break down during excavation and compaction to a silty-sand matrix with some gravel. The silty sand matrix will control the strength and cyclic characteristics of the compacted sandstone. Re-constituted samples of the silty-sand matrix will be prepared from samples of rock core broken down in the laboratory. Strain-controlled isotropic and anisotropic cyclic triaxial tests will be run on laboratory-reconstituted samples of sandstone shell materials to assess strain modulus

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over a range of stains and to characterize the non-linear behavior of the material during strong ground shaking.

Geotechnical laboratory tests will be performed on laboratory-reconstituted samples of sandstone and alluvial clay to characterize the materials and develop data for evaluating the triaxial test results. The test will include:

- Laboratory compaction [ASTM D1557 and DWR S-10],
- Grain size distribution and percent finer than No. 200 [ASTM D422],
- Specific gravity [ASTM D854],
- Atterberg limits [ASTM D4318],
- Pinhole dispersion tests [ASTM D4647],
- Falling head permeability [ASTM D4318].

Laboratory tests on representative samples of rock core will include unconfined-compression tests and point load tests.

Representative samples of filter and drain materials obtained from select potential off-site commercial sources will be tested for gradation (ASTM C117 and C136), durability (ASTM C33) and pH (EPA 9045). The potential drain materials will be tested under the following standards:

- Absorption [ASTM C127]
- Specific gravity [ASTM C127 & C128]
- Abrasion resistance [ASTM C131]
- Sodium sulfate [ASTM C88]

### ***Assumptions***

This program is based on the field investigation program discussed in (Task B5).

### ***Deliverables***

No separate deliverables will be prepared for this task. The work products will be included in Task 10, Geotechnical Data Report.

## **Task 7 – Test Fill Program**

### ***Objectives***

The objective of this task is to construct an embankment test fill and carry out the associated field and laboratory test program. The test fill will be used to obtain data on the excavation and compaction characteristics of the onsite construction materials, verify compaction efforts and lift thicknesses and to develop engineering parameters for dam design and contract document specification preparation.

### ***Approach***

This task will be broken down into the following tasks:

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- Task 7.1 - Test Fill Program Plan
- Task 7.2 - Test Fill Field Program (Optional):
  - Subcontract preparation
  - Construction oversight
  - Laboratory testing
  - Data evaluation

#### Task 7.1 - Test Fill Program Plan

URS will design the test fill program that will include describing the objectives and design criteria. The work will involve identifying potential material borrow sources and test fill locations. Test fill borrow locations will be based on the information developed during the field investigation. URS will develop a construction and testing protocol that will include test fill configurations, the type of equipment to be used, lift thicknesses, material moisture content, and number of compactor passes. Guidance will be provided on modifying variables such as lift thicknesses and number of compactor passes based on conditions encountered.

#### Task 7.2 - Test Fill Field Program (Optional)

After review of the test fill program plan, SFPUC and URS will decide whether to proceed with the field program. The decision will be based on evaluation of environmental permitting requirements, CTAP's review of the technical merit of the plan, and associated costs.

##### Subcontract Preparation

URS will prepare a subcontract to construct the test fill, which will be based on time and materials. Small local earthworks contractors will be identified and their equipment and labor hourly rates will be solicited. We expect that the main equipment could include an excavator, loader, dump truck(s), bulldozer with ripper, tamping-foot compactor, grader, and water truck.

##### Construction Oversight

URS will oversee the test fill construction and testing. To accomplish the test fill objectives, URS will monitor variables such as lift thickness and number of compactor passes based on the results obtained as the work progresses. URS will also collect field data and sample materials for laboratory testing.

##### Laboratory Testing

URS will develop a laboratory testing program based on the results of the test fill program and on the field investigation and laboratory testing.

##### Data Evaluation

URS will evaluate the field and laboratory data collected for use in design and preparation of earthfill specifications.

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#### **Assumptions**

- The final scope of work, budget and schedule for Task 7.2 will be reviewed and approved in writing by the SFPUC Project Manager prior to beginning work on the task.
- SFPUC will provide 1 to 2 full-time staff for field coordination activities and technology transfer, similar to what was done for the investigation for the conceptual engineering phase.
- The assumptions indicated Task B2 also apply to this task. URS will select the appropriate subcontractor for the test fill and administer the subcontract.
- The test fill program will have a total duration of 5 working days (excluding mobilization/demobilization) and the field work will be done during the dry season.

#### **Deliverables**

- Task 7.1: Test fill plan
- Task 7.2 (Optional): Test fill report of findings.

### **Task 8 – Grouting Test Program**

#### **Objectives**

The objective of this task is to provide data to evaluate the technical viability of grouting the pervious Temblor Sandstone in the left abutment. The test program will closely replicate the production grouting program. The results of the grouting test will be used in the evaluation of the seepage control alternatives, namely, the cutoff wall and the grout curtain (Task C3).

#### **Approach**

This task will consist of the following tasks:

- Task 8.1 - Grouting Test Program Plan
- Task 8.2 – Grouting Test Field Program (Optional)
  - Subcontract preparation
  - Field test program oversight
  - Data evaluation

#### **Task 8.1 - Grouting Test Program Plan**

URS will design the grouting test program, which will include describing the objectives and design criteria. Basically, it is envisioned that the grouting test pad will include a 40-foot long by 15-foot-wide test section along which two low-mobility grout (LMG) curtains would be constructed followed by two permeation grout curtain lines between the LMG curtains. We propose to excavate a trench 10 to 15 feet deep in the abutment and conduct the grouting in the bottom of the trench. The trench will be backfilled and the road will be restored after the grout test program has been completed. The location of grouting test pad will be near, or on the gravel road, west of the existing spillway (east side of Observation Hill).

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Procedures and requirements will be developed that include:

- Grout hole drilling – equipment, hole spacing, diameter, and orientation.
- Grouting – mixing and pump equipment, grout proportioning and mixing, injection pressures, and staging. The objective is to have zero-bleed grout mixes.
- Evaluation of closure criteria. – assessment of closure results. This will involve conducting verification water pressure tests.
- Water pressure testing – assessment of hydraulic conductivities.
- Verification core holes – observation of grout-filled fractures.

The grout testing program will include televiewer logging of 10 holes to observe fracture opening conditions.

### Task 8.2 – Grouting Test Field Program (Optional)

After review of the grouting test program plan, SFPUC and URS will decide whether to proceed with the field program. The decision will be based on evaluation of environmental permitting requirements, CTAP's review of the technical merit of the plan, and associated costs.

#### Subcontract Preparation

URS will prepare a subcontract for the test grouting program, which will be based on time and materials. Grouting contractors will be identified and their equipment and labor hourly rates will be solicited.

#### Field Test Program Oversight

A URS engineer/engineering geologist will work with the contractor to conduct the test grouting program. In addition, a staff geologist/engineer will assist with data collection and reduction during the test grouting field work.

#### Data Evaluation

URS will evaluate the grouting test data, with the objective of assessing the technical viability of grouting as a seepage control measure. In particular, we will assess the practical closure criteria and target hydraulic conductivities (lugeon values) to be expected in the full-scale grouting program.

### **Assumptions**

- The final scope of work, budget and schedule for Task 8.2 will be reviewed and approved in writing by the SFPUC Project Manager prior to beginning work on the task.
- SFPUC will provide 1 to 2 full-time staff for field coordination activities and technology transfer, similar to what was done for the investigation for the conceptual engineering phase.
- The assumptions indicated Task B2 also apply to this task.

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- URS will select the appropriate subcontractor for test grouting program and administer the subcontract.
- Grout test program will have a total duration of approximately 8 weeks and the field work will be done during the dry season.

#### ***Deliverables***

- Task 8.1: Grouting test program plan
- Task 8.2 (Optional): Grouting test report of findings

### **Task 9 – Geotechnical Data Report**

#### ***Objectives***

The objective of this task is to provide a comprehensive geotechnical data report summarizing the results of the field investigations and laboratory testing.

#### ***Approach***

- The Geotechnical Data Report will include the results of the investigation performed for the CER and previous investigations.
- All field data will be compiled into a report with supporting appendices, including geologic maps, logs of borings and test pits, geophysical survey results, groundwater levels, borehole packer test data, rock mechanics test data, and laboratory test results.
- A draft report will be completed and submitted to SFPUC for comments and these comments will be incorporated into the final report.

#### ***Deliverables***

Draft and final Geotechnical Data Report.

### **Task 10 – Geotechnical Interpretive Report**

#### ***Objectives***

The objective of this task is to address the nature of the geotechnical conditions that could be encountered during construction of the proposed dam and appurtenant works.

#### ***Approach***

The Geotechnical Interpretive Report will integrate and interpret the collected data presented in the Geotechnical Data Report and help define the site geotechnical conditions. It will include geologic and engineering analyses regarding dam foundation conditions, borrow sources, foundation objectives, estimated foundation excavation depths, cutoff/grouting depths and construction considerations. This report will be used to develop the bid drawings (Task Group D).



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### ***Deliverables***

Draft and final Geotechnical Interpretive Report.

## **Task 11 – Environmental Clearance for Test Fill and Test Grouting Programs**

### ***Objectives***

The objective of this task is to prepare the required documentation and agency coordination for the test fill and test grout programs, similar to what is described in Task B2 for the geotechnical investigation.

### ***Approach***

The approach for this task would be similar to Task B2. In addition, a SWPPP for this work will be prepared as described in Task B3.

### ***Assumptions***

Similar to Task B2.

### ***Deliverables***

Similar to Tasks B2 and B3.

## **TASK GROUP C – ENGINEERING STUDIES**

### **Task 1 – Design Earthquake Ground Motions**

#### ***Objectives***

Develop site-specific design parameters for the Maximum Credible Earthquake (MCE) based on updates from PEER NGA.

#### ***Approach***

- Obtain new attenuation relationships from the ongoing Pacific Earthquake Engineering Research (PEER) Center's Next Generation of Attenuation (NGA) Project.
- Evaluate the appropriateness of the new attenuation relationships with respect to the spectrum used for the CER analyses, and select the spectrum for use in final design.
- Calculate MCE design ground motion parameters including design response spectra, using empirical attenuation relationships and numerical models.
- Evaluate 3 to 4 accelerograms in addition to the Lucerne Valley record that was used for the CER.

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#### **Assumptions**

- The new attenuation relationships from the ongoing PEER Center's NGA Project will be available in time for use in final design (by February 2006). If not, we will use the CER spectrum.

#### **Deliverables**

- Technical Memorandum on ground motion design parameters for the MCE ground motions (with response spectra).

### **Task 2 – Stability and Seismic Deformation Analyses**

#### **Objectives**

The objectives for this task are to:

- Evaluate and refine the design by assessing the stability of the embankment under various loading conditions that include end-of-construction, emergency reservoir drawdown, operational drawdown and steady-state seepage.
- Evaluate the long-term stresses and deformations of the embankment.
- Study the dynamic response to the design earthquake motions.
- Calculate potential deformations induced by the design earthquake motions.

#### **Approach**

- Static stability will be assessed using the computer program UTEXAS3. The rapid drawdown stability analysis method proposed by Duncan et al. will be used.
- Two-dimensional plane-strain finite-difference analyses will be used to simulate the long-term static stress condition within the dam. The analysis will simulate the construction of the dam by numerically constructing the dam in layer increments and will include seepage forces in the core under full reservoir load.
- Dynamic finite element response analyses will be run using the computer programs QUAD4M and FLAC. These programs will compute the dynamic stresses induced in the dam by the design earthquakes and thus allow an evaluation to be made of the pore pressure generation and cyclic and post-cyclic strength and deformation characteristics of the dam materials. The overall dynamic and post earthquake stability of the can then be verified together with an assessment of potential earthquake-induced embankment deformations. The analyses will be run for three horizontal acceleration time histories developed based on the target MCE response spectrum.

