Memo

To	Russ Esses	AMEC#	3-915-17568-0
From	Ryan Bartelheimer	cc	Kersh-Wishkah Flood Levee Project Team
Tel	(425) 368-0980		
Fax	(425) 368-1001		
Date	March 5, 2013		

Subject Kersh-Wishkah Flood Levee Project Goals and Design Criteria

On February 21, 2013, Ryan Bartelheimer (AMEC Environment & Infrastructure, Inc.), Joel Darnell (Coast & Harbor Engineering, Inc.), and Hari Sharma (Berglund, Schmidt & Associates, Inc.) visited with Frank Kersh and Terry Willis at Frank's house and walked the Kersh-Wishkah Flood Levee Project site. We all subsequently met with you, Commissioner Cormier, and Al Smith later that evening.

The scope of work for this project identified the following goals and design criteria, which were discussed during that evening meeting:

- 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, and reporting results.

For convenience, the scope of work is reproduced as a stand-alone document and attached to this memorandum. This memorandum summarizes the discussion at the meeting regarding project objectives and limitations, specific concerns about the project, design criteria to be developed, and the anticipated project timeline.

PROJECT OBJECTIVES

Currently, Wishkah Road is frequently flooded, at times preventing emergency responders from travelling north of Baretich Road. Therefore, the primary project objective is to reduce flooding on Wishkah Road to facilitate emergency response. A secondary benefit of the project will likely be to reduce the frequency of flooding experienced in homes and properties located west of the roadway.

AMEC Environment & Infrastructure
11810 North Creek Parkway N
Bothell, Washington 98011
(425) 368-1000 Phone
(425) 368-1001 Facsimile
www.amec.com

PROJECT LIMITS

The project area for flood protection is limited to an approximately 2,700-foot-long segment of Wishkah Road approximately centered at the intersection with Frosty Road. Modeling and analysis will extend beyond the project area toward the river's mouth, but detailed results will be focused on the project area only.

SITE-SPECIFIC CONCERNS AND ISSUES

Participants at the meeting raised and discussed the following site-specific concerns regarding the project.

The Wishkah River flows very close to one part of the road; any design solution must consider potential long-term river migration and bank erosion.

Soils appear very soft in the project area, and wetlands are present along the east side of Wishkah Road. During the development of design alternatives, impacts to wetlands will be avoided to the extent possible. Where impacts are unavoidable, the project will be designed to minimize the impacts and consider likely mitigation requirements.

There is concern that buried intact wood (logs) could prevent sheet piling, or other types of piling, from being installed to the required depth. Geotechnical investigations that do not discover the presence of wood would not preclude the possibility of encountering wood or other obstructions during construction.

The existing road is above the grade of homes on the west side of the road in some places. Raising the road could result in unfeasibly steep driveways for some homes, depending upon the level of flood protection selected.

There is concern that flows from the local drainages west of the project area could contribute to localized flooding if the water levels in the river are high and the rainfall has been locally heavy.

Homeowners have indicated that the major flooding events have occurred during the King Tides even when the weather pattern had been relatively dry, as during the week of November 24, 2011.

The largest culvert (36-inch corrugated metal pipe) crossing the road has no flap gate, apparently due to WDFW concerns regarding fish passage. Floodwater therefore passes freely from Wishkah River through the culvert beneath the road and floods properties. Regardless of the level of proposed flood protection along the roadway, this existing culvert and others without functional tide gates must be addressed as sources of potential flooding.

Buildings and properties on the east side of the road would be excluded from flood protection for this project. It was mentioned that these properties should be purchased during a later phase of this project, presumably by Grays Harbor County.

Buried gas and water lines are present in the project area and must be considered in the alternatives analysis.

Floodwater has overtopped Wishkah Road severely enough to result in erosion on its western shoulder that required repair and maintenance.

Wishkah Road was previously raised in most of the project area, except for a section in the southern portion of the project area, which appears to be the lowest-lying section of road. The road was also realigned slightly eastward at the same time, which left the old roadside drainage ditch on the west side of the roadway in place, and created a new one about 15 feet farther east. The old ditch has been filled in by some landowners.

FREQUENCY AND RAMIFICATIONS OF FLOODING

Residents indicated that Wishkah Road floods two to three times each year. During these flood events, water from Wishkah River overtops the roadway to a depth that makes it impassible and floods adjacent properties on the west side of the road. Shallow flooding is very frequent (approximately 20 times last year, according to Frank Kersh) and appears to be caused primarily by high water levels at the river mouth, driven by tidal influences.

According to residents, the worst flooding on the road has been observed in the last 5 years with a maximum depth of about 2 to 3 feet on top of the road. Water depths are even greater in adjacent homes and yards, due to their lower elevations relative to the road, with water depths of up to 4 feet in some yards. Significant flood events were noted by residents on approximately the following dates:

- December 31, 2005
- December 5, 2007
- January 1, 2009 (Frank Kersh noted worst flooding in recent times)
- November 24, 2011

Some adjacent homes have experienced water levels above the lowest floor of the dwelling.

Emergency vehicles can travel through shallow water depths, but avoid using the road when the depth of water is more than about 1 foot.

FLOODING PROTECTION LEVELS

The design team will complete a preliminary cost/benefit analysis to determine the appropriate level of flood protection. Given the frequency of flooding noted above, we propose to consider flood levels with return periods ranging from 5 years to 100 years. Local sea level rise will be investigated and addressed as part of the cost/benefit analysis.

The County has indicated that if a sheet pile wall is constructed, the design should consider providing protection for up to the 100-year flood event.

DESIRED DESIGN LEVEL

During the evening meeting, it was commented that the closer the project comes to being "shovel ready," the better the chances of obtaining funding for future phases of the project. The Scope of Work indicates that the alternatives will include development of a typical preliminary cross-section, conceptual design detail including scour protection (if required), and a schematic plan view alignment within Autodesk software.

PROJECT TIMELINE

No concerns were expressed about the timeline identified in the scope of work. Bi-weekly project status calls are scheduled to occur on Mondays at 9:30 am, starting on March 11, 2013. Since no major objections or concerns were raised about the scope of work, the design team will continue with the activities identified in the scope of work in accordance with the project timeline.