

May 30, 2025 | Technical Proposal **Town of Bristol**

Mountain Street Stormwater Improvement Scoping Study





Contents

	Cover Letter	3
1	Qualifications	4
2	Scope of Work	8
3	Project Schedule	16
4	Project Organization	17
5	References	18
6	Cost Proposal	19

Appendices

Appendix A: Resumes20



May 30, 2025

Ian Albinson, Interim Town Administrator Town of Bristol 1 South Street P.O. Box 249 Bristol, VT 05443

Re: Request for Proposals—Mountain Street Stormwater Improvement Scoping Study

Dear Mr. Albinson:

We are familiar with the drainage issues many communities like Bristol face due to aging infrastructure and the increased frequency of major storms. We have assisted numerous communities throughout Vermont and New England in identifying and implementing solutions to stormwater and drainage problems causing significant disruptions and flooding, and we are prepared to bring this experience to Bristol for the section of Mountain Street identified in the Town's request for proposals. We integrate the right people and resources to help clients initiate and complete significant projects aimed at providing sustainable solutions. VHB's Vermont staff was built around our relationships with local municipalities, and we are excited to continue our partnerships throughout the state.

Providing consulting services to municipalities is a core purpose of our company and a key focus of our Vermont staff. We are pleased to present the following proposal for the Mountain Street Stormwater Improvement Scoping Study and have selected key staff with the necessary qualifications and project experience to assist the Town in evaluating solutions to the drainage issues on Mountain Street. No project is too big or small for us; we understand how to tailor our approach and our product appropriately. We are sensitive to the fact that funding to municipalities is limited and strive to economize our engineering efforts so that more funding can be allocated to construction.

Sustainability is a foundational element of VHB's practice and an integral part of our approach. A company founded on stewardship, sustainability is inherent in who we are and how we provide our clients with results that shape our communities in meaningful ways. We are eager to evaluate sustainable solutions that consider engineering, environmental, and funding needs to reduce disruptions and property damage in this stretch of Mountain Street by the Bristol Elementary School.

We welcome the opportunity to discuss our proposal with you. Should you need further information or have any questions, please contact Andrew Mills, PE, at <u>amills@vhb.com</u> or 802.497.6169.

Sincerely,

VHB

de

Andrew Mills, PE Project Manager

David Saladino, PE Regional Operations Manager

 Engineers
 Scientists
 Planners
 Designers

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Whb

Qualifications

VHB Overview

VHB's passionate professionals include engineers, scientists, planners, and designers who partner with public and private clients in the transportation, real estate, institutional, and energy industries, as well as federal, state, and local governments.

Together, we work to improve mobility, enhance communities and economic vitality, and balance development and infrastructure needs with environmental stewardship.

We're a team—2,000+ strong—eager to deliver value by embracing our clients' goals, anticipating challenges, building lasting partnerships, and always providing an exceptional experience. We're passionate about making meaningful contributions to the world through the work we do; and we are proud, yet humbled, to have been doing this for over 40 years. Our 100-plus staff in Vermont offer full-service survey, planning, and engineering across three offices.

VHB's innovative thinking leads to creative, practical solutions for our clients.

Relevant Qualifications

Stormwater Infrastructure Improvements

Older infrastructure was often constructed of antiquated materials, installed incorrectly, or has served its useful life and simply needs replacement. Manmade system failure isn't the only problem; nature seems to be conspiring against the infrastructure. With more frequent storms, of higher magnitude, and a rising sea level, infrastructure is subject to more 'wear and tear' and cannot maintain its intended efficiency. Water moving through flat conveyance systems, under low head conditions, typically doesn't travel fast enough for the velocity to reach cleansing speed. This results in sedimentation, and collection of organic debris, which reduces available piping capacities. With constrained maintenance budgets rarely allowing for proactive replacement of dilapidated infrastructure, being responsive to failure indicators is of utmost importance. By listening closely to the problem, VHB will assist in providing solution-menus for Town staff, which will lead to the most cost effective and informed solutions for the community.

1979

Year Founded

2,000+

Engineers, Scientists, Planners and Designers

30+

locations on the east coast

61

On ENR Top 500 U.S. Design Firms List

VHB has been serving Vermont agencies, municipalities, and institutions for over 30 years. Our portfolio of public and private clients looks to VHB professionals to provide specialized design services and costeffective solutions for a broad range of projects including environmental, landscape architecture, civil engineering, and planning and design services.



VHB professionals sampling a stormwater pipe

VHB's capabilities and depth of experience guide the smallest to the most complex projects through the often-challenging regulatory arena. VHB designs drainage improvements for public agencies, site owners, and new developments. Our services include the preparation of contract plans, specifications, estimates, utilities design – including green infrastructure, grading and drainage design, stormwater management, erosion control design, and design of structural improvements. Complying with the many new stormwater management requirements while balancing budgets is a challenge facing many municipalities and institutions. VHB has extensive experience in all areas of stormwater management, including:

- National Pollutant Discharge Elimination System permitting
- Environmental Protection Agency and Department of Environmental Conservation compliance
- Stormwater hydrologic/hydraulic and pollutant load modeling
- » Illicit discharge detection and elimination (IDDE)
- » Best Management Practice (BMP) design and engineering

VHB has become a leader in the development and implementation of stormwater programs and utilities, helping communities respond to the challenges of regulatory compliance in financially constrained times. Our understanding of local communities, their needs, infrastructure, and regulations helps our clients write ordinances, identify funding sources, and guide projects through regulatory processes.

Site and Civil Design

VHB offers our clients full-service civil engineering capabilities that result in projects that are managed efficiently and effectively. Our professionals provide services that include site design, land planning, due diligence analysis, feasibility studies, master planning, utility infrastructure design, traffic and environmental impact analysis, landscape architecture, community involvement, and permitting and regulatory approvals. VHB's team has a proven track record in securing necessary project clearances from regulatory agencies to help our client's projects to move forward.

Survey/Data Collection

VHB's Vermont-based survey team understands Vermont and the state's unique environment and surveying requirements. Our Winooski office's geographic information system (GIS), surveying, unmanned aerial vehicle (UAV), planning, engineering, and environmental professionals cover a broad range of services. We offer locally-based skills and knowledge along with the resources of a strong regional team of geospatial professionals. Our Vermont-based survey team is supported by more than 60 surveyors in New England who routinely work with our Vermont team.

