San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

Contract Administration Bureau
1155 Market Street, 9th Floor
San Francisco, CA 94103
T 415.551.4603
F 415.554.3225

June 8, 2012

JaNell Cook
MWH/URS, JV
44 Montgomery Street, Suite 1400
San Francisco, CA 94104
Email: JaNell.cook@mwhglobal.com

RE: 1) Notice of Contract Award - Planning & Engineering Services CBSIP (CS-169)
2) Transmittal - Executed Agreement between the City and County of San Francisco Public Utilities Commission and MWH/URS, JV

Dear Ms. Cook:

This letter provides a ***notification of contract award*** for the following contracted work:

BLANKET PURCHASE ORDER NO:	**BPUC12000075** *- Work may not be charged against this blanket purchase order number*
SCOPE:	To provide planning and engineering services for the Central Bayside System Improvement Project
EFFECTIVE DATE:	**June 8, 2012 to May 28, 2021**
CONTRACT TO DATE:	Total value of contract not to exceed **$30,000,000.00**

Invoices must be charged against specific task orders only after a *Notice to Proceed* has been issued.

Should you have any questions, please do not hesitate to contact Rosiana Angel at (415) 554-1549.

Enclosure: Executed Agreement

cc: Manfred Wong
File/NCA-CS-169

Edwin M. Lee
Mayor

Anson Moran
President

Art Torres
Vice President

Ann Moller Caen
Commissioner

Francesca Vietor
Commissioner

Vince Courtney
Commissioner

Ed Harrington
General Manager

City and County of San Francisco
San Francisco Public Utilities Commission
1155 Market Street, 11th Floor
San Francisco, California 94103

Agreement between the City and County of San Francisco and

MWH/URS, Joint Venture.

Agreement No. CS-169, Planning & Engineering Services, Central Bayside System Improvement Project

This Agreement is made this **28th** day of **February**, 2012, in the City and County of San Francisco, State of California, by and between: **MWH/URS Joint Venture, 44 Montgomery Street, Suite 1400, San Francisco CA 94104**, hereinafter referred to as "Contractor," and the City and County of San Francisco, a municipal corporation, hereinafter referred to as "City," acting by and through the San Francisco Public Utilities Commission.

Recitals

WHEREAS, the San Francisco Public Utilities Commission ("Department") wishes to retain the services of **MWH/URS Joint Venture** to provide Planning and Engineering Services for Central Bayside System Improvement Project; and

WHEREAS, a Request for Proposal ("RFP") was issued on **September 23, 2011,** and City selected Contractor as the highest qualified scorer pursuant to the RFP; and

WHEREAS, Contractor represents and warrants that it is qualified to perform the services required by City as set forth under this Contract; and

WHEREAS, approval for this Agreement was obtained when the Civil Service Commission approved Contract number **4014-11/12** on **September 23, 2011**; and

WHEREAS, approval for this Agreement was obtained from the San Francisco Public Utilities Commission Resolution Number **12-0035** on **February 28, 2012**; and

WHEREAS, approval for this Agreement was obtained from the San Francisco Board of Supervisors by Resolution Number **179-12** on **May 15, 2012**; and

Now, THEREFORE, the parties agree as follows:

1. Certification of Funds; Budget and Fiscal Provisions; Termination in the Event of Non-Appropriation. This Agreement is subject to the budget and fiscal provisions of the City's Charter. Charges will accrue only after prior written authorization certified by the Controller, and the amount of City's obligation hereunder shall not at any time exceed the amount certified for the purpose and period stated in such advance authorization. This Agreement will terminate without penalty, liability or expense of any kind to City at the end of any fiscal year if funds are not appropriated for the next succeeding fiscal year. If funds are appropriated for a portion of the fiscal year, this Agreement will terminate, without

penalty, liability or expense of any kind at the end of the term for which funds are appropriated. City has no obligation to make appropriations for this Agreement in lieu of appropriations for new or other agreements. City budget decisions are subject to the discretion of the Mayor and the Board of Supervisors. Contractor's assumption of risk of possible non-appropriation is part of the consideration for this Agreement.

THIS SECTION CONTROLS AGAINST ANY AND ALL OTHER PROVISIONS OF THIS AGREEMENT.

2. Term of the Agreement. Subject to Section 1, the term of this Agreement shall be **nine (9) years** from **May 28, 2012** to **May 28, 2021**.

3. Effective Date of Agreement. This Agreement shall become effective when the Controller has certified to the availability of funds and Contractor has been notified in writing.

4. Services Contractor Agrees to Perform. The Contractor agrees to perform the services as set forth in Appendix A, "Description of Services," attached hereto and incorporated by reference as though fully set forth herein.

5. Compensation. Compensation shall be made in monthly payments on or before the thirtieth day of each month for work, as set forth in Section 4 of this Agreement, that the General Manager of the Public Utilities Commission, in his or her sole reasonable 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 **Thirty Million Dollars ($30,000,000)**. 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 Contractor until reports, services, or both, required under this Agreement are received from Contractor and approved by the San Francisco Public Utilities Commission as being in accordance with this Agreement. City may withhold payment to Contractor in any instance in which Contractor has failed or refused to satisfy any material obligation provided for under this Agreement.

In no event shall City be liable for interest or late charges for any late payments except as set forth in section 6.22(J)(7) of the San Francisco.

The Controller is not authorized to pay invoices submitted by Contractor prior to Contractor's submission of HRC Progress Payment Form. If Progress Payment Form is not submitted with Contractor's invoice, the Controller will notify the department, the Director of HRC and Contractor of the omission. If Contractor's failure to provide HRC Progress Payment Form is not explained to the Controller's satisfaction, the Controller will withhold 20% of the payment due pursuant to that invoice until HRC Progress Payment Form is provided. Following City's payment of an invoice, Contractor has ten days to file an affidavit using HRC Payment Affidavit verifying that all subcontractors have been paid and specifying the amount.

6. Guaranteed Maximum Costs. The City's obligation hereunder shall not at any time exceed the amount certified by the Controller for the purpose and period stated in such certification. Except as may be provided by laws governing emergency procedures, officers and employees of the City are not authorized to request, and the City is not required to reimburse the Contractor for, Commodities or Services beyond the agreed upon contract scope unless the changed scope is authorized by amendment and approved as required by law. Officers and employees of the City are not authorized to offer or promise, nor is the City required to honor, any offered or promised additional funding in excess of the maximum amount of funding for which the contract is certified without certification of the additional

amount by the Controller. The Controller is not authorized to make payments on any contract for which funds have not been certified as available in the budget or by supplemental appropriation.

7. Payment; Invoice Format. Invoices furnished by Contractor under this Agreement must be in a form acceptable to the Controller, and must include a unique invoice number. All amounts paid by City to Contractor shall be subject to audit by City. Payment shall be made by City to Contractor at the address specified in the section entitled "Notices to the Parties."

8. Submitting False Claims; Remedies. Pursuant to Article V of Chapter 6 of the San Francisco Administrative Code, any contractor, subcontractor, supplier, consultant or subconsultant who submits a false claim may be subject to monetary penalties, investigation and prosecution and may be declared an irresponsible bidder or an unqualified consultant and debarred as set forth in that Article. The text of Article V of Chapter 6, along with the entire San Francisco Administrative Code is available on the web at http://www.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:sanfranciscо_ca . A contractor, subcontractor, supplier, consultant or sub consultant will be deemed to have submitted a false claim to the City if the contractor, subcontractor, supplier, consultant or subconsultant: (a) knowingly presents or causes to be presented to an officer or employee of the City a false claim or request for payment or approval; (b) knowingly makes, uses, or causes to be made or used a false record or statement to get a false claim paid or approved by the City; (c) conspires to defraud the City by getting a false claim allowed or paid by the City; (d) knowingly makes, uses, or causes to be made or used a false record or statement to conceal, avoid, or decrease an obligation to pay or transmit money or property to the City; or (e) is a beneficiary of an inadvertent submission of a false claim to the City, subsequently discovers the falsity of the claim, and fails to disclose the false claim to the City within a reasonable time after discovery of the false claim.

9. Left blank by agreement of the parties (Disallowance.)

10. Taxes. Payment of any taxes, including possessory interest taxes and California sales and use taxes, levied upon or as a result of this Agreement, or the services delivered pursuant hereto, shall be the obligation of Contractor. Contractor recognizes and understands that this Agreement may create a "possessory interest" for property tax purposes. Generally, such a possessory interest is not created unless the Agreement entitles the Contractor to possession, occupancy, or use of City property for private gain. If such a possessory interest is created, then the following shall apply:

(1) Contractor, on behalf of itself and any permitted successors and assigns, recognizes and understands that Contractor, and any permitted successors and assigns, may be subject to real property tax assessments on the possessory interest;

(2) Contractor, on behalf of itself and any permitted successors and assigns, recognizes and understands that the creation, extension, renewal, or assignment of this Agreement may result in a "change in ownership" for purposes of real property taxes, and therefore may result in a revaluation of any possessory interest created by this Agreement. Contractor accordingly agrees on behalf of itself and its permitted successors and assigns to report on behalf of the City to the County Assessor the information required by Revenue and Taxation Code section 480.5, as amended from time to time, and any successor provision.

(3) Contractor, on behalf of itself and any permitted successors and assigns, recognizes and understands that other events also may cause a change of ownership of the possessory interest and result in the revaluation of the possessory interest. (see, e.g., Rev. & Tax. Code section 64, as amended from time to time). Contractor accordingly agrees on behalf of itself and its permitted successors and assigns to report any change in ownership to the County Assessor, the State Board of Equalization or other public agency as required by law.

(4) Contractor further agrees to provide such other information as may be requested by the City to enable the City to comply with any reporting requirements for possessory interests that are imposed by applicable law.

11. Payment Does Not Imply Acceptance of Work. The granting of any payment by City, or the receipt thereof by Contractor, shall in no way lessen the liability of Contractor to replace unsatisfactory work, equipment, or materials, although the unsatisfactory character of such work, equipment or materials may not have been apparent or detected at the time such payment was made. Materials, equipment, components, or workmanship that do not conform to the requirements of this Agreement may be rejected by City and in such case must be replaced by Contractor without delay.

12. Qualified Personnel. Work under this Agreement shall be performed only by competent personnel under the supervision of and in the employment of Contractor. Contractor will comply with City's reasonable requests regarding assignment of personnel, but all personnel, including those assigned at City's request, must be supervised by Contractor. Contractor shall commit adequate resources to complete the project within the project schedule specified in this Agreement.

13. Responsibility for Equipment. City shall not be responsible for any damage to persons or property as a result of the use, misuse or failure of any equipment used by Contractor, or by any of its employees, even though such equipment be furnished, rented or loaned to Contractor by City.

14. Independent Contractor; Payment of Taxes and Other Expenses.

a. Independent Contractor. Contractor or any agent or employee of Contractor shall be deemed at all times to be an independent contractor and is wholly responsible for the manner in which it performs the services and work requested by City under this Agreement. Contractor or any agent or employee of Contractor shall not have employee status with City, nor be entitled to participate in any plans, arrangements, or distributions by City pertaining to or in connection with any retirement, health or other benefits that City may offer its employees. Contractor or any agent or employee of Contractor is liable for the acts and omissions of itself, its employees and its agents. Contractor shall be responsible for all obligations and payments, whether imposed by federal, state or local law, including, but not limited to, FICA, income tax withholdings, unemployment compensation, insurance, and other similar responsibilities related to Contractor's performing services and work, or any agent or employee of Contractor providing same. Nothing in this Agreement shall be construed as creating an employment or agency relationship between City and Contractor or any agent or employee of Contractor. Any terms in this Agreement referring to direction from City shall be construed as providing for direction as to policy and the result of Contractor's work only, and not as to the means by which such a result is obtained. City does not retain the right to control the means or the method by which Contractor performs work under this Agreement.

b. Payment of Taxes and Other Expenses. Should City, in its discretion, or a relevant taxing authority such as the Internal Revenue Service or the State Employment Development Division, or both, determine that Contractor is an employee for purposes of collection of any employment taxes, the amounts payable under this Agreement shall be reduced by amounts equal to both the employee and

employer portions of the tax due (and offsetting any credits for amounts already paid by Contractor which can be applied against this liability). City shall then forward those amounts to the relevant taxing authority. Should a relevant taxing authority determine a liability for past services performed by Contractor for City, upon notification of such fact by City, Contractor shall promptly remit such amount due or arrange with City to have the amount due withheld from future payments to Contractor under this Agreement (again, offsetting any amounts already paid by Contractor which can be applied as a credit against such liability). A determination of employment status pursuant to the preceding two paragraphs shall be solely for the purposes of the particular tax in question, and for all other purposes of this Agreement, Contractor shall not be considered an employee of City. Notwithstanding the foregoing, should any court, arbitrator, or administrative authority determine that Contractor is an employee for any other purpose, then Contractor agrees to a reduction in City's financial liability so that City's total expenses under this Agreement are not greater than they would have been had the court, arbitrator, or administrative authority determined that Contractor was not an employee.

15. Insurance.

a. Without in any way limiting Contractor's liability pursuant to the "Indemnification" section of this Agreement, Contractor 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, injury, or illness; and

(2) Commercial 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; and

(3) Commercial Automobile Liability Insurance with limits not less than $1,000,000 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, applicable to Contractor's profession, with limits not less than $5,000,000 each claim with respect to negligent acts, errors or omissions in connection with professional services to be provided under this Agreement.

b. Commercial General Liability and Commercial Automobile Liability Insurance policies must be endorsed to provide:

(1) Name as Additional Insured the City and County of San Francisco, the San Francisco Public Utilities Commission, and their respective 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.

c. Regarding Workers' Compensation, Contractor hereby agrees to waive subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. Contractor agrees to obtain any endorsement that may be necessary to effect this waiver of subrogation. The Workers' Compensation policy shall be endorsed with a waiver of subrogation in favor of the City for all work performed by the Contractor, its employees, agents and subcontractors.

d. All policies shall provide thirty days' advance written notice to the City of reduction or nonrenewal of coverages or cancellation of coverages for any reason. Notices shall be sent to the City address in the "Notices to the Parties" section.

e. 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.

f. 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.

g. 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.

h. Before commencing any operations under this Agreement, Contractor shall 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. Failure to maintain insurance shall constitute a material breach of this Agreement.

i. Approval of the insurance by City shall not relieve or decrease the liability of Contractor hereunder.

j If a subcontractor will be used to complete any portion of this agreement, the Contractor shall ensure that the subcontractor shall provide all necessary insurance and shall name the City and County of San Francisco, the San Francisco Public Utilities Commission, and their respective officers, agents and employees and the Contractor listed as additional insureds.

16. Indemnification.

a. **General.** To the fullest extent permitted by law, Contractor shall assume the defense of (with legal counsel subject to approval of the City), indemnify and save harmless the City, its boards, commissions, officers, and employees (collectively "Indemnitees"), from and against any and all claims, loss, cost, damage, injury (including, without limitation, injury to or death of an employee of the Contractor or its subconsultants), expense and liability of every kind, nature, and description (including, without limitation, incidental and consequential damages, court costs, attorneys' fees, litigation expenses, fees of expert consultants or witnesses

in litigation, and costs of investigation), that arise out of, pertain to, or relate to, directly or indirectly, in whole or in part, the negligence, recklessness, or willful misconduct of the Contractor, any subconsultant, anyone directly or indirectly employed by them, or anyone that they control (collectively, "Liabilities").

b. **Limitations.** No insurance policy covering the Contractor's performance under this Agreement shall operate to limit the Contractor's Liabilities under this provision. Nor shall the amount of insurance coverage operate to limit the extent of such Liabilities. The Contractor assumes no liability whatsoever for the sole negligence, active negligence, or willful misconduct of any Indemnitee or the contractors of any Indemnitee.

c. **Copyright infringement.** Contractor shall also indemnify, defend and hold harmless all Indemnitees from all suits or claims for infringement of the patent rights, copyright, trade secret, trade name, trademark, service mark, or any other proprietary right of any person or persons in consequence of the use by the City, or any of its boards, commissions, officers, or employees of articles or services to be supplied in the performance of Contractor's services under this Agreement. Infringement of patent rights, copyrights, or other proprietary rights in the performance of this Agreement, if not the basis for indemnification under the law, shall nevertheless be considered a material breach of contract. Contractor's obligations under this paragraph shall apply to, and shall not be limited to, claims asserted by a third party resulting from any derivative product or other modifications of the SSIP Hydraulic Model by Contractor or its Subconsultants.

17. Incidental and Consequential Damages. Contractor shall be responsible for incidental and consequential damages resulting in whole or in part from Contractor's acts or omissions. Nothing in this Agreement shall constitute a waiver or limitation of any rights that City may have under applicable law.

18. Liability of City. CITY'S PAYMENT OBLIGATIONS UNDER THIS AGREEMENT SHALL BE LIMITED TO THE PAYMENT OF THE COMPENSATION PROVIDED FOR IN SECTION 5 OF THIS AGREEMENT. NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT, IN NO EVENT SHALL CITY BE LIABLE, REGARDLESS OF WHETHER ANY CLAIM IS BASED ON CONTRACT OR TORT, FOR ANY SPECIAL, CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT OR THE SERVICES PERFORMED IN CONNECTION WITH THIS AGREEMENT.

19. Left blank by agreement of parties. (Liquidated Damages)

20. Default; Remedies. Each of the following shall constitute an event of default ("Event of Default") under this Agreement:

(1) Contractor fails or refuses to perform or observe any term, covenant or condition contained in any of the following Sections of this Agreement:

8. Submitting false claims
10. Taxes
15. Insurance
24. Proprietary or confidential information of City
30. Assignment
37. Drug-free workplace policy

53. Compliance with laws
55. Supervision of minors
57. Protection of private information
58. Graffiti removal

(2) Contractor fails or refuses to perform or observe any other term, covenant or condition contained in this Agreement, and such default continues for a period of ten days after written notice thereof from City to Contractor.

(3) Contractor (a) is generally not paying its debts as they become due, (b) files, or consents by answer or otherwise to the filing against it of, a petition for relief or reorganization or arrangement or any other petition in bankruptcy or for liquidation or to take advantage of any bankruptcy, insolvency or other debtors' relief law of any jurisdiction, (c) makes an assignment for the benefit of its creditors, (d) consents to the appointment of a custodian, receiver, trustee or other officer with similar powers of Contractor or of any substantial part of Contractor's property or (e) takes action for the purpose of any of the foregoing.

(4) A court or government authority enters an order (a) appointing a custodian, receiver, trustee or other officer with similar powers with respect to Contractor or with respect to any substantial part of Contractor's property, (b) constituting an order for relief or approving a petition for relief or reorganization or arrangement or any other petition in bankruptcy or for liquidation or to take advantage of any bankruptcy, insolvency or other debtors' relief law of any jurisdiction or (c) ordering the dissolution, winding-up or liquidation of Contractor.

On and after any Event of Default, City shall have the right to exercise its legal and equitable remedies, including, without limitation, the right to terminate this Agreement or to seek specific performance of all or any part of this Agreement. In addition, City shall have the right (but no obligation) to cure (or cause to be cured) on behalf of Contractor any Event of Default; Contractor shall pay to City on demand all costs and expenses incurred by City in effecting such cure, with interest thereon from the date of incurrence at the maximum rate then permitted by law. City shall have the right to offset from any amounts due to Contractor under this Agreement or any other agreement between City and Contractor all damages, losses, costs or expenses incurred by City as a result of such Event of Default and any liquidated damages due from Contractor pursuant to the terms of this Agreement or any other agreement. All remedies provided for in this Agreement may be exercised individually or in combination with any other remedy available hereunder or under applicable laws, rules and regulations. The exercise of any remedy shall not preclude or in any way be deemed to waive any other remedy.

21. Termination for Convenience.

a. City shall have the option, in its sole discretion, to terminate this Agreement, at any time during the term hereof, for convenience and without cause. City shall exercise this option by giving Contractor written notice of termination. The notice shall specify the date on which termination shall become effective.

b. Upon receipt of the notice, Contractor shall commence and perform, with diligence, all actions necessary on the part of Contractor to effect the termination of this Agreement on the date specified by City and to minimize the liability of Contractor and City to third parties as a result of termination. All such actions shall be subject to the prior approval of City. Such actions shall include, without limitation:

(1) Halting the performance of all services and other work under this Agreement on the date(s) and in the manner specified by City.

(2) Not placing any further orders or subcontracts for materials, services, equipment or other items.

(3) Terminating all existing orders and subcontracts.

(4) At City's direction, assigning to City any or all of Contractor's right, title, and interest under the orders and subcontracts terminated. Upon such assignment, City shall have the right, in its sole discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts.

(5) Subject to City's approval, settling all outstanding liabilities and all claims arising out of the termination of orders and subcontracts.

(6) Completing performance of any services or work that City designates to be completed prior to the date of termination specified by City.

(7) Taking such action as may be necessary, or as the City may direct, for the protection and preservation of any property related to this Agreement which is in the possession of Contractor and in which City has or may acquire an interest.

c. Within 30 days after the specified termination date, Contractor shall submit to City an invoice, which shall set forth each of the following as a separate line item:

(1) The reasonable cost to Contractor, without profit, for all services and other work City directed Contractor to perform prior to the specified termination date, for which services or work City has not already tendered payment. Reasonable costs may include a reasonable allowance for actual overhead, not to exceed a total of 10% of Contractor's direct costs for services or other work. Any overhead allowance shall be separately itemized. Contractor may also recover the reasonable cost of preparing the invoice.

(2) A reasonable allowance for profit on the cost of the services and other work described in the immediately preceding subsection (1), provided that Contractor can establish, to the satisfaction of City, that Contractor would have made a profit had all services and other work under this Agreement been completed, and provided further, that the profit allowed shall in no event exceed 5% of such cost.

(3) The reasonable cost to Contractor of handling material or equipment returned to the vendor, delivered to the City or otherwise disposed of as directed by the City.

(4) A deduction for the cost of materials to be retained by Contractor, amounts realized from the sale of materials and not otherwise recovered by or credited to City, and any other appropriate credits to City against the cost of the services or other work.

d. In no event shall City be liable for costs incurred by Contractor or any of its subcontractors after the termination date specified by City, except for those costs specifically enumerated and described in the immediately preceding subsection (c). Such non-recoverable costs include, but are not limited to, anticipated profits on this Agreement, post-termination employee salaries, post-termination administrative expenses, post-termination overhead or unabsorbed overhead, attorneys' fees or other costs relating to the prosecution of a claim or lawsuit, prejudgment interest, or any other expense which is not reasonable or authorized under such subsection (c).

e. In arriving at the amount due to Contractor under this Section, City may deduct: (1) all payments previously made by City for work or other services covered by Contractor's final invoice;

(2) any claim which City may have against Contractor in connection with this Agreement; (3) any invoiced costs or expenses excluded pursuant to the immediately preceding subsection (d); and (4) in instances in which, in the opinion of the City, the cost of any service or other work performed under this Agreement is excessively high due to costs incurred to remedy or replace defective or rejected services or other work, the difference between the invoiced amount and City's estimate of the reasonable cost of performing the invoiced services or other work in compliance with the requirements of this Agreement.

f. City's payment obligation under this Section shall survive termination of this Agreement.

22. Rights and Duties upon Termination or Expiration. This Section and the following Sections of this Agreement shall survive termination or expiration of this Agreement:

8. Submitting false claims
9. Disallowance
10. Taxes
11. Payment does not imply acceptance of work
13. Responsibility for equipment
14. Independent Contractor; Payment of Taxes and Other Expenses
15. Insurance
16. Indemnification
17. Incidental and Consequential Damages
18. Liability of City
24. Proprietary or confidential information of City
26. Ownership of Results
27. Works for Hire
28. Audit and Inspection of Records
48. Modification of Agreement.
49. Administrative Remedy for Agreement Interpretation.
50. Agreement Made in California; Venue
51. Construction
52. Entire Agreement
56. Severability
57. Protection of private information

Appendix A, Para. 6, Grant of License to Use SSIP Hydraulic Model (as indicated in that Paragraph)

Subject to the immediately preceding sentence, upon termination of this Agreement prior to expiration of the term specified in Section 2, this Agreement shall terminate and be of no further force or effect. Contractor shall transfer title to City, and deliver in the manner, at the times, and to the extent, if any, directed by City, any work in progress, completed work, supplies, equipment, and other materials produced as a part of, or acquired in connection with the performance of this Agreement, and any completed or partially completed work which, if this Agreement had been completed, would have been required to be furnished to City. This subsection shall survive termination of this Agreement.

23. Conflict of Interest. Through its execution of this Agreement, Contractor acknowledges that it is familiar with the provision of Section 15.103 of the City's Charter, Article III, Chapter 2 of 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.

24. Proprietary or Confidential Information of City. Contractor understands and agrees that, in the performance of the work or services under this Agreement or in contemplation thereof, Contractor may have access to private or confidential information which may be owned or controlled by City and that such information may contain proprietary or confidential details, the disclosure of which to third parties may be damaging to City. Contractor agrees that all information disclosed by City to Contractor shall be held in confidence and used only in performance of the Agreement. Contractor shall exercise the same standard of care to protect such information as a reasonably prudent contractor would use to protect its own proprietary data.

25. Notices to the Parties. Unless otherwise indicated elsewhere in this Agreement, all written communications sent by the parties may be by U.S. mail, or by e-mail, and shall be addressed as follows:

To City:

Manfred Wong
San Francisco Public Utilities Commission
1145 Market Street,
San Francisco, CA 94103
(tel.) 415-558-4025
(cell.) 415-290-6568
email: mwong@sfwater.org

To Contractor:

JaNell Cook
MWH/URS Joint Venture
44 Montgomery Street, Suite 1400
San Francisco, CA 94104
(tel.) 925-627-4725, (cell) 415-606-2949
(fax) 925-945-1760
email: JaNell.cook@mwhglobal.com

Any notice of default must be sent by registered mail.

26. Ownership of Results. Any interest of Contractor or its Subcontractors, in drawings, plans, specifications, blueprints, studies, reports, memoranda, computation sheets, computer files and media or other documents prepared by Contractor or its subcontractors in connection with services to be performed under this Agreement, shall become the property of and will be transmitted to City. With the approval of the City, Contractor may retain and use copies for reference and as documentation of its experience and capabilities.

27. Works for Hire. If, in connection with services performed under this Agreement, Contractor or its subcontractors create artwork, copy, posters, billboards, photographs, videotapes, audiotapes, systems designs, software, reports, diagrams, surveys, blueprints, source codes or any other original works of authorship, such works of authorship shall be works for hire as defined under Title 17 of the United States Code, and all copyrights in such works are the property of the City. If it is ever determined that any works created by Contractor or its subcontractors under this Agreement are not works for hire under U.S. law, Contractor hereby assigns all copyrights to such works to the City, and agrees to provide any material and execute any documents necessary to effectuate such assignment. With the approval of the City, Contractor may retain and use copies of such works for reference and as documentation of its experience and capabilities.

28. Audit and Inspection of Records. Contractor agrees to maintain and make available to the City, during regular business hours, accurate books and accounting records relating to its work under this Agreement. Contractor will permit City to audit, examine and make excerpts and transcripts from such books and records, and to make audits of all invoices, materials, payrolls, records or personnel and other data related to all other matters covered by this Agreement, whether funded in whole or in part under this Agreement. Contractor shall maintain such data and records in an accessible location and condition for a period of not less than five years after final payment under this Agreement or until after final audit has been resolved, whichever is later. The State of California or any federal agency having an interest in the subject matter of this Agreement shall have the same rights conferred upon City by this Section.

29. Subcontracting. Contractor is prohibited from subcontracting this Agreement or any part of it unless such subcontracting is first approved by City in writing. Neither party shall, on the basis of this Agreement, contract on behalf of or in the name of the other party. An agreement made in violation of this provision shall confer no rights on any party and shall be null and void.

30. Assignment. The services to be performed by Contractor are personal in character and neither this Agreement nor any duties or obligations hereunder may be assigned or delegated by the Contractor unless first approved by City by written instrument executed and approved in the same manner as this Agreement.

31. Non-Waiver of Rights. The omission by either party at any time to enforce any default or right reserved to it, or to require performance of any of the terms, covenants, or provisions hereof by the other party at the time designated, shall not be a waiver of any such default or right to which the party is entitled, nor shall it in any way affect the right of the party to enforce such provisions thereafter.