#### **Assumptions**

- None.

#### **Deliverables**

Dam Analysis Technical Memorandum

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### **Task 3 – Seepage Cutoff/Grouting**

#### **Objectives**

The objectives for this task are to develop the design of the foundation cutoff alternatives identified during conceptual engineering, evaluate their feasibility and construction constraints and then select the preferred alternative to include in the Contract Documents. The work will address the ideas and opinions on the foundation cutoff concepts provided during the CER CTAP meetings.

#### **Approach**

- Preliminary design packages will be prepared for the foundation cutoff alternatives identified during conceptual engineering. This work will include the preparation of preliminary construction drawings and specifications for each of the cutoff alternatives identified during conceptual engineering. The work will incorporate the information developed during the field exploration program and the grouting test program. The purpose of this work is to allow the potential costs and construction constraints to be further evaluated based on specific requirements and the designs will serve as a basis for discussions with specialist contractors and industry experts. Concepts considered feasible will be further refined based on input from specialist contractors and industry experts.
- The left abutment grouting alternative (exterior curtains of low mobility grout providing confinement to two interior rows of permeation grout lines) will be designed based on the results of the grouting test program. Grout-take, injection pressures and split-spacing requirements will be assessed and technically acceptable and economically feasible closure criteria will be developed. Grouting design objectives and proposed specification requirements will be discussed with DSOD. A cut-and-cover grout gallery under the core of the dam will be considered for the grouting alternative as recommended by the CTAP.
- Constructability issues including access for heavy construction equipment will be evaluated and discussed in detail with select specialist concrete cutoff and grouting contractors. Site visits with the specialist contractors will be arranged so that site specific issues and constraints, particularly with respect to work on the steep left abutment slope in the Temblor sandstone, can be reviewed and evaluated.
- Preliminary construction access plans will be prepared to evaluate access to the steep left abutment Temblor sandstone and associated construction costs. The plans will assess the feasibility and potential cost of constructing staged access haul roads to facilitate cutoff construction. The access plans will be specific to the construction requirements of each type of potential foundation alternative. Quantity takeoffs will be made and cost estimates of construction access will be developed for alternative comparison purposes.
- Potential construction risks and advantages will be evaluated. Risk consequences will include the direct costs as well as indirect costs and potential impact on construction schedule and project delivery date.

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#### **Assumptions**

- The field grouting test program (Task B8) will be carried out early in the final design schedule so that the data can be used in the selection and design of the left abutment cutoff.

#### **Deliverables**

- Dam Foundation Cutoff Evaluation and Design Technical Memorandum

### **Task 4 – Abutment Stability Analyses/Landslide Treatment Evaluation**

#### **Objectives**

The objectives for this task are to assess the stability of the existing right abutment landslide immediately upstream of the axis of the new replacement dam and to develop stabilization treatment alternatives.

#### **Approach**

- The area extent of the landslide will be assessed from surface mapping carried out during the field investigation activities. Similarly, the borings drilled through the slide will be the basis of the estimates of the basal surface depth and configuration, and current groundwater depth.
- Stability analyses [UTEXAS3] will be performed to evaluate the relative reduction in stability due to dam foundation excavation impacts on the toe of the slide. A suite of analyses will be run to assess the sensitivity of the computed stability to changes in variables such as the depth and configuration of the basal surface, residual strength of the slide surface material, and the depth of groundwater.
- Various stabilization and treatment alternatives will be evaluated to mitigate dam foundation excavation impacts and to increase the stability of the slide to compensate for inundation of the toe due to the increase in reservoir surface elevation. Alternatives include partial removal of the head of the slide, tieback stabilization, abutment drainage, or combinations of these.

#### **Assumptions**

- The basal slide surface will be identified in the field investigation borings.

#### **Deliverables**

- Abutment Stability Analyses/Landslide Treatment Evaluation Technical Memorandum

### **Task 5 – Spillway Design (URS Lead, SFPUC EDB Structural Staff Performing Designated Subtasks)**

#### **Objectives**

The design for the spillway will consider the following:

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- Safely passing the Probable Maximum Flood while meeting residual freeboard requirements.
- Balancing the cut requirement for the spillway with the fill requirement for the dam.
- Minimizing the quantity of structural concrete needed for walls and slabs.
- Developing a curved chute design that provides acceptable hydraulic performance over the full range of flows.
- Developing a stilling basin design that results in a discharge velocity acceptable for discharge into Calaveras Creek.
- Developing a stilling basin that can assist in dissipating the energy associated with discharges from the 72-inch diameter fixed cone valve.
- Developing a design that minimizes maintenance costs.

### **Approach**

URS will designate a task leader responsible for overall coordination of the design. In general, URS will perform the overall geotechnical, hydraulic and civil design and structural design of the spillway, and will determine the location, critical/controlling design forces and the allowable deflection and displacement for any bridges crossing the spillway. The SFPUC EDB will provide structural design for the bridges crossing the spillway.

- Review and confirm the hydraulic basis of design for the spillway. Select a crest profile and length and route the design flood.
- Relocate the spillway from the location included in the Conceptual Engineering Report to a location somewhat closer to the dam embankment to reduce the overall excavation. Develop preliminary plan and profile drawings for use in the hydraulic model study (Task 6).
- Modify the plan and profile based on the results of the hydraulic model study.
- Detail the geotechnical basis of design specific to spillway development including temporary excavation slopes, foundation anchor capacities in the native material along the spillway route, backfill and drainage provisions, loading conditions (static and seismic), bearing pressures and sliding resistance for native and backfill materials.
- Develop the structural basis of design for the spillway crest, chute and stilling basin, including loading conditions (normal, seismic and PMF), and factors of safety for stability (sliding, flotation and overturning). Complete design analyses and refine the preliminary design to improve overall cost effectiveness.
- Locate and develop the basis of design of the two spillway bridges.
- **SFPUC EDB Subtask.** Complete the structural design of the two spillway bridges and the associated portion of the spillway.
- **URS/SFPUC Joint Subtask.** Task Coordination. Coordinate the work of the URS and EDB staff. This will involve regular meetings with the various discipline leaders and design engineers, and visits by the URS task leader and discipline leaders to the

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EDB design office (or the EDB structural lead to the URS office) several times a week during critical portions of the design.

- Determine erosion protection requirements along the spillway and where the stilling basin discharges to Calaveras Creek.

### **Assumptions**

- The design will be based on an ungated ogee crest spillway with a curved upper chute and stilling basin as described in the Conceptual Engineering Report.
- A physical hydraulic model will be constructed to assist in the development of the hydraulic design because of the unknowns associated with the curved upper chute. Of particular concern are the wall heights necessary to contain high discharges from the curved portion of the downstream to the stilling basin and the flow pattern entering the stilling basin.
- The existing 72-inch diameter fixed cone valve will be relocated to discharge into the spillway stilling basin.
- SFPUC EDB will be responsible for quality control for those subtasks where EDB is the responsible designer.

### **Deliverables**

- Spillway Design Report

## **Task 6 – Spillway Hydraulic Model Testing**

### **Objectives**

Confirm acceptable hydraulic performance for the spillway and stilling basin while minimizing overall costs. Of particular concern are the wall heights necessary to contain waves that might develop due to the curved portion of the spillway chute. Also of concern is that an uneven flow pattern entering the stilling basin might reduce the basin's effectiveness.

### **Approach**

- The model study will be performed at Colorado State University. The approach to this task is described in Appendix A.

### **Assumptions**

- The model will be a design tool to assist in the design of the spillway. As such, the designer will be directly involved in both the development of the model, in directing modifications to the model to improve hydraulic performance and in determining the acceptability of the chosen design.

### **Deliverables**

Spillway Model Test Technical Memorandum.



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## **Task 7 – Outlet Works Design (URS Lead, SFPUC EDB Mechanical, Electrical and Structural Staff Performing Designated Subtasks)**

### ***Objectives***

Develop the design for the inlet outlet facilities. The following will be considered in the design:

- Maintaining or improving upon the discharge capacity of the existing inlet-outlet system.
- Ease and safety of operation of the completed system.
- Reliability and maintainability of the completed system.
- Developing a constructible design that can be scheduled with minimal impacts to other construction activities and with minimal impacts to existing reservoir operations.
- Reuse of existing facilities (adits, outlet conduit and valves) where appropriate.
- Improve utility services to the site

### ***Approach***

URS will designate a task leader responsible for overall coordination of the design. In general, URS will perform the geotechnical and civil design, and will determine the critical/controlling design forces and the allowable deflection and displacement for the structures. The SFPUC EDB will provide structural design for the above ground portion of the new inlet tower and the access bridge to the tower, and mechanical and electrical design for all of the outlet works, including the tower, the downstream shutoff valves, the fixed cone outlet valve and the stream maintenance release valve.

- ***URS/SFPUC Joint Subtask.*** Task Coordination. Coordinate the work of the URS and EDB staff. This will involve regular meetings with the various discipline leaders and design engineers, and visits by the URS task leader and discipline leaders to the EDB design office several times a week during critical portions of the design.
- ***URS/SFPUC Joint Subtask.*** Confirm the overall requirements for the outlet, and develop a structure that meets those requirements while fitting within the site limitations.
- ***URS/SFPUC Joint Subtask.*** Confirm the location and general arrangement of the tower and shaft.
- ***SFPUC EDB Subtask.*** Confirm size, location and number of intakes and conduits and develop plan and profile for the entire system.
- ***SFPUC EDB Subtask.*** Confirm system hydraulic capacity based on the plan and profile.
- ***URS/SFPUC Joint Subtask.*** Establish scheduling requirements based on overall dam construction schedule and reservoir operational requirements.
- ***URS/SFPUC Joint Subtask.*** Prepare overall demolition plan for the existing tower and ancillary facilities including existing valve vault and Potassium Permanganate

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Building. URS will develop overall plan based on scheduling requirements, EDB will prepare plans for mechanical and electrical demolition.

- Develop the geotechnical basis of design including expected shaft and tunnel excavation conditions and temporary and permanent support requirements.
- **SFPUC EDB Subtask.** Develop design for connecting new piping to existing conduits.
- Develop the structural basis of design for the tower including loading conditions (normal and static) and factors of safety for stability. Design the shaft and the overall connection between the tower and the shaft.
- **SFPUC EDB Subtask.** Analyze the tower using SAP 2000 or a similar finite element model and complete tower structural design. Design access bridge to the tower.
- **URS/SFPUC Joint Subtask** Complete 72-inch and 44-inch conduit design, extending the 72-inch conduit downstream and including a new valve vault, wye and connections to the relocated fixed cone valve and existing Calaveras pipeline. URS will develop overall arrangement and trench design, EDB will complete mechanical and electrical design.
- **SFPUC EDB Subtask.** Develop design for the ventilation of the intake structure
- **SFPUC EDB Subtask.** Develop design for the elevator/hoist system
- **SFPUC EDB Subtask.** Develop design for draining the intake tower
- **SFPUC EDB Subtask.** Complete intake tower piping design including selection of appropriate valves
- **SFPUC EDB Subtask.** Develop design to relocate 72-inch diameter fixed cone valve and discharge to new spillway stilling basin.
- **SFPUC EDB Subtask.** Coordinate with Alameda Creek Fishery Enhancement Project to design a system for making stream maintenance releases to Alameda Creek.
- **SFPUC EDB Subtask.** Develop electrical design of new intake tower including lighting, ventilation, valve power and control.
- **SFPUC EDB Subtask.** Complete design of utility electrical service improvement, on-site standby power, valve monitoring and control
- **SFPUC EDB Subtask.** Develop electrical design for lighting, ventilation, valve power and control within valve vault and at relocated fixed cone valve.
- **SFPUC EDB Subtask.** Complete miscellaneous metal/access platform/stairs design

### **Assumptions**

- The design will be based on "Intake Tower Option 2 – New Tower" as described in the Conceptual Engineering Report.
- The existing 72-inch diameter outlet pipe installed in the tunnel under the dam in 1992 is acceptable for continued long-term use.

