

**DRAFT SECOND AMENDMENT TO CONSULTANT SERVICES AGREEMENT
BETWEEN THE CITY OF SUNNYVALE AND CAROLLO ENGINEERS FOR
DESIGN AND CONSTRUCTION SUPPORT SERVICES FOR WATER
POLLUTION CONTROL PLANT MASTER PLAN AND
PRIMARY TREATMENT FACILITY DESIGN**

This Second Amendment to Consultant Services Agreement, dated _____, is by and between the CITY OF SUNNYVALE, a municipal corporation ("CITY") and CAROLLO ENGINEERS ("CONSULTANT").

WHEREAS, on May 21, 2013, CITY and CONSULTANT entered into a Consultant Services Agreement whereby CONSULTANT would perform professional services necessary for investigation, analysis, environmental documentation, master planning services, engineering design, preparation of construction drawings and contract specifications, consultation, services during construction and other services for a project known as the Water Pollution Control Plant Master Plan and Primary Treatment Facility Design (Public Works Project No. UY-15/01-19); and

WHEREAS, on January 9, 2015, CITY and CONSULTANT entered into an Amendment to Consultant Services Agreement to add CEQA and design-related services associated with a Membrane Bioreactor (MBR) option for the production of recycled water at the Water Pollution Control Plant (WPCP), which increased the total contract value by \$507,160, from \$12,439,641 to \$12,946,801, in conjunction with a funding agreement with the Santa Clara Valley Water District (SCVWD); and

WHEREAS, the CITY and CONSULTANT now agree that a Second Amendment to said Agreement is advisable in order to increase funding for Engineering Services During Construction associated with the Primary Treatment Facility Package 2 construction contract;

NOW, THEREFORE, THE PARTIES ENTER INTO THIS SECOND AMENDMENT TO CONSULTANT SERVICES AGREEMENT:

1. Services by CONSULTANT – Replace first paragraph with the following:

1. Services by CONSULTANT

CONSULTANT shall provide Base services in accordance with Sections I through VIII of Exhibit "A" and associated Attachment 1 entitled "Master Plan and Primary Treatment Facility Design Scope of Work", as well as Exhibit "A-2" entitled "Scope of Services to Support Potential MBR/RO Facilities", and Exhibit A-3 entitled "Scope of Services for Additional Engineering Services During Construction for Primary Treatment Facility Package 2" attached and incorporated by reference.

2. Notice to Proceed/Completion of Services – Replace Paragraph (b) with the following:

2. (b) When CITY determines that CONSULTANT has satisfactorily completed the services defined in Exhibits “A”, “A-2” and “A-3”, CITY shall give CONSULTANT written Notice of Final Acceptance, and CONSULTANT shall not incur any further costs hereunder. CONSULTANT may request this determination of completion when, in its opinion, it has satisfactorily completed the Scope of Work (Exhibit “A”) Scope of Services to Support Potential MBR/RO Facilities (Exhibit “A-2”), and Scope of Services for Additional Engineering Services During Construction for Primary Treatment Facility Package 2 (Exhibit “A-3”), and if so requested, CITY shall make this determination within fourteen (14) days of such request.

4. Payment of Fees and Expenses – Replace with the following:

4. Payment of Fees and Expenses

City agrees to pay CONSULTANT for the services rendered pursuant to this Agreement, the amounts and rates in Exhibit “C – Compensation Schedule” and also in Exhibits “A-2” and “A-3”, subject to the payment provisions and not-to-exceed sums set forth in this section.

Payments shall be made to CONSULTANT on a monthly basis. Compensation will not be due until a detailed billing is submitted to CITY within a reasonable time before payment is expected to allow for normal CITY processing. An estimate of the percent of total completion associated with the various categories of the services shall be furnished by CONSULTANT with said billing. Copies of the pertinent financial records will be included with the submission of billings) for all direct reimbursables.

In no event shall the total amount of compensation payable under this Agreement for Base services exceed the sum of Eleven Million Eighty-Eight Thousand One Hundred Twenty Seven and No/100 Dollars (\$11,088,127.00), unless upon written modification of this Agreement executed by both parties.

In no event shall the total amount of compensation payable under this Agreement for As-needed services exceed the sum of One Million Three Hundred Fifty One Thousand Five Hundred Fourteen and No/100 Dollars (\$1,351,514.00), unless upon written modification of this Agreement executed by both parties.

