Agenda Item IV.2

210800X
September 25, 2023

Town of Bristol
1 South Street, PO Box 249
Bristol, VT 05443
Attention: Valerie Capels, Town Administrator

Re: Proposal for Slope Stabilization Engineering Services on Briggs Hill Road

Dear Selectboard Members:

DuBois & King (D&K) is pleased to provide our proposal for preliminary and final design, bid documents, and bid phase services for a failing slope on Briggs Hill Road. Engineering services will be funded with FEMA reimbursement of expenses related to the storms of July and August 2023. This proposal is being submitted per your request on September 18, 2023.

The proposed D&K project team is thoroughly experienced with slope stabilization projects. I will serve as Project Director and the Town's primary point of contact regarding the project. I have more than 30 years of engineering and construction experience including design, management, permitting, and construction management for slope protection and roadway reconstruction projects in Addison, Bristol, Ripton, Hancock, Rochester, Middlebury, West Rutland, Bethel, Weybridge, and Roxbury, Vermont. Jacob Wimmett, PE, PhD, of subconsultant partner firm GEODesign, Inc. (GEODesign) will serve as a senior geotechnical engineer. Jacob brings more than 18 years of experience, including post-Irene slope repairs in Stockbridge and Granville. GEODesign and D&K have worked together on multiple slope stabilization projects throughout Vermont. Our team includes additional senior-level professionals, including geotechnical engineers, hydrogeologists, permitting specialists, surveyors, and civil engineers.

Our team is familiar with the FEMA requirements for slope repair projects, and we have recently assisted the Towns of Bethel and Weybridge with FEMA-funded slope stabilizations, including post-project closeout documentation so that the towns received full reimbursement.

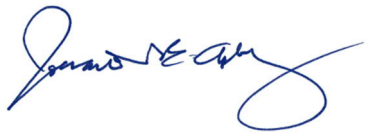
Please consider the strengths the D&K team will bring to the Town:

- Our proposed project team has the required experience with FEMA-funded assessment, design, and construction of slope repairs in a variety of settings.
- Our firm's Brandon and Randolph offices are located a short distance from the project site. Our local presence will allow us to provide a high, responsive level of service.
- Our prior experience assisting the Town of Bristol with slope stabilization projects and with an intersection study in the project area gives us familiarity with the site conditions.
- Our geotechnical teaming partner, GEODesign, is also assisting us with another project in Town, providing some efficiencies in their services.

- Our project team is supported by the substantial technical resources of a Vermont-based 150-person, multidisciplinary engineering firm with additional offices in New Hampshire, Maine, and New York.

This proposal outlines our proposed project approach, scope of services, budget, schedule, and qualifications. If the Town wishes to proceed, we will provide an agreement for the Town's signature. The D&K team appreciates the opportunity to submit a proposal for this project and has a strong interest in assisting the Town in recovering from this challenging situation. Please do not hesitate to contact me with any questions you may have. I am available at jashley@dubois-king.com or at 802.465.8396.

Sincerely,
DuBois & King, Inc.



Jonathan B. Ashley, PE
Director, Public Works Division

Attachments: Approach, Scope, Budget, and Schedule

Project Description and Understanding

Two slope failures occurred on Briggs Hill Road above the intersection with Lincoln Road as a result of July and August 2023 heavy rain events. The failing slopes are situated above Lincoln Road and show signs of instability as evidenced by crest erosion, pavement cracking, roadway settlement, and guardrail post movement.

Chris Lathrop, PE, of DuBois & King, Inc. (D&K) and Jacob Wimett, PE, PhD, of GEODesign, Inc. (GEODesign) visited the site in September 2023 and reviewed GIS mapping information on the site.

A steep wooded hillside exists between Briggs Hill Road and Lincoln Road about one mile east of the Bristol Town center. In general, the hillside increases in height as Briggs Hill Road rises above Lincoln Road which is less steep and parallels the New Haven River. The two slope sections have been identified as follows:

- Upper Briggs Hill (Slide 1) – This site is located furthest uphill and is approximately 100 feet high. The section of instability appears to be at least 200 feet long measured along the roadway. A temporary concrete waste block wall measuring about 50 feet long by 10 feet high was constructed at the slope crest. A culvert exits the slope near the crest with an outfall and downstream channel that is well defined and eroded. The culvert was observed to be dry during our site visits but water was observed flowing mid-way down the slope.

