Winooski Basin Clean Water Service Provider:
FY24 Round 4 Call for Proposals

The Central Vermont Regional Planning Commission, in its role as the Clean Water Service Provider for the Winooski Basin, is accepting applications for funding for non-regulatory, phosphorous reduction projects that improve water quality. Fiscal Year 2024 - Round 4 proposals are due by 4:00 PM on 9 May 2024. For more information, including submission details, see the Winooski Clean Water Service Provider webpage.

0. Project Eligibility

Please Review the following reference materials before completing your proposal:

- *FY23 Clean Water Initiative Program Funding Policy*
- *Act 76, Clean Water Service Provider Rule and Guidance & explanatory materials*

Is the portion of the project for which you seek funding both non-regulatory and voluntary? (i.e. not a required or compelled element of a regulatory permit or a legal settlement)? **(answer must be Yes to proceed)**	Yes
Does the project type meet the applicable definitions and minimum standards in the FY23 Clean Water Initiative Funding Policy? **(answer must be Yes to proceed)**	Yes

1. Applicant Information

Organization/Municipality Name: Vermont Land Trust
Primary Contact: Allaire Diamond
Title: Ecology & Restoration Program Director
Mailing Address: PO Box 850, Richmond VT 054077
Phone Number: 802-879-6672
E-mail Address: allaire@vlt.org

Has the proposing organization / municipality been pre-qualified to receive subcontracts / subgrants from the Central Vermont Regional Planning Commission serving in its capacity as the Winooski Basin Clean Water Service Provider?* * If you responded no to this question, please include Qualification Materials along with your funding proposal. See the Winooski Clean Water Service Provider webpage for more details.	Yes

2. Project Information

Project Title: Roland Stream Crossing Implementation
Watershed Projects Database ID*: Pending

* Projects without a Watershed Projects Database ID will be evaluated. However, prior to receiving funding, a project must be entered into the Watershed Projects Database. See pages 11-13 of the FY23 Clean Water Initiative Funding Policy.

Select the most representative project type (according to Appendix B Project Types Table of the 2023 CWIP Funding Policy) from the dropdown list below.*

Floodplain/Stream Restoration – Implementation

* If there is more than one project type associated with the proposal, enter additional project types in the Project Description section below.

Project Phase for which you are seeking funding: Implementation

Project GPS coordinates (e.g. 44.26278, -72.58054):
(44.24356, -73.03273)
Project Sub-basin: Tributaries to Lower Mid-Winooski

3. Project Description

Describe the proposed project. Include the following: project history; the phosphorus reduction practices that will be developed, designed or implemented with the requested funds; ***details*** *of the project development activities, conceptual or final design plans and cost proposals (if available); and* ***references*** *to prior plans and studies that support the funding request. Propose a project schedule based on the milestones of the proposed project type. Assume a 7 May 2024 start date. (1000 words maximum)*

The project is the implementation of a stream crossing improvement on a headwater tributary of the Winooski River in Richmond, Vermont. The existing stream crossing consists of two undersized culverts that cannot adequately pass large storm flows, resulting in sediment accumulation upstream, scour and erosion downstream, and risk of failure on the private road. The culverts impede the stream and floodplain access as detailed in the included existing conditions report & hydraulic analysis memo. Vermont Land Trust (VLT) owns this parcel of conserved land, which was gifted to the organization by former owner Margaret Roland. As part of its ownership, VLT intends to complete ecological restoration work on the property, and has retained Fitzgerald Environmental Associates (FEA) to complete existing conditions and hydraulic analysis, final design plans, and a phosphorus crediting analysis for this stream crossing project, which is the first of multiple restoration efforts on the land. This work was funded with Vermont state clean water funds administered by the Mount Ascutney Regional Commission.

This design and analysis work determined that replacing the two undersized culverts with an appropriately-sized structure, along with associated floodplain restoration immediately downstream (including partial removal of a stone wall that is currently impounding water) would allow better flow from the 78-acre drainage area, and improve water quality, flood resiliency and habitat in this small stream. FEA's investigation of the existing 15" and 18" diameter culverts deemed them incompatible due to their small spans compared to the bankfull width of 4.5’. They estimate a 5.72 kg P/yr credit for the replacement of the two undersized culverts with a 64”x43” pipe arch. This analysis is detailed in the memo "Roland Property Culvert Replacement and Partial Stone Wall Removal". Design plans for the replacement and floodplain work are in the planset "Roland Property Culvert Replacement".

VLT hopes to move forward with implementing this project as soon as funding is secured and seasonal conditions allow; we are aiming realistically for construction in spring 2025. We do not anticipate issues with permitting, and have gotten initial project input from the DEC Rivers Program and the Winooski basin planner. Vermont Department of Historic Preservation paperwork was submitted at the time of design initiation (May 2024). We will engage with the DEC Wetlands Program due to the project's proximity to riparian wetlands, and do not anticipate permitting issues here.

4. Staff Capacity & Past Experience

A list of key staff and a (brief) description of their role in the project. If any of the staff listed here were not included in your organization's pre-qualification materials, please attach a one-page resume describing their qualifications to the project proposal.

Name	Project Role
Allaire Diamond	Ecology & Restoration Program Director; Project Manager
Tyler Miller	Vice President for Land Activation; Project Oversight

Provide three examples of relevant past work. Include the Watershed Projects Database ID (if applicable), key staff and their role(s) in the project, a brief description of the project (phase, type, partners, etc.) and contact information for project references. Projects listed here should demonstrate the experience of the specific staff anticipated to work under this proposal.

Example Project 1:

Watershed Projects Database ID (if applicable): 9395
Project staff & their project role(s):

Allaire Diamond, Project Manager
Tyler Miller, Project Oversight

Project description (250 words max):

Oversee Fitzgerald Environmental Associates to develop a design for the removal of a dam on Crooked Creek, Colchester (Lake Champlain Direct watershed). This dam had a failing outlet that was causing excessive erosion and incision downstream.

Reference contact information:

Name: Evan Fitzgerald
Affiliation: Principal, Fitzgerald Environmental Associates
Phone: 802-999-1357
Email: evan @fitzgeraldenvironmental.com

Example Project 2:

Watershed Projects Database ID (if applicable): 10074
Project staff & their project role(s):

Allaire Diamond, Project Manager
Tyler Miller, Project Oversight

Project description (250 words max):

Coordinating with Fitzgerald Environmental Associates, run bidding and selection process and oversee construction for dam removal and stage zero wetland restoration on Crooked Creek in Colchester according to design (project 9395).

Reference contact information:

Name: Staci Pomeroy

Affiliation: Vermont DEC Rivers Program
Phone: 802-490-6191
Email: staci.pomeroy@vermont.gov

Example Project 3:

Watershed Projects Database ID (if applicable): N/A
Project staff & their project role(s):

Allaire Diamond, Project Manager
Tyler Miller, Project Oversight

Project description (250 words max):

Oversee the development of a preliminary engineering plan for floodplain restoration at the confluence of Mill Brook and the Winooski River in Jericho. The chosen alternative is an engineered logjam that will protect Rt. 117 while providing floodplain benefits, and is

Reference contact information:

Name: Roy Schiff
Affiliation: SLR Consulting
Phone: 802-882-8335
Email: rschiff@slrconsulting.com

5. Estimated annual total phosphorus load reduction (kg/yr)

Please review the Department of Environmental Conservation's Standard Operating Procedures (SOPs) for Tracking and Accounting of Phosphorous prior to completing this section.

For Developed Lands projects, estimate the annual phosphorous load reduction using the Department of Environmental Conservation's Stormwater Treatment Practice Calculator. Export the results from the calculator and include that information in the proposal package. For Natural Resource Restoration projects, estimate the annual phosphorous load reduction using the Department of Environmental Conservation's Interim Phosphorous Calculator Tool (v1.0). Save the results from the calculator and include them in the proposal package.

Enter the estimated annual total phosphorous load reduction (kg / yr):

5.72 kg P/year

If the proposed project consists of project identification / assessment or development-phase work, provide details regarding the types of projects you intend to investigate and the anticipated phosphorus reduction benefits you expect the project(s) might achieve.

6. Project Budget

Develop a detailed budget with a cost breakdown of all project and administrative expenses. The budget should be itemized by Task with anticipated costs for personnel, equipment, materials, subcontracted services and other costs as appropriate. Be sure to request sufficient funding to complete the required milestones and deliverables (including project reporting) for the type of project being proposed. See the FY23 Clean Water Initiative Program Funding Policy for more information on the milestones required for the project type you are proposing.

Notes:
Mileage: Use the FY24 federal rate ($0.67 / mile)
Indirect: If you have a negotiated indirect rate, please use that. Otherwise, you may charge up to 10% on all APPLICANT costs and 10% on the first $50,000 of SUBCONTRACTORS costs.

Funding request
Amount of funding requested: $48,995.88
State matching funds:
Non-State matching funds: $390
Total project budget: $49,385.88

Future costs
If this proposal seeks funds for Preliminary (30%) or Final (100%) Design-phase work, please estimate anticipated future costs for subsequent project phases. Do not include this amount in the "Funding request" section above.

Anticipated future funding:

7. Co-benefits

a) **ENVIRONMENTAL JUSTICE:** points are awarded when a project is located in a Census Block Group where one or more Environmental Justice Focus Population demographic conditions exist. *This value is calculated by the Clean Water Service Provider based on the project location.*

b) **ECOLOGICAL BENEFITS:** points are awarded when a project reduces sediment and / or non-phosphorous nutrient loads to stressed, altered, impaired or priority waterways to which it is hydrologically connected. *This value is calculated by the Clean Water Service Provider based on the project location.*

c) **ECOSYSTEM SERVICES:** points are awarded when a project moderates natural phenomena through carbon sequestration and flood resilience. *This value is calculated by the Clean Water Service Provider based on the type of project being proposed.*

d) **COMMUNITY BUILDING:** points are awarded when a project involves the community in data collection and decision-making, enhances the working landscape and provides recreational benefits. Please answer the following:

- Are there proposed efforts to meaningfully involve community members in planning, project development, decision-making and implementation?

  No

  If you answered Yes to the previous question, please describe the effort to involve community members:

- Does the project involve data collection by community members (e.g. citizen science initiative)? No

  If you answered Yes to the previous question, please describe the effort to involve community members in data collection:

- Is the project located on a parcel that is enrolled in the Use Value & Appraisal Program (aka the Current Use Program) (Contact the Clean Water Service Provider for assistance.)? Yes

- Does the project maintain / improve an existing recreational space?

  No

If you answered Yes to the previous question, please describe the maintenance or improvement of existing recreational space(s):

- Will the project result in new / expanded recreational opportunities?

No

If you answered Yes to the previous question, please describe the effort to create new or expand existing recreational opportunities:

e) **EDUCATION:** An Education Co-Benefit is realized when a project includes aspects of public outreach designed to educate community members about the importance of phosphorus reduction and watershed health

- Will the project include an educational component? No

If you answered Yes to the previous question, please describe the educational component of the project below:

- Interpretive signage:

- Educational meetings / workshops:

8. Other Considerations

a) **DESIGN LIFE:** The design life of the proposed project is: 10 years

b) **LANDOWNER RELATIONS**

- PROPERTY OWNERSHIP: The project will be located on:

  privately-owned property.

- LANDOWNER SUPPORT: Provide a list of landowner support letters below. Please submit any letters or email from the landowner indicating their support for the project and awareness of their required commitment. Note date of letter/email and sender below.

  VLT is the landowner.

- OTHER: Include other information regarding landowner relations here.

c) **OPERATIONS & MAINTENANCE**

- COST ESTIMATE: Provide a quantitative estimate of operation & maintenance costs on an annual basis where available. If not available, please provide a qualitative estimate. The anticipated annual operations & maintenance expenses for this project are:

  est. $600/yr for 4 years of monitoring, maintenance of planted trees. $0/year after 4

- O & M AGREEMENT: There is a signed operations & maintenance agreement for this project: No

  If you answered Yes to the previous question, please include a copy of the signed O & M Agreement in the proposal package.

- OTHER: Include any other information regarding the operations & maintenance agreement for this project.

d) **PERMITTING:** This project will require a permit: Yes

If you answered Yes to the previous question, please provide a list of the required permits, any issues anticipated in obtaining the permits and the status of the permit. If you have permit(s) for the project in hand, please include a copy of them in the proposal package.

VTDEC wetlands program - VTDEC's 3-9026 General Permit -needed, no issues ar

e) **BARRIERS:** Describe any potential barriers to completing this project and how you plan to manage those challenges:

No major barriers are anticipated.

f) **HISTORIC SITE REVIEW:** Consult the Vermont Historic Sites spreadsheet and accompanying guidance in the State Historic Preservation Review section of the FY23 Clean Water Initiative Program Funding Policy to determine whether the proposed project will require Preliminary and Final Project Review by the Vermont Division of Historic Preservation. Include a copy of the completed Vermont Historic Preservation Project Review Form in the proposal package.

- The proposed project will require State Historic Preservation Review:

Yes

9. Proposal Submission

Assemble the following materials in the order listed into a single PDF and submit to Brian Voigt (voigt@cvregion.com) with the Subject line: "Winooski Basin Clean Water Service Provider Project Proposal – FY24, Round 4".

1. If your organization or municipality has not yet been pre-qualified as an eligible Basin 8 Clean Water Service Provider Clean Water Partner, please complete and submit a pre-qualification form along with your funding proposal.

2. Project proposal form (i.e. this document).

3. Include the following information in the order listed (please):
   a) Natural Resources Screening Form (see the FY23 Clean Water Initiative Program Funding Policy – Appendix A. Required for preliminary design, final design, or implementation phase projects.)
   b) Project Locator Map – applicants may use the Vermont Agency of Natural Resources Atlas to generate the Project Locator Map (Contact the Clean Water Service Provider for assistance.)
   c) Project Timeline – Propose a project schedule based on the milestones of the proposed project type. Assume a 2 July 2024 start date.
   d) Staff capacity – list key staff and their role(s) in the project. Attach one-page resumes for any staff listed in Section 4 of the Application Form who were not included in your pre-qualification materials.
   e) Completed DEC Interim Phosphorus Reduction Calculator Tool v1.0, or, for Developed Land Projects, report from DEC Stormwater Treatment Practice Calculator. (Contact the Clean Water Service Provider for assistance.)
   f) Detailed project budget with a cost breakdown of all project and administrative expenses. The project should be itemized by Task with anticipated costs for personnel, equipment, materials, subcontracted services and other costs as appropriate. Be sure to request sufficient funding to complete the required milestones and deliverables (including project reporting) for the type of project being proposed.
   g) Letter(s) of support from landowner(s) indicating their support for and awareness of the commitment required to advance / implement the project
   h) Signed Operations & Maintenance Agreement (if applicable)
   i) Permits – Attach approved project permits (if applicable).
   j) Historic Site Review - Use the spreadsheet and accompanying guidance in the State Historic Preservation Review section of the FY23 Clean Water Initiative Program Funding Policy to determine whether your clean water project will require Preliminary and Final Project Review by the Vermont Division of Historic Preservation. Attach a copy of the completed Vermont Historic Preservation Project Review Form.

APPENDIX A. CLEAN WATER INITIATIVE PROGRAM - PROJECT ELIGIBILITY SCREENING FORM

This fillable PDF form is designed to assist with project review by systematically walking through all eligibility criteria. It should be completed for all projects seeking funding for 30% + design or implementation work. It may be applied to projects seeking funding for assessment or development if helpful for determining their alignment with eligibility criteria 2, 3, 6, and 8.

Step 1: Conduct Eligibility Criteria #1 Screening: Project Purpose

Table 1A: Project Purpose	
From the drop-down list to the right, please select which of the four objectives of Vermont's Surface Water Management Strategy this project addresses. If multiple, please list below:	Minimize flood and fluvial erosion hazards

Step 2: Conduct Eligibility Criteria #2 Screening: Project Types and Standards

Table 2A: Project Types and Standards	
Please select the most representative project type from the drop-down list to the right.[1,2] If multiple BMPs are included in the project, please list below:	Floodplain/Stream Restoration - Implementation
Is the project type an eligible project type for the funding program you are applying to as listed in column B of the CWIP Project Types Table? (Answer must be YES to proceed)	Yes ◉ No ○
Does the project meet the project type definitions and minimum standards as provided in column C of the CWIP Project Types Table? (Answer must be YES to proceed)	Yes ◉ No ○
Will the project result in the standard performance measures, milestones, and deliverables as defined by project type in columns D-F of the CWIP Project Types Table? (Answer must be YES to proceed)	Yes ◉ No ○
Is the project listed as an ineligible project or activity in the CWIP Funding Policy? If Yes, please explain below how project meets the allowable exceptions within the CWIP Funding Policy. (Answer must be NO to proceed, unless reasonable justification is provided above)	Yes ○ No ◉

Step 3: Conduct Eligibility Criteria #3 Screening: Watershed Projects Database

Verify project has been recorded in the Watershed Project Database (WPD). Each project must have a Watershed Project Database number specific to the proposed project phase (for example,

[1] Note that Road/Stormwater Gully project-types must not otherwise be considered intermittent or perennial streams by the DEC Rivers Program and therefore project proponent must show documentation of this determination in order to select this project type.

[2] One project may include multiple best management practices (BMPs) that cross "project types." For example, a single project may include both stormwater and lake shoreland BMPs. Proponents should use their best judgement in selecting the most representative project type for the purposes of eligibility screening and reporting.

a final design will have a different WPD-ID from a preliminary design even if for the same project). If the project, or the specific phase, is not yet in the Watershed Project Database, follow directions provided in the CWIP Funding Policy to secure a WPD-ID. Please see CWIP Funding Policy for more information on the WPD-ID.

