



**CITY OF MARTINEZ**

**CITY COUNCIL AGENDA  
March 19, 2014**

**TO:** Mayor and City Council  
**FROM:** Tim Tucker, City Engineer  
**SUBJECT:** Water Treatment Plant Seismic and Structural Upgrade Project  
**DATE:** March 11, 2014

**RECOMMENDATION:**

Adopt a resolution authorizing the Interim City Manager to execute an amendment to an agreement for consultant services with Carollo Engineers in the not to exceed amount of \$393,800, to provide additional design and bid phase support services for the Water Treatment Plant (WTP) Seismic and Structural Upgrade Project.

**BACKGROUND:**

The City Council approved the WTP Master Plan in February of 2012. The plan identified six seismic and structural projects to be completed over an estimated fifteen-year period. On October 2, 2013, the City Council adopted a resolution authorizing the City Manager to execute an agreement for consultant services with Carollo Engineers to provide design and bid phase services for five of the six identified seismic and structural projects. This agreement also included work associated with other structural improvements to accommodate the WTP Electrical Upgrade project that is currently under design. In summary, the authorized design and bid phase services include the following improvements and work:

- 1948 Building Seismic Retrofit
- Tier 2 Analysis of the 1967 Filter Building (study)
- Backwash Water Tank Seismic Retrofit
- Clearwell Seismic Retrofit
- Filter Gallery Pipe Supports
- Reclaimed Water Pump Pad

The estimated construction cost for the above improvements is \$1,200,000.

The preliminary design of the above improvements is currently underway, and the Tier 2 Analysis study is complete. Based on the results of the Tier 2 Analysis and the implementation of the design, it is proposed that additional seismic and safety improvements be included in this project. The inclusion of these improvements would result in cost savings associated with additional shutdown costs, economies of scale, less operational plant disruptions, and complying with more stringent and costly seismic requirements and standards in the future.

## DISCUSSION:

It is proposed that additional plant improvements be added to the WTP Seismic and Structural Upgrade Project. This work is listed below.

- Seismic upgrade of the 1967 Filter Control Building as a result of the Tier 2 Analysis
- Replacement of the Reinforced Concrete Pipe as recommended in the referenced Master Plan
- Other miscellaneous improvements including improvements to the chemical dosing of the finished water, hydraulic efficiency improvements of the clearwell, and an access platform for two finished water pumps to improve safety.

### **Seismic Upgrade of the 1967 Filter Control Building**

As stated above, the Tier 2 Analysis of the 1967 Filter Building is now complete. This analysis is a second level study that follows an initial study (Tier 1 Analysis), performed as part of the 2012 Master Plan. The purpose of this analysis is to more closely assess the current condition of the Filter Control Building in relationship to the minimum seismic requirements for existing buildings. This Tier 2 Analysis concluded that the existing building does not meet minimum standards and rehabilitation is required. Three rehabilitation options are recommended as follows:

Option 1 - Braced Frame with an estimated construction cost of \$695,000

Option 2 - Shear Wall with an estimated construction cost of \$790,000

Option 3 - Replacement of Building with an estimated construction cost of \$1,200,000

Staff recommends Option 2 because it provides for a stronger lateral load resisting system resulting in less damage after a seismic event when compared to Option 1 and is less expensive and will have less impact to plant operations than Option 3.

### **Replacement of the Reinforced Concrete Pipe**

This work is referenced in the 2012 Master Plan and originally scheduled to occur in 2015. However, to avoid the cost an additional shutdown, and since it is operationally related to the proposed clearwell improvements, it is recommended that this work be included as part of the 2013 Water Treatment Plant (WTP) Seismic and Structural Upgrade Project. This pipe connects the filter basins to the clearwell. The estimated construction cost for the above pipe replacement is \$500,000.

### **Other miscellaneous improvements**

- It is recommended that improvements to the chemical dosing of the finished water, hydraulic efficiency improvements of the clearwell, and an access platform for two finished water pumps be included in this project to avoid the cost of a separate plant shutdown, as well complement the replacement of the reinforced concrete pipe.

The estimated construction cost for the above miscellaneous improvements is \$80,000.

### **Additional design and bid phase support services**

In order to incorporate the above improvements into the WTP Seismic and Structural Upgrade project, additional design and bid phase support services are needed. Staff recommends amending the Agreement with Carollo Engineers to provide these services. Attached is a proposal from Carollo Engineers to perform this work through the bidding phase.

