

May 8, 2023

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Mr. Steven Masalin, P.E., Public Works Director
Town of Ledyard
741 Colonel Ledyard Highway
Ledyard, CT 06339

Re: Engineering Services – Whitford Brook Watershed Infrastructure Improvements
2023-07 - Our Reference No. 23016

Dear Mr. Masalin:

Wengell, McDonnell and Costello Inc. (WMC) respectfully requests the Town's consideration of this revised Fee Proposal for the referenced watershed infrastructure improvement project. The following is our proposed Project Approach and Fee Proposal:

Project Approach

WMC proposes the following methodology and approach to the evaluation of alternatives and the design of the watershed infrastructure improvements:

Phase I – H&H Modeling and Alternatives Evaluation

WMC proposes to use the HEC-HMS – USACE Hydrologic Engineering Center-Hydrologic Modeling System for modeling of the watershed and evaluating alternatives.

HMS is used to generate flow hydrographs, based on drainage area, soil types, and land use. For predicting runoff for specific flood events, such as the 1% annual chance (100-year), rainfall input is taken as the 100-year 24-hour rainfall depth, or some multiplier of that value, at the centroid of the drainage area in question. Rainfall data will be taken from Atlas 14 data, and will use the second quadrant 50% distribution curve to divide the total rainfall into discrete 30-minute sub-totals. Geographic information systems (GIS) software and data is key to obtaining data leading to defining sub-basin variable values.

The total drainage area is broken into sub-areas, as appropriate, for areas draining to the ponds, or areas draining to separate branches of the stream system. Separate inputs for each variable are defined for each sub-basin.

Stream reaches between sub-basins are included in an HMS model, and the time for a hydrograph to travel the length of the stream segment is calculated using one of the several routing options available.

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Specific to the Lantern Road project, the HMS model would terminate with alternative dam spillway configurations, and the model would be run for a number of simulations until the spillway configurations, as well as the interconnection between Bush and Long Pond, that perform most favorably could be selected.

Once the pond spillways sizing is fixed, discharge hydrographs from each pond can be transferred to a HEC-RAS model that will be used to select the appropriate bridge or culvert replacement structures at each downstream location.

As noted, alternative dam/spillway/watershed alternatives will be explored, and if technically feasible, preliminary cost opinions of the alternatives will be prepared. Additionally, permissibility of the alternatives will be evaluated, as well as any environmental concerns, such as species of special concern and a decision matrix can be prepared.

The model documentation and alternatives will be summarized in a report to the Town for consideration, following which (or at any time the Town desires) public/stakeholder input can be solicited.

Finally, an overall plan can be selected for implementation.

Phase II – Design of Improvements

Based upon the approach selected at the culmination of Phase I, design of improvements can be initiated. These improvements are assumed to be required as follows:

Dams

Bush Pond Dam & Dike including Hyde Mill Pentway

Long Pond Dam including incorporation of the proposed fish ladder

Culverts/Bridges

Connection between Long Pond and Bush Pond as an optional “add alternate”

Culvert downstream of Long Pond Dam on Lantern Hill

In general, the following tasks are anticipated for each project:

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- A. Borings, Topographic Survey, and Wetlands Mapping
- i. Test Borings - Schedule and conduct test borings to determine foundation conditions for construction of the dam, spillway and downstream culverts. WMC will coordinate such with the Town prior to bringing boring equipment on site.
 - ii. Survey - Perform a T-2 topographic survey to a contour interval of one foot of the dams, culverts and surrounding area. It is not apparent that the ponds can be readily drawn down, and WMC anticipates that the survey may require the services of a diver. To the extent possible, boundary information and roadway lines shall be included on the plan and any areas of boundary concern shall be brought to the attention of the Town.
 - iii. Wetland Mapping - Within the survey limits, WMC will delineate both Federal and State wetland limits as well as ordinary high-water levels. The wetland limits will be field surveyed and plotted on the project survey. An accompanying Soil Scientist's Report will also be prepared to support future permit applications.
- B. Semi-Final and Final Design - WMC shall provide engineering design services which shall include, at a minimum, collection of necessary data and meeting with representatives of the Town. Design shall include:
- i. Hydrology and Hydraulics - WMC will review available existing information on the hydraulic conditions of the dams and spillways and utilizing the model prepared in Phase I utilizing the HEC-HMS computer program, WMC will design the improvements. For each individual project, WMC will prepare a summary brief of the hydrologic and hydraulic investigations to facilitate DEEP review of the design.
 - ii. Design Plans - Based upon the above compilation of data and facts, WMC shall prepare semi-final design (70%) and final design plans. Copies of the design will be provided to the Town for review and revised, as needed, based on comments received.
- C. Preliminary Cost Estimate - Following completion of semi final and final design, cost estimates shall be prepared which shall include all design elements which were identified during the design process and discussed with Town staff. This shall also include an outline of necessary technical specifications and the identification of permits necessary to conduct the proposed work.
- D. Permitting - Prepare the following documentation and permit applications for approval:
- Local Wetland Permits (not required for dam projects which are governed by DEEP)
 - DEEP Dam Construction Permit Application - WMC will prepare for approval an application for a Dam Construction Permit, including the necessary attachments and supporting documentation.
 - DEEP Flood Management Certification for those projects requiring this certification
 - U.S. Army Corps of Engineers (ACOE) Preconstruction Notification (PCN) permit - WMC will prepare for approval an application for an ACOE PCN permit, including the necessary attachments and supporting documentation.
 - Engineering Design Report - WMC will prepare an engineering design report summarizing the hydrologic and hydraulic investigations, structural analyses and other relevant engineering information required for the DEEP Dam Construction Permit.

