

CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Authorize the City Manager to Execute Contract 10498 with David Evans & Associates, Inc. in the Amount of \$153,075 for Engineering Design Services for the City of Shoreline Lift Station 15 Conceptual Design
DEPARTMENT:	Public Works
PRESENTED BY:	Samuel Supowit, Wastewater Systems Engineer
ACTION:	<input type="checkbox"/> Ordinance <input type="checkbox"/> Resolution <input checked="" type="checkbox"/> Motion <input type="checkbox"/> Discussion <input type="checkbox"/> Public Hearing

PROBLEM/ISSUE STATEMENT:

In 2022, the City engaged David Evans and Associates (DEA) to update the wastewater hydraulic model in order to make updates to the City’s capital improvement plan. The analysis indicates that within five years, the capacity of Lift Station 15 would be insufficient to meet state requirements. Lift Station 15 suffered an overflow event in 2021 wherein wastewater surcharged a vent pipe and spilled into the dry well after a pump failure. There is also a legacy overflow pipe that could discharge into McAleer Creek in the event of pump failure.

Staff is requesting that City Council authorize the City Manager to execute a contract with David Evans & Associates, Inc. in the amount of \$153,075 for engineering consultation services for the City of Shoreline Lift Station 15 Conceptual Design. The proposed scope of work for this contract is attached to this staff report as Attachment A.

RESOURCE/FINANCIAL IMPACT:

The City of Shoreline Lift Station 15 Conceptual Design budget is part of the approved 2023-2028 Capital Improvement Plan for the rehabilitation or replacement of Lift Station 15. The subsequent construction effort is estimated to cost between \$2 million and \$3.5 million and will necessitate a separate contract and staff report upon completion of the design efforts.

RECOMMENDATION

Staff recommends that the City Council authorize the City Manager to execute a contract with David Evans & Associates in the amount of \$153,075 for engineering design services for the City of Shoreline Lift Station 15 Conceptual Design.

Approved By: City Manager **BE** City Attorney **MK**

BACKGROUND

In 2017, the Ronald Wastewater District proposed to the Washington State Department of Transportation (WSDOT) that Lift Station 15 be abandoned and service in the area be replaced by a gravity sewer parallel to Interstate 5 between the edge of the travelled lanes and the new light rail lines. WSDOT denied that request, so Lift Station 15 must be upgraded to meet future demands in the area.

In 2022, the City engaged David Evans and Associates (DEA) to update the wastewater hydraulic model in order to make updates to the City's Capital Improvement Plan (CIP) for projects related to wastewater system capacity. The model indicates the capacity of Lift Station 15 may be insufficient to meet state requirements within five years. During a recent storm event, Lift Station 15 suffered an overflow event wherein wastewater surcharged a vent pipe and spilled into the dry well after a pump failure. There is also a legacy overflow pipe that could discharge into McAleer Creek in the event of pump failure. This overflow pipe must be abandoned to conform with the EPA and Washington State requirements for elimination of cross connections and sources of illicit discharge. Based on this information, staff identified a priority near-term need to begin conceptual design for Lift Station 15 rehabilitation.

DISCUSSION

In October 2022, staff issued RFQ 10498 for Statements of Qualifications (SOQs) for a consultant team to provide engineering design and other support services to develop the conceptual design for Lift Station 15 rehabilitation. Two qualified consultant teams submitted Statements of Qualifications (SOQs) prior to the November 16, 2022, deadline. The SOQs were evaluated based on approach, experience and expertise, and additional insight of the consultant team, and the DEA team was selected as best-qualified firm for this work.

The contract with DEA is being presented to Council tonight for review and approval. Work on the report is expected to start in February 2023 and is expected to conclude in November 2023.

The scope of work for this contract includes review of existing project-related information, hydraulic modeling and analysis, drafting of a conceptual design report presenting an alternatives analysis of the various options for rehabilitation of the lift station, and presentation of capital cost and life cycle cost estimates for the proposed alternatives. Staff will review results of the alternatives analysis and report to select a preferred approach to rehabilitate the existing lift station to be further developed under design.

