



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

12/14/2021 Board Meeting

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7-2

**Subject**

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Award a \$11,499,000 contract to J. F. Shea Construction, Inc. for the seismic upgrade of the Casa Loma Siphon Barrel No. 1; and authorize \$1,100,000 increase to an agreement with Carollo Engineers Inc., for a new not-to-exceed total of \$3.6 million, for technical support during construction; the proposed action is in furtherance of a project that was previously determined to be exempt or otherwise not subject to CEQA

**Executive Summary**

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Casa Loma Siphon Barrel No. 1, which is located near the city of Hemet, is a key portion of the Colorado River Aqueduct (CRA) system. The siphon crosses the Casa Loma Fault and is vulnerable to significant deformation and potential rupture from a seismic event. In addition, the pipeline has deformed over time due to ongoing localized ground subsidence, and, as a result, the pipeline has experienced recurring leaks since the 1960s. Numerous repairs have been attempted over the years; however, intermittent leaks continue to occur. This project will mitigate leaks associated with long-term ground subsidence and improve the overall seismic resilience of this portion of the CRA.

This action awards a contract to replace a portion of Barrel No. 1 of the Casa Loma Siphon at the fault crossing with earthquake-resistant pipe. This action also authorizes an increase to an existing agreement for technical support during construction.

**Details**

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**Background**

Casa Loma Siphon Barrel No. 1 was constructed in 1935 as a component of the CRA. The siphon extends west from the San Jacinto Diversion Structure to the Bernasconi Tunnel near Lake Perris; a distance of five miles. The siphon was originally constructed of 148-inch-diameter concrete pipe. In the early 1960s, cracks and leakage developed in the pipe as a result of ground movement due to subsidence where the siphon crosses the Casa Loma Fault. In 1968, 300 feet of the concrete pipe was replaced with 148-inch-diameter steel pipe, joined by external sleeve type couplings. These couplings were installed across the fault to permit minor, movement of pipe segments without leaking. However, since that time, continued ground subsidence has caused leaks in that section of the pipeline, which have required numerous repairs.

Metropolitan has an extensive seismic reliability program, which periodically reassesses seismic risks to its infrastructure. This program conducted a geologic hazard evaluation of the area surrounding the Casa Loma Siphon Barrel No. 1. This evaluation indicated that a potential horizontal ground displacement of up to 13 feet is possible due to fault rupture at this location. In addition, an internal survey of the pipeline confirmed that an 800-foot-long portion of the siphon has experienced vertical displacement of more than five feet over 84 years due to ongoing non-seismic settlement of the ground surface.

In light of these unique site conditions, staff investigated innovative solutions to make this section of the siphon more resilient to seismic events and ground subsidence. Staff concluded that Earthquake-Resistant Ductile Iron Pipe (ERDIP) is a viable and superior alternative to other methods to enhance reliability and seismic resiliency of the siphon. ERDIP is a type of pipe with flexible joints that can accommodate relatively large ground displacements. Traditional welded steel pipe will be used to transition between the ERDIP and the existing concrete pipe.

In May 2018, Metropolitan's Board authorized design to replace a portion of the Casa Loma Siphon Barrel No. 1 with ERDIP. In December 2019, due to the long lead-time needed to procure these pipes and fittings and the timing of the project to meet the CRA shutdown, Metropolitan's Board authorized procurement of the pipe. Both the ERDIP and welded steel pipe have been fabricated and are currently in storage near the project site. Staff recommends award of a construction contract 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 seismic upgrade of the Casa Loma Siphon Barrel No. 1, pending board award of the contract described below. Based on the current Capital Investment Plan (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). Funds required for work to be performed pursuant to the subject contract after fiscal year 2021/22 will be budgeted within the Capital Investment Plan Appropriation for Fiscal Years 2022/23 and 2023/24. 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 Distribution System Reliability Program.

### **Casa Loma Siphon Barrel No. 1 Seismic Upgrade – Construction**

The scope of construction includes replacing approximately 1,200 linear feet of 148-inch diameter steel and concrete pipe crossing the Casa Loma Fault Zone with two parallel barrels of Metropolitan-furnished 104-inch diameter ERDIP, installing 148-inch diameter Metropolitan-furnished steel pipe and fittings to connect the ERDIP and existing siphon, and applying cement-mortar lining. In addition, Metropolitan forces will shut down the pipeline, establish clearances, perform water quality testing, and return the pipeline to service.

A total of \$16.2 million is required for this work. In addition to the amount of the contract described below, other funds to be allocated include \$110,000 for Metropolitan force construction, as described above; \$1,602,000 for construction management and inspection; \$562,000 for submittal review and preparation of record drawings; \$1,100,000 for technical support during construction by Carollo Engineers Inc., as described below, \$403,000 for contract administration, environmental support, and project management; and \$924,000 for remaining budget.