In no event shall the total amount of compensation payable under this Agreement for Scope of Services to Support Potential MBR/RO Facilities (Exhibit “A-2”) exceed the sum of Five Hundred Seven Thousand One Hundred Sixty and

No/100 Dollars (\$507,160.00) unless upon written modification of this Agreement executed by both parties.

In no event shall the total amount of compensation payable under this Agreement for Scope of Services for Additional Engineering Services During Construction for Primary Treatment Facility Package 2 (Exhibit "A-3") exceed the sum of One Million Two Hundred Ten Thousand One Hundred Seventy Three and No/100 Dollars (\$1,210,173.00) unless upon written modification of this Agreement.

In no event shall the total amount of compensations payable under this Agreement exceed the total sum of Fourteen Million One Hundred Fifty Six Thousand Nine Hundred Thirty Eight and No/100 Dollars (\$14,156,938.00).

All invoices, including detailed backup, shall be sent to City of Sunnyvale, attention Accounts Payable, P.O. Box 3707, Sunnyvale, CA 94088-3707.

8. Standard of Workmanship – Replace second paragraph with the following:

8. Standard of Workmanship

The plans, designs, specifications, estimates, calculations, reports and other documents furnished under Exhibits "A", "A-2" and "A-3" shall be of a quality acceptable to CITY. The criteria for acceptance of the work provided under this Agreement shall be a product of neat appearance, well-organized, technically and grammatically correct, checked and having the maker and checker identified. The minimum standard of appearance, organization and content of the drawings shall be that used by CITY for similar projects.

All other terms and conditions remain unchanged.

IN WITNESS WHEREOF, the parties have executed this Agreement Amendment.

ATTEST:

CITY OF SUNNYVALE ("CITY")

By _____
City Clerk

By _____
City Manager

APPROVED AS TO FORM:

CAROLLO ENGINEERING
("CONSULTANT")

By _____
City Attorney

By _____

Name and Title

By _____

Name and Title

SCOPE OF SERVICES FOR ADDITIONAL ENGINEERING SERVICES DURING CONSTRUCTION FOR PRIMARY TREATMENT FACILITY PACKAGE 2

BACKGROUND

The City of Sunnyvale (City) (Owner) is currently moving forward with the Primary Treatment Facility project at the Water Pollution Control Plant (WPCP). This project includes construction of a new headworks, primary sedimentation tanks, and associated support facilities. Engineering services during construction (ESDCs) were estimated in 2013 by Carollo/HDR (Consultant) before any detailed engineering was completed on the proposed facilities. The construction value of the project based on the current project scope is estimated at approximately \$106 million. The project will be completed in three construction packages based on the following assumed construction schedule:

- Package 1 - June 2016 through May 2017
- Package 2 - June 2017 through December 2020
- Package 3 - To be determined.

This scope of work covers additions to the Primary Facility – ESDC's Task 4.2 and associated subtasks for the ESDCs for Package 2 contained in the initial Consultant Services Agreement dated May 21, 2013. The design of Package 3, which consists primarily of landscaping work, is currently on hold and will be developed at a later date.

These additional Task 4.2 costs total \$1,210,137. Of this amount, \$989,346 is apportioned to Carollo/HDR. The remainder of \$220,791 is apportioned to subconsultants as detailed below.

SCOPE OF SERVICES

This section presents the Scope of Services for the WPCP Primary Treatment Facility Project - Engineering Services during Construction (ESDC). This project will utilize Oracle Unifier software, a web-based construction management software to be provided by the Owner, to manage electronic media. The City has selected Covello Associates to provide third party construction management services for this project.

Task 4.2.1 – Review Request for Information (RFIs)

Consultant shall review Requests for Information (RFIs) from the Contractor forwarded by the City's Construction Manager (CM) within an average turnaround time of seven (7) calendar

days. Consultant shall issue Design Clarifications (DCs) where a need for clarification is identified by the City, CM or Consultant.

Task 4.2.1.1 – Review RFIs. Consultant shall review and respond to RFIs and issue interpretations and DCs to the contract documents. For budgeting purposes, the following assumptions have been made:

- Consultant shall respond to approximately 760 RFIs and DCs assuming an average review time of 6 hours per RFI/DC response. DCs typically require additional effort but should be accommodated within this budget based on the assumption of no more than 40 DCs within the 760 actions under this task. Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:
 - \$10,448 for geotechnical subcontractor (Fugro).
 - \$10,080 for architectural subcontractor (Burks Toma).
 - \$5,000 for air permitting support (Mizutani)
 - \$4,706 for other wetlands mitigation effort (HT Harvey)

Information Provided by City/CM:

- RFIs (from Contractor and City/CM).