If Council authorizes this preliminary design contract with DEA, the immediate next steps would be to begin project activities, including the kickoff meeting and data consolidation. Staff anticipates returning to Council for authorization of a subsequent design contract in the spring of 2024 in the event that the wastewater utility desires to use a different consultant for the final design, or a contract amendment in the event that the utility decides to use DEA, as the scope of work allows.

The alternative to authorizing this contract, which is not recommended, is to not authorize the award of this contract, which would result in either not proceeding with the project or going out for a competitive Request for Qualification for the consultant selection.

COUNCIL GOAL(S) ADDRESSED

This item implements City Council Goal No. 2:

Goal #2: Continue to deliver highly-valued public services through management of the City's infrastructure and stewardship of the natural environment.

RESOURCE/FINANCIAL IMPACT

The City of Shoreline Lift Station 15 Conceptual Design budget is part of the approved capital improvement project for the rehabilitation or replacement of Lift Station 15, as seen in the Capital Improvement Plan model. The subsequent construction effort is estimated to cost between \$2 million and \$3.5 million and will necessitate a separate contract and staff report upon completion of the design efforts.

RECOMMENDATION

Staff recommends that the City Council authorize the City Manager to execute a contract with David Evans & Associates in the amount of \$153,075 for engineering design services for the City of Shoreline Lift Station 15 Conceptual Design.

ATTACHMENTS

Attachment A: Scope of Work



**DAVID EVANS
AND ASSOCIATES INC.**

**SCOPE OF WORK
City of Shoreline Lift Station 15 Conceptual Design
Engineering Services
December 16, 2022**

UNDERSTANDING

The City is the owner and operator of the sanitary sewer system generally within the City right-of-way. The City is the owner and operator of an existing sanitary sewer lift station, Lift Station 15 (LS 15). The City is also the owner and operator of an existing stormwater pump station, Pump Station 26, that is located on the same land parcel as LS 15.

The City is experiencing population growth and changing land use predominantly due to the construction of the Sound Transit light rail improvements taking place parallel to Interstate 5. With the anticipation of two stations opening for service in 2024 within the City's boundary, one just north of NE 145th Street and the other near NE 185th Street, the City has changed the land use zoning in the areas surrounding the new stations. LS 15 is located approximately two blocks east of the new light rail station on NE 185th St. The projected increase in population density will increase flows in the wastewater collection basin tributary to LS 15. LS 15 and its force main will require upgrades to adequately pump the projected peak hourly flow.

This project is part of the planning stage for making the aforementioned improvements. The City has enlisted David Evans and Associates, Inc. to perform an alternatives analysis and create a Conceptual Design Report outlining and analyzing several of the most plausible options for both the lift station and force main upgrades.

The Project Team (Team) and proposed roles are as follows:

- Project Manager: Sam Supowit, PhD, PE, City
- Project Manager: Scott Christensen, PE, DEA
- Lead Engineer: Craig Christensen, PE, DEA
- QA/QC Lead: Rodney Langer, PE, DEA
- Design Engineer: Tucker Collins, PE, DEA
- GIS and CAD Lead: Scott Stcherbinine, DEA
- Construction Cost Estimator: Levi Young, PE, DEA
- Electrical/Power Engineer: RJC Engineering, PLLC

DEA will provide civil engineering design and preparation of a 10 percent Conceptual Design Report (Report) for the rehabilitation of LS 15 and its force main to meet future peak flows. The Report will contain the following information:

- Reference, summary or raw data of the existing project-related information, including the LS 15 service area, projected demands, infiltration and inflow estimates, and the LS 15 and LS 15 force main as-builts.

