INFORMATIONAL MEMORANDUM

TO: **Transportation and Infrastructure Services Committee**
FROM: **Pete Mayer, Interim Public Works Director**
BY: **Adam Cox, Transportation Program Manager**
CC: **Mayor Thomas McLeod**
DATE: **February 21, 2025**
SUBJECT: **42nd Ave South Bridge Replacement Project- Supplement Agreement No. 5**
Project No. 91810404
Contract No. 20-116, Supplement No. 5

ISSUE

Approve Supplemental Agreement No. 5, Contract No. 20-116 with David Evans and Associates, Inc. (DEA) for the 42nd Avenue South Bridge Replacement Project.

BACKGROUND

In September 2024, Tukwila's consultant informed the City that a supplement would be needed to account for the remaining design/permitting work in the amount of $1,386,694.00. The project has faced several unexpected hurdles including permitting delays, navigating culturally sensitive areas, utility coordination, and accounting for complex site conditions. These hurdles have resulted in additional coordination, consultation, and costs.

In August 2024, TranTech, LLC., the designer of record for the 42nd Ave S Bridge, announced they were being acquired by David Evans & Associates, Inc. Project staff were informed the indirect cost recovery (ICR) rate would increase once the merger occurred, and the City is now processing the supplement to include this change. Since there is still a balance in the budget for the existing contract, work has continued to date.

ANALYSIS

This supplement will cover the remaining design and permitting work. Demolition of the existing bridge is scheduled to begin in Spring 2027, and we expect the new bridge to be open to the public in late 2029. Final design and permitting of the 42nd Ave S Bridge have been delayed, resulting in delayed construction. Some of the delays are a result of design timeline extensions, unexpected geological conditions, complex environmental, historical, and cultural requirements, 2-D hydrology analysis requirement, customized architectural components, the discovery of different utility conditions and associated coordination, navigating challenging constructability conditions, in-water work window constraints, and more associated civil/ stormwater and structural design, including additional walls and utility bridge requirements. In sum, this project has faced many hurdles, primarily related to permitting delays and culturally sensitive areas, requiring additional coordination with the Washington State Department of Transportation, the Department of Archeological and Historic Preservation, the Washington Department of Fish and Wildlife, the Washington Department of Natural Resources, and Tribes, among others. The 42nd Ave S Bridge replacement project is currently at 90% Plans and Estimate.

FISCAL IMPACT

The contract for Supplement Agreement No. 5 is to bring the 90% Plan and Estimate (P&E) to 100% Plans Specs & Estimate design in the amount of $1,386,694. The City is using funding from our Move Ahead Washington (MAWA) grant to cover the Supplement Number 5 costs. Supplement 1 expanded the scope of work from 30% plans and estimate to 100% bid-ready plan set, Supplement 2 provided a time extension, Supplement Number 3 accounted for a change in subconsultant, and Supplement Number 4 accounted for the merge of TranTech, LLC to David Evans and Associates (DEA). DEA's scope of work and cost estimate for Supplement 5 are attached.

	Contract Estimate		Funding Sources
Original Contract	$1,078,487	City Funding	$1,106,661
Supplement No. 1	$1,528,174	Puget Sound Regional Council (PSRC) Grant	$1,500,000
Supplement No. 2	$0		
Supplement No. 3	$0		
Supplement No. 4	$0		
Supplement No. 5	$1,386,694	Move Ahead WA Grant	$1,386,694
Total	$3,993,355	Total	$3,993,355

RECOMMENDATION

Council is being asked to approve supplemental agreement No. 5 for design services with David Evans and Associates, Inc. in the amount of $1,386,694 for the 42nd Ave S Bridge Replacement Project and consider this item on the Consent Agenda at the March 03, 2025 Regular Meeting.

Attachments: 42nd Ave S CIP Page
Supplemental Scope of Work and Budget

CITY OF TUKWILA CAPITAL PROJECT SUMMARY
2025 to 2030

PROJECT: **42nd Ave S Bridge Replacement** **Project #** 91810404

Project Manager Adam Cox **Department** Arterial Streets

DESCRIPTION: Design and construct a replacement structure for the existing 42nd Ave S Bridge adjacent to the Tukwila Community Center.

JUSTIFICATION: The current bridge has been restricted to one lane for southbound traffic due to the bridge being struck by an over height truck. The current through truss bridge is fracture critical, structural deficient, and has lasted longer than its deign life.

STATUS: The project is currently in the design phase, with 90% design complete. Project construction is anticipated to begin in early 2027 and be complete by end of 2028.

MAINTENANCE IMPACT: Streets crews will be responsible to sweep the bridge and maintain any vegetation that is planted.

COMMENT: The City has secured project costs through multiple grants- $1.5M in Surface Transportation Program funding (13.5% match), $12M in Local Bridge Programs funding (no match), and $17M in Move Ahead Washington funding (no match).

FINANCIAL (in thousands)	2025	2026	2027	2028	2029	2030	Beyond	TOTAL
Project Costs								
Project Mgmt (Staff Time/Cost)	$ 100	$ 100	$ 100	$ 50	$ -	$ -	$ -	$ 350
Design	$ 200	$ 500	$ 50	$ 50	$ -	$ -	$ -	$ 800
Land (R/W)	$ -	$ -	$ 100	$ -	$ -	$ -	$ -	$ 100
Construction Mgmt.	$ -	$ -	$ 1,500	$ 1,500	$ -	$ -	$ -	$ 3,000
Construction	$ -	$ -	$ 15,000	$ 15,000	$ -	$ -	$ -	$ 30,000
Contingency	$ -	$ -	$ 1,000	$ 1,000	$ -	$ -	$ -	$ 2,000
Total Project Costs	**$ 300**	**$ 600**	**$ 17,750**	**$ 17,600**	**$ -**	**$ -**	**$ -**	**$ 36,250**
Project Funding								
Awarded Grant	$ 200	$ 500	$ 16,500	$ 14,650	$ -	$ -	$ -	$ 31,850
Proposed Grant	$ -	$ -	$ 1,150	$ 2,950	$ -	$ -	$ -	$ 4,100
Fund Balance	$ 100	$ 100	$ 100	$ -	$ -	$ -	$ -	$ 300
Total Project Funding	**$ 300**	**$ 600**	**$ 17,750**	**$ 17,600**	**$ -**	**$ -**	**$ -**	**$ 36,250**

Supplement No. 5 - Prime Consultant Cost Computations Summary

City of Tukwila 42nd Ave S Bridge Replacement

DEA TEAM BUDGET BREAKDOWN

TranTech	**$**	**803,573**
1 Alliance	**$**	**13,785**
Facet	**$**	**90,871**
HWA Geosciences	**$**	**79,922**
Landau	**$**	**104,062**
Ott-Sakai	**$**	**59,680**
Transpo	**$**	**53,084**
Natural Waters	**$**	**55,654**
TOTAL PROJECT BUDGET	**$**	**1,260,631**
MANAGEMENT RESERVE (MR) @ 10%	**$**	**126,063**
TOTAL PROJECT BUDGET + MR	**$**	**1,386,694**

Supplement No. 5 – Exhibit A
Scope of Work

CITY OF TUKWILA 42ND AVE S BRIDGE REPLACEMENT

INTRODUCTION

Under the *42nd Ave S Bridge Replacement* project, the City of Tukwila (City) has requested that David Evans & Associates' team (Consultant) prepare a supplement to provide professional services to perform work not included within the original Scope of Services and Construction Phase Engineering and Construction Management Services.

