REQUEST FOR PROPOSALS

Saco River Flood Hazard Reduction Study

Requested by:
Town of Bartlett – Board of Selectmen
May 1, 2019

Introduction:

The Town of Bartlett invites firms to submit engineering proposals for modelling, assessing, and proposing solutions for a 3-mile +/- section of the Saco River. While there are several specific areas of concerns within this section of the river, it is anticipated that the study will consider impacts on all properties along the entire reach and the long-term effect of the flood-control measures. As such, the study shall include a river morphology assessment in addition to hydraulic modeling. Any questions regarding this proposal or the study should be directed to the Selectmen's Office at (603) 356-2950 or email at selectmen@townofbartlettnh.org.

Background:

Flooding and erosion along the reach of the Saco River through Bartlett Village creates public safety hazards, damages infrastructure and property, and has adverse environmental impacts. The most significant problems are in the vicinity of the River Street Bridge where recent floods have over topped the roadway, eroded the embankment, inundated homes, and deposited large amounts of sediment in the river on the upstream side of the bridge. Of significance, properties on the north side of the river are inaccessible when the roadway or bridge are flooded or washed out since River Street and its bridge are the only access.

In an effort to alleviate some of these problems and repair some of the damage caused by Tropical Storm (TS) Irene:

- the river was dredged immediately upstream of the bridge
- a section of the south bank, upstream of the bridge, was rebuilt and armoured with where it had failed
- two 10-foot span concrete box culverts were installed (2015) through the northerly embankment of River Street since the bridge was deemed too narrow and the soil adjacent to the abutment washed out during TS Irene

Other new issues caused or exacerbated by the Fall 2017 storm and/or the Tropical Storm Irene improvements include:

- significant erosion immediately and further downstream of the new culverts at the River Street bridge
- partial or complete failure of other sections of the berm along the south bank
- significant erosion at the upstream end of the southerly berm where it meets the railroad grade -- leaving only a thread -- which appears to be a major threat to Bartlett Village should it fail
- reported erosion and failure of an existing berm along the northerly side of the river below the “Dugway”
- erosion of an abandoned private landfill downstream of the River Street bridge resulting in solid waste migrating into the river

The berms along the river have historically protected Bartlett Village and properties north of the river from floodwaters. Consequently, the town has applied to FEMA for grants to repair the berms and re-dredge the river upstream of the River Street bridge to restore the flood protection.

The existing berms and River Street bridge were originally built at a time when rivers were less understood and without the luxury of knowing the present-day climate conditions and trends. Also, nowadays there is far more construction along the river that needs to be protected, and many more homes on the north side for which access needs to be maintained.

Tentative Project Approach:

To identify the causes of flooding and erosion and develop recommendations for reducing these hazards, the Town expects that a study will be needed for approximately 3.0 miles of the Saco River. As shown in Figure 1, the study area would likely begin at the second iron railroad bridge (approximate GPS coordinates 44 04' 48.42" N and 71 18' 45.43") and end a point about 0.8 miles downstream from the River Street Bridge (approximate GPS coordinates 44 04' 49.77N and 71 16' 20.60" W).

Figure 1 – Study Area

It is expected that the study will include:

- Survey of river bathymetry and existing bridges;
- Flood frequency analysis;
- Hydraulic models simulating the bankfull and Tropical Storm Irene floods under existing conditions;
- Hydraulic models simulating the same flood events with the proposed FEMA-funded berm repairs completed;
- Identification of additional and/or alternative improvements aimed at reducing the depth and lateral extent of flooding;
- Assessment of river morphology and stability;
- Conceptual river restoration plan;
- Summary report documenting the study methods, results, and recommendations for reducing flood inundation and erosion hazards; and
- Presentation of the study results and recommendations at a public meeting in Bartlett.

Tentative Scope of Services:

1 – Existing Data Collection

Collect and review existing information to be used in the study including LiDAR data that is expected to be available for this project. Also collect recent and historic aerial photography, streamflow records from the USGS gauge at River Street, and available engineering and survey plans.

2 – Field Work

Perform additional field surveys as needed to supplement the LiDAR data including below-water riverbed topography, the geometry of the bridges, washed out sections of the berms, important geomorphic features (e.g. bankfull stage indicators), areas of active bank erosion and channel aggradation/degradation. Also, collect riverbed samples as necessary for channel morphology and stability assessments (see item 9).

3 –Base Map Compilation

Compile the field survey and LiDAR data into a single terrain model and create a base plan. The base shall be in State Plane coordinates and NAVD88 elevations.

4 – Flood Frequency Analysis

Perform a flood frequency analysis for bankfull and flood-stage (e.g. 100-yr, 500-yr) events based on:

- USGS stream gage data couple an established flood-frequency analysis method.
- Compared to the online USGS StreamStats application.

5 – Base Hydraulic Modeling

Create and calibrate a computer model of the stream segment to identify the extent of flooding, inundation depths, flow velocity, and other hydraulic characteristics under existing conditions. It is expected that the river and floodplain will be modelled with 2D flow, except where this is not practical such as in pressure flow situations (e.g. submerged bridges, culverts, etc.)