Environmental

VHB's environmental engineers and scientists routinely provide environmental services to private and public-sector clients. With the largest environmental planning team in Vermont and more than 350 environmental staff company-wide, VHB's



VHB professionals collecting stormwater pond data

environmental group comprises water resources scientists and engineers, stream specialists, contamination assessment and remedial design professionals, wildlife biologists, geologists, wetland and soil scientists, and environmental planners. This diversity allows us to provide a wide range of services, many of which may be relevant to the Town's needs on this contract, including:

Environmental and cultural resource
 permitting

VHB | Mountain Street Stormwater Improvement Scoping Study

- Ecological restoration
- » Wetland delineation and mitigation
- » Natural resource inventories
- Water resources, including water quality modeling and monitoring, watershed management plans, and stormwater BMP design

Construction Observation

By providing full- or part-time construction supervision services, VHB's resident engineers and construction managers help clients control quality, schedule, and potential cost overruns based on unforeseen or changed conditions during construction and assure construction compliance with design intent. VHB provides construction administration and inspection for bridge, highway, traffic signal and utility projects. Services include bidding assistance, inspection, and measurement of quantities for payment. These services help confirm the quality of the work and provide quality control and administration of the construction contract. VHB also provides construction administration and support services for public and private development by observing construction at regular or critical intervals, reviewing contractor submittals and requests for information, providing permit compliance services, and final certifications and project close-out assistance.

Relevant Project Experience

The following briefly describes VHB's stormwater work in Vermont.



VHB Staff Involved:

Peter Smiar, PE Chris Hale-Sills, PE, ENV SP Ryan Cloutier, LS Patti Kallfelz-Werts

Green Stormwater Infrastructure Retrofits

Burlington, Vermont

To improve its water quality and resiliency to climate change, the City of Burlington has been implementing green stormwater infrastructure (GSI) retrofits to address stormwater discharges from combined sewer overflow (CSO) points. VHB's interdisciplinary team has been providing a range of engineering and technical services to deliver these projects under a stormwater/wet-weather management oncall contract with the City's Department of Public Works. The City's most challenging CSO point is located in the South End. To effectively mitigate the stormwater impacts caused by severe weather, VHB established site constraints and drainage patterns and evaluated treatment opportunities for the 15 proposed stormwater retrofit locations. VHB's final GSI retrofit design consisted of 15 separate bioretention cells that provide collection, treatment, and infiltration. They reduce peak stormwater flows and total runoff volume to the City's existing stormwater collection system, achieving the City's project goals.

The VHB team also provided topographic and utility survey, subsurface soil investigation, stormwater retrofit planning and design, and development of construction documents, and construction phase services. Burlington and VHB next teamed to develop designs of nine retrofit subsurface infiltration systems to address CSO events in Burlington's Old North End (ONE). The South End and ONE retrofits together treat approximately 15 acres of impervious area stormwater runoff.



VHB Staff Involved:

Andrew Mills, PE Peter Smiar, PE Chris Hale-Sills, PE, ENV SP Ryan Cloutier, LS



VHB Staff Involved:

Chris Hale-Sills, PE, ENV SP Patti Kallfelz-Werts Ryan Cloutier, LS

Vermont Agency of Transportation Stormwater Retrofit Program

Various Locations, Vermont

VTrans engaged VHB to advance several Stormwater Retrofit Projects as part of VTrans' TS4 (MS4) obligations. VHB provided final design and permitting for operational stormwater retrofits as required by the total maximum daily load (TMDL) for the Allen Brook, Rugg Brook, Stevens Brook, Potash Brook, and Indian Brook watersheds in northwest Vermont. Working from VTrans' Flow Restoration Plan, VHB developed design and permitting for over 40 stormwater treatment practices, including 12 new Best Management Practices (BMPs) within the I-89 median in Williston and 20 BMPs in St Albans, which were a mix of gravel wetlands and media filters, and a retrofit of an existing wet pond. The treatment practices were designed to maximize treatment towards meeting the high-flow target of the TMDLs while also maximizing water quality treatment to provide phosphorus reduction and credit towards the VTrans phosphorus control plan and Lake Champlain TMDL. VHB provided survey, utility coordination, soils and infiltration investigations, natural resources and NEPA documentation, permitting, hydraulic analysis, development of preliminary and final plans, contract plan development, and bid analysis prior to construction phase. These projects were the first impaired watershed retrofit project undertaken by VTrans.

Town of Barre Flood Support

Barre, Vermont

In response to the July 2023 Flood Event, the Town of Barre looked to VHB for assistance with various drainage infrastructure issues that had been made evident by the extreme rainfall. VHB began by assessing the hydraulic capacity of drainage features such as roadside ditches, cross culverts, and stream crossings in order to properly size structure replacements and reduce erosion. Based on these assessments, VHB then provided the town with recommendations to remediate flood damage with resilient drainage solutions. VHB completed hydrology and hydraulic analysis of various types of drainage infrastructure, prepared engineering design to repair flood-damaged infrastructure, obtained the necessary permits and authorizations, and assisted the town with contractor procurement.



2 Scope of Work

The following Scope of Work has been prepared to combine efforts wherever appropriate (e.g. meetings, mapping) and sets forth separate, yet related activities where needed (such as the development of concepts). We believe this approach will result in a comprehensive scoping effort that is streamlined and efficient. The VHB Team proposes the following Scope of Work:

Task A: Project Kick-Off Meeting



Mountain Street at Spring Street,

looking north

The VHB team will work with Town staff to schedule a kick-off meeting to initiate a dialogue and exchange information about the project. The roles and expectations for attendees as well as the specifics of the scoping study process will be discussed, and protocols will be agreed upon consistent with Town goals. VHB will prepare an agenda for the meeting and arrange to collect available information prior to the meeting.

Goals for the meeting will be as follows:

- » Discuss stakeholders' roles and respective responsibilities, general goals of the project, project schedule, approval processes, questions and answers
- » Review public engagement goals, communication protocols for team
- » Collect and/or request available information not collected prior to the meeting
- » Review current action items with schedule for completion
- » Document meeting notes to attendees

In advance of the meeting, the VHB Team will complete an initial assessment of existing information, in order to use the meeting to solicit additional potential sources of information, as well as to make sure that the Project Team has access to the most current data available.