Additional design phase services are provided by Consultant and Consultant's team members, [geotechnical, environmental, hydraulics, bridge aesthetics and landscape architecture, traffic engineering, and constructability], under **Work Elements 1, 2, 3, 4, 5, 6, 7, 8, 10 and 12** of Supplement 4 of the contract**.** Work elements consisted of additional project management, additional survey, geotechnical, environmental, aesthetics, utility coordination, traffic signal, civil and structural design services. These additional services are necessary as the result of design timeline extensions, more challenging than expected geological conditions, complex environmental, historical, and community requirements, 2-D hydrology analysis requirement, customized architectural components, the discovery of different utility conditions and associated coordination, challenging constructability conditions, and more associated civil/ storm and structural design, including additional walls and utility bridge requirements. These design revisions require additional coordination and preparation of 90%, 100%, and Bid-Ready plans, estimates, and specifications for an additional submittal, additional plan, estimate, and specifications.

In the following, the additional scope of work is described in further detail.

ADDITIONAL DESIGN PHASE SCOPE OF SERVICES

The additional Scope of Services described below are the work elements to be accomplished by the Consultant as summarized under each Task. This scope consists of the following elements:

(The task numbers below correspond to the original Scope of Services.)

Work Element 1 – Project Management (Supplemented)
Work Element 2 – Surveying and Right-Of-Way (Supplemented)
Work Element 3 – Geotechnical Engineering (Supplemented)
Work Element 4 – Environmental Permitting (Supplemented)

Work Element 5 – Bridge Aesthetics and Landscape Architecture (Supplemented)
Work Element 6 – Utility Coordination (Supplemented)
Work Element 7 – Constructability Review, Construction Schedule & Estimation (Supplemented)
Work Element 8 – Traffic Control and Traffic Signal (Supplemented)
Work Element 10 – Hydraulics and Hydrology (Supplemented)
Work Element 12 – PS&E (Supplemented)

The extra services are identified in the detailed Scope of Services below.

SCOPE OF SERVICES DEFINED

Task 1 – Project Management (Supplemented)

This task includes project administration, meeting coordination, and design team management.

Work Elements:

- Consultant Team Meetings – approximately ninety-six (96) additional team meetings are assumed for the additional design services.
- Monthly Progress Reports and Invoicing – approximately forty-eight (48) progress reports containing a narrative that identifies and describes significant activities performed in the previous month.
- Design Team Management – below is a list of continued tasks to be provided for the duration of the additional design:
    - Schedule and coordinate with the design team.
    - Prepare sub-consultant agreements, coordinate, budget, and review the project progress and submittals.
    - Monitor project budget.
    - Maintain regular informal contact telephone discussions and electronic mail.

Deliverables:

- Progress reports
- Monthly invoices
- Project schedule

WORK ELEMENT 2 SURVEYING AND RIGHT-OF-WAY (Supplemented)

This Work Element is performed by 1 Alliance to provide survey control for bathymetry, done by others, for the purpose of updating the existing basemap to include the Duwamish River for design purposes.

Please see Exhibit A, Surveying Limits.

Surveying

2.1 Survey PM, Admin, QA/QC

This task includes the survey project management, administrative duties, and quality control required for a project of this complexity and magnitude.

2.2 Survey Control

This task includes the establishment of survey control, or the recovery of existing survey control, as required for the project. Survey control will be set, found, or referenced utilizing Real Time Kinematic (RTK) GPS (GNSS) and the Washington State Reference Network (WSRN) in conformance with industry standards. This survey control is then propagated, as required, utilizing standard terrestrial total station measurements.

2.2.1. Geodetic Survey Control

- Survey work shall reference the Washington State Plane Coordinate System of 1983 as established in accordance with Chapter 58.20 Revised Code of Washington.
- Vertical Datum shall reference the North American Vertical Datum of 1988 (NAVD88).

2.3 Field Mapping

This task includes the field surveying and mapping required for this specific effort. 1 Alliance will survey using traditional Total Station and GPS technologies to collect the data for use in the creation of a basemap. All found features will be located withing the mapping limits. Trees greater than 6" DBH and/or landscaped trees will be located and will be identified as either evergreen or deciduous. Mapping will extend across the full width of the existing Right-of-Way. Please see Exhibit A, Surveying Limits, for specific mapping limits

2.4 Utility Surveying

Surface Observable utilities will be located as found within the surveying limits. Measure Downs for sewer manholes, catch basins and storm drain manholes with pipe size, material, direction, and invert elevations will be obtained, if possible, at each structure. Nearest drainage structure outside the mapping limits will also be collected. The lowest line of overhead utilities to be located on the pole face and, if possible, a point in or near the middle.
Underground Conductible Utility Locates will be mapped.

2.5 Office Processing

This task includes the office processing of the collected survey data, data extraction, field book note reductions, CADD drafting, and other duties required for the generation of the deliverable(s).

Assumptions:

- Rights-of-Entry will be provided by the AGENCY.
- Traffic control, if required, will be a uniformed officer and billed as an invoiced ODC.
- Tree Tags, driplines/canopies are not a part of the scope services.
- Setting of property corners is not a part of the scope of services.
- A record of Survey is not a part of the scope of services.
- Right-of-Way and boundary resolution is not a part of the scope of services.
- A private utility locating firm will be utilized by 1 Alliance. This will include Ground Penetrating Radar (GPR).

Deliverables:

- Updated topographic Survey with 1-foot contour intervals (electronic copy).
- Updated AutoCAD Surfaces (DTM Files) (electronic copy).
- ASCII file of control points, if requested.

WORK ELEMENT 3 GEOTECHNICAL ENGINEERING (Supplemented)

This Work Element, performed by HWA Geosciences Inc. (HWA) is supplemented to provide geotechnical engineering services.

Supplemental Geotechnical Investigation

HWA will conduct a supplemental geotechnical field investigation program. The following tasks will be included in the program:

- Develop a Geotechnical Subsurface Exploration Plan that identifies the type, location, and extent of proposed field explorations. This plan will also be used to assist in development of traffic control plans.
- Prior to beginning the field exploration program, HWA will mark the proposed exploration locations and arrange for public utility locates using the Washington State Utility Notification Center.
- Because explorations will be located within the travel lanes or shoulders of publicly owned streets, HWA will coordinate with the City of Tukwila to obtain right-of-way/traffic control permits. HWA will coordinate a traffic control subcontractor to provide appropriate traffic control personnel and devices when working within public right-of-way.
- HWA will complete four exploratory cone penetrometer test (CPT) soundings to provide supplemental information for use in evaluating lateral loads and design of ground improvement (by contractor). Two CPT soundings will be located near the north bridge approach and two CPT soundings will be located near the south bridge approach. CPT soundings will be completed by a CPT contractor under subcontract to HWA. HWA's subcontractor will provide a report summarizing the results of the CPT soundings.
- Upon completion, CPT soundings will be backfilled in accordance with Department of Ecology requirements and pavement surfaces will be patched with fast-setting concrete.