City of Shoreline Lift Station 15 Conceptual Design - Consultant Engineering Services - Scope of Work

- Reference, summary or raw data from the hydrologic and hydraulic modeling including all existing available models, how they were further developed or updated for the conceptual design, how the models were calibrated using flow monitoring data and rating curve development and a resulting hydraulic analysis for a 20-year buildout plan in the wastewater collection basin served by LS 15.
- A surge analysis for the outfall manhole with the projected flows.
- An alternatives analysis for at least four different approaches to address future capacity deficits, redundancy issues, and existing equipment inadequacies. Alternatives shall include at least the following options:
 - Pump replacement, power, VFD, SCADA, and force main upgrades, as well as the overflow structure abandonment
 - Conversion to a suction lift station and force main upsize
 - Conversion to a submersible lift station and force main upsize
- A Class 4 capital cost estimate for each proposed alternative.
- A feasibility assessment for each alternative, identifying the main hindrances to execution of the project, as well as strategies to address them.
- A non-monetary factors discussion addressing the operation and maintenance burden tradeoffs, along with other non-monetary considerations for each alternative.
- A 20-year net present value (NPV) for each analyzed alternative.
- A scoring matrix to compare the alternatives pros and cons using a weighted numerical method.

The scope of work for DEA is summarized directly below and presented in detail in the following section:

1. Project Management
2. Resources and Documentation
3. Predesign Evaluation
4. Alternatives Analysis
5. Conceptual Design Report

Engineering Services

The following summarizes the scope of work that DEA anticipates under our role of Consultant.

Given DEA's goal of efficient resource use, some meetings will be videoconference/teleconference and all deliverables (memo, letters, reports, RFP, etc.) will be provided electronically through email and cloud repository exchange.

TASK 1. PROJECT MANAGEMENT

DEA will perform project management, services as follows.

1.1. Monitoring and Control

The Project Manager will receive weekly reports of all project activity, and will review progress, schedule, and budget on a monthly basis, concurrent with preparation of monthly invoices and status/progress reports.

1.2. Project Closeout

Work for this task includes internal project closeout procedures for final billing and invoicing and final records review, completion checks and filing. Work for this task also includes confirming delivery of all project deliverables, addressing the successfulness of the project and a closing interview with the City.

Assumptions:

- Duration to complete scope is approximately 11 months (from contract execution to contract end date).

Deliverables:

- Monthly project invoices and progress updates for the duration of the contract.

TASK 2. RESOURCES AND DOCUMENTATION

DEA will perform resource and documentation review tasks as follows:

2.1. Data Acquisition and Review

Work for this task includes collecting, reviewing, and consolidating City-provided and DEA resources, including record drawings for LS 15 and its force main, the LS 15 gravity sewer basin (service area), record drawings for the storm water pump station 26, existing base maps, the most recent geotechnical report for storm water pump station 26, pending developer permit applications, projected wastewater flow demands, infiltration and inflow (I/I) information from City sanitary sewer meters, the comprehensive sewer plan and amendments, and King County Wastewater and GIS data for existing franchise utilities.

2.2. Site Visit

Work for this task includes completing site visit with City personnel to observe existing LS 15 and immediate area. Determine constraints on site, particularly due to recent surface water facility construction and other adjacent uses.

2.3. Survey and Basemap

Work for this task includes a Topographic Survey and supplementation of existing base maps. DEA will request buried utility maps for water, sewer gas, power, and communications facilities in the area of the station. The survey and utility locations will be used to prepare a basemap with surface contours and features, as well as profile sheets showing general location of known active or abandoned in place buried utilities on site.

2.4. Power Requirements

Work for this task includes determining the electrical power requirements for an upgraded

City of Shoreline Lift Station 15 Conceptual Design - Consultant Engineering Services - Scope of Work

Lift Station 15, as well as stormwater Pump Station 26, priority of use, restrictions, and clearance issues. Work for this task also includes a comparison of the following options: (1) split the generator duty between Lift Station 15 and Pump Station 26, giving priority to Lift Station 15; (2) provide a generator of sufficient capacity to simultaneously support Lift Station 15 and Pump Station 26 in the event of a power outage. This task shall necessitate evaluating the power demands for both stations and recommending a genset option with sufficient capacity for each alternative listed above.