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- The existing 72-inch diameter fixed cone valve will be relocated to discharge into the new spillway stilling basin.
- SFPUC will confirm the size for the stream maintenance release valve.
- SFPUC or its SCADA consultant will prepare any plans and specifications necessary to intertie with the existing SCADA system.
- SFPUC EDB will be responsible for quality control for those subtasks where EDB is the responsible designer.

### ***Deliverables***

- Outlet Works Design Report

## **Task 8 – Project Specific Operations Plan (SFPUC Lead)**

### ***Objectives***

Develop the facilities operation plan. Tie operation of the rehabilitated Calaveras Reservoir into the SFPUC's overall water supply system while balancing:

- Overall beneficial use of water generated by the local watershed
- Operation of the Alameda Creek Diversion
- Drought operation strategies
- Sunol Valley Water Treatment Plant capabilities, requirements and limitations
- Conveyance facilities capabilities and limitations
- Maintenance of environmental quality in the reservoir and in the downstream creek
- Maintenance of overall water quality for both municipal use and release to Calaveras Creek
- Efforts to minimize the occurrence and duration of uncontrolled spills

### ***Approach***

- Review and build upon the reservoir operations plan included in the Conceptual Engineering Report. Work with SFPUC operations, engineering, planning, and project management staff to incorporate SFPUC requirements and any changes resulting from implementation of the Water System Improvement Program.
- Incorporate Agreements or Memorandums of Understanding with resource agencies
- Include dam safety operational requirements. Describe reservoir evacuation procedures. Incorporate or reference instrumentation and monitoring requirements. Describe expected seismic performance and include (or reference) requirements related to inspection following seismic events.

### ***Assumptions***

- The SFPUC will lead the development of the operations plan and will be its primary author. URS will assist in the development by facilitating the compilation of baseline

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data and operational requirements and will assist as necessary in producing and publishing the plan.

#### ***Deliverables***

Meeting summaries, memoranda, and comments on the Project Specific Operations Plan.

### **Task 9 – Operations Strategy during Construction**

#### ***Objectives***

A construction plan will be developed that minimizes impacts to current operations during the construction of the replacement dam. The following will be considered in the design:

- Maintaining the reservoir within the present operating limits (Elevation 690 to Elevation 705.45) during construction.
- Maintaining an operational outlet works though out the rainy season (November-April)
- Minimizing any impacts to water quality within the reservoir
- Maximizing beneficial use of inflow into the reservoir
- Approach
- Confirm with SFPUC operations staff operational requirements and system needs.
- Review operational requirements with draft construction schedule. Determine potential impacts of schedule constraints resulting from operations.
- Together with the SFPUC, determine an optimal approach that balances operational and construction needs.

#### ***Assumptions***

- During the rainy season, the existing dam will be maintained in such a state that it can safely store water on a temporary basis up to the existing spillway level until the new spillway is operational.
- There will not be a requirement to release flows to Calaveras Creek during the construction period for stream maintenance purposes.
- The newly installed hypolimnetic oxygenation system will eliminate the need for the continued use of the Potassium Permanganate facility during the construction period.

#### ***Deliverables***

- Design memorandum detailing the reservoir operations strategy, including any limitations in reservoir operations and construction scheduling. The construction schedule limitations will be written so as to be readily incorporated into the "Progress and Completion" section of the contract specifications.

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## **Task 10 – Start-up and Commissioning Plan**

### ***Objectives***

The objective of this task is to prepare a start-up and commissioning plan for the Calaveras Dam Replacement Project.

### ***Approach***

The plan will address the following:

- Outlet works operation;
- Operations and maintenance; and
- Inspections and monitoring the performance of the dam during the first year after completion of construction.

The plan will be used for Task Group J, Phase 7, Start-up and Commissioning.

### ***Assumptions***

### ***Deliverables***

Start-up and Commissioning Plan

## **TASK GROUP D – DESIGN PACKAGE**

A detailed design package will be prepared for the dam, spillway, intake tower. The design package will include drawings and technical specifications ready for bidding, an Engineer's construction cost estimate for use in evaluation of bids, and a construction schedule.

The design package submitted under Design Group D does not include the following:

- Environmental mitigation
- Design of the Potassium Permanganate Facility

The following assumptions are also included:

- The plans and specifications will be prepared assuming one bid package.
- The design package assumes normal post-construction restoration of the site. The package does not include biological or cultural mitigation measures.
- SFPUC will develop the drawings, specifications, and construction cost estimates for SCADA systems.
- SFPUC will be the point of contact with Alameda and Santa Clara Counties to obtain information and criteria for improvement work on Calaveras Road.

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## **Task 1 – Contracting Plan**

### ***Objectives***

Develop a contracting plan for the project. It may be advantageous to separate the cutoff/grouting from the rest of the work to minimize the potential for costly delays and claims arising from extended a construction period for this relatively high risk work. This will involve evaluations of single and two construction packages.

### ***Approach***

The following will be considered in this task: (1) multiple contracts and (2) pre-qualification of contractors.

Develop overall construction schedules for a single construction contract and two construction contract packages. These schedules will be compared to assess the construction durations of single versus two construction contracts. The benefits of single versus two construction contracts will be evaluated and a recommended contracting plan will be developed.

Develop a pre-qualification package. Pre-qualifications will be aimed at short-listing qualified contractors to bid the work for the Calaveras Dam Replacement Project. Pre-qualifications will focus on projects of similar dollar value, scope and complexity as the Calaveras Dam Replacement Project. The contractor will be required to submit key personnel that they propose to commit to the project, project abstracts for which the key personnel have been involved, and their financial standing and bonding capacity.

### ***Assumptions***

- SFPUC will enforce the pre-qualification process; i.e., only contractors who have pre-qualified will be allowed to bid.

### ***Deliverables***

- Technical memorandum on the contacting plan
- Pre-qualification criteria.

## **Task 2 – 35% Detailed Design (Drawings, Tech Spec Outline, Cost Estimate & Schedule Update)**

### ***Objectives***

Develop the 35% detailed design.

### ***Approach***

- The results of studies in Task Group B and Task Group C will be used to advance the design from 10% to 35%.
- The drawings indicated for 35% on Table 2 will be produced in AutoCAD using Standard SFPUC format.
- The technical specification outline (Table 3) will be updated.



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- The construction cost estimate presented in the CER will be advanced based on the 35% detailed design.
  - Equipment rates will be obtained from published data on local leasing, rental or ownership rates
  - Labor rates will be based on published local prevailing wages
  - Material rates will be based on vendor quotes
  - Percentages will be added for overhead and profit
  - Design contingency appropriate for the level of design will be added
- The construction schedule presented in the CER will be advanced based on the 35% detailed design. The schedule, including CPM, will be developed using MS project.

### **Assumptions**

- SFPUC will provide additional drawings and information related to the existing facilities as identified.

### **Deliverables**

- 35% Drawings (15 half-size bound copies, 1 half-size unbound copy, 2 full-size bound copies, 1 full-size unbound copy)
- Technical Specification Outline (15 bound copies)
- Cost Estimate and Schedule Update Report (15 bound copies)

## **Task 3 – 65% Detailed Design (Drawings, Tech Specs, Cost Estimate & Schedule Update)**

### **Objectives**

Develop the detailed design to 65%.

### **Approach**

- Incorporate comments from SFPUC, CM, CTAP, and DSOD. Written responses to the comments will be prepared as a deliverable.
- The drawings indicated for 65% in Table 2- will be produced using Standard SFPUC format.
- Technical specifications will be developed following the Construction Specifications Institute (CSI) format and in accordance with SFPUC guidelines.
- The construction schedule and construction cost estimate will be advanced based on the 65% detailed design.

### **Assumptions**

- SFPUC will provide comments on previous submittal in matrix format.
- Caltrans specifications format will not be required for the two spillway bridges.

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***Deliverables***

- 65% Drawings (15 half-size bound copies, 1 half-size unbound copy, 2 full-size bound copies, 1 full-size unbound copy)
- Technical Specifications (15 bound copies)
- Cost Estimate and Schedule Update Report (15 bound copies)
- Responses to comments from SFPUC and CM in matrix format.

**Task 4 – Review and Assistance in Preparation of Division 0 and 1 Project Specifications**

***Objectives***

Assist SFPUC in the preparation of Division 0 and Division 1 project specifications. Division 0 includes bidding requirements, contract forms, general conditions and supplementary conditions of the contract. Division 1 includes general requirements of the contract.

***Approach***

- Review SFPUC's General Conditions for construction and make recommendations for special provisions to the General Conditions.
- Evaluate with SFPUC the use of escrow bid documents, partnering, and a Disputes Review Board for minimizing costs associated with changes and claims.
- Review bidding requirements and contract forms and make recommendations for revisions as applicable for this project.
- Conduct a workshop to determine SFPUC and URS responsibilities as lead for each Division 1 specification.

***Assumptions***

- SFPUC will provide Division 0.
- SFPUC will provide input to the Division 1 specifications at the 65% level.

***Deliverables***

- Memorandum detailing recommendations for Special Provisions to the General Conditions of the contract documents.
- Table of Bid Items for insertion by SFPUC into Section 00410, Schedule of Bid Prices.
- Division 1 specifications.

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## **Task 5 – 95% Detailed Design (Drawings, Tech Specs, Cost Estimate & Schedule Update)**

### ***Objectives***

Develop the detailed design to 95%.

### ***Approach***

- Incorporate comments from SFPUC, CM, CTAP, and DSOD. Written responses to the comments will be prepared as a deliverable.
- Complete final design details for all project components.

### ***Assumptions***

- SFPUC will provide comments on previous submittal in matrix format.

### ***Deliverables***

- 95% Drawings (15 half-size bound copies, 1 half-size unbound copy, 2 full-size bound copies, 1 full-size unbound copy)
- Technical Specifications (15 bound copies)
- Cost Estimate and Schedule Update Report (15 bound copies)
- Responses to comments from SFPUC and CM in matrix format.

## **Task 6 – Incorporate Permit Requirements**

### ***Objectives***

Incorporate requirements of permitting agencies such as U.S. Army Corps of Engineers, Regional Water Quality Control Board, California Fish and Game, and other regulatory agencies into the Detailed Design Documents.

### ***Approach***

- Permitting requirements will be incorporated into the 65, 95, and 100% drawings and technical specifications as they are identified.

### ***Assumptions***

- It is assumed that most of the permitting requirements will be incorporated at the 95% level of design.

### ***Deliverables***

- No separate deliverable; permitting requirements will be incorporated at the 95% and 100% levels of design.

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## **Task 7 – 100% Detailed Design (Drawings, Tech Specs, Cost Estimate & Schedule Update)**

### ***Objectives***

Finalize the detailed design and produce 100% drawings and technical specifications ready for bidding. Produce a final construction cost estimate and schedule for use in evaluation of bids.

### ***Approach***

- Incorporate comments from SFPUC, CM, CTAP, and DSOD. Written responses to the comments will be provided as a deliverable.

### ***Assumptions***

- SFPUC will provide comments on previous submittal in matrix format.
- Responsible individuals from the SFPUC EDB will stamp and sign the structural, mechanical and electrical drawings that were prepared by EDB.

### ***Deliverables***

- 100% Drawings (15 half-size bound copies, 1 half-size unbound copy, 2 full-size bound copies, 1 full-size unbound copy, 1 full-size mylar unbound copy).
- Technical Specifications (15 bound copies).
- Cost Estimate and Schedule Update Report (15 bound copies).
- Responses to comments from SFPUC and CM in matrix format.
- Electronic copy of AutoCAD drawings.
- Electronic copy of specifications in MS Word and Adobe Acrobat PDF.