Supplemental Geotechnical Engineering Analyses and Reporting

Information from HWA's field investigations, and those previously completed by Landau will be analyzed by a geotechnical engineer from HWA to develop geotechnical engineering conclusions, recommendations, and specifications for design and construction of the proposed improvements. HWA will also discuss the potential need for DSM near Piers 1 and 2 after attempting to refine the lateral earth pressures near the south bridge abutment. HWA's field explorations, engineering analyses, and geotechnical conclusions and recommendations will be summarized in a draft geotechnical report. The draft geotechnical report will include the following:

A site vicinity map and site plans identifying the approximate locations of the explorations completed by HWA and Landau.

The report, prepared by HWA's subcontractor, documenting the results of the CPT soundings.

Logs of explorations and laboratory testing previously completed by Landau.

A cross section along the bridge alignment that shows the anticipated geologic conditions under and along the banks of the river.

A discussion of near surface soil and groundwater conditions observed along the project alignment.

An evaluation of the liquefaction and lateral spreading hazards along the project alignment.

Seismic design criteria in accordance with the American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications.

Geotechnical recommendations for the design of deep foundations for the proposed replacement bridge as well as temporary foundation support for the existing bridge, which will be used as a temporary bridge during construction of the replacement bridge. The recommendations will include estimates of the following: tip elevation, axial resistance, downdrag loads and loss of side resistance during seismic loading, uplift resistance, lateral shaft analysis, and construction considerations.

Lateral earth pressure criteria for design of proposed bridge abutment walls and permanent retaining walls, including equivalent fluid densities for the active, at-rest, and passive states of stress.

Updated recommendations related to earth pressures acting on retaining walls and bridge piers that will retain DSM-improved soil.

Updated lateral spreading loads acting on Pier 1, developed using limit equilibrium analyses.

If needed, recommendations related to the potential for ground improvement near the location of Pier 1, should the limit equilibrium analysis indicate that further reduction of lateral loads are required.

Recommendations related to mechanically stabilized earth (MSE) walls along the Green River Trail, which crosses beneath the southernmost bridge span.

Recommendations related to stormwater infiltration along the project alignment.

Recommendations related to design of flexible pavements.

Recommendations for design and construction of signal standard foundations at the intersection of S 115th St and E Marginal Way S.

Recommendations for shallow foundation support, including subgrade preparation, allowable soil bearing pressures, estimates of settlement, and soil parameters for lateral load resistance (for use during design of proposed gateway structure).

Recommendations for monitoring and testing during construction.

An appendix containing recommended specifications for construction of DSM ground improvement at the north bridge approach.

After receipt and review of consolidated review comments from the design team, a stamped final geotechnical report will be prepared.

ASSUMPTIONS

HWA made the following assumptions when preparing this scope of services and cost estimate:

All field tasks will be performed within or adjacent to City right-of-way. The City will issue HWA a no cost right-of-way permit.

If it is necessary to perform field tasks outside of City right-of-way, access permission will be obtained by others at no cost to HWA.

Due to the significance of 42nd Avenue S for freight traffic, it has been assumed that the proposed CPT soundings will need to be completed as night work on weekdays. HWA has assumed at least 8 hours per night will be available for on-street work.

The geotechnical field investigation will be completed under one mobilization.

The project area is assumed to be free of contamination.

Traffic control and flagging, in the form of a temporary 1-lane closure, will be required for the proposed CPT soundings. HWA will be responsible for preparing Traffic Control Plans (TCP). TCPs will be developed in accordance with WSDOT standard TCPs. TCPs will be submitted to the City of Tukwila for approval and permitting.

Traffic control will require closing the 42nd Avenue South bridge for one night.

Due to proximity to the signalized intersection of 42nd Avenue South and Interurban Avenue S, a uniformed police officer will be required during explorations in the vicinity of the south bridge approach.

Utility locates, completed via the Washington Utility Locate Center, will be comprehensive and accurate enough to allow for reliable and safe location of CPT soundings.

The City of Tukwila will allow the pavement at the CPT sounding locations to be patched with fast-setting concrete.

Portland cement concrete pavement is not present below the asphalt concrete pavement at the proposed CPT sounding locations (i.e., no concrete coring will be required).

Groundwater levels at the time of the CPT soundings will be estimated based on the CPT information that is collected.

Upon completion of each CPT sounding, the soundings will be decommissioned in accordance with the requirements of WAC 173-160.

Seismic design of the MSE wall proposed along the Green River Trail might not be practical because it will likely be subject to liquefaction and relatively large lateral spreading loads during the design seismic event. As such, it is assumed that seismic design of the proposed MSE wall will not be required. If seismic design is required, an alternative wall type will need to be considered. A budget amendment will be required for evaluation of alternative wall types.

If the results of the additional geotechnical analyses proposed herein do not sufficiently reduce the estimated lateral loads on Pier 1, more advanced analysis techniques (e.g., Newmark's sliding block analysis, site response analysis, etc.) could be performed to further refine the estimate of lateral loads. If more advanced analysis techniques are determined to be needed, a budget amendment will be required. It will be feasible to utilize existing geotechnical information contained in HWA's library in developing recommendations for the proposed signal standard foundations.

Up to 16 hours has been budgeted for a Senior Geotechnical Engineer to attend virtual meetings with the design team.

WORK ELEMENT 4 ENVIRONMENTAL PERMITTING (Supplemented)

This Work Element, performed by LAI Associates, Inc., (LAI) is supplemented to provide environmental permitting documentation support for the National Environmental Policy Act (NEPA), the State Environmental Policy Act (SEPA), and local permits/approvals. Federal funding is anticipated to be administered through WSDOT Local Programs. LAI therefore assumes that the WSDOT will be the lead coordinator for NEPA. For the purposes of this Scope of Services, LAI assumes that this project can be authorized under a NEPA Categorical Exclusion (CE). The necessary work elements associated with Environmental Permitting are assumed to be:

4.3 Team and Agency Meetings

LAI will assist in scheduling and participate in meetings, as needed, with the AGENCY, Washington State Department of Transportation (WSDOT), US Army Corps of Engineers (USACE), Washington Department of Natural Resources, and Washington Department of Fish & Wildlife (WDFW) to coordinate permit conditions for the project. This task includes bi-weekly team meetings with the City and Consultant team.

