

**HIGHLINE WATER DISTRICT  
King County, Washington**

**RESOLUTION 25-4-2E**

**RESOLUTION AUTHORIZING AMENDMENT #1 TO CONTRACT #25-60-03  
WITH CAROLLO ENGINEERS, INC., FOR RESERVOIR STUDY OPTIONS  
ANALYSIS**

**WHEREAS**, the District has entered into a consultant contract with Carollo Engineers, Inc. to update the District's 2026 Comprehensive Water System Plan; and

**WHEREAS**, the District requested Carollo Engineers, Inc., submit a Scope of Services and Fee estimate proposal for the study of rehabilitation and replacement of three existing reservoirs (referenced as Attachment 1 and incorporated herein); and

**WHEREAS**, management reviewed the Scope of Services and Fee Estimated submitted by Carollo Engineers, Inc. and recommend approval of this resolution.

**NOW, THEREFORE, BE IT RESOLVED:**

1. The Board of Commissioners approves Amendment #1 for a not to exceed amount of \$104,446 to Contract 25-60-03 with Carollo Engineers, Inc.
2. The Board of Commissioners authorizes the General Manager or designee to execute Amendment #1 (referenced as Attachment-1 and incorporated herein) to the 2026 Comprehensive Water System plan.
3. The General Manager and Legal Counsel are authorized to make minor changes to the Amendment as required.

**ADOPTED BY THE BOARD OF COMMISSIONERS** of Highline Water District, King County, Washington, at an open public meeting held this **2nd** day of **April 2025**.

**BOARD OF COMMISSIONERS**

DocuSigned by:

*Vince Koester*

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**Vince Koester**, President

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*Polly Daigle*

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**Polly Daigle**, Commissioner

Signed by:

*Kathleen Quong-Vermeire*

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**Kathleen Quong-Vermeire**, Commissioner

Signed by:

*Todd Fultz*

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**Todd Fultz**, Secretary

Signed by:

*Daniel Johnson*

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**Daniel Johnson**, Commissioner

## **ATTACHMENT 1**

### **HIGHLINE WATER DISTRICT RESERVOIR STUDY OPTIONS ANALYSIS AMENDMENT #1**

The Highline Water District (District) has engaged Carollo Engineers (Consultant) to develop their new Comprehensive Water System Plan (Plan). As part of this effort, the District has identified the need to evaluate options for rehabilitating or replacing three of their existing reservoirs. Carollo has partnered with Evergreen Coating Engineers, LLC (ECE) to conduct this evaluation, with Carollo providing additional support as outlined herein.

#### **PROJECT BACKGROUND**

The District's water system includes three aging storage reservoirs: McMicken and Mansion Hill, both elevated reservoirs, and Bow Lake, a standpipe. These reservoirs are nearing the end of their useful coating life and are likely to have significant seismic deficiencies due to changes in seismic codes since their last modifications. The District seeks to optimize the storage capacity of these reservoirs while considering present-day needs, life cycle costs, and the feasibility of rehabilitation or replacement.

#### **OVERVIEW**

The District operates and maintains a water supply, treatment, and distribution system, serving customers in its water service area. Currently, the District delivers water to its customers from local wells, interties with Seattle Public Utilities, booster pump stations, and storage tanks. The District's last Comprehensive Water System Plan was completed in 2015.

#### **Project Assumptions:**

- Carollo Engineers, Inc. will be referred to as "Consultant" in this document.
- Highline Water District and its staff will be referred to as "District" in this document.
- All meetings will be held on Microsoft Teams, unless otherwise specified.
- Draft Chapters will be provided in electronic copy (PDF and/or Microsoft Word) transmitted via email or secure file transfer.
- District comments on draft chapters will be documented in the Project Comment Response Log by the Consultant. The Consultant will prepare responses to address the comments in the Comment Response Log for the District's review and acceptance. The resulting changes will be incorporated in the Draft Agency Review Plan, rather than reissuing a draft chapter at the time. However, revised draft chapters can be produced upon District request.
- The Consultant will prepare an agenda, presentation materials, and document discussions, including action items and decisions, in meeting minutes for Consultant-led meetings.
- Meeting notes and related materials will be transmitted electronically in MS Word and/or PDF formats via email.
- The District will print and produce all documents as necessary for its use. Consultant will not provide any deliverables in a paper format.
- The Consultant shall complete the services required hereunder in accordance with the prevailing engineering standard of care by exercising the skill and ability ordinarily required of engineers performing the same or similar services, under the same or similar circumstances, in the State of Washington.