## **Task 8 – Package for Two Construction Contracts (Optional Task)**

### ***Objectives***

The objective of this optional task is to provide an allowance for two construction contracts, as discussed in Task D1.

### ***Approach***

Prepare two sets of bidding and construction documents. This will include preparing two sets of Special Provisions, General Requirements, and selected technical specifications, such as excavation.

### ***Assumptions***

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***Deliverables***

Two sets of construction documents.

**TASK GROUP E – PERMITTING SUPPORT (SFPUC LEAD)**

***Objectives***

Assist SFPUC by requested providing technical data and support for preparation of permit applications.

***Approach***

- Assist SFPUC to prepare the application for approval to construct from DSOD.
- Assist SFPUC to prepare applications for environmental permits.
- The permit requirements will be incorporated in the specifications (Task D6).

***Assumptions***

- URS will provide engineering and other technical support services as requested and authorized by the SFPUC.

***Deliverables***

- Requested information in the form of memoranda on an as-needed basis.

**TASK GROUP F – PRE-CONSTRUCTION CM INTERACTION (SFPUC LEAD)**

***Objectives***

The construction manager (CM) will need to support and enforce the contact specifications. The objective of this task is to assist SFPUC to conduct reviews of the construction plans and specifications with the CM to obtain their input and “buy-in”.

***Approach***

- Assist SFPUC to conduct review meetings of the 35% plans and outline of specifications, and the 65%, 95% and 100% plans and specifications.
- SFPUC and CM will provide comments on plan/specification set in matrix format and URS will respond to the comments. Resolutions to the comments will be incorporated into the succeeding submittal of plans and specifications.

***Assumptions***

- SFPUC and CM will provide comments in matrix format within three weeks of receipt of a plan/specification set.

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***Deliverables***

- Meeting agendas
- Responses to comments from SFPUC and CM in matrix format.

**TASK GROUP G – PROJECT MEETINGS (SFPUC LEAD)**

**Task 1 – SFPUC Meetings**

***Objectives***

- Meet with SFPUC periodically to review and develop solutions for significant design and related project issues.

***Approach***

- Prepare for and attend 8 review meetings with SFPUC to review significant design and related project issues through completion of Final Design, Phase 4 (end of 2008). Approximate meeting dates are shown on the Project Schedule (Attachment 4).
- Work with SFPUC to prepare agendas before the meetings to assure all critical issues are covered.

Prepare and conduct the review meetings to present the results of the major deliverables, receive comments and to propose resolutions to issues. Key subject areas to be reviewed in meetings with SFPUC are those indicated in Task G2 plus environmental considerations and construction cost and schedule.

***Assumptions***

- Allowed for 8 workshops with SFPUC through completion of final design.
- Review meetings with SFPUC will be held at SFPUC's offices in San Francisco, Millbrae, or Sunol.

***Deliverables***

- Meeting presentation materials, agendas, hand-outs, and minutes indicating decisions reached on significant design issues.

**Task 2 – DSOD Meetings**

***Objectives***

- Meet and coordinate with DSOD to obtain their input on dam-related design issues.

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#### **Approach**

- Prepare for and attend 8 review meetings with DSOD to review significant design and related project issues through completion of Final Design, Phase 4 (end of 2008). Approximate meeting dates are shown on the Project Schedule (Attachment 4).
- Work with SFPUC to prepare agendas well before the meetings to assure all critical issues are covered.
- Prepare and conduct the review meetings to present the results of the major deliverables, receive comments and to propose resolutions to issues. Key subject areas to be reviewed in meetings with DSOD are:
  - Project Goals & Design Criteria Memorandum
  - Geotechnical Investigations [includes Work Plan; field data (monthly during field visits), laboratory testing data; large scale field fill test; grouting test; Geotechnical Data Report; and Geotechnical Interpretive Report].
  - Engineering Studies and technical memoranda [includes design earthquake ground motions; stability and seismic deformation analyses; seepage cutoff and grouting evaluations; abutment stability analyses and landslide treatment evaluation; spillway design and hydraulic model testing; outlet works design; and operations during construction]
  - Plans and technical specifications at 35%, 65%, 95% and 100% levels.
- The DSOD review meetings will be conducted after the review meetings with the SFPUC and Calaveras Technical Advisory Panel (CTAP). (The CTAP meetings are covered under Task G3). In general, the DSOD review meetings will only cover subject areas under their jurisdiction; and all design issues and decisions would have been reviewed by the SFPUC and the CTAP. This approach should streamline and strengthen the review and approval process with DSOD.

#### **Assumptions**

- Allowed for 8 meetings with DSOD through completion of final design.
- Review meetings with DSOD will be held in DSOD's office in Sacramento, and at least one of the meetings with DSOD will include a site visit and the meeting would be held at SFPUC's facilities in Sunol.

#### **Deliverables**

- Meeting presentation materials, agendas, hand-outs, and minutes indicating decisions reached on significant design issues.



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### **Task 3 – CTAP Meetings**

#### ***Objectives***

- Meet with Calaveras Technical Advisory Panel (CTAP) periodically to present recommendations on significant design and related project issues.

#### ***Approach***

- Prepare for and attend 7 review meetings with the CTAP to review significant design and related project issues through completion of Final Design, Phase 4 (end of 2008). Approximate meeting dates are shown on the Project Schedule (Attachment 4).
- Work with SFPUC to prepare agendas well before the meetings to assure all critical issues are covered.
- Prepare and conduct the review meetings to present the results of the major deliverables, receive comments and to propose resolutions to issues. The issues would be the same as those identified in Task G1.
- Assist SFPUC to prepare questions for each CTAP meeting to obtain their input to resolve issues.
- Respond to CTAP's comments in a matrix format.

#### ***Assumptions***

- Allowed for 7 meetings with the CTAP at facilities provided by the SFPUC through completion of final design.

#### ***Deliverables***

- Presentation materials and agendas for the CTAP meetings.
- Responses to the CTAP's comments in matrix format.

### **TASK GROUP H – PHASE 5 - BID PERIOD SERVICES (SFPUC LEAD)**

#### ***Objectives***

URS will assist SFPUC during the bidding period.

#### ***Approach***

Provide the following support as requested by SFPUC in the following items:

- Support advertisement for bidding.
- Participate in the conduct of the pre-bid meeting.
- Respond to bidder's questions and prepare addenda to the plans and specifications.
- Assist in bid evaluation.

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- Assist in SFPUC meetings.

***Assumptions***

- URS will provide bid period support services as requested and authorized by the SFPUC.

***Deliverables***

- Written responses to bidder's inquiries and addenda to plans and specifications.
- Requested information in the form of memoranda on an as-needed basis.

## Tables

**Table 1**  
**Calaveras Dam Replacement Project**  
**Final Investigation Plan**

GROUP	EXPLORATION TYPE / NO. <sup>1</sup>	LOCATION	Ground Elevation	Structure Elevation	Additional Drilling	DEPTH / LENGTH (ft)	Formation <sup>2</sup>	PIEZO	ACCESS	GOAL OF INVESTIGATION	IN-SITU TESTING
<b>DAM FOUNDATION</b>											
2	CB-27	left abutment, axis	810	610	0	200	Tts	No	helicopter	dam fnd/grouting	packer, borehole camera
1	CB-28	left abutment, axis	750	550	0	200	Tts	No	on existing road	dam fnd/grouting	packer, borehole camera
1	CB-29	left abutment, axis	700	500	0	200	Tts	Yes	helicopter	dam fnd/grouting	packer, borehole camera
2	CB-30	left abutment, axis	660	460	0	200	Tts/fm	Yes	helicopter	dam fnd/cutoff	packer, borehole camera
1	CB-31	valley bottom, axis	610	410	0	200	Tts/fm	yes	helicopter	dam fnd/cutoff	packer, borehole camera
1	CB-32	valley bottom, axis	600	400	0	200	fm	yes	on existing road	dam fnd/grouting	packer
1	CB-33	right abutment, axis	650	450	0	200	fm	no	helicopter	dam fnd/grouting	packer, borehole camera
2	CB-34	right abutment, axis	870	670	0	100	fm	no	helicopter	dam fnd/grouting	packer
2	CB-35 <sup>3</sup>	valley bottom, core trench edge	595	525	0	70	fm		on existing road	dam fnd	none
1	CB-36	valley bottom, core trench edge	605	505	0	100	fm		on existing road	dam fnd	none
2	CB-37	right abutment, core trench edge	635	535	0	100	fm		helicopter	dam fnd	none
1	CB-38	right abutment, core trench edge	755	655	0	100	fm		on existing road	dam fnd	none
1	CB-39 <sup>3</sup>	valley bottom, shell	600	500	0	100	fm		on existing road	dam fnd	none
2	CB-40	right abutment, shell	625	525	0	100	fm		on existing road	dam fnd	none
1	CB-41 <sup>3</sup>	valley bottom, shell	580	540	0	40	Tts		on existing road	dam fnd, (3Ca-2 outlet)	borehole camera at outlet level
1	CB-42	right abutment, shell	670	570	0	100	fm		helicopter	dam fnd	none
2	CB-43	right abutment, shell	750	700	0	50	fm	NA	on existing road	dam fnd	none
2	CB-44	left abutment, shell	590	540	0	50	Tts		helicopter	dam fnd	none
2	CB-45	left abutment, shell	765	610	20	175	Tts		on existing road	dam fnd/spillway fnd/(3Ca-2 outlet)	borehole camera at outlet level
2	CB-46	left abutment, shell	745	695	0	50	Tts		on existing road	dam fnd	none
2	TP-20	right abutment			0	15	Qls		on existing road	landslide contact	none
2	TP-21	right abutment			0	15	Qls	NA	on existing road	landslide contact	none
2	TP-22	valley bottom toe			0	15	Qal		on existing road	transfer pipeline fnd	none
1	RW-1	valley bottom, u/s toe	665	550	0	115	fill, Qal		on existing road	dam fnd/soil improvement zone	none
1	RW-2	valley bottom, u/s toe	710	550	0	160	fill, Qal		on existing road	dam fnd/soil improvement zone	none
1	RS-15	valley bottom				650	Qal/fm		on existing road	dam fnd	--
1	RS-16	valley bottom				550	Qal/fm		on existing road	dam fnd	--
1	RS-17	valley bottom				800	Qal/fm		on existing road	dam fnd	--
1	RS-18	right abutment				800	fm		--	dam fnd	--
1	RS-19	right abutment				650	fm		--	dam fnd	--
1	RS-20	right abutment				800	fm		--	dam fnd	--