- Lower Briggs Hill (Slide 2) – This site is located about 200 feet downhill of Slide 1 and is approximately 75 feet high. The section of instability appears to be at least 250 feet long measured along the roadway. A culvert exits the slope near the crest on the uphill side of the unstable area. The culvert was trickling water (estimated at about 1 gallon per minute) during GEODesign's site visit. Pavement cracking and guardrail post movement/erosion was evident.

The overall slope geometry between Slides 1 and 2 appears to be similar. However, no active slope movements were observed and some areas were more heavily vegetated (e.g., larger trees and root masses) and with locally flatter terrain. Boulders roughly 10 feet or greater in nominal diameter were observed on the slopes, both above and below Briggs Hill Road, and a bedrock outcrop was visible at the slope base along Lincoln Road and in the New Haven River.

Published mapping from the Vermont ANR online atlas indicates sands and gravels (alluvium, fluvial, and nearby kame terrace deposits). Quartzite and phyllite bedrock is mapped within the project vicinity with local bedrock outcrops, consistent with our site visit observations. We understand no subsurface explorations have been conducted thus far for the project.

The Town has requested an evaluation of design alternatives with an overall objective of stabilizing the slopes and roadway to maintain vehicular access through the area.

Scope of Services

D&K is pleased to offer the following preliminary and final design, permitting, and bid services to address the slope failures and improve conditions at Briggs Hill Road.

Task 1: Project Coordination

DuBois and King will provide ongoing coordination of the project with the Selectboard, state and federal regulators, and FEMA.

Task 2: Topographic Survey

D&K's survey crew will survey the failed slopes, the road slightly above and below the damaged section, edges of tree line and large trees within 20 feet of the failed slope sections, existing drainage ditches, existing roadway and guardrail, and aboveground utilities within the road right-of-way adjacent to the failed slopes. We will establish vertical and horizontal control points and we will show these on the drawings with the applicable tie information. The survey level-of-effort provided herein is based on non-winter conditions.

Project control will be based on the GPS-derived state plane coordinate system and NGVD vertical datum. Right-of-way and property lines will be represented on the plan to the extent feasible using tax maps and other information provided by the Town.

D&K will prepare an existing conditions plan with one-foot contours including the roadway and topographic features of the failed slopes. Features such as trees, tree lines, edges of road, aboveground utilities, guardrail, and other surficial features relevant to the design will be shown as well.

D&K will also coordinate with the Town to identify ownership of the area impacted by the proposed project. A full boundary survey is not included in this scope. D&K will represent approximate easement areas needed from private landowners on the design plans based on Town tax maps or other mapping provided by the Town. Drafting easements language and negotiating easements with landowners is not included in D&K's scope of services.

Task 3: Resource Inventory (Wetlands, Wildlife, etc.) of Project Site

D&K's Qualified Wetland Scientist/Field Naturalist will delineate wetlands in the project area along with potential bat habitat trees, which we will mark and identify on the site plans. We will incorporate the limits of wetland areas or other resources that could be impacted by the work on the existing conditions plan. To the extent possible, our design will avoid and minimize work in these areas. Based on the mapped soils and observed site conditions, it is not expected that wetlands are present in the project area.

Task 4: Subsurface Investigation and Laboratory Testing

D&K's geotechnical subconsultant, GEODesign will prepare a Proposed Exploration Location Plan (Plan), which we anticipate will include two soil borings at the crest of each slope and one soil boring at the base of each slope, with one groundwater monitoring well at each site, to characterize in-situ soil and groundwater conditions. We will present the plan for the Town's consideration prior to drilling operations. D&K will pre-mark the Site by measuring off prominent site features and then obtain Dig Safe utility clearance prior to drilling.