Deliverables:

VHB will prepare an agenda and minutes of the meeting and distribute them to participants and other appropriate parties.



Mountain Street at Spring Street, looking south

Task B: Compile Base Map/Document Existing Conditions

The VHB Team will meet with Town staff to discuss available information, compile this information, and conduct field reconnaissance to assemble a complete picture of available information. This effort will focus on data that has the greatest impact on runoff and drainage conditions such as soils, land cover, slopes, and existing drainage infrastructure. The VHB Team will:

- Compile a **base map** using available mapping, including VT digital orthophotos, digital parcel maps for the Town, and other natural resource-based geographic information system (GIS) data available from the regional planning commission or the Vermont Center for Geographic Information (VCGI). Existing conditions to be noted include drainage features, topographic data, natural resources, right-ofway (ROW)/parcel widths, roadway ownership, and other items as appropriate. VHB will obtain the digital GIS tax parcels from the Town and include this information on the orthophotos base mapping. We assume that the Town will provide the property owner information to include on the base mapping. Additional items will include natural resource constraints, utilities, historic and archaeological constraints, etc.
- 2. Identify **existing utilities** in the project area using available information. We will contact the Bristol Water & Sewer Department; Fairpoint; GMP; Comcast; and Vermont Gas Systems requesting copies of their utility record plans and other pertinent utility information. Using the information collected, the general location of existing utilities will be shown on the base mapping.
- 3. Collect **land use** data within the study area to include general land cover/uses and any known development projects in the area.
- Conduct a desktop assessment to identify and document the cultural and environmental resources within the study area. These resources include, but are not limited to, the following:
 - » Wetlands and floodplains
 - » Archaeological and historic sites/districts/structures
 - » Air and water quality
 - » Noise sensitive land uses
 - » Fish and wildlife habitats
 - » Endangered/threatened species/habitats
 - » Community character (local aesthetics)
 - » Socioeconomic characteristics

Catch basin on Mountain Street

- » Agricultural lands
- » Land and Water Conservation Funds lands (Section 6(f))
- » Public and recreational land (Section 4(f))
- » Climatology data
- » Precipitation data
- » Soils data
- » Groundwater table
- 5. Conduct **field investigations** to supplement the available information research. This field work will focus on inventorying elements important to the project and the development of the recommended alternatives, such as land use, drainage patterns, drainage infrastructure, and the presence of utilities. During the field review, existing conditions mentioned above will be recorded in field notes by taking photographs and by indicating them on the available high-resolution aerial photos.

Field investigations relative to stormwater management will include inventory and visual inspection of existing infrastructure within the Town ROW, and beyond for systems that extend into other public streets within the study area. The field inspection will include roadways, driveways, culverts, open channel and closed pipe drainage infrastructure, utility setbacks, and conflicts or obstacles within the ROW. Both natural and manmade outfall points will be included in this assessment. Rim or catch-basin elevations and pipe invert elevations will be acquired for all existing closed-pipe infrastructure using sub-decimal accurate Global Positioning System (GPS).

In addition, the size and material of system components will be verified and tracked where this information is not already included in the Town's stormwater infrastructure inventory.

6. Complete a desktop evaluation using readily available information on the physical characteristics of the study area, including topography, hydrology, and soils data (with particular attention to soil series that often lend themselves to infiltration-based stormwater designs), as well as elevation of seasonal high groundwater and local precipitation data.

Information on potential natural resource constraints, such as wetlands, floodplains, and wildlife habitat, will also be compiled. As part of this data compilation effort, the Project Team will identify potential undeveloped areas, if any, that may be suitable for stormwater treatment/attenuation within the study area. This information will inform field investigations, as well as later efforts to develop planning and design criteria for the project.



Culvert inlet on Mountain Street, looking north

Information about planning-level soil suitability for infiltration-based stormwater management practices will also be evaluated by VHB.

Deliverables

The VHB Team will prepare base mapping for the project and distribute to the Town. Field notes, photographic documentation of existing conditions, resource mapping, utility mapping, etc. will be compiled and distributed to the Town as appropriate.

Task C: Local Concerns Meeting and Purpose and Need Statement

The VHB Team, with the Town's assistance, will organize, moderate, and document a Local Concerns Meeting for the project. This will be a publicly-noticed, in-person meeting seeking input from adjacent landowners and local citizens, as well as representatives from the Town. At this meeting, the project definition process will be explained in general terms. We will welcome comments and concerns from the attendees regarding the project. The purpose of the meeting is to develop a clear understanding of the perceived stormwater/drainage concerns within the project area. The project goals and objectives will be discussed. The meeting can include a field visit to the project site if the Town feels this would be beneficial.

After the Local Concerns Meting, VHB will prepare a draft Purpose and Need Statement for review and approval by the Town that will consider input from the Town as well as public input received at the Local Concerns Meeting. This statement will clearly define the project needs and succinctly explain the deficiencies within the project area that the alternatives are to address. This statement will help to determine which alternatives fulfill the Project's goals and needs. Upon the Town's review, a final version will be prepared.

Deliverables:

VHB will prepare and distribute meeting minutes and presentation materials. Submittal of draft and final Purpose and Need Statement to the Town for review and acceptance.



VHB staff presenting at a public meeting in Vermont

Task D: Stormwater Modeling and Infrastructure Assessment



Mountain Street, looking south

The VHB Team will delineate a drainage area or sub-basin for each inlet/drainage infrastructure item to the extent necessary to model the drainage network and flows within the study area. Delineation of these drainage areas may extend beyond the immediate project boundaries in order to capture the entirety of each area. Sub-basin boundaries will be field verified. Then, in tandem with the existing conditions information and data collected during the field investigation, VHB will select and apply a suitable modeling tool to assess the capacity of the existing stormwater drainage system for various storm events. Design storm events will be selected in consultation with the Town. Any critical structural deficiencies or hydraulic restrictions will be documented in a technical memo.

Deliverables:

The VHB Team will prepare and distribute a technical memo describing the results of the sub-watershed delineation and stormwater modeling. This information will also be incorporated into the final report.