**Attachment 1** provides the allocation of the required funds. The total estimated cost to complete the Casa Loma Siphon Barrel No. 1 Seismic Upgrade, including the amount allocated to date and funds allocated for the work described in this action, is \$37.2 million. Approximately \$21 million has been expended on this project to date.

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

Specification No. 1958 for the Seismic Upgrade of Casa Loma Siphon Barrel No. 1 was advertised for bids on September 24, 2021. As shown in **Attachment 2**, seven bids were received and opened on November 16, 2021. The low bid from J. F. Shea Construction, Inc, in the amount of \$11,499,000, complies with the requirements of the specifications. The other bids ranged from \$12,982,500 to \$20,425,706, while the engineer's estimate for this project was \$16.1 million. 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 agreed to meet this level of participation. The subcontractors for this contract are listed in **Attachment 3**. This action awards an \$11,499,000 contract to J. F. Shea Construction, Inc. for Seismic Upgrade of Casa Loma Siphon Barrel No. 1.

As described above, Metropolitan staff will perform construction management and inspection. Additionally, the ERDIP manufacturer, Kubota Corporation, will provide field support, including hands-on training, joint testing, and ERDIP installation inspections. These services were included in the ERDIP procurement contract. Engineering Services' performance metric target range for inspection of projects with construction greater than \$3 million is 9 to 12 percent. For this project, the performance metric goal for inspection is 7.5 percent of the total construction cost. The metric is derived from the total cost of inspection and the total value of the construction and procurement costs for the project. The total cost of inspection for this project is \$2.07 million, which includes inspection of the subject pipe installation (\$1,602,000) and pipe fabrication (\$470,000); funds for the pipe fabrication inspection were previously allocated. The total cost of construction for this project is \$27.6 million, which includes the subject installation contract (\$11,499,000), previously procured Metropolitan-furnished pipe (\$15,991,000), and Metropolitan force work (\$110,000).

### **Technical Support During Construction (Carollo Engineers Inc.) – Amendment to Agreement**

Carollo Engineers Inc. (Carollo) performed the design and provided technical support during pipe procurement for the Casa Loma Siphon Barrel No. 1 Seismic Upgrade under a board-authorized agreement. As the engineer of record for the design, Carollo is recommended to provide technical support during construction. The planned activities include review of submittals, responding to requests for information from the contractors, and advising staff on technical issues as they arise. The estimated cost for these services is \$1.1 million.

This action authorizes an increase of \$1.1 million to the existing agreement with Carollo for a new not-to-exceed amount of \$3.6 million to provide technical support during construction for the Casa Loma Siphon Barrel No. 1 Seismic Upgrade. For this agreement, Metropolitan has established an SBE participation level of 25 percent. Carollo has agreed to meet this level of participation. The subconsultants for this work are Degenkolb Engineers, Inc., Hushmand Associates, Inc., JDH Corrosion Consultants, Inc., and Lettis Consultants International, Inc.

### **Alternatives Considered**

During planning and design of this project, staff considered replacing the existing Casa Loma Siphon Barrel No. 1 with conventional steel pipe. On a short-term basis, this option would address the persistent leakage issues at the siphon. However, this approach would not provide the pipeline flexibility necessary to accommodate the continuing settlement displacement that is expected to occur over time, nor the significant displacement from a potential seismic event. Taken collectively, the alternative to use only steel pipe for the siphon/fault crossing would not increase the overall resiliency of this portion of the CRA. Staff evaluated multiple configurations and sizes of ERDIP and steel pipe and determined that a combination of ERDIP and steel pipe is the most cost-effective and reliable option.

### **Summary**

This action awards a \$11,499,000 construction contract to J. F. Shea Construction, Inc. for Casa Loma Siphon Barrel No. 1 Seismic Upgrade and authorizes an increase in an agreement with Carollo Engineers Inc. for technical support during construction. 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**

June 2023 – Complete construction for Casa Loma Siphon Barrel No. 1 seismic upgrade

### **Policy**

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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 51196, dated May 8, 2018, the Board authorized design to replace Casa Loma Siphon Barrel No. 1

By Minute Item 51830 dated December 10, 2019, the Board authorized procurement of pipe materials to replace Casa Loma Siphon Barrel No. 1

By Minute Item 51963, dated April 13, 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)**

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#### **CEQA determination for Option #1:**

The proposed action was previously determined to be exempt under the provisions of CEQA and the State CEQA Guidelines. The Casa Loma Siphon Barrel No. 1 project was found by the Board to be statutorily exempt under Section 21080.21(a) of the California Public Resources Code and Section 15282(k) of the State CEQA Guidelines and categorically exempt under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the

State CEQA Guidelines) on May 8, 2018. With the current board action, there is no substantial change proposed since the original project was first approved in 2018. Hence, the previous environmental documentation in conjunction with the project fully complies with CEQA and the State CEQA Guidelines. Accordingly, no further CEQA documentation is necessary for the Board to act with regard to the proposed action.