Table 3A. WPD-ID	
Watershed Project Database ID number assigned	Pending
Watershed Project Database Project Name	Roland Stream Crossing Implementation

Step 4: Conduct Eligibility Criteria #4 Screening: Natural Resource Impacts[3]

Agency of Natural Resources (ANR) permit screening for natural resource impacts includes 1) an initial desktop review to identify which ANR permitting programs should be contacted, 2) a review by the relevant ANR permitting staff, and 3) a response summary from the project proponent addressing any permitting staff concerns. [4]

1) **Table 4. Natural Resource Impacts** facilitates a high-level desktop review of the most likely ANR permits to apply to clean water projects. Project proponents should answer all the questions to identify likely permit needs. [5] Please note that "project site" may include both the active restoration location as well as any additional impact footprint related to staging, site access, or storage of waste or disposed materials.
2) If responses to the **Table 4. Natural Resource Impacts** desktop review trigger a permitting staff consultation, **Table 4** provides appropriate contact information.
    a. Proponents should send the identified permitting staff the following:
        i. The watersheds project database identification number (WPD-ID) (if available),
        ii. Project location (GPS coordinates)
        iii. Summary of proposed scope of work, and
        iv. Any other relevant information they request that will be utilized in their review.
    b. **Proponents should clarify they are seeking permitting staff input on potential permitting needs, permit-ability of proposed scope of work, and other design considerations but they are NOT seeking a formal permit determination.**
    c. Project proponents must attempt to communicate with the permitting staff and provide them with at least thirty days to review the project and provide a

[3] Easements and Riparian Buffer Plantings are excluded from this eligibility requirement/step.

[4] In cases where this screening may have already occurred in a prior project phase, project proponents may supply attachments or links to relevant permit needs assessment documents in place of completing Table 4.

[5] Entities selected for funding are expected to perform due diligence to ensure all applicable permits (including non-ANR state, local, and federal permits) are discovered and secured prior to implementation. The ANR Permit Navigator and an Environmental Compliance Division Community Assistance Specialist can help confirm ANR permitting needs for any projects once selected for funding.

response. Project proponents are encouraged to perform this screening during a project development phase as opposed to during a project solicitation round to allow for more time for feedback. Permitting feedback may be up to one year old.

3) Proponents should summarize permitting staff feedback and how the proposed scope of work will address this at the bottom of **Table 4**. Specifically, please include:
   a. Which permits or permit amendment are needed or might be needed? [6]
   b. What type might be needed? (e.g., a general or individual permit[7])?
   c. What concerns were voiced by permitting staff?
   d. How will the proposed scope of work address these concerns?[8]

Table 4A: Natural Resource Impacts		
I. Act 250 Permits		
1. Have any Act 250 (Vermont's Land Use and Development Control Law) Permits been issued in the project site's parcel location?[9]	Yes ○	No ◉
If ***yes***, please provide the permit number and list any water resource issues or natural resource issues found[10]: **PermitNumber:** **ResourceIssues:** _____ If ***yes***, use the Water Quality Project Screening Tool to identify the appropriate regulatory contact for an Act 250 consultation. **Regulatory Point of Contact Name/Position:**		
II. Lake and Shoreland		
1. Is the project site located within 250 feet of the mean water	Yes ○	No ◉

[6] Occasionally permit staff may indicate they need a field visit or to see more completed designs prior to making a permit need determination.

[7] Design phase projects that require an individual wetlands permit must have the permit in hand at the close of the final design phase. Implementation phase projects must have the individual permit in hand to be eligible for funding.

[8] Examples could include planned design changes or inviting permitting staff to stakeholder meetings.

[9] An Act 250 Permit is required for certain categories of development, such as subdivisions of 10 lots or more, commercial projects on more than one acre or ten acres (depending on whether the town has permanent zoning and subdivision regulations), and any development above the elevation of 2,500 feet. The ANR Atlas Clean Water Initiative Program Grant Screening tool can help answer this yes/no question. Follow the instructions on the link above to identify whether your project is located on an Act 250 parcel. Note that the layer to activate in ANR Atlas is now named "Clean Water Initiative Program Grant Screening."

[10] Note that Act 250 permit amendments may require more extensive review of project impacts to natural resources including wildlife habitat, significant natural communities, and riparian zones. Please consult with the Act 250 District Coordinator regarding the nature and scope of that review and what bearing it may have on your project design.

level (shoreline) of a lake or pond? [11]	
If ***yes***, you might need either a Shoreland Protection Act Permit or a Lake Encroachment Permit. Use the Water Quality Project Screening Tool to find the Lakes and Ponds Program contact for your project's region. **Regulatory Point of Contact Name/Position:**	
III. Rivers, River Corridors, and Flood Hazard Areas	
1. Is there any portion of the project site located within 100' of a river corridor and/or mapped Federal Emergency Management Agency (FEMA) flood hazard area[12]**?** (e.g. a stormwater pond's pipe draining into a river corridor area)? Any permanent excavation/filling or construction within a flood hazard area or river corridor may trigger regulatory requirements through municipal bylaws or through state authorities.	Yes ○ No ◉
If ***yes***, you will need to speak with a Floodplain Manager. Use the Water Quality Project Screening Tool to find the Floodplain Manager for your project's region. **Regulatory Point of Contact Name/Position:**	
2. Is any portion of the project site within a perennial river or stream channel? [13]	Yes ◉ No ○
If ***yes***, you will need to speak with a Stream Alteration Engineer. Use the Water Quality Project Screening Tool to find the Stream Alteration Engineer for your project's region. **Regulatory Point of Contact Name/Position:** Staci Pomeroy	
IV. Wetland	

[11] The ANR Atlas Clean Water Initiative Program Grant Screening tool can help answer this yes/no question. Follow the instructions on the link above to identify whether your project is located in the jurisdictional zone to trigger a Lakeshore permit. Note that the layer to activate in ANR Atlas is now named "Clean Water Initiative Program Grant Screening."

[12] FEMA mapped Flood Hazard Areas are not available statewide on the ANR Natural Resources Atlas. For projects located in Grand Isle, Franklin, Lamoille, Addison, Essex, Orleans, Caledonia, and Orange Counties, maps are available via the FEMA Flood Map Service Center: https://msc.fema.gov/portal/home. ANR Floodplain Managers are available to provide technical assistance if needed.

[13] Stream Alteration Permits regulate all activities that take place within perennial river and stream channels. Examples of regulated activities include streambank stabilization, dam removal, road improvements that encroach on streams, and bridge/culvert construction or repair. The ANR Atlas Clean Water Initiative Program Grant Screening tool can help answer this yes/no question. Follow the instructions on the link above to identify whether your project is located in the jurisdictional zone to trigger a Stream Alteration permit. Note that the layer to activate in ANR Atlas is now named "Clean Water Initiative Program Grant Screening."

1. Does the Wetland Screening Tool[14] provide a result of wetlands likely, very likely, or present at the project site?	Yes ◉ No ○
2. Does your project site involve land that is in or near an area that has any of the following characteristics: o Water is present – ponds, streams, springs, seeps, water filled depressions, soggy ground under foot, trees with shallow roots or water marks? o Wetland plants, such as cattails, ferns, sphagnum moss, willows, red maple, trees with roots growing along the ground surface, swollen trunk bases, or flat root bases when tipped over? o Wetland Soils – soil is dark over gray, gray/blue/green? Is there presence of rusty/red/dark streaks? Soil smells like rotten eggs, feels greasy, mushy or wet? Water fills holes within a few minutes of digging? (See Landowners Guide to Wetlands for additional information on identifying wetlands onsite.)	Yes ◉ No ○ Not Sure ○

If you answered ***yes*** or ***not sure*** to either of the above questions, you will need to contact your District Wetlands Ecologist using the Wetland Inquiry Form. The District Wetlands Ecologist can help determine the approximate locations of wetlands and whether you need to hire a Wetland Consultant to conduct a wetland delineation. Alternatively, if you answered ***yes*** or ***not sure*** to either of the above questions, you can simply budget for a Wetland Consultant in the proposed scope of work. Any activity within a Class I or II wetland or wetland buffer zone (minimum of 100 feet and 50 feet respectively) which is not exempt or considered an "allowed use" under the Vermont Wetland Rules requires a permit. All permits must go through review and public notice process, which takes at minimum 6 weeks for a General Permit and 5 months for an Individual Permit.

Regulatory Point of Contact Name/Position:

Tina Heath

1. Is your project a Wetland Restoration project type?	Yes ◉ No ○

If you answered yes, under the Vermont Wetland Rules you will need an "allowed use" determination from the DEC Wetlands Program. Contact your District Wetlands Ecologist using the Wetland Inquiry Form.

Regulatory Point of Contact Name/Position: Tina Heath

V. Fish and Wildlife

State law protects endangered and threatened species. No person may take or possess such species without a Threatened & Endangered Species Takings permit. 1. **Does your project involve cutting down trees larger than 5 inches in diameter in any of the following towns?** Addison, Arlington, Benson, Brandon, Bridport, Bristol, Charlotte, Cornwall, Danby, Dorset, Fair Haven, Ferrisburgh, Hinesburg, Manchester, Middlebury, Monkton, New Haven, Orwell, Panton, Pawlet, Pittsford, Rupert, Salisbury, Sandgate, Shoreham, Starksboro, St. George, Sudbury, Sunderland, Vergennes, Waltham, West Haven, Weybridge, Whiting	Yes ○ No ◉

[14] To view the Wetland Screening Tool introduction video, see https://youtu.be/6lv5en0AB1o

2. Is the project site within 1 mile of a mapped[15] Significant Natural Community or Rare, Threatened, or Endangered Species?	Yes ○ No ◉
If *yes* to either of the above questions, connect with the VT Fish and Wildlife department (everett.marshall@vermont.gov 802-371-7333) to discuss your project and any necessary permitting. **Regulatory Point of Contact Name/Position:**	
VI. Stormwater	
1. Will the project disturb more than an acre of land during construction, add or redevelop impervious surface, create new development or otherwise require a Stormwater permit?	Yes ○ No ◉
If *yes*, forward to the appropriate Stormwater specialist to ensure necessary permitting. Use the Water Quality Project Screening Tool to find the Stormwater specialist for your project's region. **Regulatory Point of Contact Name/Position:**	
VII. Solid Waste	
2. Will you be creating any debris (including construction and demolition waste, stumps, brush, untreated wood, concrete, masonry, and mortar) with your project that you intend to bury on site? [16]	Yes ○ No ◉
If yes, connect with the Waste Management & Prevention Division (dennis.fekert@vermont.gov 802-522-0195) to discuss your project and any necessary permitting. **Regulatory Point of Contact Name/Position:**	
Provide below or attach a narrative summary of Table 4 findings. Please include: a. Which permits or permit amendment are needed or might be needed? b. What type might be needed? (e.g. a general or individual permit)? c. What concerns were voiced by permitting staff? d. How will the proposed scope of work address these concerns?	
Is the project, as proposed, reasonably considered permit-able by all applicable	Yes ◉ No ○

[15] Find both of these layers on the ANR Atlas under Atlas Layers/Fish and Wildlife. Use the Measurement tool to 1) Plot Coordinates for your project 2) select the coordinates from the left panel 3) select the Radius Tool 4) click on your project location 5) Indicate 1 mile distance 6) look for overlap with either of these mapped layers.

[16] If your project will result in the transfer and disposal of debris (including construction and demolition waste, stumps, brush, untreated wood, concrete, masonry and mortar), you do not need a permit from this office as long as you hire a licensed solid waste hauler and bring the material to a certified facility.

ANR permitting programs? (Answer must be Yes to continue)	

Step 5: Conduct Eligibility Criteria #5-8 Screenings

Table 5A. Eligibility Criteria 5-8	
Landowner and Operation and Maintenance Responsible Party Support. Project identifies and demonstrates commitment from a qualified and willing operation and maintenance responsible party. Project demonstrates landowner support for the proposed project phase. (Answer must be YES to proceed)	Yes ◉ No ○
Budget. Project budget includes ineligible expenses. (Answer must be NO to proceed)	Yes ○ No ◉
Leveraging. Proposed leveraging meets required leveraging levels (if applicable), meets the definition of leveraging, and comes from eligible sources (Answer must be YES or N/A to proceed)	Yes ○ No ○ N/A ◉
Funding Program Specific Eligibility. Project meets additional funding program eligibility requirements*. Please list applicable funding program below: Design Implementation Block Grant Clean Water Service Provider Funding (Answer must be YES to proceed) *If Water Quality Restoration Formula Grant, complete Step 6 below	Yes ◉ No ○

Step 6: Screening Projects on Agricultural Lands (Water Quality Restoration Formula Grants Only)

For Water Quality Restoration Formula Grant projects, please complete the following information as part of your Funding Program Specific Eligibility Screening (Criteria 8). Please note this must be completed for all projects located on agricultural lands regardless of project type. See CWIP Project Types Table for eligible project types.

Table 6A. Screening Projects on Agricultural Lands	
1. Is the proposed project located on a jurisdictional farm operation[17]? Complete a preliminary review to	○ Yes - Proceed to next question below.

[17] Jurisdictional farm operations are required to meet Vermont's Required Agricultural Practices (RAPs).

determine if it is a jurisdictional farm operation, and any case that requires consultation with AAFM will occur via the farm determination process. Please note this form must be submitted by the farm operation/landowner seeking the determination.	◉ **No**[18] - There is no additional requirements related to agricultural review for these projects.
2. Is the proposed project an agricultural project? Examples of agricultural projects include but are not limited to Production Area Practices – (e.g. Waste Storage Facilities, Heavy Use Area, Diversion) Fence, Livestock Exclusion, Filter Strip, Cover Crop, Reduced Tillage, Manure Injection, Rotational Grazing. Please note this is not an exhaustive list of all agricultural practices.	○ **Yes** - Agricultural Projects on jurisdictional farms are not an eligible project type. You can provide a referral to an applicable state or federal agricultural assistance program, or a local organization. ◉ **No** - The natural resource, innovative, or other project type will require an agricultural project review and approval from the Vermont Agency of Agriculture, Food and Markets (VAAFM) to ensure a consistent approach on farms statewide that follows rules, regulations, and laws in place. Please follow Steps 1 & 2 below. **Step 1** - Please submit a detailed description of the project, project site, project details, landowner, farm operation, and any other relevant information to VAAFM at AGR.WaterQuality@Vermont.gov . **Step 2** - Once you complete this Agricultural Project Review, please allow 30 days for a response. Once that response has been received, please include a summary of the response in the next section.

Agricultural Project Review Status & Summary:	
Check as Applicable	**Status**
☐	Submitted/ Pending
☐	Approved
☐	Denied

[18] Note CWIP's Agricultural Pollution Prevention project type eligibility is limited to land where owner or operator is not a jurisdictional farm (i.e., not required to meet the Required Agricultural Practices (RAPs)). As such, projects that meet the definition of the Agricultural Pollution Prevention project type in the Appendix B. Project Types Table are not subject to review by VAAFM.

Please include a summary of the response here:

Please note that it is expected that all projects with the status "submitted/pending" will be "approved" prior to a project approval for funding.

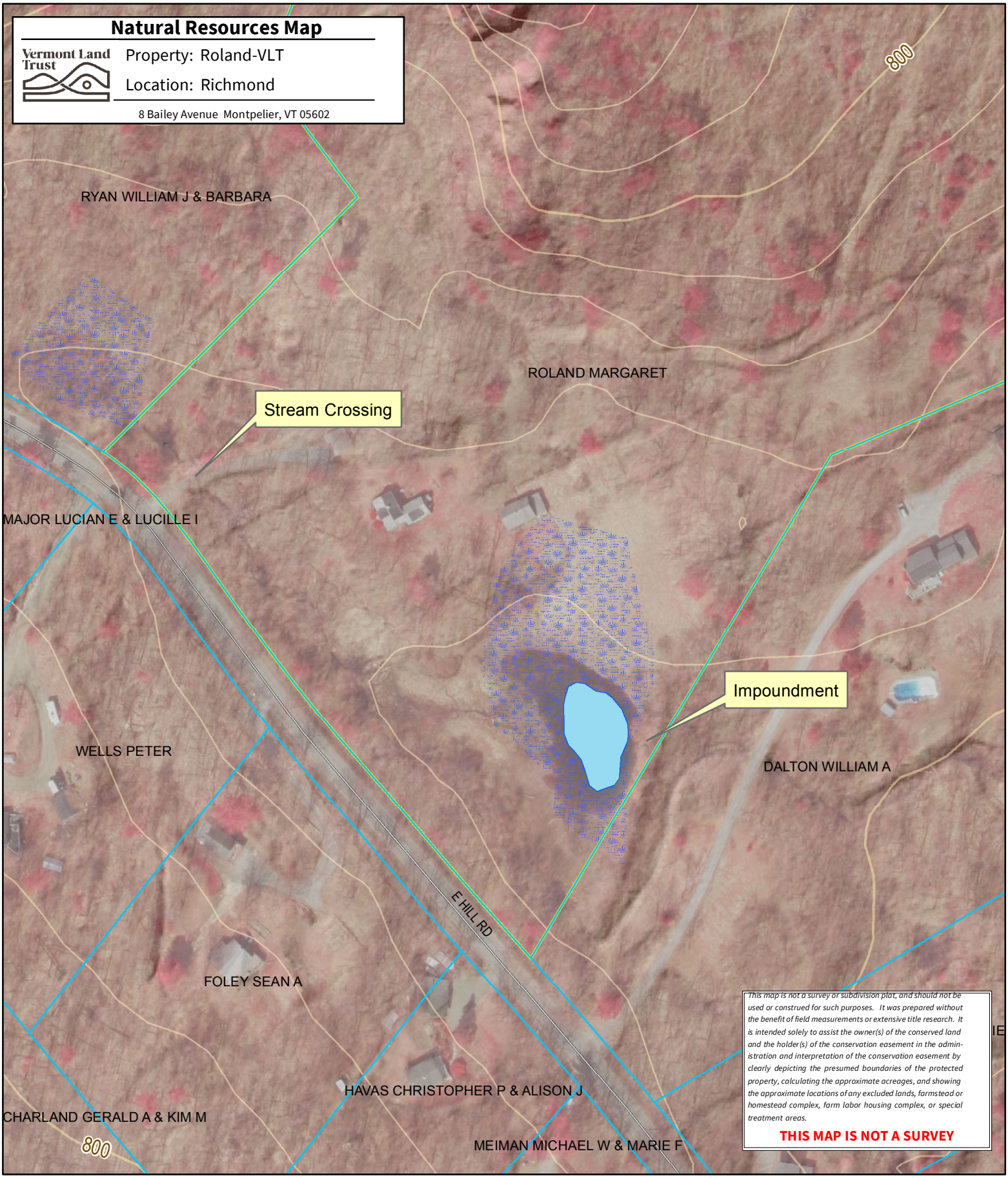
Natural Resources Map

Vermont Land Trust

Property: Roland-VLT

Location: Richmond

8 Bailey Avenue Montpelier, VT 05602



This map is not a survey or subdivision plat, and should not be used or construed for such purposes. It was prepared without the benefit of field measurements or extensive title research. It is intended solely to assist the owner(s) of the conserved land and the holder(s) of the conservation easement in the administration and interpretation of the conservation easement by clearly depicting the presumed boundaries of the protected property, calculating the approximate acreages, and showing the approximate locations of any excluded lands, farmstead or homestead complex, farm labor housing complex, or special treatment areas.

