12787 Gateway Drive S. | Seattle, WA 98168 | 206.241.6000 | www.nhcweb.com

nhc
northwest hydraulic consultants

January 29, 2019

Nicole Sanders
City of Snoqualmie Public Works Department
38624 SE River Street
PO Box 987
Snoqualmie, WA 98065

**Re: Sandy Cove Park Bank Protection and Restoration (Phase 2)**

Dear Nicole:

Enclosed for your review and signature are two copies of Task Order No. 38 under the on-call services contract between the City of Snoqualmie (City) and Northwest Hydraulic Consultants Inc. (NHC). This task order will authorize NHC to perform engineering services related to bank protection and restoration at Sandy Cove Park and other locations along the Snoqualmie River.

A cost breakdown is attached for our estimated budget to be billed on a time and materials basis.

Please let me know if you have any questions or concerns. We look forward to working with you on this project.

Sincerely,

NORTHWEST HYDRAULIC CONSULTANTS

Derek Stuart

Derek L. Stuart, P.E.

nhc

ON-CALL SERVICES

HYDROLOGY, HYDRAULICS & STORMWATER MANAGEMENT

TASK ORDER NO. 38

SANDY COVE PARK BANK PROTECTION AND RESTORATION (PHASE 2)

AGREEMENT FOR PROFESSIONAL SERVICES

This Agreement is made this 28th day of January, 2019, by and between **Northwest Hydraulic Consultants Inc.**, hereinafter called "NHC," and the **City of Snoqualmie**, hereinafter called the "CITY."

NHC has an Agreement dated 23 January 2017 with the CITY, which is herein referred to as the **Prime Agreement**, and which provides for NHC performing unspecified professional services in hydraulics, hydrology, and related fields on an on-call basis, with specific work items to be identified in subsequent **Task Orders**.

The professional service which the CITY has employed NHC to perform under this Agreement constitutes **Task Order No. 38** under the provisions of the **Prime Agreement** and is generally described as follows:

Sandy Cove Park Bank Protection and Restoration (Phase 2)

NHC and the CITY, for mutual consideration hereinafter set forth, agree as follows:

1. SCOPE OF WORK. NHC, acting as additional city staff, shall perform services as directed by the City Director of Public Works, to assist the City of Snoqualmie with a topographic and bathymetric survey at Sandy Cove Park along the Snoqualmie River. The scope of work to be completed is attached.

2. PERIOD OF SERVICE. The period for services provided under this Task Order shall begin on January 28, 2019 and expire on December 31st, 2022.

3. COMPENSATION. The CITY shall pay NHC on a time and materials basis at NHC's current rates, as agreed to in the Prime Agreement, provided the total compensation payable under this Task Order shall not exceed $448,136 without the authorization of the CITY. The attached spreadsheet shows a budget for the tasks described above.

4. ADDITIONAL CONTRACT REQUIREMENTS. All other contract requirements are as specified in the Prime Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement effective as of the day and year first above written.

**CLIENT:**

**CITY OF SNOQUALMIE, WASHINGTON**

Signature: _____

Name: Matthew R. Larson

Title: Mayor

Address: P. O. Box 987

38624 SE River Street

Snoqualmie, WA 98065

Telephone: (425) 888-5307

Date of Execution:

2/26/2019

**NORTHWEST HYDRAULIC CONSULTANTS INC.**

Signature: _____

Name: Derek L. Stuart

Title: Principal

Address: 12787 Gateway Drive S.

Seattle, WA 98168

Telephone: (206) 241-6000

Date of Execution:

2/26/2019

12787 Gateway Drive S. | Seattle, WA 98168 | 206.241.6000 | www.nhcweb.com

nhc
northwest hydraulic consultants

# Sandy Cove Park Bank Protection and Restoration - Phase 2

**Prepared by Northwest Hydraulic Consultants Inc.**

**Scope of Work**
**Prepared for City of Snoqualmie**
**January 28, 2019**

## PROJECT DESCRIPTION

The City of Snoqualmie has requested that Northwest Hydraulic Consultants, Inc. (NHC) perform a second phase of the Sandy Cove Park Bank Restoration Project (NHC, 2014)[1]. An update to that design is needed due to major modifications that were made to the weir at the Snoqualmie Falls in 2012 by Puget Sound Energy (PSE). In addition to needing to characterize impacts due to these hydraulic modifications, the City's vision for the river has evolved and the City now requires a hydraulic and erosion hazard assessment focusing on the entire reach from SR-202 upstream to approximately Schusman Avenue SE (see sketch provided by City below right).

The primary objectives of the Project will include:

1. Develop an erosion risk assessment map that identifies locations where bank stability issues are most likely and specifically focuses on those locations where there are public safety and/or infrastructure damage implications. Specific areas of concern include:
    - riverfront houses north of Sandy Cove Park,
    - the river channel north of Sandy Cove Park,
    - river banks in and around Riverview park, and
    - the exposed stormwater outfall pipe at River Street.
2. Incorporate new criteria into the Sandy Cove Park bank restoration design concepts that were identified by City staff in relation to the Riverwalk Master Plan. As part of the design update NHC will also evaluate if the weir modifications made by PSE have changed the river hydraulics in a way that will require any modifications to the restoration design.


**Figure-1: Sketch of Focus Area for River Hydraulic and Erosion Hazard Assessment**

[1] NHC. 2014. Sandy Cove Bank Restoration Project. Prepared for City of Snoqualmie. Prepared by Northwest Hydraulic Consultants. Review Draft April 2013. Final Draft January 2014. NHC Project#200080.

3. Assess how proposed bank modifications at Sandy Cove Park will most likely affect the river, specifically the bank opposite of Sandy Cove Park and downstream;
4. Design of a new stormwater outfalls at River Street (90% PS&E) and King Street (30%).
5. A Scour assessment of Meadowbrook Bridge and erosion on the left bank of the river near Walnut Street. Optional design of embankment stabilization at Walnut Street (preliminary design).
6. A secondary objective of the Project will include a high-level assessment of potential floodplain restoration opportunities within and around the City's jurisdiction.

## BACKGROUND

The PSE weir modifications were made during the 2014 NHC study (first issued in April 2013), and NHC made several recommendations related to the resulting changes to the hydraulics and geomorphology of the project reach:

- At the time of NHC (2014), the most recent hydraulic model calibration that had been performed was documented in 2008, before the weir at Snoqualmie Falls was lowered. NHC (2014) recommended that new calibration be performed after water-level data is collected from a post weir modification flood.
- The NHC (2014) geomorphic assessment noted the growing influence of significant gravel bars in the Snoqualmie River reach. In particular, erosion at the project site is likely the result of mid-channel gravel bar growth in the channel at Sandy Cove Park. The lowering of the PSE weir at Snoqualmie Falls lowered the water surface through the river reach and this is expected to further increase the relative prominence of gravel bars and their hydraulic impact on the flow. Additionally, lowering the weir will increase the hydraulic power and gravel bedload transport into the reach. Since sand and gravel have a direct impact on the stability of the river and river banks, this transition could have a major impact on banks at the Park.

The following scope of work defines the specific work plan tasks requested by the City.

### Task 1. Data Collection, Kick-off Site Inspections, Geomorphic Assessment, and Sub-Surface Borings

Two kick-off meetings will be held. The first will be an internal meeting attended by NHC and City staff. The second meeting also include City staff, but other project stakeholders such as King County, the Snoqualmie Tribe, and/or permitting agencies will also be invited. The purpose of these meetings will be collection of information needed to establish the project objectives and constraints that will guide development of project concepts. NHC will assist the City with development of the meeting agenda.

NHC will collect and review readily available data pertaining to the project. This may include historical aerial and ground photographs, available hydrologic data and reports for the Snoqualmie River, previous hydraulic analyses, property boundary information, and other relevant data. The City will provide NHC with any related data it may have. The City will be responsible for obtaining property owner permission to conduct surveys on private land.

NHC's design team will travel to and assess how physical conditions of river and project site have changed since 2012. This evaluation will examine channel/floodplain relationships, erosion characteristics, channel stability

concerns, and site-specific constructability issues. Special attention will be paid to recent channel evolution in response to the 2014 weir modifications and the anticipated response of the river and potential impacts to channel/habitat conditions upon construction of the project. This review is critical for understanding how the river will likely respond to the bank protection, as well as helping to define key elements to include in the design.

NHC will explore subsurface conditions at the site by drilling a total of two borings to approximately 20 to 25 feet below the river thalweg, not exceeding 80 feet of total drilling footage. The borings are intended to support a request from permitting agencies for a pile reinforced design at Sandy Cove Park. The drilling will be subcontracted by NHC to a drill rig operator. NHC will call the state "dial-before-you-dig" contractor number to clear utility locations prior to the explorations. However, we request that the City (or other property owner if land is not owned by the City) clear and/or identify any site utilities. The borings will be monitored by NHC's geologist (or geotechnical engineering sub-consultant), he/she will obtain soil samples, classify the materials, and maintain a detailed log of each exploration. The collected soil samples will be used for laboratory testing of physical characteristics such as moisture content and sieve analysis.

Assumptions:

- The City will provide NHC with plans for the Riverwalk Park trail (draft or final), including the Subsurface Exploration, Geologic Hazard and Geotechnical Engineering Report (AESI, September 25, 2017).
- NHC has assumed that all sub-surface explorations can be completed in a single day using a track or, if space allows, a truck mounted drill rig.
- NHC has assumed that soil collected by the drill can be left on-site following the exploration.

### Task 2. Field Survey and Development of Digital Terrain Model

NHC will conduct a topographic and bathymetric survey of the project reach, capturing enough detail to update to the hydraulic model and development of conceptual bank protection designs for the site. Two days of fieldwork have been allocated to perform the survey using a two-man crew, jet sled, RTK GPS and eco-sounder. In addition to this, one day of post-processing the survey data in the office is also included.

There are multiple legacy terrestrial survey datasets that will be referenced as part of this project; these include:

- Survey data collected for the Riverwalk Trail project by KPFF in 2017 and stamped by their Professional Land Surveyor (PLS) was provided to NHC by the City in datafile "41600532TOPOBM.DWG". This is the most comprehensive of the three existing terrestrial survey datasets.
- Perteet 2016 survey performed for the Snoqualmie Infrastructure Improvements Project (AutoCAD filename "20160013_Topo.dwg"). This survey is focused on roadway corridors and has only limited information in the river corridor. This dataset is not expected to be widely applicable.
- Terrestrial survey of Sandy Cove Park was also collected by NHC in 2012 as part of the NHC (2014) project.
- Base mapping for the Meadowbrook bridge site work will be based on the April 2003 King County survey documented in CAD files "x_survey.dwg" and "MB_basemap.dwg".

In addition to the bathymetric survey NHC will perform up to 2 days of additional field terrestrial survey using RTK GPS methods to fill in gaps in the existing terrestrial survey datasets. The primary area that is expected to require additional refinement is the river bank in the vicinity of Sandy Cove Park where the river has been advancing into the park. Some limited survey in the vicinity of the Meadowbrook bridge may also be required to support the bridge scour assessment (Task 11)

The new bathymetry, new terrestrial survey, and legacy survey datasets will then be reviewed by NHC and compiled into a single digital terrain model (DTM) surface including the river corridor and floodplain that can be used for hydraulic modeling and detailed design at the Sandy Cove Park site. The complied surface will include the new bathymetry data, terrestrial survey data sets, and 2016 bare earth LiDAR ground surface data. This effort will focus on adding break lines and other refinements of the bathymetric survey data as needed to define the river bathymetry for hydraulic modeling. NHC has allocated up to four days of office time (32 hours) to complete these refinements.

**Assumptions:**

- The bathymetric survey will be limited to the mainstem reach of the Snoqualmie River between the North Fork and Middle Fork confluence and the SR-202 Bridge. Survey of the South Fork is not currently included within the scope of the survey.
- The City will be responsible for obtaining property owner permission to conduct surveys on private land.
- The City will open a gate at SE Reinig Road and 396th Drive SE that is required for vehicular access to the river. It is also assumed this access route is in a condition adequate for use as a boat launch (it was used for this purpose in 2012). Additional time required to identify an alternative access location is not included in the hour and fee estimate.

**Deliverables:**

- X,Y,Z coordinate file for bathymetric survey including the river reach near Sandy Cove Park with proposed bank restoration.

### Task 3. Hydraulic Modeling Plan and Model Development

There are several aspects of the project that will require riverine hydraulic modeling to support engineering analysis and mapping. All prior hydraulic modeling within the City[2] has utilized a one-dimensional (1D) model, but the tasks included in this task order are arguably better supported by a two-dimensional (2D) hydraulic model application. At a minimum, significant updates to the existing 1D model are required.

[2] Previous significant hydraulic modeling of the Snoqualmie River has been performed with HEC-2 (e.g. NHC, 1993) or HEC-RAS 1D (e.g. NHC, 2008, 2014; King County, 2015; and the City's on-going LOMR study to be completed in 2019).