4.6 Cultural Resources

LAI will obtain the services of a qualified cultural/historic resources subconsultant to support historic resources mitigation in compliance with Section 106 of the National Historic Preservation Act (NHPA). The qualified cultural/historic resources subconsultant will assist in preparing project correspondence regarding proposed Section 106 NHPA mitigation that will be incorporated into a Memorandum of Agreement (MOA) between the City, WSDOT Local Programs, Washington Department of Archaeology and Historic Preservation, and affected Tribes. Upon execution of the MOA, the subconsultant will develop the required mitigation documents. LAI will provide support in revising subconsultant documents for consistency with project application materials and agency coordination..

4.7 Section 4(f) Documentation

If required, LAI will support the City in developing the WSDOT Section 4(f) matrix that will determine the content of an Individual Section 4(f) Review report. The matrix will present an overview of project purpose and need, Section 4(f) resources, and a least harm analysis.

Following WSDOT concurrence on the contents of the Section 4(f) matrix, Landau will prepare a Draft Individual Section 4(f) Review report following the WSDOT provided outline to include:

- Introduction
- Proposed Project
- Purpose and Need
- Description of 4(f) Properties
- Alternatives Analyzed (including No Build)
- Avoidance Alternatives
- Least Harm
- Measures to Minimize Harm
- Coordination

An electronic-only (MSWord) copy of the draft report will be submitted to Consultant/DEA and the City for review. Based on Consultant/City comments, LAI will revise the draft and prepare a pdf of the draft report for WSDOT review and coordination. LAI will prepare a final report following receipt of comments from WSDOT and consulting agencies. This task includes support with agency coordination to obtain information necessary for project concurrence.

4.12 Bidding Services

This task includes effort by LAI to provide support during bidding services and is limited to response to questions regarding permit conditions.

Work Element 4 Assumptions:

- Team and agency meetings will occur through 2026.
- WSDOT Local Programs will prepare the Section 106 NHPA MOA.
- The determination on adverse impacts to historic resources has not been confirmed and this task includes a not to exceed fee for mitigation documentation. A supplement may be required upon determination of mitigation required in accordance with the Section 106 NHPA MOA.
- Consultant will provide support in providing engineering justification for reasonable and feasible project alternatives.
- No more than two project avoidance alternatives will be evaluated.
- This task includes support in developing at least two iterations of the Section 4(f) matrix.
- The determination on adverse impacts to all Section 4(f) resources in the project area has not been confirmed. This task includes a not to exceed fee for documentation in support of Individual Section 4(f) review.
- This task includes a limited not to exceed fee for bidding support. A supplement may be required depending on the extent of support requested during bidding.

Work Element 4 Deliverables:

- Meeting participation and correspondence.
- Section 106 NHPA mitigation documentation
- WSDOT Section 4(f) matrix in Excel format.
- An electronic-only (MSWord) copy of the draft Individual Section 4(f) Evaluation Report.
- An electronic-only (Adobe Acrobat pdf) copy of the draft Individual Section 4(f) Evaluation Report.
- An electronic-only (Adobe Acrobat pdf) copy of the final Individual Section 4(f) Evaluation Report.
- Bidding services correspondence as requested.

WORK ELEMENT 5 BRIDGE AESTHETICS AND LANDSCAPE ARCHITECTURE (Supplemented)

This Work Element is performed by Makers Architecture and Urban Design, LLP (MAKERS), and a landscape architect subconsultant, (LAS) and is supplemented to provide Bridge Aesthetics, Landscaping design, Arborist Services, and Gateway Design. The following describes Amendment 04 for this work between CONSULTANT and Facet (formerly DCG/Watershed,) as a landscape architect subconsultant (hereafter referred to as LAS) to Makers Architecture and Urban Design (SUBCONSULTANT).

Amendment 04 Scope Summary:
Amendment 04 includes services to be completed to advance Bridge Aesthetics and Landscape Architecture, Arborist Services, and Gateway Design to 100% design. The original project rates from 2021 are renegotiated with an anticipated completion of scope in 2026. Scope items remaining from the agreement dated 3/13/2023, which includes 100% plans, specifications, and estimate for Bridge Aesthetics and Landscape Architecture, will be completed per the rates noted in this agreement.

Elements included in Amendment 04 include:

1. Updated rates for Work Element 5, Bridge Aesthetics and Landscape Architecture
2. Arborist Services
3. 100% Gateway Design

Work Element 5. Bridge Aesthetics and Landscape Architecture
Completion of Work Element 5 scope outlined in the agreement dated 3/13/2023 using new negotiated rates.

A04.1. Tree Inventory, Impacts Assessment and Reporting

a. Inventory all significant trees (per TMC 18.06.775) located within the expanded project (APE) area that were not inventoried as a part of Amendment 2 scope. Trees will be tagged with a 1-1/4" aluminum tag with a unique identification number on the trunk. Attribute information to be collected will include species, general tree health, diameter at breast height (DBH), canopy radius (i.e. drip line) and height.

All trees will be visually assessed using current Level 1 ISA standards to evaluate current condition.

b. Trees will be identified on an annotated PDF tree sketch and attributes will be provided on a summary table.
c. 100% site plans will be reviewed to assess anticipated impacts to individual trees and determine which trees will likely require removal.
d. The results of the additional tree inventory and impacts assessment will be included as an update to the arborist report, or as a report addendum, provided as a part of Amendment 2 scope.
e. Revise Arborist Report, Tree Retention and Removal Plan, and Tree Replacement Plan per 100% site plan revisions.

Assumptions:

- Level II or Level III arborist assessment is not included.
- Access permission for the subject properties will be obtained by Consultant.
- AutoCAD file of the site survey and 100% site plan will be provided to complete tree impacts and removal assessment and preparation of plans.
- Final Arborist Report, Tree Retention and Removal Plan, and Tree Replacement Plan are based upon 100% site plan including any plan revisions made in response to draft arborist report. Additional changes to the site plan affecting tree impacts are not included and would be covered under a separate agreement.
- The budget assumes one virtual meeting with the staff/Consultant team.

Deliverables:

- Tree Inventory Map
- Tree Inventory Table
- Revised Arborist Report or Report Addendum
- Tree Retention and Removal Plan
- Tree Replacement Plan

A04.3. 100% Design for Gateway Feature

a. Work up preferred alternative at 100% design level for gateway features. Provide drawings in a format compatible with the engineering documents. (Format provided by the engineering team.)
b. Structural design of gateway feature.
c. Coordination with electrical engineer on lighting design.
d. Attendance at 2 public meeting to present current design to the community.
e. Attendance at 1 virtual or in person meeting with the City and Duwamish Tribe to present current design.

Assumptions:

- All lighting, electrical, or utilities work will be by Consultant.
- The budget includes presentation at 2 public meetings organized by others.
- The budget includes one virtual or in person meeting with the City and Duwamish Tribe organized by others.
- The engineering team will provide LAS with: CAD layouts, templates and numbering to meet the requirements of the final bid document formatting; all background documentation stated above or that could be useful in informing gateway feature design.
- Coordination with respective landowners and utility managers regarding location of gateway features shall be handled by Consultant. LAS will locate features as directed by Consultant. Relocation of features during 100% design that results in additional coordination, redesign and/or design modification, and/or revisions to documentation may require additional fee.
- Redesign of gateway feature elements based on city, community, landowner, or tribal feedback during 100% design that results in additional coordination, redesign and/or design modification, and/or revisions to documentation may require additional fee.