32. Earned Income Credit (EIC) Forms. Administrative Code section 12O requires that employers provide their employees with IRS Form W-5 (The Earned Income Credit Advance Payment Certificate) and the IRS EIC Schedule, as set forth below. Employers can locate these forms at the IRS Office, on the Internet, or anywhere that Federal Tax Forms can be found. Contractor shall provide EIC Forms to each Eligible Employee at each of the following times: (i) within thirty days following the date on which this Agreement becomes effective (unless Contractor has already provided such EIC Forms at least once during the calendar year in which such effective date falls); (ii) promptly after any Eligible Employee is hired by Contractor; and (iii) annually between January 1 and January 31 of each calendar year during the term of this Agreement. Failure to comply with any requirement contained in subparagraph (a) of this Section shall constitute a material breach by Contractor of the terms of this Agreement. If, within thirty days after Contractor receives written notice of such a breach, Contractor fails to cure such breach or, if such breach cannot reasonably be cured within such period of thirty days, Contractor fails to commence efforts to cure within such period or thereafter fails to diligently pursue such cure to completion, the City may pursue any rights or remedies available under this Agreement or under applicable law. Any Subcontract entered into by Contractor shall require the subcontractor to comply, as to the subcontractor's Eligible Employees, with each of the terms of this section. Capitalized terms used in this Section and not defined in this Agreement shall have the meanings assigned to such terms in Section 12O of the San Francisco Administrative Code.

33. Local Business Enterprise Utilization; Liquidated Damages.

a. The LBE Ordinance. Contractor, shall comply with all the requirements of the Local Business Enterprise and Non-Discrimination in Contracting Ordinance set forth in Chapter 14B of the San Francisco Administrative Code as it now exists or as it may be amended in the future (collectively the "LBE Ordinance"), provided such amendments do not materially increase Contractor's obligations or liabilities, or materially diminish Contractor's rights, under this Agreement. Such provisions of the LBE Ordinance are incorporated by reference and made a part of this Agreement as though fully set forth in this section. Contractor's willful failure to comply with any applicable provisions of the LBE Ordinance is a material breach of Contractor's obligations under this Agreement and shall entitle City, subject to any applicable notice and cure provisions set forth in this Agreement, to exercise any of the remedies provided for under this Agreement, under the LBE Ordinance or otherwise available at law or in equity, which remedies shall be cumulative unless this Agreement expressly provides that any remedy is exclusive. In addition, Contractor shall comply fully with all other applicable local, state and federal laws prohibiting discrimination and requiring equal opportunity in contracting, including subcontracting.

b. Compliance and Enforcement.

(1) Enforcement. If Contractor willfully fails to comply with any of the provisions of the LBE Ordinance, the rules and regulations implementing the LBE Ordinance, or the provisions of this Agreement pertaining to LBE participation, Contractor shall be liable for liquidated damages in an amount equal to Contractor's net profit on this Agreement, or 10% of the total amount of this Agreement, or $1,000, whichever is greatest. The Director of the City's Human Rights Commission or any other public official authorized to enforce the LBE Ordinance (separately and collectively, the "Director of HRC") may also impose other sanctions against Contractor authorized in the LBE Ordinance, including declaring the Contractor to be irresponsible and ineligible to contract with the City for a period of up to five years or revocation of the Contractor's LBE certification. The Director of HRC will determine the sanctions to be imposed, including the amount of liquidated damages, after investigation pursuant to Administrative Code §14B.17.

By entering into this Agreement, Contractor acknowledges and agrees that any liquidated damages assessed by the Director of the HRC shall be payable to City upon demand. Contractor further acknowledges and agrees that any liquidated damages assessed may be withheld from any monies due to Contractor on any contract with City.

Contractor agrees to maintain records necessary for monitoring its compliance with the LBE Ordinance for a period of three years following termination or expiration of this Agreement, and shall make such records available for audit and inspection by the Director of HRC or the Controller upon request.

(2) Subcontracting Goals. The LBE subcontracting participation goal for this contract is **12.6%**. Contractor shall fulfill the subcontracting commitment made in its bid or proposal. Each invoice submitted to City for payment shall include the information required in the HRC Progress Payment Form and the HRC Payment Affidavit. Failure to provide the HRC Progress Payment Form and the HRC Payment Affidavit with each invoice submitted by Contractor shall entitle City to withhold 20% of the amount of that invoice until the HRC Payment Form and the HRC Subcontractor Payment Affidavit are provided by Contractor. Contractor shall not participate in any back contracting to the Contractor or lower-tier subcontractors, as defined in the LBE Ordinance, for any purpose inconsistent with the provisions of the LBE Ordinance, its implementing rules and regulations, or this Section.

(3) Subcontract Language Requirements. Contractor shall incorporate the LBE Ordinance into each subcontract made in the fulfillment of Contractor's obligations under this Agreement and require each subcontractor to agree and comply with provisions of the ordinance applicable to subcontractors. Contractor shall include in all subcontracts with LBEs made in fulfillment of Contractor's obligations under this Agreement, a provision requiring Contractor to compensate any LBE subcontractor for damages for breach of contract or liquidated damages equal to 5% of the subcontract amount, whichever is greater, if Contractor does not fulfill its commitment to use the LBE subcontractor as specified in the bid or proposal, unless Contractor received advance approval from the Director of HRC and contract awarding authority to substitute subcontractors or to otherwise modify the commitments in the bid or proposal. Such provisions shall also state that it is enforceable in a court of competent jurisdiction. Subcontracts shall require the subcontractor to maintain records necessary for monitoring its compliance with the LBE Ordinance for a period of three years following termination of this contract and to make such records available for audit and inspection by the Director of HRC or the Controller upon request.

(4) Payment of Subcontractors. Contractor shall pay its subcontractors within three working days after receiving payment from the City unless Contractor notifies the Director of HRC in

writing within ten working days prior to receiving payment from the City that there is a bona fide dispute between Contractor and its subcontractor and the Director waives the three-day payment requirement, in which case Contractor may withhold the disputed amount but shall pay the undisputed amount. Contractor further agrees, within ten working days following receipt of payment from the City, to file the HRC Payment Affidavit with the Controller, under penalty of perjury, that the Contractor has paid all subcontractors. The affidavit shall provide the names and addresses of all subcontractors and the amount paid to each. Failure to provide such affidavit may subject Contractor to enforcement procedure under Administrative Code §14B.17.

34. Nondiscrimination; Penalties.

a. Contractor Shall Not Discriminate. In the performance of this Agreement, Contractor agrees not to discriminate against any employee, City and County employee working with such contractor or subcontractor, applicant for employment with such contractor or subcontractor, or against any person seeking accommodations, advantages, facilities, privileges, services, or membership in all business, social, or other establishments or organizations, on the basis of the fact or perception of a person's race, color, creed, religion, national origin, ancestry, age, height, weight, sex, sexual orientation, gender identity, domestic partner status, marital status, disability or Acquired Immune Deficiency Syndrome or HIV status (AIDS/HIV status), or association with members of such protected classes, or in retaliation for opposition to discrimination against such classes.

b. Subcontracts. Contractor shall incorporate by reference in all subcontracts the provisions of §§12B.2(a), 12B.2(c)-(k), and 12C.3 of the San Francisco Administrative Code (copies of which are available from Purchasing) and shall require all subcontractors to comply with such provisions. Contractor's failure to comply with the obligations in this subsection shall constitute a material breach of this Agreement.

c. Nondiscrimination in Benefits. Contractor does not as of the date of this Agreement and will not during the term of this Agreement, in any of its operations in San Francisco, on real property owned by San Francisco, or where work is being performed for the City elsewhere in the United States, discriminate in the provision of bereavement leave, family medical leave, health benefits, membership or membership discounts, moving expenses, pension and retirement benefits or travel benefits, as well as any benefits other than the benefits specified above, between employees with domestic partners and employees with spouses, and/or between the domestic partners and spouses of such employees, where the domestic partnership has been registered with a governmental entity pursuant to state or local law authorizing such registration, subject to the conditions set forth in §12B.2(b) of the San Francisco Administrative Code.

d. Condition to Contract. As a condition to this Agreement, Contractor shall execute the "Chapter 12B Declaration: Nondiscrimination in Contracts and Benefits" form (form HRC-12B-101) with supporting documentation and secure the approval of the form by the San Francisco Human Rights Commission.

e. Incorporation of Administrative Code Provisions by Reference. The provisions of Chapters 12B and 12C of the San Francisco Administrative Code are incorporated in this Section by reference and made a part of this Agreement as though fully set forth herein. Contractor shall comply fully with and be bound by all of the provisions that apply to this Agreement under such Chapters, including but not limited to the remedies provided in such Chapters. Without limiting the foregoing, Contractor understands that pursuant to §§12B.2(h) and 12C.3(g) of the San Francisco Administrative Code, a penalty of $50 for each person for each calendar day during which such person was discriminated

against in violation of the provisions of this Agreement may be assessed against Contractor and/or deducted from any payments due Contractor.

35. MacBride Principles—Northern Ireland. Pursuant to San Francisco Administrative Code §12F.5, the City and County of San Francisco urges companies doing business in Northern Ireland to move towards resolving employment inequities, and encourages such companies to abide by the MacBride Principles. The City and County of San Francisco urges San Francisco companies to do business with corporations that abide by the MacBride Principles. By signing below, the person executing this agreement on behalf of Contractor acknowledges and agrees that he or she has read and understood this section.

36. Tropical Hardwood and Virgin Redwood Ban. Pursuant to §804(b) of the San Francisco Environment Code, the City and County of San Francisco urges contractors not to import, purchase, obtain, or use for any purpose, any tropical hardwood, tropical hardwood wood product, virgin redwood or virgin redwood wood product.

37. Drug-Free Workplace Policy. Contractor acknowledges that pursuant to the Federal Drug-Free Workplace Act of 1989, the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited on City premises. Contractor agrees that any violation of this prohibition by Contractor, its employees, agents or assigns will be deemed a material breach of this Agreement.

38. Resource Conservation. Chapter 5 of the San Francisco Environment Code ("Resource Conservation") is incorporated herein by reference. Failure by Contractor to comply with any of the applicable requirements of Chapter 5 will be deemed a material breach of contract.

39. Compliance with Americans with Disabilities Act. Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to the disabled public. Contractor shall provide the services specified in this Agreement in a manner that complies with the ADA and any and all other applicable federal, state and local disability rights legislation. Contractor agrees not to discriminate against disabled persons in the provision of services, benefits or activities provided under this Agreement and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents or assigns will constitute a material breach of this Agreement.

40. Sunshine Ordinance. In accordance with San Francisco Administrative Code §67.24(e), contracts, contractors' bids, responses to solicitations and all other records of communications between City and persons or firms seeking contracts, shall be open to inspection immediately after a contract has been awarded. Nothing in this provision requires the disclosure of a private person or organization's net worth or other proprietary financial data submitted for qualification for a contract or other benefit until and unless that person or organization is awarded the contract or benefit. Information provided which is covered by this paragraph will be made available to the public upon request.

41. Public Access to Meetings and Records. If the Contractor receives a cumulative total per year of at least $250,000 in City funds or City-administered funds and is a non-profit organization as defined in Chapter 12L of the San Francisco Administrative Code, Contractor shall comply with and be bound by all the applicable provisions of that Chapter. By executing this Agreement, the Contractor agrees to open its meetings and records to the public in the manner set forth in §§12L.4 and 12L.5 of the Administrative Code. Contractor further agrees to make-good faith efforts to promote community membership on its Board of Directors in the manner set forth in §12L.6 of the Administrative Code. The Contractor acknowledges that its material failure to comply with any of the provisions of this paragraph shall

constitute a material breach of this Agreement. The Contractor further acknowledges that such material breach of the Agreement shall be grounds for the City to terminate and/or not renew the Agreement, partially or in its entirety.

42. Limitations on Contributions. Through execution of this Agreement, Contractor 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, for the furnishing of any material, supplies or equipment, for the sale or lease of any land or building, or for a grant, loan or loan guarantee, from making any campaign contribution to (1) an individual holding a City elective office if the contract must be approved by the individual, a board on which that individual serves, or the board of a state agency on which an appointee of that individual serves, (2) a candidate for the office held by such individual, or (3) a committee controlled by such individual, at any time from the commencement of negotiations for the contract until the later of either the termination of negotiations for such contract or six months after the date the contract is approved. Contractor acknowledges that the foregoing restriction applies only if the contract or a combination or series of contracts approved by the same individual or board in a fiscal year have a total anticipated or actual value of $50,000 or more. Contractor further acknowledges that the prohibition on contributions applies to each prospective party to the contract; each member of Contractor's board of directors; Contractor's chairperson, chief executive officer, chief financial officer and chief operating officer; any person with an ownership interest of more than 20 percent in Contractor; any subcontractor listed in the bid or contract; and any committee that is sponsored or controlled by Contractor. Additionally, Contractor acknowledges that Contractor must inform each of the persons described in the preceding sentence of the prohibitions contained in Section 1.126.

43. Requiring Minimum Compensation for Covered Employees.

a. Contractor agrees to comply fully with and be bound by all of the provisions of the Minimum Compensation Ordinance (MCO), as set forth in San Francisco Administrative Code Chapter 12P (Chapter 12P), including the remedies provided, and implementing guidelines and rules. The provisions of Sections 12P.5 and 12P.5.1 of Chapter 12P are incorporated herein by reference and made a part of this Agreement as though fully set forth. The text of the MCO is available on the web at www.sfgov.org/olse/mco. A partial listing of some of Contractor's obligations under the MCO is set forth in this Section. Contractor is required to comply with all the provisions of the MCO, irrespective of the listing of obligations in this Section.

b. The MCO requires Contractor to pay Contractor's employees a minimum hourly gross compensation wage rate and to provide minimum compensated and uncompensated time off. The minimum wage rate may change from year to year and Contractor is obligated to keep informed of the then-current requirements. Any subcontract entered into by Contractor shall require the subcontractor to comply with the requirements of the MCO and shall contain contractual obligations substantially the same as those set forth in this Section. It is Contractor's obligation to ensure that any subcontractors of any tier under this Agreement comply with the requirements of the MCO. If any subcontractor under this Agreement fails to comply, City may pursue any of the remedies set forth in this Section against Contractor.

c. Contractor shall not take adverse action or otherwise discriminate against an employee or other person for the exercise or attempted exercise of rights under the MCO. Such actions, if taken within 90 days of the exercise or attempted exercise of such rights, will be rebuttably presumed to be retaliation prohibited by the MCO.

d. Contractor shall maintain employee and payroll records as required by the MCO. If Contractor fails to do so, it shall be presumed that the Contractor paid no more than the minimum wage required under State law.

e. The City is authorized to inspect Contractor's job sites and conduct interviews with employees and conduct audits of Contractor

f. Contractor's commitment to provide the Minimum Compensation is a material element of the City's consideration for this Agreement. The City in its sole discretion shall determine whether such a breach has occurred. The City and the public will suffer actual damage that will be impractical or extremely difficult to determine if the Contractor fails to comply with these requirements. Contractor agrees that the sums set forth in Section 12P.6.1 of the MCO as liquidated damages are not a penalty, but are reasonable estimates of the loss that the City and the public will incur for Contractor's noncompliance. The procedures governing the assessment of liquidated damages shall be those set forth in Section 12P.6.2 of Chapter 12P.

g. Contractor understands and agrees that if it fails to comply with the requirements of the MCO, the City shall have the right to pursue any rights or remedies available under Chapter 12P (including liquidated damages), under the terms of the contract, and under applicable law. If, within 30 days after receiving written notice of a breach of this Agreement for violating the MCO, Contractor fails to cure such breach or, if such breach cannot reasonably be cured within such period of 30 days, Contractor fails to commence efforts to cure within such period, or thereafter fails diligently to pursue such cure to completion, the City shall have the right to pursue any rights or remedies available under applicable law, including those set forth in Section 12P.6(c) of Chapter 12P. Each of these remedies shall be exercisable individually or in combination with any other rights or remedies available to the City.

h. Contractor represents and warrants that it is not an entity that was set up, or is being used, for the purpose of evading the intent of the MCO.

i. If Contractor is exempt from the MCO when this Agreement is executed because the cumulative amount of agreements with this department for the fiscal year is less than $25,000, but Contractor later enters into an agreement or agreements that cause contractor to exceed that amount in a fiscal year, Contractor shall thereafter be required to comply with the MCO under this Agreement. This obligation arises on the effective date of the agreement that causes the cumulative amount of agreements between the Contractor and this department to exceed $25,000 in the fiscal year.

44. Requiring Health Benefits for Covered Employees. Contractor agrees to comply fully with and be bound by all of the provisions of the Health Care Accountability Ordinance (HCAO), as set forth in San Francisco Administrative Code Chapter 12Q, including the remedies provided, and implementing regulations, as the same may be amended from time to time. The provisions of section 12Q.5.1 of Chapter 12Q are incorporated by reference and made a part of this Agreement as though fully set forth herein. The text of the HCAO is available on the web at www.sfgov.org/olse. Capitalized terms used in this Section and not defined in this Agreement shall have the meanings assigned to such terms in Chapter 12Q.

a. For each Covered Employee, Contractor shall provide the appropriate health benefit set forth in Section 12Q.3 of the HCAO. If Contractor chooses to offer the health plan option, such health plan shall meet the minimum standards set forth by the San Francisco Health Commission..

b. Notwithstanding the above, if the Contractor is a small business as defined in Section 12Q.3(e) of the HCAO, it shall have no obligation to comply with part (a) above.

c. Contractor's failure to comply with the HCAO shall constitute a material breach of this agreement. City shall notify Contractor if such a breach has occurred. If, within 30 days after receiving

City's written notice of a breach of this Agreement for violating the HCAO, Contractor fails to cure such breach or, if such breach cannot reasonably be cured within such period of 30 days, Contractor fails to commence efforts to cure within such period, or thereafter fails diligently to pursue such cure to completion, City shall have the right to pursue the remedies set forth in 12Q.5.1 and 12Q.5(f)(1-6). Each of these remedies shall be exercisable individually or in combination with any other rights or remedies available to City.

d. Any Subcontract entered into by Contractor shall require the Subcontractor to comply with the requirements of the HCAO and shall contain contractual obligations substantially the same as those set forth in this Section. Contractor shall notify City's Office of Contract Administration when it enters into such a Subcontract and shall certify to the Office of Contract Administration that it has notified the Subcontractor of the obligations under the HCAO and has imposed the requirements of the HCAO on Subcontractor through the Subcontract. Each Contractor shall be responsible for its Subcontractors' compliance with this Chapter. If a Subcontractor fails to comply, the City may pursue the remedies set forth in this Section against Contractor based on the Subcontractor's failure to comply, provided that City has first provided Contractor with notice and an opportunity to obtain a cure of the violation.

e. Contractor shall not discharge, reduce in compensation, or otherwise discriminate against any employee for notifying City with regard to Contractor's noncompliance or anticipated noncompliance with the requirements of the HCAO, for opposing any practice proscribed by the HCAO, for participating in proceedings related to the HCAO, or for seeking to assert or enforce any rights under the HCAO by any lawful means.

f. Contractor represents and warrants that it is not an entity that was set up, or is being used, for the purpose of evading the intent of the HCAO.

g. Contractor shall maintain employee and payroll records in compliance with the California Labor Code and Industrial Welfare Commission orders, including the number of hours each employee has worked on the City Contract.

h. Contractor shall keep itself informed of the current requirements of the HCAO.

i. Contractor shall provide reports to the City in accordance with any reporting standards promulgated by the City under the HCAO, including reports on Subcontractors and Subtenants, as applicable.

j. Contractor shall provide City with access to records pertaining to compliance with HCAO after receiving a written request from City to do so and being provided at least ten business days to respond.

k. Contractor shall allow City to inspect Contractor's job sites and have access to Contractor's employees in order to monitor and determine compliance with HCAO.

l. City may conduct random audits of Contractor to ascertain its compliance with HCAO. Contractor agrees to cooperate with City when it conducts such audits.

m. If Contractor is exempt from the HCAO when this Agreement is executed because its amount is less than $25,000 ($50,000 for nonprofits), but Contractor later enters into an agreement or agreements that cause Contractor's aggregate amount of all agreements with City to reach $75,000, all the agreements shall be thereafter subject to the HCAO. This obligation arises on the effective date of the agreement that

causes the cumulative amount of agreements between Contractor and the City to be equal to or greater than $75,000 in the fiscal year.

45. First Source Hiring Program.

a. Incorporation of Administrative Code Provisions by Reference. The provisions of Chapter 83 of the San Francisco Administrative Code are incorporated in this Section by reference and made a part of this Agreement as though fully set forth herein. Contractor shall comply fully with, and be bound by, all of the provisions that apply to this Agreement under such Chapter, including but not limited to the remedies provided therein. Capitalized terms used in this Section and not defined in this Agreement shall have the meanings assigned to such terms in Chapter 83.

b. First Source Hiring Agreement. As an essential term of, and consideration for, any contract or property contract with the City, not exempted by the FSHA, the Contractor shall enter into a first source hiring agreement ("agreement") with the City, on or before the effective date of the contract or property contract. Contractors shall also enter into an agreement with the City for any other work that it performs in the City. Such agreement shall:

(1) Set appropriate hiring and retention goals for entry level positions. The employer shall agree to achieve these hiring and retention goals, or, if unable to achieve these goals, to establish good faith efforts as to its attempts to do so, as set forth in the agreement. The agreement shall take into consideration the employer's participation in existing job training, referral and/or brokerage programs. Within the discretion of the FSHA, subject to appropriate modifications, participation in such programs maybe certified as meeting the requirements of this Chapter. Failure either to achieve the specified goal, or to establish good faith efforts will constitute noncompliance and will subject the employer to the provisions of Section 83.10 of this Chapter.

(2) Set first source interviewing, recruitment and hiring requirements, which will provide the San Francisco Workforce Development System with the first opportunity to provide qualified economically disadvantaged individuals for consideration for employment for entry level positions. Employers shall consider all applications of qualified economically disadvantaged individuals referred by the System for employment; provided however, if the employer utilizes nondiscriminatory screening criteria, the employer shall have the sole discretion to interview and/or hire individuals referred or certified by the San Francisco Workforce Development System as being qualified economically disadvantaged individuals. The duration of the first source interviewing requirement shall be determined by the FSHA and shall be set forth in each agreement, but shall not exceed 10 days. During that period, the employer may publicize the entry level positions in accordance with the agreement. A need for urgent or temporary hires must be evaluated, and appropriate provisions for such a situation must be made in the agreement.

(3) Set appropriate requirements for providing notification of available entry level positions to the San Francisco Workforce Development System so that the System may train and refer an adequate pool of qualified economically disadvantaged individuals to participating employers. Notification should include such information as employment needs by occupational title, skills, and/or experience required, the hours required, wage scale and duration of employment, identification of entry level and training positions, identification of English language proficiency requirements, or absence thereof, and the projected schedule and procedures for hiring for each occupation. Employers should provide both long-term job need projections and notice before initiating the interviewing and hiring process. These notification requirements will take into consideration any need to protect the employer's proprietary information.

(4) Set appropriate record keeping and monitoring requirements. The First Source Hiring Administration shall develop easy-to-use forms and record keeping requirements for documenting compliance with the agreement. To the greatest extent possible, these requirements shall utilize the employer's existing record keeping systems, be nonduplicative, and facilitate a coordinated flow of information and referrals.

(5) Establish guidelines for employer good faith efforts to comply with the first source hiring requirements of this Chapter. The FSHA will work with City departments to develop employer good faith effort requirements appropriate to the types of contracts and property contracts handled by each department. Employers shall appoint a liaison for dealing with the development and implementation of the employer's agreement. In the event that the FSHA finds that the employer under a City contract or property contract has taken actions primarily for the purpose of circumventing the requirements of this Chapter, that employer shall be subject to the sanctions set forth in Section 83.10 of this Chapter.

(6) Set the term of the requirements.

(7) Set appropriate enforcement and sanctioning standards consistent with this Chapter.

(8) Set forth the City's obligations to develop training programs, job applicant referrals, technical assistance, and information systems that assist the employer in complying with this Chapter.

(9) Require the developer to include notice of the requirements of this Chapter in leases, subleases, and other occupancy contracts.

c. Hiring Decisions. Contractor shall make the final determination of whether an Economically Disadvantaged Individual referred by the System is "qualified" for the position.

d. Exceptions. Upon application by Employer, the First Source Hiring Administration may grant an exception to any or all of the requirements of Chapter 83 in any situation where it concludes that compliance with this Chapter would cause economic hardship.

e. Liquidated Damages. Contractor agrees:

(1) To be liable to the City for liquidated damages as provided in this section;

(2) To be subject to the procedures governing enforcement of breaches of contracts based on violations of contract provisions required by this Chapter as set forth in this section;

(3) That the contractor's commitment to comply with this Chapter is a material element of the City's consideration for this contract; that the failure of the contractor to comply with the contract provisions required by this Chapter will cause harm to the City and the public which is significant and substantial but extremely difficult to quantity; that the harm to the City includes not only the financial cost of funding public assistance programs but also the insidious but impossible to quantify harm that this community and its families suffer as a result of unemployment; and that the assessment of liquidated damages of up to $5,000 for every notice of a new hire for an entry level position improperly withheld by the contractor from the first source hiring process, as determined by the FSHA during its first investigation of a contractor, does not exceed a fair estimate of the financial and other damages that the City suffers as a result of the contractor's failure to comply with its first source referral contractual obligations.

(4) That the continued failure by a contractor to comply with its first source referral contractual obligations will cause further significant and substantial harm to the City and the public, and that a second assessment of liquidated damages of up to $10,000 for each entry level position improperly withheld from the FSHA, from the time of the conclusion of the first investigation forward, does not exceed the financial and other damages that the City suffers as a result of the contractor's continued failure to comply with its first source referral contractual obligations;

(5) That in addition to the cost of investigating alleged violations under this Section, the computation of liquidated damages for purposes of this section is based on the following data:

A. The average length of stay on public assistance in San Francisco's County Adult Assistance Program is approximately 41 months at an average monthly grant of $348 per month, totaling approximately $14,379; and

B. In 2004, the retention rate of adults placed in employment programs funded under the Workforce Investment Act for at least the first six months of employment was 84.4%. Since qualified individuals under the First Source program face far fewer barriers to employment than their counterparts in programs funded by the Workforce Investment Act, it is reasonable to conclude that the average length of employment for an individual whom the First Source Program refers to an employer and who is hired in an entry level position is at least one year;

therefore, liquidated damages that total $5,000 for first violations and $10,000 for subsequent violations as determined by FSHA constitute a fair, reasonable, and conservative attempt to quantify the harm caused to the City by the failure of a contractor to comply with its first source referral contractual obligations.

(6) That the failure of contractors to comply with this Chapter, except property contractors, may be subject to the debarment and monetary penalties set forth in Sections 6.80 et seq. of the San Francisco Administrative Code, as well as any other remedies available under the contract or at law; and

Violation of the requirements of Chapter 83 is subject to an assessment of liquidated damages in the amount of $5,000 for every new hire for an Entry Level Position improperly withheld from the first source hiring process. The assessment of liquidated damages and the evaluation of any defenses or mitigating factors shall be made by the FSHA.

f. Subcontracts. Any subcontract entered into by Contractor shall require the subcontractor to comply with the requirements of Chapter 83 and shall contain contractual obligations substantially the same as those set forth in this Section.

46. Prohibition on Political Activity with City Funds. In accordance with San Francisco Administrative Code Chapter 12.G, Contractor 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. Contractor 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 Contractor 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 Contractor from bidding on or receiving any new City contract for a period of two (2) years. The Controller will not consider Contractor's use of profit as a violation of this section.

47. Preservative-treated Wood Containing Arsenic. Contractor 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. Contractor 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 Contractor 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.

48. Modification of Agreement. This Agreement may not be modified, nor may compliance with any of its terms be waived, except by written instrument executed and approved in the same manner as this Agreement. Contractor shall cooperate with Department to submit to the Director of HRC any amendment, modification, supplement or change order that would result in a cumulative increase of the original amount of this Agreement by more than 20% (HRC Contract Modification Form).

49. Administrative Remedy for Agreement Interpretation. Should any question arise as to the meaning and intent of this Agreement, the question shall, prior to any other action or resort to any other legal remedy, be referred to Purchasing who shall decide the true meaning and intent of the Agreement.

50. Agreement Made in California; Venue. The formation, interpretation and performance of this Agreement shall be governed by the laws of the State of California. Venue for all litigation relative to the formation, interpretation and performance of this Agreement shall be in San Francisco.

51. Construction. All paragraph captions are for reference only and shall not be considered in construing this Agreement.

52. Entire Agreement. This contract sets forth the entire Agreement between the parties, and supersedes all other oral or written provisions. This contract may be modified only as provided in Section 48, "Modification of Agreement."

53. Compliance with Laws. Contractor shall keep itself fully informed of the City's Charter, codes, ordinances and regulations of the City and of all state, and federal laws in any manner affecting the performance of this Agreement, and must at all times comply with such local codes, ordinances, and regulations and all applicable laws as they may be amended from time to time.

