# STP BP 21(20) SOUTH POMFRET VILLAGE

## Request for Proposal
## Scoping Study
## At-the-Ready Consultant Services
## Town of Pomfret, Vermont

**Issued: March 17, 2022** **Due: April 20, 2022**

**Contact person: Jonathan Harrington, Municipal Project Manager, 5218 Pomfret Road, North Pomfret, VT 05053, 802-457-1299, Jon.Harrington@pomfretvt.us.** All questions related to this request for proposals shall be addressed, in writing, to this individual no later than 5 business days prior to the due date above.

## I. INTRODUCTION

The Town of Pomfret is requesting proposals for production of a scoping study to identify alternatives, issues and costs and provide recommendations related to construction of pedestrian and bicycle facilities in South Pomfret Village, funded in part by the Federal Highway Administration and the Town of Pomfret, through the Vermont Agency of Transportation (VTrans) Municipal Assistance Section (MAS).

The purpose of this scoping study to evaluate the South Pomfret Village area, including the intersections of Pomfret Road and Stage Road, Pomfret Road and Library Street, and evaluation of safety improvements to allow for the safer movement of vehicles, pedestrians, and bicyclists. The scoping study should take into special consideration safe pedestrian connectivity of the major facilities in this area, including Teago Store and Post Office, Abbott Library, Artistree Arts and Activities Buildings and grounds, Artistree Theater, Suicide Six Ski area and Bicycle Facility, Teago Fire Department, Prosper Valley School, and the residences in this village. Refer to Attachment A, map indicating the scoping area. Special consideration is also anticipated for two town owned bridges that exist within the scoping area as it relates to safe bicycle and pedestrian facilities. These two bridges were evaluated by DuBois & King in 2013, the engineering report is included as Attachment B. It is anticipated that this evaluation will need to be revisited to address more current public input and to reflect current permitting and land use conditions among other project elements within the context of this bike/pedestrian scoping study.

The owner of the project is the Town and the sole authority for the Consultant during the project rests with the Town of Pomfret Selectboard.

Project development must follow the VTrans Municipal Assistance Section (MAS) process. Questions related to the MAS project development process can be answered by VTrans Project Supervisor / Manager Nydia Lugo, Municipal Assistance Section, by phone at (802) 595-3347 or email at Nydia.Lugo@vermont.gov.

All work will be accomplished in accordance with the following:

- MAS Guidebook for Municipally Managed Projects (found on the VTrans MAS website https://vtrans.vermont.gov/highway/local-projects ).
- MAS Scoping Process flow chart (found on the VTrans MAS website).
- Specifications for Contractor Services (found on the VTrans MAS website).

## II. SCOPE OF WORK

In general, the scope of this project will consist of a planning process that identifies the needs of South Pomfret Village within a defined area taking into consideration the existing conditions. The outcome of the process will be:

- Identification and prioritization of improvements
- A public involvement process to ensure local input and support of projects
- An assessment of historic, archaeological and environmental impacts
- Clear, written documentation of project issues and overall feasibility
- A complete preliminary cost estimate for further engineering, project administration, environmental review, and construction

The draft and final reports will include all elements of this RFP in a format outlined in section L.

### A.) Project Kickoff Meeting

Meet with Town and State officials (VTrans Bicycle and Pedestrian Section staff or Transportation Alternatives Coordinator) to develop a clear understanding of the project goals, objectives, timelines and deliverables.

### B.) Compile Base Map/Document Existing Conditions

Compile a base map using available mapping including VT Digital Orthophotos, digital parcel maps for the Town (if available) and other natural resource-based GIS data available from the RPC or the Vermont Center for Geographic Information (VCGI). The compiled information must be displayed in an ArcView-compatible format. Display of typical sections and other engineering type drawings may be done with software other than ArcView. Existing conditions to be noted include presence of existing pedestrian/bike facilities, roadway widths, subsurface drainage and any other items the consultant feels are appropriate. Additional items to be mapped may include natural resource constraints, utilities, historic and archaeological impacts, etc. Additionally, the consultant will collect traffic information such as the Average Daily Traffic, pedestrian and bicycle counts and available crash data. The consultant may elect to undertake a topographic survey to map roadway widths more accurately, location of existing buildings, drainage facilities and any other features that may be critical to the design of the project.

### C.) Local Concerns Meeting

The consultant will organize and moderate a Local Concerns meeting with Town representatives and applicable State officials This meeting is with the public to develop a

clear understanding of the project goals, objectives and concerns. This meeting may be an opportunity to discuss any future maintenance issues or concerns with the proposed project. As an outcome of the local concerns meeting and the project kickoff meeting, the consultant will develop a Project Purpose and Need Statement for proposed improvements. The consultant will generate this statement based on local input and an understanding of existing conditions. Items that may be discussed (especially for shared use paths) are what different user groups are anticipated/desired (e.g. bicyclists, roller-bladers, snowmobiles in winter, etc.) and what surface type is desired.

**D.) Identify Land Use Context**

The consultant will identify the existing and proposed land uses in the project area as well as the overall context of the area where the project is proposed (e.g. rural, suburban, village area, etc.) Based on existing land use patterns and potential connections to planned or existing pedestrian and/or bicycle facilities, the consultant will document predicted and existing pedestrian/bicycle travel patterns to gain an understanding of the best location for new sidewalks/bike facilities. The consultant shall discuss how the proposed project fits in with the overall bicycle or pedestrian network in the community.

**E.) Develop Conceptual Alternatives**

In cooperation with the Town staff the consultant will be responsible for identifying potential alternatives for the proposed bicycle and/or pedestrian facilities utilizing the information compiled for the base plan, and site visit(s). Conceptual alternatives should also include roadway crossing needs. If a shared use path paralleling a road is proposed, the alternative of providing on-road accommodation for bicyclists should be discussed. If a proposed alignment includes off road (shared use path) and on road bike facilities, discuss how these transitions will be made. The consultant will also review the proposed alternatives to ensure that they meet the Americans with Disabilities Act Accessibility Guidelines and other applicable State and Federal requirements.

If the proposed improvement covers a large distance and will likely be implemented in phases, the consultant shall make suggestions about how to break up the project into logical segments. The consultant will develop typical sections for the different alternatives that show basic dimensions and, if applicable, where the facility is located within existing road rights of way and in relation to travel lanes, shoulders, existing building faces and other features.

As part of developing alternatives, the consultant will become familiar with the most recent edition of the “Work Zone Safety & Mobility Policy and Guidance” Document and assess the impact of the project construction on existing vehicle, pedestrian and bicycle traffic. An initial determination should be made as to what level of project significance (Project Type - A, B, C or D) is likely to result from project construction. The study shall include a section on traffic management that discusses the possible impacts, what stakeholders may be impacted and what measures are likely to be needed to address work zone impacts during construction. If traffic control measures, including any temporary pedestrian facilities, are needed, their cost shall be identified in the overall costs for each alternative.

**F.) Identify Right-of-way Issues**

Compile all right-of-way and abutting property ownership information along the proposed alignment of the project, including roadway and railroad where applicable. This information should identify public/private ownership and any existing easements or restrictions (e.g. Act 250 permits) on affected property. Map right-of-way information on the same base mapping as the existing conditions – Task B). If the project will cross existing commercial or residential driveways that are excessive in width, a discussion should be included of the impacts of modifying the driveway to meet current standards (access management).

**G.) Identify Utility Conflicts**

Identify and discuss all public and private underground and overhead utilities (water, sewer, fiber optics, electric, TV, cable, phone) in the project area. Include a preliminary assessment of whether any relocations will be required. Will the relocations occur outside of the existing Rights of Way? For underground utilities, an assessment should be made of whether they will be impacted by construction of the proposed improvements. The assessment should include identification of owners of potentially impacted utilities.

**H.) Identify Natural and Cultural Resource Impacts and Permitting Requirements**

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

All environmental resource work shall be conducted by qualified professionals in that field (i.e. wetland reviews conducted by qualified wetland biologists, historic preservation reviews by historic preservation professionals, archaeological reviews by archaeologists, etc.), and should be well documented in the scoping report. Reviews can be completed with remote sensing, maps, archives, professional judgement and minimal field work, if any. More detailed analysis of reviews will be completed during design stages of the project. Project area should be depicted on a map. Environmental resource areas and impacts should also be delineated/illustrated/or otherwise described on the map.

Historic and Archaeological resources will be reviewed to determine potential direct and indirect impacts to those resources. Consultants should identify a proposed Area of Potential Effects (APE) for both direct and indirect effects. For the Historic resources, the correct level of study for above-ground resources would be a survey that identifies properties in the APEs that are potentially eligible for listing on the National Register of Historic Places. For Archaeology, the correct level of effort is an Archaeological Resources Assessment (ARA) which involves no excavations, but identifies where and how much of a proposed project area has archaeologically sensitive land. This is based on the Predictive Model developed by the SHPO office, historic maps such as Beers, Wallings, Sanborn for urban areas, Google imaging using the timeline feature to potential land changes over the years and the On-Line Resource Center (ORC) for professional archaeologists conducting work in Vermont. See link below. Field visits may be required to verify any disturbance but at this preliminary

level, a desk review may be sufficient to determine general sensitivity. https://accd.vermont.gov/historic-preservation/identifying-resources/online-research-center

Because an alternative has not yet been selected, all Environmental Resource ID work shall include the general project area in which all proposed alternatives will take place. If alternatives are provided in the scoping report, then recommendations for the alternatives' impact on environmental resources shall be stated in the scoping report, along with anticipated permit requirements.

When possible, documentation from appropriate state and federal agencies (e.g. Agency of Natural Resources, Department of Fish and Wildlife, Corps of Engineers) should be included to summarize the extent to which resources may or may not be impacted. The consultant will identify any permits that will likely be needed for the project.