Consultant Deliverables:

- Written responses to RFIs.
- Design Clarifications (DCs).

Assumptions:

- RFIs will be sourced from the construction contractor and requests from the CM team have been addressed through the design review process. No allowance is included for design review queries from the CM team following the design period.

Task 4.2.2 – Review Submittals and Shop Drawings

Consultant shall review submittals and shop drawings from the Contractor transmitted by the CM.

Task 4.2.2.1 – Review Submittals and Shop Drawings. Consultant shall review and respond to product submittals and shop drawing submittals (excluding submittals listed below under assumptions and clarifications) from the Contractor forwarded by the CM. Submittals will be reviewed in accordance with the contract documents and returned to CM within 30 calendar days. Review comments will be returned to the CM for processing and distribution to the Contractor and other parties. For budgeting purposes, the following assumptions have been made:

- Package 2: Consultant shall respond to approximately 540 submittals assuming an average processing and review time of 8 hours per submittal and 135 resubmittals assuming an average processing and review time of 4 hours per shop drawing resubmittal. Preceding assumptions are based on a specification derived list of submittals compiled from the contract specifications. Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:
 - \$9,398 for geotechnical subcontractor (Fugro).
 - \$18,669 for architectural subcontractor (Burks Toma).
 - \$2,000 for odor control (Webster and Associates).
 - \$4,706 for wetlands mitigation effort (HT Harvey)

Information Provided by City/CM:

- Submittals, including shop drawings, as required by the Contract Documents and resubmittals (from Contractor).

Consultant Deliverables:

- Written comments on submittals and resubmittals.

Task 4.2.2.2 – Review Substitution Requests. Consultant shall review equipment substitution (or-equal) requests submitted by the Contractor. For budgeting purposes, the following assumptions have been made:

Package 2: Consultant shall review approximately 4 equipment substitution (or-equal) requests assuming an average processing and review time of 16 hours per request.

Information Provided by City/CM:

- Formal equipment substitution requests (from Contractor).

Consultant Deliverables:

- Written responses to substitution requests.

Task 4.2.3 - Project Management, Meetings and Field Observation

Consultant shall provide project administration and management, attend specified meetings, and provide supplemental field observation during the construction period.

Task 4.2.3.1 - Project Management. Consultant shall provide project management and administration necessary for proper planning, filing, execution, monitoring, quality control, and reporting of this project during the construction period. Consultant shall prepare a brief monthly progress summary letter report for attachment to the monthly invoice to track status of budget expenditures by task description and key work activities completed during that billing period. For budgeting purposes, the following assumptions have been made:

- For this task, Consultant has assumed an effort level of 10 hours per month for 44 months. Consultant's subcontractor has the following budget for this task:
 - \$6,216 for architectural subcontractor (Burks Toma).
 - \$4,212 for wetlands mitigation effort (HT Harvey)

Information Provided by City:

- None.

Consultant Deliverables:

- Monthly progress summary letter with each invoice.

Task 4.2.3.2 – Pre-Construction Conference. Consultant's principal-in-charge, project manager, project engineer, and Consultant's design partner (HDR) shall attend a pre-construction meeting with the City, CM, plant staff, and Contractor. The purpose of the meeting is to facilitate understanding of the contract requirements by all parties involved. For budgeting purposes, the following assumptions have been made:

- Package 2: For this task, Consultant has included a budget of 8 hours, including travel time.

Information Provided by City/CM:

- Meeting agenda and meeting minutes (from the CM).

Consultant Deliverables:

- As-needed discussion topics prior to the meeting.
- Attendance and input at the pre-construction conference.
- Review and comment on meeting minutes.

Task 4.2.3.3 – Progress Meetings. Consultant shall attend progress meetings once per month with the City, plant staff, construction manager (CM) and Contractor. The purpose of these meetings is to discuss construction status and to review key issues with the Contractor. The meetings will be conducted by the CM. For budgeting purposes, the following assumptions have been made:

- Consultant's project manager or project engineer (Carollo) shall attend 42 progress meetings.