**FISCAL IMPACT:**

The project was included in the recently adopted 2013/14 and 2014/15 biennial budget. The project is budgeted under Account No. C7042 and is currently funded with \$1,200,000 of Water System funds. Additional funds will be required to fully fund the project. It is contemplated that the necessary Water System Funds will be allocated for construction and construction phase services at the time of contract award in the next fiscal year.

The current and future budget and funding are as follows:

<b><u>Budget</u></b>	<b><u>Current Amount</u></b>	<b><u>Future Amount</u></b>
Existing Design Agreement	\$319,400	
Amendment 1	\$393,800	
Staff project administration	\$75,000	
Subtotal Design and Bidding Phase	\$788,200	\$788,200
Original Construction Estimate		\$1,200,000
Construction of Additional Improvements		\$1,370,000
Construction Contingency (12%)		\$335,000
Construction Support Services		\$225,600
Construction Management (18%)		\$481,200
<b>TOTAL BUDGET</b>	\$1,200,000	\$4,400,000
<b><u>Funding</u></b>	<b><u>Amount</u></b>	<b><u>Amount</u></b>
Water System funds	\$1,200,000	\$1,200,000
Water System funds - <i>Future Allocation</i>		\$3,200,000
<b>TOTAL FUNDING</b>	\$1,200,000	\$4,400,000

**ACTION:**

Adopt a resolution authorizing the Interim City Manager to execute an amendment to an agreement for consultant services with Carollo Engineers in the not to exceed amount of \$393,800 to provide additional design services and bid phase support services for the Water Treatment Plant Seismic and Structural Upgrade Project.

Attachments:

Resolution

Amendment to Agreement

APPROVED BY:

  
Interim City Manager

RESOLUTION NO. -14

**AUTHORIZING THE INTERIM CITY MANAGER TO EXECUTE AN AMENDMENT TO AN AGREEMENT FOR CONSULTANT SERVICES WITH CAROLLO ENGINEERS IN THE NOT TO EXCEED AMOUNT OF \$393,800, TO PROVIDE ADDITIONAL DESIGN AND BID PHASE SUPPORT SERVICES FOR THE WATER TREATMENT PLANT (WTP) SEISMIC AND STRUCTURAL UPGRADE PROJECT**

**WHEREAS**, on February 15, 2012 the City Council by motion approved the 2012 WTP Master Plan (Plan); and

**WHEREAS**, the Plan identified certain seismic and structural improvements having a high priority; and

**WHEREAS**, the project was included in 2013/14 and 2014/15 biennial budget under Account No. C7042; and

**WHEREAS**, on October 2, 2013, the City Council authorized the City Manager to execute an agreement for consultant services in an amount of \$319,400 with Carollo Engineers to provide the design and bid phase services of the 2013 WTP Seismic and Structural Upgrade Project; and

**WHEREAS**, these consultant services included a study of the seismic condition of the 1967 Filter Building; and

**WHEREAS**, this study has been completed resulting in recommendations to rehabilitate the building to meet safety requirements; and

**WHEREAS**, these consultant services also included preliminary design studies that have resulted in recommendations to include certain other WTP improvements to improve safety, plant efficiencies, as well as future cost savings; and

**WHEREAS**, inclusion of these certain WTP improvements into the WTP Seismic and Structural Upgrade Project will require additional design and bid phase services.

**NOW, THEREFORE, BE IT RESOLVED** by the City Council of the City of Martinez, that the Interim City Manager is authorized to execute an amendment to an agreement for consultant services with Carollo Engineers in the not to exceed amount of \$393,800 to provide additional design services and bid phase support services, and that the total authorized amount for consultant services under said agreement and amendment shall not exceed \$713,200 for the Water Treatment Plant Seismic and Structural Upgrade Project.

\* \* \* \* \*

**I HEREBY CERTIFY** that the foregoing is a true and correct copy of a resolution duly adopted by the City Council of the City of Martinez at a Regular Meeting of said Council held on the 19th day of March, 2014 by the following vote:

AYES:

NOES:

ABSENT:

RICHARD G. HERNANDEZ, CITY CLERK  
CITY OF MARTINEZ



# Seismic and Structural Upgrade Project Amendment #1

## INTRODUCTION

Design for the Seismic and Structural Upgrade Project at the City of Martinez Water Treatment Plant (WTP) is currently underway. This work includes design of the following improvements (which are specifically defined within the WTP Master Plan):

- 1948 Building Seismic Retrofit (Master Plan project S1) to address seismic deficiencies identified in the WTP Master Plan.
- Backwash Water Tank Seismic Retrofit (Master Plan project S3) to improve the seismic stability of the structure.
- Clearwell Seismic Retrofit (Master Plan project S4) to alleviate discontinuities in the foundation in order to increase shear transfer.
- Filter Gallery Pipe Supports (Master Plan project S5) to provide adequate seismic support for piping and valves in the Filter Gallery.

