



● **Board of Directors**
Engineering and Operations Committee

9/15/2020 Board Meeting

7-3

Subject

Award a \$13,419,000 contract to J.F. Shea Construction, Inc. to replace the overhead bridge cranes at each Colorado River Aqueduct pumping plant; and authorize an agreement with Chamieh Consulting & Industrial Group, Inc. in an amount not-to-exceed \$500,000 for technical support; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

A long-term, comprehensive program on the Colorado River Aqueduct (CRA) to rehabilitate all 45 main pumps and their support systems is underway. Replacing the aging, overhead bridge cranes will facilitate inspection and replacement of pump components and their support systems under the rehabilitation program as well as routine maintenance. This action awards a construction contract to replace the overhead bridge cranes at Metropolitan's five CRA pumping plants. This action also authorizes entering into an agreement with Chamieh Consulting & Industrial Group, Inc. to provide specialized technical consulting services related to the rehabilitation of major facilities and equipment within Metropolitan's CRA pumping plants.

Details

Background

The CRA is a 242-mile-long conveyance system that transports water from the Colorado River to Lake Mathews. It consists of five pumping plants, 124 miles of tunnels, 63 miles of canals, and 55 miles of conduits, siphons, and reservoirs. The aqueduct was constructed in the late 1930s and was placed into service in 1941.

Each of Metropolitan's five pumping plants has nine main pump units that were installed in four stages between 1941 and 1959. Each of these units is comprised of a main pump, motor, discharge valve, and various ancillary support systems. While all pump units continue to operate reliably, recent inspections have identified that the pumps and their related equipment are showing signs of wear and deterioration. Staff has initiated a comprehensive, multi-year program to rehabilitate the pump units at all five CRA pumping plants in order to extend the service life and maintain the overall reliability of the CRA system. The last time a major effort was undertaken to rehabilitate and refurbish these pump units was in the mid-1980s.

In order to rehabilitate the pumps, they must be completely disassembled into their component pieces, refurbished and reassembled. Many of the pump components range in weight from 2,000 to 80,000 pounds and require disassembly prior to performing any improvements or regular maintenance. Due to the physical size and weight of these components, overhead bridge cranes and portable cranes are used to facilitate the disassembly, removal, and reassembly of these components.

Each CRA pumping plant has one overhead bridge crane, located on the main floor of the pump room. The existing cranes were installed during the original CRA construction. Each crane spans the width of the entire floor, running along tracks that are anchored to the building at a height of 45 feet above the ground floor. Each bridge assembly has two hooks, with ratings up to 15 and 45 tons. These ratings vary at the different pump houses. These cranes have performed well over the last 80 years; however, they are now showing signs of deterioration and require frequent repair. For example, the cranes' control systems have begun to fail, which makes it difficult to lift and move equipment. Furthermore, replacement parts are no longer available.

In addition to the overhead bridge cranes, one portable bridge crane is located at the below-grade pump bays at each of the pumping plants. The portable cranes have a 15-ton hook to support maintenance and repair activities at lower levels of the pump house. The portable bridge cranes are in good working condition; however, their support structures are in need of retrofit to comply with the latest seismic design standards.

Replacing the overhead cranes and retrofitting the support structures at the below-grade pump bays at each of the five CRA pumping plants is an important precursor project to support the planned rehabilitation of all 45 CRA main pumps. In January 2016, Metropolitan's Board authorized design for the replacement of the overhead bridge cranes. Design is now complete, and construction is recommended to proceed at this time.

In accordance with the April 2020 action on the biennial budget for Fiscal Years 2020/21 and 2021/22, the General Manager will authorize staff to proceed with the replacement of the overhead bridge cranes at each CRA pumping plant, pending board award of the construction contract described below. Based on the current CIP expenditure forecast, funds for the work to be performed pursuant to this action during the current biennium are available within the Capital Investment Plan Appropriation for Fiscal Years 2020/21 and 2021/22 (Appropriation No. 15517). This project has been reviewed in accordance with Metropolitan's CIP prioritization criteria and was approved by Metropolitan's CIP evaluation team to be included in the Colorado River Aqueduct Reliability Program.

CRA Overhead Bridge Cranes Replacement – Construction

The scope of the construction contract includes: (1) replacing five overhead bridge cranes; (2) retrofitting the support structures within the below-grade pump bays; (3) upgrading the electrical system related to the bridge cranes; and (4) abatement and disposal of hazardous materials including asbestos and lead. Metropolitan force activities will include establishing crane outage clearances within the plants, isolating the existing bridge crane electrical systems to allow the contractor to demolish the existing cranes, and participating in the commissioning/start-up of the new cranes.

