DATE: June 25, 2024

TO: Mayor and City Council

FROM: Director of Public Works

SUBJECT: Adopt a Resolution Authorizing the City Manager to Amend the Professional Services Agreement with Carollo Engineers, Inc., to Increase the Contract Amount by $378,774 for a Not-to-Exceed Amount of $1,764,354 to Provide Additional Construction Support Services for the Water Resource Recovery Facility (WRRF) Switchgear Rehabilitation Project No. 07656, and Appropriating Additional Funds in the Amount of $135,154

RECOMMENDATION

That Council adopts the attached resolution (Attachment II):

1. Authorizing the City Manager to amend the professional services agreement (PSA) with Carollo Engineers, Inc., (Carollo) to increase the contract amount by $378,774 for a not-to-exceed amount of $1,764,354 to provide additional construction support services for the Water Resource Recovery Facility (WRRF) Switchgear Rehabilitation Project No. 07656; and

2. Appropriating additional funds in the amount of $135,154 from the Sewer System Replacement Fund (Fund 611).

SUMMARY

The WPCF treats an annual average flow of approximately eleven million gallons per day (MGD) and meets current requirements to discharge treated effluent to the deep waters of the San Francisco Bay. Originally installed in 1982, the existing main switchgear (MSB) is a key component of the power distribution system at the WPCF. The MSB along with several related 480-volt motor control centers (MCCs) and 480-volt distribution panelboards have provided power and controls to vital plant facilities for over forty years and are in need of replacement for continued operational reliability of the WRRF.

On May 18, 2021[1], Council authorized entering into a PSA with Carollo to provide engineering, design, and construction support services for the Switchgear Rehabilitation Project in an amount not-

[1] https://hayward.legistar.com/LegislationDetail.aspx?ID=4955268&GUID=821E06AC-AAAD-450F-8B45-0A98D661D498&Options=&Search=

to-exceed $1,108,835. On June 27, 2023[2], Council authorized amending the contract amount by $276,746 to include programming, acceptance testing, and commissioning services for the new programmable logic controller (PLC) equipment as part of the construction support services for an amended contract not-to-exceed amount of $1,385,581.

Due to supply chain issues and delays in procurement and delivery of some of the electrical equipment, the construction schedule has lengthened by approximately a year since issuing notice to proceed to the Contractor. In addition, because of the highly specialized nature and complexity of electrical retrofits, additional assistance by the electrical engineer responsible for the design is needed to assist the Contractor and WRRF staff with the complex sequence of shutdowns and cutovers, as well as performing other specialty on-site inspection support services outside the City's inspection staff area of expertise. Therefore, Staff is requesting an amendment in the amount of $378.774 for additional construction support services for an amended contract not-to-exceed amount of $1,764,354.

BACKGROUND

The WRRF collects and treats wastewater from the City's residents and businesses. The original WRRF 480-volt MSB was commissioned in 1982 and has been in service for over forty years. In 2008, the Phase 1 WCPF upgrade project was completed, which included construction of a new electrical service entrance from PG&E, a new 12-kV switchgear building, a 12-kV power grid, several 12-kV substations to distribute power around the plant, and a new standby diesel generator. The electrical system upgrades were largely constructed to serve new loads added as part of the Phase 1 project and other than sub-feeding the power from the new 12-kV switchgear to the MSB, did not include improvements to the plant's existing 480-volt power distribution system. In 2014, a new 1,132 kW cogeneration engine was commissioned as part of the Cogeneration Upgrade Project, and the old cogeneration engines that previously supplied power to the plant through the MSB were decommissioned. The MSB continues to supply power to many vital loads throughout the plant including the headworks, the north vacuator, the primary treatment process, the west trickling filter, the anerobic digesters, the site waste pump station, the FOG receiving station, the sludge blending tank area, the air compressor building, site lighting, as well as various buildings including the Operations Control House, Maintenance Shop, and the Administration Building.

Concern over continued reliability of the switchgear due to obsolescence and availability of parts, as well as the current condition and continued deterioration from corrosive atmospheres, prompted staff to request that the electrical system be evaluated as part of the WPCF Phase II Facilities Plan. The 2020 Phase II Facilities Plan recommended replacing the existing MSB, several existing aged MCCs, an existing 12-kV to 480-volt transformer that is severely corroded and at risk of failure, as well as retrofitting the existing old Cogen Building to house the new electrical equipment.