THIS MAP IS NOT A SURVEY

Roland Property (tax parcel)

Wetlands (VSWI)

0 12.5 25 50 75 100 Meters

0 55 110 220 330 440 Feet

Scale:1:1,561

N

Roland Stream Crossing Implementation Timeline

Activity	Date
Retain FEA and Project Management Consultant	November 2024
Secure Permits	November 2024-March 2025
Secure Construction Contractor	Winter 2025
Construction and Planting	Spring 2025

Winooski Basin Water Quality Council
Roland Stream Crossing Implementation

		Gray cells auto-calcul	
Personnel (Name, Title)	**Tasks/Responsibilities**	**Hours**	**Hourly Rate**
Allaire Diamond, Ecology & Restoration Program Director	Project management/completion oversight, Project reporting	30	$86.92
Tyler Miller, Vice President for Land Activation	Project oversight	6	$108.12
Dan Kilborn, Lands Program Director	Project coordination with fee land management	6	$83.74
Maggie Herrick, Bookkeeper	Invoicing	5	$61.21
Personnel Subtotal			

Anticipated Travel	**Purpose**	**Miles**	**Mileage Rate**
VLT staff	Travel to site	70	$0.67
		0	$0.00
Travel Subtotal			

Supplies	**Description/Use**	**# of Units**	**Unit Cost**
Trees & shrubs	For planting in restored floodplain & wetland	15	$20.00
Wetland plant seed mix	For restored wetland area	1	$50.00
64"x43" Pipe Arch (delivered)	Crossing structure	1	$7,500.00
		0	$0.00
Supplies Subtotal			

Contractual/Construction	**Description/Use**	**# of Units**	**Unit Cost**
Consultant - Fitzgerald Environmental Associates	Construction Oversight, Bid Support, Pre-construction meeting	1	$3,000.00
Consultant - Archeology TBD	Archeological study if needed	1	$7,500.00
Consultant - Project Manager TBD	Project management; permitting; construction oversight	40	$50.00
Volunteer labor	for tree planting	15	$26.00
Construction Contractor - TBD. Cost opinion provided by FEA	Mobilization, staging, excavation, water management, erosion control, mulching, seeding, demobilization	1	$27,930.00
Contractual Subtotal			0
Project subtotal			

Indirect Costs	**Indirect Rate**	**Cost related to Indirect rate**
If rate is above 10%, provide documentation indicating the reason	10%	$44,541.71
Indirect Subtotal		

Totals

Notes:

Total Funding Request for Final Design & Implementation
#REF!

Updated 3/23/2021

ate, do not edit. Enter in white cells only.

Total Salary Expense	Leverage amount	Amount requested
$2,607.60	$0.00	$2,607.60
$648.72	$0.00	$648.72
$502.44	$0.00	$502.44
$306.05	$0.00	$306.05
$4,064.81	**$0.00**	**$4,064.81**

Total Travel Expense	Leverage amount	Amount Requested
$46.90		$46.90
$0.00	$0.00	$0.00
$46.90	**$0.00**	**$46.90**

Total Supplies Expense	Leverage amount	Amount Requested
$300.00	$0.00	$300.00
$50.00	$0.00	$50.00
$7,500.00	$0.00	$7,500.00
$0.00	$0.00	$0.00
$7,850.00	**$0.00**	**$7,850.00**

Total Contract. Expense	Leverage amount	Amount Requested
$3,000.00	$0.00	$3,000.00
$7,500.00	$0.00	$7,500.00
$2,000.00	$0.00	$2,000.00
$0.00	$390.00	$0.00
$27,930.00	$0.00	$27,930.00
$40,430.00	**$390.00**	**$40,430.00**
$44,541.71	**$390.00**	**$44,541.71**

Total Indirect cost	Leverage amount	Amount Requested
$4,454.17	$0.00	$4,454.17
$4,454.17	**$0.00**	**$4,454.17**

$48,995.88	$390.00	$48,995.88

Roland Stream Crossing Implementation Timeline

Activity	Date
Retain FEA and Project Management Consultant	November 2024
Secure Permits	November 2024-March 2025
Secure Construction Contractor	Winter 2025
Construction and Planting	Spring 2025

Entering information

Note: Do not edit any formulas in gray cel

1. For each expense item in the budget, e
cost based on these numbers.
2. You must then enter what portion of th
auto-calculates based on the Cost minus
3. Totals for Project Cost, Leverage Amo
47.
4. When completed, save the Budget Ter

Directions by Column and Row

Item (Column A):

Description/Use (Column B)
Unit Column (Column C):

Unit Cost or Rate Column (Column D):

Expense Column (Column E):

Leverage Amount Column (Column F):

Amount Requested (Column G):

Totals Row (Row 42)

Percent Leverage (Row 43)

Leverage+ Amount requested= Total project cost (Row 44)

DEC strongly encourages applicants
working with contractors to secure qu
Expenditures are cost-reimbursable,

For further inforation about eligible and in
FY 2021 Funding Policy

lls.

enter the number of **units** and the **unit cost.** The template automatically calculates a total

at total cost will be provided as leverage/**match** (if any). The Amount Requested column
leverage.
unt and Amount Requested are automatically calculated at the bottom of the page in Row

nplate form as a PDF and attach to the application file.

Enter the name of the project related item
Enter the description or purpose for the item, you may need to make the row wider to accomadate more text
Enter the number of units (eg. hours, miles, rate or units) required for this project.

Enter the unit cost or rate related to the particular line item.
This field is auto-calculated by multiplying the units and the unit cost and it indicates the total cost of the budget item. Do not edit the calculations.

Enter the amount of leverage/match funds in the white cells that will be contributed to cover total project costs, if any. This can be the dollar equlivient such as volunteer labor.
Do not edit the subtotal row (in gray) of the match column to avoid miscalculations.
This column is autocalculated based on Expense minus Leverage. It is the amount you are requesting to be funded in this proposal. *ensure this value is not negative
This row shows the final auto-calculated totals for Total Project cost (Column E), Total Leverage (Column F) and Total Amount Requested (Column G). Ensure these numbers are correct and copy these totals onto the Application form. If the numbers appear to be incorrect, edit the information in the white cells above. Do not edit the formulas in these cells.

The percent Leverage is auto-calculated, Do not edit. This is for DEC review purposes.
The total leveaged plus the amount requested must equal total project cost. If it does not, column E will display "PLEASE FIX". If these amounts agree, the cell displays "YES".
Ensure this cell says "YES" prior to submitting,

to make every effort to secure accurate estimates for the proposal's budget, including
otes/bids during the proposal development process.
documentation of expenses is required.

eligible expenses refer to

Fitzgerald Environmental Associates, LLC.

Applied Watershed Science & Ecology

MEMORANDUM

To: Allaire Diamond, VLT
From: Rodrigue Spinette, PhD, and Evan Fitzgerald, CPESC, CFM
Re: Roland Property Culvert Replacement and Partial Stone Wall Removal
Date: September 30, 2024

FEA was retained by VLT to develop design plans for the replacement of two undersized culverts at a driveway stream crossing and the partial removal of a stone wall impounding the same stream at the Roland property on East Hill Road in Richmond, VT. The purpose of this memo is to summarize the results of our field site investigation (i.e. existing conditions), describe our proposed plan, and present estimates of P removal and implementation costs for the project.

Methods

FEA staff visited the property on 7/15/2024 and surveyed the project area with a Trimble Geo7x (centimeter grade accuracy) and a Nikon NPL-322+ Total Station (2 second accuracy). The collected data was used to develop existing conditions plans of the project area and inform our culvert replacement and restoration design. The surveyed features included an existing stream crossing by a driveway with two culverts and areas upstream and downstream of this crossing (longitudinal profile and cross-sectional data). The survey furthermore included a small stone wall impounding the same stream and located approximately 50 ft downstream of the driveway.

The surveyed data was analyzed using GIS and compared to data sources from VCGI (LiDAR elevation, soils, wetland mapping, historical aerial imagery) to gain a better understanding of the project site in terms of past land use and its setting within the watershed and surrounding landscape.

Finally, FEA performed a hydrological and hydraulic (H&H) analysis of the project area to support the structure replacement and restoration design. FEA's H&H analysis included: mapping of the upstream watershed, determination of flow discharge at the crossing for a range of flood events, evaluation of the stream geomorphic conditions at the crossing, and development of hydraulic models for existing and proposed conditions to validate the structure replacement design.

Watershed Hydrology

FEA reviewed the drainage area estimated by Streamstats at the project site and, with minor adjustments in GIS based on the available LiDAR DEM, determined that the drainage area at this location was approximately 78 acres (Figure 1). Several approaches were taken to estimate flow discharges at the crossing location for a range of flood events (2-YR to 500-YR). These approaches included several regional regression equations (Dune and Leopold 1978, Olson 2014, Jacobs 2010) and the development of a TR-20 hydrological watershed model using HydroCAD.

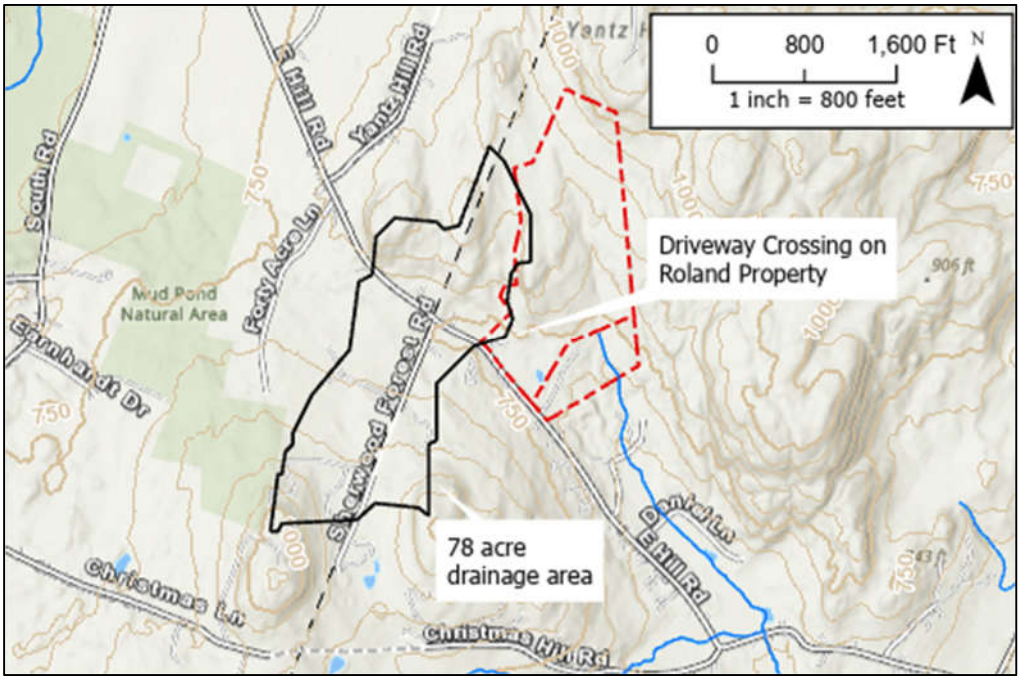


Figure 1. Watershed associated with stream (black line) at the Roland Property at the location of the driveway crossing. The Roland parcel and adjoining parcel lines are shown in red.

As shown in table 1, the flow discharge estimates cover a relatively wide range of values. In our experience, actual flow discharges lie somewhere between those predicted by the USGS or NETC regression equations and those predicted by the TR-20 model. As a conservative approach, the TR-20 values were used when evaluating an appropriate size for the culvert replacement.

Table 1. Flow discharge estimates at the Roland Property for a range of flood events.

		Peak flow estimates (cfs)			
Flood Return Interval (Yrs)	AEP (%)	USGS (Olson 2014)	NETC (Jacobs 2010)	Dunne & Leopold	TR-20
2	50.0%	5.1	6.9	4.6	12.5
5	20.0%	8.5	11.1	4.9	23.0
10	10.0%	11.2	14.7	6.7	33.2
25	4.0%	15.3	19.7	8.8	48.3
50	2.0%	18.9	23.5	12.3	60.5
100	1.0%	22.9	27.5		73.9
200	0.5%	27.4			90.3
500	0.2%	34.0	40.3		115.5

Geomorphology and Existing Conditions

As shown on the design plans (Attachment 1), the channel upstream of the driveway crossing consisted of a 4-foot-wide bankfull channel with an approximately 2.5% slope. It was observed during our survey that sediment deposits had accumulated upstream of the crossing, a likely result of the existing 15" Ø HDPE and 18" Ø HDPE round culverts being undersized. The driveway is approximately 14 ft wide at the

top with an elevation low point of approximately 734' located above the existing culverts. The driveway appears stable. The channel immediately downstream of the crossing is 5-ft wide and includes the convergence of the two culvert outlet flows. Sediment deposits, mostly sand and gravel, are significant downstream of the crossing because of a small stone wall impounding the stream 50 ft downstream of the crossing. This stone wall acts as an unnatural grade control and we observed water spreading over a wider area immediately upstream of the wall. Downstream of the stone wall, the stream channel is better defined and its geometry approaches that of the upstream section, 4-foot-wide bankfull channel with an approximately 1.2% slope.

The Vermont Department of Environmental Conservation (VTDEC) hydraulic geometry regression curves were used to predict bankfull widths based on drainage area (VTDEC, 2006) and yielded bankfull widths similar to our field measurements. The predicted bankfull width and depth were 5.2 ft and 0.5 ft respectively.

Hydraulic Analysis

HY-8 7.80.0.2 software (USFHWA, 2022) was used to create hydraulic models of the crossing under existing conditions as well as range of culvert replacement options. Additional details of the modeling can be found in the HY-8 Model Output in Attachment 2.

Existing Conditions Modeling Results

The existing conditions HY-8 model showed flows overtopping the road when flows exceed 15.48 cfs, corresponding to flow discharges between the TR-20 2-year and 5-year storms. The model showed the 2-year 24-hour storm headwater elevation 8 in below the top of the driveway crossing but above the top of both culverts. The 5-year 24-hour storm slightly overtops the driveway. The 15" Ø culvert discharge tops out at 7.5 cubic feet per second (cfs) and the 18" Ø culvert at 10.9 cfs in the 500-YR storm according to our existing conditions model. Outlet water velocities ranged between 6.8 and 7.7 feet per second (fps) for 15" Ø culvert and between 8.0 and 9.1 fps for the 18" Ø culvert.

Proposed Conditions Modeling Results

The goals of the proposed structure replacement were to increase the size of the pipe structure to a span consistent with the reference bankfull width (approximately 5 ft) and maximizing water conveyance capacity while preserving the overall driveway grade and form. Different size structures were therefore tested in the HY-8 model. Our modelling and analysis indicated that a 64-inch span by 43-inch rise pipe arch (54" round equivalent), with about 12" of embedment, could handle up to 61.16 cfs of flow with no overtopping of the driveway, which is between the TR-20 50-YR and 100-YR storm discharge estimates. Use of a pipe arch allows for a wide span and makes it easier to maintain the required minimum cover over the structure. The modelled outlet velocity in the 100-year storm was 9.7 fps. The pipe arch discharge tops out at 71.54 cfs in the 500-YR storm. The design plans (Attachment 1) provide additional details on the proposed design.

P Removal Credit

Our estimates of P removal credit for the replacement of the two undersized culverts with a 64"x43" pipe arch is 5.72 kg P/year. This figure is based on the median P credits given for the replacement of a

mostly incompatible culvert in a steep channel in the the HUC 12 Snipe Island Brook-Winooski River basin (043001030702). The existing culvert conveyances were deemed fully and mostly incompatible due to their small spans (18" and 15") compared to the predicted bankfull width of 4-5', and further supported by the deposition that was observed upstream of the crossing.

Cost Opinion

Table 2 presents an estimated cost for the construction of the project.