NHC always recommends that our clients develop some form of a modeling plan at the onset of a project that includes a significant modeling task to ensure that current and future modeling objectives are addressed by the project. There are three primary project objectives related to hydraulic modeling:

- design of bank restoration measures at Sandy Cove Park,
- scour assessment of Meadowbrook bridge
- detailed flood routing and hazard mapping across the floodplain within the City and its UGA. This will be used for evaluation of floodplain restoration opportunities (Task 11b) and also future infrastructure work within the Kimball Creek corridor (roadways and bridges).

NHC will develop a draft modeling plan that will recommend which 1D model, 2D model, or combination of models will be used for the project, what input data will be used, and what outputs will be needed. A few of the models NHC commonly recommends for similar studies include the U.S. Army Corps of Engineers HEC-RAS 1D, HEC-RAS 2D, Adaptive Hydraulics (AdH), and the U.S. Bureau of Reclamation's SRH-2D. Each of these tools have advantages and disadvantages. Generally speaking HEC-RAS is preferred for simulating flood depths across larger floodplain areas and AdH and SRH-2D is preferred for modeling detailed bridge and structure hydraulics.

For the purposes of developing an estimate for model development under this task, it is assumed that three different hydraulic modeling approaches will be applied for the project as illustrated in Figure-2.

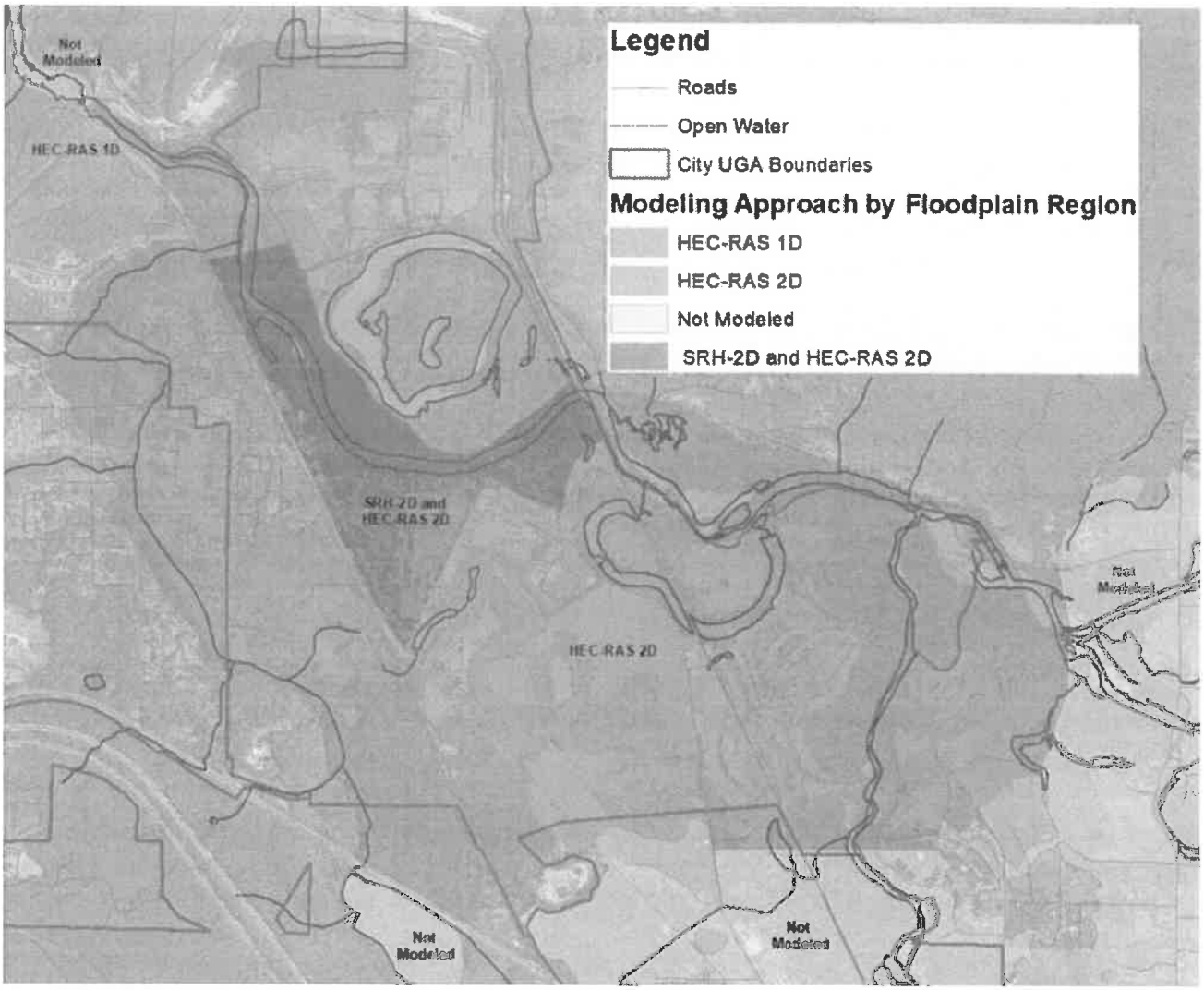



**Figure-2: Proposed Hydraulic Model Extents and Modeling Approach by Floodplain Region**

Proposed modeling approaches shown in Figure-2 include:

- The floodplain region shaded blue will be modelled with HEC-RAS 2D, extending from the Middlefork and North Fork Snoqualmie River confluence downstream to the SR-202 bridge. Areas in Northbend and to the east shown as "Not Modeled" on Figure-2 will not be included in the model domain. Flows from the South Fork Snoqualmie River Flood Insurance Study (FIS) will be used to define inflows entering the HEC-RAS 2D model at the South Fork Snoqualmie River boundary. The HEC-RAS 2D model will be used to simulate flood depths and overland flow velocities and will provide time-series of water-level and inflows for the SRH-2D model.

- The region in dark purple, extending from the Snoqualmie Valley Trail railroad bridge crossing downstream to Kimball Creek, includes the Sandy Cove Park bank restoration project and the Meadowbrook Bridge scour assessment and will require the SRH-2D model for engineering design; this region will also be included in the HEC-RAS 2D model. Southeast Mill Pond Road will form the northern boundary of this model and Railroad Avenue will form the southern boundary.

- The region shaded green, downstream of SR-202 to the Snoqualmie Falls weir, will be modeled with the existing 1D HEC-RAS model.

All three models will utilize the same DTM of the ground surface developed under Task 2. The HEC-RAS 2D model will utilize a coarser mesh than the SRH-2D model, but it will also require breaklines to be defined along roadways and other prominent embankments. NHC will define these breaklines for all railroads and major public roadways affecting flood flows within the City that are visible within the existing 2016 LiDAR dataset.

The manning's N roughness coefficients used in the HEC-RAS 2D model will be assigned similar values to those in the existing 1D HEC-RAS model that was previously calibrated to high water marks (HWMs) surveyed for the 2006, 2009, and 2015 floods. Only the 2015 flood HWMs are representative of the current weir configuration at Snoqualmie Falls. A limited effort (8 hours) is included in NHC's fee estimate to allow for limited refinement of the in-channel roughness coefficients to improve the match to the 2015 flood HWMs.

The models will then be applied to compute the hydraulic information needed to develop the conceptual alternatives (e.g. flow velocities and depths) and for calculations of scour along the bank, riprap sizing and/or large woody debris ballast forces required for subsequent tasks.

Note: The City is currently performing a LOMR study that will result in an updated 100-year FEMA floodplain and floodway maps based on output from the existing 1D HEC-RAS model. NHC discussed the use of an updated 2D HEC-RAS model for that study and the FEMA LOMR reviewer expressed that the LOMR should utilize the 1D HEC-RAS model, not the 2D, for the floodway analysis. NHC expects that the HEC-RAS 2D model will inform the LOMR, but that study and associated FEMA mapping will proceed using the 1D HEC-RAS model.

**Assumptions:**

- No new hydrologic analysis is included in this task order.

**Deliverables:**

- Input and output files for models developed under Task 3.

### Task 4a. Assessment of Bank Erosion near Sewer Pipe on Left Bank at Walnut Street

NHC took photographs documenting erosion along 500 feet of the left bank of the Snoqualmie River upstream of the Meadowbrook bridge at Walnut Street during site visits following the 2006 flood (example photos

included below). There is a sewer pipe that runs parallel to the Snoqualmie River at this location; erosion impacts to this sewer pipe are of specific concern to the City.

**Figure 3: 2007 Photos of Bank Erosion near Sewer Pipe upstream of Meadowbrook Bridge at Walnut Street**

Under this task NHC will provide a specific assessment of the river bank near Walnut Street. The assessment will leverage the conclusions on river migration made as part of the geomorphic assessment in Task 1 and add a new site inspection of the current bank conditions. The assessment will characterize the current processes affecting erosion of the river bank and, depending on the severity of the erosion at the site, recommendations for mitigating additional erosion and protecting the sewer pipe from being compromised will be provided to the City in a technical memorandum.

**Deliverables:**

- Memorandum documenting the assessment of bank erosion at Walnut Street and recommendations for mitigating additional erosion.

**Assumptions:**

- The bank stabilization measures recommended for the Walnut Street site will be simple. Up to three concepts with minor variations will be illustrated.
- Meeting to discuss Meadowbrook erosion hazard and design concepts for the site (Meeting #3).

### Task 4b. Conceptual Design of Bank Stabilization Measures near Sewer Pipe on Left Bank at Walnut Street

The erosion and mitigation concepts recommended as part of Task 4a will be developed into 8.5" x 11" JARPA format drawings adequate for permit application submittal (permit application is to be performed under Task 5).

48 North Solutions scope of work and fee estimate for the River Street embankment and Sandy Cove Park included as Attachment A does not include the Walnut Street embankment. It is assumed that adding this site to the permit package will add 25% to the total permitting cost for the River Street embankment and Sandy Cove Park. If 48 North Solutions final estimate for the Walnut Street embankment is larger, then the fee estimate associated with this element of the Task Order may need to be amended.

**Deliverables:**

- 8.5" x 11" JARPA format drawings

**Assumptions:**

- No cultural resources support is included for the Walnut Street site.

### Task 5. Refinement of Preferred Alternative, 60% Design Drawings, and Permitting Support

NHC will produce a Basis of Design (BOD) Report memorandum (1-3 pages) that presents documentation supporting the project design and summarizing technical analyses developed for the project. The BOD Report will integrate and/or reference technical documentation from NHC (2014) and earlier tasks and describe the physical processes that have caused the erosion problem for review and use by the City and other stakeholders. The BOD report will be updated and expanded as part of subsequent tasks serving as the final design documentation report at the completion of Task 6. The memorandum will be submitted in draft form to the City for review and will be finalized following receipt of comments.

NHC will refine the "preferred" lower bank alternative L1 from NHC (2014) (see attachment) based on the updated hydraulic model output and new criteria identified by City staff. The refined alternative (1) will again target a design that is practical, cost effective, durable and likely to receive approval from the permitting agencies. A simple drawing of the concept, similar to that provided in NHC (2014), will be prepared and a preliminary construction cost estimate developed.

In addition to refining the preferred alternative as part of this task, NHC will also assess how the proposed bank modifications will most likely affect the river, specifically the bank opposite of Sandy Cove Park and downstream.

NHC's permitting sub-consultant, 48 North Solutions, will prepare and submit all permits. NHC will support 48 North Solutions with information needed to prepare the environmental permits such as grading quantities. A scope of work for 48 North Solutions that is associated with both this and a potential project at the River Street embankment is included as Attachment A with narrative of cost savings between the two related projects.

NHC's cultural resources sub-consultant, Stell, will perform a review of pertinent literature on the archaeology, ethnography, and history of the project area to determine the probability for archaeological resources and traditional cultural properties in the project area. The scope of work for Stell is included as attachment B. A cultural resources field survey is <u>not</u> included in the current project budget.

NHC will incorporate one round of comments from permitting agencies, King County, and/or the City, make revisions, and develop details for the 60% design, special provisions and quantity estimates. The 60% plans will also be developed in JARPA format (8.5"x11") to support permitting. Special provisions will be developed assuming the WSDOT Standard Specifications for 2018 unless NHC is otherwise directed by the County. The project QAQC plan, including senior review of all deliverables will be followed throughout the design process.

**Assumptions:**

- NHC will use its standard CAD templates for all drawings, such as borders, titles, and plot files, etc.
- City will provide information on property boundaries (ROW, property lines, easements), Riverwalk Park layout and planting plan in the vicinity of the bank protection project.
- See Design Meeting, Deliverable, and Comment Workflow summary at end of scope of work for commentary of design review and comments. It is assumed that comments on the 30% and 60% submittal packages will each be returned to NHC within 3 weeks.
- Review comments for each design submittal (30% and 60%) will be provided to NHC in one set from each stakeholder (i.e. not individual sets of comments from individual staff).
- Time is included for one meeting following both the preliminary and 60% design submittals.
- The City will be responsible to pay any federal, state, or local permitting costs or associated fees.
- No cultural resources exist at the site. If remains or artifacts are identified, or a cultural resources field survey is deemed necessary, the contract will be amended to include the required expertise.
- The City would like to enhance the wetland within Sandy Cove Park. It is assumed that this enhancement will include plantings, signage, and similar minor interventions (i.e. not earthwork or structures). NHC has assumed 8 staff hours for discussion and design of these elements. If a more extensive design is requested additional design hours may be required.
- It is assumed that the refined alternative concept will be expanded upstream and downstream, not exceeding 3 times the extent of the alternative documented by NHC (2014) as L1.
- Design of the "Upper Bank" above Sandy Cove Park and including the King Street lot is not included in this Task Order.