On May 18, 2021 , Council authorized entering into an agreement with Carollo to perform final design services for the WPCF Switchgear Rehabilitation Project that includes replacing the plant's existing main switchgear (MSB), several motor control centers (MCCs), several 480-volt distribution

[2] https://hayward.legistar.com/LegislationDetail.aspx?ID=6271753&GUID=74AA8E7D-3A76-4126-8980-D564267D68DE&Options=&Search=

panelboards, transformers, lighting panels, and related equipment. The scope of work and fee in an amount not-to-exceed $1,108,835 included final design and engineering services during construction for the project.

On October 11, 2022[3], Council awarded the construction contract to Blocka Construction. A detailed description of the project elements is included in the October 11, 2022 staff report.

On June 27, 2023[4], Council authorized amending the PSA with Carollo by $276,746 to include programming, acceptance testing, and commissioning services for the new programmable logic controller (PLC) equipment as part of the construction support services for an amended contract not-to-exceed amount of $1,385,581.

PROJECT SCOPE AMENDMENT

When the design commenced in May 2021, the expected construction duration was estimated to be 322 days. Due to supply chain issues exacerbated by the pandemic, and subsequent delays in procurement, fabrication, and delivery of some of the electrical equipment, the construction schedule lengthened. At the time the project was advertised for bid in July 2022, the construction duration was estimated to be 960 calendar days. After issuing notice to proceed to the Contractor, and after submittal approval and release for fabrication, the time to manufacture and procure the 12 kV transformer, an integral component to the overall project, caused the schedule to lengthen to 1,349 calendar days. Because of the longer duration of construction, additional engineering services are needed to cover higher labor rates, additional project management activities, and related construction support activities.

In addition to supply chain issues, the project is extraordinarily complex in the required construction sequencing needed to replace critical existing electrical infrastructure for plant processes that must remain online at all times except for short shutdown durations. Carollo has developed a detailed construction sequence and constraints for the project that the Contractor will follow, however due to the critical nature of the work, the highly specialized nature and complexity of electrical retrofits, and lack of in-house expertise in construction oversight and inspection of this type of complex electrical retrofit, additional electrical engineering assistance is needed to provide technical support and on-site inspection support services. Therefore, Staff is requesting approval for an additional $378,774 for construction support services for an amended total PSA contract not-to-exceed amount of $1,764,354.

DISCUSSION

Engineering services during construction include project management, submittal review, review of Contractor's Requests for Information (RFIs), preparation of design clarifications, periodic site visits, preparation of record drawings, factory witness testing, and field-testing for all equipment affected by the installation of new electrical and PLC equipment. Despite the construction duration increasing from 322 days to 960 days between starting design, and beginning construction of the

[3] https://hayward.legistar.com/LegislationDetail.aspx?ID=5866919&GUID=DCE0F30C-4E50-44B2-9458-9389F2CA6EA3&Options=&Search=
[4] https://hayward.legistar.com/LegislationDetail.aspx?ID=6271753&GUID=74AA8E7D-3A76-4126-8980-D564267D68DE&Options=&Search=

improvements, Carollo's scope and fee for the engineering services during construction had not changed. Based on the Contractors current estimated duration of 1,349 days, the project has been extended by approximately 2.8 years. As a result, it is expected that there will be additional effort expended from the extended project duration in most categories of support. Typically, City engineering staff perform some activities such as reviewing submittals and RFIs, however due to staffing commitments on other projects including the WRRF Improvements Phase II Project, Staff are unable to provide the normal construction support services needed, and must rely more heavily on the design engineer.

Due to the nature of the project involving complex electrical retrofits, specialty inspection is needed to verify conformance of the installation with the engineering plans, specifications, and the National Electrical Code (NEC). Therefore, a new subtask to provide electrical engineering on-site inspection and support has been added to assist the Contractor and WRRF staff with the complex sequence of shutdowns and cutovers needed to migrate equipment from existing MCCs and switchgear to the new replacement electrical equipment, as well as to provide inspection support services.