The current scope for this project also includes the following items:

- A Tier 2 Analysis of the 1967 Filter Control Building – this work has been completed, and recommendations for seismic modifications to the structure have been transmitted to the City.
- Structural modifications to the Reclaimed Water Pump Pad – this work is underway and associated design details are incorporated into the deliverables for the Electrical Power Distribution System Upgrade Project.
- A structural evaluation and design details for improvements to the Old Chlorine Room – this work is underway and associated design details are incorporated into the deliverables for the Electrical Power Distribution System Upgrade Project.
- Valve and actuator replacement for Finished Water Pumps No. 5 and 6 – this work is underway and associated design details are incorporated into the deliverables for the Electrical Power Distribution System Upgrade Project.

As work has progressed on each of the active design projects (Electrical and Seismic), additional project needs have been identified for the Seismic project. Each is incorporated into the current Seismic project per this contract amendment, as discussed herein.

## SCOPE OF SERVICES

Scope and budget is included herein for the following additional services:

- Detailed design of additional components
  - Replacement of reinforced concrete pipe (RCP) that serves the Clearwell and has no redundancy (Master Plan project S6)
  - Modified chemical dosing of the finished water
  - CT analysis and hydraulic efficiency improvements at the Clearwell
  - Replacement of the trolley system at Finished Water Pumps No. 5 and 6

- Addition of an access platform near Finished Water Pumps No. 5 and 6
- Seismic upgrade design for the 1967 Filter Control Building
- Additional bid phase support

### **Task 1 – Detailed Design of Additional Project Components**

The scope and fee estimate is based on our understanding that the additional work described herein will be included in the current contract document package, which assumes construction of the final design will be accomplished by procurement through a standalone, publically bid contract. The frontend specifications developed for the Chemical Containment Project (currently in construction at the WTP) will be used, and Consultant will provide technical specifications for project elements necessary to provide a complete bid package.

This amendment to the original Scope of Services and associated fee estimate is based on the addition of several project components: one is a predefined WTP seismic retrofit need outlined in the Master Plan, and another is based on the recent results of the Tier 2 Analysis of the 1967 Filter Control Building. The remaining additional project components are based on operational modifications at the facility that fit into this scope due to their structural nature or because they fit well into the current project because shutdown needs associated with each are consistent with the needed shutdown of the Clearwell for completion of seismic rehabilitation to this structure (in current contract).

Details associated with each of the subtasks below will be added to the design documents for the Seismic and Structural Upgrade Project. The fee estimate and schedule for project deliverables is modified herein to accommodate the increased level of effort associated with these project additions.

#### ***Task 1.1 – Replace RCP Piping at Clearwell***

The WTP Master Plan includes a project aimed at improving the performance of the RCP to and from the Clearwell that has no built-in system redundancy (Master Plan project S6). These piping sections include the following:

- The 36-inch RCP from the Filtered Water Junction Box to the inlet side of the Clearwell
- The 24-inch RCP from the outlet side of the Clearwell to the Finished Water Pump Station

#### ***Task 1.2 – Seismic Upgrade for the 1967 Filter Control Building***

The Tier 2 analysis recently performed for this structure concluded that modification to this structure is needed to mitigate risk of failure in a seismic event. The Tier 2 Analysis Report included three suggested options for improvements, and the City selected the shear wall option (alternative 2). The scope and fee estimate included herein is based on the recommended project outlined for the shear wall option and also includes improved ventilation for the Filter Control Room.

### ***Task 1.3 – Replacement of the Monorail System for Finished Water Pumps No. 5 and 6***

The existing trolley system located near Finished Water Pumps No. 5 and 6 is no longer functional. As such, removal of these pumps requires a detailed maneuver through the building using the elevator. The replacement of the trolley system will allow Finished Water Pumps No. 5 and 6 (and future No. 7) to be lifted to the operating level and rolled out of the building without complex maneuvering.

### ***Task 1.4 – Access Platform near Finished Water Pumps No. 5 and 6***

The operations staff indicates that a valve located near the ceiling in the area of Finished Water Pump No. 5 is difficult to safely access. Addition of an access platform will provide safe access to the valve, allowing frequent exercising/use of the valve.