**Deliverables:**

- Draft and Final 11"x17" 60% design drawings, special provisions, and quantity estimates.
- One draft of JARPA format drawings (8.5" x11") for construction grant applications.
- Meeting to discuss the 30% design. It is assumed that the erosion risk assessment mapping (Task 8) will be discussed at the same meeting.

- A meeting with the City to discuss possible refinements to the 60% embankment design (following Task 5).

### Task 6. Final Design and Embankment Design Documentation

NHC will develop the 90% final construction plans, special provisions and cost estimates (PS&E) by revising the design based on comments provided by the City and adding further details. NHC will attend a design review meeting to discuss final revisions and comments with the City.

NHC will provide a TESC plan covering both in-water and upland construction and staging areas.

The Basis of Design report from Task 5 will be updated to document design methods and summarize analyses added to the design in Task 6.

KPFF will provide bid package assembly support including coordination of specification questions developed by contractors during the bid process for the Division 01 Specifications. Revision of design specifications as needed to reflect clarifications during contractor bidding. KPFF will also assemble the division 1 specifications and specification deliverables. The project specifications will be compiled for 90% and Final design submittals as listed in the NHC proposal in PDF format. KPFF will review and provide a comment matrix with proposed corrections for the Division 01 Specifications. Recommendations for specification editing, including draft language will be provided based on comments for the City's use. KPFF's scope of work and fee estimate for the River Street project is included as Attachment C. If KPFF's final estimate for similar services on the Sandy Cove Park project is larger than that for the River Street project the fee estimate associated with this element of the Task Order may need to be amended.

**Assumptions:**

- City will provide information on property boundaries (ROW, property lines, easements), Riverwalk Park layout and planting plan in the vicinity of the bank protection project,
- See Design Meeting, Deliverable, and Comment Workflow summary at end of scope of work for commentary of design review and comments. It is assumed that comments on the 90% submittal package will be returned to NHC within 3 weeks.
- Development of a construction traffic control plan will be included as part of the Riverwalk project and is not included as a deliverable for this project.
- NHC staff to provide construction inspection and/or support services is limited to the hours prescribed under Task 14.
- NHC will make a final set of revisions based on the final design meeting (1) and one set of comments provided by the County.

- The necessary Division 01 specifications will be provided from the City to NHC and KPFF for KPFF's use and review.
- Specification Sections provided by the City will be in CSI format and will not require formatting over and above compiling the sections into different document types.

**Deliverables:**

- NHC will submit the final design package stamped by a Washington State registered Professional Engineer consisting of plans (PDF), special provisions (MS Word), and engineer's cost estimate. A basis of design memorandum will be prepared to document design methods and summarize analyses.
- TESC plan for in-water and upland construction and staging areas.
- meeting with the City to provide an overview of the possible refinements to the final design (occurs during Task 6). It is assumed that the floodplain restoration sites identified as part of Task 11b will also be discussed at this time.

### Task 7. No-Rise Analysis and Certification

The proposed bank protection project is located within FEMA's regulatory floodway for the Snoqualmie River. A FEMA No-Rise assessment is required to demonstrate that the project would not result in any increase in flood levels during the occurrence of the base (100-year) flood discharge. The hydraulic model built in Task 3 will be used to assess any rise. If the bank protection design meets FEMA's No-Rise criteria, then it will be documented in a short memorandum. If no design is identified that meets FEMA's criteria, then pursuing the proposed design may necessitate a CLOMR (Conditional Letter of Map Revision) which notifies FEMA and the surrounding communities of intent to increase the 100-year flood profile. If a CLOMR is pursued, significant additional effort will be required that is beyond this scope of work. If requested, a separate scope and budget can be prepared.

**Assumptions:**

- It is possible the proposed design will not meet FEMA's No-Rise criteria. If NHC identifies this as the case, a meeting will be held with the City to discuss options.

**Deliverables:**

- Short memorandum documenting the No-Rise analysis results and certification.

### Task 8. Erosion Risk Assessment Mapping

NHC will develop an erosion risk assessment map for the focus reach that characterizes the bank condition along the project. The assessment will make special note of evidence of erosion near private residential property (e.g. any evidence of erosion near homes on left bank of river between Sandy Cove Park and the SR-202 bridge). In addition to noting existing bank erosion, the assessment will also identify areas with a high likelihood of future

erosion. The future erosion assessment work will leverage elements of the Geomorphic Assessment completed as part of NHC (2014) such as Exhibit 8 "Historical Channel Change" and Exhibit 9 "Historic Channel Occupancy".

**Deliverables:**

- Maps of erosion risk in PDF and/or GIS format.

**Assumptions:**

- It is assumed that the erosion risk assessment mapping will be discussed at the same meeting the preliminary designs are discussed (Meeting #4). Therefore, no additional hours for attending that meeting are included in Task 8.

### Task 9. River Street Stormwater Outfall 30% and 90% Design

The existing stormwater outfall at River Street and Park Avenue was found to be undersized as part of the 2015 Snoqualmie Infrastructure Improvement Project (NHC, 2015). The existing outfall pipe, a galvanized pipe circled red in the 2017 KPFF survey shown below, is approximately 40 feet in length.

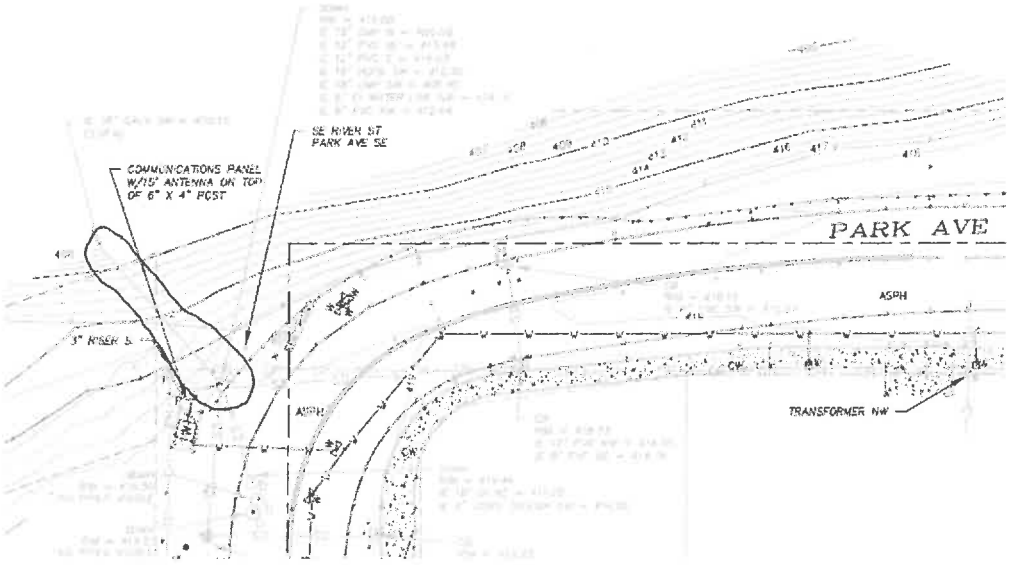



**Figure 4: River Street Stormwater Outfall Pipe (circled red) in 2017 KPFF Survey Drawing**

NHC will develop 30%, and 90% final construction plans, special provisions and cost estimates (PS&E) for a new stormwater outfall to the Snoqualmie River at River Street. The replaced outfall line will be located in the same basic alignment as the existing pipe and match existing upstream and downstream inverts.

NHC will attend a design review meeting to discuss final revisions and comments with the City.

NHC will provide a TESC plan covering both in-water and upland construction and staging areas.

**Assumptions:**

- The design fee estimate for the River Street outfall design assumes that stormwater modeling and other technical analysis for sizing the outfall pipe will be included and performed as part of the City's on-going stormwater utility plan efforts. If that analysis is not included in that project this task may need to be amended to include modeling of the stormwater system. It is assumed that effort will result in a 10% design (size, discharge, depth, material, etc.). If the stormwater modeling analysis confirms that this outfall is not undersized this task may be omitted.
- NHC will use its standard AutoCAD file template for the drawings, such as borders, titles, and plot files.
- City will provide information on property boundaries (ROW, property lines, easements).
- Any survey effort, including preparation of documents, for any new easements that may be required is NOT part of this scope.
- The same staging area used for the River Street embankment repair construction will also be available and suitable for construction staging for the outfall replacement.

**Deliverables:**

- Draft and Final 30%, 60%, and 90% construction plans, special provisions and cost estimates (PS&E) for a new stormwater outfall to the Snoqualmie River at River Street.
- TESC plan covering both in-water and upland construction and staging areas for River Street outfall replacement.
- A meeting with the City to provide an overview of the 30% outfall designs (discussion of deliverables for Tasks 9 and 10).

### Task 10. King Street Stormwater Outfall 30% Design

The existing stormwater outfall at King Street and Falls Avenue was found to be undersized as part of the 2015 Snoqualmie Infrastructure Improvement Project (NHC, 2015). The existing outfall pipe, a 15" galvanized pipe circled red in a hybrid of the 2017 KPFF and NHC 2012 surveys shown below, is approximately 260 feet in length.

**Figure 5: King Street Stormwater Outfall Pipe (circled red)**

NHC will develop 30% construction plans and planning level cost estimate for a new stormwater outfall to the Snoqualmie River at King Street.

NHC will attend a design review meeting via phone to discuss final revisions and comments with the City.

**Assumptions:**

- The design fee estimate for the River Street outfall design assumes that stormwater modeling and other technical analysis for sizing the outfall pipe will be included and performed as part of the City's on-going stormwater utility plan efforts. If that analysis is not included in that project this task may need to be amended to include modeling of the stormwater system. It is assumed that effort will result in a 10% design (size, discharge, depth, material, etc.). If the stormwater modeling analysis confirms that this outfall is not undersized this task may be omitted.

- NHC will use its standard AutoCAD file template for the 90% plan set, such as borders, titles, and plot files.

- City will provide information on property boundaries (ROW, property lines, easements).

- The gravel parking lot between Sandy Cove Park and the bowling alley will be suitable for construction staging.

- No cultural resources support is included for the stormwater pipe replacement corridor.

- No arborist will be required for the project or one will be provided by the City separately from this Task Order.

**Deliverables:**

- Draft and Final 30% construction plans and cost estimates (PS&E) for a new stormwater outfall to the Snoqualmie River at King Street.

### Task 11a. Scour Assessment of Meadowbrook Bridge – Technical Work

The historic Meadowbrook bridge (WSDOT Bridge No. 1726A) was constructed in 1921 and is documented by the Historic American Engineering Record (HAER). The last work on the bridge structure was made in 2005 when King County performed some minor improvements to the abutments. City would like to better understand the potential for scour of the bridge sub-structure (see Figure 6) and has asked NHC to perform a scour assessment and confirm the scour code for the structure, which was listed as 5 at the time of the most recent inspection.

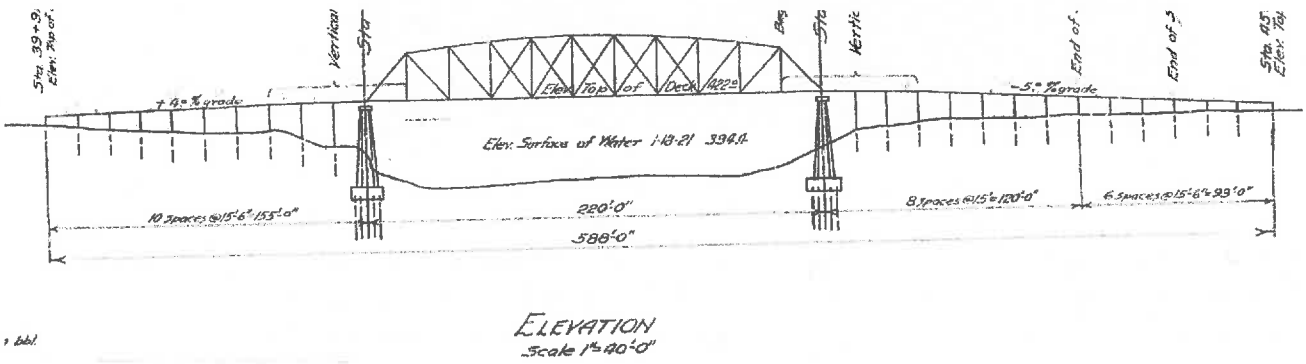



**Figure 6: Elevation View of Meadowbrook Bridge from February 1921 Design Drawings**

NHC will work with City staff to capitalize on existing data and information that will be necessary to efficiently perform the hydraulic and scour analysis. Existing information includes but is not limited to that from other tasks in this scope of work, bridge inspection records, bridge plans, geotechnical reports, and piling driving records.