Task E: Develop Conceptual Alternatives

VHB understands that the Town has identified that stormwater bypasses the existing two-foot drainage inlet on Mountain Street during larger storm events, which is most likely caused by clogging of the inlet, insufficient capacity of the inlet, or insufficient capacity of downstream infrastructure. Utilizing the results of the drainage modeling, VHB will develop up to four conceptual alternatives which seek to address the root cause of the issue with one or more solutions. The VHB Team will develop conceptual plans and narratives that address these suites of alternatives, and will likely include one or more of the following elements:

- » Improving inlet capacity and/or providing anti-clogging features
- » Replacing/enlarging drainage existing drainage infrastructure
- » Expanding the drainage infrastructure network and/or adding inlets
- Providing flow attenuation by adding green stormwater infrastructure (bioretention, infiltration, etc.) to reduce flows to the existing infrastructure if soil conditions allow



Culvert inlet on Mountain Street, looking south

Deliverables:

For each improvement, a conceptual design will be prepared that includes an alternatives evaluation matrix of each project such as functionality, cost, public sentiment, constructability, maintenance concerns, and any required permits or easements. Conceptual designs of alternatives will be submitted to the Town for review and comment.

Task F: Identify Right-of-Way Issues

VHB will estimate the limits of the public ROW and parcel information within the project area based on the Town's tax parcel database and other field-identified information. The ROW and parcel information will be overlaid onto our base mapping. The ROW and parcel information will be overlaid onto our base mapping and land ownership will be identified. The conceptual alternatives will be overlaid in order to conceptually estimate levels of ROW impact resulting from each alternative.

Task G: Identify Utility Conflicts

VHB will identify and assess public and private utilities within the project area where they would constrain or be impacted by the proposed improvements. We will request information on underground utilities from the Town's DPW and private utility providers such as Vermont Gas. Using this information, we will estimate the extent of impacts and potential relocations anticipated under the various alternatives.

Task K: Identify Resource Constraints and Permitting Requirements

The VHB Team will review natural and cultural resource issues including wetlands, surface waters, floodplains, river corridors, lake shorelands, flora/fauna, endangered species, stormwater, hazardous material sites, forest lands, historic, archaeological and architectural resources, 4(f) and 6(f) public lands, and agricultural lands. We will identify potential impacts on these resources and permitting requirements, including the potential for review under Act 250.

Historic resources will be reviewed by VHB to determine potential impacts to those resources. This will include a reconnaissance-level survey for historic resources.

Because a series of alternatives has not yet been selected, all environmental resource work will include the areas in which all proposed alternatives will take place.

Recommendations for the effects on environmental resources, along with anticipated permit requirements for each alternative, will be assessed and included in the evaluation matrix.

VHB will contact state and federal resource agencies as applicable (e.g. Agency of Natural Resources, Department of Fish and Wildlife, United States Army Corps of Engineers) to ascertain the presence or absence of resources in the project area. If resources are found to be present, we will summarize the extent to which resources may or may not be impacted for each alternative.

The VHB Team will estimate the new, redeveloped, and existing contributing impervious surface areas resulting from each alternative (assumed to be minimal), as well as an assessment of what will be required to obtain a stormwater discharge permit, if needed. An estimate of the area of disturbance resulting from the projects will be included to assess the extent of mitigation required under the National Pollutant Discharge Elimination System (erosion prevention and sediment control) permit.

Deliverables:

Resource mapping and copies of correspondence with the contacted resource agencies. Additionally, the VHB Team will prepare Historic and Archeological Resource memorandums summarizing our findings and recommended actions to be undertaken during the design phase.

Task G: Alternatives Presentation

The VHB Team, with the Town's assistance, will organize, moderate, and document an Alternatives Presentation Meeting. VHB will present the outcome of the alternatives investigations at the meeting to solicit public input. This will likely be conducted at a Selectboard meeting or could be an independent public meeting specifically scheduled to discuss the many project issues. This meeting will be publicly warned, and the various alternatives, pros and cons, the evaluation matrix, and supporting documentation will be presented. The desired outcome is selection of a preferred alternative by the Town based in part on public input.

Deliverables:

Meeting notification, alternatives, meeting agenda and meeting notes.

Task H: Selection of Preferred Alternatives

Following the Alternatives Presentation Meeting the VHB Team will meet with the Town Project Manager and/or Selectboard to discuss the alternatives and make recommendations regarding the preferred alternative for the project.

Deliverables:

VHB will prepare and distribute a summary of the meetings and a list or table of the preferred alternatives.

Task I: Scoping Reports

Following the selection of the preferred alternative, VHB will compile pertinent information gathered during the investigative stage, including relevant meetings and engineering analyses, in a draft Scoping Report. Summaries of the resource impacts will be prepared to clearly state the information presented in the evaluation matrix for each component. VHB will also prepare a synopsis of the alternatives that includes benefits and impacts for each alternative and present a final recommendation. VHB will prepare a Draft Report for review and comment by the Town and the VHB Team will then prepare a Final Report to address the comments.

Task J: Project Management and Coordination

The VHB Project Manager will conduct regular internal coordination meetings to check on progress, discuss ideas and alternatives, and have the task managers exchange information and ideas. Additionally, the VHB Team will meet monthly with the Town to review progress, provide updates, and exchange information as appropriate.



3

Project Schedule

July 1, 2025	.Project Kickoff (assumed start date)
July 18, 2025	.Finalize existing conditions
July 25, 2025	Local Concerns Meeting & Purpose and Need Statement.
August 22, 2025	.Finalize stormwater modeling
September 19, 2025	.Finalize conceptual alternatives
October 10, 2025	Identify ROW/utility impacts, resource constraints, and permitting requirements.
October 24, 2025	Alternatives presentation and preferred alternative selection.
November 21, 2025	.Finalize scoping reports



4 Project Organization

VHB's experienced team of local professionals is ready to offer responsive, highquality services to the Town of Bristol, relying on our local knowledge and depth of experience. Our team works collaboratively on all assignments we undertake, and professionals from our Vermont office will lead this effort. **Andrew Mills**, PE, will act as Project Manager. He is supported by a team engineers, surveyors, and scientists as may be required to meet the Town of Bristol's goals. **Peter Smiar**, PE, will act as Technical Adviser, serving as both a technical resource and confirming the quality of deliverables. **Chris Hale-Sills**, PE, ENV SP, will provide modeling support to aid in the determination of potential solutions to flooding on Mountain Street. **Ryan Cloutier**, LS, is prepared to provide survey support, and **Patti Kallfellz-Werts** is a Senior Environmental Scientist who can support the evaluation of environmental impacts. Principal-in-Charge, **David Saladino**, PE, has over two decades of project management experience and is Managing Director of VHB's Winooski office. He is authorized to commit the company to this contract.