Table 2. Cost Opinion - VLT Roland Culvert Replacement and Stone Wall Removal

Description	Unit	Estimated Quantity	Unit Price	Cost
Mobilization/Demobilization	LS	1	$2,000.00	$2,000.00
Common Excavation (cut/fill)	CY	140	$20.00	$2,800.00
Stone bedding	CY	5	$40.00	$200.00
E-stone Type 1 (conservative)	CY	15	$85.00	$1,275.00
Excavator day rate	LS	5	$2,000.00	$10,000.00
Stream bypass (pumping / temp. piping)	LS	1	$5,000.00	$5,000.00
Misc. Erosion Control/Site Restoration	LS	1	$2,000.00	$2,000.00
64"x 43" Pipe Arch (Delivered)	LS	1	$7,500.00	$7,500.00
Tree sapling / shrubs	EA	15	$20.00	$300.00
Native Wetland Seed (1lb/1250sqft)	LBS	1	$50.00	$50.00
Straw Mulch	SF	1000	$0.06	$60.00
Laborer (seeding, planting, water control)	HR	40	$60.00	$2,400.00
			Subtotal:	$33,585.00
			Contingency (20%):	$6,717.00
			Total:	**$40,302.00**

Permitting

Engagement with the VTDEC wetlands program will be needed because the project overlaps with significant wetlands. The project likely qualifies or notification under VTDEC's 3-9026 General Permit, which is designed for water quality improvement projects in jurisdictional wetlands and buffer zones. Engagement with the VTDEC rivers program will also be necessary to determine whether the stream crossed by the driveway on the Roland Property is jurisdictional under the VTDEC Stream Alterations Rule. That determination would impact the need for a stream alteration permit. Engagement and permitting with the US Army Corps of Engineers is also likely because some wetlands and streams are considered Waters of the U.S. and protected at the federal level. Finally, the restoration project may require a review of the site for historical and archeological significance with VT DHP.

Conclusions and Next Steps

Replacing the undersized culverts at the driveway crossing on the Roland Property with a larger pipe arch and removing a stone wall impoundment as presented in this report represents a good opportunity to improve water quality, flood resiliency and habitat on a small stream within the Winooski River

watershed. The next steps toward implementation are to engage with regulatory agencies at the state and federal level to determine the permitting required by the project, and to determine sources of funding for the project.

Attachments

Attachment 1: Draft 100% design Plans – VLT Roland Property
Attachment 2: HY-8 model inputs and results

References

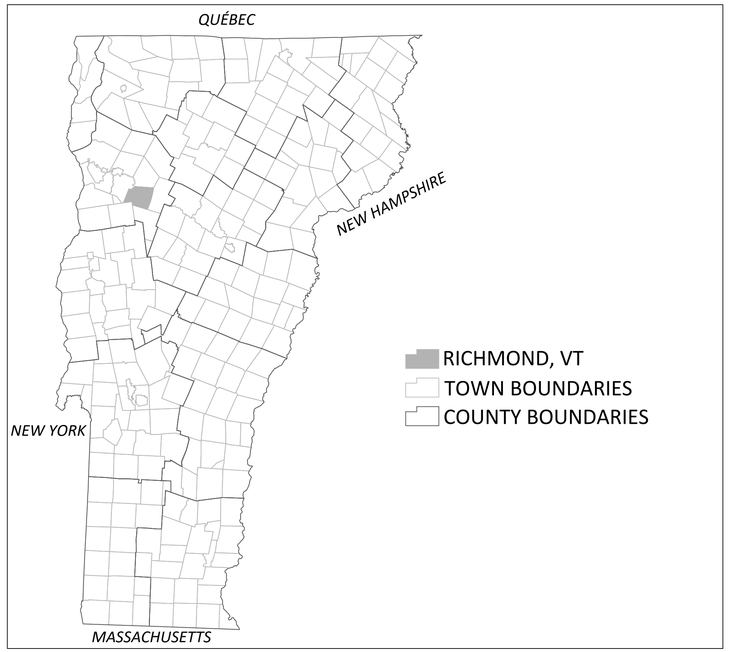
Dunne, T. and Leopold, L. B., 1978, Water in Environmental Planning, WH Freeman and Co., San Francisco, CA.

Jacobs, J., 2010. Estimating the Magnitude of Peak Flows for Steep Gradient Streams in New England. New England Transportation Consortium Report NETC81, Project No. NETC 04-3. New England Transportation Consortium in cooperation with the Federal Highway Administration, Burlington, VT.

Olson, S. A., 2014, Estimation of Flood Discharges at Selected Annual Exceedance Probabilities for Unregulated, Rural Streams in Vermont, United States Geologic Survey, USGS Scientific Investigations Report 2014-5078.

USFHWA (US Federal Highway Administration), 2022. HY-8 Culvert Hydraulic Analysis Program, Version 7.80.0.2. Available at: https://www.fhwa.dot.gov/engineering/hydraulics/software/hy8/

VTDEC (Vermont Department of Environmental Conservation), 2006. Vermont Regional Hydraulic Geometry Curves. Appendix J of the Vermont Stream Geomorphic Assessment Protocol Handbooks: Remote Sensing and Field Surveys Techniques for Conducting Watershed and Reach Level Assessments. Vermont Agency of Natural Resources, Department of Environmental Conservation, Division of Water Quality, River Management Program, Waterbury, VT.



ROLAND PROPERTY CULVERT REPLACEMENT

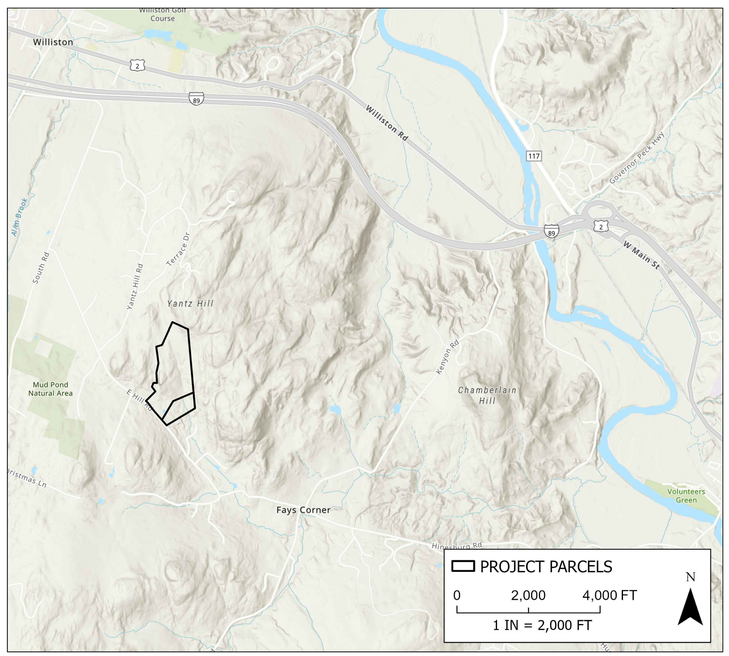
1090 EAST HILL ROAD

RICHMOND, VERMONT

DRAFT

DRAFT 100% DESIGN PLANS
9/30/2024

FITZGERALD ENVIRONMENTAL WORKED WITH VERMONT LAND TRUST AT THE ROLAND PROPERTY IN RICHMOND TO DEVELOP PLANS FOR THE REPLACEMENT OF TWO UNDERSIZED CULVERTS WITH ONE LARGER PIPE ARCH AT A STREAM CROSSING AND THE PARTIAL REMOVAL OF A SMALL STONE WALL IMPOUNDING THAT SAME STREAM. THE PROJECT AIMS TO IMPROVE FLOOD RESILIENCY, WILDLIFE HABITAT, AND WATER QUALITY IN THE AFFECTED STREAM AND THE SURROUNDING RIPARIAN AREAS.



DRAWING INDEX		
NO.	NAME	TITLE
1	EX-1	SITE PLAN - EXISTING CONDITIONS
2	PR-1	SITE PLAN - PROPOSED CONDITIONS - OVERVIEW
3	PRO-1	PROFILE AND CROSS SECTIONS
4	DT-1	CONSTRUCTION DETAILS
5	N-1	CONSTRUCTION NOTES

EXISTING CONDITIONS AND SOURCE NOTES

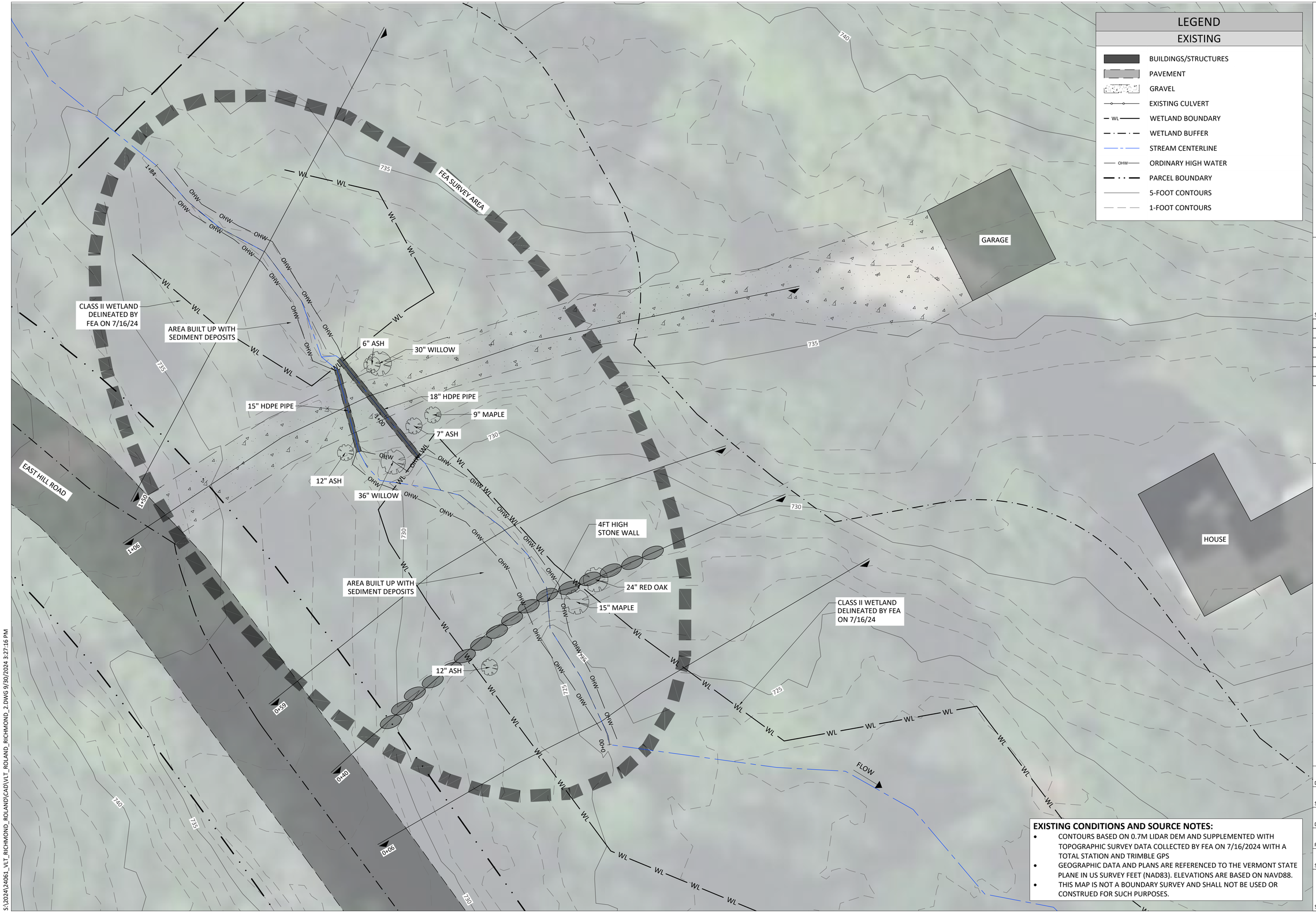
1. GEOGRAPHIC DATA AND PLANS ARE REFERENCED TO THE VERMONT STATE PLANE IN US SURVEY FEET (NAD83). ELEVATIONS ARE BASED ON NAVD88.
2. PARCEL BOUNDARY DATA SHOWN ON THE PLANS ARE FROM VCGI.
3. CONTOURS BEYOND FEA SURVEY AREA WERE DEVELOPED FROM VCGI 0.7M DIGITAL ELEVATION MODEL.
4. SUPPLEMENTAL DATA COLLECTED BY FEA TO VERIFY AVAILABLE DATA.

PREPARED BY:

Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

PREPARED FOR:

Vermont Land Trust
UNITING LAND AND LIVES
226 Bridge Street, PO Box 850
Richmond, VT 05477
Phone: 802.434.3079
www.vlt.org



EXISTING CONDITIONS AND SOURCE NOTES:

- CONTOURS BASED ON 0.7M LIDAR DEM AND SUPPLEMENTED WITH TOPOGRAPHIC SURVEY DATA COLLECTED BY FEA ON 7/16/2024 WITH A TOTAL STATION AND TRIMBLE GPS
- GEOGRAPHIC DATA AND PLANS ARE REFERENCED TO THE VERMONT STATE PLANE IN US SURVEY FEET (NAD83). ELEVATIONS ARE BASED ON NAVD88.
- THIS MAP IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED OR CONSTRUED FOR SUCH PURPOSES.

Fitzgerald Environmental Associates, LLC
164 Main Street, Suite 2
Colchester, VT 05446
Telephone: 802.876.7778
www.fitzgeraldenvironmental.com

DRAFT

SIGNATURE

REVISIONS

#	DESCRIPTION	DATE

10 0 5 10

1" = 10'

N

DRAFT 100% DESIGN PLANS

SITE PLAN - EXISTING CONDITIONS

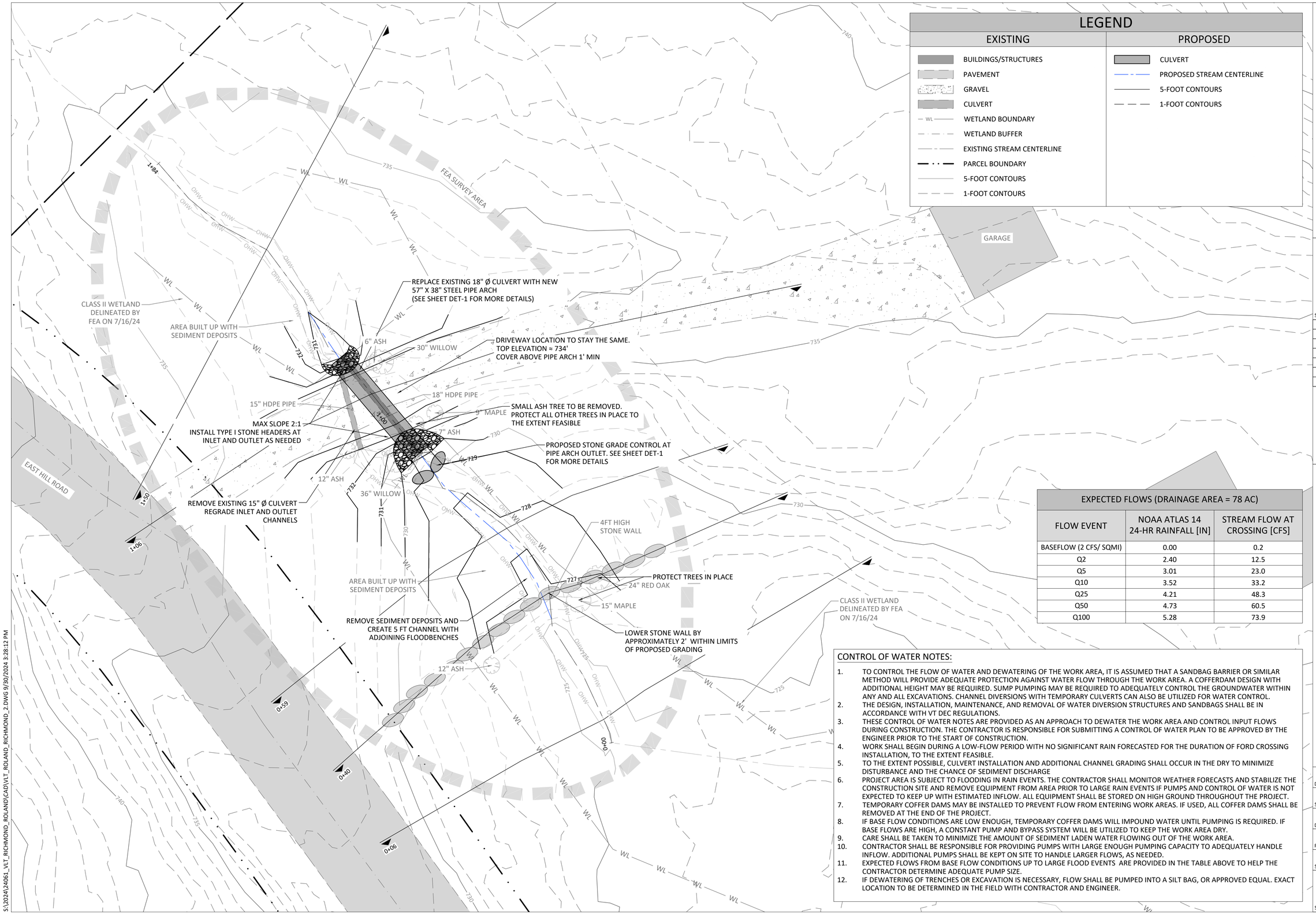
VLT - ROLAND PROPERTY CULVERT REPLACEMENT

1090 EAST HILL ROAD
RICHMOND, VT
NOT FOR CONSTRUCTION

DRAWN	CHECKED
RFS	EPF

SCALE	1" = 10'
DATE	2024-09-30
PROJECT NO.	24061
SHEET NO.	1 OF 5
SHEET NAME	EX-1

S:\2024\24061_VLT_RICHMOND_ROLAND\CAD\VLT_ROLAND_RICHMOND_2.DWG 9/30/2024 3:27:16 PM



LEGEND

EXISTING	PROPOSED
BUILDINGS/STRUCTURES	CULVERT
PAVEMENT	PROPOSED STREAM CENTERLINE
GRAVEL	5-FOOT CONTOURS
CULVERT	1-FOOT CONTOURS
WETLAND BOUNDARY	
WETLAND BUFFER	
EXISTING STREAM CENTERLINE	
PARCEL BOUNDARY	
5-FOOT CONTOURS	
1-FOOT CONTOURS	