The Vermont ANR Natural Resource Atlas *and BioFinder* are web-based mapping tools which should be used to approximate natural resource features. The Atlas serves as a quick reference to help determine which resources, mentioned above, are possibly located within the project limits. To aid in the review the following web applications should be viewed and referenced.

ANR Natural Resource Atlas: https://anrmaps.vermont.gov/websites/anra5/

- Wetland VSWI & Wetlands Advisory layers
- VT Fish and Wildlife Layers (RTE, uncommon species, deer wintering)
- Hydric Soils layers
- Rivers layers

ANR BioFinder: https://anr.vermont.gov/maps/biofinder

The Vermont Significant Wetland Inventory (VSWI) and Wetlands Advisory layers are good places to start to determine potential presence of wetlands although, all state significant wetlands are not mapped. The hydric soils mapping indicates additional areas where wetlands may be present. The actual boundaries and presence of wetlands must always be determined in the field by a professional wetland scientist.

The DEC Watershed Management Division has regional resource scientists who are available to help with project scoping and permitting requirements. For instance, the floodplain managers can help evaluate river corridors and whether certain types of bike and pedestrian facilities meet the State river corridor performance standard, i.e., fit within these dynamic areas without the application and maintenance of river channelization practices.

Improvements for bicyclists and pedestrians are likely to increase impervious surface area, especially where a closed, subsurface drainage system is proposed (new or addition to existing). An estimate of new, redeveloped and existing contributing surface areas should be included as well as an assessment of what will be required to obtain a stormwater discharge permit. An estimate of the area of earth disturbance that will result from the project should be included to assess the extent of mitigation that will be required under the ANR Construction Stormwater (erosion prevention and sediment control) permit.

During development of alternatives, the Consultant shall attempt to minimize discharges of untreated stormwater to surface waters or wetlands, particularly during smaller storms (1yr return frequency and smaller). Reasonable effort shall be made to identify and attempt to minimize conflicts and align project goals as practicable with known community stormwater master plans, tactical basin plans, jurisdictional features associated with State stormwater permits, planned stormwater retrofits and other related considerations which may be affected by the project.

This resource work will inform the alternative selection so that the project avoids and minimizes, to the extent practicable, impacts to environmental resources. Thorough and well-documented resource identifications will inform the selection of the Least Environmental Damaging Practicable Alternative (LEDPA) and development of Conceptual Plans. Scoping reports will be reviewed by the VTrans Project Delivery Environmental Section

**I.) Alternatives Presentation**

All of the proposed alternatives (including a mandatory "no build" alternative) will be evaluated in an alternatives matrix. The matrix will include resource impacts, right of way impacts, utility impacts, ability to meet the project purpose and need, estimated cost and any other factors that will help the community evaluate the alternatives being considered. Taking into consideration previously gathered information, conduct a public informational meeting to present all the different alternatives that have been considered. The outcome of this meeting should be an alternative selected by the community for further development.

**J.) Develop Preliminary Cost Estimates**

The consultant will develop preliminary cost estimates for further planning, design, construction and maintenance cost of the project. Construction cost estimates shall include preliminary bid item quantities. Per foot or lump sum costs will not be an acceptable substitute. The estimates should assume that the project will be constructed using a combination of Federal and local funding and will be managed by the local community. The cost estimates should include amounts for construction, engineering, municipal project management and construction inspection. If the project is to be completed in phases, cost estimates for each phase shall be provided.

**K.) Project Timeline**

The consultant will provide a project development timeline that takes the project through the design, permitting and construction phases assuming the use of a combination of Federal and local funding. If necessary, the consultant will develop a project phasing plan for construction of the project over a multi-year period.

**L.) Report Production**

Using information gathered from the activities outlined above and from the meetings with the Town, submit draft and final reports outlining the findings of the study. The draft report must be submitted to VTrans for comment prior to issuing a final report. A minimum of 3 weeks

must be allowed for VTrans review of the draft report. A public informational meeting will be held to review the draft report before completion of the final report. The consultant shall follow the report format shown below and is expected to include all of the elements listed in this RFP. It is expected that the local legislative body will endorse or decline the proposed project at this meeting.

**Recommended Format for Final Scoping Report:**

Purpose and Need of the Project
Project Area and Existing Conditions
Each Alternate Should Define:
- Right of Way Impacts
- Utility Impacts
- Natural & Cultural Resource Impacts
- Preliminary Project Cost Estimate
- Future Maintenance

Public Involvement
Compatibility with Planning Efforts
Project Timeline
Viability

## III. STANDARDS AND DELIVERABLES

**A.)** All documents should be provided in both hard copy (paper) and digital format. All hard copies of draft and final reports shall be printed on both sides (i.e. double-sided). Adobe .pdf format is required for the draft and final reports.

**B.)** All data, databases, reports, programs and materials, in digital and hard copy format created under this project shall be transferred to the Town/City or RPC upon completion of the project and become the joint property of the Town/City or RPC and the State of Vermont when applicable.

**C.)** The consultant will provide five copies to the Town of the draft and final reports. One digital copy as an Adobe .pdf document of both the draft and final reports shall be sent to the VTrans project Supervisor / Manager and the Town.

## IV. RESPONSE FORMAT

Responses to this RFP should consist of:

1. A cover letter expressing the firm's interest in working with the Town of Pomfret including identification of the principal individuals that will provide the requested services.

2. A description of the general approach to be taken toward completion of the project, an explanation of any variances to the proposed scope of work as outlined in the RFP, and any insights into the project gained as a result of developing the proposal.

3. A scope of work that includes detailed steps to be taken, including any products or deliverables resulting from each task.

4. A summary of estimated labor hours by task that clearly identifies the project team members and the number of hours performed by each team member by task.

5. A proposed schedule that indicates project milestones and overall time for completion.

6. A list of individuals that will be committed to this project and their professional qualifications. The names and qualifications of any sub-consultants shall be included in this list.

7. A composite schedule by task of direct labor hours, direct labor cost per class of labor, overhead rate, and fee for the project. If the use of sub-consultants is proposed, a separate schedule must be provided for each.

Please note that the proposal should be limited to a total of 15 pages.

## V. CONSULTANT SELECTION

The Selection Committee is made up of the five members of the Pomfret Selectboard, which includes the MPM. The Committee has reviewed and evaluated at least three of the Statements of Qualifications from consultants in the At-the-Ready Qualified Roster and selected one. After selecting the firm, the Selection Committee requests a technical and cost proposal under this RFP. If negotiations are successful, the Selection Committee will award a contract.

The rates that are proposed will be in effect for the complete term of the contract.

The selection committee may elect to interview the consultant prior to final selection. The Town of Pomfret reserves the right to seek clarification of any proposal submitted and to select the proposal considered to best promote the public interest.

The proposal will be evaluated and awarded based on the personnel presented in the At-the-Ready Qualification Proposal. Should the awarded consultant propose any substitutions to the project personnel either at the time of the proposal or in the future, they must submit a request to VTrans in consultation with the Municipality, for approval of such a change.

## VI. SUBMISSION

All questions related to this request for proposal shall be addressed to the contact person indicated.

The proposal shall conform to the following requirements. The proposer shall:

Submit 6 copies of the proposal in a sealed envelope to the name and address indicated above prior to 12:00 PM on, April 20, 2022. The proposal should be double sided and use recycled paper, if possible. Twin pocket portfolios or other simple, reusable binding method is recommended.

And:

Submit as an electronic submission via email clearly marked in the subject with the project name. Please inform the Contact Person prior to submission to avoid proposal being relegated to their spam or junk email files.

Proposals and/or modifications received after the date and time due will not be accepted or reviewed. No facsimile machine transmitted proposals will be accepted.

The proposal upon submission becomes the property of Town of Pomfret. The expense of preparing and submitting a proposal is the sole responsibility of the consultant. The Town of Pomfret reserves the right to reject the proposal received, to negotiate with any qualified source, or to cancel in part or in its entirety this RFP as in the best interest of the Town of Pomfret. This solicitation in no way obligates the Town of Pomfret to award a contract.

## VII. CONTRACTING

The Consultant, prior to being awarded a contract, shall apply for registration with the Vermont Secretary of State's Office to do business in the State of Vermont, if not already so registered. The registration form may be obtained from the Vermont Secretary of State, 128 State Street, Montpelier, VT 05633-1101; Phone: (802) 828-2363, (800) 439-8683; Vermont Relay Service – 711; Web: https://www.vtsosonline.com/online. The contract will not be executed until the Consultant is registered with the Secretary of State's Office.

The Consultant's attention is directed to the VTrans' Disadvantaged Business Enterprise (DBE) Policy Requirements. These requirements outline the State's and the consultant's responsibility with regard to the utilization of DBEs for the work covered in the RFP. It is expected that the consultant will make good faith efforts to solicit DBE sub-consultants. The successful Consultant will be expected to execute sub-agreements with sub-consultants named in the At-the-Ready Consultant Services proposal upon award of this contract.

Prior to beginning any work, the Consultant shall obtain Insurance Coverage in accordance with the Specifications for Contractor Services located in the Municipal Assistance Section website. The certificate of insurance coverage shall be documented on forms acceptable to the Town.