54. Services Provided by Attorneys. Any services to be provided by a law firm or attorney must be reviewed and approved in writing in advance by the City Attorney. No invoices for services provided by law firms or attorneys, including, without limitation, as subcontractors of Contractor, will be paid unless the provider received advance written approval from the City Attorney.

55. Left blank by agreement of the parties. (Supervision of Minors)

56. Severability. Should the application of any provision of this Agreement to any particular facts or circumstances be found by a court of competent jurisdiction to be invalid or unenforceable, then (a) the validity of other provisions of this Agreement shall not be affected or impaired thereby, and (b) such provision shall be enforced to the maximum extent possible so as to effect the intent of the parties and

shall be reformed without further action by the parties to the extent necessary to make such provision valid and enforceable.

57. Protection of Private Information. Contractor has read and agrees to the terms set forth in San Francisco Administrative Code Sections 12M.2, "Nondisclosure of Private Information," and 12M.3, "Enforcement" of Administrative Code Chapter 12M, "Protection of Private Information," which are incorporated herein as if fully set forth. Contractor agrees that any failure of Contactor to comply with the requirements of Section 12M.2 of this Chapter shall be a material breach of the Contract. In such an event, in addition to any other remedies available to it under equity or law, the City may terminate the Contract, bring a false claim action against the Contractor pursuant to Chapter 6 or Chapter 21 of the Administrative Code, or debar the Contractor.

58. Graffiti Removal. Graffiti is detrimental to the health, safety and welfare of the community in that it promotes a perception in the community that the laws protecting public and private property can be disregarded with impunity. This perception fosters a sense of disrespect of the law that results in an increase in crime; degrades the community and leads to urban blight; is detrimental to property values, business opportunities and the enjoyment of life; is inconsistent with the City's property maintenance goals and aesthetic standards; and results in additional graffiti and in other properties becoming the target of graffiti unless it is quickly removed from public and private property. Graffiti results in visual pollution and is a public nuisance. Graffiti must be abated as quickly as possible to avoid detrimental impacts on the City and County and its residents, and to prevent the further spread of graffiti. Contractor shall remove all graffiti from any real property owned or leased by Contractor in the City and County of San Francisco within forty eight (48) hours of the earlier of Contractor's (a) discovery or notification of the graffiti or (b) receipt of notification of the graffiti from the Department of Public Works. This section is not intended to require a Contractor to breach any lease or other agreement that it may have concerning its use of the real property. The term "graffiti" means any inscription, word, figure, marking or design that is affixed, marked, etched, scratched, drawn or painted on any building, structure, fixture or other improvement, whether permanent or temporary, including by way of example only and without limitation, signs, banners, billboards and fencing surrounding construction sites, whether public or private, without the consent of the owner of the property or the owner's authorized agent, and which is visible from the public right-of-way. "Graffiti" shall not include: (1) any sign or banner that is authorized by, and in compliance with, the applicable requirements of the San Francisco Public Works Code, the San Francisco Planning Code or the San Francisco Building Code; or (2) any mural or other painting or marking on the property that is protected as a work of fine art under the California Art Preservation Act (California Civil Code Sections 987 et seq.) or as a work of visual art under the Federal Visual Artists Rights Act of 1990 (17 U.S.C. §§ 101 et seq.).

Any failure of Contractor to comply with this section of this Agreement shall constitute an Event of Default of this Agreement.

59. Food Service Waste Reduction Requirements. Contractor agrees to comply fully with and be bound by all of the provisions of the Food Service Waste Reduction Ordinance, as set forth in San Francisco Environment Code Chapter 16, including the remedies provided, and implementing guidelines and rules. The provisions of Chapter 16 are incorporated herein by reference and made a part of this Agreement as though fully set forth. This provision is a material term of this Agreement. By entering into this Agreement, Contractor agrees that if it breaches this provision, City will suffer actual damages that will be impractical or extremely difficult to determine; further, Contractor agrees that the sum of one hundred dollars ($100) liquidated damages for the first breach, two hundred dollars ($200) liquidated damages for the second breach in the same year, and five hundred dollars ($500) liquidated damages for subsequent breaches in the same year is reasonable estimate of the damage that City will incur based on the violation, established in light of the circumstances existing at the time this Agreement was made.

Such amount shall not be considered a penalty, but rather agreed monetary damages sustained by City because of Contractor's failure to comply with this provision.

60. Left blank by agreement of the parties. (Slavery Era Disclosure)

61. Cooperative Drafting. This Agreement has been drafted through a cooperative effort of both parties, and both parties have had an opportunity to have the Agreement reviewed and revised by legal counsel. No party shall be considered the drafter of this Agreement, and no presumption or rule that an ambiguity shall be construed against the party drafting the clause shall apply to the interpretation or enforcement of this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day first mentioned above.

CITY

Approved:

Ed Harrington
General Manager
San Francisco Public Utilities Commission

Approved as to Form:

Dennis J. Herrera
City Attorney

By
John G. White
Deputy City Attorney

CONTRACTOR

By signing this Agreement, I certify that I comply with the requirements of the Minimum Compensation Ordinance, which entitle Covered Employees to certain minimum hourly wages and compensated and uncompensated time off.

I have read and understood paragraph 35, the City's statement urging companies doing business in Northern Ireland to move towards resolving employment inequities, encouraging compliance with the MacBride Principles, and urging San Francisco companies to do business with corporations that abide by the MacBride Principles.

Authorized Signature

Bruce K Howard

Printed Name

President

Title

MWH Americas Inc.

Company Name

MWH/URS Joint Venture

87725

City Vendor Number

44 Montgomery St. Ste 1400 SF, CA 94104

Address

45-4967232

Federal Employer ID Number

SAID SALAH-MARS

VICE PRESIDENT

URS CORPORATION AMERICAS

Appendices

A: Services to be provided by Contractor
B: Calculation of Charges

Appendix A
Services to be provided by Contractor

Contractor agrees to perform said services all in accordance with the terms of this Agreement and of its proposal dated **November 14, 2011** and incorporated by reference as though fully set forth herein. Should there be a conflict of terms, this Agreement shall control over the RFP and the Contractor's proposal.

1. Description of Services

Contractor will be required to (1) perform geotechnical, archeological, and hazardous material investigations including preparing reports; (2) perform detailed alternative analysis and design; (3) perform physical and computer hydraulic modeling including providing air surge analysis; (4) inspect condition of the CHS sump area, Bruce Flynn Pump Station (BFS), major intercepting sewers, and ICT pertinent to this project and determine need for additional work including corrosion protection; (5) perform a basin-wide Urban Watershed Assessment and provide recommendation on a total basin solution incorporating feasible/appropriate green infrastructures; (6) provide support to City staff and respond to Requests for Information (RFIs) for environmental review, (7) prepare detailed design for all trenchless work and associated temporary structures; (8) prepare plans and specifications for inclusion in the construction contract documents; (9) prepare engineering cost estimates; (10) prepare schedules for phases of planning, design, and construction; (11) provide engineering support and management for the project from planning through construction closeout; (12) review and size necessary construction and permanent easements; (13) coordinate with designated governmental and private entities; and (14) coordinate with City staff and prepare Needs Assessment and Alternative Identification Report (NAR), Alternative Analysis Report (AAR), Conceptual Engineering Report (CER), Design Criteria Report (DCR), and performing associated tasks. The deliverables produced by the Contractor will be used by the City in its planning, analysis, and design efforts and/or will be incorporated into the advertising documents. This contract will be performed jointly with City staff. Close coordination with City staff is essential for the timely completion of all phases of the entire project.

The work to be performed and responsibilities to be assumed by City staff are as follows:

- Designing all the permanent junction/control structures located throughout the ENTIRE project alignment as well as necessary permanent structures for future maintenance access along the tunnel alignment. Such line of responsibility and designation are subject to change depending on recommended construction methodology determined during the design phase;

- Providing all utility coordination and developing all utility composite drawings from Planning through Design;

- Providing right-of-way/property acquisition services;

- Designing the new Pump Station and modifications to existing pump stations including all related Mechanical, Electrical; and Instrumentation/Control upgrades or modifications as described in Task 14;

- Writing the hazmat specifications for the ENTIRE project based on Contractor's investigative findings, including the hazmat assessment report, EIR mitigation measures, research, recommendations, and mitigation plans; and

- Specific work as described in the **Detailed Description of Tasks**.

2. Task Orders

Performance of the service under this Agreement will be executed according to a task order process, and Contractor is required to provide adequate quality control processes and deliverables in conformance with the technical requirements of the task order. The SFPUC Project Manager will initially identify tasks and request the contractor to propose a project scope, sub tasks, staffing plan, LBE utilization, schedule, deliverables, budget and costs to complete the task in accordance with Appendix B. All costs associated with the development of the scope of work shall be borne by Contractor. A final task order will be negotiated between the SFPUC Project Manager and the Contractor and then submitted to the Bureau Manager for approval. However, as provided in the RFP, the budget, if applicable, identified for tasks is an estimate, and the City reserves the right to modify the applicable budget allocated to any task as more specific information concerning the task order scope becomes available.

The task order request will be processed for Controller certification of funding, after which a *Notice to Proceed* will be issued. The Contractor is hereby notified that work cannot commence until the Contractor receives a written Notice to Proceed in accordance with the San Francisco Administrative Code. ***Any work performed without a Notice to Proceed will be at the Contractor's own commercial risk.*** The calculations of costs and methods of compensation for all task orders under this Agreement shall be in accordance with Appendix B.

These following tasks provide general guidance to the Contractor as to the anticipated scope of work which the SFPUC reserves the right to modify or delete:

Task 1 Management and Coordination of Services

MWH•URS will provide overall project coordination for keeping project participants informed of progress, technical issues, planned activities, and events. Project participants include City staff in project management, engineering, environmental planning, operations, and public outreach; Project Management Consultant (PMC) staff; independent experts; and other parties such as public agencies and the public. For scheduling purposes, MWH•URS will provide three weeks for City review of each draft deliverable, unless otherwise noted. This task assumes a period of 5.5 years (66 months) as the duration for planning and design phases of this project. All other assumptions are presented in the spreadsheet associated with this task to estimate the labor effort. MWH•URS will perform coordination activities under this task as described below.

1.1. Management Work Plan

Management Work Plan for the Project to define workflow processes, communication/ coordination plans, and key management activities. The Work Plan will serve as the roadmap for the project team, establishing project goals, schedule, and budget. The Work Plan will also focus and apply our overall project management procedures to project-specific actions, such as risk management, quality control, and resource management. Points of contacts will be identified, and clear assignments of roles and responsibilities will be provided and documented in a Responsibility Assignment Matrix (RAM) that is mapped to the Project's Work Breakdown Structure (WBS).

Based on the Project Approach Coordination and Control (see Section V.3.C of the RFP) and the Task Description (see Section V.3.D of the RFP), MWH•URS will prepare a Draft Management Work Plan within four (4) weeks following NTP for review and acceptance by the SFPUC. The City will have three (3) weeks to return comments and MWH•URS will have one (1) week to incorporate the comments. The Final Management Work Plan shall be submitted including all applicable comments within eight (8) weeks of NTP. The Work Plan is intended to lay the groundwork for efficient execution of contracted engineering services. The Plan shall include the following information:

1.1.1. Project Team organization and responsibility;

1.1.2. MWH•URS contract administration procedures;

1.1.3. Cost and schedule control procedures;

1.1.4. List of tasks and corresponding staff and budget;

1.1.5. Detailed Critical Path Method (CPM) schedule of tasks, milestones, and deliverable due dates, completed in Primavera P6 software;

1.1.6. File management for project record sharing/keeping and coordination guidelines utilizing Microsoft SharePoint software to allow integration with project team members within SFPUC, SFDPW, MWH•URS, agencies and others; and

1.1.7. Detailed change control/management procedure and decision documentation for tracking and controlling changes, particularly those impacting the project schedule and construction cost estimate. Schedule and cost impacts shall be identified and communicated to the SFPUC in a timely fashion.

1.2. Project Kick-off Meeting

At the outset of the project MWH•URS will conduct a Kick-Off Meeting with the Project Team and Client. Prepare for and attend project kick-off meeting to review tasks, milestones, roles, communication, and coordination processes. Management Work Plan will be discussed during this kick-off meeting. The project scope of work will be reviewed, points of contact established, matrix of responsibilities confirmed, schedules will be confirmed, and the overall approach to the work will be reviewed and finalized.

1.3. Bi-Weekly Coordination Meeting

Prepare for and attend coordination bi-weekly progress meetings for the duration of the planning and design phases of the Agreement (assumed 5.5 years, or ~143 meetings). Construction phase meetings are included under Task 17. Assume ~2 hours per meeting between SFPUC/SFDPW staff and ~4 project staff from MWH•URS. Minutes for the meetings will be prepared and distributed by MWH•URS.

1.4. Presentations for Planning reports and Design

Prepare and make presentations as required by SFPUC's Infrastructure Division Procedures. Assume up to ~20 technical presentations and ~4 senior project staff from MWH•URS.

1.5. Coordination Workshops

Prepare for and participate in coordination workshops and reconcile comments after each presentation. Each workshop shall be one-half day (i.e., 4 hours) and shall be coordinated between MWH•URS and SFPUC after the presentations on NAR, AAR, CER, design criteria, 35% design, 65% design, and 95%

design. MWH•URS will lead these workshops. A total of seven workshops are planned. Assume up to ~4 senior project staff from MWH•URS attend each workshop.

1.6. Monthly Progress Reports and Meetings
Submit monthly progress reports, with highlights of work performed during the past month (including the community benefit effort), issues requiring action and proposed solutions, and work planned and important milestones for the upcoming month. Also for each task provide: (1) suggested updates to schedule (for discussion); (2) estimate of actual (not based on budget) percent complete; and (3) summary of current expenditures (man-hours, dollars expended, and percent of task budget expended). The report shall identify issues or scope changes that may affect overall cost and/or schedule of planning/ design phases. Reports will be provided for the duration of the planning and design phases of the Agreement (assumed 5.5 years, or ~66 reports). Invoices will be submitted monthly. Monthly invoices will be prepared and submitted to SFPUC in accordance with City requirements.

1.7. Document Maintenance
Maintain project both hard copy and electronic files including plans, reports, correspondences, calculations, and other documents pertaining to the planning and design efforts. A collated, organized, indexed set of copies shall be transferred to the SFPUC within twenty (20) working days of the 100% planning and 100% design completions, including copies of documents already passed to SFPUC during the assignment. Documents shall be fully checked and signed off in accordance with Quality Assurance/Quality Control procedures.

1.8. Coordination of Comments
Coordinate review comments provided by SFPUC, SFDPW, and PMC staff on reports, memoranda, project documents, and other work products. Document and disseminate responses to review comments.

1.9. Draft Engineering Plan
Submit a Draft Engineering Work Plan prior to initiation of Pre-Design including deliverables and resource loading. The Work Plan will be submitted in the Primavera P6 software platform. The City will have three weeks to return comments and MWH•URS will have one (1) week to incorporate the comments into a Final Engineering Work Plan.

1.10. Project Team Management
Throughout the project, MWH•URS's Project Manager will ensure delivery of services within the prescribed budget and schedule constraints; keep the City informed of the technical, scheduling, and budgetary status of the project; and provide overall management of MWH•URS's staff and sub consultants.

1.11. Cost Control Schedule Preparation, Coordination, and Maintenance
MWH•URS will establish cost and schedule baseline and milestones and will make updates to indicate percentage complete, float time and slipped tasks. The cost/resource-loaded schedule will be developed using computer-scheduling software; the project schedule will be in Primavera P6. The schedule will be maintained and updated monthly to identify and revise start, end and duration dates of the project tasks. The schedule will also include key tasks, resources, costs, project milestones, anticipated Client review dates and schedule of deliverables. A summary of the schedule updates will be provided with the monthly progress report under Task 1.6.

Task 1 Dependency on other Tasks
None, Receipt of NTP

Task 1 Responsible Party
Project Manager

Task 1 Deliverables

1.A. Draft Management Work Plan, 10 hard copies and one copy in digital format, within four (4) weeks from NTP;

1.B. Final Management Work Plan, 10 hard copies and one copy in digital format, within three (3) weeks of receiving City's comments;

1.C. Draft Engineering Work Plan, 10 hard copies and one copy in digital format, prior to initiation of Pre-Design;

1.D. Final Engineering Work Plan, 10 hard copies and one copy in digital format;

1.E. Meeting minutes documenting key decisions and action items for project meetings and workshops, one hard copy and one copy in digital format;

1.F. Monthly Progress Reports, one hard copy and one copy in digital format, within five (5) calendar days after the end of each month;

1.G. Monthly invoices, three (3) hard copies, or as in accordance with City requirements;

1.H. Project plans, reports, correspondence, calculations, and other project records pertaining to the design, two hard copies and one digital copy, within twenty (20) working days of the 100% planning and 100% design completions;

1.I. Responses to SFPUC review comments for project deliverables, one hard copy and one copy in digital format.

Task 2: Quality Assurance / Quality Control

Quality planning will be completed before the start of major work products. Execution of established quality procedures under this task will be performed through planning and design phases of the work. Quality Assurance/Quality Control (QA/QC) procedures for the Project are tailored to meet the requirements of Section 5: Quality Management of the SFPUC Infrastructure Division Procedures Manual Volume 2.

2.1. Prepare Quality Assurance (QA) Plan –MWH•URS will prepare and submit a Draft QA Plan within six (6) weeks following NTP, for review and acceptance by the City. The plan will establish activities and procedures to be implemented during the execution phase of the project or task. The Final QA Plan incorporating applicable comments will be submitted within three (3) weeks after receipt of City comments. The QA Plan will be aligned with the SFPUC QA/QC Program and will identify MWH•URS's requirements and procedures for ongoing QA efforts, including the following:

2.1.1. Ensuring work products comply with applicable codes and standards and industry practices;

2.1.2. Planning and executing systematic activities necessary to provide the City confidence that the contract documents will meet the given requirements and objectives.

2.2. Implement QA Plan – MWH•URS MWH•URS will implement QA procedures uniformly for the planning and design phases of the project resulting in deliverables conforming to the standard of care of the industry with minimal construction change orders. Internal QA will be conducted prior to presenting deliverables to the SFPUC. Established QA procedures, to be employed by MWH•URS team members, will address the use of quality control review, calculation checking, design checking, AutoCAD (latest City version) reference to City Standards, interference checking, construction and operation issues, and other measures necessary to maintain a consistent, complete, high-quality, and compatible design. MWH•URS will establish QA procedures for successfully interfacing the planning and design with subconsultants and City personnel, including members of the Programmatic consultant and Biosolids Digester consultant.

2.3. Prepare Quality Control (QC) Plan –MWH•URS will prepare and submit a Draft QC Plan within six (6) weeks following NTP, for review and acceptance by the City. The plan will establish activities and procedures to be implemented during the execution phase of the project or task. The Final QC Plan incorporating applicable comments will be submitted within three (3) weeks after receipt of City comments. The QC Plan will be aligned with the SFPUC QA/QC Program and will identify MWH•URS's requirements and procedures for ongoing QC efforts including the following:

2.3.1. Operational techniques and individual activities that focus on controlling or regulating the planning and design processes to fulfill comparable industry standard requirements for quality. The focus is on preventing ineffective contract documents that can lead to defective construction of the project's infrastructure.

2.3.2. Procedures for reviewing, distributing, checking, tracking, controlling, and cataloguing all documents;

2.3.3. Procedures for resolving review comments; and

2.3.4. Procedures for coordinating with the City Project Team, SSIP Program Management Team (PMC), and any independent Technical Advisory Panel and Value Engineering Panel.

2.4. Implement QC Plan –MWH•URS will implement QC procedures uniformly for the project resulting in deliverables conforming to the standard of care of the industry with minimal construction change orders. At a minimum, internal QC will be conducted prior to presenting deliverables to the SFPUC (actual QC efforts of deliverable are included in budgets of related tasks). Established QC procedures, to be employed by all team members, will address the use of quality control review, calculation checking, design checking, AutoCAD (latest City version) reference to City Standards, interference checking, construction and operation issues, and other measures necessary to maintain a consistent, complete, and compatible design conforming to the standard of care of the industry. MWH•URS will establish QC procedures for successfully interfacing the planning and design with subconsultants and City personnel, including members of the Programmatic consultant and Biosolids Digester consultant.

Task 2 Dependency on other Tasks

Task 1 – Management and Coordination of Services

Task 2 Responsible Party
Project Manager

Task 2 Deliverables

2.A. Draft QA Plan, 3 hard copies and one copy in digital format, within six (6) weeks from NTP.

2.B. Final QA Plan, 3 hard copies and one copy in digital format, within three (3) weeks from receipt of City comments.

2.C. Draft QC Plan, 3 hard copies and one copy in digital format, within six (6) weeks from NTP.

2.D. Final QC Plan, 3 hard copies and one copy in digital format, within three (3) weeks from receipt of City comments.

2.E. Documentation of Monthly reports that document compliance with both the QA and the QC plans included with Monthly Progress Report from Task 1 for the duration of the planning and design phases of the Agreement (assumed 5.5 years, or ~66 reports), and with each project deliverable (i.e. QC reviewer signatures on forms for key project deliverables, etc.)

Task 3 - Review Background Information

3.1. Relevant Project Document Review - This task shall include reviewing relevant project documents from available sources. An allowance of four (4) meetings for ~two (2) people lasting for one (1) hour each is assumed to facilitate the collection of background information. Allowances for level of effort have been documented in this scope. MWH•URS shall review the following:

3.1.1. Relevant record drawings of Division Street Box Project, ca. 1960; It is assumed that the review shall require ~eight (8) people for ~two (2) hours per person;

3.1.2. Relevant record drawings of Channel Outfall Consolidation Project, ca. 1975; It is assumed that the review shall require ~eight (8) people for ~two (2) hours per person;

3.1.3. Relevant record drawings of Islais Creek Projects –Contracts A through E, ca. 1992; It is assumed that the review shall require ~eight (8) people for ~two (2) hours per person;

3.1.4. Relevant record drawings of Channel P.S., Bruce Flynn P.S. (formerly known as Rankin P.S.), Mariposa P.S., 20th Street P.S., and Headworks Lift Station and related facilities; It is assumed that five (5) packages shall be reviewed, each requiring ~eight (8) people for ~two (2) hours per person;

3.1.5. Relevant record drawings of Channel Force Main; It is assumed that the review shall require ~eight (8) people for ~two (2) hours each;

3.1.6. Draft Technical Memoranda for Wastewater Master Plan, 2008; It is assumed that the forty eight (48) Technical Memoranda shall be reviewed, each requiring ~eight (8) people for ~one and a half (1.5) hours per person;

3.1.7. Available geotechnical and hazardous materials investigation reports for the areas located in the vicinity of this project from SFDBI, SFPUC, and SFDPW libraries. Also any readily available geotechnical and hazardous material investigation reports from other public/private projects/entities; It is assumed that each report to be reviewed shall require ~eight (8) people for ~two (2) hours per person. A total of ten (10) reports are assumed;

3.1.8. Record drawings of other facilities located in close proximity to this project, including Caltrain and Caltrans; It is assumed that each facility record drawing review shall require ~eight (8) people for two (2) hours each. A total of four (4) record drawing packages are assumed;

3.1.9. Pertinent Stormwatch Reports, which summarizes City personnel's field observations of flooding during heavy storm events; It is assumed that each report to be review shall require ~eight (8) people for ~two (2) hours each. A total of four (4) reports are assumed;

3.1.10. General Plan, Zoning, Community Plan, other applicable plans and environmental documents including the Wastewater Enterprise (WWE) business plan, workforce and development plan, communication plan, security and emergency response plan, regulatory compliance plan, strategic plan, health and safety management system, asset management plan, and sustainability plan and program. It is assumed that each report to be review shall require ~eight (8) people for ~two (2) hours each. A total of twelve (12) reports are assumed;

3.1.11. Pertinent documentation relating to planned future infrastructure – specifically the high speed rail project. It is assumed that each document to be review shall require ~eight (8) people for two (2) hours each. A total of two (2) documents are assumed;

3.1.12. Regulatory permits and documentation – specifically the National Pollutant Discharge Elimination System (NPDES) permit and Municipal Regional Stormwater Permit. It is assumed that each document to be review shall require ~eight (8) people for ~two (2) hours each. A total of two (2) documents are assumed;

3.1.13. Adopted climate change policies and planning guidelines. It is assumed that each document to be review shall require ~eight (8) people for ~two (2) hours each. A total of two (2) documents are assumed;

Additional materials for review include, surveying data; aerial photos; topographic maps; right-of-way (ROW) maps; impact avoidance and mitigation studies; design and as-built drawings related to the existing facilities; and information related to environmental studies. It is assumed that each additional document to be reviewed shall require ~eight (8) people for ~two (2) hours each. A total of twenty two (22) documents are assumed;

Site reconnaissance and verification of existing site conditions and existing facilities/utilities may be required. MWH•URS will request and coordinate site entry through the Project Manager or Project Engineer. MWH•URS assumes ~four (4) site visits will be required, each expected to take up to ~two (2) hours for ~eight (8) staff.

Task 3 Dependency on other Tasks

Task 1 – Management and Coordination of Services
Task 2 – Quality Assurance/Quality Control

Task 3 Responsible Party

Project Manager

Task 3 Deliverables

3.A. Draft and Final Technical Memoranda confirming the adequacy and applicability of information presented in the background documentation; identifying data gaps that must be completed during planning and design phases of the project; and presenting a schedule and plan for recovery of the data gaps. If necessary, a recommended scope of work and budget to obtain additional data shall be submitted with the plan. Provide ten (10) hard copies and one (1) digital copy. MWH•URS will attend ~one (1) meeting to review draft deliverable comments and assumes ~ two (2) staff for four (4) hours.

Task 4 Develop Survey Information

MWH•URS will coordinate with the San Francisco Public Utilities Commission (SFPUC), San Francisco Department of Public Works (SFDPW), and Program Management Consultant (PMC) staff to provide survey data for all aspects of the Central Bayside System Improvement Project (Project).

Control Assumptions

Vertical - MWH•URS anticipate elevations will be based on the North American Vertical Datum (NAVD) 88 datum. The National Geodetic Survey (NGS) NAVD 88 has several benchmarks along the Embarcadero waterfront and near the Project site. There are also a series of first order NAVD 88 level runs through City benchmarks around the boundary of the Project. These two sources for NAVD 88 vertical datum elevations will be the basis for the projects vertical control. Digital level loops will be run between benchmarks to confirm compatibility.

Horizontal - It is our understanding that City uses EPOCH 1991.35 (NAD 83). However, MWH•URS can use available horizontal datum through EPOCH 2007.0 (NAD83).

The following are the responsibilities of MWH•URS under **Develop Survey Information**:

4.1. Visit site to verify existing field conditions of the project alignments and vicinity. MWH•URS *understands that although there are project alignments mentioned in the Proposal, the final alignment and necessary elements of the project may be a hybrid between alternatives or a new alternative altogether in order to reflect the findings/recommendations during the planning phase of this project.* An allowance of ~160 hours has been made for Engineer and Surveyor to view field conditions, including locating: a) CCSF benchmarks (if needed); b) target locations; c) aerial obstructions; d) specific detailed areas; e) ID high precision vertical control point locations; and, f) 3D/scan robotic features. An allowance of ~two (2) meetings for ~two (2) people, each lasting for ~three (3) hours each has been made as part of this ~160 hours.

4.2. MWH•URS will perform land surveys and aerial surveys and prepare maps for areas within the boundaries of Figure 4 (5.6 square miles) to develop topographic information for inclusion in background/contract drawings for the Project facilities for construction bids. The aerial limits will be expanded to include the entire Channel basin (13 square miles). Due to limitations of aerial flight methods, technical issues relating to the curvature of the earth, and safety concerns related to performance of additional static GPS sessions, the larger area aerial is recommended to be 1"=40' and have a 1-foot contour interval (while greater than the specified 0.5-foot contour

interval, the photogrammetry will obtain the desired top and base of curb elevations and be sufficient for hydraulic modeling). MWH•URS will work with the City for appropriate grid size, scale, and resolution. Topographic surveying is assumed to be no more than 20,000 LF of ROW needed total for project (including portals, pump station, open cut areas, connections and LID). In addition we will support City Real Estate staff with an allowance of ~320 hours for Surveyor, including ~two (2) people attending ~four (4) meetings, each lasting ~three (3) hours to provide legal descriptions for proposed alignment and establishing temporary (construction) easements, subsurface easements, and final easements. Surveying and mapping shall include hydrographic surveys to provide bathymetric data along the Tunnel alignments. MWH•URS understands that datum, scale, and contour interval of plots of survey information shall be reviewed, accepted, and approved by the City. We will provide necessary legal descriptions, recordation, and contract drawings to support design team for contract bidding. Survey field notes and data shall be submitted to the City. Field book entries shall be neat, legible, and sequential and include the names of crewmembers, date at the beginning of each day-entry, an index, and the serial number and type of instrument used. There is to be a maximum of one (1) horizontal setup per page. An allowance of ~four (4) meetings for ~two (2) people, each lasting for ~three (3) hours each has been made.