Assumptions:

- The LS 15 site was surveyed within the last few years for the City's Pump Station 26 rehabilitation project. A partial base map from that project will be provided in AutoCAD *.dwg format by the City for use by DEA on this project.
- The above-referenced partial basemap will be supplemented by survey work performed by DEA for preparation of a topographic basemap.
- City to provide coordination and assistance regarding site access and access to facilities.

Deliverables:

- None. Information retrieved from the work in this task to be included in other deliverables.

TASK 3. PREDESIGN EVALUATION

DEA will perform the following tasks as part of the predesign evaluation.

3.1. Capacity Estimate

Work for this task includes calibrating the hydraulic model using existing flow meter data and rating curve analysis, then reviewing and confirming estimated peak hour wastewater flow (sanitary and I/I) and providing hydraulic analysis based on City design criteria for existing and 20-year forecast tributary basins. The capacity estimate will be used in subtasks 3.4 and 4.1 to generate alternatives for pump and force main sizing as well as genset power requirements.

3.2. Site Evaluation

Work for this task includes: evaluation of the LS 15 site and current structures (wet well/dry well and generator vault) for adequacy of future pumps; evaluation of the existing controls and standby power equipment; evaluation of the existing force main capacity to meet projected demand; surge analysis for the receiving structure using projected demand; and evaluation of downstream gravity sewer line capacity.

3.3. Conceptual Plan

This task involves preparing conceptual site plans with vertical sections to document and summarize findings of research, field observations, and mapping, with supporting summary of flow and capacity estimates.

Assumptions:

- No geotechnical report for the LS 15 site or force main will be necessary for this

City of Shoreline Lift Station 15 Conceptual Design - Consultant Engineering Services - Scope of Work

project, as an existing geotechnical report for the same site is available from the stormwater Pump Station 26 rehabilitation project records. No geotechnical report for the force main will be necessary for this stage of the project. The City will provide copies of available geotechnical analyses in the project area.

- Peak hour flow capacity for LS 15 will be based on the current City land use plan and maximum development density by land use designation for wastewater flows, with diurnal peaking factor as evident in City flow monitoring records for dry weather flows, and peak hour I/I based on I/I design criteria developed from City and King County flow monitoring records. It is assumed the City will concur with the basis for the flow predictions/estimates.

Deliverables:

- None. Production from work in this task to be included in other deliverables.

TASK 4. ALTERNATIVES PREPARATION

DEA will perform the following tasks as part of the Alternatives Preparation.

4.1. Lift Station Alternatives

Work for this task includes preparing at least four approaches to address future LS 15 capacity, redundancy, site, and equipment inadequacies (current or forecast). Work for this task also includes analyzing each of the following alternatives and up to one additional alternative identified in meetings with the City. Each alternative will consider replacement of pumps, valves, piping, power, and control equipment including variable frequency drive (VFD) and SCADA equipment abandonment. If one or more of the existing confined-space-entry (CSE) structures are retained, the analysis will identify air monitoring options in support of OSHA-compliant CSE protocols.

4.1.1. Wet well/dry well with electrical equipment below grade (i.e., retain existing configuration)

4.1.2. Wet well/dry well with electrical equipment above grade in a fabricated electrical enclosure

4.1.3. Conversion to suction lift configuration (e.g., wet-well mounted equipment) with electrical equipment above grade in a fabricated electrical enclosure

4.1.4. Conversion to submersible lift station with new wet well and valve vault and with electrical equipment above grade in a fabricated electrical enclosure

Work for this task also includes conceptual design of the electrical work. Electrical design will consider two configurations, one above grade and one below grade in the existing vault. The above grade configuration will consider the potential need for extraordinary sound enclosure in addition to the factory enclosure.

Work for this task also includes determining the requirements to address the current overflow pipe that discharges to the Interstate 5 drainage system and ultimately McAleer Creek.

4.2. Force Main Alternatives

Work for this task includes preparing at least two approaches to address future LS 15 force main capacity inadequacies (current or forecast). Work for this task also includes analyzing each of the following alternatives and up to one additional alternative identified in meetings with the City. The primary considerations in this analysis will be capital cost and constructability.