EXPECTED FLOWS (DRAINAGE AREA = 78 AC)

FLOW EVENT	NOAA ATLAS 14 24-HR RAINFALL [IN]	STREAM FLOW AT CROSSING [CFS]
BASEFLOW (2 CFS/ SQMI)	0.00	0.2
Q2	2.40	12.5
Q5	3.01	23.0
Q10	3.52	33.2
Q25	4.21	48.3
Q50	4.73	60.5
Q100	5.28	73.9

CONTROL OF WATER NOTES:

1. TO CONTROL THE FLOW OF WATER AND DEWATERING OF THE WORK AREA, IT IS ASSUMED THAT A SANDBAG BARRIER OR SIMILAR METHOD WILL PROVIDE ADEQUATE PROTECTION AGAINST WATER FLOW THROUGH THE WORK AREA. A COFFERDAM DESIGN WITH ADDITIONAL HEIGHT MAY BE REQUIRED. SUMP PUMPING MAY BE REQUIRED TO ADEQUATELY CONTROL THE GROUNDWATER WITHIN ANY AND ALL EXCAVATIONS. CHANNEL DIVERSIONS WITH TEMPORARY CULVERTS CAN ALSO BE UTILIZED FOR WATER CONTROL.
2. THE DESIGN, INSTALLATION, MAINTENANCE, AND REMOVAL OF WATER DIVERSION STRUCTURES AND SANDBAGS SHALL BE IN ACCORDANCE WITH VT DEC REGULATIONS.
3. THESE CONTROL OF WATER NOTES ARE PROVIDED AS AN APPROACH TO DEWATER THE WORK AREA AND CONTROL INPUT FLOWS DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A CONTROL OF WATER PLAN TO BE APPROVED BY THE ENGINEER PRIOR TO THE START OF CONSTRUCTION.
4. WORK SHALL BEGIN DURING A LOW-FLOW PERIOD WITH NO SIGNIFICANT RAIN FORECASTED FOR THE DURATION OF FORD CROSSING INSTALLATION, TO THE EXTENT FEASIBLE.
5. TO THE EXTENT POSSIBLE, CULVERT INSTALLATION AND ADDITIONAL CHANNEL GRADING SHALL OCCUR IN THE DRY TO MINIMIZE DISTURBANCE AND THE CHANCE OF SEDIMENT DISCHARGE
6. PROJECT AREA IS SUBJECT TO FLOODING IN RAIN EVENTS. THE CONTRACTOR SHALL MONITOR WEATHER FORECASTS AND STABILIZE THE CONSTRUCTION SITE AND REMOVE EQUIPMENT FROM AREA PRIOR TO LARGE RAIN EVENTS IF PUMPS AND CONTROL OF WATER IS NOT EXPECTED TO KEEP UP WITH ESTIMATED INFLOW. ALL EQUIPMENT SHALL BE STORED ON HIGH GROUND THROUGHOUT THE PROJECT.
7. TEMPORARY COFFER DAMS MAY BE INSTALLED TO PREVENT FLOW FROM ENTERING WORK AREAS. IF USED, ALL COFFER DAMS SHALL BE REMOVED AT THE END OF THE PROJECT.
8. IF BASE FLOW CONDITIONS ARE LOW ENOUGH, TEMPORARY COFFER DAMS WILL IMPOUND WATER UNTIL PUMPING IS REQUIRED. IF BASE FLOWS ARE HIGH, A CONSTANT PUMP AND BYPASS SYSTEM WILL BE UTILIZED TO KEEP THE WORK AREA DRY.
9. CARE SHALL BE TAKEN TO MINIMIZE THE AMOUNT OF SEDIMENT LADEN WATER FLOWING OUT OF THE WORK AREA.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING PUMPS WITH LARGE ENOUGH PUMPING CAPACITY TO ADEQUATELY HANDLE INFLOW. ADDITIONAL PUMPS SHALL BE KEPT ON SITE TO HANDLE LARGER FLOWS, AS NEEDED.
11. EXPECTED FLOWS FROM BASE FLOW CONDITIONS UP TO LARGE FLOOD EVENTS ARE PROVIDED IN THE TABLE ABOVE TO HELP THE CONTRACTOR DETERMINE ADEQUATE PUMP SIZE.
12. IF DEWATERING OF TRENCHES OR EXCAVATION IS NECESSARY, FLOW SHALL BE PUMPED INTO A SILT BAG, OR APPROVED EQUAL. EXACT LOCATION TO BE DETERMINED IN THE FIELD WITH CONTRACTOR AND ENGINEER.

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#	DESCRIPTION	DATE

10 0 5 10
1" = 10'

N

DRAFT 100% DESIGN PLANS

SITE PLAN - PROPOSED CONDITIONS
VLT - ROLAND PROPERTY CULVERT REPLACEMENT
1090 EAST HILL ROAD
RICHMOND, VT
NOT FOR CONSTRUCTION

DRAWN: RFS	CHECKED: EPF
SCALE: 1" = 10'	
DATE: 2024-09-30	
PROJECT NO.: 24061	
SHEET NO.: 2 OF 5	
SHEET NAME: **PR-1**	

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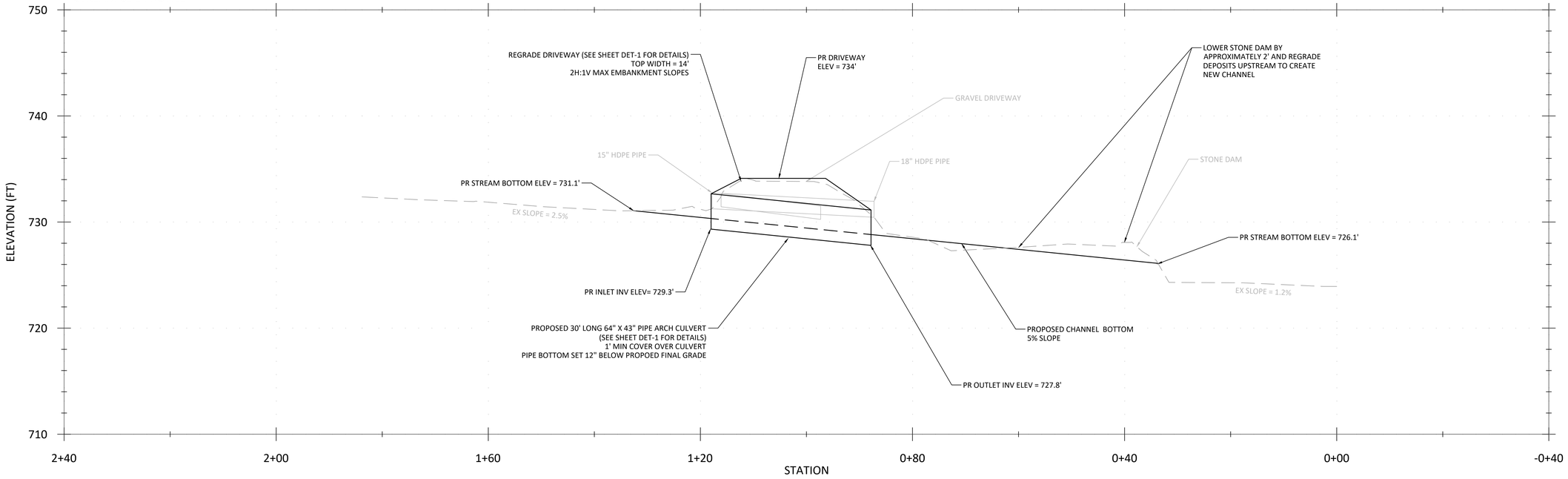
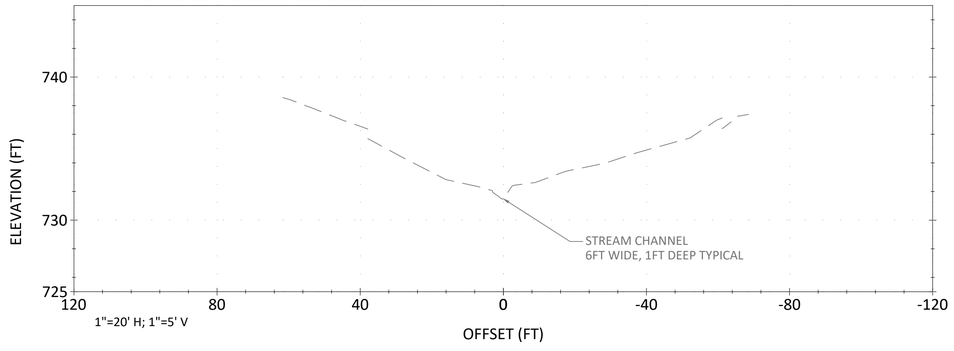
STREAM CL 1 PROFILE



CROSS SECTIONS	1"=10' H; 1"=5' V	STA 1+50	STA 1+06	STA 0+59	STA 0+40	STA 0+06

STA 1+50 STREAM CL 1 CROSS SECTION



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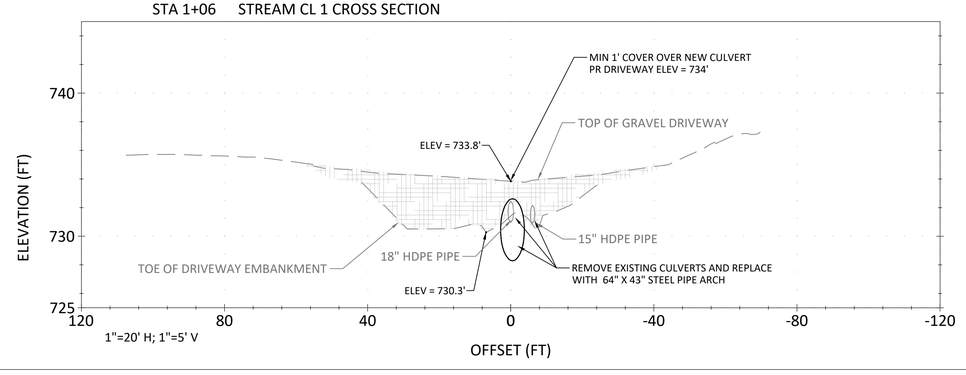

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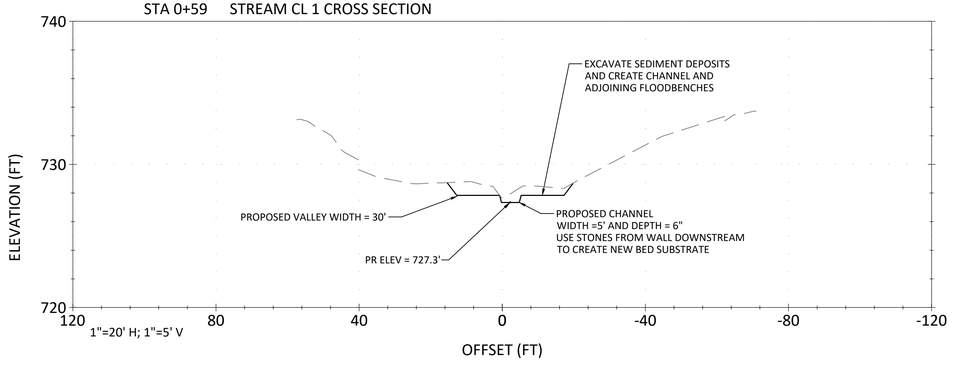

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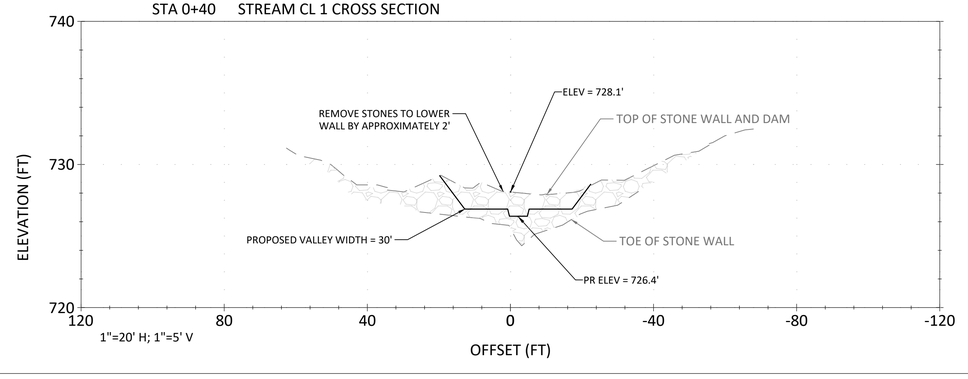

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#	DESCRIPTION	DATE

SITE PLAN - PROFILE AND CROSS SECTIONS

VLT - ROLAND PROPERTY CULVERT REPLACEMENT

1090 EAST HILL ROAD
RICHMOND, VT

NOT FOR CONSTRUCTION

DRAFT 100% DESIGN PLANS

DRAWN	CHECKED
RFS	EPF

SCALE	AS SHOWN
DATE	2024-09-30
PROJECT NO.	24061
SHEET NO.	3 OF 5

PRO-1

SHEET NAME

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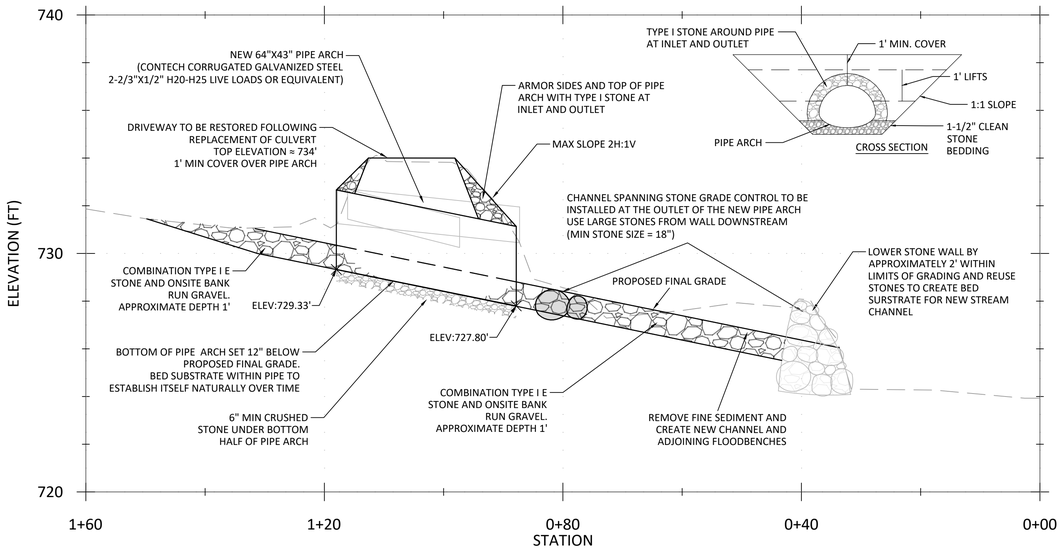
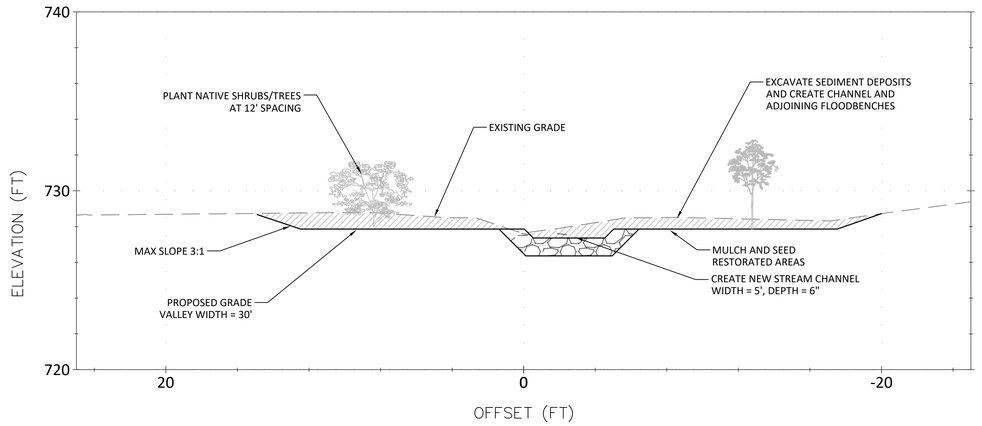


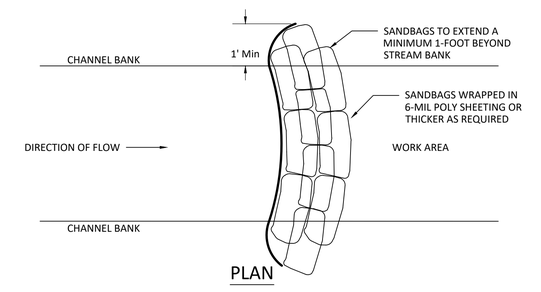
PIPE ARCH CONSTRUCTION DETAIL

N.T.S



STREAM AND VALLEY RESTORATION DETAIL

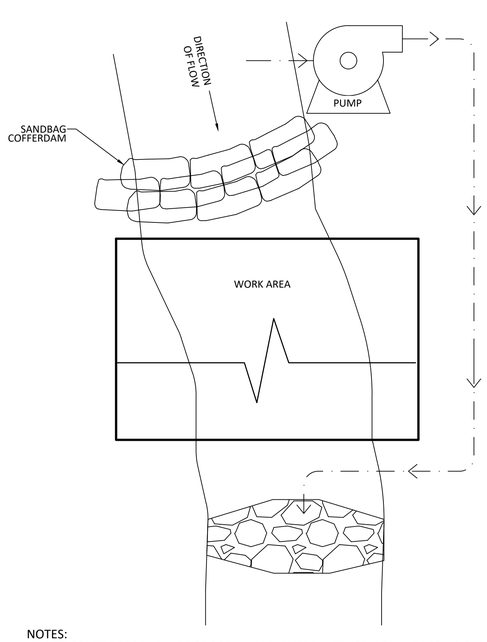
N.T.S



NOTES:
1. SANDBAGS OR APPROVED EQUIVALENT (I.E. PRECAST WASTE BLOCKS) SHALL BE USED AS TEMPORARY COFFER DAM.
2. IMPERVIOUS LINER (POLYETHYLENE PLASTIC LINER OR EQUIVALENT) SHALL BE PLACED BELOW SAND BAGS, AND WRAPPED AROUND TO PREVENT SEEPAGE OF WATER.
3. COFFER DAM HEIGHT SHALL EXTEND A MINIMUM OF 1-FOOT ABOVE THE TOP OF THE STREAM BANK AND TIE INTO BOTH BANKS OF THE CHANNEL. TOP HEIGHT SHALL EXTEND OVERBANK AS NEEDED TO TIE INTO EACH BANK.