GEODesign will subcontract drilling of the soil borings and will provide a geotechnical engineer on a full-time basis to observe and log the subsurface conditions in the soil borings, collect soil samples, and measure groundwater levels during drilling. GEODesign will select soil samples from the subsurface exploration program to be sent to a certified geotechnical laboratory for analysis. GEODesign will measure and record groundwater levels in the newly-installed groundwater monitoring well after the completion of the borings and well installation.

Task 5: Geotechnical (Slope Stability) Analysis and Geotechnical Report

GEODesign will evaluate subsurface soil and groundwater conditions and prepare a two-dimensional slope stability model of existing site conditions. Potential slope repair options will be incorporated into the model to develop a proposed long-term slope repair recommendation.

Two slope repair alternatives will be evaluated for each slope based on GEODesign's evaluation of the site conditions. The results of the slope stability analysis work will be summarized in a geotechnical engineering memo that will describe the subsurface exploration program, the subsurface conditions encountered, and our team's geotechnical engineering recommendations. The geotechnical report will also include test boring logs, an Exploration Location Plan, the geotechnical laboratory testing reports, results of the slope stability modeling, and recommendations.

Task 6: Preliminary Design

Based on the results of the slope stability analysis, the D&K team will develop typical cross sections and preliminary opinions of probable construction costs (OPCCs) for up to two slope stabilization alternatives for each slope. We will include conceptual plans for the typical repairs on the plans for each alternative, along with notes regarding drainage improvements and other site work.

We will present the findings of the geotechnical report and the preliminary design alternatives to the Town at a regularly-scheduled Selectboard meeting for the Town's selection of the preferred alternative to advance into final design.

Task 7: Final Design

After incorporating input from the Town on the preliminary plans, D&K will develop the final design plans and an opinion of probable construction costs for the preferred alternative selected by the Town. The plans are anticipated to consist of:

- Title page
- Layout sheets showing existing and proposed features in plan view
- Approximate right of way lines, construction limits, and proposed access locations
- Plans showing easement areas recommended to construct and maintain the project improvements
- Typical sections for the proposed improvements
- Typical and site-specific details of design elements
- Soil boring information
- Cross sections
- Erosion Prevention and Sediment Controls
- Construction details and notes

D&K will meet with the Selectboard to review the plans and costs. Comments and questions received will be resolved or incorporated in the permit documents and bid documents.

Task 8: Permit Applications

D&K will incorporate comments from the Town review, and submit permit applications. It is anticipated that the project will not require a wetland permit, Army Corps permit, or Stream Alteration permit.

Based on the extents of the two slides, it appears that the slope repairs will require disturbance of more than one acre of soil, and as such will require a Stormwater Construction General Permit. It is also possible that 0.5 acres of impervious roadway will be disturbed and reconstructed, which will require a Stormwater Discharge Permit.

All associated permitting fees will be the responsibility of the Town and are not included in D&K's proposed budget. Archaeological resources assessments, historic resources inventory, and other archaeological testing are not included in the scope of services.

If, during the course of developing the project, the need for additional permitting efforts and/or additional permits are identified as being necessary, we will bring this to your attention and discuss how to proceed. Additional permitting services can be incorporated via amendment.

Task 9: Bid Documents

D&K will revise the project plans to accommodate regulatory, Town, and public comments after the comments have been evaluated by the Town and the design team. A quantity takeoff will be conducted for the final plans and we will revise the OPCC accordingly. We will assemble VTrans contract documents with FEMA-required provisions suitable for bidding and construction of the project along with technical specifications.

Task 10: Bid Phase Assistance

D&K anticipates providing the following bid phase services for implementing the recommended long-term improvements:

- Conduct a pre-bid meeting with prospective Contractors.
- Respond to Contractor questions and issue one (1) to two (2) addenda.
- Attend the Bid Opening.
- Evaluate bids for responsiveness, price, and references.
- Make a recommendation for award of the construction contract to the Town based on a review of the bids.
- Prepare and assist the Town with issuing a Notice of Award.
- Prepare a conformed set of contract documents for execution and coordinate a Contract Signing.
- Conduct a contract signing and assist the Town with issuing a Notice to Proceed.