Information Provided by City/CM:

- Meeting agenda and meeting minutes (from CM).

Consultant Deliverables:

- Identify discussion topics prior to the meeting, as needed.
- Attendance and input at the progress meetings.
- Review and comment on meeting minutes.

Task 4.2.3.4 –Technical Meetings. Consultant shall attend technical meetings with the City, plant staff, CM and Contractor. The purpose of these meetings is to discuss technical elements of the project outside of the regular progress meetings. These meetings will be conducted by the CM. For budgeting purposes, the following assumptions have been made:

- Consultant shall attend the following meetings during the construction period: 4 equipment pre-submittal meetings; 6 quality assurance meetings; 4 field pre-installation meetings; 3 electrical system study meetings per Section 16050; 4 control logic meetings per Section 17050; and 3 PG&E coordination meetings. Attendance at system configuration meetings is included in Task 7.2.2 described below. Consultant shall provide, as-requested, discipline specific personnel in the areas of civil, architectural, structural, HVAC, mechanical, electrical, and instrumentation for these technical meetings. For this task, a budget of 252 hours, including travel time, has been included. Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:

- \$10,395 for geotechnical subcontractor (Fugro).
- \$5,040 for architectural subcontractor (Burks Toma).

Information Provided by CM:

- Meeting agenda and meeting minutes.

Consultant Deliverables:

- Identify discussion topics prior to the meeting, as needed.
- Attendance and input at technical meetings.
- Review and comment on meeting minutes.

Task 4.2.3.5 – Post Construction Guaranty Period Meetings. Consultant's project manager and project engineer shall attend a post construction meeting with the City, CM, plant staff, and Contractor approximately 11 months after the date of substantial completion for Package 2. The purpose of this meeting is to review any issues that may require the Contractor to repair prior to expiration of the project warranty period. For budgeting purposes, the following assumptions have been made:

- Package 2: For this task, Consultant has included a budget of 8 hours, including travel time.

Information Provided by City/CM:

- Meeting agenda and meeting minutes.

Consultant Deliverables:

- Identify discussion topics prior to the meeting, as needed.
- Attendance and input at the post construction meeting.
- Review and comment on meeting minutes

Task 4.2.3.6 – Partnering Meetings. Consultant shall attend the partnering workshop that is part of the pre-construction conference with the City, plant staff, construction manager (CM) and Contractor. Consultant shall also attend follow-up partnering meetings when requested by the Owner. The purpose of these meetings is to keep all parties involved and apprised of project status, events and schedule. The meetings will be conducted by the CM.

For budgeting purposes, the following assumptions have been made:

- Consultant's principal-in-charge and project manager shall attend the initial partnering workshop.

Information Provided by City/CM:

- Meeting agenda and meeting minutes (from CM).

Consultant Deliverables:

- Identify discussion topics prior to the meeting, as needed.
- Attendance and input at the partnering meetings.
- Review and comment on meeting minutes

Task 4.2.3.7 – Field Observation. Consultant will provide the field structural observation services by a registered civil or structural engineer required by Chapter 17, Section 1704.5 of the 2013 CBC specifically described below. Contractor and/or CM will provide all special inspection services required by the California Building Code (CBC).

- Consultant will provide the following field structural observation services during construction for the items indicated on the "Schedule of Structural Observation" included on the Package 2 Contract Drawings. For this task, Consultant has assumed 16 site inspections with each inspection requiring 8 hours including travel time. In addition, Consultant's geotechnical engineer (Fugro) will provide field observation services for the geotechnical related items indicated on the "Schedule of Structural Observation" included on the Package 2 Contract Drawings during construction. Fugro will also provide periodic observation for the installation of the vinyl and coated steel sheet pile cut-off walls installed for flood protection under the project. Consultant has budgeted the following amount for Consultant's subcontractor to provide this service:
 - \$52,500 for geotechnical subcontractor (Fugro).
- Consultant's environmental subcontractor (HT Harvey) will provide up to 10 site inspections to review implementation of habitat mitigation work. Consultant has budgeted the following amount for Consultant's subcontractor to provide this service:
 - \$6,868 for environmental subcontractor (HT Harvey).

Information Provided by City/CM:

- Advance notice (3 working days minimum) of need for field observation.

Consultant Deliverables:

- Field reports by geotechnical engineer.
- Field reports by structural engineer.
- At the conclusion of work included in the building permit, written statement that the site visits have been made and identify any reported deficiency submitted to the City Building Department.
- Field notes by environmental subcontractor.