Deliverables:

- 100% documents of gateway elements of the project in digital format (CAD) as provided by the engineering team.
- Bid-ready, stamped and signed, plans, specification, and estimate in digital format (PDF).

Work Element 6 – Utility Coordination (Supplemented)

Additional Coordination with Utilities and design and analysis services include:

6.1 Utility Coordination

During initial project scoping the AGENCY believed they owned the property between Interurban Ave and the Duwamish River. This property is owned by Seattle City Light (SCL). This made the coordination more time consuming, will require additional meetings beyond the original scope, and more components are included than franchise utilities being within AGENCY owned property and being requested to relocate. We need to follow SCL requirements on their property. With the utilities being on a third party owned property additional coordination was needed. We have had 11 meetings to date, the original scope was for 12, we anticipate about 28 meetings will be needed before the plans are finalized. We have had 7 utility meetings and 4 meetings with Districts and Stakeholders relating to utilities. Additional coordination outside of meetings is also required due to the property ownership. To date there have been over 100 coordination emails and calls between utilities, districts and stakeholders. It is anticipated that at least double this amount will be needed to complete the project.

SCL process requires approval through the Seattle City Council, permanent easement changes, temporary easements, approval of the modified Green River Trail configuration, artwork, tree plantings, wall configurations, trail connection to 42nd, illumination, and other design elements will all need to be reviewed by the Council. There will be additional effort required for all of these design elements to have approval for work on SCL property. This will also include approval from various SCL departments such as Electrical Engineering, Real Estate, Environmental Engineering, Vegetation Management, and Technical Engineering divisions at a minimum.

The coordination work for the temporary gas and temporary water to be hung from the temporary bridge was assumed to not be part of the CONSULTANT scope. The CONSULTANT will be including specifications to meet the utilities requirements as a performance specification for the Contractor to follow.

The pressurized sewer line was not one of the 6 utilities considered in the original scope and is an important element of the design because it is a 96” pressurized sewer serving two entire cities and must be protected during construction. The line runs parallel to Interurban and so it must be crossed with cranes and other construction equipment and loads much be considered. Only the sewer line that crosses under the Duwamish was a known utility when design began.

WORK ELEMENT 7 CONSTRUCTABILITY REVIEW, CONSTRUCTION SCHEDULE AND ESTIMATION (Supplemented):

This work element is performed by Ott-Sakai Construction Consultants (OS), to provide constructability review, construction schedule, and construction estimation services, and is supplemented as follows.

The constructability had more challenges than originally envisioned like staging areas and major utilities on the south end of the project; erection of the long girders, and north side soil conditions.

The work element includes the following activities:

7.3 Constructability Review and Cost Estimation 90% and Pre Ad-ready - Supplemented

OS will provide Constructability Review, Construction Schedule and Cost Estimation of the design team's prepared Plans, Specifications & Estimate (PS&E) package at 90% and pre-Ad-ready design levels.

7.4 Project Management / Meeting Participation

This sub task includes OS's project management with CONSULTANT, various administrative duties, and quality control. OS will participate in internal meetings with the design team for consultation during design of the project.

Deliverables:

- Constructability Review, Construction Schedule and Cost Estimation for supplemented 90% and pre-Ad-ready PS&E Levels

WORK ELEMENT 8 - TRAFFIC CONTROL AND TRAFFIC SIGNAL (Supplemented):

This work element is performed by Transpo Group, Inc. (TRANSPO) to provide traffic control, detour, and traffic signal plans for the Contractor's use in constructing the proposed bridge and roadway improvements. The original contract is supplemented with the following:

8.1 Traffic Analysis

No modifications and/or additions to scope.

8.2 Traffic Control

TRANSPO will prepare traffic control plans, special provisions, and engineer's opinion of cost for constructing the proposed bridge and roadway improvements. As noted in Supplement 02, the exact limits of the traffic control and specific plans were unknown at the time of contracting. Supplement 02 included the following plans:

- Eight (8) short term traffic control plans
- One (1) long term traffic control plan

Since that time, the extent of traffic control needs has been further established based on coordination with the CITY and King County, and the 90% design submittal included the following plans:

- One (1) general notes plan
- One (1) long term traffic control overview plan
- One (1) long term traffic control plan
- One (1) long term trail plan
- One (1) detour removal plan (removing "emergency work" detour)
- Five (5) short term traffic control plans
- Four (4) traffic control detail plans
- One (5) channelization restoration plan

The plans were/will be developed to conform with MUTCD and/or WSDOT/CITY procedures and standard plans. The Scope of Work under this Supplement 03 modifies/updates the traffic control plan deliverables.

TRANSPO will also assist the City in developing estimated travel time information for scenarios with a temporary bridge during construction, and without a temporary

bridge during construction. It is anticipated that the travel time information will be incorporated into a PowerPoint presentation for the CITY's use.

Assumptions:

- Traffic control plans noted under Supplement 02 will not be provided.
- Traffic control plans are based on the 90% submittal package and include:
    - TCP 1: General notes plan
    - TCP 2: Long term plan - overview plan
    - TCP 3: Long term plan - temporary staging (channelization and signing) plans for temporary bridge bypass on 42nd Ave S between S 124th St and Interurban Ave S.
    - TCP 4: Long term plan – trail closure/diversion plan
    - TCP 5: Detour removal plan
    - TCP 6: Short term plan – full closure of 42nd Ave S
    - TCP 7: Short term plan – full closure of Temporary 42nd Ave S
    - TCP 8: Short term plan – intersection corner plan with uniformed police officer at 42nd Ave S/Interurban Ave S
    - TCP 9: Short term plan – intersection corner shoulder closure plan at 42nd Ave S/Interurban Ave S
    - TCP 10: Short term plan – multiple work zone plan at 42nd Ave S/Interurban Ave S
    - TCP 11: Details – pedestrian and driveway traffic control details
    - TCP 12: Details – right lane closure details
    - TCP 13: Details – flagger control details
    - TCP 14: Details – multi-lane closure details
    - CH 1: Permanent – channelization restoration plan for Interurban Ave S and Macadam Road S
- Long term staging plans are not required for work at the E Marginal Way S/S 115th Street intersection.
- Short term staging plans listed above will be used for work at the E Marginal Way S/S 115th Street intersection.
- It is assumed that others will prepare all civil-related plans for temporary traffic control. This includes, but is not limited to, the design of temporary curbs, sidewalks, paving, grading, utilities, drainage, structures, geotechnical design, and related work.
- Standard traffic control plans will be used to the extent feasible.
- Traffic analysis is not included in this task.
- Virtual attendance for up to two (2) meetings with the CITY is included.