NHC will conduct a field inspection to examine the characteristics of the bridge, and surrounding reach with respect to hydraulic, erosion, and scour processes. The purpose of this inspection is to understand site hydraulics and channel conditions, with an emphasis on determining scour susceptibility to the structure and roadway. Field measurements will include: characterizing sediment size, estimating channel/floodplain roughness, bridge measurements, assessment of existing scour protection, documenting lateral and longitudinal erosion, identification of high water marks, and other relevant information to aid in the scour assessment. A groundline survey will be performed using a tape down method at the upstream bridge face.

The 2D hydraulic model developed for Task 7 will be applied to ascertain the hydraulic characteristics necessary to support the scour evaluation of the existing structure.

NHC will examine scour susceptibility of the existing structure, scour protection and river banks utilizing various design manuals such as HEC-18 and HEC-23. A scour evaluation will be performed following the guidelines described in the Washington State Bridge Inspection Manual, Chapter 5 and FHWA HEC-18, 5th Edition. If scour/bank protection measures are needed based on scour evaluation, NHC can work with City staff to develop preliminary design concepts in a separate task order.

**Assumptions:**

- Base mapping for the bridge will be based on the April 2003 King County survey documented in CAD files "x_survey.dwg" and "MB_basemap.dwg".


## Task 11b (Optional). Scour Assessment of Meadowbrook Bridge – Reporting and Plan of Action

City staff may elect to halt additional work on the scour assessment by not authorizing optional Task 11b if the results of Task 11a indicate that the scour condition of Meadowbrook Bridge is not of concern.

If authorized, NHC will summarize the results of the bridge hydraulic and scour evaluation in a brief technical memorandum. The memorandum will include a description of the physical characteristics of the site, including photographs taken during the site reconnaissance; text, tables, and figures that describe the results of the hydraulic and scour analysis. A draft version of the report will be provided to the City for review and one set of comments. Upon receipt of comments, NHC will finalize the memorandum and submit digital or hard copies as requested by City. The results of the scour evaluation will also be recorded in a WSDOT Scour Summary Sheet (5.04-A-1).

NHC will assist City of Snoqualmie staff in the development of a Scour Critical Plan of Action (POA) if it is deemed necessary from the scour evaluation. Up to 8 hours is available for assistance.

**Deliverables:**

- Draft and final versions of a technical memorandum documenting the scour assessment results.
- WSDOT Scour Summary Sheet (5.04-A-1)

### Task 12. Assessment of Potential Floodplain Restoration Opportunities

A high-level assessment will identify potential floodplain restoration opportunities within and around the City's jurisdiction. Concepts that could be included involve:

A. lowering Reinig Road to allow the Snoqualmie River to flow through Borst Lake, and across Mill Pond Road back to the Snoqualmie River north of downtown,

B. activating side channels through the three forks natural area.

The concept will be evaluated with the 2D hydraulic model and a memorandum describing the restoration concepts and potential challenges and/or benefits will provided to the City for discussion.

**Deliverables:**

- Short memorandum providing commentary on the viability and/or obstacles related to identified floodplain restoration opportunities.

- Meeting to discuss potential floodplain restoration opportunities (occurs during Task 11b). It is assumed that this meeting will coincide with the final design meeting for Task 6 (i.e. no hours for a separate meeting are included as part of Task 11b).

### Task 13. Project Management/Administration and Quality Control

NHC will keep the City's project manager informed on project activities through the use of email and phone. Meeting dates will be set well in advance to ensure adequate time to secure commitments from key participants. Monthly invoices will be submitted that are accompanied by a brief progress report. Each progress report will detail the following:

1. Work completed from the Scope in this billing period.
2. Work anticipated for next billing period.
3. Project issues that need to be addressed.
4. Tracking of any work performed outside the original scope.

Quality control services performed under this Task includes a drafting a quality control and quality assurance plan memorandum at the outset of project work. The QAQC plan will document measures NHC will implement to assure that the deliverables are on-time, technically sound and meet professional industry standards, and to ensure effective and accurate analyses and development of recommendations, including demonstration of effective integration of multiple disciplines.

### Task 14. Construction Support.

NHC staff will provide up to 70 hours of on-site construction inspection and supervision to ensure that the design is implemented properly by the contractor.

## DESIGN MEETING, DELIVERABLE, and COMMENT WORKFLOW SUMMARY

1. Kickoff
    - Initial internal kick-off meeting for the project (Task 1), may be via phone
        - Attended by NHC, City, Subconsultants
    - External kick-off meeting for the project (Task 1)
        - Attended by NHC, City, County, Subconsultants, Tribe
2. Initial assessment of Walnut Street Embankment (Task 4a)
    - Meet with City staff to discuss assessment of Walnut Street and recommend if embankment design concept is needed (Meeting #3).
3. Refinement of NHC (2014) preferred concept for Sandy Cove Park embankment (Task 5) and develop concepts for Walnut Street embankment, if needed (Task 4b).
    - Develop concept alternatives (project objectives, narrative memorandum, simple figure, concept comparison table)
        - Submit to City
    - No-Rise memorandum, assuming the proposed design meets No-Rise criteria (Task 6)
        - Submit to City
    - Meeting to decide on preferred alternatives (Meeting #4)
        - Attended by NHC, City
        - Submit to stakeholders
    - Receive comments from all stakeholders and incorporate in next milestone
4. Sandy Cove Park Embankment 60% Design (Task 5)
    - Develop 60% plans (preferred alternative), construction notes, technical special provisions, cost estimate, BOD
        - Submit to stakeholders and 48 North in JARPA format
    - 48 North to submit 60% package for permits
        - Meeting to discuss 60% submittal (Meeting #5)
        - Attended by all stakeholders
    - Receive comments from all stakeholders (including permit agencies) and incorporate in next milestone
5. Sandy Cove Park Embankment 90% Design (Task 6)
    - Develop 90% plans, complete specifications, cost estimate, BOD
        - Submit to stakeholders
    - Meeting to discuss 90% submittal (Meeting #6)
        - Attended by NHC, City
    - Receive comments from City and incorporate in next milestone
6. River Street Stormwater Outfall 30% Design (Task 9) and King Street Stormwater Outfall 30% Designs (Task 10)
    - Develop 30% drawing of stormwater outfall pipe, construction notes, planning level cost estimates, narrative memorandum
        - Submit to City
    - Receive comments from City and incorporate in next milestone (River Street outfall only)
7. River Street Stormwater Outfall 90% Design (Task 9)
    - Develop 90% plans (including TESC), complete specifications, cost estimate, BOD

        - Submit to City
    - Meeting to discuss 90% River Street stormwater outfall submittal (meeting via phone)
        - Attended by NHC, City
    - Receive comments from City and incorporate in next milestone
8. Final Sandy Cove Park Embankment 90% Design (Task 6) + River Street Stormwater Outfall 90% Design (Task 9)
    - Develop final plans, complete specifications, cost estimate, BOD
        - Submit to City only

## OTHER DELIVERABLES INDEPENDENT OF DESIGN WORKFLOW

1. X,Y,Z coordinate file for bathymetric survey including the river reaches at Sandy Cove Park and Walnut Street with proposed bank restoration. (Task 2)
2. Input and output files for models developed under Task 3.
3. Maps of erosion risk in PDF and/or GIS format. (Task 8)
4. Draft and final versions of a technical memorandum documenting the scour assessment results. (Task 11b)
5. WSDOT Scour Summary Sheet (5.04-A-1) (Task 11b)
6. Short memorandum providing commentary on the viability and/or obstacles related to identified floodplain restoration opportunities. (Task 12)

## TIME AND PERFORMANCE

1. At a schedule coordinated with City staff following issuance of this Task Order.

## COST ESTIMATE

As listed in the following table, the cost estimate for NHC to complete this work is $448,136 if the City elects to include ESA consultation, a mitigation plan (i.e. 48 North Solutions Optional Task), specialized geotechnical engineering services, and authorizes use of a 10% contingency. The actual effort required for this project may be reduced to as little as $277,843 based on use of the contingency and two factors related to the effort required for permitting:

1) If the River Street embankment protection project is also authorized there will be an estimated $38,170 savings in permitting and cultural resources research costs to the Sandy Cove Park Bank Restoration Project alone (this is in addition to similar savings to the River Street embankment protection project).
2) If the ESA consultation and/or a mitigation plan (48 North Solution's optional task) are not needed for the Sandy Cove Bank Restoration project an additional $20,342 could also be saved.

If the full $448,136 is budgeted, the City could place between $40,740 and $162,732 as optional and/or management reserve tasks that would require City staff authorization to activate if required based on these factors that cannot currently be determined.

**nhc -- Northwest Hydraulic Consultants Inc.**
**12787 Gateway Drive S.**
**Seattle, WA 98168**

**Tel. (206) 241-6000**
**Fax (206) 439-2420**

**Prepared for:** City of Snoqualmie
**Project:** Sandy Cove Park Bank Protection and Restoration (Phase 2)
**Date:** January 28, 2019
**Project No.:** 2003862
**Prepared By:** Derek Stuart/Erik Rowland

| | TASK DESCRIPTION | Principal Erik Rowland or Casey Kramer | Principal T3 Derek Stuart, Vaughn Collins, or Chris Long | Staff Scientist Andrew Nelson | Engineer 1 Jaron Brown | Engineer 2 Victor Lam and/or Jessica Lammers | Technician/GIS Analyst Justin Scollock or Madalyn Ohrt | Contract Admin Diane Numrich | Totals |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Data Collection, Kick-off, Site Inspecton, Geomorphic Assessment and Subsurface Borings | 8 | 20 | 40 | | | | | $13,200 |
| 2 | Field Survey and Development of DTM | | 6 | | 16 | 64 | 80 | 1 | $20,640 |
| 3 | Hydraulic Modeling Plan and Model Development | | 24 | | | 88 | 8 | 1 | $17,540 |
| 4a | Assessment of Erosion ... at Walnut Street | 2 | 6 | 8 | | 15 | | | $5,075 |
| 4b | (Optional )Design of Erosion Mitigation at Walnut Street (30%) | 10 | 6 | 8 | | 50 | | | $11,450 |
| 5 | Refinement of Preferred Alternative, 60% Design Drawings, and Permitting Support | 24 | 48 | 28 | | 100 | 24 | 6 | $37,640 |
| 6 | Final Design and Embankment Design Documentation | 24 | 21 | 12 | | 60 | | 6 | $21,150 |
| 7 | No-Rise Analysis and Certification | | 24 | | | 80 | | | $15,520 |
| 8 | Erosion Risk Assessment Mapping | 4 | 16 | 40 | | | 12 | | $12,600 |
| 9 | River Street Stormwater Outfall 30% and 90% Design | | 24 | | | 52 | 16 | | $13,780 |
| 10 | King Street Stormwater Outfall 30% Design | | 16 | | | 32 | 16 | | $9,440 |
| 11a | Scour Assessment of Meadowbrook Bridge - Technical | 24 | | | 4 | 36 | | | $11,080 |
| 11b | (Optional) Scour Assessment of Meadowbrook Bridge - Reporting and POA | 8 | | | | 16 | 2 | 0.5 | $4,290 |
| 12 | Assessment of Potential Floodplain Restoration Opportunities | | 8 | 24 | | 14 | 8 | | $8,430 |
| 13 | Project Management/Administration and Quality Control | 8 | 80 | | | 20 | | 2 | $23,180 |
| 14 | Construction Support | 10 | 40 | | | 30 | | 2 | $15,730 |
| | Total Hours and Direct Labor Cost (DL) | 122.0 | 339.0 | 160.0 | 20.0 | 657.0 | 166.0 | 18.5 | |
| | Standard Rate | $250.00 | $230.00 | $165.00 | $145.00 | $125.00 | $110.00 | $140.00 | $240,745 |
| | TOTAL LABOR COST (BASE SCOPE OF WORK ONLY) | | | | | | | | $225,005 |
| | TOTAL LABOR COST (OPTIONAL TASK 12 ONLY) | | | | | | | | $15,740 |

**Direct Expense Detail**

| | Units | Rate | Cost |
|---|---|---|---|
| Mileage (estimated 30-40 round trips) | 3,966 | $0.580 | $2,300 |
| Reproduction & Communication | | | $200 |
| Survey Equipment (Boat/RTK GPS/Eco Sounder) | (per field equipment sheet) | | $3,800 |
| | | | $6,300 |

**Subconsultants**

| | Sub Fee | Markup | Cost |
|---|---|---|---|
| **Base Scope of Work** | | | |
| Drilling Rig ($1000 per boring x 2 boring + $500 mobilization) | $2,500 | $250 | $2,750 |
| Stell for Cultural Resources Support (excludes cultural resources field survey) | $6,874 | $687 | $7,561 |
| 49 Degrees North for Permit Application Support | $63,500 | $6,350 | $69,850 |
| | | Base Scope of Work | $80,161 |
| **Optional Tasks** | | | |
| Geotechnical support for Task 1 from Terracon Consultants | $10,000 | $1,000 | $11,000 |
| KPFF bid package and Division 1 specification review | $8,400 | $840 | $9,240 |
| 48 Degrees North for Permit Application Support (Additional for Walnut Street site, Task 8; not included in Attachment A) | $25,000 | $2,500 | $27,500 |
| 48 Degrees North for Permit Application Support (ESA Consultation, Mitigation Plan) | $29,500 | $2,950 | $32,450 |
| | | Optional Tasks | $80,190 |
| | | Subconsultants Base Scope and Optional Tasks Combined | $160,351 |

**Cost Summary**

| | |
|---|---|
| Total NHC Labor (Base Tasks + Optional Task) | $240,745 |
| Total Direct Expenses | $6,300 |
| Subconsultants | $160,351 |
| TOTAL COST BASE SCOPE OF WORK | $311,486 |
| TOTAL COST INCLUDING OPTIONAL TASKS | $407,396 |
| **TOTAL COST INCLUDING OPTIONAL TASKS AND 10% CONTINGENCY** | **$448,136** |
| ESTIMATED MINIMUM COST (WITH PERMITTING/CULTURAL RESOURCES COST SHARE, NO OPTIONAL TASKS) | $277,843 |

## REFERENCES

NHC 1993, Draft interim report, Snoqualmie River flood control project. Prepared for City of Snoqualmie, Snoqualmie, Washington.