# ATTACHMENT A

# SOUTH POMFRET VILLAGE SCOPING STUDY

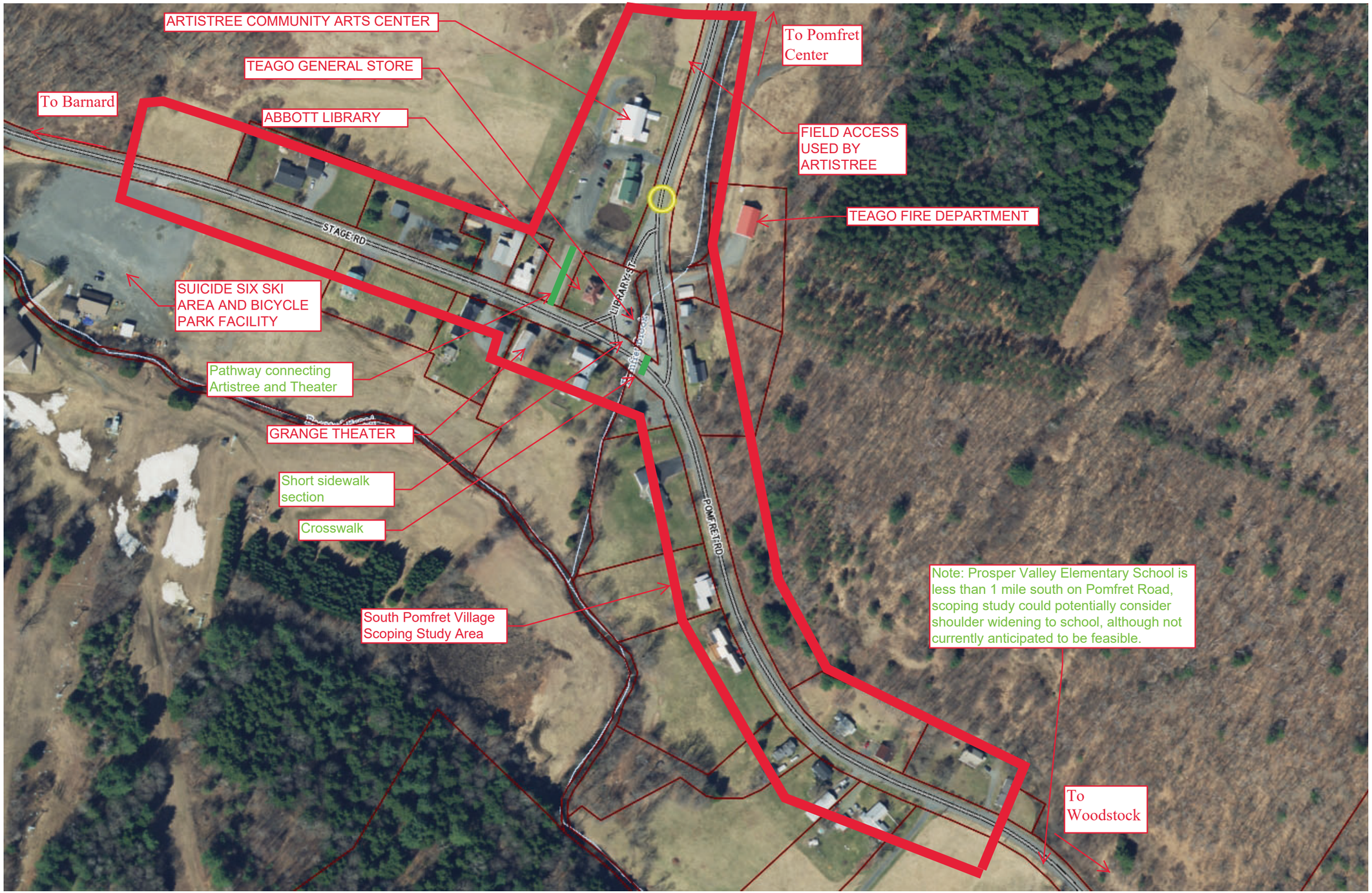
# SCOPING AREA MAP

VERMONT

# Natural Resources Atlas

**Vermont Agency of Natural Resources**

vermont.gov





## LEGEND

- Parcels (standardized)
- Roads
  - Interstate
  - US Highway; 1
  - State Highway
  - Town Highway (Class 1)
  - Town Highway (Class 2,3)
  - Town Highway (Class 4)
  - State Forest Trail
  - National Forest Trail
  - Legal Trail
  - Private Road/Driveway
  - Proposed Roads
- Stream/River
  - Stream
  - Intermittent Stream
- Town Boundary

SOUTH POMFRET VILLAGE BIKE AND PEDESTRIAN SAFETY IMPROVEMENTS SCOPING STUDY AREA

Existing pedestrian facilities labeled in green

**1: 2,568**

1in = 214 ft.
1cm = 26 meters

130.0 0 65.00 130.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere





**NOTES**

South Pomfret Village Scoping Study Area

# ATTACHMENT B

# 2013 DUBOIS & KING, INC.

# REPORT ON BRIDGES

# Town of Pomfret, Vermont

## Bridge No. 9 – Pomfret Road over Pomfret Brook
## Bridge No. 5 – Stage Road over Pomfret Brook

# Engineering Investigation and Recommendations Report

Prepared by

DuBois & King inc.

July, 2013

# Town of Pomfret, Vermont

# Bridge No. 9 – Pomfret Road over Pomfret Brook
# Bridge No. 5 – Stage Road over Pomfret Brook

# Engineering Investigation and Recommendations Report

## Background and Introduction

The Town of Pomfret has retained the services of DuBois & King, Inc. to conduct an engineering study to investigate options to replace or abandon the two bridges near the Teago General Store. The bridges to be considered carry Pomfret Road (Bridge 9) and Stage Road (Bridge 5) over Pomfret Brook. Both bridges are located close to each other, near the intersection of Pomfret Road and Stage Road. The Town has received a Town Structures Grant from VTrans to replace Bridge 9; however, the Town would like their options explored before this bridge is simply replaced. Because the two bridges are in close proximity to each other, both cross Pomfret Brook, and both are hydraulically inadequate, the Town has asked DuBois & King to consider several options, which include:

- Replacing Bridge 9 with a new bridge approximately 32'x6', and raising the road at the bridge to accommodate the required 6' vertical opening.
- Replacing Bridge 9 with a new bridge approximately 32'x6', and lowering the brook's elevation to accommodate the required 6' vertical opening.
- Removing Bridge 9 altogether and replacing Bridge 5 with a new bridge approximately 32'x6' - this option would include closing Pomfret Road between Stage Road and Library Street.

The Pomfret Selectboard understands that the general feeling of the public is that they would like to keep Pomfret Road open to traffic, which requires replacement of Bridge 9. However, if Bridge 9 were removed, the money the Town would invest in replacing it could be invested in Bridge 5 to replace or repair it rather than Bridge 9. The purpose of this Engineering Investigation and Recommendations Report is to present the Pomfret Selectboard

**Existing Bridge 9, Looking North**

with the issues, impacts, costs, and recommendations of the foregoing options so that they can make an informed decision regarding which option to pursue in the best interest of the Town.

## Existing Conditions

The two bridges under consideration are located in close proximity to each other, at the 3-way intersection in South Pomfret formed by Pomfret Road, Stage Road and Library Street. All three roads are local, Town-owned roads. Bridge 9 was constructed in 1926, and consists of a cast in place concrete deck and concrete parapets supported on cast in place concrete abutments. It has a clear span of 18'-0", with a clear height of approximately 4.5'. Bridge 9 has a superstructure depth that is approximately 25" from bottom of deck to top of road including the bridge slab and paving. Bridge 9 is located at the south end of a horizontal curve in the roadway, and the road is on a tangent (straight) section south of the bridge. The posted speed limit of Pomfret Road is 35 mph.

Bridge 5 was constructed in 1939 (and later widened), and consists of a cast in place concrete deck supported on cast in place concrete abutments. There is a cast in place concrete parapet and sidewalk on the north side, and fascia mounted bridge rail on the south side. It has a clear span of approximately 17'-3", with a clear height of approximately 5'-6'. The east abutment of this bridge directly ties into the foundation of the Teago building. Bridge 5 has a superstructure depth that is approximately 29" from bottom of deck to top of road including the bridge slab and paving. Bridge 5 is located on a relatively straight section of roadway, with a horizontal curve located just east of the bridge at the intersection of Pomfret Road.

**Existing Bridge 5, Looking Southeast**

There are no known underground public utilities in the area, although there are a few storm drains, the well of the Teago building, and an underground electric power line to the Fire Station. Approximately 150' upstream of Bridge 9 there is a private pump station with a sewer line that crosses the brook. There are numerous utility poles throughout the area that support overhead electric and communication lines. There are overhead electric lines located directly over Bridge 9 and the electric and communications lines for the Teago General Store are located directly over Bridge 5.

A topographic survey plan of the project area is included in Appendix A of this Report.

The VTrans Hydraulics Unit has prepared a Preliminary Hydraulic Report for this site and concluded that both bridges at this location are hydraulically inadequate (although Bridge 5 is somewhat better than Bridge 9). Both bridges should have a hydraulic opening of approximately 224 square feet, and should be configured to provide a span of 32 feet and a vertical clearance of 7 feet (note, this is 1' taller than requested by the Town in their RFP). This size of structure will provide an opening adequate to convey the flows from a 25-year storm with the required 1 foot of freeboard between the low chord of the bridge and the water surface elevation. DuBois & King has reviewed VTrans' information and conclusions, and has independently confirmed them. The exact bridge configuration would be determined once survey, geotechnical borings, and the preferred bridge option are selected and preliminary design is initiated. A copy of VTrans' Preliminary Hydraulic Report is included in Appendix B of this Report.