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Environmental Report - An environmental report, evaluating existing site conditions and proposed project impacts to such, will be prepared to support the permit applications.

DEEP Fisheries Coordination - WMC will submit preliminary design plans to DEEP Fisheries for initial review and address any comments as needed.

NDDB Coordination - It appears that the dams and culverts are within areas identified by the Natural Diversity Data Base as areas of potential concern. WMC will submit preliminary design plans to the DEEP NDDB for initial review and address any comments as needed.

SHPO Coordination - WMC will submit preliminary design plans to the State Historic Preservation Office for initial review and address any comments as needed.

THPO Coordination - WMC will submit preliminary design plans to the Tribal Historic Preservation Offices for initial review and address any comments as needed.

Invasive Plant Species Control Plan - For the purposes of U.S. Army Corps of Engineers permitting, WMC will prepare an invasive plant species control plan.

Planting Plan - Not included. If a planting plan is later required, the preparation of such would be an additional service.

Mitigation Plan - Not included. If mitigation is later required, the preparation of such plan would be an additional service.

Historical and Archaeological Report - Not included. If a historical and archaeological report is later required, the preparation of such would be an additional service.

- E. Public Meeting(s) - WMC will assist the Town in advertising and conducting public meeting(s). It is anticipated that at least one meeting per project will be required.
- F. Develop Bid Package/Bid Phase Services - Following review and discussion of prior submittals, WMC will prepare Construction and Bid Documents. Bid Phase services will include a site walk, responses to questions by prospective bidders, attendance and preparation of minutes of the bid opening and Bid Tabulation.
- G. Project Meetings, Administration & Miscellaneous - WMC will attend miscellaneous projects meetings and perform administrative and miscellaneous project related task as may be required by the Town and the DEEP.

Deliverables for Each Project

- Hydrology and Hydraulics Report including watershed modeling and alternatives
- Survey
- Test Boring Logs
- Federal/State Soil Scientist's Report
- Environmental Report
- Design (100%) Plans
- Final Construction Plans
- Technical Specifications
- Environmental Permit Applications
- Design Summary Report
- Bid Package



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Fee Proposal

Since there are many variables in terms of watershed alternatives, environmental impacts, structure types, permit requirements, etc. WMC proposes to complete the project on an hourly rate basis with not-to-exceed upset limits for each individual task/project.

As noted above, we recommend that the project be divided into two phases or stages. The first phase would include the hydrological and hydraulic evaluation including hydraulic model preparation and evaluation of watershed alternatives. Once through this initial phase, and the alternative(s) are chosen, then the scope of work could be revisited, better defined and lump sum or hourly rate fees could be finalized for each project.

WMC's proposed fee for Phase 1 is \$53,000. This Phase of the project can be completed within 180 days of a notice to proceed.

For Phase II, all project design fees presented below include detailed survey, borings, wetlands delineation and environmental reports as may be required by the DEEP or the Army Corps of Engineers for permitting. The fees are for complete design (plans, specifications and bid documents) and permitting of each project, such that they are "shovel ready". The following fees are proposed:

Dams

Bush Pond Dam & Dike/Hyde Mill Pentway Culvert	\$168,000
Long Pond Dam including fishway incorporation	\$113,000

Culverts/Bridges

Culvert downstream of Long Pond Dam on Lantern Hill	\$ 75,000
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Total Estimated Base Project Design Budget	\$356,000
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Add Alternate - Connection between Long Pond and Bush Pond	\$ 69,000
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Relative to time schedules, each project, including design, permitting and rights-of-ways would take approximately one year and they could be designed concurrently.

We would like to thank the Town for considering our firm for this exciting project and should you have comments or questions concerning the Proposal, please contact us at your convenience.

Sincerely,

Wengell, McDonnell & Costello

A handwritten signature in blue ink, appearing to read 'S. McDonnell', is written over the typed name.

Stephen R. McDonnell, P.E.



2023

FEE SCHEDULE

Fees are computed based on employee time records. Time is posted weekly and billed periodically or monthly depending upon the specific assignment. There is no separate charge for mileage to a project site or meeting however travel time for the employee(s) will be charged, portal to portal, and invoiced. Mileage will be charged for travel within the project area.

All invoices are due and payable upon receipt

BASIC RATE SCHEDULE

<u>EMPLOYEE CLASSIFICATION</u>	<u>HOURLY RATE</u>
Principal	\$225.00
Senior Project Manager	\$175.00
Project Manager	\$165.00
Senior Hydraulics Engineer	\$165.00
Senior Project Engineer	\$155.00
Project Engineer	\$140.00
Engineer	\$120.00
Construction Coordinator	\$160.00
Chief Construction Inspector	\$150.00
Construction Inspector	\$120.00
CADD Operator	\$ 95.00
Licensed Survey Chief	\$145.00
Survey Instrument Person	\$ 75.00
Technician	\$ 75.00
Clerical	\$ 65.00

DIRECT COSTS and MATERIALS

Reproduction	As Incurred
Mileage	\$ 0.58/mile
Postage	As-Incurred
Laboratory and other Special Services	Cost + 10%

Legal Proceedings: Deposition and testimony will be invoiced at the above noted basic rate schedule times 1.25.