**Table 1**  
**Calaveras Dam Replacement Project**  
**Final Investigation Plan**

GROUP	EXPLORATION TYPE / NO. <sup>1</sup>	LOCATION	Ground Elevation	Structure Elevation	Additional Drilling	DEPTH / LENGTH (ft)	Formation <sup>2</sup>	PIEZO	ACCESS	GOAL OF INVESTIGATION	IN-SITU TESTING
<b>RIGHT ABUTMENT LANDSLIDE</b>											
1	CB-47	right abutment	1050	1000	0	50	Qls		helicopter	landslide thickness	none
2	CB-48	right abutment	1105	1055	0	50	Qls		helicopter	landslide thickness	none
2	CB-49	right abutment	1005	955	0	50	Qls		helicopter	landslide thickness	none
2	BA-12 (if needed)	right abutment	700	600	0	100	Qls/fm		on existing road	landslide thickness	none
1	BA-13 (if needed)	right abutment	770	670	0	100	Qls/fm		on existing road	landslide thickness	none
1	BA-14 (if needed)	right abutment	780	710	0	70	Kau		on existing road	landslide thickness	none
2	BA-15 (if needed)	right abutment	820	750	0	70	Kau		on existing road	landslide thickness	none
<b>SPILLWAY</b>											
2	CB-50	approach channel	860	740	20	140	Tts	no	helicopter	spillway fnd & shell matls	none
1	CB-51	left abutment, axis	950	640	50	360	Tts		helicopter	3Ca-1 spillway (3Ca-2 dam fnd/grouting)	packer, borehole camera
2	CB-52	spillway chute	905	740	20	185	Tts	NA	helicopter	spillway fnd & shell matls	down-hole seismic vel.
1	CB-53	spillway chute	760	710	20	70	Tts	NA	on existing road	spillway fnd & shell matls	none
2	CB-54	spillway chute	725	650	20	95	Tts	NA	on existing road	spillway fnd & shell matls	none
1	CB-55	spillway chute	615	560	20	75	Tts/fm	no	helicopter	spillway fnd, Tts/fm contact	down-hole seismic vel.
1	CB-56	spillway chute	590	560	20	50	fm		helicopter	spillway fnd	down-hole seismic vel.
<b>NEW INTAKE TOWER</b>											
1	CB-57 <sup>3</sup>	intake tower	760	600	30	190	fm	no	dozer	intake tower foundation	borehole camera
<b>BORROW AREA E</b>											
1	TP-23 to 42	Borrow Area E				12 to 15			reservoir bottom	core materials	none
1	BA-16	Borrow Area E				35			reservoir bottom	core & drain materials	none
1	BA-17	Borrow Area E				35			reservoir bottom	core & drain materials	none
1	BA-18	Borrow Area E				45			reservoir bottom	core & drain materials	none
1	BA-19	Borrow Area E				45			reservoir bottom	core & drain materials	none
1	BA-20	Borrow Area E				45			reservoir bottom	core & drain materials	none
1	BA-21	Borrow Area E				55			reservoir bottom	core & drain materials	none
1	BA-22	Borrow Area E				50			reservoir bottom	core & drain materials	none
1	BA-23	Borrow Area E				60			reservoir bottom	core & drain materials	none
1	BA-24	Borrow Area E				55			reservoir bottom	core & drain materials	none
1	BA-25	Borrow Area E				55			reservoir bottom	core & drain materials	none
1	BA-26	Borrow Area E				50			reservoir bottom	drain materials	none
1	BA-27	Borrow Area E				50			reservoir bottom	drain materials	none
1	BA-28	Borrow Area E				50			reservoir bottom	drain materials	none
1	BA-29	Borrow Area E				50			reservoir bottom	drain materials	none
1	BA-30	Borrow Area E				50			reservoir bottom	drain materials	none
2	TP-43 to 62	Borrow Area E				12 to 15			reservoir bottom	core materials	none
2	BA-31 to 40	Borrow Area E				40 to 60			reservoir bottom	core & drain materials	none

**Table 1**  
**Calaveras Dam Replacement Project**  
**Final Investigation Plan**

GROUP	EXPLORATION TYPE / NO. <sup>1</sup>	LOCATION	Ground Elevation	Structure Elevation	Additional Drilling	DEPTH / LENGTH (ft)	Formation <sup>2</sup>	PIEZO	ACCESS	GOAL OF INVESTIGATION	IN-SITU TESTING
<b>DISPOSAL AREA BERM</b>											
2	CB-58	left abutment				50	fm/fsp		helicopter	berm foundation level	none
1	CB-59	valley bottom				75	fm/fsp		barge	berm foundation level	none
2	CB-60	right abutment				50	Kau		helicopter	berm foundation level	none
1	RS-21	right abutment				530	Kau		—	berm foundation level	none

Notes: 1: CB = HQ-3 wireline core boring, BA = 30-inch bucket auger boring, I = Inclined, P = Piezometer TP = Test pit, RS = Seismic refraction line.

2: Qal = alluvium, Qls = Landslide, Tls = Temblor Sandstone, Ksh = shale, fm = melange, sp = serpentinite / glaucophane blueschist.

3: Survey of existing outlet pipe and other underground required prior to drilling.

4: Group 2 locations would be confirmed based on results of Phase 1 explorations.

Exploration Group Summary	Group 1	Group 1	Group 2	Group 2
	Qty.	(footage)	Qty.	(footage)
Core Borings (Helicopter)	9	1310	11	1175
Core Borings (non-helicopter)	9	1075	6	540
Rotary Wash Borings	2	275	0	0
Bucket Auger Borings	17	900	12	670
Seismic Refraction Lines	7	4,780	0	0
Test Pits	24	0	23	0

**Table 2  
List of Drawings**

Drawing No.	Drawing Name	Responsibility	35%	65%	95% & 100%
<b>GENERAL</b>					
GN-1	Title Sheet	URS	X	X	X
GN-2	Sheet Index	URS	X	X	X
GN-3	Abbreviations and Symbols	URS	X	X	X
GN-4	Location and Vicinity Maps	URS	X	X	X
GN-5	General Arrangement	URS	X	X	X
GN-6	Survey Control	URS		X	X
GN-7	Hydrologic Information and Storage/Area Curves	URS		X	X
<b>EXISTING CONDITIONS</b>					
EC-1	Existing Dam Plan and Center Cross Section	URS	X	X	X
EC-2	Existing Conditions, Sheet 1 of 4 (subject; titles?)	URS	X	X	X
EC-3	Existing Conditions, Sheet 2 of 4	URS	X	X	X
EC-4	Existing Conditions, Sheet 3 of 4	URS	X	X	X
EC-5	Existing Conditions, Sheet 4 of 4	URS	X	X	X
<b>DEMOLITION</b>					
DM-1	General Demolition Plan	URS	X	X	X
<b>EXCAVATION AND FOUNDATION TREATMENT</b>					
FD-1	General Excavation Plan	URS	X	X	X
FD-2	Excavation Pay Limits	URS		X	X
FD-3	Cofferdam Excavation Plan	URS	X	X	X
FD-4	Cofferdam Excavation Sections	URS	X	X	X
FD-5	Spillway Excavation Plan, Sheet 1 of 2	URS	X	X	X
FD-6	Spillway Excavation Plan, Sheet 2 of 2	URS	X	X	X
FD-7	Spillway Excavation Sections, Sheet 1 of 2	URS	X	X	X
FD-8	Spillway Excavation Sections, Sheet 2 of 2	URS	X	X	X
FD-9	Right Abutment Excavation Plan	URS	X	X	X
FD-10	Right Abutment Excavation Sections and Details	URS	X	X	X
FD-11	Dam Foundation Excavation Plan	URS	X	X	X
FD-12	Dam Foundation Excavation Sections	URS	X	X	X
FD-13	Surface Treatment Details	URS		X	X
FD-14	Secant Pile Cutoff Plan and Profile	URS	X	X	X
FD-15	Grout Curtain Plan and Profile	URS	X	X	X
FD-16	Grout Curtain Sections and Details	URS		X	X



**Table 2**  
**List of Drawings**

Drawing No.	Drawing Name	Responsibility	35%	65%	95% & 100%
<b>DAM</b>					
EM-1	Embankment Plan	URS	X	X	X
EM-2	Maximum Section and Profile	URS	X	X	X
EM-3	Crest Details	URS	X	X	X
EM-4	Sections, Sheet 1 of 2	URS	X	X	X
EM-5	Sections, Sheet 2 of 2	URS	X	X	X
EM-6	Embankment Details, Sheet 1 of 2	URS		X	X
EM-7	Embankment Details, Sheet 2 of 2	URS		X	X
EM-8	Downstream Zone 2 / Zone 3 Footprint - Plan and Sections	URS	X	X	X
EM-9	Downstream Embankment Toe Plan	URS	X	X	X
EM-10	Surface Drainage and Bench Details	URS		X	X
<b>INSTRUMENTATION</b>					
IN-1	Instrumentation Plan	URS	X	X	X
IN-2	Dam Section, Sheet 1 of 3	URS	X	X	X
IN-3	Dam Section, Sheet 2 of 3	URS	X	X	X
IN-4	Dam Section, Sheet 3 of 3	URS	X	X	X
IN-5	Piezometer Details, Sheet 1 of 2	URS		X	X
IN-6	Piezometer Details, Sheet 2 of 2	URS		X	X
IN-7	Inclinometer Details	URS		X	X
IN-8	Seismometer Installation Details	URS		X	X
IN-9	Survey Monument Details	URS		X	X
IN-10	Terminal Buildings and Vaults	URS		X	X
IN-11	Toe Drain Weir, Plan and Sections	URS		X	X
IN-12	ADAS System	URS	X	X	X
IN-13	ADAS Details, Sheet 1 of 2	URS		X	X
IN-14	ADAS Details, Sheet 2 of 2	URS		X	X
IN-15	Meteorological Station - Details	URS		X	X
IN-16	Instrumentation Schedule	URS		X	X
<b>BORROW AREAS</b>					
BA-1	Borrow Area E Plan and Section	URS	X	X	X
BA-2	Borrow Area B1 Plan and Section	URS	X	X	X
<b>DISPOSAL AREAS</b>					
DA-1	Disposal Area 1 Plan and Section	URS	X	X	X
DA-2	Disposal Area 3 Plan	URS	X	X	X
DA-3	Disposal Area 3 Section and Dike Details	URS	X	X	X

**Table 2**  
**List of Drawings**

Drawing No.	Drawing Name	Responsibility	35%	65%	95% & 100%
<b>SPILLWAY</b>					
SP-1	Plan and Profile Sheet 1	URS	X	X	X
SP-2	Plan and Profile Sheet 2	URS	X	X	X
SP-3	Crest Structure & Upper Chute - Excavation	URS		X	X
SP-4	Chute - Excavation	URS		X	X
SP-5	Lower Chute and Stilling Basin - Excavation	URS		X	X
SP-6	Crest Structure and Upstream Wingwalls - Plan and Section	URS		X	X
SP-7	Crest Structure and Upstream Wingwalls - Sections and Details	URS	X	X	X
SP-8	Upper Chute - Plan and Profile	URS	X	X	X
SP-9	Lower Chute - Plan and Profile	URS	X	X	X
SP-10	Chute - Sections and Details	URS	X	X	X
SP-11	Stilling Basin - Plan and Profile	URS	X	X	X
SP-12	Stilling Basin - Sections and Details 1	URS	X	X	X
SP-13	Stilling Basin – Sections and Details 2	URS		X	X
SP-14	Crest Structure and Upstream Wingwalls - Reinforcement	URS		X	X
SP-15	Crest Bridge – General Plan	URS w/EDB input	X	X	X
SP-16	Crest Bridge – Foundation Details	URS w EDB input	X	X	X
SP-17	Crest Bridge – Abutment	EDB w/URS input	X	X	X
SP-18	Crest Bridge – Abutment Details 1	EDB w/URS input		X	X
SP-19	Crest Bridge – Abutment Details 2	EDB w/URS input		X	X
SP-20	Crest Bridge – Typical Section	EDB	X	X	X
SP-21	Crest Bridge – Girder Layout	EDB		X	X
SP-22	Crest Bridge – Girder Details	EDB		X	X
SP-23	Stilling Basin Bridge – General Plan	URS w/EDB input	X	X	X
SP-24	Stilling Basin Bridge – Foundation Details	URS w EDB input	X	X	X
SP-25	Stilling Basin Bridge – Abutment	EDB w/URS input	X	X	X
SP-26	Stilling Basin Bridge – Abutment Details 1	EDB w/URS input		X	X
SP-27	Stilling Basin Bridge – Abutment Details 2	EDB w/URS input		X	X
SP-28	Stilling Basin Bridge – Typical Section	EDB	X	X	X
SP-29	Stilling Basin Bridge – Girder Layout	EDB		X	X
SP-30	Stilling Basin Bridge – Girder Details	EDB		X	X
SP-31	Chute – Reinforcement	URS		X	X
SP-32	Stilling Basin – Reinforcement 1	URS		X	X
SP-33	Stilling Basin – Reinforcement 2	URS		X	X
SP-34	Underdrain Details – Sheet 1	URS		X	X