4.2.1. Replace the sanitary sewer force main concurrently with the existing stormwater Pump Station 26 force main along 10th Ave NE.

4.2.2 Replace the sanitary sewer force main separately from the stormwater Pump Station 26 force main along 10th Ave NE with the stormwater force main being replaced within one year of the sanitary sewer force main replacement.

Assumptions:

- None.

Deliverables:

- Technical memo outlining all considered alternative configurations for the lift station and force main. The memo will contain CAD drawings and a summary of the key features of each alternative.

TASK 5. ALTERNATIVES ANALYSIS

DEA will perform the following tasks as part of the Alternatives Analysis.

5.1. Alternatives Analysis

Work for this task includes preparation of AACE Class 4 Engineer Opinion of Probable Construction Cost (OPCC) for each alternative. Work for this task also includes evaluating the feasibility, identifying the hinderances and preparing avoidance strategies. DEA will analyze the constructability of each alternative on the existing site and the need for temporary power, control and pumping systems. Options for expanding the footprint of Lift Station 15 will also be considered and proposed if viable. Work for this task also includes addressing non-monetary factors related to operation and maintenance tradeoffs and other possible non-monetary issues, including visual impact on the local community. DEA will prepare a 20-year net present value (NPV) estimate for each alternative configuration for the City's consideration.

5.2. Scoring Matrix

Work for this task includes preparing a scoring matrix that compares alternatives using a weighted numerical method. The evaluation criteria will include, but not be limited to, the following: capital cost, life cycle cost, aesthetics, O&M burden, permitting requirements, footprint impacts, environmental impacts, etc.

Assumptions:

- Space is available at the existing site or immediately adjacent City-owned property or right-of-way, outside the improved roadway section, for the alternatives to be evaluated.

City of Shoreline Lift Station 15 Conceptual Design - Consultant Engineering Services - Scope of Work

Deliverables:

- None. Production from work in this task to be included in other deliverables.

TASK 6. CONCEPTUAL DESIGN REPORT

DEA will prepare draft and final versions of a 10 percent Conceptual Design Report (CDR) synthesizing the analysis, findings, and recommendations for the upgrades or rehabilitation of LS 15, the force main, receiving structure, and downstream gravity lines. The CDR will include summary of hydraulic model updates, peak hour capacity determination, force main analysis, force main alternatives with capital costs, CAD drawings of the proposed site plans for the various alternatives, alternatives analysis with capital cost estimates, NPVs, and presentation of alternatives in a matrix ranking each according to scoring rubric, and supporting memo from electrical subconsultant.

Assumptions:

- None.

Deliverables:

- Draft 10 percent Conceptual Design Report
- Final 10 percent Conceptual Design Report

SCHEDULE

The estimated schedule is outlined below:

February 1, 2023	Assumed date of City of Shoreline notice to proceed
March 1, 2023	Begin hydraulic calculations, alternatives evaluation, reviews with City
June 15, 2023	Final review of alternatives with City of Shoreline
July 15, 2023	Adjust final alternatives as required
October 15, 2023	Complete Conceptual Plan
November 1, 2023	Present to City of Shoreline Staff
December 31, 2023	Present Final Conceptual Plan to City of Shoreline

City of Shoreline Lift Station 15 Conceptual Design - Consultant Engineering Services - Scope of Work

BUDGET

For the scope of work outlined above, DEA proposes the following not-to-exceed fee:

		BUDGET
TASK 1.	PROJECT MANAGEMENT	\$8,800.00
TASK 2.	RESOURCES AND DOCUMENTATION	\$23,880.00
TASK 3.	PREDESIGN EVALUATION	\$49,675.00
TASK 4.	ALTERNATIVES PREPARATION	\$35,380.00
TASK 5.	ALTERNATIVES ANALYSIS	\$21,200.00
TASK 6.	CONCEPTUAL DESIGN REPORT	\$12,560.00
Expenses		\$1,500
TOTAL NOT-TO-EXCEED FEE		\$153,075.00

(Expenses include costs for mileage including but not limited to survey, site visits, and meetings and include cost for reproduction of materials including but not limited to plans, specifications, and figures.)