Deliverables:

- Previously submitted Traffic Control package for 90% in an electronic delivery format (PDF)
- Responses to 90% traffic control comments
- Virtual attendance for up to two (2) meetings with the CITY

- Traffic Control package for 100% in an electronic delivery format (PDF)
- Stamped and Signed Ad-ready design plans in electronic format.
- Travel time information

8.3 Traffic Signal Design (42nd Ave S/Interurban Ave S)

No modifications and/or additions to scope.

8.4 Emergency Staging Design

No modifications and/or additions to scope.

8.5 Traffic Signal Design (E Marginal Way S/S 115th St)

TRANSPO will prepare traffic signal plans, special provisions, and engineer's opinion of cost for constructing a new traffic signal system at the E Marginal Way S/S 115th Street intersection. TRANSPO will coordinate with Puget Sound Energy (PSE) for new electrical service for the traffic signal system. TRANSPO will coordinate potholing for new traffic signal poles. For estimating purposes, it is assumed up to three (3) locations will be potholed.

Assumptions:

- Traffic analysis and/or traffic signal warrant analysis is not anticipated.
- Traffic signal poles will be mast arm style.
- Special/custom signal pole foundation design is not anticipated.
- It is assumed that others will prepare all civil-related plans. This includes, but is not limited to, the design of curbs, sidewalks, paving, grading, utilities, drainage, structures, geotechnical design, and related work.
- The existing E Marginal Way S bridge over the Duwamish River will not be impacted.
- Fiber optic connection and/or interconnect design to adjacent traffic signals, traffic operations fiber-optic network, and/or traffic management center is not anticipated.
- Video detection will be used for vehicle detection on each intersection leg.
- Streetlights will be included on the traffic signal poles, as needed, to meet intersection lighting requirements.
- Utility relocation design, if needed, will be prepared by others.
- Up to three (3) locations will be potholed. If additional potholes are required, this will be provided as an additional expense. Utility potholing services will be invoiced as a project expense. The fee for potholing provided at the time of contracting is an estimate only. If the actual cost is higher than estimated, TRANSPO coordinate with the CITY to discuss options. Potholing for each location will occur under the same mobilization. Repairs for potholing will be cold mix asphalt patch, if located within concrete sidewalk or roadway. The CITY will not charge a permitting fee for potholing.

- Virtual attendance for up to one (1) meeting with the CITY is included.
- Traffic signal plans are anticipated to include:
  - TS06: Traffic Signal Plan at 1"=20' scale (1 sheet)
  - TS07: Traffic Signal Field Termination Plan (1 sheet)
  - TS08: Traffic Signal Pole Schedule (1 sheet)

Deliverables:

- 90%, 100%, and stamped/signed ad-ready traffic signal plans in an electronic format (PDF).
- Responses to 90% and 100% traffic signal comments.
- Virtual attendance for up to one (1) meeting with the CITY.
- Potholing data (up to three locations, as needed).

8.6 Channelization Design (E Marginal Way S/S 115th St)

TRANSPO will prepare channelization plans, special provisions, and engineer's opinion of cost for modifying the existing channelization at the E Marginal Way S/S 115th Street intersection to support the installation of a new traffic signal system.

Assumptions:

- Traffic analysis is not anticipated.
- The existing left turn lane storage length for southbound E Marginal Way S will not be modified.
- Channelization improvements are anticipated to primarily include installation of new crosswalks and stop bars, and removal of existing conflicting markings.
- Channelization plans are anticipated to include:
  - CH 2: Channelization Plan (1 sheet)

Deliverables:

- 90%, 100%, and stamped/signed ad-ready channelization plans in an electronic format (PDF).
- Responses to 90% and 100% channelization comments.

WORK ELEMENT 10 HYDRAULICS & HYDROLOGY (Supplemented)

This Work Element replaces work element 10 in the original contract, is performed by Natural Waters (NW) to provide Hydraulics & Hydrology services for the project. The hydraulic and hydrology activities include the following subtasks:

10.01 Existing Data Review

NW will review existing available data and information that may be needed for the hydraulic and scour evaluation. NW will request available information from the AGENCY, such as: existing topography, aerial photos, bridge inspection records, bridge plans, and anecdotal information on past flood events.

10.02 Site Reconnaissance

NW will conduct a site reconnaissance to examine the characteristics of the river, bridge, and surrounding river corridor with respect to hydraulic, erosion, and scour processes. The purpose of this reconnaissance is to understand site hydraulics and channel conditions. It will be beneficial for NW to meet with the project surveyors on site during the site reconnaissance to discuss where additional survey is needed to support the hydraulic and scour analysis.

10.03 Hydrologic Review

The hydrology for the reach has been studied extensively by the US Corps of Engineers. NW will review available information from the US Corps of Engineers, in addition to available FEMA Flood Insurance Study (FIS) information, to assess appropriate discharges, which will serve as the basis of design for the proposed water crossing. Anticipated flows may consist of the 2-, 10-, 50-, 100-, and 500-year flood events.

10.04 Geomorphic Assessment

NW will conduct a rapid geomorphic assessment using newly obtained survey information, geotechnical reports, aerial photos, and findings from the field reconnaissance. The purpose of this assessment is to determine if there have been significant geomorphic changes over time which will need to be accounted for in the design of the proposed water crossing.

10.05 Hydraulics

Based on review of existing data (Task 10.1) and direction from the AGENCY on acceptable level of risk, either an existing hydraulic model developed by the US

Corps of Engineers, FEMA or another source may be used as the existing conditions model, with minor modifications to incorporate the proposed bridge to simulate proposed conditions. Based on the proposed crossing being located on a sharp bend, the FHWA recommends a 2D model for assessing hydraulics at a water crossing. For the purposes of this scope and estimate, development of a 2D model was assumed to provide sufficient budget. All survey required for proper development of the existing conditions hydraulic model will be performed by others and provided to NW as a combined surface in a Land XML format in State Plane Coordinates. A proposed combined surface, which includes the proposed bridge and grading, will be provided by CONSULTANT in a Land XML format in State Plane Coordinates.

- Amendment 01
    - The bridge design has changed since the original scope and as such several proposed condition alternatives have been required to be modeled to assist in the proposed project meeting FEMA no-rise criteria. A final proposed combined surface, which includes all the proposed project elements and grading, has been provided by CONSULTANT in a Land XML format in State Plane Coordinates. This final proposed combined surface will be used to finalize the 2D hydraulic model for assessing hydraulics and scour estimates for the final proposed design (Task 10.06).

10.06 Scour Estimates

A scour evaluation will be conducted using the hydrology and corresponding hydraulic characteristics estimated from the hydraulic model developed in Task 10.5. The proposed bridge is not anticipated to have any elements within the 100-yr water surface elevation. The proposed combined surface, which includes the proposed bridge and grading, will be provided by CONSULTANT in a Land XML format in State Plane Coordinates. The scour estimates will be performed using this information following the guidelines described FHWA HEC-18, 5th Edition.