Task 4.2.4 - Prepare Record Drawings

Consultant shall prepare record drawings of the project to incorporate changes made during the construction period.

Task 4.2.4.1 – Record Drawings. Consultant shall prepare record drawings after construction contract closeout using Consultant's standard format to include changes made during the construction period. It is assumed that the Contractor and City's CM team will maintain a full-size set of marked-up drawings detailing all field changes and clarifications. Consultant shall not be responsible for field measuring as-built conditions and will rely solely on the information provided by the CM and Contractor as the basis for preparing the record drawings. For budgeting purposes, the following assumptions have been made:

- For this task, Consultant has included a budget based on an average of 1.5 hours per drawing and a total of 695 drawings. Consultant has budgeted \$5,670 for Consultant's architect (Burks Toma) to assist with this effort.
- Consultant has also budgeted \$8,388 for consultant's environmental subconsultant, HT Harvey, to prepare and submit a Biological As-built Report to the California Department of Fish and Wildlife (CDFW) after completion of the mitigation site construction.

Information Provided by City/CM:

- Conformed copy of full-size as-built drawing markups by the Contractor and the City's CM team.

Consultant Deliverables:

- One hard copy of the full-size record drawings.
- One electronic copy (pdf) of the half-size and full-size record drawings.
- AutoCAD drawing files with .ctb files, plot configuration files, and Xref drawings.
- Biological As-built Report in pdf format (no hard copies will be provided) including plan view drawings of the mitigation areas showing planting zones, quantities installed, spacing and any biologically significant deviations from the concepts in the Project MMP.

Task 4.2.5 – Review Proposed Substitutions (included in Task 4.2)

Task 4.2.6 – Assistance With Contract Changes

Consultant shall provide engineering support services specified herein to assist the City and CM during the construction period.

Task 4.2.6.1 – Review Cost Reduction Proposals. Consultant shall review formal cost reduction proposals submitted by the Contractor. For budgeting purposes, the following assumptions have been made:

- For this task, Consultant shall respond to 2 cost reduction proposals assuming an average processing and review time of 40 hours per proposal. Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:
 - \$3,483 for geotechnical subcontractor (Fugro).
 - \$5,000 for constructability consultant (Ewing)
 - \$1,344 for architectural subcontractor (Burks Toma).

Task 4.2.6.2 – Assist With Review of Contract Change Orders. Review shall be limited to merits of the proposed change order and providing input on applicable unit and material prices of selected items. The City and CM will negotiate the proposed change order cost with the Contractor based on Consultant's input on applicable equipment and material prices. For budgeting purposes, the following assumptions have been made:

- For this task, Consultant shall respond to approximately 20 contract change orders assuming an average processing and review time of 8 hours per change order. Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:
 - \$3,483 for geotechnical subcontractor (Fugro).
 - \$5,000 for constructability consultant (Ewing)
 - \$2,016 for architectural subcontractor (Burks Toma).

Task 4.2.6.3 – Assist With Owner Requested Field Changes. Clarify and/or change the intent of the contract documents at the request of the City. In preparing the proposed change, Consultant shall issue revised specifications, drawings, and/or sketches, as necessary, to

change the intent of the contract documents and review cost of proposed changes. For budgeting purposes, the following assumptions have been made:

- For this task, Consultant shall respond to approximately 4 City requested field changes assuming an average processing and review time of 40 hours per field change. Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:
 - \$3,483 for geotechnical subcontractor (Fugro).
 - \$2,688 for architectural subcontractor (Burks Toma).
 - \$5,000 allowance for air permitting of odor treatment facilities if accepted as a bid alternate (Mizutani)

Information Provided by City:

- Value engineering proposals from the Contractor.
- Proposed change orders.
- Proposed Owner requested changes to contract documents.

Consultant Deliverables:

- Written responses to the value engineering proposals.
- Written review comments to change orders.
- Completed specifications, drawings, and/or sketches per proposed changes to contract documents.

Task 4.2.7 - Operation and Maintenance Manual Updates

Consultant shall prepare operation and maintenance (O&M) manual updates for new elements of this project.