- In providing opinions of cost, financial analyses, economic feasibility projections, schedules, and quantity and/or quality estimates for potential projects, the Consultant has no control over cost or price of labor and material; unknown or latent conditions of existing equipment or structures that may affect operation and maintenance costs; competitive bidding procedures and market conditions; time or quality of performance of third parties; quality, type, management, or direction of operating personnel; the incoming water quality and/or quantity; the way District's plant(s) and/or associated processes are operated and/or maintained; and other economic and operational factors that may materially affect the ultimate project elements, including, but not limited to, cost or schedule. Therefore, the Consultant makes no warranty that the District's actual project costs, financial aspects, economic feasibility, schedules, and/or quantities or quality realized will not vary from the Consultant's opinions, analyses, projections, or estimates.
- The services to be performed by the Consultant are intended solely for the benefit of the District. No person or entity not a signatory to the Agreement shall be entitled to rely on the Consultant's performance of its services hereunder, and no right to assert a claim against the Consultant by assignment of indemnity rights or otherwise shall accrue to a third party as a result of the Agreement or the performance of the Consultant's services hereunder.

#### **Summary of Meetings:**

- Monthly Progress Meeting(s)
- Meeting No. 1: Kickoff Meeting (Virtual)
- Meeting No. 2: Options Brainstorming and Evaluation Methodology
- Meeting No. 3: Site Visit(s)
- Meeting No. 4: Evaluation Findings
- Meeting No. 5: Results of Reservoir Options Analysis

#### **Summary of Deliverables:**

- Draft Technical Memorandum
- Final Technical Memorandum

#### **SCOPE OF WORK**

##### **TASK 1100 – RESERVOIR STUDY OPTIONS ANALYSIS**

##### **Subtask 1101 - Project Management**

The purpose of this subtask is to direct activities as assigned by the District and maintain the project within the contracted scope, schedule, and budget. Includes project administration, monthly invoicing, client and team coordination.

##### **Subtask 1101-1 – Monthly Progress Reports and Invoices**

This effort is an amendment to the Water System Plan contract. It is assumed that this effort will be part of that effort and not change the Water System Plan timeline. No level of effort was included.

##### **Subtask 1101-2 – Project Coordination**

Manage the Consultant team to complete the project. Create and maintain a working project schedule. Review project status, including scope, budget, and schedule. Monthly progress meetings with District staff.

##### **Subtask 1101-3 – Meeting No. 1: Kickoff Meeting**

Facilitate a kick-off meeting to review project management and initial data requests.

**Task 1101 Assumptions:**

1. Monthly progress reports and invoices will be included with the Water System Plan. No separate invoices.
2. Kickoff meeting will be held virtually.
3. Kickoff meeting will be no more than one (1) hour in duration.
4. Duration of project is six (6) months.

**Task 1101 District Input:**

1. Attend the kickoff meeting and provide feedback on project objectives, expectations, and initial data needs.

**Task 1101 Consultant Deliverables:**

1. Water System Plan Monthly progress reports detailing work completed, budget status, and upcoming tasks.
2. Water System Plan Monthly invoices corresponding to work completed.
3. A project schedule with regular updates as needed.

**Task 1101 Meetings:**

1. Meeting No. 1: Kickoff Meeting.

**TASK 1102 - – OPTIONS AND EVALUATION METHODOLOGY IDENTIFICATION**

This task identifies potential options for addressing the rehabilitation or replacement needs of the McMicken, Mansion Hill Elevated, and Bow Lake Reservoirs, as well as developing the methodology to evaluate these options.