10.07 Documentation

The results of the hydrologic, geomorphic, hydraulic and scour assessments will be summarized in a brief report. The report will include a description of the physical characteristics of the site, including photographs taken during the site reconnaissance, along with pertinent information to support the basis of design. A draft version of the report will be provided to CONSULTANT and the AGENCY for review and one set of combined comments. Upon receipt of combined comments, NW will finalize the report and submit a digital (pdf) copy, as requested by CONSULTANT and the AGENCY.

- Amendment 01

- The results from the no-rise assessment (Task 10.08) will be summarized in the brief bridge hydraulic and scour report that includes pertinent information to document the no-rise assessment. A separate no-rise report is assumed to not be required.

10.08 Intentionally left blank

Amendment 01: No- Rise Assessment

The bridge design has changed since the original scope which now includes project elements within the FEMA floodway. Since the project now includes elements within a FEMA floodway a no-rise assessment is required. A preliminary no-rise assessment utilizing the final proposed combined surface, which includes all the proposed project elements and grading, provided by CONSULTANT, has been incorporated into the 2D hydraulic model developed as part of Task 10.5. The preliminary no-rise assessment using the 2D model suggests the proposed project should meet FEMA no-rise criteria.

The AGENCY has provided the effective FEMA 1D model to the CONSULTANT. After review of the effective FEMA 1D model, it was recommended to the AGENCY that the effective FEMA 1D model not be used for the no-rise assessment. The proposed bridge is not in the best location from a hydraulics perspective due to being on a sharp bend which does not follow the assumptions of 1D flow. This has been verified based on the preliminary 2D hydraulic model results as the effective FEMA 1D model does not model the bridge or areas within the river bend accurately due to flow being more 2D/3D. In addition, the cross sections that were placed in the area of the proposed bridge by the modeler for the development of the FEMA 1D effective model do not seem to be properly placed and there is minimal information to determine how they were adjusted to account for the existing bridge skew. The AGENCY corresponded with FEMA and the Department of Ecology (DOE) and determined that the 2D hydraulic model can be used to demonstrate a no-rise for this project. As such, this task will use the final 2D hydraulic model (Task 10.05) to demonstrate the no-rise as it follows standard engineering practice for modeling bridges on a skew and for rivers on sharp bends. The FEMA Effective 1D model is inappropriate for these conditions. The 2D hydraulic model uses information from the FEMA Effective Flood Insurance Study (FIS) dated August 19, 2020, including the 1% annual chance flood flow, floodway elevations and base flood elevations. Using the 2D hydraulic model will also provide efficiencies by using one hydraulic model for both the no-rise and providing hydraulic information to support the bridge design.

10.09 Permitting Assistance

NW will be available to assist with the team's preparation of permit applications and answer questions that arise during agency review.

10.10 60%/90%/100% Plans Review

NW will review river related plans at the 60%, 90%, and 100% project phases.

10.11 Project Management and Meetings

Throughout the project, NW will maintain a line of communication with the CONSULTANT team and the AGENCY through frequent meetings and e-mails. Various team and resource agency meetings are anticipated throughout the project delivery process. Meetings are assumed to be virtual.

- Amendment 01 – Due to a project time extension, additional hours for project management and meetings have been added. Meetings are assumed to be virtual. It is assumed that hydrology and hydraulics related meetings will be end prior to June 30, 2025.

Assumptions:

- One site visit is assumed to cover all tasks.
- A no-rise assessment or no-rise certificate (if required by AGENCY) is not assumed to be needed and therefore is not included in the scope or budget.
  - Amendment 01
    - The bridge design has changed since the original scope which now includes project elements within the FEMA floodway. A preliminary no-rise assessment utilizing the 2D hydraulic model developed as part of Task 10.5 has been conducted. The preliminary no-rise assessment utilizing the final proposed combined surface, which includes all the proposed project elements and grading, provided by CONSULTANT, suggests the proposed project should meet FEMA no-rise criteria. Based on coordination with the AGENCY, the 2D hydraulic model developed as part of Task 10.5 will be used to demonstrate a no-rise.
- No CAD related services will be performed by NW.
- Only hydrologic and hydraulic services to support the riverine aspects of the bridge design are assumed. No other services, such as bridge drainage and stormwater, are assumed to be needed.
- It is assumed no scour countermeasures will be required as bridge elements, walls, roadway prism and other transportation assets will be designed to account for total scour without the need for a scour countermeasure. If scour countermeasures are determined to be needed, an amendment will be required.
- No large woody material or other habitat/restoration features are anticipated for this project. If habitat restoration features are determined to be needed, an amendment will be required.
- No plans, specifications or estimates are assumed to be needed from NW.
- CONSULTANT team will provide required geotechnical and structural information at scheduled time to complete hydraulics and scour related tasks.
- Only one proposed condition is scoped and budgeted to be assessed and documented in report.

  - Amendment 01
    - The bridge design has changed since the original scope and as such several proposed condition alternatives have been required to be modeled to assist in the proposed project meeting FEMA no-rise criteria. This amendment provides hours to model the final proposed condition.
- Climate change is not anticipated to be accounted for in the hydrologic and hydraulic analyses.
  - Amendment 01
    - AGENCY has stated climate change does not need to be accounted for in the hydrologic and hydraulic analyses.
- It is assumed the project will have no change to the existing groundline and therefore will meet AGENCY and FEMA no-rise criteria due to being within a floodway. For these reasons, a CLOMR and LOMR is not within this scope or estimate. If a CLOMR or LOMR is needed, an amendment will be required.
  - Amendment 01
    - The bridge design has changed since the original scope which now includes project elements within the FEMA floodway. As such, there are some modifications to the existing groundline which includes but is not limited to a new trail location on the south side of the proposed bridge, removal of existing piers and placement of new piers and walls within the FEMA floodway. All other proposed ground has been graded by CONSULTANT to match the existing groundline. Based on a preliminary no-rise assessment utilizing the final proposed combined surface provided by CONSULTANT, the proposed project should meet FEMA no-rise criteria.
    - It is assumed the AGENCY no-rise criteria and flood hazard code requirements are equivalent to FEMA requirements.
    - Based on coordination with the AGENCY, the 2D hydraulic model developed as part of Task 10.5 will be used to demonstrate a no-rise. For these reasons, a CLOMR and LOMR is not within this scope or estimate. If a CLOMR or LOMR is needed, an amendment will be required.
- A detailed lateral migration analysis will not be performed. A qualitative assessment of lateral migration potential will be based on site observations and surveyed ground information provided by the AGENCY.
- The US Corps of Engineers and the Effective FEMA hydraulic models will be requested through or in collaboration with the AGENCY.
- AGENCY will pay any fees for acquiring US Corps of Engineers or FEMA hydraulic models and any required permits.
- The number and level of detail of such tasks shall be performed by NW commensurate with the level of effort allocated in the estimate.
- No hydraulic or scour analyses is assumed for any temporary features or work access platforms within the 100-year WSE.