Encl: Consultant Civil Engineering Design Services Fee Estimate (1 page)



Project Fee Estimate
The City of Shoreline Lift Station 15 Conceptual Design
David Evans and Associates, Inc. Estimated Labor Consultant Engineering Services

Project Ref:	NA
Date:	12/16/2022
Prepared By:	THCO / SXCH

Task/Subtask (1)		Estimate of Effort											Labor										
		Personnel Positions and Est. Hours											Total Hours	Total Est. Fee									
		Project Manager	Project Engineer	Design Engineer	CAD/GIS Technician	Admin. Assistant	Survey Manager	Prof. Land Surveyor	Survey Technician II	Survey Technician I	Two Person Field	RJC Engineering, PLLC (EE)											
\$	240.00	\$	170.00	\$	140.00	\$	135.00	\$	100.00	\$	210.00	\$	180.00	\$	110.00	\$	100.00	\$	220.00	\$	192.50		
1	Project Management	20	8	8	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	\$8,880.00
	1.1 Monitoring and Control	16	8	8		12																44	\$7,520.00
	1.2 Project Closeout	4				4																8	\$1,360.00
2	Resources and Documentation	18	24	26	8	0	6	8	8	8	8	8	8	8	8	8	8	8	8	8	24	138	\$23,880.00
	2.1 Data Acquisition and Review	8	12	18																		38	\$6,480.00
	2.2 Site Visit	8	8																			22	\$4,435.00
	2.3 Survey and Basemap	2	4	8	8		6	8	8	8	8	8	8	8	8	8	8	8	8	8	6	60	\$9,500.00
	2.4 Power Requirements																					18	\$3,465.00
3	Pre-design Evaluation	56	76	112	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	298	\$49,675.00	
	3.1 Capacity Estimate	24	32	40	16																	112	\$18,960.00
	3.2 Site Evaluation	24	32	40																		96	\$16,800.00
	3.3 Conceptual Plan	8	12	32	32																	84	\$12,760.00
4	Alternatives Preparation	28	38	48	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	198	\$35,380.00	
	4.1 Lift Station Alternatives	24	32	40	6																	48	\$26,850.00
	4.2 Force Main Alternatives	4	6	8	6																	24	\$8,530.00
5	Alternatives Analysis	32	40	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120	\$21,200.00
	5.1 Alternatives Analysis	24	32	40																		96	\$16,800.00
	5.2 Scoring Matrix	8	8	8																		24	\$4,400.00
6	Conceptual Design Report	16	16	16	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	\$12,560.00
	6.1 Conceptual Design Report	16	16	16	16	16																80	\$12,560.00
	Total	170	202	258	84	32	6	8	8	8	8	8	8	8	8	8	8	8	8	102	806	\$151,575.00	

Estimated Direct Expenses	
Mileage and Reproduction	\$1,500
Total	\$1,500

Project Fee Estimate Summary and Total	
Total Estimated Labor	\$151,575.00
Total Estimated Expenses	\$1,500.00
Total Fee Estimate	\$153,075.00

Notes and Assumptions:

- (1) See detailed Scope of Work dated December 16, 2022
- (2) Hours and Rates shown are approximate, actual hours and rates will be based on assigned staffing and may decrease or increase. However, DEA will not exceed the Total Fee Estimate without the client's written authorization.
- (3) The DEA project manager may transfer budget between tasks or from estimated expenses to labor and vice versa, as the project manager may determine as appropriate. Work will be billed on a time and expense basis, subject to the limit of the not-to-exceed Total Fee Estimate value. DEA shall communicate in writing to the City PM the decision to transfer funds between tasks prior to doing so.
- (4) Client shall be responsible for direct payment of all permit, agency review, advertisement, service or other project expenses not expressly included in the Project Fee Estimate and/or Scope of Work.