COUNCIL AGENDA: 2/25/20
FILE: 20-179
ITEM: 6.4

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Kerrie Romanow

SUBJECT: SEE BELOW

DATE: February 4, 2020

Approved D DSyC

Date 2/6/2020

SUBJECT: SECOND AMENDMENT TO THE CONSULTANT AGREEMENT WITH BROWN AND CALDWELL FOR ENGINEERING SERVICES FOR THE DIGESTER AND THICKENER FACILITIES UPGRADE PROJECT

RECOMMENDATION

Approve the Second Amendment to the Consultant Agreement with Brown and Caldwell for engineering services for the Digester and Thickener Facilities Upgrade project at the San José-Santa Clara Regional Wastewater Facility, modifying the scope of services, extending the term of agreement from June 30, 2020 to December 31, 2021, and increasing the amount of compensation by $2,530,734 for a total agreement amount not to exceed $16,548,144, subject to the appropriation of funds.

OUTCOME

Council approval of the Second Amendment to the Consultant Agreement with Brown and Caldwell will allow for the incorporation of additional engineering services during construction, startup, commissioning and post construction needed to successfully complete the Digester and Thickener Facilities Upgrade project.

EXECUTIVE SUMMARY

This amendment will increase the amount of compensation for engineering consultant services by $2,530,734, for a total agreement amount not to exceed $16,548,144 to allow for the incorporation of additional engineering services during construction, startup, testing and commissioning. The additional engineering services during construction are required primarily to address unforeseen site conditions and the extended construction schedule. In addition, funds are required to ensure the implementation of the programmatic guidelines for functional and operational testing, training and process performance testing for the complex systems associated with the biosolids facilities. This amendment also extends the term of agreement from June 30, 2020 to December 31, 2021.

BACKGROUND

Agreement Background

On October 8, 2013, City Council (Council) approved a Consultant Agreement (Agreement) with Brown and Caldwell (Consultant), in the amount of $12,017,526, to provide engineering services for the Digester and Thickener Facilities Upgrade project (Project) at the San José-Santa Clara Regional Wastewater Facility (RWF). The original term was through December 31, 2019. The scope of the agreement included providing engineering services for the design, support during bidding, engineering services during construction, start up and commissioning and post-construction engineering services.

Brown and Caldwell were selected for their nationally recognized expertise in the anaerobic digestion and biosolids processing field. As part of their proposal for the Project, they presented the City with an abundance of projects that confirmed their extensive design experience. The Consultant is also the designer for similar upgrades for East Bay Municipal Utilities District (EBMUD), City and County of San Francisco Public Utilities Commission (SFPUC), New York City Department of Environmental Protection (NYCDEP), and the City of St. Petersburg, Florida, among other large similar projects.

Council approved an amendment to the Agreement on February 24, 2015 that incorporated additional scope into the project, increased the total contract amount to $14,017,410 and extended the term through June 30, 2020.

Construction Background and Status

On May 24, 2016, Council awarded a construction contract for the Project to the low bidder, Walsh Construction Company II, LLC (Contractor), in the amount of $107,925,000, with a 12.5% construction contingency in the amount of $13,490,625, and a duration of 790 work days. The Project includes retrofitting existing digesters and sludge thickeners at the RWF, as well as the addition of new ancillary buildings and an external elevated digester gas pipe network. Construction was originally scheduled to be completed by September 27, 2019.

Since contract award, Council has approved two construction contingency increases to address several unforeseen issues that have significantly delayed the schedule and increased the cost of construction.

On June 5, 2017, while reviewing the lower seismic cable design/installation plan with the Contractor, the Consultant identified a potential issue with the seismic design for the digester tanks. As explained by City staff, the Consultant's original design failed to account for certain forces that would act on the facility under a seismic event, and therefore, failed to comply with applicable seismic building codes.

On July 15, 2017, the Consultant notified the City by telephone confirming the existence of a "seismic uplift design issue" that would require a significant re-design to construction work already underway.