A total of \$18.5 million has been budgeted for this work; besides the amount of the contract, other allocated funds include: \$1,580,000 for construction management and inspection; \$600,000 for Metropolitan force activities as described above; \$680,000 for Metropolitan staff and the design consultant to review submittals, respond to requests for information, advise inspectors on technical issues as they arise, provide technical support, and prepare record drawings; \$950,000 for contract administration, environmental monitoring, and project management; and \$1,271,000 for remaining budget. Jacobs Engineering will provide technical support during construction under an existing board-authorized, professional services agreement.

Award of Construction Contract (J.F. Shea Construction, Inc.)

Specifications No. 1946 for replacement of the overhead bridge cranes was advertised for bids on May 22, 2020. As shown in **Attachment 2**, three bids were received and opened on July 30, 2020. The low bid from J.F. Shea Construction, Inc., in the amount of \$13,419,000, complies with the requirements of the specifications. The other bids ranged from \$14,754,151 to \$15,000,000, while the engineer's estimate was \$13,000,000. For this contract, Metropolitan established a Small Business Enterprise (SBE) participation level of at least 20 percent of the bid amount. J.F. Shea Construction, Inc. has committed to meet this level of participation. The subcontractors for this contract are listed in **Attachment 3**.

This action awards a \$13,419,000 contract to J.F. Shea Construction, Inc. for the replacement of the overhead bridge cranes at all five CRA pumping plants.

For this project, the anticipated cost of inspection is approximately 11.3 percent of the total construction cost. Engineering Services' goal for inspection of projects with construction greater than \$3 million is 9 to 12 percent. The total cost of construction for this project is \$14,019,000, which includes the amount of the contract (\$13,419,000) and Metropolitan force activities (\$600,000).

Alternatives Considered

During the planning phase for this project, staff examined several alternatives in addition to the recommended project. One alternative involved undertaking a comprehensive in-place rehabilitation of the existing overhead bridge cranes. This alternative would include removing and replacing individual components on the cranes, with the objective of upgrading as many of the existing components as possible, while leaving in place some of the

critical structural elements of the existing systems. Staff determined that replacement of key mechanical drive components may extend the life of the crane system for another 10 to 15 years. This alternative would not achieve the long-term rehabilitation goals of the project because many of the 80-year-old structural components of the crane systems would remain in place. A second alternative that was considered was the use of portable gantry cranes, in lieu of the fixed overhead cranes. Under this alternative, one crane would be brought to each site on an as-needed basis, assembled in the pump plant when needed, and removed after the repair project was completed. This alternative was deemed infeasible and impractical due to the time required to assemble the crane at each site, and the inability of the smaller portable crane to pick up some of the heaviest loads within the pump bays.

Finally, while the cranes were designed to function similarly at all five pumping plants, each installation is slightly different. Replacement of the cranes provides an opportunity to standardize the bridge crane systems across all five plants; thus, minimizing the capital cost, simplifying maintenance, and improving the interchangeability of parts. Furthermore, the new cranes are lighter in weight and provide innovative features such as radio-controlled operations through Bluetooth technology, which will streamline and optimize the operation of the cranes by staff. For these reasons and those outlined in other sections of this board letter, staff recommends the replacement of the existing cranes at each pumping plant. The recommended replacements and retrofits associated with this project will increase operational flexibility, improve long-term reliability of the bridge crane systems, and reduce maintenance costs over the next 40 years when compared to the other alternatives that were considered.

Technical Support Services (Chamieh Consulting & Industrial Group, Inc.) – New Agreement

Staff recently initiated a long-term comprehensive program to rehabilitate all 45 main pumps and their support systems at all five pumping plants along the CRA. This Pump Rehabilitation Program requires evaluation, design, testing, and repair or rehabilitation of various equipment within the plants. A specialized consultant is needed to supplement staff's existing capabilities by providing technical peer reviews and other technical support services related to the design and rehabilitation of major infrastructure facilities and equipment related to the Pump Rehabilitation Program.

Specialized technical services, as described above, are recommended to be provided by Chamieh Consulting & Industrial Group, Inc. (Chamieh) under a new professional services agreement. Chamieh was selected via Request for Proposal No. 1242. Chamieh was selected based on the established best value proposal evaluation criteria, which included their specific knowledge and expertise with highly specialized equipment such as that within Metropolitan's CRA pumping plants.

This action authorizes a professional services agreement with Chamieh in an amount not-to-exceed \$500,000 to provide technical support services for the Pump Rehabilitation Program. For this agreement, Metropolitan has established an SBE participation level of 25 percent. Chamieh is an SBE firm, and thus achieves 100 percent SBE participation. Jacobs Engineering is the sole subconsultant listed under Chamieh's agreement.