Project Team



Key personnel resumes have been included as an Appendix.



5 References

Project	Reference/Address	Contact Information
Town of Barre Flood Support <i>Barre, Vermont</i>	Josh Martineau Town Engineer and Director of Public Works Town of Barre 149 Websterville Road, Barre, VT 05641	802.476.3522 jmartineau@barretown.org
Green Stormwater Infrastructure Retrofits Burlington, Vermont	Chapin Spencer <i>Director of Public Works</i> City of Burlington 645 Pine Street Burlington, VT 05401	802.863.9094 <u>cspencer@burlingtonvt.gov</u>
Vermont Agency of Transportation Stormwater Retrofit Program Various Locations, Vermont	Mr. Bruce Martin, P.E. Highway Safety & Design Project Delivery Bureau Vermont Agency of Transportation 219 N. Main Street Barre, VT 05641	802.595.9653 bruce.b.martin@vermont.gov



6 Cost Proposal

The following table illustrates our proposed cost to assist the Town of Bristol with the Mountain Street Stormwater Scoping Study:

Task		Labor & Expense Fee
Α	Project Kick-Off Meeting	\$1,300
В	Compile Base Map/Document Existing Conditions	\$9,800
С	Local Concerns Meeting and Purpose and Need Statement	\$1,800
D	Stormwater Modeling and Infrastructure Assessment	\$10,300
E	Develop Conceptual Alternatives	\$6,500
F	Identify Right-of-Way Issues	\$1,300
G	Identify Utility Conflicts	\$2,300
Н	Identify Resource Constraints and Permitting Requirements	\$9,800
I	Alternatives Presentation	\$2,300
J	Scoping Reports	\$4,100
	TOTAL FEE	\$49,500

19 Cost Proposal



Appendix A: Resumes

Andrew G. Mills, PE

Project Manager

Andrew is a Project Manager at VHB, and performs a wide range of design, permitting, and project management tasks. He has extensive experience in all aspects of civil/environmental engineering, particularly the stormwater management field. Andrew also performs construction administration and observation duties for a variety of clients including erosion control monitoring and reporting. With over 18 years of engineering experience, Andrew utilizes his broad range of skills and experience working on demanding, fast-paced projects to complete projects in an efficient and effective manner. He maintains good working relationships with a host of state and local regulators as well as provides quality project presentations at local hearings and meetings.

18 years of professional experience

Rugg & Stevens Brook, SW Retrofit, St Albans, VT

Andrew is the lead stormwater engineer for this project, consisting of operational stormwater retrofits in the impaired Rugg Brook and Stevens Brook watersheds in St. Albans. The project includes the design and permitting of 21 separate gravel wetland treatment practices in the Interstate 89 median and other areas within the VTrans ROW which provide credit towards the high-flow target of the impaired watershed TMDLs as well as phosphorus reduction in accordance with the VTrans phosphorus control plan. The project also includes the design of new drainage conveyance infrastructure to collect and treat significant portions of unmanaged impervious surface in two larger gravel wetlands.

South Burlington Stormwater Retrofits, South Burlington, VT

The City of South Burlington Department of Public Works engaged VHB to provide stormwater retrofit design and permitting for multiple "3-Acre" sites throughout the City. Andrew has been the project manager and lead stormwater engineer for this project, which seeks to provide retrofit stormwater treatment for existing, privately owned commercial and residential developments which share infrastructure (roads) with the City of South Burlington. The retrofit designs seek to maximize treatment, often in stormwater impaired watersheds, while minimizing impacts to existing development.

VTrans Stormwater Retrofit Program, Various Locations, VT

VTrans engaged VHB to provide final design and permitting for operational stormwater retrofits as required by the TMDL for the Allen Brook, Rugg Brook, Stevens Brook, Potash Brook, and Indian Brook watersheds in northwest Vermont. Andrew served as the lead stormwater engineer for these projects, which included the first impaired watershed retrofit project undertaken by VTrans, and included the design and permitting of over 40 stormwater treatment practices, primarily along Interstate 89 between Williston and St. Albans. The treatment practices were designed to maximize treatment towards meeting the high-flow target of the



Education BS, Civil Engineering, Worcester Polytechnic Institute, 2007

Registrations/Certifications

Professional Engineer (Civil), VT, 7/2026 (reg# 018.0079708)

Affiliations/Memberships

American Society of Civil Engineers, Vermont, 2007 TMDLs while also maximizing water quality treatment to provide phosphorus reduction and credit towards the VTrans phosphorus control plan and Lake Champlain TMDL.

VTrans, I-89 Exit 17 Interchange, Colchester, VT

VHB was the lead operational stormwater designer for this major transportation infrastructure project to reconstruct Exit 17 on Interstate 89 in Colchester. The project addressed safety concerns and replaced the structurally deficient bridge over the interstate. In addition, the project included new ramp construction, ramp relocation, roadway widening, reconstruction of three signalized intersections, bicycle and pedestrian accommodations, and stormwater treatment. VHB also led the environmental permitting and engineering design efforts including traffic modeling and engineering, highway geometry design, structural engineering, environmental permitting, transportation management, and public outreach. Andrew led the design and permitting of the operational stormwater treatment system across the project footprint, which included three different types of water quality treatment practices and extensive modeling to demonstrate compliance with peak storm events.

City of South Burlington, Exit 14 East/West Connection, South Burlington, VT

Andrew provided stormwater engineering design and permitting services for this project which consists of a new multiuse path and bridge through the Exit 14 interchange of Interstate 89 in South Burlington. The project required coordination with the City of South Burlington as the owner of the path and VTrans due to the use of the interstate ROW and the establishment of maintenance agreements for the stormwater treatment practices on both sides of the interstate. The project also required extensive pre-application coordination with the VT DEC Stormwater Program due to its location on the border of two impaired watersheds.