On July 31, 2017, the City issued a stop-work notice to the Contractor due to the design changes that were going to affect the construction of the digester tanks. On or about October 5, 2017, shortly after the design team began working on a revised seismic design, polychlorinated biphenyls ("PCB") were discovered in portions of the Project site and improvements. The Consultant continued to work on the seismic re-design during the City's concurrent PCB mitigation work. The Consultant provided the seismic re-design in April 2018.

On November 28, 2017[1], Council approved a $15,000,000 increase to the construction contingency to address a multitude of unknown conditions, utility relocations, major repairs to a deteriorated 78-inch primary effluent pipe and junction structure, and delays to the Project caused by changes in regulatory conditions. These conditions resulted in an increase in the contract time by 140 working days. At the time of this increase, staff informed Council that a future contingency increase would be needed to resolve two other issues recently identified, the need for re-design of some structural components to fully address seismic requirements and the finding of hazardous materials (PCBs) on site.

On June 12, 2018[2], Council approved a $25,000,000 increase to the construction contingency to address the seismic requirements and hazardous materials issue, along with associated delay costs. Since the approval of the second contingency, the Contractor has reduced delays for these two issues to 133 days.

The City and the Consultant have negotiated a settlement of the City's costs incurred as a result of the seismic re-design, which is pending Council approval. The Settlement Agreement includes direct damages and delay costs accumulated to date and also accounts for unknown future costs. The total settlement amount of $2,750,000 will include a cash payment to the City of $2,500,000 and $250,000 of future in-kind services from Brown and Caldwell.

The future in-kind services will be used on this Digester Project for Engineering Services During Construction and startup. The scope of these in-kind services is included in this Second Amendment. The Second Amendment states that the City is not required to pay for the first $250,000 worth of services rendered following the date of the Second Amendment. Staff will track the in-kind services credit amounts at the program level using letters signed by the Consultant and the City. The Consultant's invoices also will reflect the credits for the in-kind services. Once the in-kind services credit has been depleted, the City will begin paying for services rendered under the Agreement after the date of the Second Amendment.

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[1] November 2, 2017: https://sanjose.legistar.com/View.ashx?M=F&ID=5559728&GUID=BDD6C135-14B4-4B6A-A0CA-78A6A65300CF

[2] May 31, 2018: https://sanjose.legistar.com/View.ashx?M=F&ID=6280063&GUID=6AD06EDA-AAB8-4E0B-89CF-4E76E4D8A2D9

The project is currently delayed by a total of 273 working days, resulting from the aforementioned numerous unforeseen and unexpected conditions, with a new completion date of November 2020. As of December 2019, construction was 85% complete.

Agreement Status

The severity of construction issues encountered in the last two years has adversely impacted the original budget for the engineering services during construction (ESDC) that are being provided by the Consultant. As is typical for ESDC services, the budget made assumptions about the number of requests for information (RFIs), submittals, and design clarifications that would need to be addressed during construction, as well as the number of site visits that would be required. The budget also made assumptions about the time each item would take.

Project records show that the Consultant's effort, through November 2019, has significantly exceeded the original Agreement's assumptions, as summarized in Table 1:

Table 1: Summary of Engineering Services Efforts

Item	Assumptions in Agreement	Project Records (as of January 2020)
Number of Requests for Information (RFIs)	602	993
Number of Submittals	538	1627
Number of Design Clarifications	83	240
Number of Site Visits	60	105

The volume of work for some of the items, such as submittals and design clarifications, has already exceeded the original assumptions established in the contract by 50 to 300%.

The original budget set for ESDC in the Agreement was $2,547,687. After the start of construction, and under the authority of the Environmental Services Department (ESD) Director, an additional $1,285,868 was reallocated from unused tasks for a total of $3,833,555. Between 2016 and 2017 a total of $925,619 was reallocated to cover additional geotechnical investigations necessary to address differing site conditions and the condition assessment and design for the deteriorated 78-inch pipe and junction structure uncovered during construction. The remaining reallocated funds were authorized in 2018 to cover additional RFIs and change orders related to the hazardous materials mitigation and the contract requirements. The balance remaining for ESDC at this point is $ 160,639, most of which is reserved for record drawings to be provided at the end of construction. It must be noted that all the previous phases of work under the agreement, were complete within the negotiated tasks budget. A summary of the budgets remaining for each task is presented in Table 2 below.