4.3. MWH•URS will perform a 3D laser/sonar robotic inspection of key infrastructure for , the Channel Pump Station influent chamber, Berry Box, Division Box, ICT Box, and the Bruce Flynn Pump Station influent chamber/sump. Information to be gathered will be the location of structure and access points, condition of structures, and dimensions of structures. Coordination with the City for confined space entry into a sewage environment will be necessary. An allowance of 3D scans for ~five (5) specific features/sites together with confined space entry has been made (supervised by SFPUC). An allowance of ~four (4) meetings for ~two (2) people, each lasting for ~three (3) hours each has been made.

4.4. MWH•URS will coordinate with and obtain necessary approvals from local agencies, private owners, and utilities through City representatives for survey work. In addition to those permits and agreements identified in Task 11, we will obtain access and/or permits required to accomplish Task 4.1 by completing and processing permit applications, and by providing technical support, as needed, to secure these permits. We understand that any costs for permits will be reimbursed back to MWH•URS with proper receipts/documentations via progress payments. We will work with City staff who will help support this task in addition to MWH•URS's own QA/QC process as dictated in Task 2, but overall responsibility of this task remains with MWH•URS. We assume that right of entry is provided for under the Code, and that coordination with property owners, scheduling crews and supervision will be provided by the City. An allowance of ~160 hours has been made for Surveyor to obtain approvals/access/permits for survey work. An allowance of ~four (4) meetings for ~two (2) people, each lasting for ~three (3) hours each has been made as a part of these ~160 hours.

Task 4 Dependency on other Tasks

Task 3 – Review Background Information

Task 5 – Develop Utility Information

Task 6 – Hydrological and Hydraulic Modeling Analysis

Task 8 – Channel Watershed Assessments & UWF Program

Task 12 – Tunnel Engineering

Task 13 – Pump Station/System Modification Design

Task 4 Responsible Party
Surveying

Task 4 Deliverables
4.A. Background Drawings – Provide background drawings, in both AutoCAD (latest City version) electronic format and hard copy, containing topographic information. For the drawing submittal, furnish two (2) bound full-size sets and one (1) set of the drawings in electronic AutoCAD (latest City version) format.

4.B Land and Aerial Survey Information – Submit ten (10) hard copies and one (1) electronic copy of survey field notes and data and other backup information used in developing background topographic drawings. Aerial imagery shall be provided at 1.0ft pixel size. Contours shall be provided at 1.0ft intervals. Breaklines for top of curbs, gutterline and driveways shall be provided in AutoCAD or Shapefile format.

4.C. Robotic Inspection – Provide three electronic copies of 3D laser/sonar robotic inspection video. Output shall be compatible with the land/aerial survey and AutoCAD application to be used to develop the contract drawings. Provide ten (10) hard copies and one (1) electronic copy of inspection report.

Task 5 Develop Utility Information

MWH•URS will work with the San Francisco Public Utilities Commission (SFPUC), and San Francisco Department of Public Works (SFDPW) to gather readily available utility information for analysis of alternatives for the Central Bayside System Improvement Project (Project). To inform the overall Project alternatives development and evaluation process, it is anticipated that utilities in the vicinity of each potential tunnel alignment, pump station location and Low Impact Development (LID) features, will be gathered in compliance with American Society of Civil Engineers (ASCE) Standard Guidance for the Collection and Depiction of Existing Subsurface Utility Data (ASCE 38-02).

Assumptions
- The SFPUC will collate and composite utility base maps of a level of detail commensurate with preliminary alternatives screening and evaluation (Level D and C).
- Key areas of concern related to each tunnel alignment and pump station location will be identified (e.g., shafts and gravity tie-in points, etc.) and evaluated for completeness. Through the alternatives evaluation process, as alternatives are brought forward to a "short-list," additional levels of detail will be developed (Level B and A) to allow for more detailed evaluation of needed utility relocations and/or replacement to support selection of preferred alternative(s) and ultimately design of the selected Project alternative.
- For critical areas, it is anticipated non-invasive (and possibly invasive-Level A) means of locating underground utilities will be performed and pot-holing used to obtain vertical and horizontal extent of utilities ("air-knife" in congested areas).
- With the information gathered from the utility agencies/purveyors and included in utility composite drawings, MWH•URS will support the City staff to verify location of utilities and facilities that may conflict with Project facilities. This is expected to require invasive (pothole-Level A) and/or non-invasive investigations of both City and private utilities/facilities.

City staff has the overall responsibility for gathering, identifying, and documenting all utility information for the utility composite drawings. City staff will coordinate with utilities to obtain existing utility records. The following are the support responsibilities of MWH•URS under this task during Planning and Design Phases.

5.1. Support City staff to perform field inspection/subsurface investigations as needed to verify location of utilities and facilities that may conflict with Project facilities. This will require pothole investigations of both City and private utilities/facilities. An allowance of Level B potholing by a vendor/subcontractor for ~25 locations has been made. These are assumed to be within the Right of Way (ROW) and include a hot patch repair.

5.2. Coordinate and provide design or design support for any required relocation of utilities or facilities (public or private). An allowance of ~940 labor hours has been made for design support to City based on an estimate of ~twenty (20) 25'x25' locations.

City staff will be responsible and provide oversight on this task in addition to MWH•URS's own QA/QC process as detailed in Task 2 to support the Task 5 deliverables.

Task 5 Dependency on other Tasks
Task 12 – Tunnel Engineering

Task 13 – Pump Station/System Modification Design

Task 17 – Engineering Support Services During Construction and Closeout

Task 5 Responsible Party
Utility Coordination

Task 5 Deliverables
5.A. Utilities and Facilities Coordination Technical Memorandum – Prepare and submit three (3) hard copies and one (1) text-searchable electronic copy of a technical memorandum package summarizing the results of utilities and facilities field location work. The technical memorandum and accompanying documents shall record field information on utilities and facilities that may conflict with the tunnel facilities. It shall identify and record existing and abandoned utilities and facilities, utilities and facilities requiring relocation, and proposed utilities and facilities that would be impacted by tunnel facilities construction or which may impact the completed tunnel facilities. The package shall include summary information and detailed field data that will be compatible with the software used for the design documents.

Task 6 Hydrological and Hydraulic Modeling and Analysis

City staff will be the lead and provide guidance and oversight for this task. MWH•URS will perform the task scope as identified below, which includes documentation and record keeping. The modeling effort shall follow established City modeling practices and focus on flooding issues associated with the sewer network and overland flow. The City's existing model network is comprised of manhole nodes, sewer links with standard and custom cross sections, weir links, pump links with pump curves or real-time-control rules, and additional flow, level, and rain gauges at various City facilities. The sub-catchment data contains initial hydrological parameters per Storm Water Management Model (SWMM) run-off

computational methodology of fast response run-off. The current modeling program allows for ESRI Geographical Information System (GIS), shape files and a Digital Terrain Model (DTM) to be incorporated into the plan view background. Therefore, shape files for City ROW, Street Names, Property Lines, etc., shall be incorporated. MWH•URS shall allocate one full-time Hydraulic/Water Resource Engineer and one half-time senior engineer through at least 35% Design (assumed to be a 36 month time allocation) to aid City staff in modeling work.

Hydrologic and Hydraulic Model Support – MWH•URS will provide one and one-half full-time Hydraulic/Water Resource Engineers to provide hydrologic and hydraulic modeling services to the City for a period of up to 36 months. Tasks to which the above modeling staff will perform work in support of the City and SSIP Program Management Consultant staff are listed in items 6.1 through 6.6 below.

6.1. **Flow Model for the Proposed Collection System** –MWH•URS will assist City and SSIP Program Management Consultant staff to define and implement a modeling program utilizing the City's existing model ("SSIP Hydraulic Model") for analysis, modeling and recommending hydraulic modifications necessary for (1) a fully redundant gravity conveyance to replace the existing 66-inch force main from CHS to the SEP; (2) validating the pipe network developed in the Channel Basin Urban Watershed study; and (3) achieving Project objectives as defined in **Project Background and Objectives**.

6.2. **Working with the City's SSIP Hydraulic Model** as a starting point, MWH•URS in support of the City and PMC staff shall confirm and justify the existing model to establish baseline. Simulation and meter results shall be compared on a flow, velocity, and depth basis. The calibration effort is not limited to changing existing hydrological or network inputs to the existing model but shall include reevaluating sub-catchment delineation work, loading locations, and coding of network elements including the following:

6.2.1. CSD (Combined Sewer Discharges, number of events and volume) performances of the Channel and Islais Creek Drainage Basins;

6.2.2. Hydraulic analysis of alternative alignments;

6.2.3. Sizes and Configuration of Transportation, Storage, and Junction Structures;

6.2.4. Tunnel Size(s) including auxiliary tunnel size(s) connecting to satellite pump stations;

6.2.5. Lift requirement between sump and headworks;

6.2.6. Revised dry weather and wet weather operational plans including existing and proposed Bayside Operational Plans for review and approval;

6.2.7. Boundaries will include the inlet and outlet of the Channel and Islais Creek T/S Facilities;

6.2.8. Relief for flooding areas within the Channel Basin.

The calibrated City model will be used to establish a baseline condition for the Central Bayside system. MWH•URS will document /validate pertinent baseline results including: CSD occurrences and volume; utilization of transport/storage structures; treatment volumes; pertinent dry and wet weather flow rates; and pertinent operational (RTC) parameters.

6.3. **Data Development** –MWH•URS will work with City and SSIP Program Management Consultant staff on the following:

6.3.1. 'Deleted';

6.3.2. Build and improve current underground pipe network model. Current network consists of 36" diameter pipes and larger;

6.3.3. Analyze and improve catchment delineations;

6.3.4. Analyze the current performance of the Sewer System, for both the hydraulics and hydrology. Recommend and develop a basin monitoring plan and/or pilot study (i.e., flow meters, air pressure sensors, level sensors, closed circuit television (CCTV)) that will be implemented during Design and Construction.

6.4. Coordinate with the SSIP Program Management team that is conducting the Bayside System evaluation and the watershed assessments and develop recommendations for design criteria and guidelines for the design of future facilities. Assess and share results with SSIP Program Management team to prevent duplication of work. MWH•URS will perform milestone review and provide input to City and SSIP Program Management Consultant staff on the Bayside system hydraulic modeling tasks.

6.5. Conduct additional modeling runs as necessary and pre-approved by City. Model runs provide hydraulic analyses for tunnel alignments; lift requirements for pump stations; LID implementation; and watershed assessment alternatives. Model results may aid in revisions to dry weather and wet weather operational plans including existing and proposed Bayside Operational Plans for review and approval; and planning for needed facilities and improvement projects including collection system, detention basins, RTC, LID, and pump stations modifications. This subtask will support alternative development and evaluation identified in Tasks 8.2, 8.3, 8.4 and 8.5.

6.6. Prepare, document, and record-keep hardcopies and electronic files of all alternatives performed for the duration of this task. End products will belong to the City.

The results of the analytic assessments will assist with the planning of needed facilities and improvement projects including: collection system, detention basins, Real-Time Controls, Low-Impact Design, additional pump stations, etc.

Task 6 Dependency on other Tasks

Task 7 – Advanced Numerical Modeling and Physical Modeling
Task 8 – Channel Watershed Assessments & UWF Program

Task 12 – Tunnel Engineering
Task 13 – Pump Station/System Modification Design

Task 6 Responsible Party

Hydraulic Modeling Task Leader

Task 6 Deliverables

City staff will provide oversight on this task in addition to MWH•URS's own QA/QC process as dictated in Task 2. Overall responsibility of this task remains with the City.

With the exception of design and construction support, the deliverables under this task shall be completed within the Planning Phase of this Project.

6.A. Detailed Drainage Modeling Work Plan for the Subject Collection System – This work plan is a City/PMC deliverable. MWH•URS will review and provide comments on the work plan to the City/PMC team.

6.B. **Modeling using the latest version of InfoWorks ICM (IW-ICM) (incorporates 2D surface modeling)** –MWH•URS will provide the flow model(s) of existing condition including surface runoffs, alternatives (preliminary runs), and preferred alternative (detailed runs). Model and all its data and results will become property of the City. Any use of such material outside of this project requires permission from the Project Manager.

6.C. **Draft and Final Hydraulic Report For Channel Watershed** –Led by MWH•URS, the report shall include all assumptions, profiles of proposed project area elements with HGL indicated, dry weather flow parameters, surcharge conditions, necessary operational changes including pumping schemes, tributary area map indicating loading locations, and summary table of all hydraulic elements 36-inches (or equivalent) and larger (e.g., HGL, Pipe Slope, size, percent capacity, flow rate, max/min velocity, etc.) The report is to provide backup to the City's final recommendation. The report shall include all assumptions, surcharge and air entrapment assessment of the tunnel element, Consultant-recommended scale profiles of proposed project area elements with HGL indicated, dry and wet weather flow parameters, necessary operational changes including pumping schemes, as well as methodology. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final report.

6.D. **Validation of Draft and Final Design Criteria Recommendations for the Channel Watershed System Assets** – This Design Criteria Recommendation report is a City/PMC deliverable. MWH•URS will review and independently validate this report which will include Real-Time Control strategies, monitoring requirements, and specific needs for the Bayside climate adaption in relation to the design elements of this project. This report will developed by the SSIP Program Management team and incorporated into the overall Citywide approach to sewer system management.

6.E. **Hardware and Software** – Furnish and install necessary workstations, servers, backup power, dedicated computer networks for subject task-if approved by City. No budget has been assigned for this item at this time.

Task 7 Advanced Numerical Modeling and Physical Modeling

MWH•URS will be responsible for performing state-of-the-art Advanced Numerical Modeling and Physical Modeling of the best apparent alternative and associated infrastructure (including microtunnels from satellite pump stations and drop structures).

A surge/transient hydraulic analysis for the proposed tunnel and the connected flow system are required to accurately predict all stages of the tunnel filling process, including the creation of pipe filling bores as the tunnel fills, locations of high transient hydraulic grade lines, locations where sub-atmospheric pressures can occur during filling, and the locations where air can potentially be trapped and vent may be required. Advanced numerical modeling combined with physical modeling necessary to evaluate the tunnel and pump station geometry and to determine whether peak dry weather inflows and wet weather inflows during extreme rain events would overwhelm the tunnel by trapping large packets of air that could push sewage to the surface, or cause flooding at the surface due to tunnel sloshing. The objective of this task is to predict potential adverse impacts of tunnel-filling surges and recommend design modifications to prevent them.

7.1. This task shall include determining the issues that traditional mathematical and/or hydraulic modeling cannot resolve, and for which advanced numerical analysis can be utilized for this project. The modeling shall address and provide recommendations for the following issues:

prevention of sediment buildup/movement in tunnel, pump station influent chamber, air and water flow surges in tunnel, vent locations, and any pertinent results from computer analysis and from Hydrological and Hydraulic Modeling and Analysis task. The task will include time for three (3)model runs of each structure and flexibility to optimize the initial advanced numerical dynamic models to final advanced numerical dynamic models to incorporate into design.

The development of the numerical modeling will be conducted in the following steps:

1. Develop basic dimensions of the hydraulic structures to be tested using CFD. These dimensions will be scaled from similar structures that we have designed previously. Six (6) structures have been allowed for.
2. Generate and run CFD models of each structure for a range of design flows and heads.
3. Evaluate results from CFD models and compare to design criteria.
4. Modify structures as needed and rerun models to develop a final preliminary design to be used in the physical models.
5. Develop ITM model of the tunnel, two drop shafts, two connecting structures, pump station and pump station discharge tunnel using the ITM model.
6. Run model for a range of flows and pumping scenarios.
7. Compare results to design criteria and modify design as required.

7.2. The task shall include physical model(s) of the proposed tunnel, new pump station influent chamber/sump, two connecting structures and two drop shaft structures~~,~~ for which hydraulic issues ~~that~~ cannot be resolved by advanced numerical modeling and/or computational analyzes from the Hydrological and Hydraulic Modeling and Analysis task(six (6) structures in total). Physical models shall complement advanced numerical modeling as a form of validation. The task will include time for three (3) model runs of each structure and flexibility to optimize the initial physical models to final physical models to incorporate into design.

The development of design for the tunnel, drop structures and connecting structures will be conducted in the following phases:

1. A one-day design workshop will be conducted to develop a conceptual design for the main drop structure at the upstream end of the tunnel. A second one-day workshop will also be conducted for the second drop structure and two connecting structures.
2. Using the physical model of the selected design a series of baseline tests will be conducted to evaluate the proposed system. We have assumed that up to six (6) flow rates should be adequate.
3. Modification testing will be conducted to develop a concept that provides stable hydraulics upstream and downstream of the drop shaft and help limit air entrainment into the system.
4. A one-day witness test of the model study would be conducted for SFPUC personnel following completion of design development testing. A "hands-on" demonstration of the initial design and proposed geometries will be tested for a range of flow conditions. Preliminary modification drawings will be presented at the witness test.
5. Detailed documentation tests will be conducted to document the proposed system under a full range of upstream inflow rates and downstream HGLs. We have assumed that up to eight tests should cover the range of flows.

Model testing for the new pump station influent chamber/sump will be conducted in the following phases:

1. Initial design testing will be conducted to evaluate the performance of the wet well. We have assumed six pump operating combinations will be conducted.
2. Design development testing will be conducted to correct any performance issues identified in Phase 1.
3. Final design testing will be conducted for the selected design over a full range of operating conditions. We have assumed that up to 12 tests will be adequate for this phase. Testing will also include self-cleaning testing to ensure solids deposition will be minimized.
4. A one-day model demonstration/witness test will be conducted at the end of design development testing so all interested parties can observe the operation of the model with the initially proposed design and with the recommended modifications in place.

City staff will provide oversight/review on this task in addition to MWH•URS's own QA/QC process as detailed in Task 2, but overall responsibility remains with MWH•URS. Physical modeling staff shall provide continued support throughout the detailed design phase.

For budgeting purposes and the preparation of the Overhead and Profit Schedule, an allowance of ~$1,000,000 has been provided for this task.

Task 7 Dependency on other Tasks

Task 6 – Hydrological and Hydraulic Modeling and Analysis

Task 12 – Tunnel Engineering

Task 13 – Pump Station/System Modification Design

Task 7 Responsible Party

Physical Modeling Task Leader

Task 7 Deliverables

7.A. **Advanced Numerical Model** –MWH•URS will provide the advanced numerical model(s) and results to the City. Model(s) and all its data and results will become property of the City. The model(s) shall be submitted in a form that the City can use to develop presentation videos. Any use of such material outside of this project requires permission from the Project Manager.

7.B. **Draft and Final Advanced Numerical Modeling Alternative Analysis Report** – MWH•URS will provide draft and final reports of the advanced numerical modeling analysis and alternatives to resolving the air surge and transient flow issues. The report will include an executive summary, introduction and background, model development, assumptions, model results in tabular and graphical format, conceptual hydraulic drawings of the basic layouts developed, conclusions and recommendations. Reports shall include discussion of methodology, digital photo, and video files of the rapid filling, and its effects on the system. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

7.C. **Physical Modeling for Tunnel** – Construct physical model(s) of the proposed tunnel, two connecting structures and two drop shaft structures which will include, vents, and other pertinent elements as described in this task.-to illustrate certain situations in regards to potential transient and air surge issues at the drop inlets. Ten (10) hard copies and one (1) text-searchable electronic copy

of draft and final reports will be provided prior to 65% Design or other intermediate design submittal as agreed upon with City staff. Deliverables will also include video and photo files necessary to illustrate the recommendations of MWH•URS. The reports will include an executive summary, introduction and background, model scaling, assumptions, test procedures, test results, model drawings, conceptual hydraulic drawings of any recommended modifications, conclusions and recommendations.

7.D. Physical Modeling for Pump Station Inlet Chamber/Sump – Construct physical model(s) of the transition between the tunnel outlet to the pump station influent chamber/sump as necessary. The physical model should demonstrate the movement of grit to the pumps, sump, and air issues that may relay back into the tunnel itself. Ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports will be provided prior to 65% Design or other intermediate design submittal as agreed upon with City staff. Deliverables will also include video and photo files necessary to illustrate the recommendations of MWH•URS. The reports will include modeling methodology, scaling, performance criteria, testing results, and conclusions and recommendations. Conceptual drawings of any modifications will accompany the report.

Task 8 Channel Watershed Assessments and Urban Watershed

The following tasks will contribute to an Urban Watershed Framework (UWF) process for determining Channel Watershed collection system project alternatives.

8.1 Review Existing Channel Watershed Information – MWH•URS will work with City staff and the SSIP Program Management Consultant to review and understand the framework and tools pertaining to the Channel Watershed. The focus of the review shall include:

8.1.1. 'Deleted';

8.1.2. **'Deleted'**;

8.1.3. Review existing system hydraulic model simulation results provided by the City staff and the SSIP Program Management Consultant;

8.1.4. **'Deleted'**;

8.1.5. **'Deleted';**

8.1.6. **'Deleted'**;

8.1.7. **'Deleted'**.

8.1.8. Review PUC Urban Stormwater Management Program documents and projects including reports, facilities, website, Charettes, rainwater harvesting, Stormwater Ordinance, etc.)

8.1.9. Conduct a gap analysis of City/PMC Watershed Assessment Task deliverables to determine missing data and areas where additional data is required.

8.1.10. Review Technical Memoranda and Reports prepared by the City and SSIP Program Management Consultant for the Channel, Islais and North Shore watersheds. Assume up to six (6) Technical Memoranda / Reports.

Subtask 8.1 Dependency on other Tasks

Task 3 – Review Background Information

Task 6 – Hydrological and Hydraulic Modeling Analysis

Subtask 8.1 Responsible Party

Assessment

Subtask 8.1 Deliverables

8.A. **Provide a Technical Memorandum** of the existing watershed information findings and gap analysis of Task 8.1. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final documents by an agreed upon date with City staff and SSIP Program Management Consultant.

8.2. MWH•URS will participate in workshops led by City staff and the SSIP Program Management Consultant for the hydrologic and hydraulic watershed assessment for the Channel Watershed. The assessment will consider the current and future performance of the combined sewer system to reduce flooding and CSDs in the Channel Watershed and resolve the operational, reliability, and maintenance issues and performance gaps. Project Alternatives that include both "green" and "gray" projects will be developed that comply with the SSIP's goals and levels of service and PUC's Sustainability Plan tenets. In cooperation and consultation with City staff and the SSIP Program Management Consultant:

8.2.1 'Deleted';

8.2.2 It is understood that the SSIP Program Management Consultant will be conducting a monitoring program within the Channel Watershed. The results of this program will be reviewed and recommendations will be developed for additional monitoring if necessary.

8.2.3 It is understood that the SSIP Program Management Consultant will update where there are areas of concern for excess water during storm events and develop future predictions based on climate change for a 50- and 100-year outlook. The results of this analysis will be reviewed in the context of the Channel Watershed and comments provided to City staff and the SSIP Program Management Consultant;

8.2.4 Review milestone deliverables of the City/PMC Bayside Watershed System evaluation and the watershed assessments of the North Shore, Channel, and Islais Creek Watersheds. The Program Management Consultant will be revisiting the design criterion for storms and developing recommendations for the design criteria for Sewer System assets; Real-Time Controls strategies, monitoring requirements, and specific needs for the Bayside and Oceanside sea level rise and climate change adaptations. The Program Management Consultant will develop recommendations for design criteria and guidelines for the design of all future wastewater facilities. They will be developing the Central Bayside System Improvement Project design criteria and guidelines and providing this information to MWH•URS. The design criteria and guidelines are to be validated by MWH•URS

8.2.5 Coordinate and conduct additional hydraulic modeling runs under Task 6;

8.2.6 Identify opportunities and challenges for the Channel Watershed –MWH•URS shall participate in workshops with City staff and the SSIP Program Management Consultant to review and provide input to green and grey infrastructure opportunities for the Channel Watershed.

8.2.7 Removed (per Addendum 2, issued 10/25/2011)

8.2.8 'Deleted'.

Subtask 8.2 Dependency on other Tasks

Task 1 – Management and Coordination of Services

Task 2 – Quality Assurance/Quality Control

Task 14 – Technology Transfer

Task 18 – Community Benefits Commitments

Subtask 8.2 Responsible Party

Assessment, Implementation Plan, and Value Engineering

Subtask 8.2 Deliverables

8.B. Review Technical Memoranda/Reports prepared by the City and SSIP Program Management Consultant that document the efforts/results of all 8.2 subtasks.

Expected City and SSIP Program Management Consultant documents include following components:

- Bayside Watersheds Hydrologic and Hydraulic Assessments
- Bayside Watersheds Impact of Climate Change Assessments
- Bayside Watersheds Monitoring Program
- Bayside Watersheds Design Criteria and Guidelines
- Bayside Watersheds Challenges, Characterization, Opportunities, Alternatives, Recommendations ,

8.3 Propose and perform pilot studies and field investigations to test for feasibility and performance of Low-Impact Design alternatives within the Channel Watershed. MWH•URS will determine the final locations and LID design elements with the consideration of the recommendations and design guidelines from the Urban Watershed Assessment.

Subtask 8.3 Responsible Party

LID Pilot, Design, Implementation Plan, and Utility Coordination

Subtask 8.3 Dependency on Other Tasks

This task will rely on the other subtasks of Task 8 particularly Subtask 8.2 and Subtask 8.6 as well as Task 6 – Hydrological and Hydraulic Modeling and Analysis.

Other task dependencies include:

Task 1 – Management and Coordination of Services

Task 2 – Quality Assurance/Quality Control

Task 3 – Review Background Information

Task 15 – Communication and Public Outreach

Task 18 – Community Benefits Commitments

Subtask 8.3 Deliverables

8.C. Provide work plan for pilot Low Impact Design study of Task 8.3. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final documents by an agreed upon date with City staff and SSIP Program Management Consultant.

The main subtask deliverable will be TM 8.C LID Pilot Work Plan including the following components:

- Preliminary screening document identifying "long-list" of candidate pilot studies (five (5)), their expected value and "short-list" recommended for further consideration (three (3) maximum)
- Status report of available background information, more specificity on pilot study LID/BMP features and updated "short-list" of pilot tests for further consideration
- Gap analysis findings and recommendations for field investigations to close gaps and refine candidate pilot studies
- Preliminary model output summarizing assumed pilot study benefits as measured by flow rate and volume reduction
- Decision support report, including updated model output confirming expected performance of pilot study suitable for detailed review prior to approving performance of field investigations
- Findings report for field investigations and recommended updated "short-list" of candidate pilot studies and refined decision support report for selection of candidate pilot study for implementation plan preparation
- Implementation plan summarizing more detail on recommended pilot studies (two (2) maximum), including more detailed cost estimates for support final selection of pilot studies for preparation of construction documents (primarily prepared by City, with support from MWH•URS)
- Support City (DPW) in preparation of construction documents suitable for bidding for two (2) pilot studies
- Support City (DPW) in preparation of O&M Plan including roles and responsibilities of City staff, documentation requirements, period of operation, sampling and analysis for water quality, and monitoring for flow rate and volume

8.4. Conduct Alternative Development and Screening – The SSIP Program Team and the SSIP Program Management Consultant shall develop a wide range of project alternatives utilizing information obtained from the watershed assessments and a public outreach process and include both "gray and green" projects. MWH•URS shall review and provide input to project alternatives through a series of workshops and meetings. The project alternatives will be developed into strategies to improve stormwater management including: collection system storage and low impact design elements for runoff modification, stormwater retention, and infiltration. Projects will be bundled so that SSIP goals and levels of service are met within each alternative and benefits optimized. MWH•URS shall independently validate the project alternatives for the

central bayside system. The project alternatives should incorporate the planning of needed facilities and improvements to the Channel Watershed including: collection system pipelines/tunnels, transport/storage structures, distributed detention facilities, Real-Time Controls, low-impact design (green infrastructure), pump stations.

As part of this effort, MWH•URS shall independently validate alternatives in relation to operational optimization and integration with the central bayside system. This will include: locations and strategies for identified local and global Real-Time control opportunities, the definition, validation and justification for conceptual alternatives, the evaluation of alternatives including a trade-off analysis with system wide life cycle cost estimates, the implementation plan complete with instrumentation and control specifications and cost estimates.