NHC 2008, Technical Analysis for FEMA Letter of Map Revision for the Snoqualmie River near the City of Snoqualmie, Washington. May 23, 2008. LOMR became effective February 26, 2010. NHC Project Number 21478.

NHC 2014, Sandy Cove Bank Restoration Project, Final Report, Prepared by Northwest Hydraulic Consultants for the City of Snoqualmie in coordination with Perteet Inc. and Terracon Inc. Review Draft April 2013, Final Draft January 2014. NHC Project Number 200080.

NHC 2017, Infrastructure Improvement Program, Hydrologic and Hydraulic Analysis, Final Report, Prepared by Northwest Hydraulic Consultants for Perteet Inc. on behalf of the City of Snoqualmie. February 2017. NHC Project Number 2001642.

## Attachment A

Sub-consultant 48 North Solutions Scope and Fee Estimate for both Sandy Cove Park and River Street Embankment projects

48 north solutions

909 NE Boat Street, Seattle, Washington, 98105

October 18, 2018

Mr. Derek Stuart, PE,
Northwest Hydraulics Consultants
12787 Gateway Drive S.
Seattle, WA 98168

submitted via email to: dstuart@nhcweb.com

**Re: Version 2** - Environmental Permitting Support for the City of Snoqualmie's River Street Embankment Project (Phase 1) and Sandy Cove Bank Stabilization (Phase 2).

Dear Mr. Stuart:

48 North Solutions, Inc. (48 NORTH) is excited to submit this proposal to Northwest Hydraulic Consultants (NHC) to provide permit acquisition services for the proposed Snoqualmie Riverwalk embankment and bank stabilization project along the left bank of the Snoqualmie River, proposed by the City of Snoqualmie (the City). We have combined Phases 1 and 2 of the Snoqualmie Riverwalk Master Plan elements into one permitting effort to minimize costs and maximize effort for this project. This approach is the preferred strategy to follow since providing separate permitting documents for each phase would increase the cost of the project(s) significantly. If each Phase was permitted on its own, the cost would be significantly higher for each phase, than a combined permitting approach. Anticipated standalone permitting costs for Phase 2 are higher due to a more complex project involving stormwater, wetland, and other environmental impacts that are not anticipated in the Phase 1 standalone permitting costs. A 60/40 cost share split was derived based on the anticipated cost if each project was permitted on its own (see Part 2: Cost Estimate and Assumptions for more details).

While the City has recently stated that Phase 1 does not need to be expedited and can be constructed on the same timeline as Phase 2, the permit applications could to be split depending on the initial permitting strategy meetings with the U.S. Army Corps of Engineers (USACE) and on conditions and timeline with Phase 1 that needs to get done, but are not tied up with Phase 2. This proposal outlines 48 NORTH's effort to provide a combined cost-share environmental permit support for Phases 1 and 2 of this project.

## PART 1: SCOPE OF WORK

The left bank of the Snoqualmie River, within the City limits, has experienced increased bank erosion that threatens Sandy Cove Park, River Street, local drainage infrastructure, and/or a planned Snoqualmie Riverwalk project. Sandy Cove Park and the riverbank adjacent to River Street are being eroded by the Snoqualmie River and require streambank protection. The City has asked NHC to design an embankment restoration at the River Street outfall, as well as incorporate new criteria into the Sandy Cove Park bank restoration design concepts that were identified by City staff in relation to the Riverwalk Master Plan and as outlined in the Berger Partnership Sandy Cove Phase 2 Schematic Plan.

The overall scope has grown in complexity since our initial consultation, but both projects are expected to have similar permitting requirements since bank protection along the river will be incorporated in both Phases. In-water work below the Ordinary High Water Mark (OHWM) is expected to trigger USACE, U.S. Fish and Wildlife Service (USFWS), Washington Departments of Fish and Wildlife (WDFW), and Ecology, and the City permits and reports. The City is also considering incorporating a replacement

outfall into the embankment repair project and conducting work in a wetland as part of the Sandy Cove stormwater effort. 48 NORTH has extensive experience permitting these types of projects and is currently in the process of completing the permitting of an outfall structure on the Nooksack River and is currently working closely with the USACE on a support system for an intake structure in Eastern Washington.

Formal and informal permitting agency consultation with federal, state and local agencies, and external stakeholders is a critical component of the permitting processes in Washington State. Consultation generally involves analysis of a proposed project to determine any potential environmental effects and to develop effective monitoring, mitigation, and adaptive management measures necessary to prevent, minimize and/or mitigate project effects on the environment. Consultation should start as early as possible to ensure that the correct environmental documentation and needs of both the project and agencies overseeing the permitting efforts are met. 48 NORTH will support NHC and the City with obtaining the environmental permits and the supporting consultations necessary to complete the bank stabilization and restoration with large woody debris, from Sandy Cove Park upstream to the City's outfall structure on River Street. We have broken these efforts into four tasks.

Task 1: Permitting

*A) Local (City) Permits*

48 NORTH will plan a kick off meeting with the City to engage in the local permitting strategy. As the City is leading this effort, we assume they will be the lead agency for the State Environmental Policy Act (SEPA) review. We anticipate that a standard SEPA Environmental Checklist will likely be required, as opposed to a SEPA Environmental Impact Statement (EIS). The checklist requires governmental agencies to consider the environmental impacts of a proposal before making decisions and helps agencies identify those impacts. The City (as the lead agency) will use this checklist to determine whether the environmental impacts of the proposal are significant. If impacts are not significant, the City will issue a Determination of Non-Significance for this project. 48 NORTH will work closely with the City's Planning team to develop the project's SEPA checklist for their review. In addition to developing the SEPA Checklist, 48 NORTH will prepare a Letter of Exemption for Shoreline Permit and a Flood Improvement Permit.

As part of the design, critical areas such as wetlands, should be avoided where practical. If they cannot be avoided, impacts should be minimized to the greatest extend practical. As part of the Critical Area Report (CAR), a wetland delineation and/or OHWM delineation would be necessary to avoid or minimize these impacts (see Task 2 for more detail). Wetlands are regulated by the City under the Sensitive Areas Ordinance, Chapter 19.12.180. The preparation of a special report (i.e., wetland delineation report, CAR, or Habitat Management Plan) will identify critical natural resources are within the proposed project. These assessments will identify if wetlands are present, and if so, where in relation to the project; if there are threatened and/or endangered species present; and surface waters are present, in addition to those identified as being present in the project area. These reports, or information contained within them, will support permit applications including the Conditional Use Permit and SEPA Checklist. Other City-related permits that maybe required include clearing and grading permits.

48 NORTH will prepare one (1) draft copy of the SEPA Checklist, CAR, and each City permit application, that includes both Phase 1 and 2, in MS Word format for internal review by NHC and/or the City. Upon receipt of one (1) consolidated set of comments, 48 NORTH will then prepare the final SEPA Checklist, CAR, and permit applications for submission to the City. Copies of all applications, as pdfs, will be submitted to NHC for their records.

*B) State and Federal Permits*

When it comes to permitting a project at a federal and State level, a Joint Aquatic Resource Permit Application (JARPA) is a key part of the permitting process. The JARPA serves as an application to the USACE, along with multiple state and local agencies. The JARPA is an efficient process because it initiates several related permitting processes through one application, including WDFW via its online APPS system, Ecology, and USACE. Each agency receives a separate copy of the same application.

To expedite the permitting process, 48 NORTH recommends conducting an on-site, pre-application meeting with the various federal and state permitting agencies, in particular, WDFW, Ecology and USACE. Upon receiving feedback during the pre-application meeting, 48 NORTH will develop the JARPA, that includes both Phase 1 and 2, for submission. 48 NORTH in collaboration with NHC will conduct a preliminary site visits with the USACE and other pertinent permitting agencies. 48 NORTH will then send the JARPA, that includes both Phase 1 and 2, application to the various permitting agencies including Ecology and USACE. The JARPA submission to USACE is to obtain either a Standard Permit (e.g., an Individual Permit) or a General Permit (e.g., a Nationwide Permit). The JARPA is submitted to Ecology for concurrence of Section 401 of the Clean Water Act (CWA). This concurrence can be in the form of either issuance of a Water Quality Certification or concurrence to the issuance of a nationwide permit by the USACE. Since this project is in King County and requires federal permitting, a Coastal Zone Management Certification may be required. The JARPA submission to WDFW, via its online APPS system, is to obtain a Hydraulic Project Approval (HPA) for the in-water work component of the project.

48 NORTH will develop the JARPA and the Determination of Consistency form for submission. We assume NHC will prepare all JARPA-formatted figures for this submission. 48 NORTH will send the application, that includes both Phase 1 and 2, to the various permitting agencies. 48 NORTH will use the information included in the JARPA and upload it onto the WDFW APPS online application system to obtain an HPA. A Determination of Consistency form will be submitted to the USACE and Ecology.

48 NORTH recognizes the regulatory agencies are involved with multiple projects at any one time. Therefore, once each application is submitted, 48 NORTH will work closely with the respective agencies to support the permitting review process so that it is completed as efficiently as possible. Our aim will be to minimize any lag time during the application review. Throughout the permit review process, 48 NORTH will monitor and engage these agencies via phone calls and/or electronic mail correspondence to receive updates from them and address any concerns that may arise. We will work closely with NHC to address agency comments received and provide any supplemental information to keep the project on schedule.

Task 2: Field Surveys, Critical Area Report, and Conceptual Mitigation Plan

The USACE, under Section 404 of the CWA, regulates the filling of "waters of the United States," including associated wetlands (Environmental Laboratory 1987). USACE defines wetlands as: *"Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, marshes, and similar areas" (U.S. Environmental Protection Agency, 40 Code of Federal Register [CFR] 230.3, 33 CFR 328.3, Federal Register 1982).*

Ecology also regulates wetlands under section 401, when applicable, of the CWA and under state regulations. According to Section 401 of the federal CWA, Ecology may require any permit issued by the

USACE to meet state water quality standards. Conditions placed on the issuance of a Section 401 certification by Ecology become part of the Section 404 permit issued by the USACE. Ecology has the regulatory authority to deny a Section 401 certification. A Section 404 permit cannot be issued by the USACE if there is a denial of the Section 401 certification by Ecology.

Two (2) 48 NORTH biologists will conduct a Critical Area review and wetland and waters determination for the proposed project area that includes both Phase 1 and 2 sites. The purpose of this study will be to verify the presence or absence of wetlands and important habitat areas in, and within approximately 200 feet of the project, where access is available. We will assess for the presence of wetlands on the site in accordance with the current methodology of the USACE (2010) *Western Mountains, Valleys, and Coast Regional Supplement (Version 2.0)* and the USACE (1987) *Wetlands Delineation Manual*. A global positioning system unit will used by the field team to assist in locating the project area and to record submeter-accurate site spatial data. Wetlands will be rated using Ecology's *Wetland Rating System for Western Washington* (2014 Update).

Ecology defines the OHWM as "*that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland…*"

Following Ecology's 2016 guidance for OHWM determination, 48 NORTH will delineate the OHWM along the left bank of the Snoqualmie River, at the site of the proposed streambank stabilization and embankment project. Prior to the delineation, our biologist will complete a desktop assessment to identify water flow-related data for the determined river reach. If field indicators are not conclusive in determining the OHWM, hydrologic data will be used to develop an understanding of the timing and elevation of high water that creates marks on the soil with respect to vegetation. We have assumed that this delineation will be limited to the left bank of the river only. Principal elements of the field assessment will include general observations of the site conditions, as well as identifying the boundaries of the OHWM using field indicators.