Table 2: Engineering Services Agreement Summary

Type of Services	Agreement Amount (Including Reallocations)	Paid to Date	Balance in Agreement
Project Administration	$ 879,647	$ 880,791	$ -1,143
Preliminary Engineering	$ 947,887	$ 947,816	$ 71
Design Development	$ 6,442,004	$ 6,441,764	$ 240
Support Services during Bid & Construction	$ 3,833,555	$ 3,672,916	$ 160,639
Commissioning and Training Services	$ 214,453	$ 102,215	$ 112,238
Post Construction	$ 381,193	$ 18,024	$ 363,169
Optional Services	$ 1,318,671	$ 1,315,904	$ 2,767
TOTAL	$ 14,017,410	$ 13,379,430	$ 637,980

The term of the Agreement was from October 8, 2013 to June 30, 2020, based on the original project assumptions of 33 calendar months of construction and start-up, and 12 months for post-construction operations and training and engineering support. The Contractor's current schedule estimate for construction completion is November 2020, bringing the overall construction phase duration to 52 calendar months, almost 19 months longer than originally assumed.

ANALYSIS

The Second Amendment to the Agreement will add $2,530,734 in compensation for the additional professional services. Of this amount, $1,905,137 is allocated to replenish and supplement the budget for engineering services during construction. There are a number of factors that have contributed to the depletion of the funds for the project. As an example, the efforts related to the 78-inch SES pipe and juncture structure replacement alone consumed $925,619 that was supposed to cover the original scope of the contract. An additional $525,597 is being requested for additional startup and commissioning support needed for the new facilities and $100,000 for additional project management. The most significant factors that have contributed to the exhaustion of funds are discussed in the next sections.

78-inch Settled Sewage Pipe and Juncture Structure Replacement

Upon discovery of severely deteriorated 78-inch pipe and junction structure, in November 2016, a large engineering effort was required to address the replacement of the damaged pipeline and junction structure. The Consultant completed emergency pipe condition assessment and

inspection activities and conducted a detailed alternatives evaluation to identify a preferred solution. The pipe and junction in need of replacement handles half of the plant flows so a re-route system was required to allow for its replacement. Flows are lowest in the summer, so design of the new structures and bypass system had to be ready, and the construction sequence had to be planned so that the work would be completed during the dry months (April to October) of 2018. The Consultant provided a detailed design for the replacement of the 78-inch pipe and junction structure, including the analysis for a large temporary pumped diversion, and reviewed contractor submittals to prepare for the execution of this emergency repair. The construction cost for the new structures and bypass system was approximately $15 million which had been added to the project budget in the First Contingency increase. However, the cost for all the engineering services associated with these elements were covered with funds from the original agreement even though this emergency bypass and pipe replacement were not part of the original scope.

Additional Engineering Services During Construction

Outside of the seismic redesign issue, there are several factors that have been encountered during construction that significantly expanded the scope of the consultant's ESDC services, including:

1. Unforeseen Buried Utility Conflicts
   Despite extensive pot-holing efforts completed during design and the use of existing utility records, many subsurface utility interferences were identified during construction, requiring re-design to relocate existing utilities and resolve the conflicts. Just as an example, 43 out of 144 elevated pipe rack column foundations had to be moved or redesigned. The earliest facilities and the RWF were installed in 1956, prior to the age of computerized asset management systems and utility location mapping. Electrical utilities have been especially problematic as their small size made their locations even less likely to have been recorded on RWF maps.

2. Existing Condition of Major Equipment and Ancillary Support Systems
   The Contractor, in performing the defined contract work uncovered existing plant systems and components in various states of disrepair, including dissolved air floatation tanks (DAFT), DAFT electrical rooms, digester vessel foundations, piping supports, and electric distribution components. Specifically, when it came time to connect new utilities into the electrical equipment in the basement of the existing sludge control building, workers found corrosion and deteriorated equipment. It took additional condition assessments to determine what portions needed replacement or repair and extra engineering design to determine how to meet current codes and industry best practices, while keeping some older equipment in service and connecting it to new. Parts could not always be replaced in-kind because the same equipment was no longer manufactured.