Task 11: Construction Phase Assistance

Construction phase services are not included in the scope and fee at this time, because the level of effort will vary significantly depending on the selected alternatives for the slope repairs. Construction phase services can be incorporated at a later date via an amendment.

Budget

Based on the above-outlined scope of services and experience on similar projects, D&K proposes to complete the work on an hourly basis with the following estimated task budgets:

Task	Proposed Budget
Field Work and Preliminary Design Alternatives	$97,850 to $110,200
Final Design and Permitting	$53,110
Bid Phase	$9,500
Construction Phase	To be Determined Based on Selected Alternative
Total	**$160,460 to 172,810**

A level of effort estimate of the anticipated labor hours for each task is attached. The proposed budget includes subcontracted geotechnical engineering and construction laboratory testing services and customary direct expenses and incidentals such as mileage.

Schedule

D&K will initiate work in 2023 with a focus on getting the necessary field work completed first, including the topographic survey and review of environmental resources, which are services that D&K provides in-house.

The project design will be advanced through the winter with a goal of having the project ready for bid in spring of 2024 for construction in the summer of 2024. Following is an overview of project milestones that would be targeted to achieve the Town's schedule objectives:

Project Task/Milestone	Schedule Goal
Initiate field work	October 2023
Complete geotechnical evaluation and alternatives analysis	December 2023
Final design of preferred alternative	January-March 2024
Submit permit applications (and Town secures easements)	March 2024
Bid project (after securing easements and permits)	April-May 2024
Construct project	2024

Town of Bristol
Briggs Hill Road - Slope Stabilization Engineering
Project No.: 210800X

DuBois & King inc.

Project Phases & Tasks		Labor Categories													
		Senior Principal	Principal/ Director I	Sr. Project Manager II	Project Manager II I	Proj. Mgr. I/ Sr. Project Engineer II	Project Engineer I/ Sr. Designer II	Survey Technician	Landscape Architect/ Planner	Field Naturalist/ Survey Party Chief	Construction Inspector	Licensed Surveyor	Three Person Survey Crew	Admin. Support	Total Hours
	Site Visits														
1 Design Phase															
A. Initial Project Coord. with Town, Regulators, and Funding Agency	1		2	4											6
B. Topographic Survey															
i. Field Survey	4			1						6		6	32		45
ii. Draft Basemap							8	14							22
C. Resource Inventory	2		1		4		6			12					23
D. Subsurface Investigation															
i. Coordination with GEODesign, Dig Safe Pre-Marking	2		6								6				12
E. Slope Stability Analysis and Geotechnical Report		1	4				20								25
F. Preliminary Design Alternatives															
i. Alternatives Analysis, Preliminary Plans - 2 alts. for each slide		1	8				48								57
ii. OPCCs for Alternatives			2	8			12								22
iii. Summary and Meet with Town	1		6												6
G. Final Design Drawings															
i. 90% Plans		1	12	8	8		72		8						109
ii. 90% OPCC			2	6			8								16
iii. Meet with Town	1		6												6
H. Permit Applications															
i. Stormwater Construction General Permit	1		1			12	16								29
ii. Stormwater Discharge Permit			1			16	24								41
I. Bid Documents															
i. Plan Revisions from Review Comments and Permitting			4			8	12								24
ii. Technical Specifications, Special Provisions		1	4	10			20		4						39
iii. Contract Documents		1	8	4		8								6	27
iv. Final OPCC			2	4			8								14
2 Bid Phase															
A. Advertisement/Schedule						2								4	6
B. Attend and Lead Pre-Bid Meeting	1		6												6
C. Respond to Questions and Issue One Addendum			4			2	4							2	12
D. Attend Bid Opening	1		3											1	4
E. Tabulate and Evaluate Bids and Provide Recommendation			1	1		4	6							1	13
F. Prepare Notice of Award							1								1
G. Construction Contract, Signing, Issue Notice to Proceed	1		5			2								4	11
Total Hours:		5	88	46	12	54	265	14	12	18	6	6	32	18	576