Task 4.2.7.1 – Operation and Maintenance Manuals Updates. Consultant shall prepare operational awareness and decision making information to support the plant's existing O&M manual. Information will be provided as a PowerPoint-based Area Management Plan (AMP) document. Each AMP will furnish information for staff to understand, operate, and optimize new unit processes in a format that can be used to train future workers. One AMP will cover the headworks process and ancillary equipment including the Influent Junction Box, Screenings Facility, Grit and Screenings Handling Facility, Influent Pump Station, Grit Basins, Grit Pump

Station, and Odor Control Facility. The second AMP will cover the primary sedimentation process, including the Primary Sedimentation Tanks, Primary Sludge Pump Station, Primary Scum Pump Stations, and CEPT Facility. It is anticipated that each AMP presentation will be presented to plant staff twice. AMP sections include:

- Process Overview and Objective
- Design Criteria
- Process Parameters and Performance Goals
- Key Performance Indicators
- Process Control Variables and Parameters
- Process Control Decisions
- Process Control Response
- Process Control Observations
- Sampling and Data Recording
- Situational Response (links to Standard Operating Procedures by others)
- Duties and/or Expectations of the O&M staff working within each area

Materials generated during the unit process peer-to-peer vendor training will make up a large portion of the content of each AMP. In addition, graphics generated from the SCADA controls effort will be included to the extent possible. Electronic versions of the final PowerPoint-based AMPs will be provided to allow them to be added to an electronic O&M Manual, or accessed using a tablet or other comparable device. Electronic versions will be formatted to allow Sunnyvale staff to update them as desired in the future. The City's existing O&M manual will not be edited. Reference to the new AMP documents from the existing O&M manual will be made by City staff. For this task, Consultant has included a budget equivalent of 448 hours. Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:

Information Provided by City:

- Expectations of the various levels of staff with respect to operating, maintaining, and managing the headworks and primary sedimentation processes.
- SCADA controls graphics.
- Review comments on draft documents.

Consultant Deliverables:

- Two Area Management Plan (AMP) documents in electronic PowerPoint format (draft and final versions).
- Conduct two training sessions at WPCP for plant staff to present the AMPs.

Task 4.2.8 – Participate in Equipment Testing, Integration, Commissioning and Startup

Consultant shall provide selected support services outlined herein to the City staff and CM.

Task 4.2.8.1 – Witness Factory Testing. Consultant shall witness factory testing of the following equipment:

- Influent Pumps (Section 11312G). For budgeting purposes it has been assumed that the PMC will witness the influent pump factory testing and the Consultant will not attend the factory testing.
- Generator Control System (Section 16251) and 15-Kilovolt Medium Voltage Switchgear (Section 16342): For budgeting purposes it is assumed these two items will be tested together. 1 trip and a total of 5 working days (including testing and travel) has been assumed.
- Instrumentation and Control Testing, Calibration and Commissioning (Section 17950). For budgeting purposes, 4 site visits to the systems integrator house and total of 10 working days (including testing and travel) is assumed.

For this task, a budget of 120 hours has been included. Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:

Information Provided by City/CM:

- Construction schedule updates and minimum 1 month advanced notification of testing dates as related to the above listed elements.

Consultant Deliverables:

- Letter report summarizing findings from each test witnessing.

Task 4.2.8.2 – SCADA Integration Assistance.

Task 4.2.8.2.1- Engineering Support for Programming Standards and Algorithms Development

The following scope of work outlines the effort required by Carollo/HDR to support the program management consultant (PMC) effort to develop Programming Standards and Control Algorithms for the Primary Treatment Facility. This work was previously approved by Notice to Proceed No. 15 dated October 7, 2015. Work under this task is most closely associated with Package 2 and has been budgeted under that project.

Task 4.2.8.2.1.1 - Project Management. The purpose of this task is to provide management, coordination, and overall communication between the PMC team and the engineering review team and to participate in meetings and conference calls scheduled by the PMC team. Specific activities to be completed are listed below:

- Participate by phone in two-hour Project Kickoff workshop.
- Participate by phone in four-hour PLC Programming Standard and Programming Tagging Standard workshop.
- Participate in one hour PLC Programming Standard and Final Programming Tagging Standard conference call.
- Participate by phone in four-hour HMI Programming Standard workshop.
- Participate in one hour HMI Programming Standard conference call.
- Participate by phone in one-hour Communications and Security Standards conference call.
- Participate in one hour Communications and Security Standards conference call.
- Participate by phone in three (3) four-hour process optimization workshops.
- Participate in person in three (3) four-hour Control Algorithm workshops.