Through our experience, we understand mitigation maybe required to offset a potential impact of the proposed project. Mitigation may include either restoring, and/or enhancing the riparian and aquatic habitat and invasive removal. If the presence of wetlands is determined, and more importantly, impacts to those identified wetlands and aquatic habitat cannot be avoided, 48 NORTH will prepare a conceptual wetland and aquatic resources mitigation plan. It is assumed that structures will be placed primarily for bank stabilization and river bank protection and these impacts need to be mitigated and depending on the size of the proposed impacts, we will assess the potential mitigation alternatives including enhancement and/or restoration of nearby wetland area, creation of wetlands, invasive plant removal, riverbank or side-channel restoration and/or the use of a wetland mitigation bank.

Upon completion of our delineations, 48 NORTH will prepare one CAR, inclusive of both Phase 1 and 2, including findings of our wetland/OWHM delineations and a Conceptual Mitigation Plan. The CAR will also include a description of the aquatic and terrestrial resources at the site, photographs, and vegetation and soil characteristics of the area, and a description of the mapped critical area boundaries. 48 NORTH's wetland staff will develop a conceptual mitigation plan for the City that will describe temporary and permanent wetland and aquatic impacts and present an overview of possible mitigation solutions to provide compensatory mitigation for wetland and aquatic impacts from the proposed project. The alternatives in this conceptual mitigation plan will be developed using *Wetland Mitigation in Washington State Part 2: Developing Mitigation Plans* (Ecology et al., 2006) and the *Wetland Rating System for Western Washington* (Ecology 2014 Update).

Prior to submittal, 48 NORTH will submit one (1) draft copy of the CAR and Conceptual Mitigation Plan in Word format to NHC for review, along with pdfs of the final report. A printed copy of this report will be included in the JARPA submittal(s) as an appendix.

### Task 3: Endangered Species Act Consultation (Optional – Depending on USFWS requirements)

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure actions it authorizes, or permits are not likely to jeopardize the continued existence of listed species or adversely modify designated critical habitats. To meet ESA requirements, agencies review the likely effects of their projects in consultation with the National Marine Fisheries Service (NMFS) and/or USFWS, commonly referred to as the "Services". The Services share responsibility for administering Section 7 of the ESA.

Consultation with the Services may be required if the project requires a federal permit from the USACE, which is considered a federal nexus. Projects that have a federal nexus (i.e., receive federal funds, occur on federal lands, or require federal permits or approval) trigger the completion of Section 7 consultation with the Services.

Consultation under the ESA would require the City to submit either a letter of "no effect" or request a Biological Assessment (BA) for informal (determination of "may effect, is not likely to adversely affect"), or formal consultation (determination of may affect, is likely to adversely affect") to the Services. The USACE is responsible for initiating and coordinating the consultation process and obtaining the Services concurrence. The City is responsible for preparing either a "letter of no effect" or a BA to address the potential impacts and possible mitigation measures to offset these impacts.

The project is located upstream of Snoqualmie Falls and does not contain any ESA-listed species and/or critical habitat overseen by NMFS but may contain ESA-listed species and/or critical habitat overseen by USFWS. As such, we assume there will be no consultation with NMFS. Consultation requirements with the USFWS may include 1) an assessment of the proposed construction of the streambank stabilization and culvert replacement to determine the level of effect on ESA-listed species such as the marbled murrelet (or their designated critical habitat, which is found just west of the City in the Middle Fork Snoqualmie River basin), protected by the respective agencies, and 2) preparation of a letter (or report, depending on the level of effect) addressed to the Services requesting concurrence with the effect determination. The USACE will issue a permit once they receive concurrence from USFWS (amongst other items).

Working through the USACE, we will meet in person or communicate over the phone with the USFWS to discuss the Proposed Action. Following this, 48 NORTH will prepare the requested documentation, (BA, Letter of No Effect, or abbreviated Biological Evaluation [BE]) summarizing the potential impacts of the Proposed Action on ESA-listed species that may occur within the Project Area.

48 NORTH will prepare one (1) draft copy of the BA, Letter of No Effect, or abbreviated BE, inclusive of Phase 1 and 2, for internal review. Upon receipt of one (1) consolidated set of comments, we will then prepare a final document for submission to the USACE.

### Task 4: Mitigation Plan (Optional – Depending on Proposed Impacts)

Due to the uncertainty as to how much wetland and aquatic habitat could be impacted and the mitigation option(s) selected, we have costed the development of a Conceptual Mitigation Plan. Upon selecting a

mitigation alternative, 48 NORTH will develop a final Mitigation Plan that will outline how the City will compensate for the impacts of the identified wetlands and aquatic habitats and increase the net wetland and aquatic habitat functions and values at a landscape level.

## PART 2: COST ESTIMATE AND ASSUMPTIONS

48 NORTH's Time & Materials estimate to complete the environmental permitting for the City's proposed combined embankment project (Phases 1 & 2) is $116,600 (Table 1). This cost estimate is net of any applicable Federal, state, and local sales taxes or fees. 48 NORTH's 2019 labor rates are presented in Table 2. These rates will be valid for the duration of the project. Our cost estimate does not include any payments for other federal, state, or local permitting costs, or other agreements.

A standalone permitting effort for Phase 1 is estimated to cost $72,000 ($42,500 for Tasks 1 & 2 and $29,500 for optional Tasks 3 & 4). A standalone permitting effort for Phase 2 is estimated to cost $114,000. Anticipated standalone permitting costs for Phase 2 would be larger due to a more complex project involving stormwater, wetland and other environmental impacts that would not be anticipated in the Phase 1 standalone permitting. A 60/40 cost share split was derived based on the anticipated cost if each project was permitted on its own.

**Table 1:** 48 NORTH's Time & Materials Cost Estimate Per Task for Combined Phase 1 and 2 Permitting Effort

| Task | Cost |
|---|---|
| Task 1: Permitting | $35,500 |
| Task 2: Field Surveys, CAR, Conceptual Mitigation Plan | $41,900 |
| Task 3: ESA Consultation (Optional) | $14,500 |
| Task 4: Mitigation Plan (Optional) | $25,000 |
| TOTAL | $116,600 |

**Table 2:** 48 NORTH's 2019 Professional Rates

| Labor Category | Rate/Hour |
|---|---|
| Principal Scientist | $156 |
| Senior Scientist | $143 |
| GIS Analyst | $126 |
| Associate Scientist II | $126 |
| Associate Scientist I | $111 |
| Junior Scientist | $ 96 |
| Field Technician II | $ 93 |
| Field Technician I | $ 74 |
| Accounts Specialist | $ 71 |

Other Direct Costs (out of pocket expenses), Travel, and Subcontractor costs are invoiced at actual plus 10%.

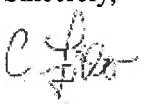
When costing this estimate, we made the following assumptions:

- Permitting effort and costs were estimated based on restoration design concepts identified by City staff in relation to the Riverwalk Master Plan and as outlined in the Berger Partnership Sandy Cove Phase 2 Schematic Plan.

- Permitting applications, reports, and other submittals (e.g., the JARPA and associated appendices, such as the delineation report) will combine Phases 1 and 2 of the Snoqualmie Riverwalk Master Plan elements into one submittal per agency to minimize costs and maximize effort for this project.
- Due to the project's location above the Snoqualmie Falls, we do not anticipate consultation with NMFS; however, USFWS may request consultation, or Best Management Practices, and a determination of impacts for Northern spotted owl and/or marbled murrelet. We have costed an abbreviated BE that can be later amended to a letter of No Effect upon consultation with USFWS. We have not costed the development of a fully expanded BA.
- The City will be the SEPA lead, not King County.
- A SEPA Checklist is sufficient and the project will not require a SEPA EIS.
- If required by the permitting agencies, a cultural resources report will be completed by a third party and will be provide to 48 NORTH for the permit application submittals.
- A Mitigation Plan for wetland, river and floodplain impacts may be required by the regulatory/local agencies. A Conceptual Mitigation Plan has been costed and a final Mitigation Plan has been costed as optional in Task 4. Mitigation Plan cost is only an estimate as impacts to critical areas have yet been determined.
- NHC will provide all JARPA-formatted figures to support permit applications.
- In an effort to minimize costs and maximize effort, permit tracking will be limited to teleconferences, phone calls, and electronic mail correspondence with regulatory agencies only.
- This cost estimate does not include additional agency/stakeholder meetings to address significant changes to the JARPA submittal and/or agency comments; or substantial project changes that may require modifying the JARPA.

We appreciate the opportunity to submit this proposal and look forward to continuing to support NHC and the City on this project. If you have any questions or would like to discuss this proposal further, please contact Bill Mavros at (206) 637-5442 or via e-mail at bmavros@48northsolutions.com.

Sincerely,



Cameron Fisher
Principal, Aquatic Lead
48 North Solutions, Inc.

## Attachment B

Sub-consultant Stell's Scope and Fee Estimate

STELL

September 24, 2018

Northwest Hydraulic Consultants
12787 Gateway Drive South
Seattle, WA 98168
ATTN: Mr. Derek Stuart P.E., Principal
DStuart@nhcweb.com

RE: Request for Proposals (RFP)---Sandy Cove Phase 2 Bank Restoration in Snoqualmie - Cultural Resources Assessment

Dear Mr. Stuart:

Enclosed please find Stell's proposal in response to the request for additional information.

Stell is a woman-owned and veteran-owned small business specializing in environmental and planning consulting services. Established in 2004, our professional staff of more than 100 archeologists, scientists, engineers, planners, and geologists has extensive experience complying with federal and state environmental laws and regulations. Over the past 6 years, Stell has provided more than $13 million in cultural resources program support to municipal, state, commercial, and federal clients. A sampling of these projects includes the following:

- Lower Big Quilcene River Floodplain Cultural Resources Assessment, Quilcene, WA
- Archaeological Field Investigations on Identified Lands of the Quileute Tribe, La Push, WA
- Cultural Inventory and Evaluation at the Turn Point Lighthouse on Stuart Island, WA
- Archaeological Monitoring for the Elliott Bay Seawall Replacement Program, Seattle, WA
- Archaeological Data Recovery Excavation at 45WH265 and the Large Woody Debris Corral Survey, Ross Lake National Recreation Area, WA
- Cultural resources investigation activities supporting several Washington State Department of Transportation fish passage projects, WA

In support of the Sandy Cove Phase 2 Bank Restoration in Snoqualmie Cultural Resources Assessment, we offer Sarah Steinkraus, MSc, RPA as our project manager. Resumes for Ms. Steinkraus and Mr. Timothy Gerrish are provided as Attachment 1. This proposal offers two separate price estimates:

1) **Project Management, Background Research and Desktop Literature Review, and Technical Report**;

If it is determined that a cultural resources survey is required, the following tasks will be required:

2) **Project Management, Background Research and Desktop Literature Review, Cultural Resources Survey, and Technical Report.**

Stell archaeologists will perform the following tasks to satisfy requirements set forth in local King County ordinances and Washington's State Environmental Policy Act (SEPA):

## Scope of Work

**Task 1 – Project Management** – Stell emphasizes the importance of strong and effective project management, as it provides the foundation for successful project execution. Furthermore, Stell recognizes that the Project pre-construction stage is a particularly dynamic phase, where clear communication, dissemination of information to

team members, and prompt implementation of appropriate compliance requirements are critical for the success of the Project. Stell project manager, Ms. Sarah Steinkraus, will serve as the single point of contact.

**Task 2 - Background Research and Literature Review and Desktop Review and Report**. Pertinent literature on the archaeology, ethnography, and history of any given project area will be reviewed to determine the probability for archaeological resources and traditional cultural properties in the project area. Previous cultural resources studies, historic building and structure inventories, ethnographies, local histories, historic maps, as well as records held by the Washington State Department of Archaeology and Historic Preservation (DAHP) will be consulted.

At this phase, the project area will need to be determined. An Area of Potential Effect (APE) letter will be written by Stell to provide a brief project description, level and amount of acreage proposed for ground-disturbing activities and a project vicinity map. A request will be made in the letter to the involved state agency and affected Native American tribes for concurrence on the proposed project area. For archaeological resources, the typical project area includes the vertical and horizontal extent of proposed construction excavation plus associated laydown and staging areas. Once concurrence on the APE is agreed upon by the reviewing authorities, a process that takes a maximum of 30 days, fieldwork for the project can commence.

**Task 3 - Cultural Resources Survey (Price Estimate No. 2 only)**. Stell will conduct a systematic field survey to identify previously recorded and/or unrecorded archaeological resources where ground-disturbing activities are expected to take place. Field reconnaissance will include a series of pedestrian transects at varying intervals, depending on terrain and vegetation cover experienced across the project area. Shovel test probes will be excavated to a maximum depth of 100 centimeters across the entire project area approximately 20 meters (65 feet) apart. All sediment excavated from the shovel probes will be hand screened using ¼- inch hardwire mesh. A hand auger will be used to determine subsurface deposits deeper than 1 meter and will be used to a maximum depth of 3 meters. New archaeological sites will be mapped, photographed, and recorded on Washington State Archaeological Site Inventory forms. This assessment assumes that no more than one new archaeological site will be identified and recorded during the fieldwork. Previously documented sites within the project area will be relocated, revaluated for condition, and updated on a Washington State Archaeological Site Inventory Addendum Sheet. The Washington State Historic Inventory Database will be utilized to record the identified historic resources.