TEMPORARY COFFER DAM

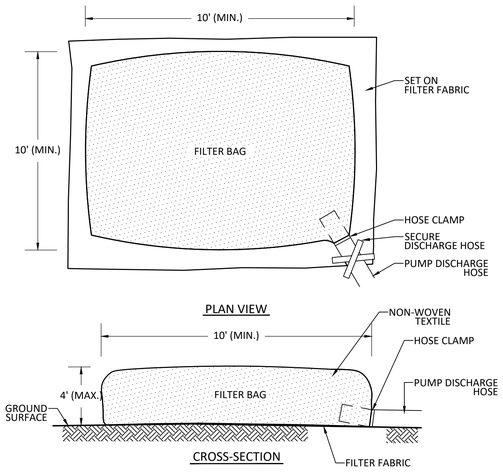
N.T.S



NOTES:
1. THE CONTRACTOR MAY PROPOSE AN ALTERNATE METHOD FOR BYPASSING STREAM FLOWS FOR ENGINEER APPROVAL.
2. PUMP OUTLET LOCATION SHALL BE STABILIZED WITH TYPE 1 STONE OR APPROVED EQUAL TO PROTECT AGAINST EROSIVE FORCES.

STREAMFLOW DIVERSION

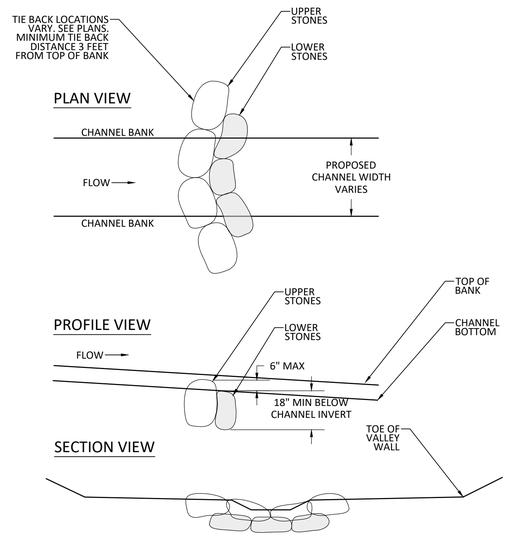
N.T.S



NOTES:
1. BAG TO BE USED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
2. FILTER BAG TO BE PLACED ON FILTER FABRIC. IF UNDERLYING SOIL IS NOT STABLE, OR SUSCEPTIBLE TO EROSION, PLACE FILTER BAG ON A BED OF CRUSHED STONE, CONSTRUCTION MATTING, OR OTHER STABILIZED SURFACE IF CONTINUOUS DEWATERING IS ANTICIPATED.
3. TO THE EXTENT POSSIBLE, THE FILTER BAG LOCATION SHALL BE PLACED GREATER THAN 50 FEET FROM A WETLAND OR STREAM.
4. IF NEEDED, DEWATERING WITHIN A WETLAND SHALL OCCUR WITH THE FILTER BAG PLACED DIRECTLY ON THE CONSTRUCTION MATTING
5. MONITOR DISCHARGE FOR TURBIDITY. REDUCE FLOW RATE AND/OR REPLACE FILTER BAG AS NEEDED TO PREVENT RELEASE OF VISIBLY TURBID WATER.
6. ADDITIONAL BEST MANAGEMENT PRACTICES MAY BE NECESSARY TO PROTECT ADJACENT NATURAL RESOURCE AREAS (I.E. DOWN GRADIENT SILT FENCE OR STAKED FIBER ROLL).

DEWATERING FILTER BAG

N.T.S



NOTES:
1. LOCATION OF STONE GRADE CONTROLS TO BE DETERMINED DURING FIELD LAYOUT WITH THE CONTRACTOR.
2. STONE SHALL BE A MINIMUM DIAMETER OF 24 INCHES AND LENGTH OF 36 INCHES.
3. UPPER STONES SHALL BE ELEVATED NO MORE THAT 6" ABOVE THE EXISTING CHANNEL BOTTOM.
4. STONES SHALL BE TIED BACK INTO CHANNEL BANKS AT LEAST 3 FEET EMBEDDED ON BOTH BANKS.
5. UPPER STONES SHALL BE LOWER IN CHANNEL CENTER TO CENTER THE FLOW OF WATER.

ROCK WEIR GRADE CONTROL

N.T.S

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SIGNATURE

REVISIONS

#	DESCRIPTION	DATE

CONSTRUCTION DETAILS

VLT - ROLAND PROPERTY CULVERT REPLACEMENT

1090 EAST HILL ROAD
RICHMOND, VT
NOT FOR CONSTRUCTION

DRAFT 100% DESIGN PLANS

DRAWN	CHECKED
RFS	EPF

SCALE: N.T.S

DATE: 2024-09-30

PROJECT NO.: 24061

SHEET NO.: 4 OF 5

SHEET NAME: **DT-1**

GENERAL CONSTRUCTION NOTES

1. THESE PLANS DO NOT CONSTITUTE A SURVEY AND SHALL NOT BE USED FOR THE TRANSFER OF LOTS.
2. EXISTING GRADE TOPOGRAPHIC INFORMATION PROVIDED BY VCGI IN 0.7M LIDAR DEM. A TOPOGRAPHIC / BATHYMETRIC SURVEY WAS COMPLETED BY FITZGERALD ENVIRONMENTAL ASSOCIATES ON JULY 16, 2024 AND INTEGRATED INTO THE TOPOGRAPHIC DATA. ACTUAL ELEVATIONS MAY VARY.
3. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE TECHNICAL SPECIFICATIONS FOR PROJECT.
4. IF A CONDITION OF THE TECHNICAL SPECIFICATIONS CANNOT BE MET, THE CONTRACTOR SHALL PROVIDE NOTIFICATION AND COORDINATE A MEETING WITH THE CLIENT/PROJECT CONSULTANT PRIOR TO CONSTRUCTION.
5. PRIOR TO ORDERING MATERIALS OR BREAKING GROUND, THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL CONTRACT DOCUMENTS INCLUDING BUT NOT LIMITED TO SHOP DRAWINGS, DESIGN PLANS, TECHNICAL SPECIFICATIONS AND OTHER RELATED DOCUMENTS TO VERIFY AND COORDINATE DIMENSIONS, LAYOUTS, PLACEMENT, AND APPLICABILITY. THE CONTRACTOR SHALL CONDUCT FIELD CHECKS TO VERIFY THE ACCURACY OF DIMENSIONS, TOPOGRAPHY, AND EXISTING CONDITIONS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CLIENT/PROJECT CONSULTANT OF ANY DISCREPANCIES BETWEEN THE INFORMATION SHOWN ON THESE PLANS AND THE CONDITIONS EXISTING IN THE FIELD. IF THE CONTRACTOR FAILS TO REPORT ANY DISCREPANCIES DISCOVERED TO THE ENGINEER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ERRORS WHICH MIGHT HAVE BEEN AVOIDED THEREBY. THE CONTRACTOR SHALL SUBMIT THE LIST AND QUANTITY OF MATERIALS TO ORDER FOR REVIEW PRIOR TO ORDERING.
6. THE LOCATION OF UTILITIES SHOWN ON THESE PLANS ARE NOT BASED ON “DIG SAFE” MARKINGS AND DO NOT PURPORT TO CONSTITUTE OR REPRESENT ALL UTILITIES LOCATED UPON OR ADJACENT TO THE SURVEYED PREMISES. THE CONTRACTOR SHALL FIELD VERIFY ALL UTILITY CONFLICTS. ALL DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER. THE CONTRACTOR SHALL CALL "DIG SAFE".
7. THE CONTRACTOR SHALL REPAIR/RESTORE ALL DISTURBED AREAS (ON OR OFF THE SITE) AS A DIRECT OR INDIRECT RESULT OF THE CONSTRUCTION TO THEIR ORIGINAL CONDITION AT THE COMPLETION OF CONSTRUCTION.
8. IN ADDITION TO THE REQUIREMENTS SET IN THESE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL COMPLETE THE WORK IN ACCORDANCE WITH ALL PERMIT CONDITIONS AND ANY LOCAL PUBLIC WORKS STANDARDS, AS NECESSARY.
9. ANY DEWATERING NECESSARY FOR THE COMPLETION OF THE SITEWORK SHALL BE CONSIDERED AS PART OF THE CONTRACT AND SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

CONSTRUCTION SPECIFICATIONS

1. SILT FENCE, STAKED FIBER ROLL, OR OTHER APPROVED SEDIMENT CONTROL MEASURE SHALL BE INSTALLED AT THE EDGE OF THE PROPOSED GRADING AND STAGING AREAS PRIOR TO DISTURBANCE.
2. LIMITS OF DISTURBANCE SHALL BE CLEARLY DEFINED.
3. ADDITIONAL EROSION CONTROL MEASURES TO BE IMPLEMENTED AS NEEDED UNDER THE DIRECTION OF THE ENGINEER.
4. NO TREES WITH A DIAMETER GREATER THAN 3" SHALL BE CUT WITHOUT PRIOR APPROVAL.
5. ALL AREAS EXPOSED DURING CONSTRUCTION SHALL BE PROTECTED IN ACCORDANCE WITH THE STANDARDS PUBLISHED IN THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S *LOW RISK SITE HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL*
6. NO STREAM IMPACTS SHALL OCCUR BEYOND THE WORK SHOWN IN THE PLANS.
7. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR ALL CONSTRUCTION ITEMS PRIOR TO PURCHASING. ENGINEER SHALL REVIEW SHOP DRAWINGS IN A TIMELY MANNER AND RESPOND AS APPROVED, APPROVED AS NOTED, OR REVIEW AND RESUBMIT.
8. EXCAVATION
   - 8.1. THE CONTRACTOR SHALL BYPASS ANY STREAM FLOW PAST THE AREA TO BE REGRADED PRIOR TO ANY EARTH DISTURBANCE.
   - 8.2. EXCAVATION AND CONSTRUCTION SHALL OCCUR UNDER DRY OR NEARLY DRY CONDITIONS, AS FEASIBLE. WORK SHALL CEASE DURING STORM EVENTS THAT CREATE ELEVATED RUN OFF CONDITIONS TO PREVENT SEDIMENT DISCHARGE OFF OF THE PROJECT SITE.
   - 8.3. THE CONTRACTOR SHALL PROTECT EXISTING STRUCTURES AND UTILITIES FROM DAMAGE AND EXCESSIVE SETTLEMENT DURING EXCAVATION, BACKFILLING, COMPACTION, AND DEWATERING ACTIVITIES. THE CONTRACTOR SHALL REPAIR ANY SUCH DAMAGE AT THEIR OWN EXPENSE.
   - 8.4. EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES SHALL BE INSTALLED PRIOR TO EARTH DISTURBANCE.
   - 8.5. EXCESS MATERIAL SHALL BE HAULED OFF SITE AND PROPERLY DISPOSED, OR COORDINATED WITH THE OWNER TO DISPOSE OF ONSITE AT DESIRED LOCATIONS AND STABILIZED UPON DISPOSAL.

MATERIAL SPECIFICATIONS

1. STONE AND SOIL
   - 1.1. TYPE I STONE FILL
     - 1.1.1. THE LONGEST DIMENSION OF THE STONE SHALL VARY FROM 1-12 INCHES, AND THE MEDIAN PARTICLE DIAMETER (D50) OF THE STONE SHALL BE 4 INCHES.
   - 1.2. E-STONE TYPE I
     - 1.2.1. MATERIAL SHALL MEET SPECIFICATIONS OUTLINED IN THE CURRENT VAOT STANDARD SPECIFICATIONS FOR CONSTRUCTION, SECTION 706.04(D).
     - 1.2.2. STONE FOR STONE FILL SHALL BE APPROVED, HARD, BLASTED, ANGULAR ROCK OTHER THAN SERPENTINE ROCK CONTAINING THE FIBROUS VARIETY CHRYSOTILE (ASBESTOS). ONLY LIMESTONE, DOLOMITE, OR QUARTZITE SHALL BE ALLOWED.
     - 1.2.3. THE LEAST DIMENSION OF STONE SHALL BE GREATER THAN 33% OF THE LONGEST DIMENSION. STONE FILL SHALL BE REASONABLY WELL GRADED FROM SMALLEST TO THE MAXIMUM SIZE STONE SPECIFIED SO AS TO FORM A COMPACT MASS WHEN IN PLACE.
     - 1.2.4. THE LONGEST DIMENSION OF THE STONE SHALL BE AT LEAST 18 INCHES, AND AT LEAST 50 PERCENT OF THE VOLUME OF THE STONE IN PLACE SHALL HAVE AT LEAST A DIMENSION OF 12 INCHES, AND AT LEAST 25 PERCENT OF THE PARTICLES SHALL HAVE A MAXIMUM DIMENSION OF 2 INCHES AND BE WELL GRADED
     - 1.2.5. THE STREAMBED STONE SHALL BE HARD, BLASTED, ANGULAR ROCK. SIMILAR SIZED RIVER SEDIMENT IS AN ACCEPTABLE ALTERNATIVE AS IS A MIXTURE OF ANGULAR ROCK AND RIVER ROCK.
     - 1.2.6. ADD SAND BORROW AS NEEDED TO SEAL THE BED AND PREVENT SUBSURFACE FLOW
     - 1.2.7. THERE SHALL BE NO SUBSURFACE FLOW UPON FINAL INSPECTION
   - 1.3. TOP SOIL
     - 1.3.1. TOP SOIL SHALL BE NATURAL SOIL CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH, FREE FROM SUBSOIL, STONES, PLANTS, ROOTS, STICKS, AND OTHER EXTRANEOUS MATERIALS.
2. DRAINAGE STRUCTURES AND PIPES
   - 2.1. PIPES
     - 2.1.1. PIPES AND PIPE FITTINGS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS. PIPE ARCH SHALL BE CONTECH GALVANIZED STEEL 57"X38" (SPANXRISE) RATED FOR H20-H25 LOADS OR APPROVED EQUAL.
3. ROCK WEIR GRADE CONTROLS
   - 3.1. STONES USED IN THE ROCK WEIR GRADE CONTROL STRUCTURES SHALL HAVE A MINIMUM DIAMETER OF 18" AND A MINIMUM LENGTH OF 24" STONES SHALL BE APPROVED, ROUGH, UNHEWN STONE. THE STONES SHALL BE HARD, SOUND, AND RESISTANT TO THE ACTION OF WATER AND WEATHERING. THEY SHALL BE OF A ROCK TYPE OTHER THAN SERPENTINE ROCK CONTAINING THE FIBROUS VARIETY CHRYSOTILE (ASBESTOS).
4. TRESS AND SHRUBS
   - 4.1. TREES AND SHRUBS SHALL BE HEALTHY, AVAILABLE LOCALLY, AND REASONABLY FREE OF DIE-BACK, ROT, AND DISEASE. AT THE TIME OF PLANTING ALL PLANTS, WITH THE EXCEPTION OF LIVE STAKES, SHALL HAVE A ROOT SYSTEM, STEM AND BRANCH FORM THAT WILL NOT RESTRICT NORMAL GROWTH, STABILITY AND HEALTH FOR THE EXPECTED LIFE OF THE PLANT.
   - 4.2. SPECIES SHALL BE NATIVE AND BE COMPATIBLE WITH PLANT COMMUNITIES KNOW TO GROW IN AREAS WITH SIMILAR CLIMATE, SOILS, HYDROLOGY, AND LANDSCAPE POSITIONS. UPLAND AREAS SHALL BE DOMINATED BY PLANTS WITH HYDROLOGY INDICATOR STATUS OF FAC-UPL AND WETLAND AREAS BY PLANT WITH INDICATOR STATUS OF OBL-FAC.
5. GRASS SEED
   - 5.1. SEED SHALL BE FURNISHED IN NEW, CLEAN, SEALED, AND PROPERLY LABELED CONTAINERS. SEED WHICH HAS BECOME WET, MOLDY OR OTHERWISE DAMAGED SHALL NOT BE ACCEPTABLE.
   - 5.2. DISTURBED AREAS SHALL BE SEEDED WITH A CONSERVATION MIX OR WETLAND SEED MIX (AS SHOW ON PLANS) APPROVED BY THE ENGINEER PRIOR TO USE.
   - 5.3. IF SEEDING IS TO OCCUR AFTER OCTOBER 15TH, ADDITIONAL WINTER RYE SHALL BE USED TO HELP ESTABLISH VEGETATION AND STABILIZATION. ADDITIONAL SPRING SEEDING MAY BE REQUIRED.
6. MULCH AND EROSION CONTROL
   - 6.1. STRAW MULCH SHALL CONSIST OF MOWED, PROPERLY CURED GRASS AND LEGUMES REASONABLY FREE OF WEEDS, TWIGS, DEBRIS, OR OTHER OBJECTIONABLE MATERIAL. MULCH AT A RATE OF 2 TONS PER ACRE.
   - 6.2. AN APPROPRIATE BIODEGRADABLE EROSION CONTROL MATTING SHALL BE USED (E.G., NORTH AMERICAN GREEN S150BN OR EQUIVALENT WITH LOOSE-WEAVE NETTING) ON SLOPES EXCEEDING 3H:1V.
   - 6.3. SILT FENCE - FENCE INSTALLED FOR SILT CONTROL SHALL BE A PREASSEMBLED WOOD POST AND FILTER FABRIC SYSTEM. FENCE SHALL BE MIRAFI, INC. ENVIROFENCE OR EQUIVALENT AS APPROVED BY DESIGNER/ENGINEER. WIDTH OF FABRIC SHALL BE 3' MINIMUM. POSTS ARE TO BE HARDWOOD OR METAL, 4.5' LONG AND SPACED 5' TO 8' ON CENTER. SILT FENCE SHALL BE KEYED INTO GROUND. SILT FENCE (OR APPROVED EQUAL) SHALL BE INSTALLED AS SHOWN ON THE PLANS PRIOR TO EARTH DISTURBANCE
7. STABILIZATION OF DISTURBED SOILS
   - 7.1. TEMPORARY STABILIZATION OF DISTURBED SOILS DURING THE PERIOD OF APRIL 15 TO OCTOBER 15 SHALL BE COMPLETED WITHIN 14 DAYS OF INITIAL DISTURBANCE. AFTER THE INITIAL DISTURBANCE PERIOD, TEMPORARY STABILIZATION SHALL BE PERFORMED ON A DAILY BASIS, EXCEPT IF WORK IS TO CONTINUE IN THE DISTURBED AREA WITHIN THE NEXT 24 HOURS AND THERE IS NO FORECAST OF PRECIPITATION FOR THE NEXT 24 HOURS, OR IF THE WORK IS OCCURRING IN A SELF-CONTAINED EXCAVATION WITH A DEPTH OF 2 FEET OR GREATER.
   - 7.2. SEED AND STRAW MULCH DISTURBED AREAS IMMEDIATELY AFTER THE COMPLETION OF RE-GRADING AND WORK ACTIVITIES. PREPARE SEEDBED AND UTILIZE SOIL AMENDMENT AS NEEDED. TRACK MULCH IN AS NEEDED TO PREVENT REMOVAL BY WIND.