### ***Task 1.5 – Facility Shutdown Coordination***

Consultant will coordinate the necessary details associated with the planned facility shutdown to accomplish project modifications. This task assumes that the City will accomplish the identification of a connection location to the Contra Costa Water District (CCWD) intertie at the WTP, the connection point for pumping to the distribution system, and proper coordination with CCWD for use of the second intertie located within the distribution system. Consultant will identify the number, volume, and proposed layout for baker tanks and will include temporary system detailing in the contract documents for bidding. Consultant will also determine whether the plant can be used during the clearwell modifications and associated piping changes instead of utilizing the CCWD intertie.

## **Task 2 – CT Analysis and Clearwell Process Improvements**

Process improvements at the Clearwell will allow its use as a free chlorine contactor, which could serve as a backup disinfection mechanism for the plant should the ozone system fail.

### ***Task 2.1 – CT Analysis***

This task involves an initial analysis of the clearwell hydraulic efficiency and options available to increase the contact time, if required, by use of baffling within the Clearwell using water quality parameters (flow, temperature, pH, and chlorine residual) supplied by the City. Recommendations for hydraulic improvements to the existing basin will be summarized in a Clearwell CT Analysis Memorandum that will be distributed for City review and buy-in prior to initiation of Task 2.2. This would include associated modifications to chemical feed points and sampling locations to support the recommended option.

Following delivery of the Clearwell CT Analysis Memorandum, Consultant will arrange a meeting to discuss the analysis and recommendations for improvement, and to collect feedback regarding intended design approach.

## **Task 2.2 – Clearwell Process Improvements**

Following receipt of feedback from the City regarding the recommendations provided for process improvements at the Clearwell, Consultant will initiate design. Anticipated process improvements will include modification of the flow path to increase contact time and chemical dosing and sampling modifications for the flow to (and from) the Clearwell.

Chemical dosing of the finished water (with ammonia, caustic, and fluoride) is currently accomplished at the junction box that connects the 24-inch cast iron pipe from the 1948 Building (serving Filters No. 1 through 4) and the 24-inch RCP from the 1967 Finished Water Pump Room (serving Filters No. 5 through 7) prior to the transition to the 36-inch inlet piping to the Clearwell. This junction box is located in the roadway between the Clearwell and the 1948 building. Chemicals are dosed directly into the free water surface in the junction box, which is subject to potential contamination due to leakage from the roadway. Modification to the chemical dosing scheme will be accomplished either with the addition of a chemical dosing vault at the inlet or outlet piping from the Clearwell and associated chemical feed line routing.

The fee estimate included for this task assumes the following:

- Use of redwood baffle walls supported by the existing in-basin columns
- Construction will be accomplished without major structural changes to the Clearwell (i.e. no access hatches will be cut into the structure)
- Existing chemical feed equipment will remain adequate for recommended alternative process configuration
- Existing analyzers are adequate for analyzing pertinent water quality parameters

## **Task 3 – Bid Phase Support Services**

The fee estimate associate with the bid phase services in the original contract is modified herein based on the additional effort expected during bidding because of the increase in overall project scope.

## **Task 4 – Additional Services Allowance**

This task assigns a budget allowance for additional work that may come up during the completion of the project (either due to unforeseen conditions or because of a City requested change). Consultant will utilize the allowance as directed by the City on an as-needed basis during the progression of work.

## **ASSUMPTIONS AND EXCLUSIONS**

The following assumptions were made in the preparation of this Scope of Services:

- Assumptions and exclusions included in original contract for this project apply herein as well.

## PAYMENT

Consultant will perform the duties described herein on a time and materials reimbursable basis in accordance with our standard fee schedule in affect at the time services are rendered. A copy of the current fee schedule is attached. The maximum compensation will not exceed the values indicated in the table below for each task without prior written approval.

<b>Task</b>	<b>Fee</b>
Task 1 – Detailed Design of Additional Project Components	\$238,300
Task 2 – CT Analysis and Clearwell Process Improvements	\$55,800
Task 3 – Bid Phase Support Services (Additional Effort)	\$14,700
Task 4 – Additional Services Allowance	\$85,000

## SCHEDULE

Consultant will manage the following modified schedule for completion of the deliverables associated with the work defined herein:

<b>Event</b>	<b>Approximate Date</b>
Clearwell CT Analysis Memorandum	Within 2 weeks of Notice to Proceed
50% Design Submittal	May 1, 2014 <sup>1</sup>
50% Design Review Meeting	Within 2 weeks following submittal of 50% design
90% Design Submittal	Within 75 days of Receipt of City Comments on 50% Design
90% Design Review Meeting	Within 2 weeks following submittal of 90% design
Bid Document Submittal	Within 60 days of Receipt of City Comments on 90% Design
Advertise for Bid	Per City's project schedule
Notes:	
1. Assumes receipt of City feedback from Clearwell CT Analysis Memorandum by April 9, 2014.	