## Alternatives Investigation

### Design Criteria

The Vermont Agency of Transportation has design standards pertaining to local roads and bridges. With the use of State monies (such as with a Structures Grant), Town's are required to follow these standards. Based on these standards, the following summarizes the design criteria we believe are appropriate for these bridges:

#### Bridge and Roadway Design Codes, Specifications, and Guidelines

- AASHTO LRFD Bridge Design Specifications, 6th Edition
- VAOT 2011 Standard Specifications for Construction
- Structural Capacity: HL-93
- Width of Bridge Lanes: 24'-0" rail-to-rail (2 lanes)
- Overall Width of Bridge: 26'-0" +/-
- Road Functional Classification: Local
- Traffic Volume (AADT): 400-1500 vpd (estimated)
- Design Speed: 35 mph
- Design Storm 25-year event with 1' of freeboard

The existing approach roadway widths and vertical alignment generally meet current design criteria at both bridges. However, Bridge 9 is located on a horizontal curve that is not superelevated (no banking). To meet design standards, this curve should be superelevated at a 6% cross slope. However, providing this amount of superelevation would not be practical for a project with a scope limited to replacement of the bridge as this would require significant additional work along the roadway. The Selectboard has asked that this curve be evaluated for possible improvement as part of this Study.

Additionally, to provide an adequate hydraulic opening beneath Bridge 9, the roadway would either need to be raised by approximately 2.5 feet, or the stream would need to be lowered by an equivalent amount. In the event that the road profile is raised significantly, then superelevation could be added to the new bridge as the roadway approach would be quite extensive.

Bridge Structure Type Alternatives

DuBois & King has evaluated two structure types that would be appropriate for the replacement of either Bridge 9 or Bridge 5 as part of this alternatives analysis:

- a precast concrete rigid frame or arch
- precast concrete slabs on either cast-in-place concrete abutments or pile foundations

Costs of the alternatives presented later in this report are stated based on experience with similar projects. Following are the structure types considered and their associated advantages and disadvantages:

Precast Concrete Rigid Frame or Arch

**Precast Concrete Rigid Frame or Arch (Frame Shown)**

Advantages:

- High quality concrete product due to plant controlled manufacturing
- Long, relatively maintenance free service life – expected to be 75 years
- Less costly alternative than precast beams on spread footings

- Short construction time and relatively simple to construct – precast units are placed with a crane
- Jointless structure – no joints to fail or corrode
- Aesthetically appealing option with an arch, or the use of form liners (provide pattern or texture to concrete)

Disadvantages:

- Reduced hydraulic opening (if an arch is used)
- Greater substructure excavation and materials required (as compared to a pile foundation)
- Thicker superstructure configuration required compared to slabs; therefore, more roadway approach work required to raise the profile

Precast Concrete Voided Slabs (On Spread Footing or Pile Foundations)

**Precast Concrete Voided Slabs**

Advantages:

- High quality concrete for superstructure due to plant controlled manufacturing
- Long, relatively maintenance free service life – expected to be 75 years
- Less excavation and abutment materials (if a pile foundation is used)
- Jointless structure – no joints to fail or corrode (if a pile foundation is used)
- Thinner superstructure configuration required compared to precast frame or arch; therefore, less roadway approach work required to raise the profile

Disadvantages:

- More costly alternative than a precast frame or arch if cast in place footings are required (approximately same cost if piles can be used)
- Somewhat longer construction time due to cast-in-place components, grouting, and post-tensioning required
- Pile foundation may not be ideal for subsurface conditions at this site (would need to be determined through geotechnical borings)
- Greater exposure of deck to road impacts and salts due to less cover compared to precast concrete rigid frame or arch
- Bridge would include joints at each end if spread footings are used, which are a maintenance item

Maintenance of Traffic During Construction

Given the close proximity of these two bridges to each other, closing either bridge site to traffic during construction and detouring traffic across the other bridge would be the most cost effective option. This will save the Town the substantial cost of a temporary bridge detour, or constructing a replacement bridge in two stages.

Project Options

1. **Replace Bridge 9 and raise Pomfret Road to provide an adequate hydraulic opening**

   In order to provide an adequate hydraulic opening for the replacement of Bridge 9, a clear span of 32 feet wide by 7 feet high would be needed. This would result in a new bridge that is longer than the existing bridge, and under this option, the road would also need to be raised in order to accommodate a new bridge deck and provide an adequate hydraulic opening without lowering the brook elevation. For a span of this length, a precast concrete rigid frame structure would be approximately 22" thick, and another 10" of cover/roadway surface would need to be provided over the frame (for a total thickness of 32"). For the precast concrete beams, a superstructure thickness between 18" (voided slabs and pavement) and 32" (precast beams and concrete deck) would be required. The existing vertical distance between the top of roadway surface and bottom of deck is approximately 25". Therefore, to provide an additional 2.5' of hydraulic opening, the roadway elevation at the bridge would need to be raised somewhere between 23" and 37" to provide an adequate hydraulic opening and accommodate the new bridge deck. For purposes of this analysis, we have assumed the minimum deck thickness of 18", and the corresponding need to raise the elevation of the road by 23".

   To raise the road profile 23", a gradual transition of the road profile would be needed. Raising the road profile would impact the parking lot of the Teago Store by forcing the

grade to be raised by approximately 24" at the north end, and approximately 6" at the end closest to the building. This would also require adjustments to the catch basin adjacent to the store, and some modifications, such as an additional step, at the basement entrance. A minor grade adjustment would be needed at the entrance to the shed on the east side of the road, and to the driveway to the Fire Station. Additionally, the intersection of Library Street would require grade adjustments. The limits of construction are shown on the plans included in Appendix C.

The existing utility poles on the northwest and southeast corners would need to be removed during construction as they would be directly affected by the excavation for the new bridge. These poles would either be reset at other nearby locations permanently, or temporarily reset and then permanently replaced at their current locations once construction of the bridge was completed. It is likely the lines on the poles would need to be reset at somewhat higher locations in order to provide adequate clearance between the new roadway elevation and the lines.

As requested by the Pomfret Selectboard, DuBois & King has investigated flattening the horizontal curve located at Bridge 9 to eliminate the relative sharp curve that exists just north of the bridge currently. Flattening the curve can be done, but realigning the road would add substantial cost to the project. A plan and profile of a potential realignment is included in Appendix C. The realignment would involve approximately 525 linear feet of roadway, and would shift the location of the bridge approximately 12' to the east. With a road reconstruction such as this, proper superelevation would need to be applied. While shifting the road and bridge to the east would reduce impacts to the Teago property and Library Street intersection, applying superelevation would roughly offset the effects of shifting the road. Because of the additional construction and cost, and minimal benefit, realigning the road to flatten the curve at Bridge 9 is not recommended.

**2. Replace Bridge 9 and lower Pomfret Brook to provide an adequate hydraulic opening**

As with Option 1, to provide an adequate hydraulic opening for the replacement of Bridge 9, a clear span of 32 feet wide by 7 feet high would be needed. This would result in a new bridge that is longer than the existing bridge, and under this option, the brook would need to be lowered in order to accommodate a new bridge deck and provide an adequate hydraulic opening without raising the road elevation. Again assuming the minimum deck thickness of 18" as described under Option 1, the brook elevation would need to be lowered by 23" in order to provide an adequate hydraulic opening.

Because this option lowers the brook rather than raises the road to achieve an adequate hydraulic opening, it would not have permanent impacts to the Teago Store's parking lot,

the adjacent shed building, or the driveway to the Fire Station. Under this option, the brook would be lowered approximately 23" at the bridge location, and this elevation change would need to be gradually tapered back into the existing brook channel profile for some distance upstream and downstream. Additionally, measures would need to be implemented to keep the brook profile stable over time. These measures would most likely consist of placing large boulders in the channel to form a series of "checks" to minimize the water velocity and keep smaller streambed materials from migrating. Unfortunately, the brook would effectively try to return to its natural state and reestablish its former profile over time. This may result in the channel near the bridge filling back in the future and cause the Town to conduct on-going maintenance to keep the bridge opening clear.

It should be noted that Mr. Todd Menees, VT ANR Stream Alteration Engineer, does not support this option. Mr. Menees stated that he would need very compelling reasons why this would be the best option before he could issue a permit to alter the stream as described herein.

It does not appear that the private sewer force main approximately 150' upstream from the bridge would ultimately be affected by the change in the brook's profile under this option, as it is far enough away and would well out of the influence zone of the change.

Roadway approach would be relatively minor under this option. Pomfret Road could be left largely intact, except for the excavation area immediately surrounding the bridge. This would likely entail reconstructing approximately 90 feet of roadway.

The existing utility poles on the northwest and southeast corners would need to be removed during construction as they would be directly affected by the excavation for the new bridge. These poles would either be reset at other nearby locations permanently, or temporarily reset and then permanently replaced at their current locations once construction of the bridge was completed.

Flattening of the horizontal curve is again not recommended under this option. Flattening of the curve would move the bridge approximately 12' farther upstream, forcing the lowering of the brook farther upstream and therefore forcing the brook to be lowered even more than it would at its current location. Also, the flattening the curve would result in significant additional costs that are well outside the scope of Town Structures Grant.