**CEQA determination for Option #2:**

None required

**Board Options**

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**Option #1**

- a. Award \$11,499,000 contract to J. F. Shea Construction, Inc. for Casa Loma Siphon Barrel No. 1 Seismic Upgrade.
- b. Authorize a \$1.1 million increase to an agreement with Carollo Engineers Inc. for a new not-to-exceed amount of \$3.6 million.

**Fiscal Impact:** Expenditure of \$16.2 million in capital funds. Approximately \$1.5 million will be incurred in the current biennium and has been previously authorized.

**Business Analysis:** This option will resolve long-term leakage and settlement issues with the Casa Loma Siphon, reduce the risk of unplanned outages and costly urgent repairs, and enhance the delivery reliability of the CRA.

**Option #2**

Do not proceed with the project at this time.

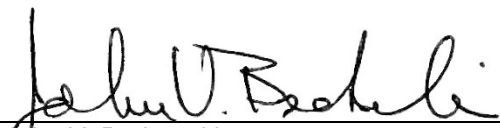
**Fiscal Impact:** None


**Business Analysis:** This option would forgo an opportunity to increase the seismic resilience of the CRA. Staff would continue to monitor the siphon and make repairs when leaks are found.

**Staff Recommendation**

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Option #1

  
 \_\_\_\_\_ 11/22/2021  
 John V. Bednarski Date  
 Chief Engineer/Manager  
 Engineering Services

  
 \_\_\_\_\_ 12/2/2021  
 Adel Hagekhalil Date  
 General Manager

**Attachment 1 – Allocation of Funds**

**Attachment 2 – Abstract of Bids**

**Attachment 3 – Subcontractors for Low Bidder**

**Attachment 4 – Location Map**

### Allocation of Funds for Casa Loma Siphon Barrel No. 1 Seismic Upgrade

	<b>Current Board Action (Dec. 2021)</b>
Labor	
Studies & Investigations	\$ -
Final Design	-
Owner Costs (Program mgmt., envir. monitoring)	403,000
Submittals Review & Record Drwgs.	562,000
Construction Inspection & Support	1,602,000
Metropolitan Force Construction	110,000
Materials & Supplies	-
Incidental Expenses	-
Professional/Technical Services	-
Carollo Engineers Inc.	1,100,000
Right-of-Way	-
Equipment Use	-
Contracts	-
J. F. Shea Construction, Inc.	11,499,000
Remaining Budget	924,000
<b>Total</b>	<b><u>\$ 16,200,000</u></b>

The total amount expended to date for the Casa Loma Siphon Barrel No. 1 Seismic Upgrade is approximately \$21 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 \$37.2 million.

**The Metropolitan Water District of Southern California**

**Abstract of Bids Received on November 16, 2021 at 10:00 A.M.**

**Specifications No. 1958  
Casa Loma Siphon Barrel No. 1 Seismic Upgrade**

The work includes replacing approximately 1,200 linear feet of 148-inch diameter steel and concrete pipe crossing the Casa Loma Fault Zone with two parallel barrels of Metropolitan-furnished 104-inch diameter ERDIP, installing 148-inch diameter Metropolitan-furnished steel pipe and fittings to connect the ERDIP and existing siphon, welding, applying cement mortar lining, and site restoration.

Engineer's estimate: \$16,100,000

<b>Bidder and Location</b>	<b>Total</b>	<b>SBE \$</b>	<b>SBE %</b>	<b>Met SBE<sup>1</sup></b>
J. F. Shea Construction, Inc. Walnut, CA	\$11,499,000	\$2,910,975	25%	Yes
Steve P. Rados, Inc. Santa Ana, CA	\$12,982,500	-	-	-
Mladen Buntich Construction Co., Inc, Upland, CA	\$13,397,000	-	-	-
James W. Fowler Co. Dallas, OR	\$14,505,000	-	-	-
Blois Construction, Inc. Oxnard, CA	\$14,974,000	-	-	-
Kiewit Infrastructure West Co. Poway, CA	\$15,474,000	-	-	-
ARB, Inc. Lake Forest, CA	\$20,425,706	-	-	-

<sup>1</sup> Small Business Enterprise (SBE) participation level established at 20% for this contract.

**The Metropolitan Water District of Southern California**

**Subcontractors for Low Bidder**

**Specifications No. 1958  
Casa Loma Siphon Barrel No. 1 Seismic Upgrade**

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

<b>Subcontractor and Location</b>
Amber Steel Co. Rialto, CA
Geo-Cell Solutions Fresno, CA
Marina Landscape, Inc. Orange, CA
Matrix Environmental Long Beach, CA
Dean's Certified Welding Temecula, CA
Miller Pipeline, LLC Indianapolis, IN

# Distribution System