3. Design Changes Due to Cogeneration Facility
   Design for the Project was completed in 2015 and included digester gas and hot water supply and return systems that were necessary for the Cogeneration Facility project

which was in the conceptual design phase. During the detailed design phase of the Cogeneration Facility, major configuration changes were required to address functionality and cost considerations. These changes required the City to request a re-evaluation and ultimately design changes to the heat recovery system included in the Project. This effort required significant engineering efforts and coordination by the Consultant.

4. Implementation and Updates of Programmatic Design Standards
   The design phase of the Project was completed prior to the publishing of some Programmatic Design Guidelines, prepared by the City, including the Automation Master Plan. To standardize all new projects, the City issued the Contractor several change orders to address the instrumentation and controls systems. These included uninterrupted power sources (UPSs), Distributed Control System (DCS) panels, and the network switch architecture. These changes required additional effort in the form of RFI responses, submittal reviews, and preparation of design change memoranda.

5. Geotechnical Engineering Field Services
   Based on the results of the preliminary investigations, it was assumed that certain soil conditions were present throughout the site. However, when excavation began, different conditions were found which required the designers to visit the site, make additional soil investigations and redesign footings and foundations. The Consultant provided geotechnical engineers to visit the site and perform the inspections in specific areas where conditions encountered during construction were different from the contract documents.

6. Extended Construction Time
   The Construction contract has extended 15 months beyond the timeframe anticipated in the amended Agreement. This extension will require additional day-to-day coordination, meeting attendance, and site visits by the Consultant.

Additional Startup and Commissioning support

Additional funding of $525,597 is also required to support the start-up and commissioning of the new facilities. The original contract included $214,453 for Start-up and Commissioning Services. The scope included in the 2013 Agreement was negotiated prior to development of the programmatic guidelines which established the coordination, functional operational and performance testing necessary for all projects within the CIP program prior to substantial completion and transition to Plant operation. The project is implementing two new processes at the Facility, the co-thickening of primary sludge and a new Thermophilic Phased Anaerobic Digestion Process (TPAD) for the digesters. These process changes require extensive training, testing and trouble-shooting to ensure the process performance requirements established by the design are achieved.

Analysis and Benchmarking

The new increased budget for ESDC of $5,738,692 represents approximately 4.3% of the current project construction cost of $135 million. This amount is the original construction contract amount of $107 million, plus the $15 million for 78-inch settled sewage pipe and juncture structure replacement described earlier in this memo, plus $13 million for the necessary seismic improvements. This $13 million represents the $25 million contingency increase in May 2018, minus $10 million for delays and $2 million for PCB remediation, neither of which are counted toward actual construction costs. This percentage is below the industry standard range of 5% to 10%, according to the American Council of Engineering Companies.

Staff has also benchmarked ESDC costs for other wastewater agencies that have completed similar projects in the last few years. Because the projects present variations in overall scope, site conditions, construction completion date and geographical location, a direct comparison cannot be readily made. However, ESDC numbers and percentages of construction cost can be used as a key indicator. The comparison completed by staff showed that other agencies had ESDC costs in the range of 4.5% to 10%, based on percentage of construction cost. Wastewater agencies included EBMUD, Orange County Sanitation District (OCSD) and Sacramento Echo Water Program, which all have projects in the same range of magnitude as ours.

All of the expenditures under prior tasks in this contract stayed within the budgeted amounts. Only the ESDC have exceeded the budgeted amounts.

CONCLUSION

This Second Amendment will increase the amount of compensation for engineering consultant services by $2,530,734, for a total agreement amount not to exceed $16,548,144 and will ensure that the Consultant is compensated for services through the end of the Project. Incorporation of these services does not affect the construction cost of the Project. All additional construction costs have been addressed by increases to the construction contingency previously approved by Council.

Staff recommends proceeding with the additional engineering services during construction, startup and commissioning and believes that the associated fee increase is reasonable to address the unanticipated challenges encountered and the complexity of the Project.