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SIGNATURE

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#	DESCRIPTION	DATE

CONSTRUCTION NOTES
VLT - ROLAND PROPERTY CULVERT REPLACEMENT
1090 EAST HILL ROAD
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DRAFT 100% DESIGN PLANS

DRAWN: RFS	CHECKED: EPF
SCALE: N/A	
DATE: 2024-09-30	
PROJECT NO.: 24061	
SHEET NO.: 5 OF 5	

N-1
SHEET NAME

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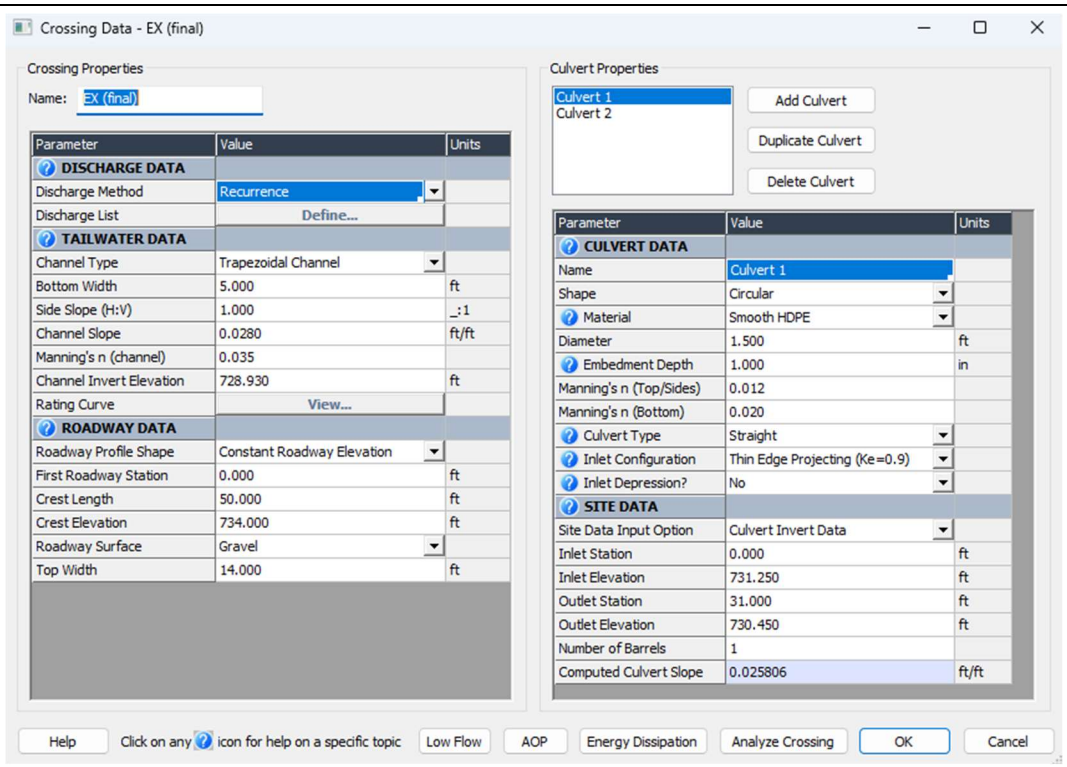
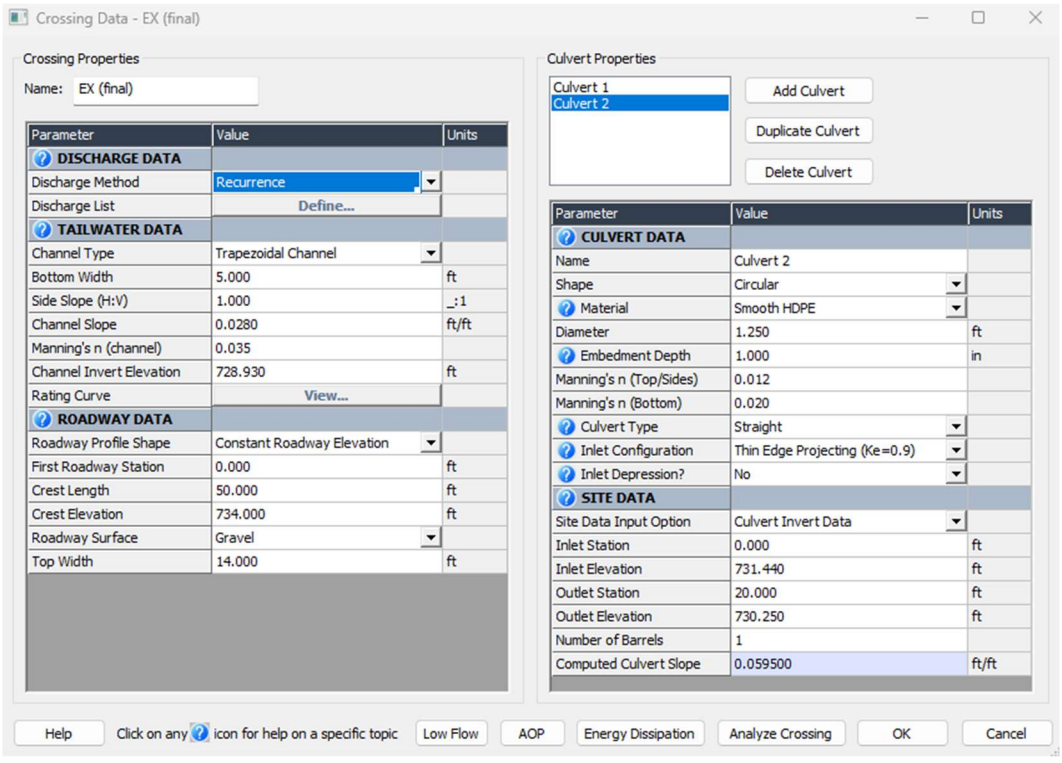
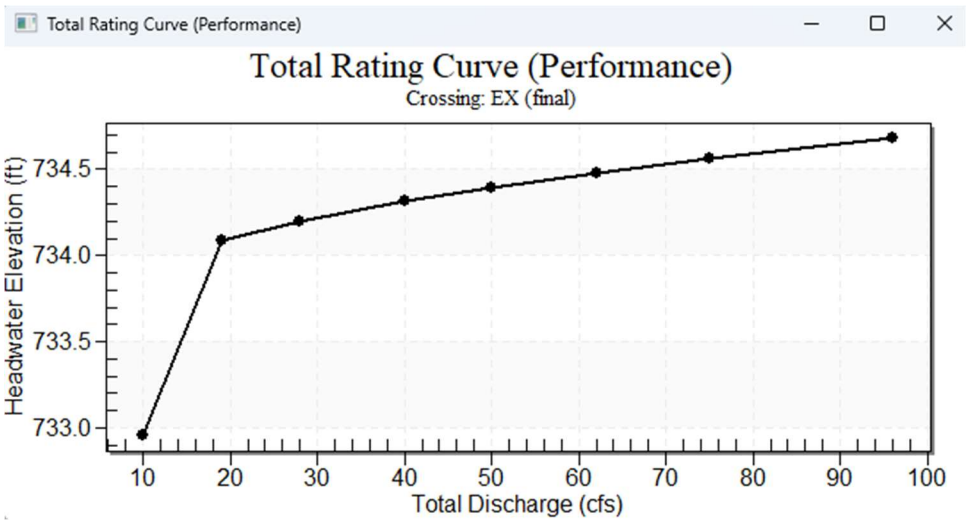


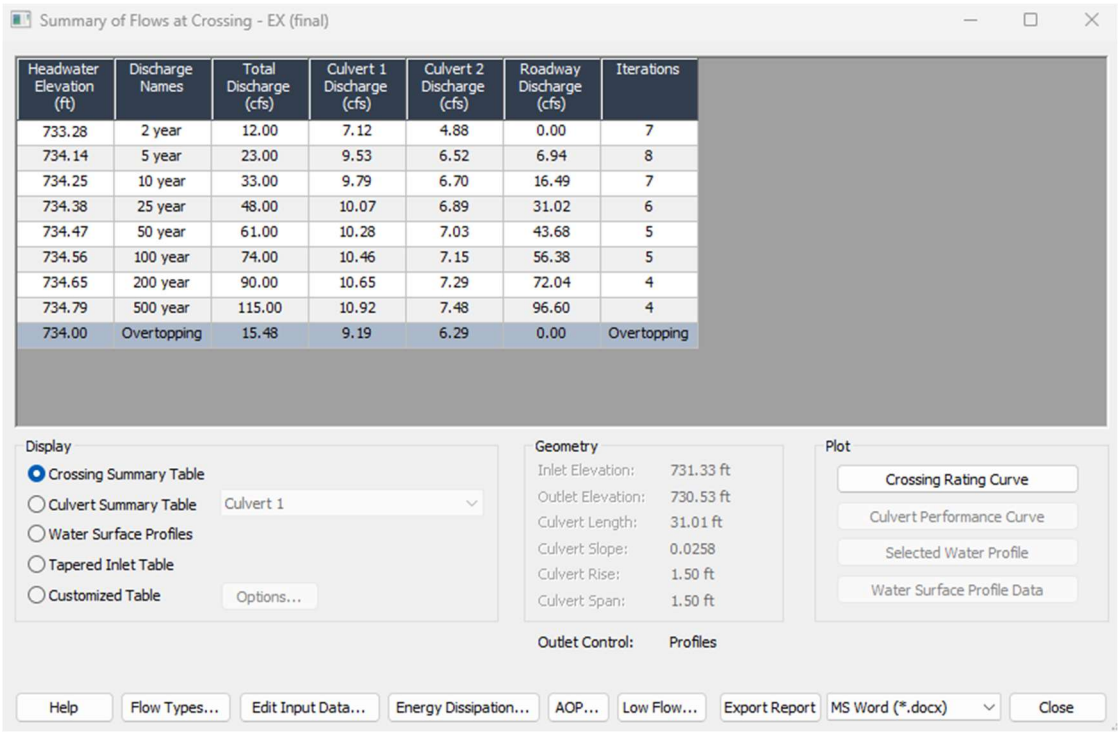
Existing Conditions – Culvert 1 (18" Ø HDPE) HY-8 Model Inputs



Existing Conditions – Culvert 2 (15" Ø HDPE) HY-8 Model Inputs

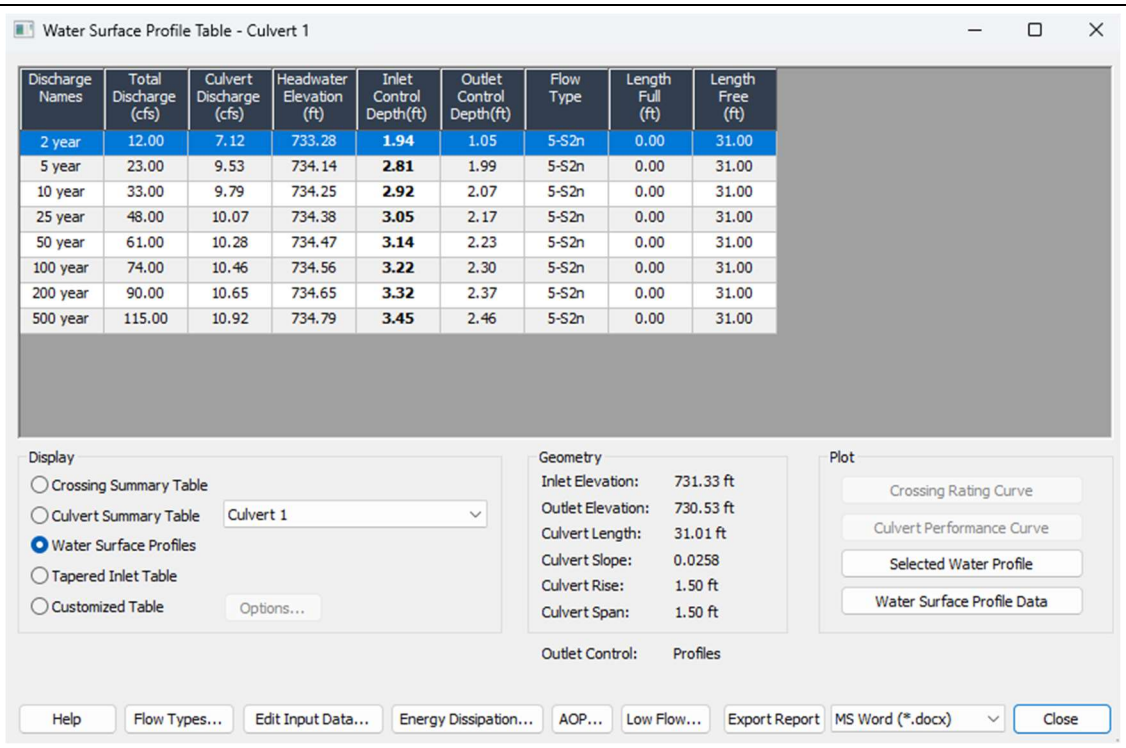


Existing Conditions – Crossing Rating Curve

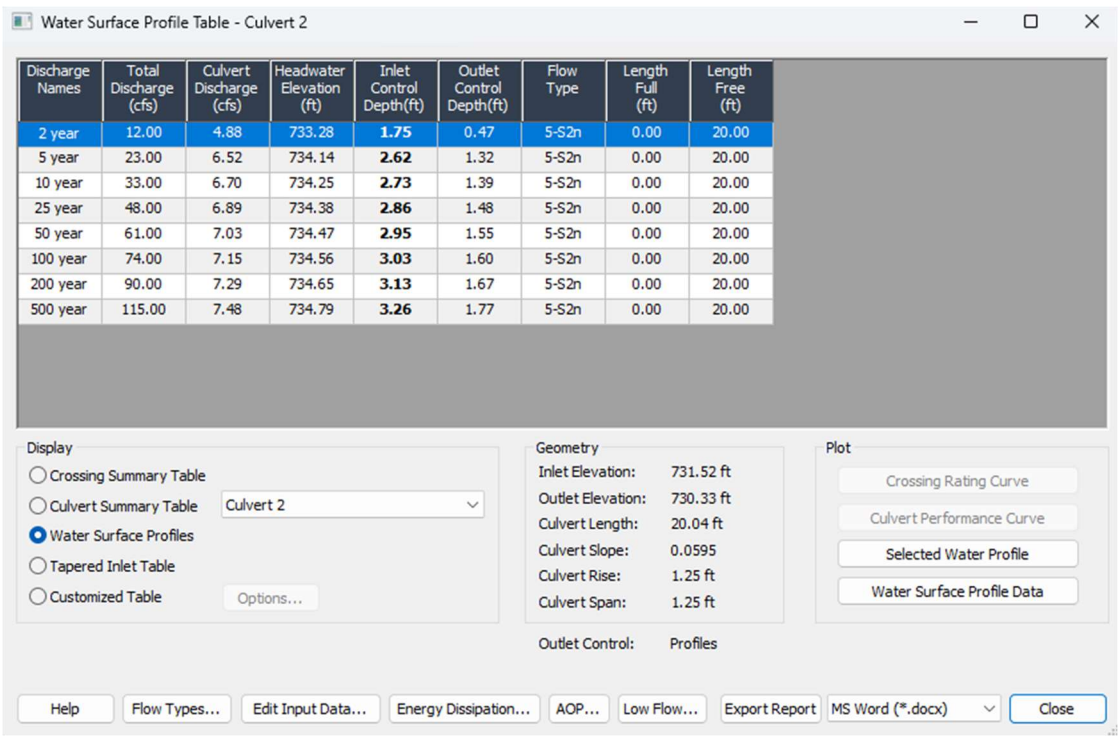


Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Culvert 2 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
733.28	2 year	12.00	7.12	4.88	0.00	7
734.14	5 year	23.00	9.53	6.52	6.94	8
734.25	10 year	33.00	9.79	6.70	16.49	7
734.38	25 year	48.00	10.07	6.89	31.02	6
734.47	50 year	61.00	10.28	7.03	43.68	5
734.56	100 year	74.00	10.46	7.15	56.38	5
734.65	200 year	90.00	10.65	7.29	72.04	4
734.79	500 year	115.00	10.92	7.48	96.60	4
734.00	Overtopping	15.48	9.19	6.29	0.00	Overtopping