**Subtask 1102-1: Options Identification**

This subtask consists of brainstorming a range of options to address the rehabilitation or replacement needs of the McMicken, Mansion Hill Elevated, and Bow Lake Reservoirs. Up to four (4) options will be identified and carried through the evaluation in the following Tasks. Each option will be developed to include potential locations, storage volume recommendations, overflow elevations, and other critical features needed to evaluate them. Options may include the following:

- Upgrade/Rehabilitate
- New Construction
- Combination of New Construction and Upgrade/Rehabilitate
- Modified Existing System

Preliminary project plan for new reservoirs will include a general description of where to site the reservoir upon an existing reservoir site, generalized piping connections, and issues to be resolved during design. It will also include a list of recommended upgrades, issues to be resolved during design.

This task will include pumping and storage options to optimize the system as well as necessary pipe and pressure reducing valve improvements to eliminate the low pressure area around Mansion Hill. Consultant will provide minimum and optimal storage volumes and elevations for those storage volumes for any new reservoirs.

### **Subtask 1102-2: Evaluation Methodology Identification**

This subtask includes the Consultant's efforts to identify evaluation methodology and criteria needed to assess the options listed in subtask 201. An evaluation methodology is to be identified by the Consultant to rate and rank options effectively. The secondary goal for this task is to discuss the level of effort and detail development for the different criteria identified.

- Options evaluation criteria may include but are not limited to:
- Hydraulics
- Operations and Maintenance
- Water Quality
- Cost Effectiveness
- Multiple Benefits

### **Subtask 1102-3 – Meeting No. 2: Options Brainstorming and Evaluation Methodology**

Facilitate a meeting with the District to brainstorm and present potential options, as well as the methodology to evaluate them. The end goal for this meeting will be for the Consultant and District to agree on the 4 options to carry forward.

#### Task 1102 Assumptions:

1. The District will provide all requested data.
2. The brainstorming meeting will be no more than one and a half (1.5) hours in duration.
3. The reservoir siting drawings will consist of one plan sheet per new reservoir (3 Total).

#### Task 1102 District Input:

1. Supply historical and operational data, including maintenance records, seismic evaluations.
2. Provide input during brainstorming meeting.

#### Task 1102 Consultant Deliverables:

1. Data request list.
2. Presentation materials to guide Options Brainstorming.

#### Task 1102 Meetings:

1. Meeting No. 2: Options Brainstorming and Evaluation Methodology and Evaluation Methodology.

### **TASK 1103 - OPTIONS DEVELOPMENT**

In this task, the Consultant will develop the four options which were identified in subtask 1102. This will involve documenting the key features, assumptions, and potential impacts of each option. The analysis will outline the steps required to implement each option and assess the technical and operational feasibility.

#### **Subtask 1103-1 – Hydraulic Modeling**

Modeling will evaluate fire flow, average day, and maximum day demand pressures per DOH regulations and guidelines based on the District's water system criteria will be conducted for the 20 year demand projections developed in the Plan. Hydraulic modeling will be conducted to evaluate each of the four options.

This evaluation will identify and address system deficiencies, such as low-pressure zone near the Mansion Hill Reservoir, while providing data-driven recommendations to support decision-making. The results of the modeling will inform storage recommendations and conceptual options for rehabilitation, replacement, or system reconfiguration, ensuring the system meets both current and future operational needs.

#### **Subtask 1103-2 – Meeting No. 3: Site Visit(s)**

Conduct a site visit to assess the physical condition of the McMicken, Mansion Hill, and Bow Lake Reservoirs. Observe key structural, coating, and operational conditions and identify preliminary areas of concern. Document findings with photos and notes to inform subsequent evaluation tasks.