Both bankfull and flood-stage events (TS Irene) shall be modelled. Calibrate both using peak flood stages measured at the gage and high water mark data where available.

6 – Hydraulic Modeling – Reflecting the Proposed FEMA-Funded Berm Repairs

Modify the base hydraulic model to include the proposed FEMA-funded berm repairs since they are likely to be built in the near future. The flood inundation results are to identify the effect of the berm repairs on the extent and depth of flooding within the study area under conditions similar to TS Irene.

7 – Identification of Flood Hazard Reduction Options

Based on the modelling above, identify the physical conditions which are acting to exacerbate flooding within the study area. Once these problem areas are identified, develop conceptual flood hazard reduction options for detailed study. These may include such improvements as enlarging the River Street Bridge, constructing additional waterway openings through the roadway embankment, lowering sections of River Street, relocating the dikes further from the river, removing existing or constructing new berms, armouring additional areas such as at the abandoned private landfill, etc. Solutions shall consider the impact of floating trees/debris, ice, etc. The goal is to identify cost-effective ways to alleviate flood damage within the entire river segment.

8 – Hydraulic Modeling of Flood Hazard Reduction Options

Modify the hydraulic models developed in items 5 and 6 to evaluate the flood-reduction effectiveness of the improvement options identified in item 7.

9 – Assessment of River Morphology and Stability

Using the river model and field data collected in item 2, assess the river morphology and stability. At minimum, it expected to include bedload sediment calculations, characterizing the channel morphology in both stable and unstable river segments, and assessing the lateral and vertical channel stability. It is also expected that the bankfull flood simulation will be used to identify areas of excessive or deficient flow velocity, depth, and shear stress. This work shall be summarized in layperson's terms by preparing a map identifying areas of active bank erosion, channel sediment accumulation and/or erosion, and lateral channel movement.

10 – Conceptual River Restoration Plan

Based on items 8 and 9, prepare a conceptual river restoration site plan illustrating the recommendations for reducing flood and erosion hazards and improving channel stability.

11 – Report

Prepare a report summarizing the study methods, results, and recommendations. The report shall include a narrative description, exhibits, documentation, and calculations in support of the findings and recommendations. Deliver three paper copies and one .pdf copy to the Town.

12 – Public Presentation

Present the study methods, results, findings, and recommendations at a public meeting in the town of Bartlett.

Proposal Requirements:

1. Proposals shall include the following.
2. General information regarding the qualifications and experience of personnel on this project.
3. Specific project experience completing similar river planning studies.
4. A scope of services identifying where it differs from the scope above.
5. Identification of specific methods and software programs that are proposed, including but not limited to, flood-frequency analysis, river modelling, and stream stability/morphology calculations and assessments.
6. A proposed schedule to complete the services.

7. Provide an hourly fee schedule and a spreadsheet of expected hours for each task. Said spreadsheet shall identify who will be performing each task and their rate.

Selection Criteria:

All responsive submittals will be evaluated based on the following criteria:

1. Qualifications of staff members and sub-consultants. The engineer certifying the study shall be a registered professional with at least 20 years of experience modelling rivers and performing geomorphic assessments. Preference will also be given to consultants for which the same engineer is responsible for certifying both the river modeling and geomorphic assessments.
2. Understanding of and ability to achieve the project objectives.
3. Responsiveness to Town's requirements reflected in the proposed approach/scope.
4. Ability to adhere to project schedule.
5. Fee estimate and ability to complete the work within the town's budget.

There will be an optional Pre-submission Site Review meeting held at the Glen Fire Station, 90 US Rt. 302, Bartlett, NH on Thursday, May 9, 2019 at 10AM for those interested. Please notify the Board of Selectmen by email at selectmen@townofbartlettnh.org if you plan to attend. The town will likely meet with the preferred consultant before the official selection is made.

Submission Information:

Proposals must comply with the following submission procedures:

1. Address And Deadline: **Sealed** proposals shall be submitted marked on the outside of the envelope:

Engineering Proposal
Saco River Flood Hazard Reduction Study

and addressed to:

Town of Bartlett
Office of Selectmen
56 Town Hall Road
Intervale, NH 03845

Proposals will be accepted until 1:00 pm on May 31, 2019. Faxed or emailed proposals will not be accepted.

2. Authorization: The proposal must be signed in ink by an authorized signer, or by an agent of the proposer legally qualified and acceptable to the proposer, and contain the printed names, titles, and business and post office address of both parties, if applicable.

3. Withdrawal Of Proposals: A proposer will be permitted to withdraw their proposal unopened after it has been deposited if such request is received in writing prior to the specified time it is to be received.

4. Reservation Of Rights: The Town of Bartlett reserves the right to reject any or all proposals, to waive technical or legal deficiencies, and to accept any proposal that it deems to be in the best interest of the Town. The offeror is solely responsible for the contents of their response to this request for proposal.

END OF RFP