**Task 4 - Technical Report.** After the completion of the fieldwork, Stell will prepare a technical cultural resources report that meets state and federal standards for reporting as outlined in the guidelines provided by the DAHP. The technical report will describe the survey methods, summarize and interpret our findings, and provides management recommendations. The report will contain brief geological, prehistoric, and historical contexts for the area, as well as discussion of the fieldwork strategy employed, results, and field conditions. Stell will submit the report to Northwest Hydraulic Consultants and the DAHP.

The cost for Price Estimate No. 1 is **$6,873.71**. The cost for Price Estimate No. 2 will be **$9,051.98**.

Stell's proposed cost options for this project is provided as Attachment 2. The two pricings enclosed are based on the following assumptions:

- Northwest Hydraulic Consultants will provide all rights of entries.
- Weather conditions permitting, the cultural resources survey is scheduled to be completed in one (1) day and will commence within 30 days of notice to proceed (Price Estimate # 2).
- Not more than 35 shovel test probes will be excavated to a depth of no more than 100 centimeters (39 inches) below the ground surface (Price Estimate # 2).
- No historic buildings/structures over 50 years of age have been identified in the project area and therefore no buildings/structures will be inventoried as part of this assessment.
- Not more than one archaeological site will be recorded during fieldwork (Price Estimate # 2).

- Should archaeological testing for NRHP evaluation eligibility and/or data recovery efforts be determined necessary, a new scope and budget will need to be submitted.
- Human remains will not be encountered. If human remains are encountered, the King County Sheriff and Coroner will be immediately contacted. If the remains are determined to be not part of a criminal investigation and anthropological in nature, Washington Department of Archaeology and Historic Preservation forensic anthropologist Guy Tasa will be contacted immediately, as will be the affected Native American tribes.
- The draft technical report will be delivered for review to Northwest Hydraulic Consultants within 6 weeks of notice to proceed.
- The draft/final technical report will not exceed 30 pages of text (not including appendices) and five figures.
- The report will undergo one cycle of review and comment; Northwest Hydraulic Consultants will collate all comments into a single list for response by Stell.
- One hard copy of the final report will be delivered to Northwest Hydraulic Consultants within 1 week after receiving comments on the draft report.
- Stell staff will not require or need to provide project-specific training.
- Stell will provide cultural resources services under a firm-fixed price (or lump sum) contract.
- The scope and price quote are valid for 60 days from the date of this proposal letter.

Based on the above assumptions, this project is anticipated to take 35 days for pricing # 1, plus Northwest Hydraulic Consultants review time of the draft technical report. If a cultural resources survey is required, then this project is anticipated to take 60 days (pricing #2).

I look forward to the opportunity to support Northwest Hydraulic Consultants. Please contact me at (206) 351-7809 or tgerrish@stellee.com with any questions.

Best regards,

Tim Gerrish
Archaeologist

Attachments:

1.) Resumes of Key Personnel
2.) Price Estimate

STELL

# Sarah M.H. Steinkraus

*Archaeologist*

## EDUCATION

M.S. Forensic Anthropology, University of Central Lancashire, UK, 2008

B.S. Anthropology, Central Washington University, 2007

## REGISTRATIONS/ CERTIFICATIONS

Register of Professional Archaeologists

National Parks Service Managing Archaeological Collections Certificate

## PROFESSIONAL AFFILIATIONS

Association for Washington Archaeology

## TRAINING

CPR / AED Certification

WISAARD and OARRA Access

## INDUSTRY TENURE

10 years

## AREAS OF EXPERTISE

Phase I, II, III archaeological surveys and investigations

National Environmental Policy Act (NEPA) / Washington State Environmental Policy Act (SEPA)

Osteology

Historic property inventories

Lithic Analysis

## PROFESSIONAL EXPERIENCE

Ms. Steinkraus has 10 years of professional experience in cultural resource management including experience as a bioarchaeologist and technical writer and editor. She has conducted survey, testing, and excavation and assisted with osteological examinations of human remains for NAGPRA repatriation, mapping, and managing GIS data. Ms. Steinkraus has also been a Lecturer and Research Associate with the Anthropology Department at Central Washington University. Ms. Steinkraus has performed over 95 surveys and excavations in Washington, Oregon, Nevada, and Mexico. Her responsibilities include client coordination, project strategizing and planning, technical reporting and analysis, field data collection, supervising field personnel, osteological analysis, construction monitoring, precontact and historic-era artifact analysis, and artifact curation following federal guidelines.

## PROJECT EXPERIENCE - WASHINGTON

**Cultural Resources Assessment of the East Rutherford Street Project, Carnation, King County, Washington.** 2016. Project Archaeologist. H.W. Lochner contracted Tierra Right of Way to conduct a review, pedestrian survey, and subsurface sampling of along East Rutherford Street in Carnation, Washington in preparation for street improvement projects. Ms. Steinkraus conducted the fieldwork and prepared the report for the project.

**Lower Satsop Habitat Restoration Project, Grays Harbor County, WA.** 2018. Project Archaeologist. Washington Department of Fish and Wildlife contracted Tierra Right of Way to conduct a review, pedestrian survey, and subsurface sampling of a portion of the Satsop Unit of the Chehalis Wildlife Area. This project proposed to remove four man-made dykes an approximately 6-acre spoil pile from the construction of the Satsop Reactor in order to regrade the area to provide off-stream habitat for various fish species. Ms. Steinkraus conducted the fieldwork and prepared the report for the project.

**Lakewood Hatchery Electrical Improvements Project, Pierce County, WA.** 2018. Project Archaeologist. Washington Department of Fish and Wildlife contracted Tierra Right of Way to monitoring of electrical improvements for its Lakewood Hatchery facility. Ms. Steinkraus monitored trenching by a small backhoe for placement of electrical conduit, documented one archaeological site on WISAARD, and prepared the report for the project.

**WEYCO Fir Creek Fish Passage Project, Grays Harbor County, WA.** 2018. Project Archaeologist. Weyerhaeuser NR Company contracted Tierra Right of Way to conduct pedestrian survey and subsurface sampling along Fir Creek in order to facilitate the replacement of three culverts which inhibited access upstream to anadromous fish and replace these with a precast concrete bridge. Ms. Steinkraus conducted the fieldwork and prepared the report for the project.

**WEYCO Little North River Tributary Fish Passage Project, Grays Harbor County, WA.** 2018. Project Archaeologist. Weyerhaeuser NR Company contracted Tierra Right of Way to conduct pedestrian survey and subsurface sampling along a tributary of the Little North River in order to facilitate the replacement of two culverts which inhibited access upstream to anadromous fish and replace these with a precast concrete bridge. The new bridge was to be placed above historic-era railroad bridge abutments. Ms. Steinkraus conducted the fieldwork and prepared an HPI form on WISAARD as well as the report for the project. Ms. Steinkraus provided communication and updates with the Washington State Recreation and Conservation Office (funding agency) and the Department of Archaeology and Historic Preservation to expedite the determination of eligibility process for the historic property onsite so that the project could continue in a timely manner.

**Samish Fish Hatchery Intake Project, Skagit County, WA.** 2017. Project Archaeologist. Washington Fish and Wildlife contracted Tierra Right of Way to conduct pedestrian survey, subsurface sampling, and historic properties documentation at the Samish Fish Hatchery release facility prior to improvements to the facility. Ms. Steinkraus conducted pedestrian survey, oversaw the subsurface sampling, documented all historic properties on HPI forms for WISAARD, and prepared the report for the project.

**Mopang Creek Fish Barrier Correction Project, Grays Harbor County, WA.** 2017. Project Archaeologist. Chehalis Basin Fisheries Task Force contracted Tierra Right of Way to conduct pedestrian survey and subsurface sampling for the replacement of a culvert along Mopang Creek that was inhibiting access upstream to multiple anadromous fish species. Ms. Steinkraus conducted pedestrian survey, subsurface sampling, and prepared the report for the project.

**Lower Russell Road Levee Setback Project, King County, WA.** 2018. Project Archaeologist. HDR, Inc. contracted Tierra Right of Way to conduct deep (three meters) subsurface sampling for a 75-acre project along the Green River along Russell Road in Kent. King County proposed to move the Russell Road Levee inland in order to create more wildlife areas in this location including fish habitat. Ms. Steinkraus conducted and oversaw fieldwork; documented multiple, large sites within the project area on archaeological site forms on WISAARD; analyzed historic artifacts including flaked glass tools; and prepared the report for the project.

**Kalama Falls Fish Hatchery Phase 2 Project, Cowlitz County, WA.** 2016. Project Archaeologist. Washington Department of Fish and Wildlife contracted Tierra Right of Way to conduct an 18.9-acre pedestrian survey, subsurface survey, documentation of built environment, and a final report for improvements planned to the Fish Hatchery facility. Ms. Steinkraus conducted the built environment documentation and prepared the report for the project.

**Corson Wildlife Area Culvert Removal Project, Snohomish County, WA.** 2016. Project Archaeologist. Washington Department of Fish and Wildlife contracted Tierra Right of Way to conduct pedestrian survey and subsurface sampling for the replacement of multiple culverts within the Corson Wildlife Area. Ms. Steinkraus conducted pedestrian survey, subsurface sampling, and prepared the report for the project.

**Weyerhaeuser-Middle Fork Satsop Passage Project, Grays Harbor County, WA.** 2016. Project Archaeologist. Weyerhaeuser NR Company contracted Tierra Right of Way to conduct pedestrian survey and subsurface sampling for the replacement of a large culvert along the Middle Fork Satsop River that was inhibiting the upstream access of multiple anadromous fish species. Ms. Steinkraus conducted pedestrian survey, subsurface sampling, and prepared the report for the project.

STELL

# Timothy Gerrish

*Archaeologist*

## EDUCATION

B.A. Anthropology, University of Washington, 2007

## REGISTRATIONS/ CERTIFICATIONS

American Academy of Underwater Sciences Certified Scientific Diver

Rescue SCUBA Diver, Professional Association of Diving Instructors

Washington State Boater Education, U.S. Power Squadron

## PROFESSIONAL AFFILIATIONS

American Academy of Underwater Sciences, Friday Harbor Laboratories, University of Washington

Underwater Archaeological Society of British Columbia

Association for Washington Archaeology

## TRAINING

OSHA 40-Hour HAZWOPER

Nautical and Foreshore Archaeological Field Methods

First Aid / CPR / AED / Emergency Oxygen Administration / Neurological Assessment for divers

## INDUSTRY TENURE

10 years

## AREAS OF EXPERTISE

Phase I, II, III archaeological surveys and investigations

National Environmental Policy Act (NEPA) / Section 106 of the National Historic Preservation Act (NHPA)

Historic property inventories

Archaeological monitoring

Lithic Analysis

## PROFESSIONAL EXPERIENCE

Mr. Gerrish has 10 years of professional experience in cultural resource management and serves as project manager. He has been coordinating with clients and developing strategies to assist in the successful completion of projects using his expertise in field survey methods, data recovery, and laboratory analytic techniques. He has conducted cultural resource inventories, including intensive and reconnaissance-level pedestrian surveys and data recoveries, throughout the Pacific Northwest. Mr. Gerrish has performed over 90 surveys and excavations in Washington, Oregon, Montana, California and Corsica, France. His responsibilities include client coordination, project strategizing and planning, technical reporting and analysis, field data collection, supervising field personnel, construction monitoring, lithic analysis, and artifact collection curation following federal guidelines.

## PROJECT EXPERIENCE

**Cultural Resources Assessment of the Hancock and Calligan Creek Hydroelectric Project, FERC Nos. P-13994 and P-13948, King County, WA.** 2011. Mr. Gerrish was field director for the cultural resources survey of two 18-acre alignment parcels along Calligan and Hancock Creeks north of North Bend in King County, Washington. The assessment consisted of a pedestrian and subsurface survey within areas of remote and rugged geography. A total of 8 acres of proposed enhancements were surveyed and 111 STPs were excavated with no observed cultural materials. Key stakeholders included Snohomish County Public Utilities District, King County, and the Snoqualmie Indian Tribe.

**Snoqualmie Transmission Line Survey, King County, WA** 2008. Archaeologist. Performed a cultural resources assessment which included pedestrian and subsurface testing of a transmission line corridor near Carnation, Washington.

**City of Redmond Driver's Club Project Cultural Resources Survey, King County, WA** 2016-2017. Supervisory Archaeologist. Under contract with Shotgun Creek LLC, Mr. Gerrish was project manager and performed an updated cultural resources assessment of the Project parcel. Mr. Gerrish conducted the fieldwork for this effort and drafted the technical report which recommended that no historic properties were subject to effect.