**Table 2**  
**List of Drawings**

Drawing No.	Drawing Name	Responsibility	35%	65%	95% & 100%
SP-35	Underdrain Details - Sheet 2	URS		X	X
SP-36	Miscellaneous Details	URS		X	X
<b>OUTLET WORKS</b>					
OW-1	Plan and Profile	URS w/EDB input	X	X	X
OW-2	New Tower & Shaft - Excavation & Support 1	URS	X	X	X
OW-3	New Tower & Shaft - Excavation & Support 2	URS	X	X	X
OW-4	New Tower & Shaft - Adit Excavation & Support	URS	X	X	X
OW-5	New Tower & Shaft - General Arrangement Elevation	EDB w/URS input	X	X	X
OW-6	New Tower & Shaft - General Arrangement Plans 1	EDB w/URS input	X	X	X
OW-7	New Tower & Shaft - General Arrangement Plans 2	EDB w/URS input	X	X	X
OW-8	New Tower & Shaft - General Arrangement Plans 3	EDB w/URS input	X	X	X
OW-9	Existing Tower - Demolition 1	EDB w/URS input		X	X
OW-10	Existing Tower - Demolition 2	EDB w/URS input		X	X
OW-11	New Tower Piping	EDB w/URS input	X	X	X
OW-12	New Tower Piping Details	EDB		X	X
OW-13	Connection to Outlet Conduit & Drain	EDB w/URS input	X	X	X
OW-14	Connections to Adits 1 and 2	EDB w/URS input	X	X	X
OW-15	New Tower and Shaft - Adit 3 & Fishscreen	EDB w/URS input		X	X
OW-16	New Tower and Shaft - Reinforcement 1 (tower)	EDB		X	X
OW-17	New Tower and Shaft - Reinforcement 2 (shaft)	URS		X	X
OW-18	New Tower and Shaft - Access Bridge 1	EDB w/URS input		X	X
OW-19	New Tower and Shaft - Access Bridge 2	EDB w/URS input		X	X
OW-20	New Tower and Shaft - Miscellaneous Metals 1	EDB		X	X
OW-21	New Tower and Shaft - Miscellaneous Metals 2	EDB		X	X
OW-22	New Tower and Shaft - Roof Details	EDB		X	X
OW-23	Electrical (Emergency Generator) Building (Civil/Structural)	EDB	X	X	X
OW-24	Outlet Conduit - Demolition & Salvage	URS	X	X	X
OW-25	Outlet Conduit Extension - Plan and Profile	URS w/EDB input	X	X	X
OW-26	Outlet Conduit Extension - Excavation Plan, Sections and Details	URS		X	X

**Table 2**  
**List of Drawings**

<b>Drawing No.</b>	<b>Drawing Name</b>	<b>Responsibility</b>	<b>35%</b>	<b>65%</b>	<b>95% &amp; 100%</b>
OW-27	Outlet Conduit Extension - Valve Vault and Bifurcation 1	URS w/EDB input	X	X	X
OW-28	Outlet Conduit Extension - Valve Vault and Bifurcation 2	URS w/EDB input	X	X	X
OW-29	Outlet Conduit Extension - Valve Vault and Bifurcation 3	URS w/EDB input		X	X
OW-30	Outlet Conduit Extension - Fixed Cone Valve Vault 1 (General Arrangement)	URS w/EDB input	X	X	X
OW-31	Outlet Conduit Extension - Fixed Cone Valve Vault 2	EDB w/URS input		X	X
OW-32	Outlet Conduit Extension - Fixed Cone Valve Vault 3	EDB w/URS input		X	X
OW-33	Outlet Conduit Extension - 44" Conveyance Pipe & Fish Release Valve 1 (General Arrangement)	URS w/EDB input	X	X	X
OW-34	Outlet Conduit Extension - 44" Conveyance Pipe & Fish Release Valve 2	EDB w/URS input		X	X
OW-35	Steel Conduits - Sections & Details 1	EDB		X	X
OW-36	Outlet Miscellaneous Details	URS w/EDB input		X	X
OW-37	Typical Reinforcement Details - Sheet 1	URS w/EDB input		X	X
OW-38	Typical Reinforcement Details - Sheet 2	URS w/EDB input		X	X
<b>MECHANICAL</b>					
ME-1	New Tower and Shaft - Gates 1	EDB	X	X	X
ME-2	New Tower and Shaft - Gates 2	EDB		X	X
ME-3	New Tower and Shaft - Elevator/Hoist 1	EDB	X	X	X
ME-4	New Tower and Shaft - Elevator/Hoist 2	EDB		X	X
ME-5	New Tower and Shaft - Ventilation System 1	EDB		X	X
ME-6	New Tower and Shaft - Ventilation System 2	EDB		X	X
ME-7	New Tower and Shaft - Drainage	EDB		X	X
ME-8	New Tower and Shaft - Details	EDB			X
ME-9	New Tower and Shaft - Details	EDB			X
ME-10	New Tower and Shaft - Details	EDB			X
<b>ELECTRICAL</b>					
EL-1	Outlet Works - One Line Diagram	EDB	X	X	X
EL-2	Electrical (Emergency Generator) Building - Plans, Sections, and Details	EDB	X	X	X
EL-3	Dam Electrical Layout - Plans, Sections, and Details	EDB		X	X
EL-4	New Tower and Shaft - Electrical Layout & Lighting 1	EDB		X	X

**Table 2  
List of Drawings**

Drawing No.	Drawing Name	Responsibility	35%	65%	95% & 100%
EL-5	New Tower and Shaft - Electrical Layout & Lighting 2	EDB		X	X
EL-6	Outlet Valve Vault - Electrical Layout and Lighting	EDB		X	X
EL-7	Fixed Cone Valve Vault - Electrical Layout and Lighting	EDB		X	X
EL-8	Outlet Works - Control Diagram 1	EDB		X	X
EL-9	Outlet Works - Control Diagram 2	EDB		X	X
EL-10	Outlet Works - Control Diagram 3	EDB		X	X
EL-11	New Tower and Shaft - Control Details	EDB		X	X
EL-12	Outlet Conduit - Control Details	EDB		X	X
EL-13	Instrumentation Symbols and Abbreviations	EDB		X	X
EL-14	PG&E Incoming Service	EDB		X	X
EL-15	Electrical Building - Interconnection diagram	EDB	-	-	-
EL-16	New Tower & Shaft - Interconnection Diagram - Sheet 1	EDB	-	-	-
EL-17	New Tower & Shaft - Interconnection Diagram - Sheet 2	EDB	-	-	-
EL-18	Outlet Conduit - Interconnection Diagram	EDB	-	-	-
<b>ACCESS ROADS</b>					
AR-1	General Layout	URS w/EDB input	X	X	X
AR-2 <sup>1</sup>	Calaveras Road Improvement Plan and Profile, Sheet 1 of 7	EDB	X	X	X
AR-3 <sup>1</sup>	Calaveras Road Improvement Plan and Profile, Sheet 2 of 7	EDB	X	X	X
AR-4 <sup>1</sup>	Calaveras Road Improvement Plan and Profile, Sheet 3 of 7	EDB	X	X	X
AR-5 <sup>1</sup>	Calaveras Road Improvement Plan and Profile, Sheet 4 of 7	EDB	X	X	X
AR-6 <sup>1</sup>	Calaveras Road Improvement Plan and Profile, Sheet 5 of 7	EDB	X	X	X
AR-7 <sup>1</sup>	Calaveras Road Improvement Plan and Profile, Sheet 6 of 7	EDB	X	X	X
AR-8 <sup>1</sup>	Calaveras Road Improvement Plan and Profile, Sheet 7 of 7	EDB	X	X	X
AR-9	Calaveras Road Realignment Sections, Sheet 1 of 2	EDB	X	X	X
AR-10	Calaveras Road Realignment Sections, Sheet 2 of 2	EDB	X	X	X
AR-11	Calaveras Road Realignment Retaining Walls, Sheet 1 of 2	EDB w/URS input	X	X	X

**Table 2**  
**List of Drawings**

<b>Drawing No.</b>	<b>Drawing Name</b>	<b>Responsibility</b>	<b>35%</b>	<b>65%</b>	<b>95% &amp; 100%</b>
AR-12	Calaveras Road Realignment Retaining Walls, Sheet 2 of 2	EDB w/URS input	X	X	X
AR-13 <sup>1</sup>	Calaveras Road Improvement Drainage Plans, Sheet 1 of 4	EDB		X	X
AR-14 <sup>1</sup>	Calaveras Road Improvement Drainage Plans, Sheet 2 of 4	EDB		X	X
AR-15 <sup>1</sup>	Calaveras Road Improvement Drainage Plans, Sheet 3 of 4	EDB		X	X
AR-16 <sup>1</sup>	Calaveras Road Improvement Drainage Plans, Sheet 4 of 4	EDB		X	X
AR-17 <sup>1</sup>	Calaveras Road Improvement Striping Plan, Sheet 1 of 4	EDB		X	X
AR-18 <sup>1</sup>	Calaveras Road Improvement Striping Plan, Sheet 2 of 4	EDB		X	X
AR-19 <sup>1</sup>	Calaveras Road Improvement Striping Plan, Sheet 3 of 4	EDB		X	X
AR-20 <sup>1</sup>	Calaveras Road Improvement Striping Plan, Sheet 4 of 4	EDB		X	X
AR-21	Dam Site Access Road, Sheet 1 of 2	URS	X	X	X
AR-22	Dam Site Access Road, Sheet 2 of 2	URS	X	X	X
AR-23	Crest Road Plan	URS	X	X	X
AR-24	Crest Road - Details at Left End of Dam	URS		X	X
AR-25	Crest Road - Details at Right End of Dam	URS		X	X
AR-26	Crest Road - Details at Intake Tower	URS		X	X
AR-27	Crest Road Curb Drain	URS		X	X
AR-28	Crest Road Miscellaneous Details - Sheet 1	URS		X	X
AR-29	Crest Road Miscellaneous Details - Sheet 2	URS		X	X
AR-30	Spillway Access Road Plan and Profile Sheet 1	EDB w/URS 35% level input	X	X	X
AR-31	Spillway Access Road Plan and Profile Sheet 2	EDB w/URS 35% level input	X	X	X
AR-32	Spillway Access Road Plan and Profile Sheet 3	EDB w/URS 35% level input	X	X	X
AR-33	Spillway Access Road Sections - Sheet 1	EDB	X	X	X
AR-34	Spillway Access Road Sections - Sheet 2	EDB	X	X	X
AR-35	Miscellaneous Details - Sheet 1	EDB		X	X
AR-36	Miscellaneous Details - Sheet 2	EDB		X	X
<b>Number of Drawings Included in Submittal</b>			<b>99</b>	<b>191</b>	<b>194</b>

**Table 2**  
**List of Drawings**

Drawing No.	Drawing Name	Responsibility	35%	65%	95% & 100%
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<sup>1</sup> Calaveras Road Improvement Plans are scaled as follows; 4 sheets at 1"=50' in the central segment of the road between Geary and the dam access road that would be realigned, and 1"=100' on the upper and lower segments for turnout locations. Drainage and striping plans for Calaveras Road would be developed only for the central portion of the roadway that is being realigned.