**Exhibit B  
CITY OF MARTINEZ  
Amendment 1 - Seismic and Structural Upgrade Project**

Task	Task Description	PIC	PM	QM	Civil/ME	PE	AP	Electrical	CAD	WP	Total Hours	Labor Cost	PECE \$11.70	Mileage/ Printing	ODC Total	Total Cost
		Cleveland \$256	Hann \$181	Dadik \$236	Hook \$181	Pham \$181	Harding \$148	Robinson \$181	Technician \$157	WP \$99						
1.0	Design															
1.1	RCP Pipe Replacement	8	12	24	80	60	16	0	116	8	324	\$56,596	\$3,791	\$0	\$3,791	\$60,400
1.2	1967 Filter Control Building	24	60	72	40	160	80	24	300	24	784	\$135,856	\$9,173	\$0	\$9,173	\$145,000
1.3	Replacement of Monorail System for Finished Water Pumps No. 5 and 6	0	2	6	0	16	8	8	20	4	64	\$10,842	\$749	\$0	\$749	\$11,600
1.4	Access Plaform Near Finished Water Pumps No. 5 and 6	0	2	6	0	16	8	0	20	4	56	\$9,394	\$655	\$0	\$655	\$10,000
1.5	Facility Shutdown - Coordination	8	12	12	6	8	0	4	0	4	54	\$10,706	\$632	\$0	\$632	\$11,300
	Task Totals =	40	88	120	126	260	112	36	456	44	1,282	\$223,394	\$14,999	\$0	\$14,999	\$238,300
2.0	CT Analysis and Clearwell Process Improvements															
2.1	CT Analysis	36	32	0	0	8	0	4	8	6	94	\$19,030	\$1,100	\$0	\$1,100	\$20,100
2.2	Clearwell Process Improvements	8	32	8	16	40	24	16	40	6	190	\$33,186	\$2,223	\$300	\$2,523	\$35,700
	Task Totals =	44	64	8	16	48	24	20	48	12	284	\$52,216	\$3,323	\$300	\$3,623	\$55,800
3.0	Bid Phase Support Services (Additional)															
	Task Totals =	4	16	6	6	16	0	0	24	4	76	\$13,482	\$889	\$300	\$1,189	\$14,700
		4	16	6	6	16	0	0	24	4	76	\$13,482	\$889	\$300	\$1,189	\$14,700
4.0	Additional Services Allowance															\$85,000
	<b>Project Totals =</b>	<b>88</b>	<b>168</b>	<b>134</b>	<b>148</b>	<b>324</b>	<b>136</b>	<b>56</b>	<b>528</b>	<b>60</b>	<b>1,642</b>	<b>\$ 289,092</b>	<b>\$ 19,211</b>	<b>\$ 600</b>	<b>\$ 19,811</b>	<b>\$ 393,800</b>

**Legend:**

- PIC Principal in Charge
- PM Project Manager
- QM Quality Manager
- PE Project Engineer
- AP Assistant Professional
- CAD Cadd Drafter/Graphics
- WP Word Processor
- PECE Project Equipment Communication Expense

**CAROLLO ENGINEERS, INC.  
FEE SCHEDULE**

**As of January 1, 2013  
California**

	<u><b>Hourly Rate</b></u>
<b>Engineers/Scientists</b>	
Assistant Professional	\$148.00
Professional	181.00
Project Professional	215.00
Lead Project Professional	236.00
Senior Professional	256.00
Senior Process Specialist	345.00
<b>Technicians</b>	
Technicians	110.00
Senior Technicians	157.00
<b>Support Staff</b>	
Document Processing / Clerical	99.00
<b>Project Equipment Communication Expense (PECE) Per DL Hour</b>	<b>11.70</b>
<b>Other Direct Expenses</b>	
Travel and Subsistence	at cost
Mileage at IRS Reimbursement Rate Effective January 1, 2103:	\$.565 per mile
Subconsultant	cost + 10%
Other Direct Cost	cost + 10%
Expert Witness	Rate x 2.0

This fee schedule is subject to annual revisions due to labor adjustments.