3. **Remove Bridge 9, close Pomfret Road between Stage Road and Library Street, and replace Bridge 5 to provide an adequate hydraulic opening**

Under this option, Bridge 9 would be completely removed and the brook channel would be restored to its natural state. Also, Bridge 5 would be replaced to provide a bridge with an adequate hydraulic opening. This option has several benefits:

- Bridge 9 is no longer an obstruction to the brook
- Bridge 9 is no longer a maintenance concern
- The cost to remove Bridge 9 is relatively minimal compared to the cost of replacing the bridge
- The funds that were going to be spent to replace Bridge 9 can be spent to improve or replace Bridge 5, which is also inadequate hydraulically
- This option has no adverse impacts to the Teago Store's parking lot, catch basins, surrounding buildings, and the Fire Station driveway
- The Teago Store parking lot may be able to be expanded somewhat
- Ice and snow that falls off of the Teago Store onto Pomfret Road is less of an immediate maintenance issue for the Town

However, this option has several drawbacks as well:

- Removal of Bridge 9 would force fire responders to go south around the Teago Store and up Library Street in order to respond to emergencies north of the station (it is estimated that this would increase response times by less than one minute)
- Through traffic using Pomfret Road will need to turn onto Stage Road and Library Street and go around the Teago Store
- Library patrons that currently park in the Teago Store parking lot may have to walk slightly farther to reach the Library
- Library Street will experience more traffic, and Library patrons that park in the parking lot across Library Street will experience more potential conflicts with traffic
- With more traffic on Library Street, upgrades to Library Street should be implemented such as minor roadway widening, and better defining movements and rights of way at the intersection of Stage Road
- Potential significant impacts to the property located on the southwest corner of the bridge

Under this option, the Structures grant the Town received for Bridge 9 could be used to remove Bridge 9, and repair Bridge 5. Bridge 5 is actually in relatively good condition and is not in need of replacement due to its condition. Although it is inadequate

hydraulically, this is not a stand-alone justification for replacement. Bridge 5 has a few issues that should be addressed in the near future. These include:

- Spalling of the parapet on the north side should be repaired
- Spalling of the wingwalls should be repaired
- The timber curb along the south curb line should be repaired or replaced
- The guard rail along the south side of the bridge should be repaired

If the Town were to pursue the replacement of Bridge 5 now or in the future, in order to provide an adequate hydraulic opening the span would need to be lengthened by approximately 15 feet. Due to the presence of the Teago Store, all of the lengthening would need to be to the west. Construction of new bridge under this configuration would impact the utility pole on the southwest corner, and have relatively minor impacts to the property on this same corner. Also, this would like affect the existing parking lot along Library Street, as the brook would tend to migrate to the west (through the middle of the new bridge) over time. However, if improvements were also made at the intersection of Library Street and Stage Road, additional space to reconfigure the existing parking would likely be available. Parking could possibly be added on the Library property as well. Plans showing the new bridge layout and possible parking lot reconfigurations are included in Appendix C.

Maintaining traffic during construction under this option would involve removing and replacing Bridge 5 in a first stage with traffic temporarily routed along Pomfret Road to Library Street to Stage Road (or the reverse), and then removing Bridge 9 under a second stage. It would be somewhat difficult for traffic to turn from Library Street to Pomfret Road (southbound) and some minor improvements to the intersection would need to be made to accommodate traffic.

## Opinion of Probable Construction Cost

An estimated opinion of probable construction cost has been developed for each Option considered. The costs were prepared based on actual bid prices of similar projects. These conceptual costs are subject to change due to fluctuations in the cost of labor and materials and with the refinement of the overall design during subsequent phases of the project. Below is a summary of the alternatives with their associated construction costs.

The cost of construction to implement Option 1 with precast concrete slabs on pile foundations would be approximately $455,000. If a rigid frame or slabs on concrete footings was used the cost would increase by approximately $20,000 or $80,000 respectively. Engineering, permitting, right of way, and construction inspection would increase the construction cost by approximately 20%.

The cost of construction to implement Option 2 with precast concrete slabs on pile foundations would be approximately $415,000. If a rigid frame or slabs on concrete footings was used the cost would increase by approximately $20,000 or $80,000 respectively. Engineering, permitting, right of way, and construction inspection would increase the construction cost by approximately 20%.

The cost of construction to implement Option 3 with precast concrete slabs on pile foundations would be approximately $535,000, including the removal of Bridge 9 and replacement of Bridge 5. If a rigid frame or slabs on concrete footings was used the cost would increase by approximately $20,000 or $80,000 respectively. Engineering, permitting, right of way, and construction inspection would increase the construction cost by approximately 20%.

If Bridge 9 was removed and Bridge 5 repaired at this time, the cost of construction would be approximately $80,000, although the costs to remove bridges can vary greatly.

Minimal maintenance costs would be expected over the life of the bridges. If slabs were used, they would need to be resurfaced with new pavement or concrete and the deck joints would need to be replaced every 20-30 years. For a rigid frame, there would be virtually no maintenance whatsoever.

**Table 1 - Opinion of Probable Construction Costs**

| Bridge Option | Estimated Construction Cost * |
|---|---|
| Option 1 - Replace Bridge 9 and Raise Pomfret Road Profile | $455,000 |
| Option 2 - Replace Bridge 9 and Lower Pomfret Brook Profile | $415,000 |
| Option 3a - Remove Bridge 9 and Replace Bridge 5 | $535,000 |
| Option 3b - Remove Bridge 9 and Repair Bridge 5 | $80,000 |

* - assuming voided concrete slabs on pile foundations

Additional costs for Engineering, Permitting, Right of Way, and Construction Inspection would be necessary. Approximate costs for these items associated with the replacement of Bridge 9 would be as follows. Costs for the removal of Bridge 9 and replacement of Bridge 5 would be slightly higher:

| | |
|---|---|
| Engineering and Permitting | $55,000 |
| Right of Way | $ 5,000 |
| Construction Inspection | $30,000 |
| Total | $90,000 |

## Recommendation

DuBois & King provides the following recommendations for this project. The recommendations are based upon the information discussed throughout this report.

**DuBois & King recommends Option 3b – Remove Bridge 9 and Repair Bridge 5**

This recommendation is based on the following:

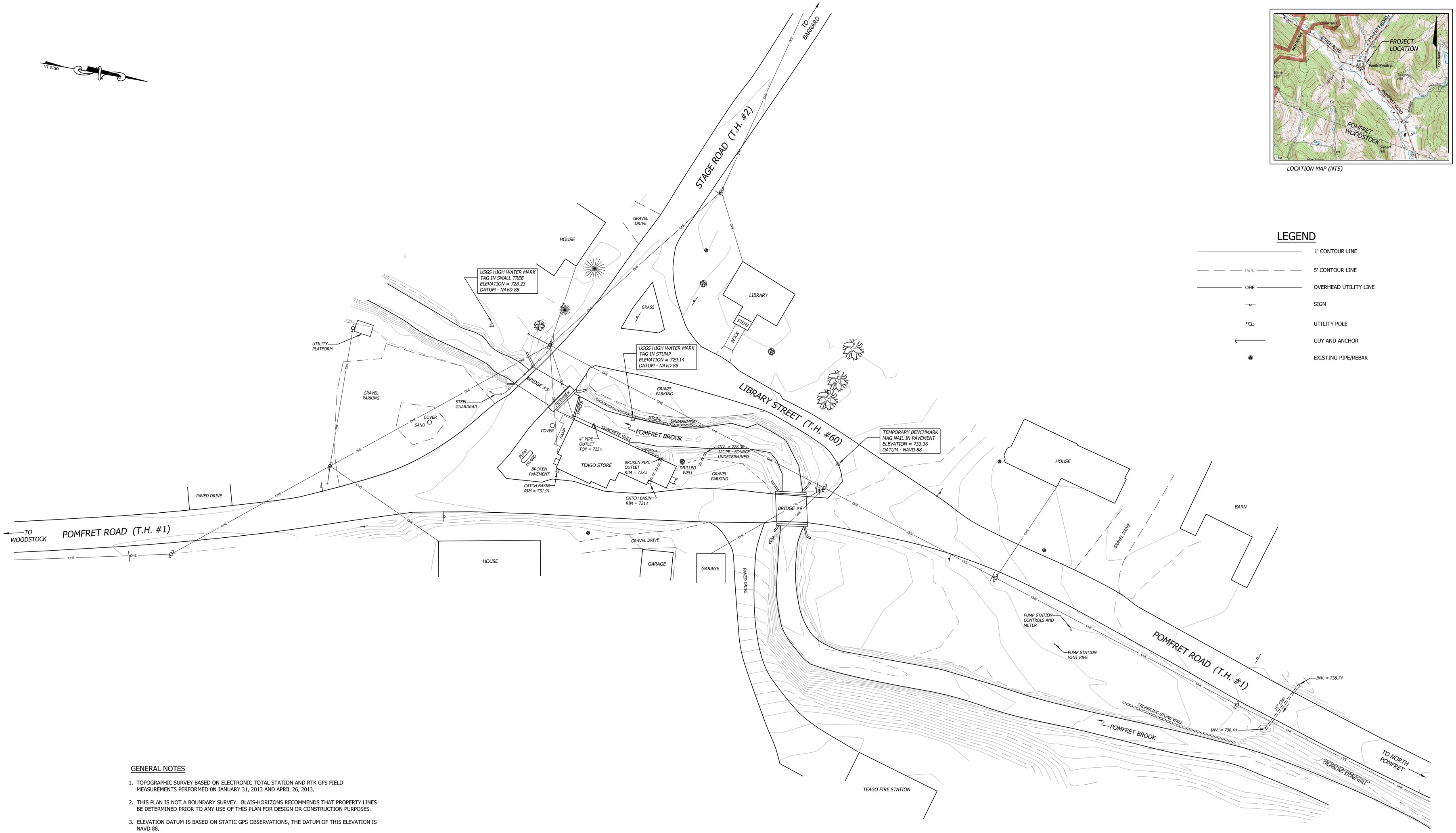
- The current cost to replace, and future costs to maintain Bridge 9, would be eliminated.
- The hydraulic problems of Bridge 9 would be eliminated.
- There would be no adverse impacts to the brook with this option.
- There would be no adverse impacts to the Teago Store with this option.
- The grant funds that are available now can be used to eliminate Bridge 9 and to repair Bridge 5.
- The current grant is not enough to replace Bridge 9, so significant additional Town funds would be needed to replace Bridge 9 at this time.
- If Bridge 9 were replaced at this time, a hydraulic problem at this location (Bridge 5) would still exist.
- If Bridge 9 is replaced at this time, Bridge 5 will still need to be repaired and/or replaced in the future. Eventual replacement of Bridge 5 would effectively double the cost of the project.
- Eliminating Bridge 9 and deferring the replacement of Bridge 5 would allow the Town to program funding for the eventual replacement of Bridge 5, and/or solicit more significant funds through the Regional Planning Commission and VTrans to replace the bridge.
- While the traffic patterns would be altered somewhat, they would remain effectively the same.
- Concerns about pedestrian crossings of Library Street can be addressed with minor pavement improvements and a new crosswalk to the parking lot.
- Emergency response times will be minimally affected.