#### **Subtask 1103-3 – Cost Development**

Develop preliminary planning level costs to seismically upgrade, upgrade the appurtenances, and recoat the existing reservoirs. No seismic analysis will be performed. Assumptions of the cost to seismically upgrade each reservoir will be made.

Develop preliminary planning level costs to construct two or three new reservoirs, as required based upon hydraulic modeling results, and demolish three reservoirs.

Develop preliminary planning level costs for all piping and pressure reducing valve improvements related to resolution of the low pressure area.

#### **Subtask 1103-4 – Meeting No. 4: Evaluation Findings**

Facilitate a meeting with the District to present and discuss the results of the modeling and cost estimates. This meeting will focus on the capital costs, operation and maintenance (O&M) costs, and life cycle cost comparisons for each of the evaluated options.

#### **Task 1300 Assumptions:**

1. The hydraulic model is already calibrated and up to date.
2. Modeling scenarios will be the same scenarios used in the Plan.
3. Up to two (2) site visits will be performed.
4. Each site visit will be no more than four (4) hours in duration.
5. Survey will not be provided.
6. Coating samples will not be taken.
7. Planning level costs will include costs to seismically upgrade, upgrade the appurtenances, and recoat the existing reservoirs. Additionally, planning level costs, life cycle cost, and preliminary design, bid, and construction schedule.
8. Assumptions of the cost to seismically upgrade each reservoir will be made.
9. No seismic analysis will be performed.
10. Preliminary planning level costs will be AACE Class 5.
11. Findings meeting will be no more than one and a half (1.5) hours in duration.
12. Negotiations and purchase of land or of easements will not be provided.

#### **Task 1103 District Input:**

1. District staff to provide access and operational insights during site visit(s).

2. Provide input during the evaluation findings meeting.

Task 1103 Consultant Deliverables:

1. Attend the site visit.
2. Presentation materials which summarize the findings of each option.

Task 1103 Meetings:

1. Meeting No. 3: Site Visit.
2. Meeting No.4: Evaluation Findings.

**TASK 1104– OPTIONS RATING AND REPORTING**

The purpose of this task is to compile the findings from Tasks 200 through 300 into a comprehensive Technical Memorandum (TM). The TM will outline the analysis, recommendations, and conclusions drawn from the evaluation of the options identified throughout the previous tasks. The objective of this task is to present a clear comparison of options, enabling the selection of a preferred approach for future evaluation.

**Subtask 1104-1: Options Rating**

The Consultant will evaluate the options using the matrix developed in Task 300. This matrix includes evaluation criteria and a scoring system to objectively assess the strengths and weaknesses of each storage option. included will be a preliminary planning level costs, life cycle cost, and preliminary design, bid, and construction schedule. By applying this structured approach, the Consultant will complete and document a thorough analysis of each option, which will support the decision-making process in selecting the preferred intertie option for further evaluation in subsequent project phases.

**Subtask 1104-2 – Meeting No. 5: Results of Reservoir Options Analysis**

Present the findings from the reservoir options analysis to District staff. Discuss the advantages, disadvantages, and estimated costs of each option, including rehabilitation, new construction, hybrid approaches, and modified storage configurations. Address District questions and gather feedback to inform the Technical Memorandum.

**Subtask 1104-3 – Draft and Final Technical Memorandum**

Prepare a draft technical memorandum summarizing the analysis and findings from Tasks 200 and 300. Include planning-level costs, life cycle costs of each options, conceptual project plans, and recommendations for the preferred options. Incorporate District feedback into the final version of the memorandum and submit it to the District.

This document will serve as an appendix to the Water System Plan. The option(s) selected within this analysis will be incorporated into the Capital Improvement Plan (CIP).

Task 1104 Assumptions:

1. Conceptual or preliminary reservoir siting drawings will be hand-drafted on aerial/satellite images by ECE for Carollo to draft in CAD or GIS for inclusion in the report.
2. Meeting will be no more than one and a half (1.5) hours in duration.
3. No hardcopies will be provided.

