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## **Exhibit A-1**

### **Scope of Work**

Kersh-Wishkah Flood Levee  
Grays Harbor County, WA

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## **SCOPE OF WORK**

### **Kersh-Wishkah Flood Levee**

### **Grays Harbor County, Washington**

#### **1.0 ESTABLISH GOALS AND DESIGN CRITERIA AND REVIEW EXISTING INFORMATION**

Meet the project stakeholders, establish goals and design criteria to be used, gather available data, report on data gaps, and finalize data gathering plan.

##### **Task 1.1 Establish Goals and Design Criteria**

Attend a 1 day meeting, including site visit, to meet Grays Harbor County (County) and other stakeholders, organized by County. Goals of the meeting will be to:

- Gain an understanding of site specific concerns and site issues;
- Understand the frequency and ramifications of the flooding problems;
- Establish appropriate level(s) of protection for the design alternatives to achieve;
- Establish desired level of design detail to be provided; and
- Establish timeline for data gathering, performing analyses, reporting results.

Deliverables:

Design team will submit a memorandum summarizing the goals and design criteria.

Assumptions:

A one-day visit to County office and site will be made. The Consultant attendees will likely be Ryan Bartelheimer (Project manager, AMEC), Vladimir Shepsis (Coastal Engineer, Coast & Harbor Engineers (CHE)), and Hari Sharma (Civil Engineer, Berglund Schmidt & Associates (BS&A)).

Schedule:

Notice to proceed: Estimated February 12, 2013

Meeting Date: Estimated February 22, 2013

Draft deliverable: Four business days after meeting date (Estimated March 1, 2013).

Final Deliverable: Two business days after receiving County comments (Estimated March 8, 2013)

## **Task 1.2    Review Existing Information**

Perform a review of readily available information, including

- Landowner petition and accompanying materials
- Anecdotal information on flooding history, road settlement, and road maintenance
- Soils and geology maps and information
- Public Works records
- Parcel boundary maps, records, and markers
- Historic photos
- Road, infrastructure, and utilities
- Maps
- Flood maps and profiles
- Topography
- Bathymetry
- Tidal modeling
- River modeling

Deliverables:

Design team will submit a memorandum including a list of information that was reviewed, with a preliminary summary of findings and a discussion of data gaps. In addition, the memorandum will recommend what additional data to collect within the project budget.

Assumptions:

Information gathering will include on-line searches, phone and e-mail interviews with County personnel, relevant agencies, and other stakeholders. This includes one visit to the County offices by AMEC, CHE, and BS&A.

Schedule:

Begin collecting data (after kick-off meeting):            Estimated February 25, 2013

Draft deliverable:        Five business days after finalizing deliverable in Task 1.1 (estimated March 15, 2013).

Final Deliverable:        Two business days after receiving County comments (Estimated March 22, 2013)

## **2.0 GATHER DATA AND EVALUATE PERMIT REQUIREMENTS**

Gather data and determine exemption thresholds and permitting pathways for the relevant federal, state, and local permits.

### **Task 2.1 Gather Topographic Data**

Call for a utility locate. Survey the marked utilities, road prism, property markers found, ditches, culverts, flap gates, high water marks, and other relevant features in the vicinity of the project.

#### **Deliverables:**

A basemap, stamped by a Professional Licensed Surveyor will be provided to County. All survey data will be collected in Autodesk Civil 3D-compatible data files and used by the design team in subsequent tasks.

#### **Assumptions:**

County and stakeholders will assist in procuring permission to collect survey data on private property, where data is needed for the project. Geotechnical investigation sites may need to be surveyed in a subsequent visit if drilling has not been completed by the time of the survey field work. County and team will review draft deliverable and provide comments to surveyors.

#### **Schedule:**

Draft deliverable (digital files and proof prints): March 15, 2013

Final Deliverable (revised digital files and stamped basemap): March 22, 2013

### **Task 2.2 Gather Bathymetric Data**

Survey the bathymetry of the Wishkah River to facilitate hydraulic modeling. Spot check overbank ground elevations in a few locations where vegetation is dense and compare results to the FEMA LiDAR elevation data. The desired locations and level of detail to be surveyed will be finalized by the design team after Phase 1 has been completed.

#### **Deliverables:**

All bathymetric survey data will be provided in Autodesk Civil 3D-compatible data files and used by the design team in subsequent tasks.

#### **Assumptions:**

Hydrographic surveyor will collect data as directed by design team.

Schedule:

Draft deliverable (digital files and proof prints): March 15, 2013

Final Deliverable (revised digital files): March 22, 2013

### **Task 2.3 Gather Geotechnical Information**

Drill exploratory bore holes in the vicinity of the road or proposed flood wall alignment. Compile data report, characterize the soil, and summarize the properties and constraints relevant to designing road improvements and constructing a new flood wall.

Deliverables:

Geotechnical constraints technical memo with boring logs.

Assumptions:

Drill up to three bore holes, located on the edge of Wishkah Road and/or in the likely alignment of a potential flood wall. Depth of borings will be a maximum of 50 feet, or less if drill refusal is encountered.

Schedule:

Drilling: Estimated March 20-22, 2013

Draft deliverable: Ten business days after drilling (Estimated April 5, 2013).

Final Deliverable: Two business days after receiving team and County comments (Estimated April 12, 2013)

### **Task 2.4 Evaluate Permit Requirements**

Determine permitting pathways and thresholds for permit exemptions for relevant federal, state, and local permits, given the nature of the expected alternatives. Summarize findings in a brief memo, including a tabular summary that lists the regulatory agency, point of contact, permit, exemption threshold, typical timeline for approval, typical cost, and comments.

Deliverables:

Brief memo with summary table.