**Table 3**  
**List of Specifications**

Section Number	Name	Scope
<b>DIVISION 0 – BIDDING AND CONTRACT REQUIREMENTS</b>		
00700	General Conditions	The general conditions of the contract by which the work is conducted. Typically provided by the Owner. Includes definitions, preliminary matters, contract documents, availability of lands, subsurface and physical conditions, references, bonds and insurance, responsibilities of contractor, owner, and engineer, changes in the work, claims, payment, tests and inspections, suspension of work, termination, dispute resolution, liquidated damages, and other miscellaneous items.
00800	Supplementary Conditions	Amendments or supplements the General Conditions of the contract.
<b>DIVISION 1 – GENERAL REQUIREMENTS</b>		
01010	Summary of Work	Description of the work, milestone requirements, existing site conditions and restrictions, Owner's use of site.
01040	Project Superintendence and Coordination	Contractor's superintendence, coordination between Owner, Engineer, and Contractor, coordination with utilities, inspections by regulators.
01050	Construction Surveying	Survey requirements for layout of work and quantities.
01060	Safety, Health, Environmental and Regulatory Requirements	Health and Safety plan, environmental and other permit requirements, Storm Water Prevention Pollution Plan, and dust abatement.
01065	Preservation of Scientific, Historical, Archaeological, Prehistorical, and Paleontological Data	Notification and protection requirements.
01090	Reference Standards	Reference standards required for the work.
01200	Project Meetings	Pre-construction, partnering, and regular project and special project meetings.
01300	Submittals	Contractor submittals, submittal log, and Engineer and Contractor actions and responsibilities.
01311	Project Schedules and Reports (CPM)	Contractor's preliminary and project schedule requirements. Includes requirements for updating schedule, providing progress reports and look-ahead schedules.
01330	Measurement and Payment	All measurement and payment conditions including mobilization.
01400	Inspection of the Work	Engineer inspections of the work and Contractor quality control responsibilities.
01500	Construction Facilities and Temporary Controls	Contractor's staging and work areas, site housekeeping, protection of new and existing improvements, and security.

**Table 3**  
**List of Specifications**

<b>Section Number</b>	<b>Name</b>	<b>Scope</b>
01510	Temporary Utilities	Temporary utility provisions including potable and non-potable water, electricity, sanitary facilities, and fire protection.
01521	Temporary Work and Storage Areas	Development, maintenance, and removal of temporary work and staging areas.
01530	Temporary Fences	Temporary construction fencing provisions.
01540	Load Restrictions	Protection of existing or new underground facilities due to overloading from construction traffic.
01550	Access, Haul Roads, Parking, and Traffic Controls	Access and control of traffic, parking within the project site, and haul roads from Borrow Area E.
01590	Field Offices	Contractor supplied Engineer's field office including furniture, communications equipment, computers, copy machines, security systems, on-site laboratory, and field support structures and Contractor's field office.
01600	Materials and Equipment	Contractor supplied materials and equipment including anchorage requirements.
01610	Delivery, Storage, and Handling	Provisions for delivering, storing, and handling of materials and equipment either supplied by the Contractor or provided by the Owner.
01700	Contract Closeout	Contract closeout schedule and procedures.
01730	Operation and Maintenance Data	Submission and format of operation and maintenance manuals and the instruction of Owner's personnel in the use of equipment.
01740	Guarantee and Warranty	Guarantee and warranty requirements for the work.
<b>DIVISION 2 – SITE WORK</b>		
02050	Demolition	Demolition and disposal of existing spillway, existing utilities, portions of the existing outlet tower, and other items within the work area.
02075	Control and Disposal of Water	Control and disposal of surface water.
02080	Foundation Dewatering and Groundwater Level Control	Dewatering for excavations including design and monitoring and disposal of water requirements.
02090	Blasting	Blaster qualifications, controlled blast methods and procedures, limitations, warning systems, and safeguards.
02110	Clearing, Grubbing, and Stripping	Removal and disposal of vegetation and roots, and removal and stockpiling of topsoil from the work areas.
02200	Foundation Excavation and Treatment	Dam and spillway foundation excavation and shaping, foundation cleaning, foundation treatment including dental and backfill concrete, slush grout, and surface grout.

**Table 3**  
**List of Specifications**

<b>Section Number</b>	<b>Name</b>	<b>Scope</b>
02225	Trench and Structure Excavation and Backfill	Excavation, trench and structure backfill material properties, foundation preparation, backfill procedures, and testing.
02226	Borrow Areas	Opening, developing, and restoring borrow areas. Includes moisture conditioning and requirements for processing riprap and riprap bedding.
02227	Embankment Construction	Requirements for each zone within the embankment including material properties, placement methods, moisture conditioning, compaction, and testing. This section also includes requirements for instrumentation trenching and dam toe drain and outfall pipe systems.
02230	Base Coarse for Access Roads (prepared by EDB)	Subgrade preparation, material properties, placement, compaction, protection, and testing of base coarse materials for permanent access roads.
02266	Foundation Drilling and Grouting	Grouter qualifications, drilling equipment, grouting equipment, grout materials and mixes, and execution of grouting. Execution of grouting includes preparation for grouting, sequence of drilling and grouting, water pressure testing, mixing and injection of grout, verification hole drilling and testing, and quality and control testing during grouting.
02275	Concrete Cutoff	Cutoff wall constructor qualifications, drilling equipment, cement and aggregate properties, concrete mix design, test sections, installation methodology, measurement of verticality and overlap, testing, remedial measures, disposal of waste materials.
02280	Well and Test Boring Decommissioning	Governing regulations, grout material requirements, grout placement methods for decommissioning of borings within the project.
02290	Embankment Material Test Fills	Materials, preparation of area for test fill pad, placement and compaction methods, inspection and testing of Temblor Sandstone.
02310	Rock Tunneling	Tunneling contractor qualifications, excavation requirements for adit tunnels.
02315	Initial Tunnel Support Systems	Initial support systems for adit tunnels.
02317	Shaft Excavation	Excavation requirements for intake tower shaft.
02318	Initial Shaft Support Systems	Initial support systems for intake tower shaft.
02321	Concrete Shaft Lining	Materials and requirements for concrete lining of intake tower shaft.
02323	Steel Tunnel Liner (prepared by EDB)	Materials and requirements for steel liner for adit tunnels.

**Table 3**  
**List of Specifications**

<b>Section Number</b>	<b>Name</b>	<b>Scope</b>
02330	Tunnel Contact Grouting	Materials and requirements for contact grouting between steel liner and tunnel.
02388	Excavation Rock Reinforcement	Material, installation, and testing requirements for rock reinforcement for excavated spillway rock slopes.
02445	Erosion Control	Hydroseeding materials, seed mix and application methods for the control of erosion on embankment slopes.
02555	Asphalt Concrete Pavement (prepared by EDB)	Asphalt concrete materials properties and placement requirements for permanent access roads.
02560	Access Road Related Items (prepared by EDB)	Section includes railing, signs, and marking requirements for permanent access roads.
02616	Reinforced Concrete Pipe and Fittings	RCP pipe type, joint requirements, connection requirements. Used for embankment toe drain and outfall pipe systems.
02726	Manholes	Concrete manhole types and installation methods. Used for embankment toe drain and outfall pipe systems.
02830	Chain Link Fence and Gates (prepared by EDB)	Permanent project fencing materials and installation methods.
<b>DIVISION 3 - CONCRETE</b>		
03100	Concrete Formwork	Concrete formwork classification, design, materials, installation methods including tolerances, surface preparation, beveled edges and removal.
03210	Reinforcing Steel	Reinforcement steel materials, fabrication, and placement methods.
03250	Anchorage in Concrete	Product requirements for anchor bolts, adhesives, anchor rods, and expansion bolts and methods of installation and quality control.
03251	Expansion, Construction, and Contraction Joints	Materials and installation procedures for expansion, construction, and contraction joints in concrete structures.
03300	Cast-In-Place Concrete	Concrete materials requirements, design of concrete mixes, batching and mixing of concrete, transportation, placing, consolidation, patching, finishing, curing, and testing of concrete.
03360	Shotcrete	Material and equipment requirements, shotcrete mix design, surface preparation, grounding, mixing, placing, joints, curing, protection, and testing of shotcrete.
03600	Grout	Material, preparation, placement, and curing requirements for non-shrink grout and mortar.

**Table 3  
List of Specifications**

<b>Section Number</b>	<b>Name</b>	<b>Scope</b>
<b>DIVISION 5 – METALS</b>		
05050	Welding (prepared by EDB)	Welder qualifications, preparation, general welding requirements, structural and stainless steel requirements, field quality control and testing.
05500	Fabricated Miscellaneous Metalwork (prepared by EDB)	Material, fabrication, installation, and finish requirements for miscellaneous metal work required for the project.
05900	Steel Pipe (prepared by EDB)	Materials, fabrication, welding, installation, hydrostatic testing, field inspection and tests for 72-inch diameter outlet pipe extension, bifurcation, and 44-inch diameter outlet pipe.
05920	Fish Screens (prepared by EDB)	Requirements for salvage and reinstallation of existing adit No. 3 fish screens or procurement and installation of new fish screens.
<b>DIVISION 7 – THERMAL AND MOISTURE PROTECTION</b>		
07530	Roofing (prepared by EDB)	Materials and installation of intake tower structure roofing.
<b>DIVISION 8 – DOORS AND WINDOWS</b>		
08110	Steel Door, Frame and Hardware (prepared by EDB)	Materials and installation of intake tower steel door.
<b>DIVISION 9 – FINISHES</b>		
09900	Paint and Coatings (prepared by EDB)	Materials and installation requirements for painting and coating of exposed metal surfaces.
<b>DIVISION 10 – SPECIALTIES</b>		
10420	Plaque (prepared by EDB)	Project plaque.
10521	Portable Fire Extinguishers (prepared by EDB)	Portable fire extinguishers for intake tower.
<b>DIVISION 11 – EQUIPMENT</b>		
11264	Gate Valves (prepared by EDB)	Materials and installation of gate valves.
11269	Outlet Valve (prepared by EDB)	Materials and installation of outlet valve.
11271	Butterfly Valves (prepared by EDB)	Materials and installation of butterfly valves.
11273	Fixed Cone Valve (prepared by EDB)	Requirements for salvage and reinstallation at the end of the 72-inch outlet pipe extension of existing 72-inch fixed cone valve.
<b>DIVISION 13 – SPECIAL CONSTRUCTION</b>		
13300	Instrumentation	Inclinometer, piezometer, instrumentation cable, survey monument, strong motion accelerograph, seepage weir material requirements. Installation methods including drilling, trenching, calibrating, and monitoring. Includes training of Owner personnel.

**Table 3**  
**List of Specifications**

Section Number	Name	Scope
13302	Automated Data Acquisition System	Network and remote monitoring station units, communications, alarms, software, enclosures, installation, maintenance, and training for Owner personnel.
DIVISION 14 – CONVEYING SYSTEMS		
14210	Elevator/Hoist (prepared by EDB)	Materials and installation of elevator or hoist system in intake tower.
DIVISION 15 – MECHANICAL		
15050	Miscellaneous Mechanical Items (prepared by EDB)	Materials, fabrication, welding, and installation of miscellaneous mechanical items.
15055	Ventilation System (prepared by EDB)	Materials and installation of intake tower ventilation system.
DIVISION 16 – ELECTRICAL		
16010	Electrical – General Provisions (prepared by EDB)	Requirements for electrical utilities work that would be required at the intake tower and other locations at the dam.
16050	Basic Electrical Materials and Methods (prepared by EDB)	
16060	Level/Flow Instrumentation (prepared by EDB)	
16110	Raceways (prepared by EDB)	
16120	Conductors (prepared by EDB)	
16450	Grounding (prepared by EDB)	
16???	TBD (prepared by EDB)	
16???	TBD	
16480	Low Voltage Motor Control (prepared by EDB)	
16470	Distribution and Lighting Panels (prepared by EDB)	
16500	Lighting (prepared by EDB)	
16975	Testing and Start-Up (prepared by EDB)	
DIVISION 17 – SCADA SYSTEM		
17000	SCADA System General requirements (prepared by EDB)	Place holder for requirements for integration of the dam into SFPUC’s existing SCADA system.
17100	SCADA System Functional Requirements (prepared by EDB)	
17200	Control Panels (RTU Enclosures) (prepared by EDB)	

**Table 3**  
**List of Specifications**

<b>Section Number</b>	<b>Name</b>	<b>Scope</b>
17201	Control Panel Instrumentation (prepared by EDB)	
17600	Telemetry (prepared by EDB)	
17610	Fiber Optic Cable and Duct (prepared by EDB)	



## Figures

## **Appendix A**

### **Calaveras Spillway Model Study**

## **Appendix A**

### **Calaveras Spillway Model Study**

#### ***Objective***

The objective of the model tests is to provide information needed to complete the design of an effective spillway for the project, taking into account hydraulic, structural, and geotechnical factors, and cost. The hydraulic model is required to determine the wave aspects that will occur in the spillway so that provisions can be made to accommodate them, and to provide for the effective dissipation of energy prior to discharge from the spillway stilling basin to Calaveras Creek.