This amendment also extends the term of agreement to reflect the additional construction timeline. With this change, the Project schedule now assumes 52 months for construction and start-up and 12 months for post substantial completion. The new end date for the agreement is December 31, 2021.

EVALUATION AND FOLLOW-UP

No additional follow-up action with City Council is expected at this time. Monthly progress reports, on this and other Wastewater Facility capital projects, will be submitted to TPAC and posted on the City's website.

CLIMATE SMART SAN JOSE

The recommendation in this memo has no effect on Climate Smart San José energy, water, or mobility goals.

POLICY ALTERNATIVES

Alternative #1: Direct staff to complete the additional scope of work utilizing in-house forces.
Pros: None
Cons: Staff does not have the capacity or expertise to complete the required work. Responses to Contractor requests for information, submittals and change orders requires in-depth wastewater design and process engineering expertise spanning multiple engineering disciplines (e.g., civil, structural, mechanical, electrical, process, instrumentation and controls). Use of City Staff will result in additional delays to the project, impacting cost and schedule, and subsequently creating delays to other pending capital projects. In addition, if City staff assumed design responsibility, it would release the consultant from their liability as designer-of-record.
Reason for not recommending: The complexity of this Project requires the use of specialized expertise and experience in the anaerobic digestion and biosolids processing field.

PUBLIC OUTREACH

This memorandum will be posted on the City's Council Agenda website for the February 25, 2020 City Council meeting.

COORDINATION

This amendment and memorandum have been coordinated with the Finance Department; Public Works Department; Planning, Building, and Code Enforcement; City Manager's Budget Office; and the City attorney's Office.

COMMISSION RECOMMENDATION/INPUT

This memorandum is scheduled to be heard at the February 13, 2020 TPAC meeting.

FISCAL/POLICY ALIGNMENT

This project is consistent with the Council-approved Budget Strategy to focus on rehabilitating aging Plant infrastructure, improve efficiency, and reduce operating costs. This agreement is also consistent with the budget strategy principle of focusing on protecting our vital core services.

COST SUMMARY/IMPLICATIONS

1. AMOUNT OF RECOMMENDATION/COST OF PROJECT: $2,530,734

2. COST ELEMENTS OF AGREEMENT/CONTRACT:

	Current Contract	Add	2nd Amendment
Project Administration	879,647	100,000	979,647
Preliminary Engineering	947,887	-	947,887
Design Development	6,442,004	-	6,442,004
Support Services during Bid & Construction	3,833,555	1,905,137	5,738,692
Commissioning & Training Services	214,453	525,597	740,050
Post Construction	381,193		381,193
Optional Services	1,318,671	-	1,318,671
TOTAL AGREEMENT AMOUNT	**14,017,410**	**2,530,734**	**16,548,144**

3. SOURCE OF FUNDING: San José-Santa Clara Plant Capital Fund (Fund 512)

4. FISCAL IMPACT: Increase of this contract compensation will have no impact on operating or maintenance costs.

5. PROJECT COST ALLOCATION: In accordance with the recommendations set forth in the Capital Project Allocations Technical Memorandum (Carollo Engineers, March 2016), the cost for the Project is allocated 40 percent to biochemical oxygen demand (BOD) and 60 percent to total suspended solids (TSS).

BUDGET REFERENCE

The table below identifies the fund and appropriations to fund the agreement.

Fund #	Appn # / RC#	Appn. Name	Current Appn. Total	Amount for Contract	2019-20 Adopted Capital Budget Page	Last Budget Action (Date, Ord. #)
512	4127 / 144943	Digester and Thickener Facilities Upgrade	$9,284,000	$2,530,734	V-128	10/22/2019 Ord. No. 30325

CEQA

San José-Santa Clara Regional Wastewater Facility Digester and Thickener Facilities Upgrade Project Mitigated Negative Declaration, File No. PP15-055.

/s/
KERRIE ROMANOW
Director
Environmental Services Department

For questions, please contact Mariana Chavez-Vazquez, Deputy Director, Environmental Services Department, at (408) 635-4008.