MWH•URS will analyze the optimization of three (3) alternatives of tunnel size and configuration (including baseline). This will be based on modeling runs for the typical year (limited to events with CSDs under baseline conditions) and for two (2) other design events (e.g. 5-year event, 3-hr duration). The main design and optimization criteria for the tunnel operation will be the number and volume of CSDs and the prioritized location of CSDs (no water quality criteria).

An optimization goal will be to maximize the use of storage capacity in the tunnel for CSD management including: lower the number and volume of CSD events, prioritize the location of discharges to protect most sensitive areas, increase WWF volume receiving full treatment, integrate water quality and pollution loading of discharges in control objectives and operation strategy. An additional optimization goal will be to maximize the use of storage capacity in the tunnel for flood relief including: shaving of critical flow peaks, lowering of critical HGL in the collection system, minimize sizing volume by diverting flow at the most favorable moment (only when peak shavings is required).

Optimization variables to be considered include: the location of flow control structures (to the tunnel at the main junction with the Channel T/S, with a potential connection with the Islais Creek T/S, at connections to upstream main collection trunks of the 3 watersheds), flow rates and distinct and optimized operating strategies for the different goals/situation (CSD Management, flood relief, standardization of operating procedures), coordinated controls to maximize use of available capacity and performance (flow diversions to the tunnel, filing rate and use of storage capacity of the tunnel, filing rate and use of storage/conveyance capacity of the T/S boxes, dewatering of the major facilities and treatment at SEP).

The list of project alternatives will be screened by the City/PMC to a set of feasible alternatives by conducting a thorough UWF triple bottom line and benefit/cost analysis. As such, this subtask may require reviewing industry/academia studies and project-specific data to identify and prioritize feasible projects for solving the Channel Watershed stormwater challenges. MWH•URS shall independently validate the feasible alternatives for the central bayside system.

MWH•URS will review Technical Memoranda and reports prepared by the SSIP Program Team and the SSIP Program Management Consultant and provide feedback and comments on screened alternatives.

Subtask 8.4 Dependency on other Tasks

Task 1 – Management and Coordination of Services

Task 2 – Quality Assurance/Quality Control

Task 15 – Communication and Public Outreach

Task 18 – Community Benefits Commitments

Subtask 8.4 Responsible Party

Cost Benefit Analysis, Alternative Screening, and Project Controls

Subtask 8.4 Deliverables

The work products from Subtask 8.4 will be incorporated in the deliverable provided in Subtask 8.5.

8.5 **Refinement of Project Packages** – The project packages identified within the list of feasible alternatives will be reviewed and refined through an outreach effort to incorporate input from other SFPUC projects, other City departments, financial evaluation, and the public. A Final Project Report recommending the final project alternative consisting of a variety of "gray and green" projects will be prepared. This report shall also include: the definition and assessment of different operating strategies and flow control opportunities; optimized alternatives considering the coordinated control of major facilities in the future Bayside system (the tunnel, the Transport/Storage boxes (especially the Channel and Islay T/S boxes) and the major pump stations feeding the SEP), definition of a standard operating procedure for the tunnel within the future Bayside system.

Subtask 8.5 Dependency on other Tasks

Task 1 – Management and Coordination of Services

Task 2 – Quality Assurance/Quality Control

Task 15 – Communication and Public Outreach

Task 19 – Environmental Planning Service (Optional)

Subtask 8.5 Responsible Party

Cost Benefit Analysis, Alternative Screening, and Project Controls

Subtask 8.5 Deliverables

8.D. **Provide Alternative Development/Screening Report and Final Project Report** as described in Tasks 8.4 and 8.5. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final documents by an agreed upon date with City staff and SSIP Program Management Consultant.

8.6 **Achieve Public Consensus** –MWH•URS shall support the City's outreach efforts to Channel Watershed stakeholders to reach consensus on the recommended projects. At specific junctures during the assessment process, the Project Team will be engaging neighborhood stakeholders because the solutions may require major infrastructure changes that will be noticeable to and potentially inconvenience the public. This effort is part of and not duplicative of Task 19.

Subtask 8.6 Dependency on other Tasks

Task 1 – Management and Coordination of Services

Task 2 – Quality Assurance/Quality Control

Task 19 – Environmental Planning Service (Optional)

Subtask 8.6 Responsible Party

Project Manager

Subtask 8.6 Deliverables

The main deliverable of this subtask will be the support to the SFPUC public outreach program. This will include the preparation of the consultation record.

8.7. **Develop Implementation Plan** –This work shall be closely coordinated with City staff and the SSIP Program Management Consultant. The implementation plan will be result from the cumulative efforts of the prior subtasks and will identify the recommended scope, sequence, and budget of the recommended project alternative for the Channel Watershed. The recommended project alternative will be subject to review, comment and agreement by the City Staff and the Program Management Consultant to evaluate Life-Cycle Costs, Benefits, Value Engineering, and Implementation. The Implementation Plan shall ultimately be incorporated into the CER as described in Task 11. The Implementation Plan shall provide a practical Green Infrastructure Program that is compatible with San Francisco's hydrology, hydraulics, topography, hydrogeology, and combined sewer system. The Plan and Program shall also incorporate input from pertinent City social, environmental and community organizations to enhance neighborhood involvement and public knowledge of the interactions between Low Impact Development and the City's combined sewer system.

Subtask 8.7 Responsible Party

Assessment

Subtask 8.7 Dependency on other Tasks

Task 1 – Management and Coordination of Services

Task 2 – Quality Assurance/Quality Control

Task 11 – Permitting and Agreements

Task 12 – Tunnel Engineering

Task 13 – Pump Station/System Modification Design

Subtask 8.7 Deliverables

8.E. **Provide the Implementation Plan** as described in Subtask 8.7. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final documents by an agreed upon date with City staff and SSIP Program Management Consultant.

8.8 **Perform Channel Watershed Project Design** –MWH•URS shall perform design of initial green infrastructure elements as identified in the Green Infrastructure Program. Provide plans and specifications with cost estimates at approximately 35, 65 and 100 percent levels of completion. Plans and specifications shall be prepared in a format as specified by City. For each submittal, provide written responses to City review comments and incorporate appropriate changes to plans and specifications based on review comments. Work with City staff to complete preparation of Special Provisions, and Divisions 0 and 1 of the project specifications including, but not limited to, providing technical project requirements, schedule requirements and constraints. Contract drawings shall be in a format as specified by City.

Subtask 8.8 Dependency on other Tasks

Task 1 – Management and Coordination of Services

Task 2 – Quality Assurance/Quality Control

Task 11 – Permitting and Agreements

Task 12 – Tunnel Engineering

Task 13 – Pump Station/System Modification Design

Subtask 8.8 Responsible Party

LID Pilot, Design, Implementation Plan, and Utility Coordination

Subtask 8.8 Deliverables

8.F. Provide Channel Watershed Green Infrastructure Program design contract documents, as described in Subtask 8.8, by an agreed upon date with City staff and SSIP Program Management Consultant.

8.G. Provide necessary design documents for recommended green projects as defined in the implementation plan and Subtask 8.8 above. Refer to General Obligations for design milestones and required submittals.

Task 9 Geotechnical and Hazardous Material Investigation

The overall task will be to assess the geology, geotechnical, and groundwater conditions along the various alignments and to determine the required design parameters.

The geotechnical investigation and site characterization program for the entire project, including City's/other agencies' ROW shall include the items listed below. Due to possible hazardous underground

soil, groundwater issues, and the monitoring wells, MWH•URS will prepare a report in accordance with the standard engineering practices and will provide the one or two best alternatives to City on mitigating geotechnical and hazmat issues as needed. Two potential alignments (a western, hard-ground route and an eastern, soft-ground route) may be carried through the CEQA process.

- In Phase 1, MWH•URS will acquire, assemble, and review all available geotechnical information within the project limits. Phase 1 is not intended to involve any fieldwork, but rather will be a desktop study. The goal will be to summarize and present, in a single concise document, relevant information obtained from review of: 1) drawings and reports relative to the design and construction of the existing facilities, and 2) geotechnical information from previous reports associated with conceptual design of the Channel Tunnel. This document will be prepared for internal use by the Design Team and the SSIP Program Management Consultant. The objective is to review and document this information for use in planning the field investigations, and to catalogue this information for use throughout the Design Phase of the project.
- A field exploration program will be developed and described in a Geotechnical & Hazardous Material Investigation and Site Characterization Phase 2 Work Plan to obtain the missing geotechnical/hazardous material information. In Phase 2, MWH•URS will implement the Geotechnical & Hazardous Material Investigation and Site Characterization Phase 2 Work Plan to obtain the geotechnical/hazardous material information. The findings will be taken into consideration for the paring down of alternatives to one (or two) alignments.
- In Phase 3, MWH•URS will implement a Phase 3 Work Plan by conducting a detailed field investigation to accurately determine the geotechnical parameters of the preferred alignment(s) for the design effort.

9.1. Site exploration will include drilling and sampling boreholes, test pits, cone penetration tests, sampling for soil and groundwater corrosivity tests, sampling for presence of hazardous materials in soil and groundwater, and installation of groundwater observation wells. Site services will include in-situ testing and monitoring including, but not limited to, groundwater monitoring, hazardous gas monitoring and testing, hazardous materials testing, and hydraulic conductivity testing. MWH•URS will perform initial assessment of all alternatives in Phases 1 and 2. A detailed investigation and assessment for the preferred alignment(s) will be necessary in Phase 3. Groundwater data from wells and piezometers will be collected by MWH•URS on a quarterly basis during Phases 2 and 3. We assume that the City will collect such data thereafter unless it authorizes MWH•URS to continue to do so.

MWH•URS will conduct a preliminary physical features survey to identify and characterize all existing surface structure and underground utilities that may be impacted by tunnel construction. Available GIS mapping will serve as the base map for the condition survey. Each feature will be numbered on the mapping and documented in standardized reporting forms with references and photo documentation.

The Phase 1 studies will include aerial photo and literature reviews. The Phase 2 and 3 investigation proposed to collect more data will include: core-hole drilling and groundwater monitoring using installed piezometers. We will augment these investigations with vane shear tests and Cone Penetrometer Tests (CPTs). In-situ tests will include pressure meter tests, packer tests, slug tests, step drawdown tests. Downhole suspension logging will be performed. We propose to stagger the spatial distribution of the Phase 2 investigations so that the data collected encompasses several potential alignments (e.g., western inland routes that pass primarily through bedrock versus eastern shoreline routes that pass through softer sediments) as well as potential microtunnel routes. The Phase 3 investigations will then strategically be positioned to fill in data gaps on up to two preferred alignments.

A total of ~80 geotechnical soil borings are estimated for this study (30 during Phase 2 and 50 during Phase 3) at a spacing of roughly 250 to 500 feet on-center, including additional borings at major crossings and potential shaft locations. The borings will likely be drilled to depths of approximately 60 to 120 feet. In soils, the borings will be advanced with mud rotary drilling techniques. Soil sampling will be performed at five-foot intervals using SPT, modified California, and Shelby tube sampling techniques. Continuous sampling may be employed in the tunnel horizon. In rock, HQ-3 wire line coring methods will be used to achieve optimum recovery and quality in the rock core. MWH•URS will notify Underground Service Alert (USA) and hire a private locator prior to drilling to clear potential buried utilities.

9.2. Laboratory testing will include material gradation and strength, index property testing, and testing for hazardous materials to assess soil and groundwater handling and disposal requirements and to assess the nature and extent of hazardous gases.

The laboratory testing program in rock will include: Point Load Index, Unconfined Compressive Strength, Indirect Tensile Strength, and Slake-Durability tests. The laboratory testing program in soil will include: Atterberg Limits, Strength, Sieve Analysis, Moisture Content, Compaction, and Corrosion tests. The groundwater testing regime will include Corrosion, General Minerals, and Metals tests.

9.3. Provide assessment of seismicity to the design of the tunnel and its associated infrastructures (proposed and existing).

Probabilistic and deterministic analyses will be performed to develop appropriate ground motions. Seismic design considerations include: fault offsets and fault crossings, axial deformation, axial bending, and ovalling of the conveyance system itself. Strong ground shaking caused by large earthquakes can induce ground displacement and/or failure such as liquefaction, compaction settlement, and slope movement. The site's susceptibility to these hazards will be evaluated.

9.4. Perform all related necessary investigations, administrative applications, submittals, and reporting in accordance with the Maher Ordinance requirements within areas of the Maher Ordinance. Documented information will be evaluated and formatted such that potential requirements for off-site disposal of soil generated during future construction activities at the site are identified with recommended mitigation measures during construction if necessary, to protect workers and the public from exposure to hazardous chemicals.

Waste Management regulations (also known as the Maher Ordinance requirements) will need to be addressed. Environmental issues along the route will be addressed as follows:

Environmental Site Assessment (Pre-Planning Phase)

MWH•URS would retain Environmental Data Resources (EDR) to conduct an environmental regulatory agency data base search for the proposed multiple routes to identify historical and current contamination along the various alternate routes. MWH•URS staff trained in site review techniques would review the database search and develop a draft, draft final, and final Environmental Site Assessment (ESA). The ESA report would identify and tabulate environmental issues along each alternate route to facilitate evaluation of the best alternate route (or routes). MWH•URS would submit the draft ESA report to the City for review and comment. The City's comments would be incorporated into the final draft ESA report. The draft final ESA report would be provided to the San Francisco Department of Health and other regulatory oversight agencies, as needed, for review and comment. Agency comments would be incorporated into the final ESA report.

Supplemental Fieldwork at Potential Shaft Locations (Planning Phase)

During the basin-wide geotechnical investigation in Phase II (Planning Phase), environmental samples will also be collected and analyzed for HazMat constituents.

HazMat Site Investigation Workplan, Fieldwork, and Reporting (Pre-Design Phase)

Once the final route (or routes) is determined, MWH•URS would develop a draft, draft final, and final investigation plan to further evaluate that route's soil and groundwater contamination issues identified in the Pre-Planning Phase ESA report. MWH•URS would submit the draft investigation workplan to the City for review and comment. The City's comments would be incorporated into the final draft investigation workplan. The draft final investigation workplan would be provided to the San Francisco Department of Health and other regulatory oversight agencies, as needed, for review and comment. Agency comments would be incorporated into the final workplan report. A site specific Health and Safety Plan would be developed for the HazMat investigation staff based on the route contaminants identified in the ESA report. A database would be set up to manage the incoming soil and groundwater data, and a SharePoint site will be set up to handle project documents and MWH•URS /client communications.

Our environmental soil and groundwater investigation will be over an approximately 2 mile eastern soft-ground alignment; we understand that the western alignments will be predominantly in bedrock and thus we have not included borings in that area. Environmental punch-core borings will be advanced at tunnel shaft, intermediate shaft, microtunnel pit and/or open-cut locations. Borings will be advanced to appropriate depths (typically 40 feet), or until groundwater is encountered. Nine soil samples and one groundwater sample will be collected from each boring. Additional naturally-occurring asbestos (NOA) samples will be collected and analyzed from the geotech borings using polarized light microscopy (PLM).

MWH•URS would implement the investigation work plan as follows:

- Retain: drilling, traffic control, and third party underground utilities sub-contractors; and an analytical laboratory. Note the HazMat investigation drilling and traffic control would be coordinated with the geotechnical field work to the maximum extent possible.
- Locate and mark boring/sampling locations.
- Notify USA of the route so that local utilities can mark their infrastructure.
- Conduct a third party utility survey of the proposed drilling locations. Some locations may be moved due to utility conflicts or safety issues.
- Obtain required permits from the City and County of San Francisco, including boring and encroachment permits.
- Coordinate private party parcel access, if needed.
- Implement the field work portion of the sampling and analysis plan.
- Evaluate the data for QA/QC purposes, enter into a project specific database and set up a SharePoint website to facilitate team data access.
- Characterize the soil for reuse and/or disposal profiling and worker protection, including NOA handling and management.

9.5. Develop and conduct a study to assess mechanized excavation by tunnel boring machine or other trenchless operation methods as well as open-cut operation for the entire project. The study will include appropriate laboratory testing of the materials for any type of mechanized excavation method considered by MWH•URS. Other than laboratory testing, the results of the study will be presented in a technical memorandum that will not be incorporated as a bid document.

Specialized testing to evaluate rock mass borability and ripability will include: Cerchar Abrasivity Index, Punch Penetration, and Total Hardness tests along with Thin Section Petrographic Analysis. Brazilian Tensile Strength and Uniaxial Compressive Strength (UCS) tests will be performed.

9.6. Perform a geoarchaeological sensitivity analysis for buried archaeology in conjunction with geotechnical and other subsurface investigations to realize efficiencies of desktop and field investigation methods.

Due to the nature of historical development and urban fill within the project area, there is the potential for encountering and disturbing buried historic-era archaeological deposits, as well as prehistoric archaeological sites, not evident at the surface. Some of the data acquired through the geotechnical and hazardous materials assessments are directly applicable to the assessment of archaeological sensitivity within the project alternatives. In an effort to ensure compatibility of acquired data, and reduce redundant efforts over the course of project planning, permitting, and implementation, URS archaeologists will work directly with the geotechnical team to develop appropriate investigation techniques.

- Review georeferenced Historic Fire Maps (Sanborn Maps)
- Conduct records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System
- Review existing archaeological reports and Quaternary geological maps
- Conduct subsurface Geoprobe investigation. Geoprobes will be placed in sensitive locations throughout the Project area. For the Pump Stations and Channel Tunnel access areas it is anticipated that a portion of the Geoprobe borings conducted for the hazardous materials analysis will be useful for the geoarchaeological sensitivity analysis as well. It is anticipated that a maximum of 15 additional borings may be necessary across the project area to better characterize the geoarchaeological/archaeological sensitivity.
- Analyze the continuous soil profile within areas and depths of potential disturbance and focus on the identification of paleosols (buried soils) that are of appropriate age, depositional setting, and lateral extensiveness to have an increased sensitivity for containing buried archaeological deposits.
- Core sampling will serve the dual purpose of assessing near-surface conditions (i.e., historic fill, as described above) and will be sited in areas determined through archival research as being potentially sensitive for historic-era deposits.

Task 9 Dependency on other Tasks

Task 6 – Hydrological and Hydraulic Modeling and Analysis

Task 10 – Prepare Planning Reports

Task 11 – Permitting and Agreements

Task 12 – Tunnel Engineering

Task 9 Responsible Party

Geotechnical Task Leader

Task 9 Deliverables

The following deliverables shall be provided during the Planning effort, in which all alignments will be explored. This includes a reconnaissance level analysis as part of the Planning documents for any alignments that may result in impacts that would be difficult to mitigate (i.e., permitting, cost, or time):

9.A. **Draft and Final Data Report on the Phase 1 Investigation** –The report will include all the geotechnical evaluation information as appendixes. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final report.

9.B. **Draft and Final Geotechnical & Hazardous Material Investigation and Site Characterization Phase 2 Work Plan** – This Work Plan will describe the Phase 2 geotechnical and hazardous material investigation and site characterization program for all project alternatives. The Plan will include the number of borings, the necessary depths, boring locations testing methods and protocols, and a number of contingency borings in case additional boring information is required during Planning. Applicable portions of the Plan will provide sufficient detail for obtaining permits for fieldwork and for use by public information staff to notify affected public in advance of fieldwork. The Plan will incorporate all available geotechnical information from previous studies and investigations, including groundwater investigations, geotechnical reports, and records from other regulatory agencies' files. This Work Plan will be reviewed and accepted by the City prior to proceeding with the program work. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final work plans.

The Work Plan will be prepared to address the following topics:

- Introduction, project team, background information and scope of geotechnical and hazmat investigation;
- Right-of-way and environmental requirements;
- Objectives and key geotechnical and HazMat issues for the project;
- Scope of work and approach for investigating and characterizing the site conditions; and
- Field procedures to be used during the investigations to insure required information is obtained in a consistent manner.

As part of the Work Plan task, a separate site specific Health and Safety Plan addressing health and safety issues and procedures for personnel completing field activities will be prepared. Best Management Practices (BMP's) will be utilized for erosion and sediment control at all sites where ground disturbing activities take place.

9.C. **Draft and Final Geotechnical and Hazardous Material Investigation and Site Characterization Phase 2 Data Report (GDR)** – The report will provide factual data and information obtained from the Phase 2 geotechnical and HazMat investigation efforts. The Phase 2 GDR is to provide information for screening of alternatives. This report will eventually be included along with the Phase 3 GDR into the construction documents package for contractor use. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

The report will include an overview of the geologic setting, plus a summary of the site exploration program. The GDR (or GDRs, depending on the number of alignments carried forward) will discuss geotechnical and HazMat test procedures and standards, borehole logging standards, and the approach to selecting the number, location, and depth of borings. Verification

of the borehole selection will be given by comparison with reported geotechnical industry practice. Data will include borehole logs, core photos, and field and laboratory test results. Rock mechanics data will be presented to be used in assessments of the rock properties, especially to characterize the weak rock units and provide data for tunnel excavation and support design. Other geotechnical data, obtained from the background review will be presented.

9.D. Draft and Final Preliminary Hazardous Materials Assessment –This preliminary assessment report is to provide estimated locations of soils and groundwater containing hazardous constituents for all the alternative alignments. The report will address handling, treatment, storage and disposal of excavated materials for each alignment. The information in this report will be taken into consideration during the alternatives screening process.

9.E. Other Reports within Planning Phase – Other reports may be requested depending on geotechnical evaluations and recommendations. Such reports will address settlement estimates and monitoring or other measures identified by MWH•URS or City.

A Geoarchaeological Sensitivity Analysis Report, documenting the findings of the archaeological desktop analysis and subsurface field investigation, will be provided to identify the locations of known archaeological sites as well as assess the sensitivity for archaeological sites to be present within areas likely to be disturbed by the proposed tunnel alignments. The report will contain sensitivity maps of the project alternatives and will be suitable for use in the future preparation of an Environmental Impact Report for the proposed project.

The following deliverables will be provided during the Pre-Design Phase for the chosen alignment(s):

9.F. Draft and Final Geotechnical & Hazardous Material Investigation and Site Characterization Phase 3 Work Plan – This Work Plan will describe a supplemental geotechnical investigation and site characterization program for the preferred alternative(s). It will include the number of borings, the necessary depths, boring locations, testing methods and protocols, and a number of contingency borings in case additional boring information is required for the Design effort. Applicable portions of the plan will provide sufficient detail for obtaining permits for fieldwork and for use by public information staff to notify affected public in advance of fieldwork. This Work Plan will be reviewed and accepted by the City prior to proceeding with the program work. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final plans.

9.G. Draft and Final Geotechnical/Hazardous Material Investigation and Site Characterization Phase 3 Data Report (GDR) – This report will provide factual data and information obtained from the Phase 3 geotechnical and hazmat investigation efforts. This report is to provide factual data and information for inclusion with the construction documents. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

9.H. Draft and Final Geotechnical Baseline Report (GBR) –This report is to provide baseline information to be used in the preparation of construction documents. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final GBR. The GBR will be a contract document. Baselines for the project will include:

- Designation of tunnel reaches giving the anticipated composition, extent, and location of expected geologic materials
- Expected locations and characteristics of geologic discontinuities such as faults
- Presence of toxic and hazardous gas

- Anticipated type and extent of difficult ground behavior during construction including: raveling, running, flowing, and squeezing conditions
- Strength of intact and rock mass material
- Boreability parameters (based on GIR report, see below)
- Corrosion potential of soil and water
- The anticipated amount and duration of groundwater inflows to be encountered during construction
- Tunnel excavation and support requirements
- Support requirements for the shaft excavations

9.I. Draft and Final Geotechnical Interpretive Report (GIR) –This report is to provide interpretation of information and recommendations to be used in project design. The report will document site-specific conditions related to seismic sources, ground motions and fault offset; assessment of liquefaction and lateral spreading; design ground motions; methods of analysis; tunnel facilities stress/strain calculations including impact on tunnel and associated infrastructure; and risk assessment related to ability of tunnel and facilities to remain operational after a design-level seismic event. Furthermore, geotechnical recommendations will be provided for design of project components, including tunnels, shafts, underground work, shallow and deep foundations, excavation compaction, grading and sub-grade preparation. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final GIR.

Using the GDR(s) information, such as borehole logs, laboratory tests on material properties, soil and rock classification methods, a geologic profile (vertical alignment section) will be developed showing formation contacts. Using this information, the tunnel will be divided into reaches with each reach having similar geologic characteristics. This task will aid in estimating the extent of each type of ground conditions within the context of evaluating viable tunneling, shaft, open cut and/or trenchless construction methods. GIR will be an internal design team document that is not part of the contract documents.

9.J. Draft and Final Hazardous Materials Assessment – This assessment report is to provide estimated locations of soils and groundwater containing hazardous constituents. The report will provide information for developing methods and locating sites for handling, treatment, storage, and disposal of excavated materials. The report will be used for design of materials management on the project, including preparation of contract specifications regarding testing of excavated materials during construction and handling and disposal of clean and contaminated soils and groundwater. The report will provide information on the presence of hazardous gases and materials. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final assessment reports.

MWH•URS would develop a draft, final draft, and final report of the hazmat investigation findings. MWH•URS would submit the draft investigation report to the City for review and comment. The City's comments would be incorporated into the final draft investigation report. The draft final investigation report would be provided to the San Francisco Department of Health and other regulatory oversight agencies, as needed, for review and comment. Agency comments would be incorporated into the final investigation report.

MWH•URS will provide information for developing methods and locating sites for handling, sampling and analysis, characterization, profiling, groundwater treatment, storage, and disposal of excavated materials. The report will be used for planning and design of materials management on

the project, including preparation of contract specifications regarding testing of excavated materials during construction and handling, reuse, and disposal of clean and contaminated soils and groundwater shipment by rail to other states for disposal would be evaluated. The potential for explosive gas such as methane and toxic gas such as hydrogen sulfide will be evaluated. In addition, information on the local site geology and regional geology will aid in determining the gas potential. This evaluation will form the basis for the GBR baseline on gas.

9.K. Other Reports within Design Phase – Other reports may be requested depending on geotechnical evaluations and recommendations. Such reports may address settlement estimates and monitoring or other measures identified by MWH•URS or City.

The GDR, GBR, Hazardous Material data and reports are expected to be made available for construction bidder's review as a part of the contract documents.

Task 10 Prepare Planning Level Reports

MWH●URS shall prepare planning level reports and memoranda as follows:

10.1. Prepare Needs Assessment Report (NAR), Alternative Analysis Report (AAR), Design Criteria Report (DCR), and Conceptual Engineering Reports (CERs) for the Task 12 Tunnel Engineering portion of the Project in accordance with SFPUC standards. Planning level documents for Task 8 Channel Watershed Assessments & UWF Program and Task 13 Pump Station / System Modification Design are included in those respective tasks. Perform associated tasks necessary for preparing each document as described in Task 1 including coordinating and conducting meetings with stakeholders, presenting reports and findings to stakeholders, and incorporating comments.

Needs Assessment Report (NAR)

Development of the NAR begins with defining a need for action in quantifiable terms. This need is based on the City's desired performance standards and the gap between what is desired and the current performance of the system. Once the need is well defined, MWH●URS will work with the City to identify engineering and operations alternatives for meeting the goals for the Project.

To identify alternatives, MWH●URS will facilitate a brainstorming session to include technical experts and management from SFPUC, SFDPW, PMC, MWH●URS, and other stakeholders. After the session, developed ideas will be edited and screened to combine duplicates and eliminate those that are clearly impractical or unreasonable. For each screened alternative, an initial analysis to identify issues associated with each alternative is completed. Preliminary life cycle cost estimates for capital expenditures, operating and maintenance are then prepared. In accordance with procedure PD 2.01: Needs and Alternatives Identification, MWH●URS will summarize results in the NAR to include the following:

- Needs definition
- Review of data collected/studies performed
- List of reference documents/drawings
- Description of the problem scope
- A discussion of ideas, potential solutions, and preliminary screening
- Further details on alternatives surviving preliminary screening
- Estimated cost and schedule for each surviving alternative

- Points of contact

Alternative Analysis Report (AAR)

The alternatives analysis and evaluation process is used to select an alternative solution to an agreed upon need identified by the NAR. MWH•URS will work with SFPUC, SFDPW, PMC, and other stakeholders to develop alternatives that achieve Project goals. Each alternative will be assessed to ensure its viability in meeting system performance standards and its practicality in design and construction. Alternatives will be defined to a level that allows for an alternatives evaluation and selection. In accordance with SFPUC's procedure PD 2.02: Alternatives Analysis and Evaluation, recommended areas for alternative definition are shown in the bullets below. MWH•URS will work with the appropriate staff from SFPUC, SFDPW, and PMC to define and include information for each of these items in the AAR.