#### ***Approach***

##### Calaveras Spillway Model Tasks

1. Develop final design of model.
2. Construct model.
3. Make preliminary model run.
4. Test model.
5. Make video and photo and other documentation.
6. Conduct demonstration for SFPUC/CTAP.
7. Prepare technical memorandum of model study findings.

##### Definitive Model Tests

The requirements for the model spillway in its present design configuration are:

1. Determine the water level in the spillway chute and the required stilling basin tailwater for the design discharge (PMF).
2. Determine chute water levels and required tailwater for two lesser spillway discharges.
3. If resulting wall heights are "too high" or hydraulic performance is "unacceptable" investigate modifications that would reduce wall height and/or improve hydraulic performance.

The results of these tests will provide information needed to complete the design, including chute and stilling basin wall heights necessary to contain the water and its waves at the design discharge and a tailwater rating curve for the stilling basin. URS may revise the design to meet specific objectives.

##### Calaveras Model Study

Colorado State University, URS, SFPUC/CTAP, and Michael Stevens (the designer's assistant) will be involved in conducting the model study. The participation of each of these entities is outlined below.

##### Colorado State University

1. With Michael Stevens, prepare detailed scope of work and contract documents.

2. Construct Froude scale model in accordance with URS' drawings.
3. Implement a modular design to permit efficient modifications.
4. Provide instrumentation for testing the model. The needs are:
  - Instrument to determine the model discharge accurately.
  - Gage to measure the reservoir level.
  - Gage to measure the tailwater level.
5. Provide a technician to operate model and provide URS with model discharges.
6. Provide URS with a list of equipment and materials used to build and operate the model.

At this stage, it is envisioned that a 1:30 Froude scale model would be constructed for the Calaveras system. The proposed scale would result in a model approximately 15 feet wide and 50 feet long. Maximum discharge through the model will be approximately 7 cfs. CSU's Dr. Christopher I. Thornton will supervise the laboratory team.

#### URS

URS will direct the model study, and will be assisted by CSU staff and Michael Stevens. URS will:

1. Provide preliminary drawings and design needs.
2. Develop and provide CSU with final drawings of the spillway hydraulic model.
3. With assistance of CSU and Michael Stevens, conduct the model study.
4. Conduct or direct the making of any video and the taking of photographs to document the operations of the model.
5. Demonstrate to SFPUC the features of the spillway design and the behavior of the flow in the model spillway.
6. Review the model study technical memorandum.

#### SFPUC/CTAP

Provision has been made for SFPUC and the CTAP to observe the operation of the hydraulic model in the final design configuration. (Estimate of time: one day.)

#### Michael Stevens

Michael Stevens will serve as the assistant to URS. Specifically, his tasks include:

1. Serve as liaison between URS and the CSU staff.
2. With CSU develop a detailed scope of work and schedule for the model study.
3. If needed, help CSU with the construction of the model.
4. Conduct a preliminary test with CSU people to ready the model for the URS designer.
5. Assist URS in conducting and demonstrating the model tests, and provide design consultation.
6. Log data and prepare the model study technical memorandum of findings, to support the final design.

***Assumptions***

An allowance is included in the cost estimate to account for limited modifications to the model.

***Deliverables***

Spillway Model Test Technical Memorandum

**Attachment 3 (Revised for Amendment No. 1)**  
**Projected Task Budget**

**Calaveras Dam Replacement Project**  
**Agreement No. CS-716**  
**Amendment No. 1**  
**Detailed Design and Final Design**

**Part A - Summary**

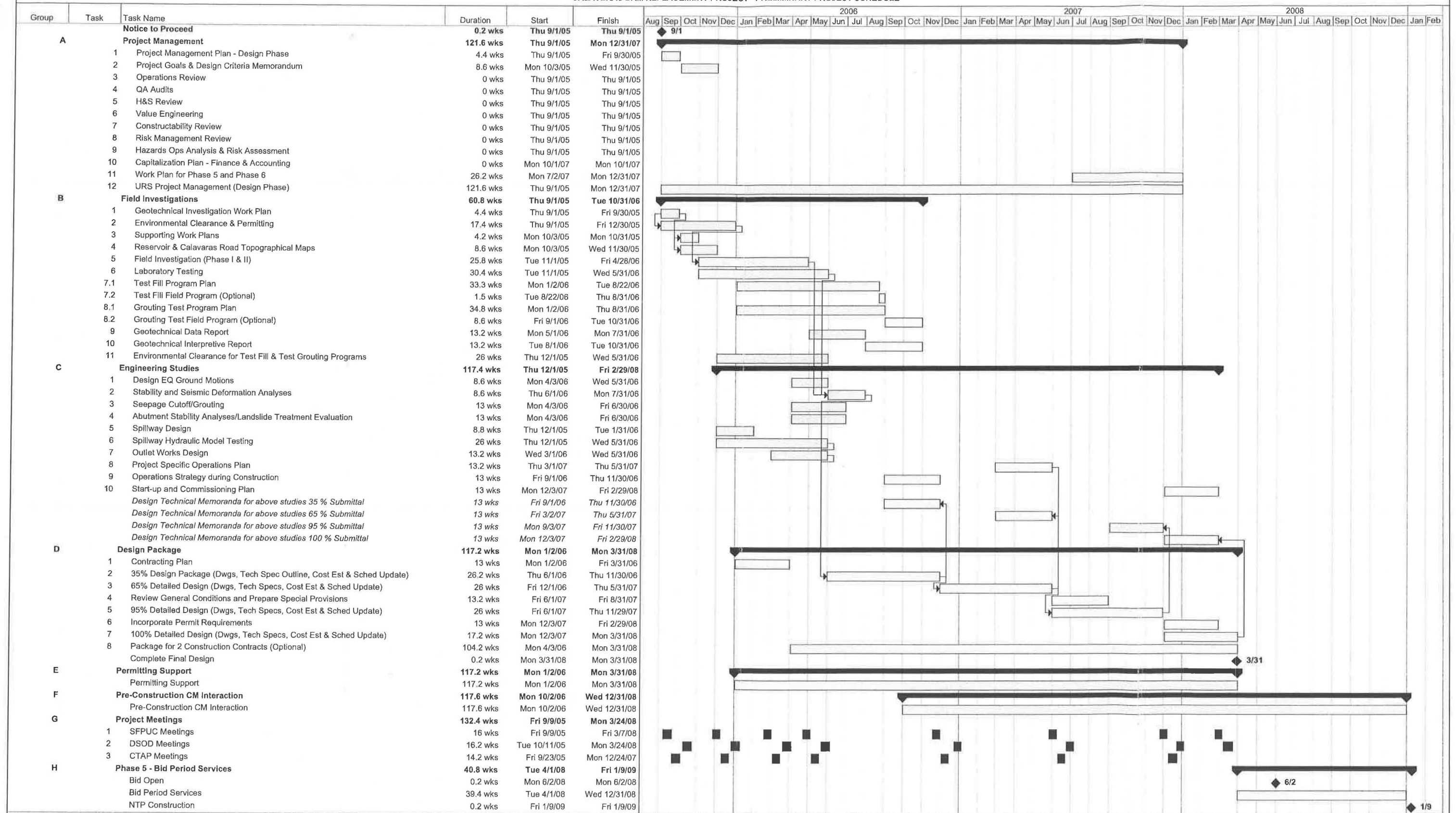
Summary of Estimated Costs				
Phase	Group	Task Description	Amount	
Detailed Design		<b>Basic Tasks</b>		
	2	A Project Management	\$ 510,000	
	2	B Field Investigations	\$ 1,703,000	
	2	C Engineering Studies	\$ 912,000	
	2	D Design Package (35% and 65%)	\$ 743,000	
	2	E Permitting Support (SFPUC Lead)	\$ 40,000	
	2	F Pre-Construction CM Interaction (SFPUC Lead)	\$ 22,000	
	2	G Project Meetings (SFPUC, CTAP, DSOD)	\$ 271,000	
		<b>Subtotal Phase 2 Basic Tasks</b>		\$ 4,201,000
Final Design	3	A Project Management	\$ 130,000	
	3	B (Not Used)	\$ -	
	3	C Engineering Studies	\$ 18,000	
	3	D Design Package (95% and 100%)	\$ 529,000	
	3	E Permitting Support (SFPUC Lead)	\$ 20,000	
	3	F Pre-Construction CM Interaction (SFPUC Lead)	\$ 45,000	
	3	G Project Meetings (SFPUC, CTAP, DSOD)	\$ 66,000	
	3	H Bid Period Services (SFPUC Lead)	\$ 65,000	
		<b>Subtotal Phase 3 Basic Tasks</b>		\$ 873,000
		<b>Total for Basic Tasks</b>		\$ 5,074,000
		<b>Optional Tasks</b>		
	B5	Field Investigation (Optional)	\$ 608,000	
	B7	Test Fill Field Program (Optional)	\$ 248,000	-
	B8	Grouting Test Field Program (Optional)	\$ 499,000	
	D8	Package for 2 Construction Contracts (Optional)	\$ 146,000	
		<b>Total for Optional Tasks</b>		\$ 1,501,000
		<b>As-Needed Services</b>		
	TBD	Feasibility Studies of Fish Passages	\$ 500,000	
	TBD	Conveyance Improvement Design Allowance	\$ 300,000	
	TBD	As-Needed Support Services for Final Design	\$ 625,000	
		<b>Total for As-Needed Services</b>		\$ 1,425,000
<b>Total</b>				<b>\$ 8,000,000</b>

Table 2 - Part B  
San Francisco Public Utilities Commission  
Calaveras Dam Final Design  
(Agreement No. CS-716)  
Estimated Hours and Costs

Group Task			PERSONNEL HOURS AND AVERAGE BILLING RATES											Total Hours	OTHER DIRECT COSTS				Total for Basic Tasks (\$)	Total for As-Needed Costs (\$)	Total Optional Costs (\$)	Adjustment Factor	Estimated Total Basic Costs (\$)	Estimated Total Optional Costs (\$)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
			Principal Engr; Project Mgr	Engin. Manager	Senior Consultant	Consultant	Sr. Project Engineer	Project Engineer/ Scientist	Engineer/ Scientist	Staff Engineer/ Scientist	CAD	Tech. Typist/ Admin.	Total Hours		Labor Costs (\$)	Sub-contractors (\$)		Subs w/5% Markup (\$ on Labor only							URS ODC's (\$)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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Attachment 4 (Revised for Amendment No. 1)  
CALAVERAS DAM REPLACEMENT PROJECT - PRELIMINARY PROJECT SCHEDULE



Date: Mon 8/29/05

Task  Milestone  Summary  Meetings 