Assumptions:

Information needed is available on-line from the various regulatory agencies.

Schedule:

Draft deliverable: April 12, 2013

Final Deliverable: To be incorporated into the report later in the project

### **3.0 ENGINEERING ANALYSIS AND ALTERNATIVES DEVELOPMENT**

Based on the geotechnical and survey information, perform engineering analysis and develop three alternatives. Most likely the three alternatives will include 1) No action, 2) Road fill, and 3) Flood Wall. Model hydrology of river and extend an existing model from the mouth of the Wishkah River up to the project site. Using the updated model, develop the design water level at the project site and predict performance of the proposed flood protection alternatives. This phase also includes adding information needed by County to move the project to the next phase, including a scope and budget for the design and permits, along with a proposed schedule for completion. These products will be useful to County in obtaining funding and support to implement the project.

#### **Task 3.1 River Hydrology and Modeling**

The objective of this task is to develop the design water level at the project site and evaluate performance of the proposed flood protection alternatives for a range of return period events defined in the design criteria. The hydrology of the river and local drainages will be developed using the USGS regression method. Local tidal data will be processed and existing model outputs used to determine statistics for extreme high water events near the confluence with the Chehalis River. Data collected for the Grays Harbor Physical Dynamics Study in 1999 will be used for model verification. Project Team will extend the existing two-dimensional hydraulic computer model of Grays Harbor and tributaries upstream in the Wishkah River to include the area up to the upstream extent of the project area. Existing high water marks will be used to validate the model output at the project site. Project Team will then model the existing conditions and proposed flood protection alternatives for the agreed upon range of extreme flooding events in the design criteria. Project Team will extract water level data and velocity distribution data at discrete locations of interest from the model output.

##### **Deliverables:**

Work progress will be updated in regular communications. The results will be incorporated into the report described in a subsequent task.

##### **Assumptions:**

Streamstats will be used to develop hydrology of Wishkah River and local drainages. Gathered survey data will be used to update an existing model to compare the alternatives.

##### **Schedule:**

Draft deliverable: Model results used by design team, available within four weeks after gathering all existing and new data (Estimated April 19, 2013)

Final Deliverable: To be included in report described in a subsequent task

### **Task 3.2 Alternatives Development and Analysis**

Based upon the design criteria and results of previous tasks, develop feasible alternatives (a maximum of two in addition to the no action alternative) for flood reduction in the project area. One alternative will likely include raising the road and the other building a flood wall. Each alternative will include development of a typical preliminary cross-section, conceptual design detail, including scour protection (if required), and schematic plan view alignment. The alternatives will be drafted in Autodesk software. A conceptual level construction cost estimate and evaluation of expected maintenance requirements will be prepared. The costs and benefits of each alternative will be considered in the determination of the feasibility of each one.

Deliverables:

Alternatives Analysis Report.

Assumptions:

Three alternatives will be evaluated. The alternatives will likely include 1) No action, 2) Road fill, and 3) Flood Wall. The analysis will focus on differences between alternatives, including level of flood protection, permit requirements, order of magnitude cost estimate, feasibility, and risks.

Schedule:

Draft deliverable: May 17, 2013

Final Deliverable: One week after County review (Estimated May 31, 2013)

### **Task 3.3 Final Report**

Generate information needed by County to move the project to the next phase, including a scope and budget for the design and permits, along with a proposed schedule for completion. These products will be useful to County in obtaining funding and support to implement the project.

Deliverables:

Scope, recommended budget, and timeline for implementing future phases of the project.

Assumptions:

Scope, recommended budget and timeline will be developed using the best available information with input from County and based on professional judgment using available tools.

Schedule:

Draft deliverable: June 14, 2013

Final Deliverable: Two business days after County review (Estimated June 21, 2013)



## **4.0 PROJECT MANAGEMENT**

This task includes work relating to the successful management of the project, coordination of work with sub-consultants and other agencies, communications with County, project schedule, invoices, and other administrative tasks related to the project.

### **Task 4.1 Establish and manage prime contract and subcontracts**

Establish contract and complete set-up necessary to ensure proper recording, filing, invoicing, and reporting of items relevant to carrying out the project.

Deliverables:

Prime contract and subcontracts, with backup documentation as needed.

Assumptions:

The effort required to get the prime contract to the point of signature is not billable against the project. After the prime contract is in place, the effort needed to manage the prime contract and procure subcontractor services is billable against the project.

Schedule: Subcontracts in place within two weeks of prime contract (Estimated February 26, 2013). AMEC will issue a Notice To Proceed to contractors earlier if needed due to overall project schedule.

### **Task 4.2 Submit monthly invoices and progress reports**

Monthly invoices with progress reports will be prepared and sent. Reports will include a summary of overall budget used and remaining, along with the status of completion of tasks worked on during the reporting period. All invoices will include the backup documentation required under the contract.

Deliverables:

Monthly invoices and progress reports

Assumptions:

Estimated term of contract is February 12, 2013 to June 30, 2013

Schedule:

Technical tasks to be completed by June 21, 2013. Final invoices from subconsultants to be received by AMEC by June 26, 2013, with final invoice and report sent no later than July 5, 2013.

### **Task 4.3    Ongoing project coordination**

Regular bi-weekly phone calls between Project Manager and County, with participation from other team members on an as-needed basis.

#### **Deliverables:**

Bi-weekly calls with an agenda sent by e-mail at least a full business day before and a summary sent within a full business day after the call.

#### **Assumptions:**

Scope, recommended budget and timeline will be developed using the best available information with input from County and based on professional judgment using available tools.

#### **Schedule:**

Specific schedule for the calls, agendas, and summaries to be determined.