Task 4.2.8.2.1.2 - Programming Standards Governance. Carollo/HDR will review the Standards Governance document which defines the standards use and revisions throughout the City's control system. Work activities include:

- Review and comment on Draft Programming Standards Governance Document.
- Resolve PMC responses to comments on Draft Programming Standards Governance Document.

Task 4.2.8.2.1.3 - PLC Programming Standard. Consultant will review the PLC Programming Standard document which defines the PLC program structure, configuration, and programming library documentation to be used throughout the City's control system. Work activities include:

- Review and comment on Draft PLC Programming Standard document.
- Resolve PMC responses to comments on Draft PLC Programming Standard document.

Task 4.2.8.2.1.4 - HMI Programming Standard. Consultant will review the HMI Programming Standard document which defines the HMI program structure, configuration, graphical requirements, alarm and navigation hierarchy, security requirements and Plant PAX graphical

object library documentation to be used throughout the City's control system. Work activities include:

- Review and comment on Draft HMI Programming Standard document.
- Resolve PMC responses to comments on Draft HMI Programming Standard document.

Task 4.2.8.2.1.5 - Programming Tagging Standard. Consultant will review the Programming Tagging Standard which defines the specific tagging structure to be used throughout the City's control system. Work activities include:

- Review and comment on Draft HMI Programming Standard document.
- Resolve PMC responses to comments on Draft HMI Programming Standard document.

Task 4.2.8.2.1.6 - Communications Standard. Consultant will review the Communications Standard document which defines the local and remote communications network structure, configuration, hardware requirements, and monitoring requirements to be used throughout the City's control system. Work activities include:

- Review and comment on Draft Communications Standard document.
- Resolve PMC responses to comments on Draft Communications Standard document.

Task 4.2.8.2.1.7 - Security Standard. Consultant will review the Security Standard document which defines the control system access, modifications, and implementation security requirements and practices to be used throughout the City's control system. Work activities include:

- Review and comment on Draft Security Standard document.
- Resolve PMC responses to comments on Draft Security Standard document.

Task 4.2.8.2.1.8 - Process Optimization & Failure Analysis Development. Consultant will review documents developed from workshops to discuss and develop additional process optimization opportunities for specific plant processes. Work activities include:

- Review and comment on three draft meeting minutes.

This scope of work assumes that results of this workshop will be incorporated into the PMC developed standards and algorithm documents and will not impact the control strategies and P&IDs developed during final design of the Primary Treatment Facility Project.

Task 4.2.8.2.1.9 - Control Systems Algorithms. Consultant will review process area specific control algorithms that will provide specific documentation on how each of the process area controls systems are controlled and monitored. Work activities include:

- Review and comment on three Draft Control Algorithms documents reflecting the individual control loops listed in Appendix B of the PMC scope of work.
- Resolve PMC responses to comments on Draft Control Algorithms document.
- Review and comment on three draft meeting minutes.

This scope of work assumes that the control system algorithms will be generated following concepts developed during the final design of the Primary Treatment Facility Project and will not alter the control strategies and P&IDs that have already been developed.

Task 4.2.8.2.1.10 - Incorporate Standards/Algorithms into Contract Documents. Consultant will incorporate standards and algorithms produced by the PMC effort into the contract documents for bidding. It is assumed that that standards and algorithms will be stand-alone electronic documents that can be incorporated as appendices to Carollo/HDR standard CSI formatted specifications with minimal formatting changes.

Task 4.2.8.2.2 Programming Field Support

Task 4.2.8.2.2.1 - System Configuration Meetings: Preliminary Meeting (Section 17050). Before any development work has begun, Consultant will have one meeting with the programmer to review examples of the following: (1) HMI displays; (2) HMI symbology; (3) HMI navigation; (4) HMI alarm banners and (5) sample reports.

Task 4.2.8.2.2.2 - System Configuration Meetings: Presubmittal Review (Section 17050). Consultant will perform this process screen review (hard copy) to verify the following: (1) majority of the equipment is included; (2) elements have proper level of detail; (3) selections made in the preliminary meeting are included and utilized and (4) all analog and digital values have the correct units and indicators.

Task 4.2.8.2.2.3 - System Configuration Meetings: Intermediate Review Meeting (Section 17050). After the initial database is developed and typical screens, trends and reports have been entered, Consultant will have a meeting with the programmer to review the system electronically live in front of staff and receive operator feedback.