**Jefferson County Public Health: Lower Big Quilcene River Floodplain Cultural Resources Assessment, Quilcene, WA.** 2017-2018. Jefferson County Public Health (County) has contracted with Stell to conduct a cultural resources assessment for the Lower Big Quilcene Floodplain Project. This project is being funded by a Recreation and Conservation Office grant and falls under the auspices of the State Environmental Policy Act. The project includes seven parcels containing a variety of structures, trailers, solid waste, and containers which will be demolished and removed as part of the floodplain enhancement. This assessment includes pertinent background literature review, field survey, inventory of two historic properties, and a final technical report.

**McSorley Creek Pocket Estuary Restoration Project at Saltwater State Park, King County, WA** 2016-present. Supervisory Archaeologist. Washington State Parks and King County Department of Natural Resources and Parks (King County) are collaborating on a feasibility study to restore the estuary and lowermost reaches of McSorley Creek which flows through Saltwater State Park into Puget Sound. The Project involved an initial exploration which contributed to the feasibility study. Mr. Gerrish is consulting with Confluence Environmental Company in the delivery of Section 106 of the National Historic Preservation Act compliant documents which include an Archaeological Monitoring Plan and Inadvertent Discovery Plan.

**U.S. Army Corps of Engineers (USACE) Seattle District: Howard Hanson Dam Archaeological District Data Recovery, Site Monitoring, and Cultural Resource Survey, King County, WA.** 2010-2015. Archaeologist and assistant project manager. Participated in development a Plan of Action according to the USACE performance work statement detailing our approach to handling data recovery activities, site monitoring, and an archaeological pedestrian survey within and adjacent to the NRHP-eligible Howard Hanson Dam Archaeological District (DT 184).

During the reconnaissance survey, archaeologists documented a previously unrecorded archaeological site in peril from erosion of a cut bank overlooking the historic channel of the Green River. Emergency excavation on what would later be identified as 45KI1083 (the Eagle Gorge Terrace Site) recovered significant amount of precontact lithic material, burnt animal fauna, at least two fire modified rock hearths, and a radiocarbon date estimating the site's age at 800 to 1,000 years before present. Post-fieldwork analysis on the recovered archaeological material included an inventory and evaluation of both the stone tool and faunal assemblages, blood residue analysis on selected diagnostic stone tools, and obsidian hydration results from recovered obsidian. Other activities executed between 2011 and 2015 included archaeological testing at six pre-contact sites, site monitoring of 19 pre-contact, historic, and multicomponent sites; and archaeological survey of over 300 acres. During the survey, documented 18 new isolated finds and 13 newly discovered archaeological sites.

The final report also recorded the demonstrative effects of erosion on this site, revealing that between 2011 and 2014 one meter of terrace edge was been lost due to erosion, and highlighted the potential for site loss based on an analysis of historic trends in reservoir levels. Recommendations were made for excavations that would build on previous work and target areas most in danger.

**Issaquah Creek Integrated Fish Passage Project, Issaquah, WA** 2012. Supervisory Archaeologist. Conducted the field survey effort for mitigation of a fish passage project at the historic Issaquah Creek Diversion Dam. Additionally, a survey of the project area was conducted which included shovel testing areas of high probability. Work was performed under a Memorandum of Agreement between USACE, the Washington State Department of Archaeology and Historic Preservation, the City of Issaquah, the Washington Department of Fish and Wildlife, and the Muckleshoot Indian Tribe. The MOA was developed to mitigate construction of a fish passage at the dam, resulting in the dam's removal and reconstruction.

**Site 45KI757 Archaeological Data Recovery, WSDOT, King County, WA.** 2009. Archaeologist. Participated in the fieldwork for a small-scale archaeological data recovery along Interstate 405. The site contained only one artifact, an isolated Olcott projectile point, so the project was salvaged by conducting an analysis of all confirmed isolated Olcott points in the region, which produced a model of early/middle Holocene hunting practices. Work included interaction with the Snoqualmie tribe.

| | Home or Client | BASE YEAR | Unit | Task 01: Project Management | | Task 02: Background Research and Literature Review | | Task 03: Site Visit | | Task 04: Technical Report | | Summary | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LABOR CATEGORIES / EMPLOYEE NAME** | | | | **Hrs** | **Cost** | **Hrs** | **Cost** | **Hrs** | **Cost** | **Hrs** | **Cost** | **Hrs** | **Cost** |
| Project Manager / Sarah Steinkraus | Home | $ 96.10 | HR | 4 | $ 384.40 | 14 | $ 1,345.40 | 6 | $ 576.60 | 12 | $ 1,153.20 | 36 | $ 3,459.60 |
| Archaeologist / Tim Gerrish | Home | $ 86.80 | HR | | $ - | | $ - | | $ - | 4 | $ 347.20 | 4 | $ 347.20 |
| Archaeologist / Mark Steinkraus | Home | $ 94.22 | HR | | $ - | 8 | $ 753.76 | | $ - | 10 | $ 942.20 | 18 | $ 1,695.96 |
| GIS Specialist / Andrew Tuleya | Home | $ 77.50 | HR | | $ - | 2 | $ 155.00 | | $ - | 4 | $ 310.00 | 6 | $ 465.00 |
| Editor / Lisa Oliver | Home | $ 59.12 | HR | | $ - | | $ - | | $ - | 4 | $ 236.48 | 4 | $ 236.48 |
| | | | HR | | $ - | | $ - | | $ - | | $ - | 0 | $ - |
| | | | | **4** | **$ 384.40** | **24** | **$ 2,254.16** | **6** | **$ 576.60** | **34** | **$ 2,989.08** | **68** | **$ 6,204.24** |
| **TRAVEL & ODC COSTS** | | **Rate** | **Unit** | **Qty** | **Cost** | **Qty** | **Cost** | **Qty** | **Cost** | **Qty** | **Cost** | **Qty** | **Cost** |
| **ODC Subtotal** | | | | | $ - | | $ - | | $ - | | $ - | | $ - |
| SUBS | | | | | | | | | | | | | |
| SUBS | | | | | | | | | | | | | |
| **Sub Subtotal** | | | | | $ - | | $ - | | $ - | | $ - | | $ - |
| **Sub/ODC G&A** | | **8.78%** | | | $ - | | $ - | | $ - | | $ - | | $ - |
| Mileage | | $ 0.545 | mile | | $ - | | $ - | 90 | $ 49.05 | | $ - | | $ 49.05 |
| **TRAVEL** | | | Per | | $ - | | $ - | | $ 49.05 | | $ - | | $ 49.05 |
| **Sub/ODC/Travel Subtotal** | | | | | $ - | | $ - | | $ 49.05 | | $ - | | $ 49.05 |
| **Profit/Fee (on Labor)** | | **10.0%** | | | $ 38.44 | | $ 225.42 | | $ 57.66 | | $ 298.91 | | $ 620.42 |
| **Total Price** | | | | | **$ 422.84** | | **$ 2,479.58** | | **$ 683.31** | | **$ 3,287.99** | | **$ 6,873.71** |

| | Home or Client | BASE YEAR | Unit | Task 01: Project Management | | Task 02: Background Research and Literature Review | | Task 03: Cultural Resources Survey | | Task 04: Technical Report | | Summary | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LABOR CATEGORIES / EMPLOYEE NAME** | | | | Hrs | Cost | Hrs | Cost | Hrs | Cost | Hrs | Cost | Hrs | Cost |
| Project Manager / Sarah Steinkraus | Home | $ 96.10 | HR | 4 | $ 384.40 | 14 | $ 1,345.40 | 10 | $ 961.00 | 14 | $ 1,345.40 | 42 | $ 4,036.20 |
| Archaeologist / Tim Gerrish | Home | $ 86.80 | HR | | $ - | | $ - | 10 | $ 868.00 | 8 | $ 694.40 | 18 | $ 1,562.40 |
| Archaeologist / Mark Steinkraus | Home | $ 94.22 | HR | | $ - | 8 | $ 753.76 | | $ - | 12 | $ 1,130.64 | 20 | $ 1,884.40 |
| GIS Specialist / Andrew Tuleya | Home | $ 77.50 | HR | | $ - | 2 | $ 155.00 | | $ - | 4 | $ 310.00 | 6 | $ 465.00 |
| Editor / Lisa Oliver | Home | $ 59.12 | HR | | $ - | | $ - | | $ - | 4 | $ 236.48 | 4 | $ 236.48 |
| | | | HR | | $ - | | $ - | | $ - | | $ - | 0 | $ - |
| | | | | **4** | **$ 384.40** | **24** | **$ 2,254.16** | **20** | **$ 1,829.00** | **42** | **$ 3,716.92** | **90** | **$ 8,184.48** |
| **TRAVEL & ODC COSTS** | | **Rate** | **Unit** | **Qty** | **Cost** | **Qty** | **Cost** | **Qty** | **Cost** | **Qty** | **Cost** | **Qty** | **Cost** |
| **ODC Subtotal** | | | | | $ - | | $ - | | $ - | | $ - | | $ - |
| SUBS | | | | | | | | | | | | | |
| SUBS | | | | | | | | | | | | | |
| **Sub Subtotal** | | | | | $ - | | $ - | | $ - | | $ - | | $ - |
| **Sub/ODC G&A** | | **8.78%** | | | $ - | | $ - | | $ - | | $ - | | $ - |
| Mileage | | **$ 0.545** | mile | | $ - | | $ - | 90 | $ 49.05 | | $ - | | $ 49.05 |
| **TRAVEL** | | | Per | | $ - | | $ - | | $ 49.05 | | $ - | | $ 49.05 |
| **Sub/ODC/Travel Subtotal** | | | | | $ - | | $ - | | $ 49.05 | | $ - | | $ 49.05 |
| **Profit/Fee (on Labor)** | | **10.0%** | | | $ 38.44 | | $ 225.42 | | $ 182.90 | | $ 371.69 | | $ 818.45 |
| **Total Price** | | | | | **$ 422.84** | | **$ 2,479.58** | | **$ 2,060.95** | | **$ 4,088.61** | | **$ 9,051.98** |

## Attachment C

Sub-consultant KPFF's Scope and Fee Estimate (example from similar task on River Street Embankment Project)

1601 Fifth Avenue, Suite 1600 Seattle, WA 98101 206.622.5822 kpff.com

January 14, 2019

Mr. Derek Stuart, PE, Principal
Northwest Hydraulic Consultants
12787 Gateway Drive South
Seattle, WA 98168

Subject: River Street Bank Protection
Specification Review and Assembly Fee Proposal

Dear Mr. Stuart:

We appreciate the opportunity to provide consulting services for the project referenced above. The project intends to provide the survey and design documents for stream bank stabilization along a portion of the Snoqualmie River near River Street, as generally shown in the NHC proposal sketch.

The City of Snoqualmie (City) will then provide the design documents to potential bidders for pricing, permitting and construction.

This proposal is provided for general review and consultation services as it relates to the Division 01 Specifications required for the work. We also understand that NHC would like KPFF to compile the specifications and format the specification documents into one complete specification for the City's use in bidding the work.

## *SCOPE OF WORK*

Our scope of work as we understand it is as follows:

### *MEETINGS AND COORDINATION*

- Attend one Kick-Off Meeting.
- Call into team coordination calls on an as-needed basis (six calls).
- Attend two City comment review meetings (90% and Final).

### *BID SUPPORT*

- Coordinate specification questions developed by contractors during the bid process for the Division 01 Specifications.
- Revise the design specifications as needed to reflect clarifications during contractor bidding.

***DIVISION 01 SPEC AND SPEC DELIVERABLES ASSEMBLY***

- The project specifications will be compiled for 90% and Final design submittals as listed in the NHC proposal in PDF format.
- KPFF will review and provide a comment matrix with proposed corrections for the Division 01 Specifications.
- Recommendations for specification editing, including draft language will be provided based on comments for the City's use.

## *ASSUMPTIONS*

- We understand that specification sections outside of Division 01 will be provided by NHC to KPFF and that those sections will not require review.
- The necessary Division 01 specifications will be provided from the City for our use in word format.
- Specification Sections provided by others will be in CSI format and will not require formatting over and above compiling the sections into different document types (ie: ready for transition from word to pdf file types).
- Project design, design drawings and design review will be by others.
- Permit documentation, execution and review will be by others.
- Design scheduling and management will be by others.
- Construction cost estimates will be prepared by others
- Input regarding permitting and administrative requirements needed in the Division 01 Specifications will be provided by others for our use.
- All deliverables will be in digital formats. Printing will not be required.

## *FEE*

We propose to accomplish the above scope of services on a lump-sum basis for the following total estimated fee, in accordance with the enclosed Terms and Conditions, which are made part of this proposal:

| | |
|---|---|
| Meetings | $ 2,400 |
| Bid Support | 2,500 |
| Division 01 Spec Review | 3,500 |
| ***Civil Fee Total*** | ***$ 8,400*** |

Expenses, such as mileage, are included in this fee. We will not exceed the total estimated fee without prior approval.

We look forward to working with you on this project. If this letter of agreement meets with your approval, please sign below and return one copy for our files. If you have any questions, please contact me at (206) 622-5822.

Sincerely,

David E. Schwartz, PE, LEED AP
Principal

ERL:des:heh

Enclosure

65400

Approved by: _____ Date: _____
Northwest Hydraulic Consultants