**Town of Pomfret, Vermont**

**Bridge No. 9 – Pomfret Road over Pomfret Brook**
**Bridge No. 5 – Stage Road over Pomfret Brook**

**Engineering Investigation and Recommendations Report**

# Appendix A – Topographic Survey Plan







LOCATION MAP (NTS)

## LEGEND

- 1' CONTOUR LINE
- 5' CONTOUR LINE (1500)
- OHE — OVERHEAD UTILITY LINE
- SIGN
- UTILITY POLE
- GUY AND ANCHOR
- EXISTING PIPE/REBAR

## GENERAL NOTES

1. TOPOGRAPHIC SURVEY BASED ON ELECTRONIC TOTAL STATION AND RTK GPS FIELD MEASUREMENTS PERFORMED ON JANUARY 31, 2013 AND APRIL 26, 2013.
2. THIS PLAN IS NOT A BOUNDARY SURVEY. BLAIS-HORIZONS RECOMMENDS THAT PROPERTY LINES BE DETERMINED PRIOR TO ANY USE OF THIS PLAN FOR DESIGN OR CONSTRUCTION PURPOSES.
3. ELEVATION DATUM IS BASED ON STATIC GPS OBSERVATIONS, THE DATUM OF THIS ELEVATION IS NAVD 88.
4. NO SITE ASSESSMENT OF HAZARDOUS OR OTHER WASTE MATERIALS WAS PERFORMED AND HORIZONS ENGINEERING, INC TAKES NO RESPONSIBILITY FOR ANY MATERIALS OR CONDITIONS THAT MAY EXIST ON THIS SITE.

0 15 30 60 120

SCALE IN FEET



BLAIS - HORIZONS
Surveying & Engineering
17 Sunset Terrace ~ Newport, VT 05855
Phone 802.334.6434 ~ Fax 802.334.5602

| | |
|---|---|
| DATE: 5/3/2013 | PROJECT #: 13501 |
| ENGIN'D BY: --- | DRAWN BY: NPN |
| CHECK'D BY: NPN | ARCHIVE #: H-___ |
| SHEET 1 OF 1 | |

EXISTING CONDITIONS SITE PLAN PREPARED FOR

TOWN OF POMFRET SELECTBOARD

5218 POMFRET ROAD
NORTH POMFRET, VT 05053

SOUTH POMFRET
STAGE ROAD - POMFRET ROAD
POMFRET, WINDSOR COUNTY, VERMONT

**Town of Pomfret, Vermont**

**Bridge No. 9 – Pomfret Road over Pomfret Brook**
**Bridge No. 5 – Stage Road over Pomfret Brook**

**Engineering Investigation and Recommendations Report**

# Appendix B – Preliminary Hydraulic Report

**VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION**

# HYDRAULICS UNIT

**TO:** Neil Lamson, Chair Pomfret Selectboard

**FROM:** Leslie Russell, P.E., Hydraulics Project Engineer

**DATE:** 29 October 2012

**SUBJECT:** Pomfret TH 1 BR 9 over Pomfret Brook
Pomfret Road N43.66525 W72.53873

---

We have completed our hydraulic study for the above referenced site, and offer the following information for your use:

## Hydrology

This site has a hilly to mountainous drainage basin. It is mostly forested. The total contributing drainage area is about 6.4 sq. mi. There is an overall length of 25,980 feet from the divide to the site, with a 1110 foot drop in elevation, giving an average overall channel slope of 4.3%. The stream slope at the site was estimated to be about 1 - 2%. Using several hydrologic methods, we came up with the following design flow rates:

| Recurrence Interval in Years | Flow Rate in Cubic Feet per Second (CFS) |
|---|---|
| Q2.33 | 310 |
| Q10 | 700 |
| Q25 | 950 |
| Q50 | 1200 – State Highway Design Flow |
| Q100 | 1400 - Check flow |

## Existing Conditions

The existing structure is a concrete slab bridge that has a clear span length of 18.3', with a clear height of about 4.5', providing a waterway opening of 82 sq. ft. There are bends into and out of the bridge and scour through the bridge. The southeast wingwall is cracked away from the bridge.

The downstream channel is constricted by the roadway fill and a retaining wall along a store/post office. Just downstream of this structure is TH 2 (Stage Road) BR 5 that is 16' by 6' high. It also is a concrete slab bridge.

Our calculations show both the existing structures are inadequate hydraulically. Neither structure has 1' of freeboard at Q50 and both structures overtop the roadway below a Q25 flow.

## Recommendations

In sizing a new structure we attempt to select structures that meet the hydraulic standards, fit the natural channel width, the roadway grade and other site conditions. We measured a channel width of over 18' upstream of BR 9 during our site visit. It was difficult to get an exact natural channel width measurement due to the roadway fill constrictions. The Agency of Natural Resources VT Regional Hydraulic Geometry Curve gives a bank full width of 30' for this size drainage area. Those curves are only based on drainage area and do not consider other factors. **Usually for structures of this size, it is**

**important to have survey so the waterway can be modeled. The downstream bridge (on Stage Road) is also hydraulically inadequate. It might be preferable to replace that structure first.** Based on our calculations and the information available, we recommend any of the following structures as a replacement for these two sites:

1. A bridge with a 32' by 7' minimum waterway opening, providing 224 sq. ft. of waterway area. This structure will result in a headwater depth at Q50 = 6.0' and at Q100 = 6.6'. Therefore, it will provide the required 1.0' of freeboard at Q50. If the roadway cannot be raised more than 6', a much wider structure would be needed. It is probably not feasible to build such a structure to obtain 1' of freeboard at Q50.

2. Another option the town may want to consider would be to replace BR 5 on Stage Road and eliminate BR 9.

3. Any similar structure with a minimum clear span of 32' and at least 224 sq. ft. of waterway area, that fits the site conditions, could be considered.

**General Comments**

If a new bridge is installed, the bottom of abutment footings should be at least six feet below the channel bottom, or to ledge, to prevent undermining.

It is always desirable for a new structure of this size to have flared wingwalls at the inlet and outlet, to smoothly transition flow through the structure, and to protect the structure and roadway approaches from erosion. The wingwalls should match into the channel banks. Any new structure should be properly aligned with the channel, and constructed on a grade that matches the channel.

Stone Fill, Type III should be used to protect any disturbed channel banks or roadway slopes at the structure's inlet and outlet, up to a height of at least one-foot above the top of the opening. The stone fill should not constrict the channel or structure opening.

**The Agency of Natural Resources (ANR), Corps of Engineers, or other permitting agency may have additional concerns regarding replacement of this structure, or any channel work. The River Management Engineer should be contacted with respect to those concerns, before a replacement structure is ordered.**

Please keep in mind that while a site visit was made, these recommendations were made without the benefit of a survey and are based on limited information. The final decision regarding the replacement of this structure should take into consideration matching the natural channel conditions, the roadway grade, environmental concerns, safety, and other requirements of the site.

A bridge of this size warrants a more detailed hydraulic study if survey becomes available.

Please contact us if you have any questions or if we may be of further assistance.

LGR

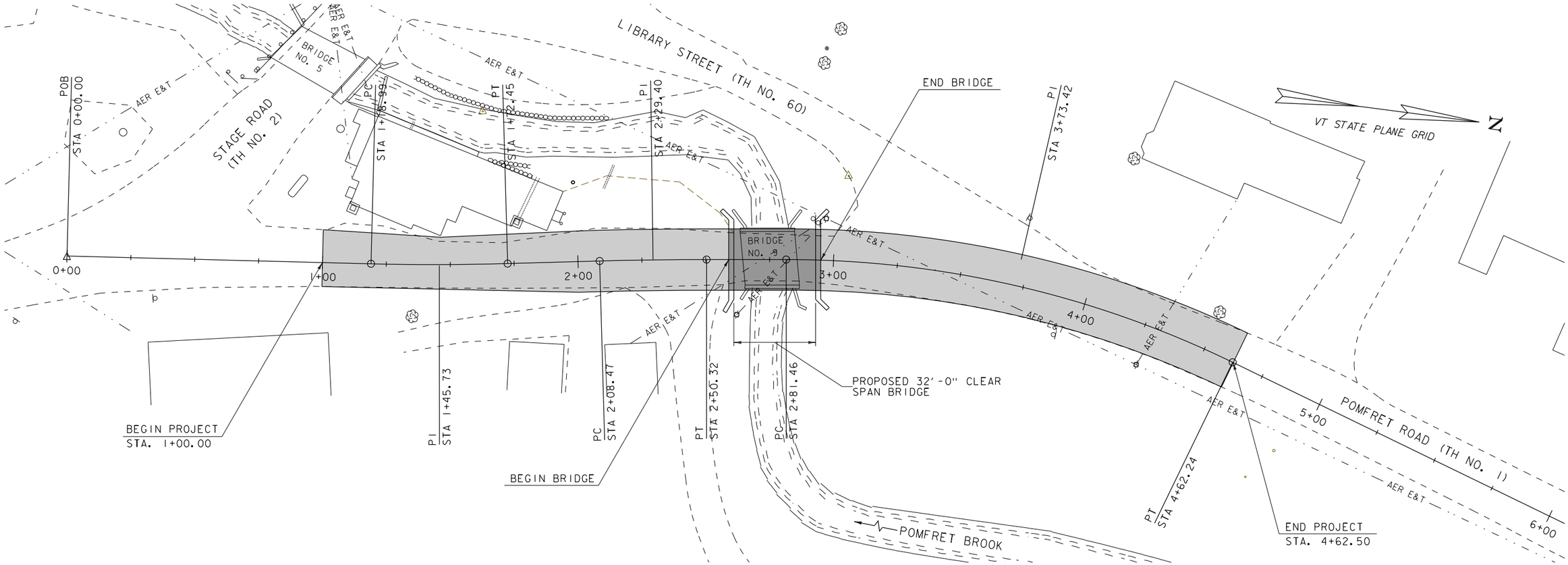
cc: Todd Menees, A.N.R. River Management Engineer
Hydraulics Project File via NJW
Hydraulics Chrono File