Deliverables:

- Digital (pdf) copy of final bridge hydraulic and scour report.
  - Amendment 01
    - The results from the no-rise assessment (Task 10.08) will be summarized in the brief bridge hydraulic and scour report to include pertinent information to document the no-rise assessment. A separate no-rise report is assumed to not be required.

Work Element 12 – PS&E (Supplemented)

Additional PS&E design and analysis services include:

12.3 & 12.4 100% and Bid-ready PS&E

As the project developed, new information where available that revised the assumptions were made in the scoping phase, which, in turn, required efforts that were not anticipated during the scoping phase. Additional design calculations, plans, and opinions of cost services are included in the 90% package and will be included in future submittals. They include:

- **More Challenging-than-expected geotechnical conditions**
  The project as scoped assumed the proposed bridge replaces the existing structure. The geotechnical report showed a deep liquefiable at the bridge's north end. During the foundation design, the bridge foundation would have been too deep (approximately 130 ft deep). Structural and geotechnical engineers worked on refining the design and reduced the pier foundation. The design requires soil mixing ground improvement to alleviate the lateral spread risk on the bridge piers.

- **Wall 17 at the north end of the bridge**
  The original scope assumed the wall at the north end is a soldier wall replacing the failed existing sheet pile wall. The new channel survey data and geotechnical analysis showed that the slope in front of the wall (in the river stream) would be unstable during a large seismic event; hence, the soldier pile would lose support and fail. Any type of wall needs to be extended below the liquefied soil layer to satisfy safety during the earthquake. The design required a complex system, including ground improvement, a secant pile wall supporting an MSE walls at both ends. The additional efforts are design calculations, plan preparation for the secant pile wall and MSE wall, and corresponding moment slabs.

- **Ground Improvement**
  Per the above design, a ground improvement by deep soil mixing is required to support the north end of the project. The ground improvement design was not anticipated in the original scope. The additional efforts are plan preparations and special specifications for the ground improvement.

- **Utility Coordination**
  Two items were changed per the new information on the utilities:

a) Surveys showed another sewer line parallel to Interurban Ave and a complex network of sewer lines at the south end of the bridge. This required additional calculations to check construction loads on the utilities and coordination meetings.
b) The north end of the detour bridge would have been close to the King County Sewer Manhole. The concept of the detour bridge assumed access of workers to the manhole, which is typical. However, during coordination meetings, King County indicated that a crane access is required—furthermore, they placed stringent requirement to drive pile near the sewer line. Considering the risk of delay to the project and damage to the sewer line, the design team has relocated the detour bridge further east of the sewer. The new King County criteria effectively double the designed effort of the detour bridge, which was not anticipated in the original scope.

- **Complex environmental, historic, and social site**
  During the design phase of the project, the historic significance of the existing bridge and the bridge site have changed. The changes required additional construction and site studies, stakeholder meetings, and public involvement meetings that were beyond the original scope of the project. So far, we have studied and prepared the following reports:
  a) Feasibility of rehabilitating and retrofitting the existing bridge.
  b) Investigation of Impacts of Closing Traffic and Pedestrian Crossing.
  c) Feasibility study of moving the existing bridge to build a new pedestrian crossing upstream.

- **Custom barrier, handrail, fence**
  The bridge design was scoped to have typical elements. The typical elements have standard drawings and designs; as a result, they do not require engineering design or full detailing. The plan preparations were also anticipated to follow the typical drawings provided by WSDOT, where the details need to be revised to match the project. The architectural components of the bridge have been beyond the anticipated level. They require structural design to assure the components' safety and performance. The custom details must be developed fully from the start. The additional effort is in two parts:
  a) The engineers need to design and stamp the barriers, rails, handrails, and fences. The design efforts for the custom elements are beyond those anticipated in the original scope.
  b) Additional plan sheets are required to include the custom details. Plan sheets in Section 12.4 would be revised as shown below:

Sheet Name	Original PS&E	Revised PS&E
Bridge Barrier details	3	3
Bridge Railing Details	1	2
Ped. Handrails on Bridge Railings Details	0	2

Ped. Handrails on Bridge Barrier Details	0	2
Fall Protection Fence on Walls	0	2
Custom light pole details	0	1

- **Civil 3D (C3D) modeling for no-rise calculations**

  It was not originally anticipated that modeling of existing or proposed conditions above or below the road would be needed and so it was not included in the scope. The initial scope included C3D modeling for the roadway plan and profile design only. Since the bridge was being lengthened from its existing condition it was assumed we would not need to create models for use by the hydraulic engineer. Additional time required included working with the existing survey and topography to create a "combined" EG surface, a secondary "EG" surface which showed grades after proposed demolition in order to have a base surface for the proposed grades to tie into, a finished grade (Fg) surface also had to be created that had more grading than what we used for the plans as it had to extend beyond the water surface for the hydraulic model to analyze properly. There were also meetings and emails required to make changes to the two surfaces so they were ready for hydraulic modeling. In addition, the no-rise condition was not met with the initial bridge design and so the bridge was modified to a wider span and reduced pier count to ensure a "no-rise" was obtained. This resulted in additional meetings, emails, and effort by the civil team modeling the surfaces, the structural team to modify the structure, and they hydraulics engineer.

- **Stormwater Design Criteria Changes**

  Since the original scope was completed, a ruling by National Marine Fisheries Services (NMFS) has come out regarding 6-PPDq. The original assumption was that standard treatment and flow control measures would be required for this project, but since the NMFS ruling it was determined that 100% infiltration is the only option to avoid a lengthy permit review process, and additional design work is needed to meet the updated requirements.
  In addition, an updated Stormwater Management Manual for Western Washington (SWMMWW) is anticipated in June of 2024, and the King County Stormwater Design Manual (KCSWDM) will need to be updated in response to the SWMMWW updates. It is unknown at this time exactly what updates will be made to the KCSWDM, but it is anticipated that these updates will impact treatment and flow control requirements for the federal side of permitting for this project. These requirements are anticipated to be far more stringent that what is currently required, and will result in additional design work.

Stormwater Assumptions:

a) 100% infiltration of new and replaced PGIS will be required, or additional (anticipated minimum 2 years) ESA review will be required.
b) Potential impacts of KCSWDM updates unknown at this time, but anticipated to require additional design work similar to that required in the 2024 SWMMWW, and potentially more stringent for ESA compliance.
c) Additional modifications to the design will need to be made after 90% based on new requirements.

- **Specifications:** The consultant revised all structural Contract Provisions ("Specifications") to incorporate the revised designs listed above.

- **Estimate:** Updated the opinion of cost to reflect new quantities from the changes. Updated the unit cost to reflect current bidding climate.

- **Internal QA/QC:** An internal consultant quality assurance/quality control review of deliverables will be conducted for each Pre-Ad Ready submittal packages, as well as confirmation that comments received have been addressed. A record of comments received will be maintained. Response to each comment received will be tracked to confirm that they have been addressed.

Deliverables:

- 100% PS&E package
- Bid-ready PS&E Package