Summary

This action awards a \$13,419,000 contract to J.F. Shea Construction, Inc. for the replacement of the overhead bridge cranes at all five CRA pumping plants. This action also authorizes an agreement with Chamieh Consulting & Industrial Group, Inc. to provide technical consulting services for the rehabilitation and/or replacement of major equipment within Metropolitan's CRA pumping plants. See **Attachment 1** for the Allocation of Funds, **Attachment 2** for the Abstract of Bids, **Attachment 3** for the listing of Subcontractors for Low Bidder, and **Attachment 4** for the Location Map.

Project Milestone

October 2023 – Complete replacement of the overhead bridge cranes

Policy

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

By Minute Item 50357, dated January 12, 2016, the Board authorized the final design for the replacement of the overhead bridge cranes.

By Minute Item 51963, dated April 14, 2020, the Board appropriated a total of \$500 million for projects identified in the Capital Investment Plan for Fiscal Years 2020/21 and 2021/22.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding, design, minor alterations, and replacement of existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

- a. Award \$13,419,000 contract to J.F. Shea Construction, Inc. to replace the overhead bridge cranes at all five CRA pumping plants; and
- b. Authorize an agreement with Chamieh Consulting & Industrial Group, Inc. for technical support, in an amount not to exceed \$500,000.

Fiscal Impact: \$19 million in capital funds. Approximately \$8.6 million will be incurred in the current biennium and have been previously authorized.

Business Analysis: This option will enable the rehabilitation program and long-term maintenance for the main CRA pumps to move forward.

Option #2

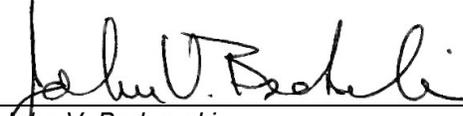
Do not proceed with the project at this time.

Fiscal Impact: None

Business Analysis: This option would defer the refurbishment of the main pumps and their related systems, which would forego an opportunity to reduce the risk of unplanned outages of the CRA.

Staff Recommendation

Option #1


 _____ 8/25/2020
 John V. Bednarski
 Manager/Chief Engineer,
 Engineering Services
 Date


 _____ 8/27/2020
 Jeffrey Wightlinger
 General Manager
 Date

Attachment 1 – Allocation of Budgeted Funds

Attachment 2 – Abstract of Bids

Attachment 3 – Subcontractors for Low Bidder

Attachment 4 – Location Map

Allocation of Funds for CRA Overhead Cranes Replacement and the CRA Main Pump Rehabilitation Program

	Current Board Action (Sep. 2020)
Labor	
Studies & Investigations	-
Final Design	-
Owner Costs (Program mgmt., envir. monitoring)	930,000
Submittals Review & Record Drwgs.	448,000
Construction Inspection & Support	1,580,000
Metropolitan Force Construction	600,000
Materials & Supplies	-
Incidental Expenses	20,000
Professional/Technical Services	
Chamieh Consulting & Industrial Group, Inc.	500,000
Jacobs Engineering, Inc.	232,000
Right-of-Way	-
Equipment Use	-
Contracts	-
J.F. Shea Construction, Inc.	13,419,000
Remaining Budget	1,271,000
Total	\$ 19,000,000

The total amount expended to date to replace overhead bridge cranes at the CRA pumping plants is approximately \$1.9 million. The total estimated cost to complete this project, including the amount appropriated to date and funds allocated for the work described in this action is \$20.4 million.

The Metropolitan Water District of Southern California

Abstract of Bids Received on July 30, 2020 at 2:00 P.M.

Specifications No. 1946

**Colorado River Aqueduct Overhead Bridge Cranes
Replacement Project**

The project consists of replacing the overhead bridge cranes, upgrading the cranes' electrical and control systems, and retrofitting the support structures within the pump bays at all five of Metropolitan's CRA Pumping Plants.

Engineer's Estimate: \$13,000,000

Bidder and Location	Total	SBE \$	SBE %	Met SBE**
J.F. Shea Construction, Inc. Walnut, CA	\$ 13,419,000	\$3,711,672	27.7%	Yes
Mehta Mechanical Co. dba MMC, Inc. La Palma, CA	\$ 14,754,151	N/A	N/A	N/A
Green Building Corporation Van Nuys, CA	\$ 15,000,000	N/A	N/A	N/A

*SBE (Small Business Enterprise) participation was established at 20% for this contract

The Metropolitan Water District of Southern California

Subcontractors for Low Bidder

**Specifications No. 1946
Colorado River Aqueduct Overhead Bridge Cranes
Replacement Project**

Low bidder: J.F. Shea Construction, Inc.

Subcontractor and Location
CL Coatings, Inc. Stanton, CA
Matrix Environmental, Inc. Long Beach, CA
Southern Contracting Company San Marcos, CA

Location Map