Task 1104 District Input:

1. Review and provide comments on the draft technical memorandum.
2. Participate in the results meeting and provide feedback on the options analysis.

Task 1104 Consultant Deliverables:

1. Draft Technical Memorandum.
2. Final Technical Memorandum.
3. Presentation materials summarizing the results of the reservoir options analysis.

Task 1104 Meetings:

1. Meeting No. 5: Results of Reservoir Options Analysis





HIGHLINE WATER DISTRICT  
WATER SYSTEM PLAN  
AMENDMENT #1 - RESERVOIR OPTIONS ANALYSIS STUDY  
LEVEL OF EFFORT

TASK / DESCRIPTION	PM	QM	PE	Shift	GIS	DP	Total Hours	Carollo Labor Cost	Subconsultant		OTHER DIRECT COSTS		TOTAL COST		
									ECE	Total Sub Cost (w/ 10% markup)	PECE				
											Travel, Shipping and Printing				
Total Labor Rate								\$235.00	\$315.00	\$205.00	\$165.00	\$145.00	\$135.00		
Task 1101 - Project Management								19	\$ 4,325	18	\$ 4,059	\$ -	\$ 304	\$ 304	\$ 8,688
1101-1 Monthly Progress Reports and Invoices							0	\$ -				\$ -	\$ -		
1101-2 Project Coordination		9					9	\$ 2,115	8	\$ 1,804		\$ 144	\$ 144	\$ 4,063	
1101-3 Meeting No. 1: Kick-off Meeting		2	2	4			10	\$ 2,210	10	\$ 2,255		\$ 160	\$ 160	\$ 4,625	
Task 1102 - Options and Evaluation Methodology Identification		9	4	14	45	12	85	\$ 15,575	16	\$ 3,608	\$ 100	\$ 1,360	\$ 1,460	\$ 20,643	
1102-1 Options Identification		2	2	8	32	8	52	\$ 9,180	16			\$ 832	\$ 832	\$ 13,620	
1102-2 Evaluation Methodology Identification		1	2	4	6		13	\$ 2,675				\$ 208	\$ 208	\$ 2,883	
1102-3 Meeting No. 2: Options Brainstorming		6	2	2	8	4	20	\$ 3,720			\$ 100	\$ 320	\$ 420	\$ 4,140	
Task 1103 - Options Development		12	5	20	108	8	164	\$ 27,790	62	\$ 13,981	\$ 420	\$ 2,464	\$ 2,884	\$ 44,655	
1103-1 Hydraulic Modeling		2	4	12	72		90	\$ 16,070	10	\$ 2,255		\$ 1,440	\$ 1,440	\$ 19,765	
1103-2 Meeting No. 3: Site Visit(s)					8		8	\$ 1,320	12	\$ 2,706	\$ 320	\$ 128	\$ 448	\$ 4,474	
1103-3 Cost Development		4	2	4	16		26	\$ 5,030	40	\$ 9,020		\$ 416	\$ 416	\$ 14,466	
1103-4 Meeting No. 4: Evaluation Findings		6		4	12	8	30	\$ 5,370			\$ 100	\$ 480	\$ 580	\$ 5,950	
Task 1104 - Hydraulic Model Calibration		8	8	15	56	0	96	\$ 18,000	48	\$ 10,824	\$ 100	\$ 1,516	\$ 1,636	\$ 30,460	
1104-1 Options Rating		2		8	24		34	\$ 6,070				\$ 544	\$ 544	\$ 6,614	
1104-2 Meeting No. 5: Results of Reservoir Options Analysis		4	4	2	8		18	\$ 3,930			\$ 100	\$ 288	\$ 388	\$ 4,318	
1104-3 Draft and Final Technical Memorandum		2	4	6	24		44	\$ 8,000	48	\$ 10,824		\$ 704	\$ 704	\$ 19,528	
Total		40	20	54	210	22	364	\$ 65,630	144	\$ 32,472	\$ 620	\$ 5,664	\$ 6,284	\$ 104,448	