**Town of Pomfret, Vermont**

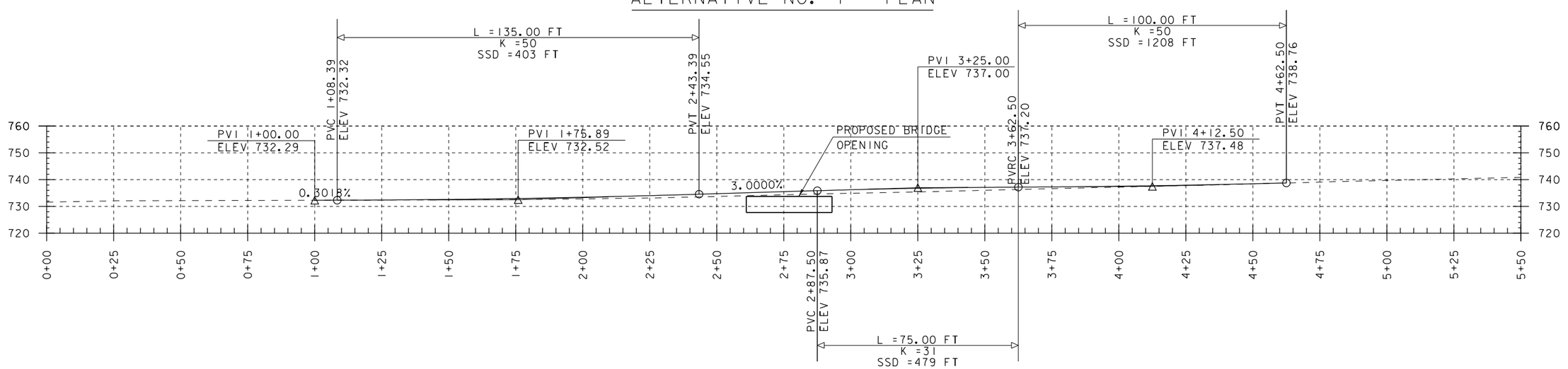
**Bridge No. 9 – Pomfret Road over Pomfret Brook**
**Bridge No. 5 – Stage Road over Pomfret Brook**

**Engineering Investigation and Recommendations Report**

# Appendix C – Plans of Alternatives




## ALTERNATIVE NO. 1 - PLAN




## ALTERNATIVE NO. 1 - PROFILE

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| PROJECT LEADER: E. DETRICK | DRAWN BY: R. BARNES |
| DESIGNED BY: R. BARNES | CHECKED BY: E. DETRICK |
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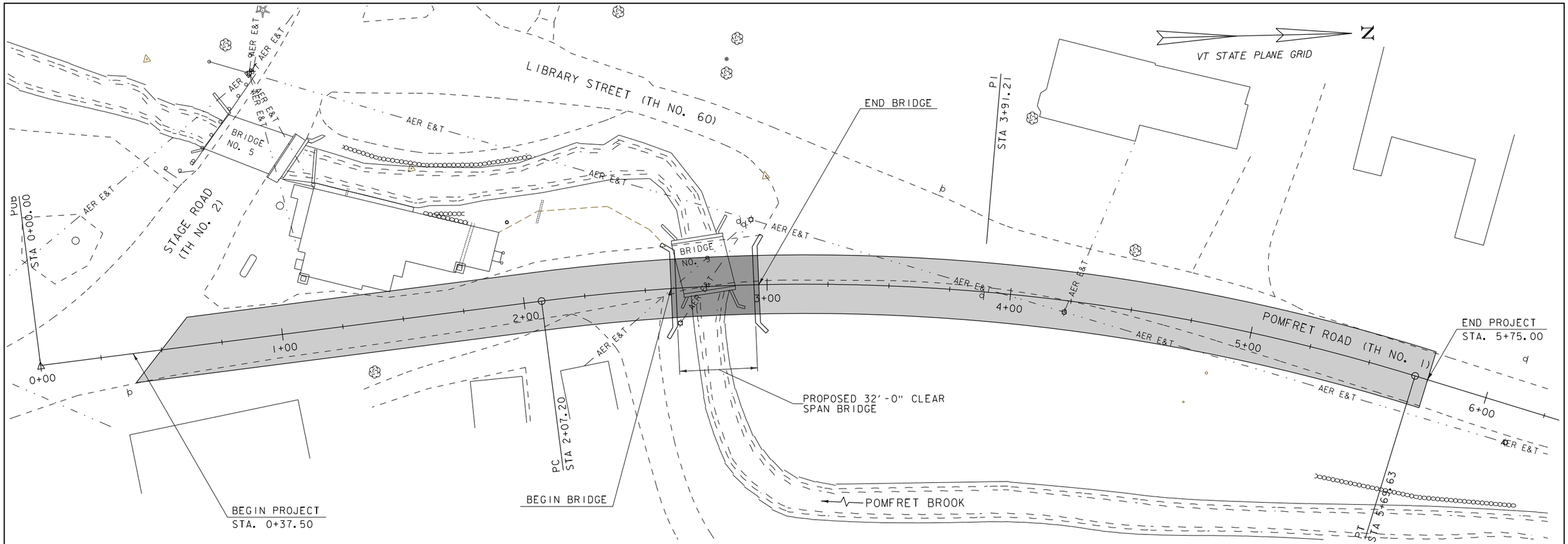


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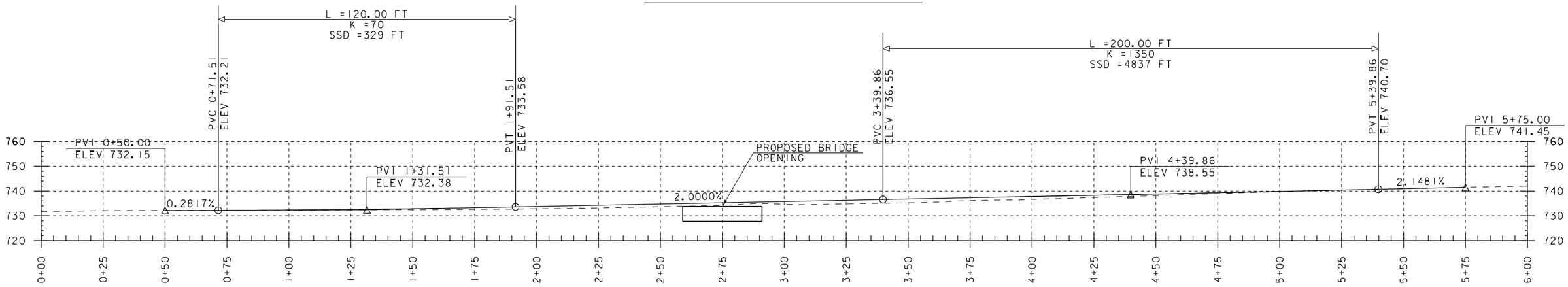


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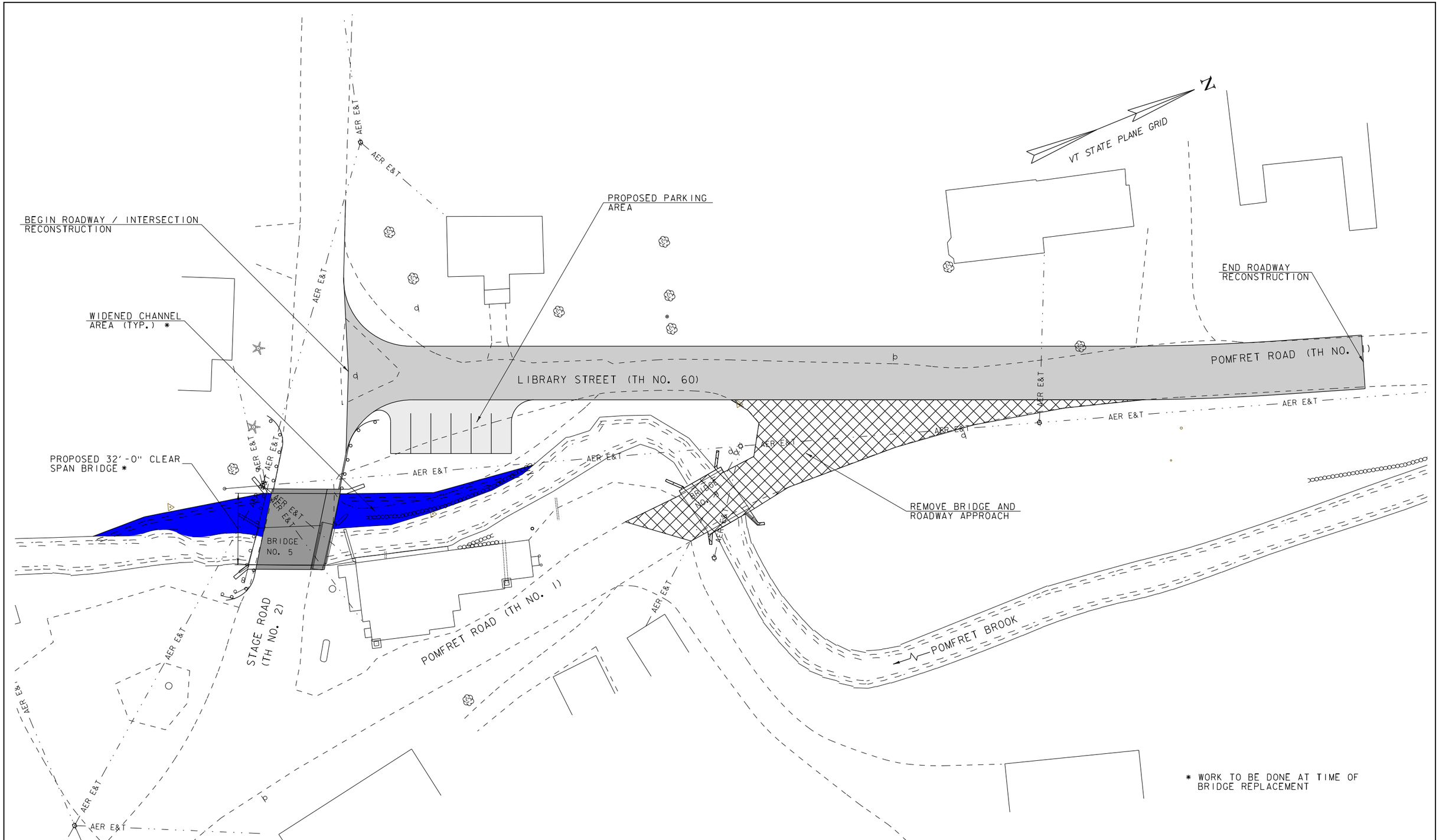