- Condition of Existing Related Assets
- Operating Philosophy
- Permitting Issues
- Alternative Description
- Water Quality/Treatment Issues
- Hydraulic Issues
- Environmental Issues
- Legal Issues
- Geotechnical Issues
- Right-of-Way (ROW)
- Cost and Schedule

Evaluation criteria will be established by working closely with SFPUC, SFDPW, PMC, and other stakeholders. Evaluation of all alternatives will be performed by the group to identify the alternative that most closely matches the objectives of the SFPUC for the Project. The AAR will document the alternatives analysis and evaluation process and results. SFPUC's process for alternatives analysis and evaluation is shown in *Figure D10.2*.

Conceptual Engineering Report (CER)

Considered a 10% design level, the CER defines the design basis for the design and construction phases of the Project and provides information required for the environmental review process. The CER also includes specific design criteria to confirm the concept of the Project (e.g., capacity, size, location, alignment, materials, mitigation measures, and geotechnical data, etc.) so that the construction documents can be prepared in a timely manner.

MWH•URS will begin the CER process with a brainstorming session to define design issues with the two preferred/recommended alternatives established in the AAR. The brainstorm would include technical experts and management from SFPUC, SFDPW, PMC, MWH•URS, and other stakeholders. In coordination with the SFPUC, SFDPW, and PMC, we will perform the required technical studies that result from topics discussed at the brainstorming session to complete the 10% design. During the CER preparation, all major decisions on location, alignment, type, capacity, and/or size of facilities and equipment should be made.

MWH•URS will include the following items for the two Project alternatives developed in the CER:

- Project background
- Assumed conditions
- Environmental and siting considerations
- Operational and functional objectives or strategy
- Preliminary drawings including basic site layout and/or alignments, hydraulic profiles, general location of equipment and facilities, preliminary structural plans and sections, preliminary mechanical plans and sections, equipment schedules; electrical site plans, Process Flow Diagrams and/or P&IDs
- Outline of the specifications including a list of technical specification sections and any special conditions necessary for the job
- Outline of the design criteria, which will form the basis for the DCR
- Construction and operational/maintenance cost estimates
- Implementation schedule.

Design Criteria Report (DCR)

Design criteria will be developed based on requirements and design recommendations set forth in the CER. The design criteria provides the design basis, specific site conditions, functional and operational requirements, extent of the design, loads, codes and standards for the design, and particular methodologies to be used for design. MWH•URS will utilize the standard SFPUC outline for the DCR, provided in procedure PD 2.04: Design Criteria. The DCR will meet design criteria standards established in Attachment 2 of the procedure.

10.2. MWH•URS will prepare a Project Delivery Evaluation technical memorandum analyzing alternative contract delivery methodologies for this project, including Design/Bid/Build (DBB), Design/Build (DB), and Construction Manager/General Contractor (CM/GC) / Integrated Project Delivery. Relative advantages and disadvantages of each alternative will be summarized in tabular and written form. MWH•URS will make a qualitative and quantitative comparison of the DBB, DB and CM/GC approaches. Risks, constraints, estimated costs and schedule of each approach will be assessed. Approach implementation issues and concerns related to SFPUC contracting requirements and procedures will be investigated and described. MWH•URS will make a recommendation of preferred contracting method for the Central Bayside System Improvement Project, consistent with the procurement requirements of the City's Administrative Code.

City staff will provide oversight on this task in addition to MWH•URS's own QA/QC process as detailed in Task 2, but overall responsibility remains with MWH•URS.

Task 10 Dependency on other Tasks

Task 3 – Review Background Information

Task 4 – Develop Survey Information

Task 5 – Develop Utility Information

Task 6 – Hydrological and Hydraulic Modeling Analysis

Task 7 – Advanced Numerical Modeling and Physical Modeling

Task 9 – Geotechnical and Hazardous Material Investigation

Task 10 Responsible Party

Tunneling Engineering Task Leader

Task 10 Deliverables

The following deliverables shall be provided during the Planning Phase:

10.A. Provide preliminary and final versions of the NAR, AAR, DCR, and CER – Format draft reports to allow augmentation and expansion of report sections into final reports. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports. Relevant planning reports are to be completed in their draft version prior to beginning of the design phase for a particular work element. Individual reports are to be submitted at a date agreed upon with City staff.

10.B. Project Delivery Evaluation Technical Memorandum – Provide ten (10) hard copies and one (1) text-searchable electronic copy of preliminary and final technical memorandum.

Task 11 Permitting and Agreements

Working with the assistance and oversight of San Francisco Public Utilities Commission (SFPUC) and Program Management Consultant (PMC) staff, MWH•URS will be responsible for acquisition of those permits, agreements, and approvals assigned to us by the City for the Central Bayside System Improvement Project (Project). The permitting efforts will be divided into two basic phases: 1) access agreements and permits required for fieldwork associated with the planning and design phases, and 2) permits and approvals necessary for Project implementation, except for resource agency approvals as specified in the Request for Proposal (RFP).

Task Management

- Preparation and updating of electronic permit/agreement tracking matrix to include information including the status, submittal date, effective date, and requirements of permits and agreements to be submitted electronically once a month during the project duration, up to ~60 submittals.
- Attend up to ~4 project status meetings per year (up to 5 years), including the project kick-off meeting.
- Attend up to ~20 permit or application specific coordination meetings with SFPUC staff. These meetings will be focused on Task 11 efforts, and will be used to review SFPUC comments, discuss approach, etc.
- Task management, to include administration, coordination, and budget and schedule tracking.

MWH•URS will be responsible for the acquisition of permits, agreements and approvals as follows:

11.1. Obtain access or permits required for fieldwork associated with the planning and design phases by completing and processing permit applications as appropriate. Fieldwork shall be performed in consideration of public safety, per industry standards, and in accordance with applicable permit

and regulations, traffic control guidelines, and all applicable City/State/Federal requirements. This task includes:

- Unless otherwise described below, up to ~2 MWH•URS representatives will attend up to ~2 coordination meetings with each agency MWH•URS has primary responsibility for obtaining the permit for, as detailed in Table 11.1. For agencies located in the Bay Area, MWH•URS will attend the meeting in person, for agencies with appropriate offices outside the Bay Area, URS will attend the meetings by phone.
- A Right of Entry Agreement for access to Caltrain property will be obtained by MWH•URS. This procedure includes:
    - Preparation and submittal of a draft and final Permit Application and Checklist,
    - Execution of a Service Agreement, which provides for reimbursement of all costs associated with the project, and transmittal of payment for such costs along with a $250 permit application fee (to be paid by SFPUC).
    - Preparation of draft and final Site Specific Work Plan (SSWP). The project team will also participate in the Weekly SSWP coordination meetings, usually three weeks before work is to commence, and to obtain approval of the SSWP, which will contain conditions of approval. URS assumes it will only need to attend ~10 Weekly SSWP meetings. MWH•URS will provide an email summary of pertinent items discussed at each meeting.
    - Applications for each week of work will be submitted to Caltrain a minimum of 6 weeks prior to the date the work is anticipated to begin. No more than 8 weeks of work in Caltrain right of way are anticipated to be needed. MWH•URS will prepare 1 draft version of each submittal for SFPUC review prior to submittal of the final
- MWH•URS will prepare the encroachment permits for design and planning requiring access to Caltrans rights-of-way.
    - For fieldwork occurring outside access-controlled highways, MWH•URS will prepare the encroachment request using Caltrans' online form, describing the Project, and explaining the Project's traffic control plan for the work.
    - For work within the right-of-way of Interstate 280, which is an access-controlled freeway, MWH•URS will prepare additional information, to include with the online form including specific location of the work, we assume that no required lane and shoulder closures would be needed for this work.
- For fieldwork within the Union Pacific Railroad right-of-way, MWH•URS will prepare the application package (available online), and submit it to the Omaha office of Union Pacific. MWH•URS will include required information including a description of the work, provide a certificate of insurance, and pay the required fee. URS assumes no work will be required within 25 feet of the railroad track centerline and, therefore, a railroad flag person will not be required.
- Currently, the California High-Speed Rail Authority (CHSRA) does not own any land in the San Francisco Project area, although a tentative Project alignment has been defined. MWH•URS assumes that no application or permit for entry to CHSRA land for fieldwork associated with the planning and design phases would be needed.
- The California Division of Occupational Safety and Health (Cal-OSHA) classifies all tunnel projects according to California Labor Code 7955 requirements. Although not technically

a permit, the Cal-OSHA classification is required during design, so that project cost estimates can be developed accurately. MWH•URS will prepare the draft and final application documents once the geotechnical investigations have been completed and preliminary design alternative alignments have been developed.

- The Cal-EPA Department of Toxic Substances Control (DTSC) would not require a specific permits or application for effort associated with planning and design, and therefore, MWH•URS will not prepare any permits for DTSC.

11.2. Obtain or assist with the acquisition of permits and approvals necessary for project implementation, **except for resource agency approvals, in accordance with the following table.** Efforts associated with permits related to the environmental process (e.g., CEQA, NEPA, CWA, FESA, CESA, CAA) are not included in this scope of work. Permits and Agreements that may be required include the following:

	Entities/Agencies	City	MWH•URS
11.2.1	PCJPB (Caltrain)	•	X
11.2.2	Caltrans	•	X
11.2.3	Bay Conservation Development Committee (BCDC)	X	•
11.2.4	Union Pacific Railroad	•	X
11.2.5	US Army Corps of Engineers	X	•
11.2.6	California High-Speed Rail Authority	•	X
11.2.7	Regional Water Quality Control Board	X	•
11.2.8	California Fish and Game	X	•
11.2.9	US Fish and Wildlife Service and National Marine Fisheries Service	X	•
11.2.10	State Lands Commission	X	•
11.2.11	San Francisco Department of Public Health	X	•
11.2.12	CAL-OSHA Tunneling and Mining	•	X
11.2.13	Department of Toxic Substances Control (DTSC)	•	X
11.2.14	San Francisco City Planning and Building Inspection	X	•

11.2.15	San Francisco Arts Commission	X	•
11.2.16	Private Property Owners	X	•
X Indicates Lead Responsible Party • Indicates Supporting Party			

- A Right of Entry Agreement for access to Caltrain property will be obtained by MWH•URS. This procedure includes:
  - Preparation and submittal of a draft and final Permit Application and Checklist,
  - Execution of a Service Agreement, which provides for reimbursement of all costs associated with the project, and transmittal of payment for such costs along with a $250 permit application fee (to be paid by SFPUC).
  - Preparation of draft and final Site Specific Work Plan (SSWP). The project team will also participate in the Weekly SSWP coordination meetings, usually three weeks before work is to commence, and to obtain approval of the SSWP, which will contain conditions of approval. MWH•URS assumes it will only need to attend ~20 Weekly SSWP meetings. MWH•URS will provide an email summary of pertinent items discussed at each meeting.
  - Applications for each week of work will be submitted to Caltrain a minimum of 6 weeks prior to the date the work is anticipated to begin. No more than 16 weeks of work in Caltrain right of way are anticipated to be needed. MWH•URS will prepare 1 draft version of each submittal for SFPUC review prior to submittal of the final
- For construction within Caltrans-owned property, which is not an access-controlled highway, MWH•URS would prepare draft and final requests for a permit for construction activity, which would include submittal project plans and a traffic control plan (completed under a separate task). If the proposed Project facilities cross under Interstate 280, the permit requirements may include restrictions on construction methods to protect the overlying highway from settlement.
- MWH•URS would prepare online package for construction activities that could potentially affect Union Pacific Railroad, to include a certificate of insurance from the construction contractor, and submit it to the Omaha office of Union Pacific. MWH•URS will include required information including a description of work and provide a certificate of insurance from the construction contractor. MWH•URS assumes no work will be required within 25 feet of the railroad track centerline and, therefore, a railroad flag person will not be required.
- MWH•URS will coordinate closely with the CHSRA's regional consultant to define SFPUC's potential project alignments and expected need for accommodation in future CHSRSA design. Coordination may be needed on Project elements to be installed by CHSRA, if CHSRA construction occurs prior to the SFPUC's project construction. If SFPUC's project construction does not occur until after the CHSRA owns property, the project team would need to apply for encroachment permits in accordance with CHSRA processes, which have yet to be developed. As part of this effort MWH•URS would facilitate, attend, and document up to 6 meetings with CHSRA representatives. As the

CHRSA permit process is not yet defined, no efforts for permit applications or fee payments are included in this scope of work.

- MWH•URS assumes that no Cal-OSHA tunnel or mining permit for project implementation is needed.
- MWH•URS assumes that no DTSC permit for tunneling or hazardous materials investigations will be needed for the implementation of the project. The site investigations described under Task 9 will attempt to identify contaminated or potentially contaminated sites along the proposed alignments. As described in Table 11.1, MWH•URS assumes that coordination, permits, and applications through SFDPH)—including preparation of site histories, soil management plans—will not be completed under this scope of work.

Task 11 Deliverables

11.A. Copies of all approved permits and approvals timely obtained by MWH•URS.

Task Management

- Agenda, sign-in sheet, and/or meeting summary for each meeting with permitting/right-of-entry agencies (1 electronic/ item/ meeting)
- Monthly electronic permit/agreement tracking matrix (108 electronic submittals)

Planning and Design Phase

- Draft and Final Caltrain Permit Application and Checklist (1 paper, 1 electronic)
- Draft and Final Caltrain Service Agreement (1 paper, 1 electronic)
- Draft and Final Caltrain Site Specific Work Plan (SSWP) (1 paper, 1 electronic).
- Summary of Weekly SSWP Meetings (20 electronic)
- Draft and Final Caltrain Applications for each week of work (16 paper, 16 electronic)
- Draft and Final Caltrans' encroachment request (2 paper, 2 electronic)
- Draft and Final Union Pacific Railroad fieldwork application package (1 paper, 1 electronic)
- Draft and Final Cal-OSHA tunnel classification application (1 paper, 1 electronic)

Implementation Phase

- Draft and Final Caltrain Permit Application and Checklist (1 paper, 1 electronic)
- Draft and Final Caltrain Service Agreement (1 paper, 1 electronic)
- Draft and Final Caltrain Site Specific Work Plan (SSWP) (1 paper, 1 electronic).
- Summary of Weekly SSWP Meetings (10 electronic)
- Draft and Final Caltrain Applications for each week of work (32 paper, 32 electronic)
- Draft and Final Caltrans construction activity permit (1 paper, 1 electronic)
- Draft and Final Union Pacific Railroad construction activity application package (1 paper, 1 electronic)

- Agenda, sign-in sheet, and meeting summary for up to 6 meetings with CHSRA representatives.

General Assumptions

- MHW/URS assumes all permit and/or application fees will be paid for directly by SFPUC.
    - MHW/URS assumes one set of compiled, reconciled comments on each submittal will be provided.
    - All technical plans and documents needed for permit/agreement applications (e.g., traffic control plans, design plans) will be completed as described elsewhere in this document.

For budgeting purposes and the preparation of the Overhead and Profit Schedule, an allowance of ~$350,000 has been provided for this task.

Task 12 Tunnel Engineering

The following are the responsibilities of MWH•URS under this Task: provide engineering and design, contract documents preparation, and cost estimate services for a complete detailed design and contract documents for tunnel facilities including tunnel portal shafts, tunnel, vent or intermediate structures, liner pipeline, and connecting pipeline to new junction/control structures along the tunnel alignment. Design under this task also includes evaluation of necessary soil stabilization methods (i.e. jet grouting) and other temporary shoring methodologies recommended for each project component. Work within this task also includes auxiliary microtunnels and any necessary associated infrastructure to connect from the main tunnel to the existing satellite pump stations. Prepared work products including design reports, contract plans, specifications, cost estimates, and construction schedules. The tunnel design shall be developed to meet the objective of enabling continued operation of the tunnel facilities after a maximum credible seismic event. Evaluate the optimal tunnel diameter size appropriate for this project. Determine the recommended construction methodology (including temporary shoring) for components of the project.

MWH•URS will follow the methodology used for defining and advancing other projects in the SFPUC, performing four specific stages before advancing to final design and construction:

1. Condition Assessment
2. Needs Assessment
3. Alternatives Analysis
4. Conceptual Engineering

The first stage will be performed as part of Task 4. The other three stages will be performed interlinked with the performance of Task 6 – Hydrological and Hydraulic Modeling and Analysis; Task 8 – Channel Watershed Assessment & UWF Program; Task 9 – Geotechnical and Hazardous Material Investigation, and Task 10 – Prepare Planning Level Reports. Additionally, these stages could be combined, particularly Needs Assessment and Alternative Analysis, considering that the two tasks could be an iterative process. The main purpose for following or confirming these stages is to provide a systematic treatment familiar to most parties involved, facilitating definition of scope (and features) and integration of schedule and cost of implementation into the overall planning and budgeting process of SFPUC.

12.1. Provide preliminary and final design reports by the end of the 35% and 95% Design Phase; respectively. Format the preliminary design report to allow augmentation and expansion of report sections into a final design report. Subjects to be addressed in design reports include design criteria, tunnel alignment, shaft locations, muck disposal, tunnel and shaft groundwater control and disposal, tunnel and shaft construction methods, initial tunnel support, type of liner pipeline, ancillary facilities, operation and maintenance issues related to design (including tunnel dewatering), independent assessment of ability of tunnel design to meet objective of continued operation after a major seismic event, construction traffic, power and other utility requirements, access road alignments, staging area requirements, instrumentation plans, design calculations, internal hydraulic pressure, constructability, corrosion protection, construction cost estimates, and construction schedules.

Design reports at the end of the 35% and 95% Design Phase will include an update of the following information:

1. Design Criteria
2. Tunnel Alignment (two alignments will be maintained through the CER)
3. Shaft Location
4. Muck Disposal
5. Tunnel and Shaft Groundwater Control and Disposal
6. Tunnel and Shaft construction Methods (that also can include Shoring Methods)
7. Initial Tunnel Support
8. Type of Liner Pipeline
9. Ancillary Facilities
10. O&M Related to Design
11. Independent Assessment of ability of tunnel design to meet objective of continued operation after a major seismic event
12. Construction Traffic
13. Power and Other Utility Requirements
14. Access Road Alignments
15. Staging Area Requirements
16. Instrumentation Plans
17. Design Calculations
18. Internal Hydraulic Pressure
19. Constructability
20. Corrosion Protection
21. Microtunneling

12.2. Provide plans and specifications for ~~all~~ tunnel facilities at approximately 35, 65, 95, and 100 percent levels of completion. Plans and specifications shall be prepared in a format as specified by City. For each submittal, provide written responses to City review comments and incorporate appropriate changes to plans and specifications based on review comments. In this scope, "plans and specifications" is used synonymously with "contract documents". Work with City staff to complete preparation of Special Provisions, and Divisions 0 and 1 of the project specifications

including, but not limited to, providing technical project requirements, schedule requirements and constraints, and hazmat mitigation specifications. Contract drawings shall be in a format as specified by City. Contract documents for tunnel facilities shall include plans and specifications for hazmat mitigation to ensure construction contractor compliance with mitigation requirements.

Activities in this task will develop the preferred project configuration identified during the planning activities and CER, and convert it into design drawings and reports, construction documents following the usual staged process of 35%, 65%, 95% and 100% levels of completion.

12.2.1 35% Design

- Drawings will be organized consistent with the SFPUC's standard organization of construction drawings, including the following categories:
  - General
  - Civil
  - Structural
  - Mechanical
  - Electrical
  - Instrumentation
  - Corrosion Protection
  - and any other category required
- A drawing list identifying the anticipated drawings, with assigned drawing numbers, will be developed as part of the 35%-level design.
- SFPUC standard drawings applicable for the design package will also be identified and integrated in the project drawing list. Any needs for integration of any SFPUC drawings produced in-house specifically for this project, or drawings produced by other consultants for adjacent water transmission system components, will also be identified and incorporated
- Contract Specifications to describe the Work required will be developed in accordance with SFPUC guidelines using the Construction Specifications Institute (CSI) format.
- Include a full listing and outlines of the anticipated technical specification sections.
- Include a full listing of the anticipated Division 0 and 1 specifications and applicable SFPUC standard General Provisions.
- The 35% Design Drawings will be completed to a level that identifies the alignments of the tunnel and all pipeline connections. The drawings will also identify all access roads, any bridges, all structures including vaults, and all major civil design details, such as earthwork, deep cuts and fills, grading and drainage provisions, and any special excavation and stabilization efforts required for the tunnel portal developments. Plans and profiles of all main conduits and roads will be developed.

12.2.2 65% Design

- Incorporation of resolutions of the comments from the 35 % design level. A formal, separate response to all comments will also be provided.
- Development of civil, structural, mechanical, and electrical drawings from the general layouts, geometry and dimensions of all facilities, roads, earth support, parking, drainage, tunnel, and connections.

- Finalizing hydraulic analysis (carried out in Task 7), including completion of assessments of complete integration of the new facilities with existing and other planned new facilities.
- Perform corrosion engineering evaluations and design.
- Perform analysis for portal stability, and detailed design of portal support.
- Perform structural, mechanical, and electrical analysis and design for all surface piping, connections, vaults, and appurtenances.
- All structural and mechanical design, and design of larger electrical components and systems, will include analysis for shaking due to an earthquake per project specific seismic design criteria or Building code requirements for Seismic Zone 4.
- The analysis and design of the tunnel lining system will, in addition to analyses for shaking, also be analyzed for racking, i.e., transverse deformations.
- The analysis and design of the tunnel final lining system will also include loads accounting for squeezing ground, as applicable.
- Development of construction specifications will continue throughout the 65% design level efforts, including both technical and non-technical specifications. It is anticipated that several Divisions of the technical specifications will be nearly complete at the end of this phase of design.
- In the Division 0 and Division 1 specifications, detailed Bid Items will be defined and described, and approaches to the contractual framework and Methods of Payment will be made incorporating SFPUC standard descriptions, as applicable.

12.2.3 95% Design

- Incorporation of resolutions of the comments from the 65% design level. A formal, separate response to all comments will also be provided.
- Complete incorporation of applicable design interfaces with work designed by SFPUC design Team and other consultants, as applicable.
- Completion of all civil, structural, mechanical, corrosion engineering, and electrical drawings
- Completion of all technical construction specifications, and all Division 0 and Division 1 General, and Special Provisions specifications
- Development of a Draft Final Design Report including most of the design calculations

12.2.4 100% Design

- Include final comments and revisions
- Complete Final Design Report including the design calculations.
- Issue to bidders

12.3. Provide construction cost estimates (based on City's latest format) at 35, 65, 95 and 100 percent levels of design completion. Provide construction schedules (in latest SFPUC standard software) at 35, 65 and 95 percent levels of design completion, showing major milestones and activities. Activities in this subtask will develop the cost of the preferred project configuration identified during the planning activities and CER, and developed into design drawings in Subtask 12.2.

12.4. Provide a Technical Memorandum on Mechanized Excavation and Shoring to document mechanized excavation and shoring methods considered by MWH•URS for all alternatives and

provide recommendations as to the types of construction methods that will be allowed and excluded for this project. The memorandum shall also address any need for soil stabilization.

12.5. Provide a Summary Report on Hazardous Material Mitigation. The report shall identify potential hazardous material impacts and the respective mitigation measures in the tunnel design and operation to mitigate soil and groundwater contamination and remediation at contaminated sites where the tunnel may pass through.

12.6. Provide a Technical Memorandum and incorporate into the design documents on the feasibility of incorporating electrical raceways and conduits into all the tunnel and shaft designs for future fiber optic installation for the City and/or private telecommunication utilities.

12.7. **Risk Assessment** –MWH•URS shall identify areas of the design that have high probability of risk during construction and conduct a workshop at 35% Design. MWH•URS shall identify and quantify these risk probabilities and determine mitigation measures in these identified areas of the design. A risk register and matrix table shall be prepared at 65% design and updated at 95% design phases.

City Staff and the Program Management Consultant will review all work products. For review comments provided by City, maintain a spreadsheet with responses indicating how the comments were addressed.

MWH•URS shall review all mitigation measures proposed and check for constructability and feasibility and suggest viable alternatives for environmental consideration, as needed.

City Staff will provide oversight on this task in addition to MWH•URS's own QA/QC process as dictated in Task 2, but overall responsibility of this task remains with MWH•URS.

Task 12 Dependencies on Other Tasks

Task 4 – Develop Survey Information

Task 5 – Develop Utility Information

Task 6 – Hydrological and Hydraulic Modeling and Analysis

Task 7 – Advanced Numerical and Physical Modeling

Task 8 – Channel Watershed Assessment and UWF Program

Task 9 – Geotechnical and Hazardous Materials Investigation

Task 10 – Prepare Planning Level Reports

Task 12 Responsible Parties

Subtask 12.1 –Tunnel Engineering Task Leader

Subtask 12.2 –Tunnel Engineering Task Leader

Subtask 12.3 –Constructability and Cost Estimating

Subtask 12.4 –Tunneling Methods

Subtask 12.5 –Hazardous Materials Task Leader

Subtask 12.6 –Tunnel Engineering Task Leader

Subtask 12.7 –Tunnel Engineering Task Leader

Task 12 Deliverables

Provide the deliverables described below. For design reports provide ten (10) hard copies each of draft and final versions, as well as one (1) text-searchable electronic copy. Design phase information may be provided in different formats other than described below if approved in advance by City. A budget for optional services may be presented for City approval to address unforeseen needs and conditions.

12.A. Design Reports – Provide ten (10) hard copies of preliminary and final design reports, and one electronic version.

12.B. Plans and Specifications – Provide for all tunnel facilities at approximately 35, 65, 95 and 100 percent levels of completion. For submittal of plans and specifications at each of the levels of completion (35, 65, 95, and 100 percent), provide fifteen (15) half-size bound copies, one (1) half-size unbound copy, two (2) full-size bound copies, and one (1) full-size unbound copy. Provide one (1) text-searchable electronic copy of the 100 percent submittal. Electronic copy shall consist of an AutoCAD 3D (latest City version) DVD of contract drawings, a disk containing contract specifications in MS Word (latest City version) and text-searchable Adobe Acrobat PDF, and be accompanied by a full-size vellum set for stamping & signatures.

12.C. Construction Cost Estimates and Schedules – Provide ten (10) hard copies and one (1) text-searchable electronic version.

Construction Cost Estimate

- Construction cost estimates (based on City's latest format) at 35, 65, 95 and 100 % levels of design completion. Provide construction schedules (in latest SFPUC standard software) at 35, 65 and 95 % levels of design completion, showing major milestones and activities.

35% Design

- Identify for each level design an appropriate contingency allowances to account for unknown or undefined factors
- The 35% Design Report will include an appropriately detailed construction schedule and construction cost estimate. These estimates will incorporate project specific assumptions relating to the level of design development, including ground conditions, excavation sizes, support type and lining details, and other site conditions for construction of the facilities

65% Design

- Updates to the Construction Schedule and the Construction Cost Estimates

95% Design

- Updates to the Construction Schedule and the Construction Cost Estimates

12.D Draft and Final Technical Memoranda on Mechanized Excavation and Shoring – Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final memoranda.

Technical Memorandum on Mechanized Excavation and Shoring to document mechanized excavation and shoring methods

- Identification of the different mechanized excavation methods. Impact of variable ground conditions on selection of excavation method.
- Evaluate the Methods for proposed alignment
- Recommend Optimal methods and soil stability as needed

12.E. Draft and Final Summary Report on Hazardous Material Mitigation – Provide ten (10) hard copies and one (1) text-searchable electronic copy of the draft and final reports.

- Report on Hazardous Material Mitigation.
- Muck disposal locations
- Soil Test
- Mitigation Alternatives
- Mitigation During Construction (PPP)

12.F. Draft and Final Summary Reports on the Incorporation of Electrical Raceways into the Tunnel Design – Provide ten (10) hardcopies and one (1) text-searchable electronic copy of draft and final reports.

12.G. Draft and Final Risk Assessment Register Technical Memorandum and Matrix Table – Provide ten (10) hardcopies and one (1) electronic copy of draft and final technical memorandum and matrix table. Risk register and matrix table shall be submitted at 65% Design and updated at 95% Design phases. This document is subject to review, comment, and revisions by City Staff and a Construction Management consultant at as early as the 95% Design phase.

- Risk Assessment
- Hazard identification
- Risk register
- Risk quantification
- Mitigation strategies

Task 13 Pump Station/System Modification Design

A new pump station will be required to lift the flows from the downstream terminus of the tunnel and pump the flows to the headworks of the Southeast Treatment Plant for treatment. In addition, modifications will be necessary at the Channel Pump Station and Bruce Flynn Pump Station. **City staff will be responsible for the preliminary design of these pump stations and modifications.**

The following are the responsibility of MWH•URS under this Task: Provide technical support services for the planning and design of the new pump station, repurposing of channel Pump Station and modification to the Bruen Flynn Station.