City of St. Albans, Federal Street Multimodal Connector, St Albans, VT

The City of St Albans engaged VHB to provide design and permitting services for this project which seeks to provide a connecting route from the St Albans State Highway to Federal Street to the north. Andrew provided stormwater treatment design and permitting services for the project, which includes a section of new road along undeveloped ROW and extensive redevelopment of additional public roads. The project is located in the impaired Stevens and Rugg Brook watersheds and as a result the stormwater treatment practices needed to not only meet the treatment requirements for the project but also the treatment targets of the Flow Restoration Plans for the impaired waterways.

Peter Smiar, PE

Director of Land Development, Vermont | Technical Adviser

Peter is Director of Land Development in VHB's Winooski office with demonstrated proficiency in providing land use planning services, utility infrastructure design, stormwater design, soil characterization, hydrologic analysis, and state and federal permitting services for public- and private-sector clients. Projects he has worked on include high-density urban infill sites utilizing subsurface infiltration facilities, pervious pavers, subsurface sand filters, and bioretention areas. His project approach involves balancing use of emerging stormwater management technologies with the practical aspects of each project, including cost, feasibility, and long-term operational success. Peter has successfully designed and permitted more than 50 stormwater management systems in the last 19 years, many of which are located in confined urban settings or in challenging mountainous terrain. His recent work includes serving as Project Manager and Lead Designer for stormwater retrofit designs and permitting at Southland Plaza, University Mall, Killington, Pico, Stowe, Mount Snow, Hermitage Club, and Sugarbush resorts, as well as for the Town of Essex/Chittenden County Regional Planning Commission (CCRPC) retrofits, "3acre sites" for the City of South Burlington and Town of Colchester, and multiple City right-of-way retrofits and stormwater outfall stabilization projects for the City of Burlington Department of Public Works.

20 years of professional experience

Farrell Properties, Cambrian Rise Master Plan—Burlington College Project, Burlington, VT

Peter has been leading the planning, design, permitting, and implementation of the Sustainable SITES-certified stormwater management design for this proposed 1,000-unit mixed-use infill project in Burlington. The project involves a blend of dense housing, open space, and 0.5 miles of proposed City roadway. Low Impact Development strategies utilized for the project include multiple bioretention areas, 600 linear feet of proposed green streets to manage runoff from the future public roadway, and multiple distributed underground infiltration systems. Peter's tasks included leading the subsurface soils investigation utilizing Geoprobe and conventional split spoon sampling; conducting a soils characterization; incorporating green infrastructure practices into the development master plan; and leading design of the stormwater management system. Peter is cooperatively teaming with the City Public Works Department and the adjacent landowner to implement infiltration retrofits within existing and proposed City rights-of-way in order to reduce stormwater flows to the existing municipal combined sewer and stormwater systems. The project involves a 42-acre tract of land with 1,200 feet of frontage along North Avenue, and 900 feet of Lake Champlain shoreline.



Education MS, Civil Engineering, University of Vermont, 2016

BS, Civil Engineering, University of Vermont, 2005

Registrations/Certifications

Professional Engineer, ME, 12/2025 (reg# 16994) Killington Ski Resort, Pico Mountain Stormwater Assessment, Killington, VT Peter is providing civil engineering services, project phasing, cost estimating, and stormwater master plan design and permitting for Pico Mountain.

State of Vermont Agriculture and Environmental Laboratory, Randolph, VT Peter led the site/civil engineering and State permitting services for the proposed \$25 million, 37,000 sq ft LEED Silver Certified laboratory building for the State of Vermont. While performing civil engineering services, Peter collaborated with the Department of Buildings and General Services and project team members to develop state of the art stormwater management practices including a bioretention area, underground sand filter, and use of pervious paver surfaces for automobile parking areas.

City of Burlington, Burlington Bike Path Phase 2, Burlington, VT

This project consisted of widening and improving the existing Burlington Bike Path—one of Vermont's busiest multiuse paths—from North Beach to the Winooski River. Stormwater management challenges included implementation of retrofit water quality practices within a confined linear right-of-way and densely populated urban corridor with several sensitive water resources. Peter performed assessment of existing stormwater-related problem areas, concept design, coordination with state and local stakeholders, construction and operational phase stormwater design, permitting, and development of construction documents. The project involved implementation of green stormwater infrastructure (GSI) practices, including two dry swales and a bioretention system retrofit.

City of Burlington, Great Streets-Main Street Revitalization, Burlington, VT

VHB was the lead consultant for the planning and design of a complete revitalization and reconstruction of 6 blocks of Main Street in downtown Burlington. The project included extensive community outreach, resulting in unanimous concept approval by City Council. VHB advanced the approved concept through final engineering design and preparation of contract documents in approximately 12 months. The project includes reconstruction and narrowing of Main Street, extensive water, sewer and stormwater improvements, new separated bike lanes, replacement of sidewalks, addition of landscape and art elements, and the replacement of streetlights and traffic signal equipment. Peter performed scoping and design oversight and observation of soil borings to support the the stormwater management components of the project.

Chris Hale-Sills, PE, ENV SP

Civil Engineer | Modeling

Chris is a site/civil engineer in VHB's Winooski, Vermont, office with experience including the design and permitting of stormwater management and treatment systems, solar farms, subdivision roadways, residential sites, commercial sites, and redevelopments, and construction oversight for both public and private clients. Chris also has experience with a variety of engineering and software suites, including AutoCAD, Civil3D, StormCAD, HydroCAD, HY8, and Estimator, among others.

9 years of professional experience

City of Burlington, South End and Old North End Stormwater Retrofits, Burlington, VT

Chris provided stormwater modeling, design, and permitting services for the installation of stormwater retrofits aimed at reducing combined sewer overflow (CSO) storm events in Burlington's South End and Old North End. The project required careful siting to appease residents while providing maximum impact balanced with cost. Chris assisted with creating existing conditions plans, incorporating survey data from third parties, VHB, and online public sources. Using HydroCAD, Chris modeled existing and proposed stormwater conditions and proposed best management practices (BMPs), including bioretention areas with and without subsurface infiltration chambers. In addition, Chris assisted in creating a complete site planset for operational and construction stormwater discharge permitting, including details for proposed BMP systems and site features, and erosion and sediment controls. Chris created exhibits in Civil3D and miscellaneous CAD figures to assist with permitting documentation. On site visits, Chris observed site conditions in various seasons and weather. To analyze potential transportation impacts and confirm regulatory compliance with City standards, Chris coordinated with other disciplines, including transportation engineers. Chris used GIS programs to identify potential treatment practice locations and existing conditions, including hazardous material sites, potentially hazardous soil areas, existing utilities, and topographic information; and delineated stormwater drainage areas and landcover totals.