Carollo's cost proposal of $378,774 includes the following breakdown:

ESDC		**Proposed Total Additional Budget**
5.1	Project Management	$ 7,800.00
5.2	Submittal Review	$ 21,840.00
5.3	RFI Review	$ 35,920.00
5.4	Design Clarifications	$ 30,040.00
5.5	Site Visits	$ 5,144.00
5.6	Record Drawings	$ 18,890.00
5.7	Factory Witness Testing	$ 10,080.00
5.8	Pre-Energization Field Testing	$ 10,080.00
5.9	Witness Commissioning	$ 0.00
5.10	Witness Functional Testing	$ 0.00
5.11	PLC Inspection	$ 0.00
5.12	Wire Tag Scheme Development (New)	$ 9,240.00
5.13	Construction Meetings (New)	$ 5,460.00
5.14	MOP Review / Allowance (New)	$ 18,480.00
5.15	Corrective Items Lists / Inspections (New)	$ 2,520.00
7.1	On-Site Presence / Inspection	$ 203,280.00
	Total	**$ 378,774.00**

The engineering services during construction (ESDC) included in the PSA awarded in May 2021 was $183,769 or about 1.6% of the construction contract amount which is below the normal range of 3.5 – 5% of the construction cost. The new ESDC fee with the additional scope is $562,543 or 4.9% of the construction contract price which is still very reasonable for a project of this complexity. The overall design and engineering services during construction, including on-site inspection is 15.4% of the

construction cost which is within the range expected for engineering and construction support services combined.

ECONOMIC IMPACT

Replacing the 480-volt main switchgear, aged MCCs, and related electrical equipment is part of an effort to modernize and upgrade existing facilities. The project will greatly improve reliability by reducing staff time associated with breakers tripping causing unplanned outages and staff time attending to issues otherwise related to component failures. The community will enjoy the benefits of the Project, including maintaining effective treatment that provides environmental protection of the San Francisco Bay.

FISCAL IMPACT

The estimated costs for the Switchgear Rehabilitation Project are as follows:

Item	Budget After June 27, 2023 Amendment	Revised Budget Including Additional ESDC
Construction Contract	$11,452,000	$11,452,000
Administrative Change Order Contingency (15%)	$1,717,800	$1,717,800
Professional Engineering Services	$1,385,581	$1,764,354
Inspection & Testing	$80,000	$80,000
Construction Administration (City Staff)	$200,000	$200,000
Total Estimated Project Cost	**$14,835,381**	**$15,214,154**

The adopted FY25 CIP includes a total of $15,079,000 for the WPCF Main 480V MCC Electrical Distribution Rehabilitation Project No. 07656, across both the Sewer System Capital Replacement Fund (Fund 611) and the Sewer System Capital Improvement Fund (Fund 612).

The total estimated cost of $15,214,145 exceeds the $15,079,000 included in the FY25 Adopted CIP by $135,154. As noted previously, staff require specialty electrical engineering assistance given the extraordinary complexity of construction sequencing required to replace existing electrical infrastructure for plant processes that must remain online at all times except for short shutdown durations, and due to the extensive modifications to existing electrical infrastructure. In addition, the project requires specialty knowledge in electrical systems to properly inspect the project for conformance with the Contract Documents and for compliance with the National Electrical Code. Therefore, staff recommends appropriating the required funding to support this project in the amount of $135,154 from the Sewer System Capital Replacement Fund (Fund 611).

STRATEGIC ROADMAP

This agenda item supports the Strategic Roadmap of Improve Infrastructure.

SUSTAINABILITY FEATURES

This project will help the City maintain its ability to treat wastewater efficiently and adequately before discharging into San Francisco Bay.

PUBLIC CONTACT

All project work will be within the WPCF plant boundary and should have no impact on area businesses or the public at large; therefore, no public contact is necessary for this project.

NEXT STEPS

Following Council approval, City Manager is authorized to increase the contract amount with Carollo Engineers, Inc., by $378,774 for a not-to-exceed amount of $1,764,354 for additional construction support services.

Prepared by: Suzan England, Utilities Engineering Manager

Recommended by: Alex Ameri, Director of Public Works

Approved by:

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Dustin Claussen, Interim City Manager