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| PROJECT LEADER: E. DETRICK | DRAWN BY: R. BARNES |
| DESIGNED BY: R. BARNES | CHECKED BY: E. DETRICK |
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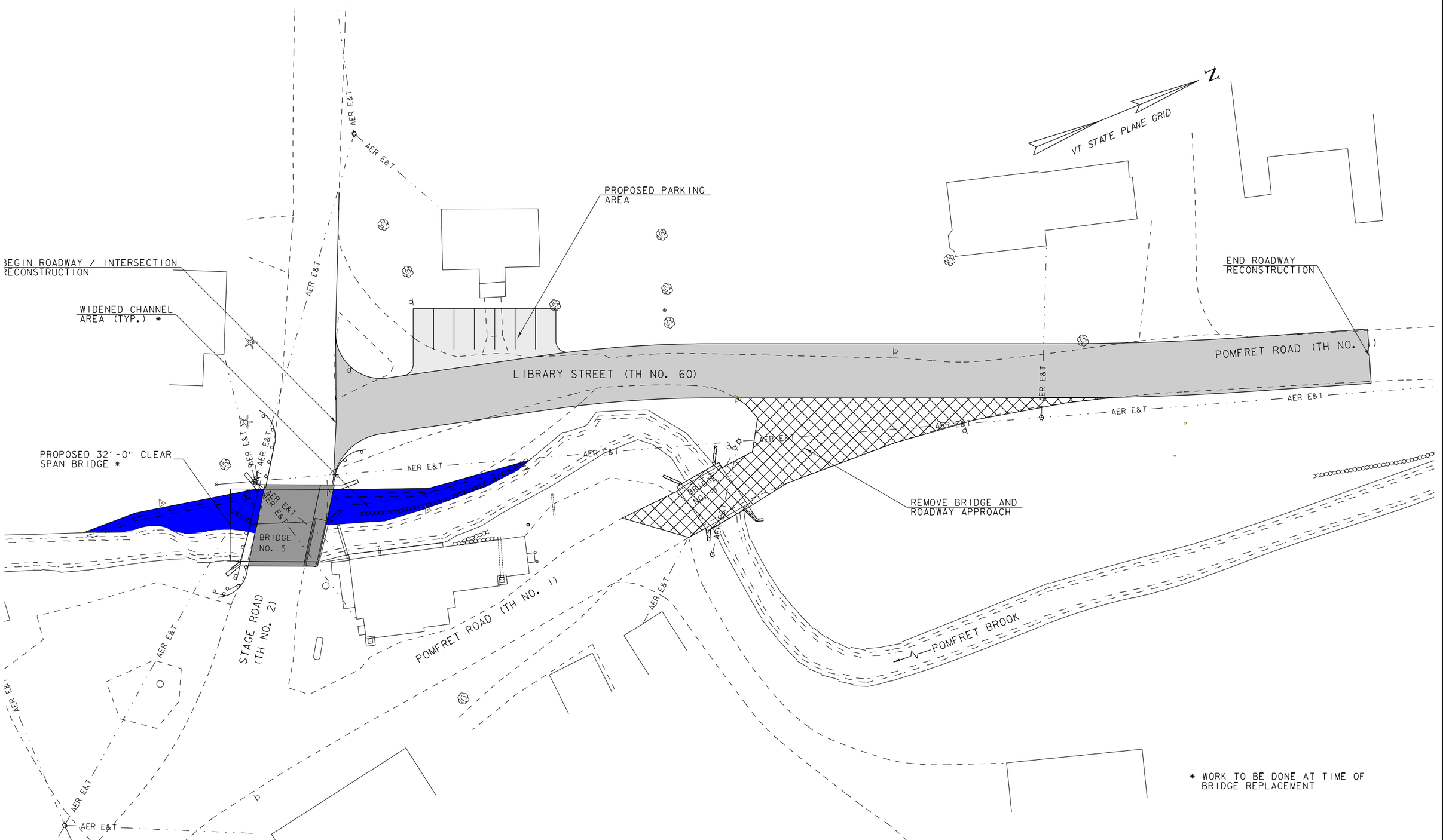


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| DESIGNED BY: R. BARNES | CHECKED BY: E. DETRICK |
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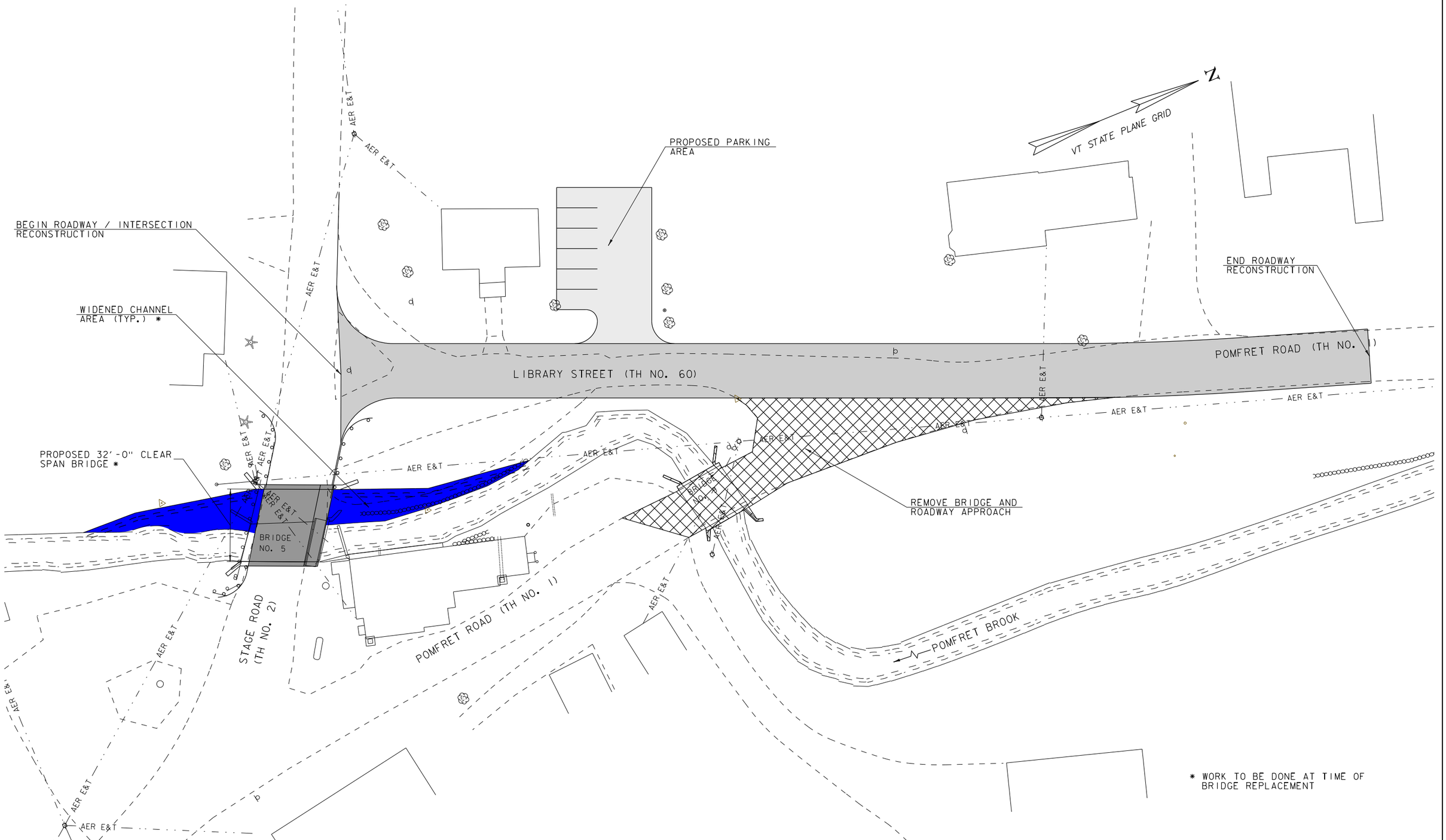


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| PROJECT NUMBER: 622060 | |
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| PROJECT LEADER: E. DETRICK | DRAWN BY: R. BARNES |
| DESIGNED BY: R. BARNES | CHECKED BY: E. DETRICK |
| ALTERNATIVE NO. 3C | SHEET 1 OF 1 |