Town of Essex, Stormwater Retrofits, Essex, VT

VHB was contracted to design, from concept to bid plans and contract documents, two stormwater retrofits for the Town of Essex. These retrofits were part of a larger flow restoration plan (FRP) effort, and consist of two large concrete vaults, one with a sand filter for treatment, one without. Chris served multiple positions over the lifetime of this project, moving from stormwater engineer, to project manager, ultimately creating the final bid documentation, and answering questions from bidders.



Education

BS, Environmental Engineering, University of Vermont, 2015

Registrations/Certifications

Professional Engineer (Civil), VT, 12/2026 (reg# 018.0134849)

Envision[™] Sustainability Professional 12/2026 (reg# 18711)

Affiliations/Memberships

American Society of Civil Engineers

VTrans, I-89 Exit 17 Interchange, Colchester, VT

Chris served as a stormwater engineer for the redesign of the I-89 Exit 17 interchange in Colchester. They used StormCAD to create a detailed model of stormwater flows throughout the project, and sized stormwater pipes, culverts, and roadway catch basins to convey large stormwater flows to on-site practices. Additionally Chris used the program HY8 to model culvert sizing, modifying an existing culvert to handle revised flows.

City of Burlington, Great Streets—Main Street Revitalization, Burlington, VT Chris performed stormwater modeling and design efforts and sustainability leadership tasks involved in the revitalization of six blocks of Burlington's Main Street. Proposed stormwater practices required careful siting to balance aesthetics and surface visibility while maximizing functionality and state and local requirements. Chris co-led multiple sustainability workshops for the project as well, focusing on identifying the social, economic, and environmental costs and opportunities of the proposed work, and is engaged in continuing to keep sustainability in the minds of project team members. Chris used a broad suite of programs to keep stormwater designs organized and modeled, including Civil3D, StormCAD, and HydroCAD. Chris also managed infiltration testing along the Main Street corridor, an effort that involved coordinating with on-site supervisors, drilling teams, and traffic safety personnel to further examine soil conditions. As the project moved forward, Chris continued to communicate with the City of Burlington to identify key design points, options, and potential problems.

City of Burlington, Manhattan Drive Outfall Stabilization, Burlington, VT

VHB provided construction level design and permitting services for the replacement and stabilization of stormwater outfalls and slopes in Burlington's Old North End. Chris assisted in the creation of existing conditions plans, including the incorporation of survey data from third parties, VHB, and online public sources. In addition, Chris created a complete site plan set for permitting, including details for proposed outfalls, erosion and sediment control strategies, stream crossings details, and stabilization techniques. Chris created profiles, exhibits, and other miscellaneous CAD graphics to assist with permitting. Using Civil3D extensively, Chris modeled proposed site conditions, including grading, a 300-foot-long, 20-foot-high rock stabilization berm, access roads, and drainage channels. Chris analyzed potential flooding impacts and conducted site visits to meet with utility owners and observe site conditions in various seasons and weather conditions. Chris coordinated with other disciplines, including environmental science professionals, regarding wetland areas, invasive species locations and disposal, and other potential project impacts. Chris also assisted with permitting tasks, such as the submittal construction and operational stormwater permits.

Ryan Cloutier, LS

Geomatics Director | Survey

Ryan is a Survey Manager in VHB's Winooski, Vermont office. He provides overall program management for the Vermont office's survey team and expands the suite of survey services offered to state, municipal, and private sector clients. Ryan serves clients' survey needs through the full project lifecycle from initial planning and research, to right of way, utility and boundary survey, through final design, construction, as-built, and ALTA survey. He has in-depth experience on both the public and private sectors having held senior positions at the Vermont Agency of Transportation and with private consulting firms throughout New England.

27 years of professional experience

Williston Stormwater Retrofits, Williston, VT

Ryan is the survey manager for the development of storm water retrofits along two and one-half miles of the I89 corridor in Williston, VT. To meet the projects aggressive schedule and budget VHB deployed UAV to collect high resolution imagery and a ground surface model in favor of the more time consuming and labor intensive conventional survey methods. Ryan's responsibilities included providing overall oversight of all field operations including both UAS and conventional on the ground survey services. Specifically he provided geodetic control and coordination for the UAV, quality analysis and control of the surface collected by the UAV, collection of features not accessible by the UAV, and mapping of the limited access right of way.

Franklin County State Airport, Vermont

Under an on-call contract with the Vermont Agency of Transportation (VTrans), Ryan was the project lead to provide boundary, topographic and records research for airport improvement projects. VHB performed a topographic survey of approximately 30 acres at the airport for stormwater improvements and fence upgrades. The topographic survey was combined with existing aerial LiDAR to build the final surface. VHB performed a boundary survey of the entire airport perimeter being approximately 318 acres. The project also included title work for a runway expansion project and possible avigation easements.

VTrans, Lamoille Valley Rail Trail, Swanton to St. Johnsbury, VT

Ryan and his team conducted the field survey for several phases of snowmobile/multiuse trail design spanning approximately 93 miles from Swanton to Sheldon. The project included over 60 miles of reconstruction on this abandoned railroad corridor which involved trail widening, drainage reconstructions, major timber cutting/trimming, signing improvements, bridge improvements, private access restriction, and full-depth reconstruction of the



Education BS, Mathematics, Saint Michael's College, 1998

Registrations/Certifications

Licensed Surveyor, VT, 09/2026 (reg# 0000744)

entire trail. As a project receiving congressional funding from Vermont Legislation, the deadlines were aggressive, and the expectations were high.

VTrans, Survey Services On-Call, Vermont

Ryan is the Project Manager for the Vermont Agency of Transportation's (VTrans) \$1.5M Survey Services On-Call Contract. His responsibilities include the full project management lifecycle, from initiation through project closeout. Ryan works closely with VTrans to scope projects, assign the appropriate resources, mitigate risks, and deliver the projects on schedule and within budget. For the U.S. 7–Shelburne Road Traffic signal project, he passed on traditional survey collection methods in favor of a UAV. The use of a UAV not only saved time and money, but it also kept the field crew out of one of Vermont's busiest roads. Other projects using remote sensing technology include Rockingham Ledge scan along I-91; three miles of the Colchester Causeway connecting Colchester to South Hero, VT; and the Hartland, VT, I-91 bridge replacement project.