Task 4.2.8.2.2.4 - System Configuration Meetings: Final Review Meeting (Section 17050). Held after all HMI interface submittals have been submitted. Meet to discuss HMI interface submittals and requirements.

A total budget equivalent of 80 hours is included for Task 4.2.8.2.2, Programming Field Support.

Consultant has budgeted the following amounts for Consultant's subcontractors to assist with this effort:

- \$21,000 for process support (Ekster and Associates)

Task 4.2.8.3 – Commissioning and Startup Assistance. The services and budget for commissioning and startup assistance is based on the assumption that the Primary Treatment Facility will be commissioned and started up over a three month period in 2020. Consultant's Operations Specialist will support the Contractor and City's staff during the Process Start-up Period and Process Operational Period of the new facilities. Activities shall include the following support to the Contractor's Commissioning and Startup Coordinator (CSC) and City plant O&M staff:

- (1) A 60 hour allowance has been included for Consultant's Operational Specialist to provide onsite support to the Contractor's CSC during the first seven days of process startup.
- (2) An 140 hour allowance has been included for Consultant's Operational Specialist and process area design engineers to support City staff by providing consultation/trouble shooting on an as-needed basis to resolve startup and process setting adjustment issues and provide general consultation regarding equipment operation issues during and following the Process Operational Period.

A total budget equivalent of 200 hours is included for this task.

Consultant has also budgeted the following amounts for Consultant's subcontractors to assist with this effort:

- \$4,000 for odor control (Webster and Associates)

Information Provided by City:

- Startup questions.
- Laboratory analysis

Consultant Deliverables:

- Onsite support for seven days starting the day before raw sewage is introduced to the new systems.

Task 4.2.9 – Participate in Final Inspection

Consultant shall assist the City and CM in performing a project “walk-through” inspection and preparing a substantial completion punch list of outstanding items to be completed by the Contractor to achieve final acceptance. For budgeting purposes, the following assumptions have been made:

- For this task, Consultant has included a budget of 32 hours. Anticipated areas requiring inspection include: screening facility; grit and screenings handling facility; influent pump station; grit basins; primary sedimentation tanks; CEPT facility; odor control facility; power generation facility; headworks electrical building; switchgear building; standby generator area; and site facilities.

Information Provided by City:

- None.

Consultant Deliverables:

- Attendance and input at the inspections.
- List of punch-list items.

ASSUMPTIONS AND CLARIFICATIONS.

Some key assumptions made in development of the scope of work are listed below.

- The work effort and budget estimate are based on the current available construction schedule for Package 1 work and the issued-for-bid Package 2 documents.
- CM will manage flow of all construction documents including logging documents, distributing Contractor generated documents (e.g. RFIs, submittals, etc.) electronically to the Consultant for review, and issuing Consultant generated documents (e.g. RFI responses, submittal review comments, etc.) to the Contractor.
- City will provide access to the City's record management software (Oracle Unifier) for the Consultant and Consultant's subcontractors free-of-charge. The scope and budget do not include any license or access fees associated with the use of the record management software.

- After completion of the project, Consultant will have full access to project files created by the Consultant through the record management software including the right to copy any files for record keeping.
- CM will review bid results, contracts and all other documentation required under Division 0.
- CM will review and comment on submittals on the following topics: site safety, Contractor cost breakdown, Contractor submittal list, Contractor quality assurance, Contractor quality control, temporary shoring, dewatering, and Contractor's geotechnical report. Consultant will not participate in review of these submittals.
- CM will review and comment on Contractor's baseline schedule and schedule updates.
- CM will review and process progress payment requests
- CM and WPCP staff will review and coordinate System Outage Requests.
- Contractor and/or CM will conduct all regular and special inspections at the project site.
- The scope and budget do not include claims management assistance to the City.
- The scope and budget do not include field alteration redesign services to correct facilities that the Contractor did not construct in accordance with the Contract Documents.
- The scope and budget do not include modifications to the existing WPCP O&M Manual.
- The scope and budget do not include the development of Standard Operating Procedures (SOPs).
- The scope and budget do not include coordination or assistance related to SRF funding.
- The scope and budget do not include pre-construction wildlife surveys that may be required.
- The scope and budget do not include conducting the 5-year monitoring period for the completed mitigation work and preparing associated annual reports.