13.1. New Pump Station - MWH•URS will determine (a) the pump station system curves, (b) grit removal system, (c) screening system and disposal methods, (d) the inlet chamber and sump configuration design, (e) perform surge analysis and recommend appropriate surge protection system, and (f) design recommendations with sample specifications on the freight elevator system, equipment hoisting system and corrosion control of equipment and structures. MWH•URS will be responsible for the shoring/primary structural walls and foundation design work, which also may be part of the tunnel shaft design in Task 13.

The overall responsibility for the design of the new pump station lies with the City. The City will receive a significant amount of input and support from MWH•URS. This table above lists the general scope of work for the new pump station effort and the role and responsibility for each scope item.

13.2. MWH•URS will provide as-needed engineering and technical support services to City during planning and design of the new pump station, and other activities as requested by SFPUC up to the budgeted allowance.

MWH•URS will develop the Conceptual Engineering Report (CER) for the new pump station under this subtask in accordance with the SFPUC Infrastructure division procedures manual for project design – procedure PD 2.03.

No other specific deliverables have been identified as the specifics of the subtask will be determined on an as-needed basis. However, it is anticipated MWH•URS will prepare memos, calculations, and recommendations and make oral presentations of the same as needed to transmit and document the result of the activities that may be generated under this subtask.

13.3. **Re-purposing of Channel Pump Station** –MWH•URS will investigate and recommend potential and feasible uses of Channel Pump Station after activation of the Channel Tunnel, including converting it to a wet weather overflow pumping system for the Central Bayside sewerage system, using it to pump a portion of flow into the North Point Main, or for any other wastewater operation usage. Studies will be performed for the Channel Pump Station modifications including pump upgrades, electrical upgrades, SCADA upgrades, civil/structural/architectural upgrades, and other improvements. Development and analysis of four repurposing options are included in the budget for this task. The result of this study will be a Need Assessment Report in accordance with the SFPUC Infrastructure division procedures manual for project design – procedure PD 2.01.

13.4. **Modification to Bruce Flynn Pump Station** – MWH•URS will investigate and recommend the feasibility and need to modify Bruce Flynn Pump Station from a wet weather pump station into a multi-purpose pump station, such as an all-weather backup pump station to the new pump station. Studies will be performed for the Bruce Flynn Pump Station modifications including pump upgrades, electrical upgrades, SCADA upgrades, civil/structural/architectural upgrades, and other improvements. Development and analysis of two repurposing options are included in the budget for this task. The result of this study will be a Need Assessment Report in accordance with the SFPUC Infrastructure division procedures manual for project design – procedure PD 2.01.

The table below lists the general scope of work for the pump station/ system modification effort and the role and responsibility for each scope item.

	Scope of Work	City	MWH•URS
13.1	New Pump Station		
13.1.1	Hydraulic Profile	•	X
13.1.2	Shoring/primary structural walls and foundation	•	X
13.1.3	Inlet chamber and sump configuration/layout	•	X
13.1.4	Screenings and grit removal/ disposal/ transport/ conveyance systems	•	X

13.1.5	Pumps and discharge manifold/piping sizing and layout	X	•
13.1.6	Pump station layout with architectural and structural work	X	•
13.1.7	Equipment and piping support and bracing	X	•
13.1.8	Surge analysis and surge control system	•	X
13.1.9	HVAC, compressed and/or instrument air, and odor control systems	X	•
13.1.10	Corrosion control	•	X
13.1.11	Pump station electrical and I&C work	X	•
13.1.12	Fire, and gas detection system, and security system	X	•
13.1.13	Aboveground electrical and MCC building, power station, standby power and general site layout	X	•
13.1.14	Pump station and site drainage system, sump and dewatering pumping system, No. 2 and auxiliary water system	X	•
13.1.15	Elevator and equipment hoisting system	•	X
13.2	As-needed Engineering and technical support services to City during planning and design of new pump station		X
13.3	Repurpose of Channel Pump Station	•	X
13.4	Modification of Bruce Flynn Pump Station	•	X
13.5	Decommissioning of related satellite pumping stations	X	
X Indicates Lead Responsible Party • Indicates Supporting Party			

Task 13 Dependency on other Tasks

Task 6 – Hydrological and Hydraulic Modeling Analysis

Task 7 – Advanced Numerical Modeling and Physical Modeling

Task 8 – Channel Watershed Assessment and UWF Program

Task 9 – Geotechnical and Hazardous Material Investigation

Task 12 – Tunnel Engineering

Task 13 Responsible Party

Pump Station Task Leader

Task13 Deliverables

Provide the deliverables described below. Prepare reports in accordance with standard practices. City staff will provide oversight on this task in addition to MWH•URS's own QA/QC process as dictated in Task 2. Overall responsibility of this task remains with the City. All reports and technical memoranda will be stamped and signed by professional engineer(s) licensed in the State of California.

Assumption: Where cost estimates are required for the alternative analysis reports, it is assumed that the City's staff will perform the necessary quantity take-offs and perform the necessary cost estimates for use in the various studies.

13.A. Draft and Final Pump Station Hydraulic Profile Reports –The hydraulic profile will be developed for the force main, the receiving structure, and the influent structure to provide a clear description of the operating conditions at initial and projected future conditions that include the extremes of maximum and minimum flows during DW and WW. Up to two (2) hydraulic profiles will be developed to accommodate different pump station locations, schemes and configurations. MWH•URS will construct a system H-Q curve envelope using a Hazen-Williams C of 110 to 120 at a low transport box storage level to estimate the maximum total dynamic head (TDH) and a C of 130 to 140 at a high transport box storage level to estimate the minimum TDH. In addition, all system curves in between the envelope from normal DW and WW operating conditions and associated operating static heads will be shown. The report will include all calculated values, assumptions, operating static heads, and references used to provide the system curves. The report will provide information for the City to select the size and the number of pumps. MWH•URS will provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

13.B.i. Draft and Final Alternative Analysis Report on Shoring/Primary Structural Wall and Foundation and Design of Shoring/Primary Structural Wall and Foundation – The AAR will address all the methods suitable for construction of the pump station shoring/ primary structural walls and foundation with consideration for cost, constructability and long term maintenance. For budgeting purposes, MWH•URS assumes utilization of the tunnel shaft as the pump station location. This option needs to be fully explored and evaluated. The report will discuss the recommended method with justifications. MWH•URS will present the report in an oral presentation to City staffs. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

13.B.ii. Should a decision be made to not utilize the tunnel shaft as the pump station location, additional effort and resources will need to be allocated to complete the design of the shoring/ primary structural wall and foundation for the pump station for incorporation into pump station construction documents. Shoring/foundation design deliverables for the tunnel shaft will be included as part of the Task 12 deliverable packages.

13.C. Draft and Final Alternative Analysis Report on Grit Removal System –The report will include a discussion of four different and viable grit removal methods suitable for the pump station and operating condition with pros and cons for each method including reliability, ease of cleaning and maintenance, redundancy, cost, and constructability. The report will address the recommended grit capturing and disposal methods. MWH•URS will present the report in an oral

presentation to SFPUC staff and provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

13.D. Draft and Final Alternative Analysis Report on Screening System –The report will include a discussion of four different and viable screening methods suitable for the pump station and operating condition with pros and cons for each method including reliability, ease of cleaning and maintenance, redundancy, cost, and constructability. The report will address the recommended screenings and debris removal, disposal, conveyance, and transport methods. MWH•URS will present the report to SFPUC staff in an oral presentation, which can be combined with the presentation on the grit removal system and will provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

13.E. Draft and Final Alternative Analysis Report on Inlet Chamber and Sump with Pumps Configuration –The report will incorporate the City-approved grit removal and screening designs into the inlet chamber and sump with pumps configuration design. The report will contain four different and viable layouts and options for transition of both DW and WW flows from the end of the tunnel to the pump intake including but not limited to dimensions, configurations, flow velocities/elevations, and descriptions of all the features for each options. The layouts will show all dimensions and footprint required with the approved grit removal and screening systems. Physical modeling (as addressed in Task 7) of the final approved layout will be performed to insure proper flow patterns and capacity exiting the tunnel and into the sump with minimal turbulence, suppression of surface and subsurface vortices, sufficient pump intake submergence, and estimation of conservative values of NPSHA. MWH•URS will provide the necessary information required for the design work to City staff. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

13.F. Draft and Final Hydraulic Report for the Force Main – The report will include surge analysis on the discharge force main with recommendation on the surge control system. Surge analysis will be performed on both DW and WW pump discharges during starting and stopping of motors and upon sudden stoppage due to power failure. The report will describe all effects on the suction side of the pumps. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

Report for Hydraulic Transient studies for the Force Main and Suction Side Elements of the Pump Station will be included in the Task 7 – Advanced Numerical Modeling Report.

13.G. Technical Memoranda on design recommendations with product information and sample specifications for the freight elevator system, equipment hoisting system, and corrosion control of equipment and structures. MWH•URS will provide ten (10) hard copies and one (1) text-searchable electronic copy of each draft and final Technical Memorandum.

13.H. Conceptual Engineering Report (CER) will be performed for the new pump station in accordance with the SFPUC Infrastructure division procedures manual for project design – procedure PD 2.03. Considered a 10% design level, the CER defines the design basis for the design of the new pump station. The CER also includes specific design criteria to confirm the concept for the new pump station (e.g., capacity, size, location, general arrangement, power supply, etc.) so that the contract documents can be prepared in a timely manner. MWH•URS will begin the CER process with a brainstorming session to define design issues with the preferred/recommended alternatives established in the various AAR's. The brainstorm would include technical experts and management from SFPUC, SFDPW, PMC, MWH•URS, and other stakeholders. In coordination with SFPUC, SFDPW and PMC we will incorporate mutually agreed upon topics into the 10% design. During the CER preparation, all major decisions on location, type, capacity, and/or size of facilities will be

made. MWH•URS will include the following items for the selected new pump station alternative in the CER:

- Project background
- Assumed conditions
- Geotechnical considerations
- Environmental considerations
- Operational and functional objectives or strategy
- Preliminary drawings including basic site layout, general location of equipment, preliminary structural plans and sections, preliminary mechanical plans and sections, electrical one line diagram, and process flow diagrams
- Outline of the specifications including a list of technical specification sections and any special conditions necessary for the new pump station

MWH•URS will provide ten (10) hard copies and one (1) text-searchable electronic copy of each draft and final CER.

13.I. Draft and Final Needs Assessment Report for re-purposing of Channel Pump Station – The report will study the potential and feasible uses of Channel Pump Station after activation of the Channel Tunnel. A potential use includes converting the station to an overflow pump station for lowering the Central Bayside transport box levels during significant wet weather events. Due to the anticipated rise of bay seawater level in the future, the overflow weir structures may need to be sealable to prevent seawater intrusion. During a significant storm event, the Bayside transport boxes will be full to capacity with no means of relief if the overflow weirs cannot be used. Another potential use of the station is the capability of pumping to the North Point Main if needed. The scope on pump station conversion will include consideration of station and system control, pump compatibility, discharge location and sump configuration. The Needs Assessment Report will be performed in accordance with the SFPUC Infrastructure division procedures manual for project design – procedure PD 2.01. MWH•URS will provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

13.J Draft and Final Needs Assessment Report for Modification of Bruce Flynn Pump Station – The report will discuss studies of the feasibility and the need to modify Bruce Flynn Pump Station from a wet weather station to a multi-purpose pump station, such as an all-weather backup pump station to the new pump station. Areas of investigation will include consideration of connection of the station sump to the tunnel; sump inlet and capacity; dry weather flow screening requirements; pumping scheme and capacity; and electrical modifications and station control scheme. The Needs Assessment Report will be performed in accordance with the SFPUC Infrastructure division procedures manual for project design – procedure PD 2.01. MWH•URS will provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

Task 14 Technology Transfer

Conduct training sessions in areas related to the scope of services in this RFP, with the objective of transferring technical design knowledge and skills to City staff. While training topics will be determined jointly with City, potential training topics will include the following: tunnel safety; maintenance and rehabilitation strategies for tunnels; construction management of tunnel projects; pipeline fault crossing design; retrofitting of portals and pipelines to guard against seismic hazards; geotechnical considerations related to rock or mixed soil tunnel design; tunnel lining design; tunneling methodology and shaft construction; tunnel portal designs; pump station design; alternative contract delivery methodologies;

integrated urban watershed designs and watershed hydrology; LID implementation; advanced numerical modeling such as computational fluid dynamics; and lessons learned.

14.1. Services to be provided under this task include preparing, coordinating, and providing training sessions, both in the field and in the office. These training sessions (field visits and in-office seminars) shall be independent of the other workshops held for this project and other services provided for other tasks. Parts of the documents developed under other tasks can be used as some of the training material. In-office training sessions will take place in a location as designated by the City. Up to ~40 half-day Technology Transfer Workshops will be delivered on a variety of topics selected by the City.

For budgeting purposes and the preparation of the Overhead and Profit Schedule, an allowance of ~$100,000 has been provided for this task.

Task 14 Dependency on other Tasks

None. Workshops will be integrated throughout planning, design and construction tasks including Task 6, Task 7, Task 8, Task 12, Task 13, and Task 17.

Task 14 Responsible Party

Key/Lead for the planning or design task being presented at each Technology Transfer Workshops

Task 14 Deliverables

14.A. Electronic and hard copy of training materials being presented, including presentation slides and attendee handouts for each training event.

Task 15 Communication and Public Outreach

The City will be implementing a comprehensive public information effort to educate the public on the Central Bayside System Improvement. SFPUC Communications will be the lead entity on this effort. MWH•URS, in addition to the SSIP Program Management Consultant, will provide support to SFPUC Communications.

The following are the responsibilities of MWH•URS under this Task:

15.1. Provide assistance in developing and implementing a Public Involvement Plan (Lead by the City and SSIP Program Management Consultant) in support of the planning and design of this project. Such communication and public outreach activities will likely include evening and/or weekend community meetings.

These include the following types of activities:

15.1.1. Public Meeting Logistics – Create illustrative displays and collateral material for distribution and other support of the meeting related to the planning and design work performed. Identify and secure meeting locations, note taking during the meeting, and production of meeting summaries and follow-up documents;

15.1.2. Support of City Speakers – Assist City staff with scheduling and developing public and Commission presentations about this project at local neighborhood, community, and merchant association meetings. This may include PowerPoint presentations, meeting scheduling, and translation services;

15.1.3. Notifications/Direct Mail Services – Create and mail newsletters, project updates, and workshop notification pieces to residents, businesses, and other stakeholders. This will also include development and placement of advertisement in print, television, or radio formats. Assist SFPUC staff in preparation of a complete contacts list and schedule for communication with key contacts, including general public, neighbors, landowners, non-governmental agencies, department staffs, and elected officials;

15.1.4. Translation – Provide oral and written translation capabilities for project materials and workshops;

15.1.5. Print Services – Provide printing services for mailed notices, newsletters, project displays, streetlight banners, decals, billboards, etc.;

15.1.6. Other outreach services as needed – Assist City with contractor outreach.

15.2. MWH•URS will provide video, graphic art, and 3D/virtual animation skill sets to support the overall communications of this project to the general public, media, public officials, staff, and/or technical audience members throughout the planning and detailed design of the project. This will include, but is not limited to, video development and creation, GIS overlays of aerial photos, animated virtual flyovers, or representations of the subsurface conditions.

15.3. MWH•URS will support the development of a project specific communications plan that integrates with the SSIP communications plan.

For budgeting purposes and the preparation of the Overhead and Profit Schedule, provide an allowance of ~$750,000 for this task

Task 15 Dependency on other Tasks

Task 1 – Management and Coordination of Proposer's Services

Task 8 – Channel Watershed Assessments & UWF Program

Task 10 – Prepare Planning Level Reports

Task 18 – Community Benefits Commitments

Task 15 Responsible Party

Public Outreach

Task 15 Deliverables

15.A. Draft and Final Meeting Summaries and Follow-up Documents –Three (3) hard draft copies and one (1) text-searchable digital copy within one (1) week of meeting. Ten (10) final hard copies and one (1) copy in digital format, within one (1) week of receiving City's comments.

15.B. PowerPoint Presentations and Translated Project Documents –Thirty (30) hard color copies and one (1) text-searchable digital copy one (1) week prior to meeting.

15.C. Animation/Video Presentations in support of Public Outreach Meetings –Provide support as requested by City.

Task 16 Engineering Support During Bid Advertisement

16.1. Provide engineering support services during the bidding period including: attending and making a presentation at a pre-bid conference, responding to questions as directed by the Project Engineer, taking notes on questions that may arise, providing written responses to bidder inquiries, preparing addenda to contract documents, and assisting the City in analyzing and evaluating the bids.

For budgeting purposes and preparation of the Overhead and Profit Schedule, provide an allowance of ~$120,000 for this task.

Task 16 Dependency on other Tasks

Task 8 – Channel Watershed Assessments & UWF Program

Task 12 – Tunnel Engineering

Task 13 – Pump Station/System Modification Design

Task 16 Responsible Party

The Key/Lead for the design of the Project element being bid.

Task 16 Deliverables

16.A. Written responses to bidder inquiries;

16.B. Addenda to contract drawings and specifications. Provide written addenda and related drawing revisions. Written addenda shall be in MS Word format (latest City version), and drawing revisions shall be in AutoCAD (latest City version) format. Transmission of electronic files shall be by email, disk or other method acceptable to City. There shall be no transmission of information to bidders without prior City consent;

16.C. Technical Memorandum on bid evaluation – If requested by City.

Task 17 Engineering Support During Construction and Closeout

17.1. Provide engineering support to City during construction phase. This includes the following:

17.1.1. Review and provide written responses to shop drawings, submittals, RFIs, change orders requests, and substitution requests from the Contractor through City;

17.1.2. Assist the Construction Management (CM) staff in responding to and negotiating claims and developing proposed change orders;

17.1.3. Provide comments for tunneling and temporary shoring work plan submittal to ensure intended mitigations are in place;

17.1.4. Attend and participate in project progress meetings at the site and issue-specific meetings at job sites and City offices (as needed);

17.1.5. Identify construction phase items requiring presence of engineer in the field and coordinate with the Project Engineer;

17.1.6. Provide field engineering support to CM team during construction.

For budgeting purposes and the preparation of the Overhead and Profit Schedule, an allowance of ~$5,000,000 has been provided for this task.

Task 17 Dependency on other Tasks

Task 8 – Channel Watershed Assessments & UWF Program

Task 12 – Tunnel Engineering

Task 13 – Pump Station/System Modification Design

Task 17 Responsible Party

Key/Lead for the design of the Project element being constructed.

Task 17 Deliverables

17.A. Written review comments for shop drawings submittals, change order requests, and substitution requests.

17.B. Written responses to RFIs.

Task 18 Community Benefits Commitments

MWH•URS will provide an investment of volunteer labor hours and money estimated to total $1 million dollars toward MWH•URS' Community Benefits Commitments during the 9 year term of the Agreement. MWH•URS' monetary commitment is $150,000 and the volunteer labor hours have an estimated value of approximately $850,000; however, the parties acknowledge that the extended value of the labor hours may vary slightly based on the billing rates associated with the volunteers participating on the various projects.

MWH•URS will provide $150,000 as part of the MWH•URS Community Benefits Commitments during the 9 year term of the Agreement. MWH•URS' $150,000 commitment will be funded independently by MWH•URS and will not be tied to or dependent upon receivables from SFPUC, or retention associated with this Project. In the event that the contract value is amended, the parties hereby agree to meet and discuss the impact to the corresponding communities benefit commitments.

MWH•URS will make $50,000 of the total $150,000 available within the first two years following issuance of the Notice-to-Proceed (NTP) for this project. The remainder of the funds will be made available and expended throughout the 9 year term of the Agreement pursuant to the Central Bayside

Community Benefits Plan and Timeline described below, which will be a detailed and substantive workplan and timeline developed between SFPUC and MWH•URS.

Central Bayside Community Benefits Plan and Timeline: MWH•URS will work with SFPUC to develop a Central Bayside Community Benefits Plan and Timeline ("Community Benefits Plan and Timeline") within six months of issuance of NTP for this Project. The Community Benefits Plan and Timeline will provide details regarding expenditures, a schedule, and timelines related to the $150,000 described above and the delivery, schedule, and timing of MWH•URS' additional Community Benefits Commitments described below. MWH•URS will develop the Community Benefits Plan and Timeline so that all of the deliverables, including the $150,000 and hours associated with the additional Community Benefits Commitments described below, are aligned with and driven by SFPUC's priorities and broader Agency-wide and Sewer System Improvement Program community benefits strategy. MWH•URS will develop the Community Benefits Plan and Timeline with the necessary flexibility relating to timing, expenditure of funds, partners, strategic delivery, scale, and performance of Community Benefits Commitments so that they are all aligned with, directed by, and driven by the SFPUC Assistant General Manager for External Affairs' community benefits strategy for the SFPUC, as well as the Sewer System Improvement Program, and in order to best leverage our collective resources and positive community impacts. In the event that the Programs or Partnerships of the proposed community benefit commitment change significantly, or if the parties agree to introduce new Partners and Programs, each will be vetted through the MWH and URS ethics and compliance process. Once the initial Community Benefits Plan and Timeline is developed, SFPUC and MWH•URS will meet at least once a year during the term of the Agreement to discuss the workplan and associated timelines, and make any adjustments or updates as necessary.

Community Benefits Commitments: MWH•URS will develop a workplan, schedule, and timeline as one component of the Community Benefits Plan and Timeline that will be aligned with and driven by SFPUC's priorities to deliver, perform and produce the following additional Community Benefits Commitments:

Workforce Development

- MWH•URS will: 1) Develop on-the-job training opportunities, internships and employment opportunities; 2) create a training curriculum for entry level jobs; 3) raise awareness about training and employment opportunities; 4) provide job placement assistance; and 5) create internship opportunities for high school and college students.
- MWH•URS will provide high school and college internships in civil and environmental engineering in the wastewater industry.
- MWH•URS will provide civil/environmental engineering internships to local college students (3,000 hours; 10 positions).
- MWH•URS will provide civil/environmental engineering internships to local high school students (3,000 hours; 10 positions).

Environmental Justice Programs

- MWH•URS will provide 1,000 hours of engineering/labor from their Urban Watershed Team for the design and incorporation of Low Impact Development (LID) features into playgrounds, parks, community gardens, and public open spaces impacted by the Project. MWH•URS will work with partners to provide the materials for and undertake construction and all of the other necessary requirements to deliver finalized LID features into playgrounds, parks, community gardens, and public open spaces.

- MWH•URS will provide 1,000 hours for trash removal and restoration of creeks, streams, and shoreline within the North Shore, Channel, and Islais Creek drainage basins.
- MWH•URS will facilitate waste disposal and energy efficiency education and will provide workshops for local industries and businesses. MWH•URS will provide workshops that go beyond teaching theory and would involve MWH•URS energy professionals providing walk-throughs of businesses willing to participate in order to help them identify practical, cost-effective ways they can make changes in the areas of recycling, waste disposal, and energy use. After conducting waste disposal and energy efficiency audits and assessments, MWH•URS team members will then work with owners on implementing identified opportunities. MWH•URS will provide 500 hours toward these efforts.
- MWH•URS will develop a Community Window for the Project to educate the public in the Project area and provide a forum for their voices to be heard. MWH•URS will provide 1,000 hours for staffing the Community Window and responding to questions raised by the community.

Economic Development

- MWH•URS will provide time and resources to the SFPUC-sponsored Contractors Assistance Center by providing technical assistance to small consultants and contractors, conducting training sessions, and participating in mentoring events. MWH•URS will provide 300 hours to this program.
- MWH/URS will track, spend, and report at least $50,000 locally with suppliers (e.g. copying and printing), vendors (e.g. vehicle maintenance and tires), and restaurants through the nine year Project lifecycle.

Community Education

- MWH•URS will provide 300 hours of workshops to middle school students on climate change.

As stated above, MWH•URS will coordinate and develop the timing, schedule, partners, and size/scale of the delivery, performance and dollar expenditures related to all of MWH•URS' Community Benefits Commitments throughout the term of the Agreement with the necessary flexibility so that they are all aligned with and driven by the SFPUC in order to leverage and maximize our collective resources and positive community impacts.

MWH•URS community benefits work will be documented in the Management Work Plan described in Task 1 and will be executed as a major task for the Project.

MWH•URS will organize, plan, track, measure, and report on MWH•URS Community Benefits Commitments. MWH•URS will develop a database of volunteers and partners and use the database to organize each event and ensure optimal participation and success.

MWH•URS' Community Benefits Leader, Kerwen Whatley, will hold monthly meetings with subtask leaders to develop volunteer events and collect status and progress on initiatives. MWH•URS' Community Benefits Leader will provide monthly progress reports to the MWH•URS Project Manager and quarterly progress reports to the Joint Venture Management Committee members.

MWH•URS will submit monthly progress reports, including the Community Benefits effort, as detailed in Task 1.6 above "Monthly Progress Reports and Meetings". To ensure accountability, each of the MWH·URS' monthly progress report submittals (described in Task 1) will include a section on progress towards MWH•URS' Community Benefit Commitments. In addition, MWH•URS will submit a stand-alone quarterly report on progress in fulfilling MWH•URS' Community Benefits Commitments, detailing factors such as the total number of dollars and hours contributed to each of the proposed tasks and organizations.

MWH•URS has tasked facilitator Lisa Beutler with leading the public interaction piece of MWH•URS community benefits initiative. Ms. Beutler will facilitate workshops for learning and community participation in the local neighborhoods.

MWH•URS' Community Benefits Commitments will be performed prospectively during the term of the Agreement, after the award of the Agreement. Commitments performed as part of previous contracts or prior to MWH•URS being awarded the Agreement cannot be used as part of MWH•URS' Community Benefits Commitments for this Project.

MWH•URS' Community Benefits Commitments Task 18 Proposal is attached and incorporated herein. MWH•URS will provide all of the Commitments, consistent with all of the terms of MWH•URS' attached Proposal (including MWH•URS' Work Approach, Project Team and Organization, and Accountability) which are not explicitly detailed in this Task Section 18. Where and if there are any conflicts between the language above in Task 18 of this Agreement and the attached Proposal, the terms of the language of Task 18 above shall prevail as MWH•URS and SFPUC's final mutual understanding and agreement.

Task 19 Environmental Planning Service (Optional)

*****The SFPUC may choose to self-perform all or most of the work included in this task*****

Environmental Planning services to be provided as part of this contract may include preparing an Environmental Constraints and Opportunities Report for preliminary alternatives to be analyzed in the AAR and for the selected preferred alternative to be recommended in the CER. Services may include reconnaissance site visits and review of published documents, as well as attending community meetings that may be held during preliminary phases of the project. **Services may NOT include preparing the EIR for the project or coordinating with the Planning Department's Environmental Planning Division**. Those services may be provided under a separate contract. MWH•URS may provide support to SFPUC's Bureau of Environmental Management's (BEM's) Environmental Project Manager and Permitting Manager to refine the proposed methodology, finalize the work plan for this work, attend any meetings with other City departments or outside agencies, and/or attend community meetings. MWH•URS may be requested to recommend methodologies for the environmental evaluations for the AAR and the CER, including criteria for identifying potential effects (impacts) and ranking as to severity, as well as the criteria for evaluating the need for and the feasibility of potential avoidance measures and mitigation measures. MWH•URS may support the Environmental Project Manager to collaboratively integrate environmental findings into the alternatives evaluation and definition of the preferred alternative.

19.1. Environmental Constraints and Opportunities Report for the AAR –MWH•URS may provide support to the Environmental Project Manager in the preparation of a reconnaissance level environmental analysis of all identified preliminary alternatives and the alternatives selected for evaluation in the AAR. This reconnaissance level review will provide a general understanding of existing conditions for the key resource areas, covering all project components in each alternative, within and immediately adjacent to the alternative alignments. At least two resource areas: Land Use and Cultural Resources may be covered in this analysis. Other potentially relevant resource areas (such as biological resources, air quality, noise, traffic, etc.) may be added to the analysis once the alternative locations are known. In addition, the review may include a reconnaissance level evaluation of potential magnitude of effects for each alternative and compare the alternatives and components of each alternative on the basis of the severity of impacts and the relative feasibility of mitigating them for each resource area. The need to acquire

resource agency or other construction permits will be identified. The analysis may include a literature search and reconnaissance level site visits by land use, archeology, historic resources, and other environmental specialists as deemed appropriate. Although it is anticipated that MWH•URS will be familiar with the MEA Archaeological Guidance and Historic Resources guidance, preparing the specific reports required under this guidance may not be part of this task but may be prepared at a later phase as part of the separate EIR preparation effort. Any mapping that is produced for the environmental constraints survey report shall be produced in a GIS format using protocols compatible with the City's GIS system.