VTrans, VT 116, CVU Road, Shelburne Falls Road, Hinesburg, VT

Ryan was a part of the survey team for the safety enhancement project at the VT 116/CVU Road/Shelburne Falls Road intersection for the Vermont Agency of Transportation (VTrans). This project aimed to install turn lanes and replace the existing traffic signal. It also involved replacing a large box culvert at the intersection and three additional culverts downstream. The scope of the project included multiple phases of traffic control, temporary traffic signals, operational and construction stormwater permitting, and comprehensive right of way acquisition.

VTrans, Wlliamstown-Northfield Park and Ride, Williamstown, VT

Ryan was part of the team working on the new park-and-ride project in Northfield and Williamstown, VT. The project scope encompassed constructing the new parkand-ride facilities, including a bus shelter and bike rack, deactivating the existing park-and-ride, removing a soil pile from the VTrans District Garage site, reconstructing the VTrans District Garage driveway, and implementing new stormwater management solutions, lighting, pavement markings, and other related features.

Patti Kallfelz-Werts

Senior Environmental Scientist | Environmental

Patti is a Senior Environmental Scientist in VHB's Winooski, Vermont, office with a specialty in wetland resources. She oversees natural resources surveys, resource impact analyses, regulatory permit applications (for federal and state agencies), wetland mitigation planning and design, data analysis, mapping, and reporting for a wide variety of clients and projects, ranging from private development to work on public transportation infrastructure. Patti also conducts rare, threatened, and endangered species (both federal and statelisted) surveys and habitat assessments as a part of the overall natural resources assessments for a wide range of clients.

22 years of professional experience

Vermont Agency of Transportation (VTrans), Lamoille Valley Rail Trail Rehabilitation Project, Northern, VT

Patti is the Task Manager for a number of environmental permits for the Lamoille Valley Rail Trail Rehabilitation Project for VTrans. Work on this project started in 2008 with wetland and waters delineations for over 90 miles of existing rail line. Recent work included coordinating wetland and waters re-delineations in the field; site visit and delineation review and pre-application meetings with the Vermont Department of Environmental Conservation (DEC) Wetlands Program Ecologist and United States Army Corps of Engineers (USACE) Project Engineer; and managing and technical review of the Section 401 Water Quality Certification application, Individual CWA Section 404 Permit application, and the Individual Vermont Wetland Permit application.

VTrans, Interstate 89 Exit 17 Reconstruction Project, Colchester, VT

Patti was the Task Manager for a number of environmental permits for the Interstate 89/Exit 17 Reconstruction Project for VTrans. Work on this project included site visit and delineation review and pre-application meetings with the Vermont DEC Wetlands Program Ecologist and USACE Project Engineer; and coordination with DEC staff to secure a waiver for the Section 401 Water Quality Certification, Individual CWA Section 404 Permit application, and the Individual Vermont Wetland Permit application.

VTrans, Vermont Route 78 Roadway Improvement Project, Swanton, VT

Patti provides technical oversight for a number of environmental permits, currently under agency review, for the Vermont Route 78 Improvement Project for VTrans. Work on this project included coordination with the DEC and USACE Individual CWA Section 404 Permit application and the Individual Vermont Wetland Permit application.



Education BS, Ecology, Unity College, 1999

Affiliations/Memberships

Renewable Energy Vermont, 2021

New England Women in Energy and the Environment, 2015

Native Plant Trus (formerly New England Wildflower Society), 2015

New York Flora Association, 2013

New York State Wetlands Forum, 2011

Society of Wetland Scientists, New England and Mid-Atlantic, 2010

Non-Native Invasive Species (NNIS) Monitoring, Various Locations, VT and NY

Patti is the Project and Task Manager and Botanist for numerous VTrans, Vermont Electric Cooperative, and Green Mountain Power monitoring projects. Work on these sites includes post-construction revegetation and remediation, NNIS monitoring and treatment, and reporting. Projects and associated monitoring areas range from bridge and culvert replacements to new road construction.

Substation Improvement and Reconstruction Projects, Various Locations, VT

Patti is the Task Manager for a number of substation improvement and reconstruction projects for Green Mountain Power, Vermont Electric Cooperative, and VELCO throughout Vermont. Ongoing work on this project includes coordinating natural resources assessments, data analysis, reporting, Section 248 support, site visits with Vermont DEC Wetlands Program and USACE District Engineers, pre-application meetings and ongoing coordination with regulatory personnel, and oversite of the preparation of the necessary environmental permit applications.

Renewable Energy Solar and Storage Projects, Various Locations, VT

Patti is the Task Manager for numerous solar energy production and storage projects throughout Vermont. Work on this project included coordinating natural resources assessments, coordination with state and federal regulators, preapplication meetings and on-going coordination with regulatory personnel, and preparation of the Individual Vermont Wetland Permit application.

Solar Energy and Storage Projects, VT, NY and CT

Patti provided regulatory, technical, and in-field support for a number of solar production and energy storage projects throughout Vermont, New York, and Connecticut. Work on these projects was completed for a number of clients and included natural resources surveys, coordination with the various local, state, and federal regulatory staff, technical report and application preparation, among other tasks, in order to assist clients with project siting and permitting for these projects.

Jay Peak Resort Golf Course Stream and Wetland Restoration, Jay, VT

Patti was the task manager and Project Lead this project that spanned seven years and included on-site wetland/waters delineations, forensic impact analysis, federal agency coordination (USACE and USEPA), After-the-Fact Individual Section 404 Permit application preparation and securing, wetland and waters restoration and creation plan preparation, two years of construction monitoring, and five years of mitigation and restoration monitoring and reporting.

Vegetation Monitoring/Invasive Species Management Plans, VT and NY

- » Various transportation improvement projects for VTrans throughout VT; prepared invasive species management plans for use during construction, to control and prevent the spread of non-native and invasive species.
- » Elting's Corner Wetland Mitigation Project, Ely, NY; native vegetation monitoring, invasive species monitoring and management plan implementation and modification.