19.2. **Environmental Constraints and Opportunities Report for the CER** –MWH•URS may support the Environmental Project Manager in following a similar process of environmental analysis as in the AAR phase but in greater depth and detail. The purpose of this analysis and recommendations will be to inform the planning and design teams of specific potential environmental constraints and opportunities as conceptual design of the preferred project/alignment develops. This may involve right-of-way recommendations, avoidance measures, methods of construction, construction details (e.g. types/number of equipment, number of workers, truck traffic, etc.), mitigation requirements and alternatives, and measures that can be incorporated as part of the project design. This work may also involve coordination with BEM's Permitting Manager and preliminary discussions with resource agencies as well as include a number of working sessions and coordination meetings with the Project Manager and Project Engineer.

19.3. Attend one monthly meeting for environmental review with BEM and MEA. Occasionally two meetings may be held in one month.

19.4. Submit timely Requests for Information for preparation of the environmental document.

Task 19 Dependency on other Tasks

Task 3 – Review Background Information

Task 9 – Geotechnical and Hazardous Material Investigation

Task 10 – Prepare Planning Level Reports

Task 15 – Communication and Public Outreach

Task 19 Responsible Party

Environmental Support

Task 19 Deliverables

The following deliverables may be required:

19.A. **Draft and Final Environmental Constraints and Opportunities Report for the AAR**, including appendices containing all recorded data, methodology, and supporting materials, and a summary of the report for inclusion into the AAR. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

19.B. **Draft and Final Environmental Constraints and Opportunities Report for the CER**, including appendices containing all recorded data, methodology, and supporting materials, summary of the report for inclusion in the CER, and a description of data needs and study

recommendation for the EIR phase. Provide ten (10) hard copies and one (1) text-searchable electronic copy of draft and final reports.

3. Performance Evaluation

Performance evaluations support the SFPUC's objective of continuously improving the quality of Contractor services. The SFPUC may or may not, at its sole discretion, conduct evaluation/s of Contractor's performance. Ratings are ultimately the decision of the SFPUC and are not subject to negotiation with the Contractor. However, the Contractor may provide comments on a performance evaluation form if an evaluation is performed. In the event that the SFPUC conducts performance evaluation(s) of the Contractor, such performance evaluation(s) shall not confer any express or implied rights upon Contractor, nor shall they shift any liability to the SFPUC for the Contractor's performance of the contract.

SFPUC's Infrastructure Division Procedures Manual, Volume 4, Program and Project Management, Section 3: Contract Management, Procedure: PM 3.16, Consultant Services Performance Evaluation requires that a contract manager evaluate a consultant's performance on engineering, environmental and construction management projects and complete the Consultant Services Performance Evaluation Form (CSPE) during the contract term. A final end of year CSPE will be kept on file with the SFPUC for three years after contract completion. Completed end-of-contract CSPEs, including any consultant responses, will be forwarded to the evaluation panel for future RFPs, where a proposer identifies the evaluated project as a qualifying project reference under the RFP. If a proposer responding to a future RFP identifies an ongoing SFPUC project as a qualifying project reference (and the ongoing project complies with RFP reference requirements), SFPUC staff will forward the most recent annual CSPE for the qualifying project, if any, to the RFP evaluation panel.(Include if contract is engineering design, environmental analysis services and construction management).

4. Reports

Contractor shall submit written reports as requested by the **SFPUC.** Format for the content of such reports shall be determined by the Project Manager. The timely submission of all reports is a necessary and material term and condition of this Agreement. The reports, including any copies, shall be submitted on recycled paper and printed on double-sided pages to the maximum extent possible.

5. Department Liaison

In performing the services provided for in this Agreement, Contractor's liaison with the SFPUC will be: Manfred Wong

6. Grant of License to Use SSIP Hydraulic Model.

The City grants Contractor a revocable, non-exclusive and non-transferable right to use the City's Sewer System Improvement Program Hydraulic Model ("SSIP Hydraulic Model" or "Model") solely in connection with the performance of services under this Agreement. The following terms and conditions, in addition to all other terms and conditions set forth in this Agreement (including but not limited to "Indemnification" and "Liability of City"), shall apply to Contractor's use of the Model.

a. **Delivery**. Contractor was provided with a copy of the SSIP Hydraulic Model in electronic format during the proposal period for this Agreement.

b. **Ownership**. Contractor acknowledges and agrees that the SSIP Hydraulic Model is the proprietary information of the City and that this Agreement grants Contractor no title or right of ownership in the SSIP Hydraulic Model or in copies, modifications or derivative works thereof. Consistent with Sections 26 and 27 of this Agreement, all subsequent improvements, corrections, derivative works, or modifications to the SSIP Hydraulic Model by RECIPIENT shall belong to and be promptly transmitted to the CITY, and all copyrights, trade secrets and other intellectual properties therein shall belong to the CITY. RECIPIENT hereby assigns to the CITY all such copyrights, trade secrets and other intellectual properties and agrees to provide any material and execute any documents necessary to effectuate such assignments.

Contractor expressly agrees that the revocable, non-exclusive and non-transferable license to use the SSIP Hydraulic Model herein granted does not grant Contractor the right to sell, use, rent, market, sublicense, Distribute or otherwise transfer the Model or any part, copy, modification or derivative version thereof to any third party except as expressly provided herein. The term "Distribute" or "Distribution" shall mean remarket, sublicense, give away, trade, sell, barter, disclose, transfer, lease, assign, disseminate, copy or otherwise provide third party access to the SSIP Hydraulic Model, or to any copy, modification or derivative version of the SSIP Hydraulic Model. Contractor understands and agrees that only the City can authorize Distribution of the SSIP Hydraulic Model. Contractor agrees not to Distribute or allow Distribution of the Model without express written authorization from City, except as authorized in this Agreement.

c. **Restrictions on Use**. Contractor is authorized to use the SSIP Hydraulic Model only in connection with Contractor's performance of services under this Agreement as set forth in Task 6 of this Appendix A. Contractor may use the Model on any CPU, multiple CPUs or CPU(s) with multi-core processors owned or leased by Contractor. Contractor may allow subconsultants of any tier to access and use the SSIP Hydraulic Model in connection with the performance of services under this Agreement. Contractor assumes full responsibility for the proper use of the SSIP Hydraulic Model by subconsultants of all tiers consistent with the terms and conditions of this Agreement.

Contractor shall not use the SSIP Hydraulic Model on other projects or for other purposes without the express written permission of the City. Unauthorized use, transmission or copying of the SSIP Hydraulic Model is strictly prohibited.

Contractor's revocable, non-exclusive and non-transferable right to use the SSIP Hydraulic Model shall expire when all obligations required to be performed by Contractor and the City under this Agreement have been fulfilled, unless sooner terminated as set forth in this Agreement.

d. **Reservation of Rights**. All rights not expressly granted by City herein are specifically and completely reserved. Nothing herein grants, expressly or implicitly, by estoppel or otherwise, any right or license to use any content or property of any third party, or may be construed to mean that CITY has authority to grant any right or license on behalf of any third party.

e. **General Advisories**. The SSIP Hydraulic Model was developed as a representation of a complex system. As such, it may be incomplete, contain inaccuracies, or be obsolete, in whole or in part. Contractor shall consider such advisory in performing its services under this Agreement, and shall

confirm the accuracy of any measurements, areas, calculations or other information extracted, generated or obtained by or from its use of the SSIP Hydraulic Model.

Contractor is further advised that translation of the SSIP Hydraulic Model from one computer to another system or environment may and often does result in the loss of important data including, but not limited to (i) portions of text and dimensions, (ii) the existence, location or scale of symbols or other elements of graphics, (iii) the internal structure of the data including layers and data attributes, and (iv) the style or weight of lines. The City makes no representation as to the usability of the SSIP Hydraulic Model on any system. In addition, the SSIP Hydraulic Model includes files that will likely have metadata associated with them. Contractor is advised to review the metadata carefully to understand the objects represented in each file, and the approximate quality, completeness and usability of each file.
The City does not warrant that the SSIP Hydraulic Model will provide or generate complete, accurate, current or error-free results or information. The City makes reasonable, ongoing efforts to revise and update the SSIP Hydraulic Model, but assumes no liability for any errors or omissions, including incomplete, inaccurate or out-of-date content, or for any damages or losses that Contractor or any third party may incur as a result of any errors or omissions in the SSIP Hydraulic Model. The City assumes no responsibility, and shall not be liable for, any damages to, or viruses that may affect, Contractor's computer equipment or other property arising from Contractor's use of or inability to use the SSIP Hydraulic Model. This provision shall survive termination of this Agreement.

f. **Contractor's Responsibility to Revise or Correct**. Contractor shall be responsible for identifying and making any required revisions, modifications or corrections to the SSIP Hydraulic Model and/or Model output data, results or information for its use in performance of services under this Agreement. The City may issue updates to the SSIP Hydraulic Model during the term of this Agreement; it is the responsibility of Contractor to maintain contact with the designated City point of contact to receive future updates, if any. In addition, if, during the course of using the Model as authorized under this Agreement, Contractor identifies apparent critical discrepancies or errors in the Model, Contractor shall provide prompt notice to the City of such apparent discrepancies or errors.

g. **Notice of Unauthorized Use**. Contractor shall take all measures reasonably necessary to prevent the unauthorized use, transmission or copying of the SSIP Hydraulic Model. In the event of the actual or potential unauthorized use, transmission or copying of the SSIP Hydraulic Model which occurs as a result of Contractor's activities or the activities of its sublicensees, Contractor agrees to provide the City with prompt notice of such unauthorized use, transmission or copying, and Contractor shall provide the City with all reasonable assistance to enable the City, if it so desires, to minimize the effects of such unauthorized use, transmission or copying. Any violation of the restrictions on the use or transfer of the SSIP Hydraulic Model shall constitute a material breach of this Agreement. This provision shall survive termination of this Agreement.

h. **Technical Assistance**. If Contractor has technical questions regarding the operation of the SSIP Hydraulic Model, Contractor may pose such questions to the City liaison designated in paragraph 5, above. The City will make a reasonable effort to respond to and address any such questions; however, the City makes no guarantee as to the operation or usability of the Model on any system. The City will not respond to questions involving or relating to the unauthorized use of the Model.

The City will not provide formal training on or instructions for how to use the SSIP Hydraulic Model. As set forth in the RFP, the City expects that Contractor's team will include team members with a minimum amount of experience using software underlying the SSIP Hydraulic Model (e.g., Innovyze (MWHSoft) InfoWorks CS and/or ICM).

i. **Transmittal of SSIP Hydraulic Model, Modifications and/or Derivative Works to City Upon Termination/Expiration**. Upon termination or expiration of this Agreement, the City will provide Contractor with instructions regarding the transmittal of the SSIP Hydraulic Model and any modifications or derivative works developed by Contractor to City.

j. **Remedies.** Contractor acknowledges and agrees with claims by the City that: (a) the SSIP Hydraulic Model contains valuable proprietary information, and; (b) any unauthorized Distribution of the SSIP Hydraulic Model would (i) substantially diminish the value to the City of the copyrights and other proprietary interests that are the subject of this Agreement, (ii) render City's remedy at law for such unauthorized Distribution inadequate, and (iii) cause irreparable harm to the City. If Contractor breaches any of its obligations with respect to the use of the SSIP Hydraulic Model, City shall be entitled to equitable relief to protect its interests therein, including but not limited to preliminary and permanent injunctive relief, and Contractor waives any requirements that a bond be posted in connection therewith.

7. Community Benefits Performance Evaluation/Remedies

The SFPUC may, at its sole discretion, evaluate MWH•URS' performance of MWH•URS' Community Benefits Commitments by including satisfactory performance of MWH•URS Community Benefits Commitments as a component of the Performance Evaluation described above. The performance evaluation of MWH•URS' Community Benefits Commitments shall not preclude or in any way be deemed to waive any other remedy. The City shall retain and have the right to exercise all of the legal and equitable remedies provided in this Agreement. All remedies provided for in this Agreement may be exercised individually or in combination with any other remedy available hereunder or under applicable laws, rules and regulations.

8. Unavoidable Delay

Task Orders issued under the Agreement may contain specific deadlines or other schedule-related requirements that will apply to Contractor's performance of services under the Agreement. Deadlines or other schedule-related requirements set forth in Task Orders shall constitute material obligations of Contractor under this Agreement.

Should Contractor be obstructed or delayed in the completion of services from causes beyond its control that could not have been avoided by Contractor's exercise of care, prudence, foresight and diligence, and solely due to acts of God, acts of government agencies, riots, insurrections, wars, fires, floods, epidemics, quarantine restrictions, terrorism, industry-wide strikes, lockouts, other labor disturbances, freight embargoes, or unusually severe weather ("Unavoidable Delay"), Contractor shall be entitled to a noncompensable extension of time.

Contractor shall be entitled to a noncompensable extension of time for Unavoidable Delay only if it demonstrates that the Unavoidable Delay actually extends the time to complete services under one or more Task Orders.

Contractor shall be entitled to a noncompensable extension of time for Unavoidable Delay only if it notifies the City point of contact identified in the Agreement promptly upon the occurrence of a delay that prevents Contractor from proceeding with services and follows up with a written notification of the causes of the delay within 7 days from the beginning of any delay. Furthermore, Contractor shall notify the City point of contact promptly at the end of the delay and follow up with written notification of the cessation of delay within 7 days from the end of the delay. Any claim for a noncompensable time extension shall be made in writing within 21 days after the conclusion of the delay period. The City will review the claim to ascertain the facts, whether the delay was an Unavoidable Delay as defined above, and the extent of the delay, and will meet with Contractor to discuss entitlement to an extension of time.

Appendix B
Calculation of Charges

As part of Contractor's proposal November 14, 2012, Contractor submitted proposed billing rates, attached hereto as Appendix B-1 Fee Schedule Form, for the requested tasks in the Overhead and Profit Schedule, incorporated herein by reference.

As provided in the Overhead and Profit Schedule, the budget identified for tasks is an estimate, and the City reserves the right to modify the budget allocated, if applicable, to any task as more specific information concerning the task order scope becomes available.

1. **Billing Rates**

   Contractor's billing rates and each and every staff classification as stated in Appendix B-1 will be the billing rates for the listed individuals. The billing rate may not exceed the lowest rate charged to any other governmental entity except the City and County of San Francisco. Billing rates may be adjusted annually on the anniversary of the effective start date as indicated in the original Notice of Contract Award letter. The first adjustment may be made no earlier than the first anniversary of the effective start date. The amount of the adjustment is limited to a maximum of the CPI annual percentage change increase (San Francisco Bay Area for Urban Wage Earners and Clerical Workers) for the previous calendar year. No increase, including the annual CPI adjustment, is allowed to billing rates exceeding $250 per hour, unless Project Manager and Bureau Manager authorize an increase to the rate in writing.

2. **Personnel Changes:**

   Any proposed changes to project personnel or staff classification as listed in Appendix B-1 must be approved in advance of any work commencing on the project and in writing by the SFPUC Project Manager. These personnel changes may include but are not limited to:

   - Proposed addition of new project personnel to perform requested services that are within the scope of the Agreement;
   - Proposed change of staff classification for existing personnel; and/or
   - Proposed replacement or substitution of any employee listed in Appendix B-1 due to termination, promotion or reclassification.

   All proposed personnel must meet all qualification requirements established by the Agreement.

3. **Effective Overhead and Profit Rate**

   The Effective Overhead and Profit Rate (EOPR) for CS-169 is **2.52.** The EOPR OR Individual Firm Overhead and Profit Rate will apply to the billing rate of all individuals not listed in Appendix B-1. The EOPR will also apply to all amendments to the Agreement. If a new subconsultant is added during the duration of the Agreement, the new individual firm multiplier can be no more than the EOPR.

4. Other Direct Costs (ODC)

Direct reimbursable expenses (ODCs – Other Direct Costs) shall include actual direct costs (with no mark up) of expenses directly incurred in performing the work. All ODCs are subject to pre-approval in writing by the SFPUC Project Manager.

The following items will be eligible for reimbursement as ODCs:

- Out-of-town travel ("out-of-town" shall mean outside the nine Bay Area counties: San Francisco, Alameda, Marin, Santa Clara, Sonoma, Contra Costa, Napa, San Mateo, Solano). Out-of-town travel will be granted only with **prior** written approval by SFPUC contract manager and documentation of the written approval by the SFPUC must be included with the invoice.
    - Rental vehicle: traveler must select the most economical contractor and type of vehicle available and acquire any commercial rate or government discount available when the vehicle is rented.
    - Personal vehicle use: Contractor will be paid per mile as established by the United State Internal Revenue Service and only for that portion of travel that is outside the nine Bay Area counties and non-routine. Should the travel begin or end on a normal workday, the Contractor shall subtract commuting mileage from total mileage to calculate reimbursable mileage. The Contractor shall submit to the City an approved mileage log with its monthly invoices.
- Specialty printing ("specialty" as used herein shall mean large volume printing and color printing and requires **prior** written approval by SFPUC project staff and documentation of the written approval by the SFPUC must be included with the invoice);
- Specialty computer hardware and software (only with **prior** written approval by SFPUC project staff and documentation of the written approval by the SFPUC must be included with the invoice – all specialty hardware and software will be the property of the City);
- Permit fees; and
- Expedited courier services when requested by SFPUC staff.

Everything not listed above is not eligible for reimbursement and therefore should be included in the Contractor's EOPR if compensation for these expenses is desired. They include, but are not limited to:

- All other travel expenses such as parking, bridge tolls, public transit, vehicle mileage within the nine Bay Area Counties, travel from Consultant's home office to SFPUC facilities;
- Contractor staff relocation costs;
- Any labor charges or pass-throughs, including but not limited to, administrative and clerical staff time;
- Telephone calls and faxes originating in the firm's home office, standard computer use charges, computer hardware or software (other than the specialty hardware or software mentioned above), communication devices, and electronic equipment;
- All meals, including refreshments and working lunches with SFPUC staff;
- Equipment to be used by SFPUC staff; and

- Postage and courier services which are not requested by SFPUC staff.

5. Subcontractor make-up and documentation

Subcontractor fees are: a) Subject to above restrictions; b) Subject to written pre-approval by the SFPUC Regional Project Manager; c) Subcontractor administration markup is limited to five percent (5%) of Subconsultants' actual labor costs.

Second-tier and pass-through subcontracting is prohibited. Additional subcontractors may be added to the contractor team after obtaining pre-authorization by the SFPUC [Project/Contract] Manager, Bureau/Division Manager and the Human Rights Commission.

6. 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 Regional [Project/Contract] Manager and all work products have been received and approved by the SFPUC Regional [Project/Contract] Manager, the Contractor may request that the retention be released. In lieu of money retention, an irrevocable letter of credit acceptable to the City will be accepted.

7. Invoice Requirements

The SFPUC is automating its contracting and invoice payment processes with online software systems (SOLIS). The following processes are being automated: Contract Certification, Insurance Compliance, Task Order Certification, Timekeeping, Invoice Approval, and Invoice Payment. As part of its contracting obligations, the Contractor is required to 1) become an authorized user of these systems, 2) attend user training for these systems; and 3) utilize these systems for the purposes for which they are intended. Contractor shall not bill the SFPUC to use these systems. Contractor shall not charge SFPUC to send appropriate personnel to user training.

Contractor shall follow the invoicing and supporting documentation instructions as detailed in the SOLIS training or otherwise prescribed by the SFPUC.

CS-169 Planning & Engineering Services, Central Bayside System Project

MWH/URS, JV Fee Schedule Appendix B-1

Consultant Name [A]	STAFF CLASSIFICATION [B]	Staff Person [C]	Billing Rate ($/hour) [D]	Firm Multiplier (one per firm) [E]
MWH	Project Manager	Akhtar Hamid	$ 235.00	3.50
	Lead Supervising Engineer	Andre Tolme	$ 181.23	
	Wastewater Practice Lead	Art Umble	$ 235.00	
	Supervising Engineer	Benjamin Herston	$ 176.63	
	Project Controls	Casey Frederick	$ 131.82	
	Principal Electrical Engineer	Charles Reynolds	$ 208.55	
	Architectural Group Lead	Charles Young	$ 235.00	
	Chief Mechanical Engineer	Constantino Senon	$ 235.00	
	Outreach	Craig Moyle	$ 191.12	
	Chief Structural Engineer	Craig Wilcox	$ 235.00	
	Lead Structural Engineer	Darren Milanowicz	$ 167.43	
	Principal Cost Estimator	Don Crone	$ 235.00	
	Operations Support	Douglas Craig	$ 235.00	
	Principal Civil Engineer	Ed Barnhurst	$ 235.00	
	Mechanical Engineer	Frank Topel	$ 218.14	
	Pump Station Task Leader	Gary Hoornaert	$ 235.00	
	Senior Civil Engineer	Gwen Rhodes	$ 73.79	
	Physical Modeling	James Lindell	$ 235.00	
	National Estimating Practice Leader	James Loucks	$ 235.00	
	Structural Lead	James Witnik	$ 226.80	
	JV Management Committee	JaNell Cook	$ 235.00	
	Professional Engineer	Jason Allard	$ 114.98	
	Principal Engineer	Jeffrey Pelletier	$ 235.00	
	Professional Mechanical Engineer	Jonathan Meier	$ 130.12	
	Associate Engineer	Jordan Damerel	$ 107.26	
	Lead Civil Engineer	Justin Bartels	$ 161.21	
	Outreach	Kerwen Whatley	$ 235.00	
	Outreach	Lisa Beutler	$ 222.78	
	Chief, I & C Engineer	Louis Yaussi	$ 235.00	
	Senior Mechanical Engineer	Lynn Mortensen	$ 148.56	
	Professional Engineer	Man Wong	$ 156.20	
	Supervising Engineer	Michael Dupont	$ 155.16	
	Senior Designer	Mike Skinner	$ 189.21	
	Senior Civil Engineer	Nicholas Anderson	$ 80.79	
	Senior Designer	Rodger Sasaki	$ 199.71	
	Environmental Engineer	Shannon Conway	$ 175.08	
	Professional Engineer	Stephen Chhit	$ 116.53	
	Supervising Engineer	Stephen Robinson	$ 176.05	
	Principal Engineer	Steven Hyland	$ 235.00	
	Civil Engineer	Wade Moore	$ 206.29	
	Civil Engineer	Wayne Coleman	$ 210.10	
	Supervising Mechanical Engineer	Wayne Welker	$ 184.42	
	Principal Engineer	William Pisano	$ 235.00	
URS	Staff Planner	Alana Callagy	$ 104.42	2.85
	Hydrologist	Anne Connell	$ 194.94	
	Constructability and Cost Estimating	Carl Linden	$ 235.00	
	Senior Tunnel Engineer	Carlos Jaramillo	$ 203.26	
	Architectural Historian	Corri Jimenez	$ 89.83	
	Green Solutions, Stormwater Management	David Dods	$ 164.73	
	Environmental Support	Denise Heick	$ 235.00	
	Tunnel Numerical Modeling	Ethan Dawson	$ 176.13	
	Lead Tunnel Engineer	Galen Klein	$ 179.32	
	Staff Engineer	Garrett Kapnelian	$ 88.35	
	Hazardous Material	Giorgio Molinario	$ 145.81	
	CSO Tunnels	Heather Ivory	$ 224.01	
	Hazardous Materials Lead	Iain Baker	$ 122.55	
	Hazardous Material	Joe Morgan	$ 176.70	
	JV Management Committee	John Bischoff	$ 235.00	
	Project Planner	Kathy Rushmore	$ 160.17	
	GIS	Kirsten Lawrence	$ 114.23	
	QA/QC Geotechnical	Lelio Mejia	$ 235.00	
	Environmental Support	Linda Peters	$ 175.45	
	Archaeologist	Mark Hale	$ 123.35	
	Microtunnels	Mathew Francis	$ 232.96	
	Final Lining Design	Michaele Monaghan	$ 145.12	
	Modeling	Mike Agbodo	$ 198.13	
	Lead QA/QC	Noel Wong	$ 235.00	
	Biologist	Ode Bernstein	$ 82.31	
	Shaft Analysis and Design	Philip Meymand	$ 177.73	
	Site Investigation and Ground Characterization	Philip Respess	$ 138.17	
	Engineering Geology	Ray Rice	$ 213.75	
	Surveyor	Robert Perez	$ 159.03	
	Geotechnical Task Lead	Sam Gambino	$ 154.24	
	High Speed Rail Coordination	Steve Perreault	$ 235.00	
	QA/QC Tunnels/Shafts	Ted Feldsher	$ 173.96	
	Regulatory Issues	Terry Cooke	$ 230.17	
	Grouting and Ground Improvement	Thomas Kolbe	$ 142.73	
	Sewer Rehabilitation	Tim Monahan	$ 145.12	
	LID Pilot, Design, Implementation Plan	Tom Sweet	$ 212.95	
	Foundation Engineering	William Paratore	$ 235.00	
	Earthquake Engineer	Wolfgang Roth	$ 235.00	

CS-169 Planning & Engineering Services, Central Bayside System Project

MWH/URS, JV Fee Schedule Appendix B-1

Consultant Name [A]	STAFF CLASSIFICATION [B]	Staff Person [C]	Billing Rate ($/hour) [D]	Firm Multiplier (one per firm) [E]
MWA Architects	Architectural	Michael Willis	$ 138.48	3.00
V&A	Odor Control	James Joyce	$ 235.00	3.00
NHC	Principal	Babb	$ 207.00	3.00
	Clerical	Bracken	$ 84.75	
	Modeling Engineer	Clohan	$ 93.81	
	Physical Modeling	David Axworthy	$ 235.00	
	Task Project Manager/Tech. Review	Tom Demlow	$ 205.71	
	Technician II	Toxopeus	$ 99.36	
Fugro	Geology (Urban Watershed)	Janet Sowers	$ 138.83	2.98
	LiDAR/Bathymetry	Jim Grant	$ 208.37	
	Geology (Urban Watershed)	Justin Pearce	$ 153.30	
	Seismic Geology	Keith Kelson	$ 235.00	
	LiDAR/Bathymetry	Mitchell Todd	$ 208.37	
Chiang	Architect	Robin Chiang	$ 175.00	2.87
BPR	RTC	Alain Charron	$ 182.40	2.85
	RTC	Diana Qing Tao	$ 165.30	
	RTC	Veronique Fortier	$ 122.55	
XCG	Urban Watershed Task Leader	George Zukovs	$ 235.00	2.85
	Urban Watershed	Phil Gray	$ 204.34	
	TAC Watershed	Robert Pitt	$ 215.09	
Gerwick	Structural Lead	Sam Yao	$ 233.95	2.82
Telamon	Principal/ Project Manager	Mennor Chan	$ 191.04	2.75
Robert Chew	Senior Engineer	Mark McKee	$ 116.94	2.65
	Principal Engineer	Robert_Chew	$ 185.93	
Katherine Loh Graphic Design	Translation Services	Katherine Loh	$ 85.00	2.00
MSE	Surveying/Robotic Inspection	Emily Thomas	$ 129.05	2.10
	Surveying/Robotic Inspection	Greg Ippolito	$ 141.58	
	Surveying/Robotic Inspection	Nathan Foley	$ 129.05	
	Surveying/Robotic Inspection	Rick Mather	$ 141.58	
	Surveying/Robotic Inspection	Stanley Gray	$ 235.00	
LeBlanc and Associates	Public Outreach	Brigette LeBlanc	$ 125.00	1.50
PPC	Outreach	Nicholas Dewar	$ 190.00	1.50
MST	GIS	Caitlin Kniazewycz	$ 75.00	1.50
	Hydraulic/Water Resource Engineer	Michael Thomas	$ 160.00	
	GIS	Richard Kos	$ 95.00	
O'Rourke	TAC Geotechnical	Tom O'Rourke	$ 235.00	1.00
Tanoue	Landscape Architect	Burt Tanoue	$ 90.00	1.00
UT	Consultant	Fulvio Tonon	$ 235.00	1.00
Wightman	TAC Constructability	Toby Wightman	$ 225.00	1.00
DeFazio	TAC Hydraulics	Frank DeFazio	$ 235.00	1.00
Korbin	TAC Tunnel/Shafts	Gregg Korbin	$ 220.00	1.00
Leahy	Hydraulic/Water Resource Engineer	Andrew Leahy	$ 125.00	1.00
Macris	Technical Editing	Natalie Macris	$ 110.00	1.00