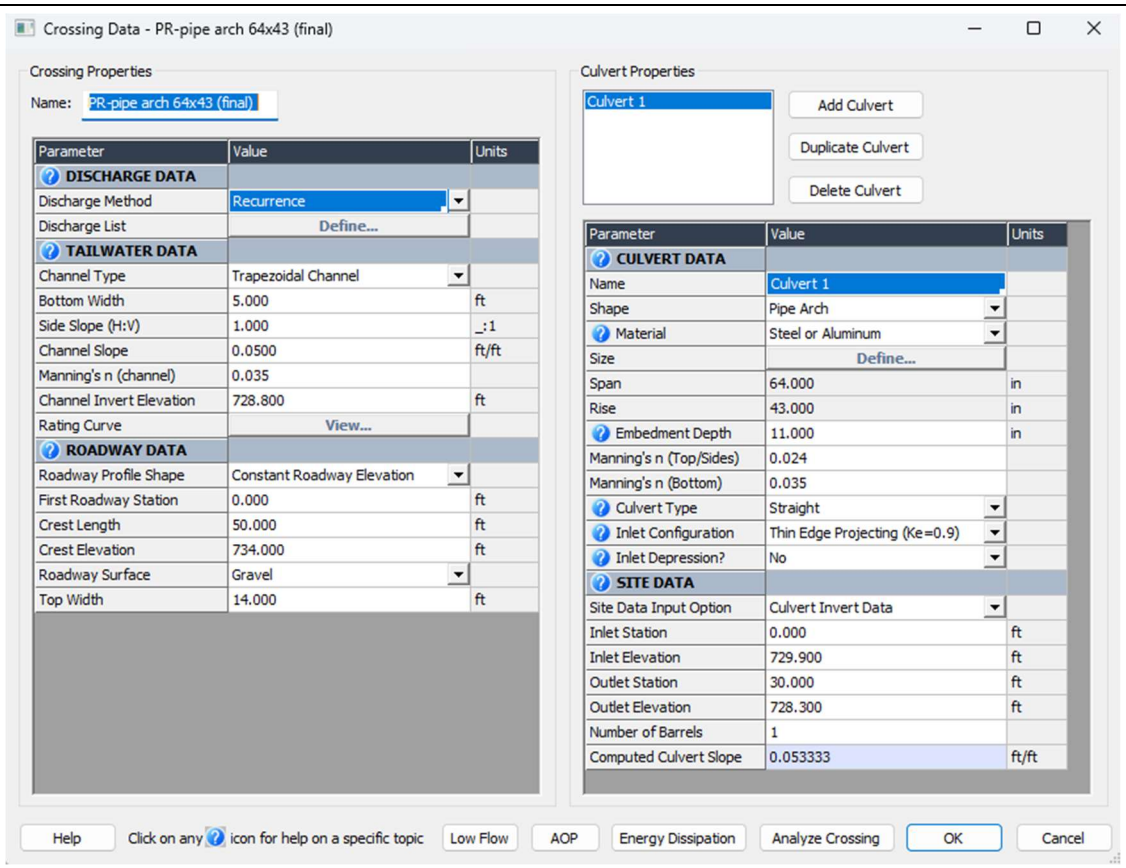
Existing Conditions – Crossing Summary Table



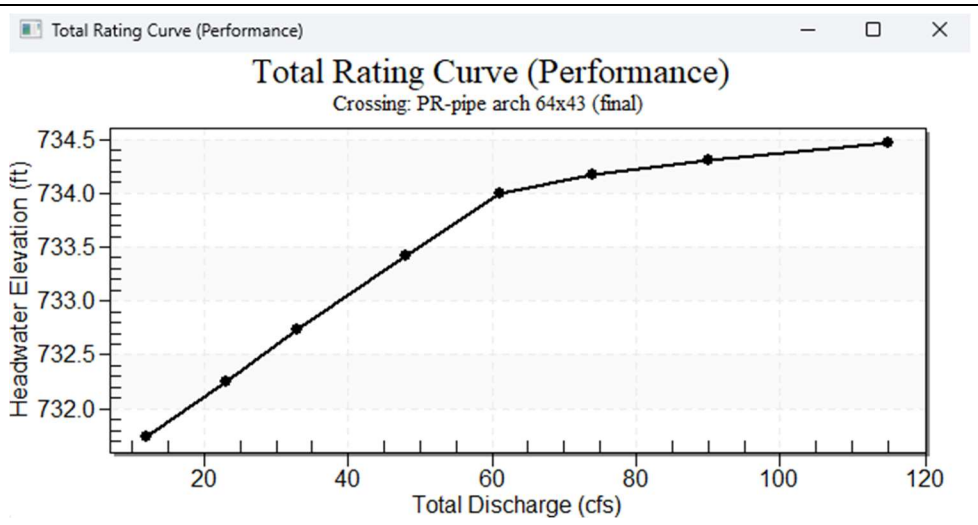
Existing Conditions – Culvert 1 Water Surface Summary Table



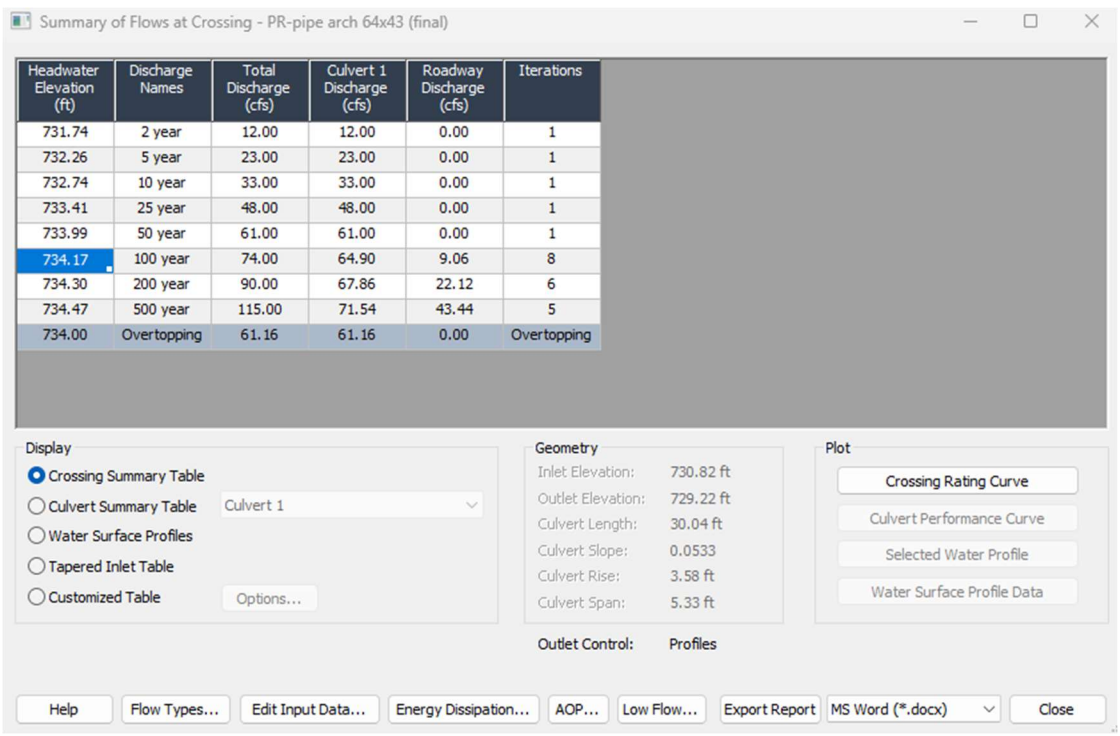
Existing Conditions – Culvert 2 Water Surface Summary Table



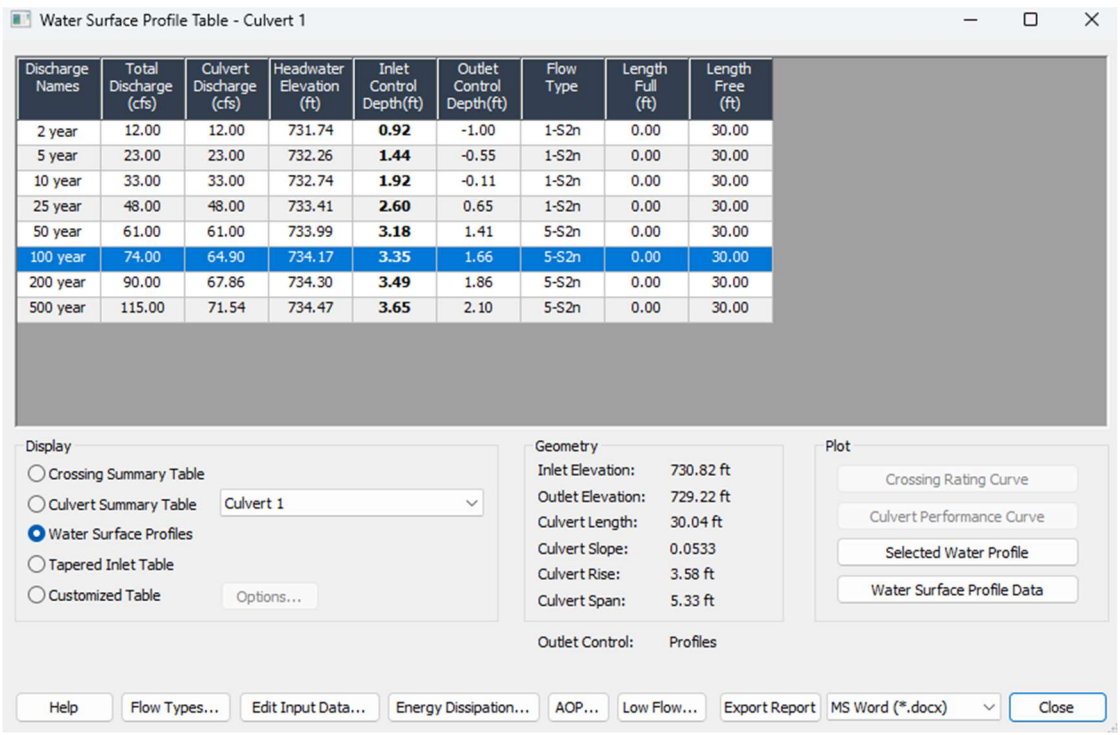
Proposed Conditions – Pipe Arch (64”x43”) HY-8 Model Inputs



Proposed Conditions – Crossing Rating Curve



Proposed Conditions – Crossing Summary Table



Proposed Conditions –Water Surface Summary Table

Vermont Division for Historic Preservation
Project Review Form

This form is to be used for both the Preliminary and Final Project Review for clean water projects funded by the Department of Environmental Conservation (DEC) Clean Water Initiative Program (CWIP). See applicable sections below.

Preliminary Project Review Section

To start the VDHP review process for CWIP-funded Clean Water Projects, please complete this form and submit it to the Vermont Division for Historic Preservation (VDHP) at ACCD.projectreview@vermont.gov with the information requested below. This Preliminary Project Review form, once completed and signed by VDHP, should be submitted as a project deliverable.

This is for non-exempt CWIP project types or conditionally exempt that have failed to meet the project qualifications. Exempt project types should NOT submit this form. Please refer to the CWIP Funding Policy for a listing of exempt and conditionally exempt project types. The CWIP Funding Policy can be found here: https://dec.vermont.gov/water-investment/cwi/grants#policy

For questions on architectural resources, archaeology, and below-ground resources, please contact Scott Dillon at (802) 272-7358 or scott.dillon@vermont.gov.

1. **Contact information**:
    a. Contact name: Allaire Diamond
    b. Email address: allaire@vlt.org
    c. Phone number: 802-879-6672
2. **WPD Project Title**: Roland Stream Crossing and Floodplain Restoration
3. **WPD – ID**: 11819
4. **Project site map**: Please attach a project site map. An annotated Google map or ANR Atlas map will suffice but professional design plans are also welcome. An example image is provided below. Site map should outline:
    a. Project Area of Potential Effects[1] with clearly marked GPS coordinates for project boundaries.

[1] The project APE or "area of potential effects" means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The

b. Proposed ground disturbance locations. Note that stream bank regrading is considered ground disturbance.

5. **Project information**:
   a. Select CWIP project type from drop down (if not listed, it's categorically exempt)
      i. Floodplain/Stream Restoration - Final Engineering Design
   a. Please provide a short description of the project's proposed scope of work (CWIP Preliminary Design Report is acceptable instead)

      A headwater stream in the Snipe Island Brook-Winooski River watershed flows through a failing and undersized crossing structure on a private road on the conserved Roland property, causing upstream sedimentation and downstream incision before the stream
   b. Are there other Agencies or funding partners involved?: Yes ◯ No ◯
      i. **If yes**, who? DEC funding administered by Mount Ascutney Regional Commission
   c. Does the project involves ground disturbance?: Yes ◯ No ◯
      i. **If yes,** please describe type and extent of ground disturbance. Specifically,
         1. Whether disturbance will be performed by hand or heavy machinery,
         2. The estimated total acreage and maximum depth of disturbance, and

APE is influenced by the scale and nature of an undertaking and may be different from different kinds of effects caused by the undertaking [36 C.F.R. § 800.16(d)]. When determining a project's APE remember to consider/include extent of restoration footprint; new, upgraded or existing access or haul roads; staging, storage, and stockpile areas; disposal sites or waste areas; borrow areas and other source locations for fill material; and areas impacted by drainage diversions or mechanical tree clearing and similar landscape alterations.

3. The history of prior naturally-caused or man-made ground disturbance to the site (if known):

The project will involve replacing two undersized, plastic (not historic) culverts under the property's driveway with one appropriately sized crossing structure, and associated floodplain/stream restoration immediately upstream and downstream. The project also involves preliminary data and conceptual design for an earthen dam removal along the property's southeastern boundary. The history of this dam is unknown but it appears to have

d. Will the project cause direct or indirect impact or disturbance to any man-made building or structure more than 50 years old (including dams, culverts, and bridges) or to any federally listed historic building or structure?

Yes ◯ No ◯ Unknown ◯

i. **If yes or unknown**, provide any known details on the buildings or structure(s) location/condition and extent of proposed impact or disturbance. Please include whether the structure is listed in the National Register of Historic Places if known:

The earthen dam is more than 50 years old. It is not known (not likely) whether this is listed in the National Register of Historic Places.

e. Is the project APE located within, intersect with, or adjacent to a state- or federally listed historic district, Designated Downtown or Village Center?

Yes ◯ No ◯ Unknown ◯

Email this form and supporting materials to ACCD.ProjectReview@vermont.gov
Please copy scott.dillon@vermont.gov

TO BE COMPLETED BY VDHP:

◯ Historic Properties/Sites Affected

☐ Potential for Architectural Historic Properties to be affected – A Qualified Architectural Historian or Historian Consultant* is required (**please see* pre-approved list of consultants)

☐ Determination of Eligibility required

Comments:

☐ Potential for Archaeological Historic Properties to be affected – a Qualified Archaeological Consultant* is required (**please see* pre-approved list of consultants)

☐ Archaeological Resource Assessment (ARA) required

☐ Phase 1 archaeological investigation required

Comments:

◯ No Historic Properties/Sites Affected/No Effect

☐ No Historic Resource Present in Area of Potential Effect

☐ Work will have No Effect on Historic Resource

Comments:

Vermont State Historic Preservation Office Concurrence and Date:

X: _____

Final Project Review Section

To complete Final Project Review, re-submit this VDHP Project Review Form with the following additional elements included. Note that this should be added to the VDHP-signed version of the Preliminary Review Form so VDHP can reference their prior guidance on this project. This Final Project Review Form, once completed and signed by VDHP, should be submitted as a CWIP project deliverable.

1. Please provide a short description of any changes to the project's proposed scope of work since the Preliminary Project Review:

2. Please attach:
    a. Final (100%) Design Plans
    b. Project narrative description of scope of work (CWIP Final Design Report will suffice)
    c. Any historical resource assessments, or determination of eligibility forms
    d. Any archaeological resource assessments, other archaeological reports, or end-of-field documents
    e. Any Treatment Plans

Email this form and supporting materials to ACCD.ProjectReview@vermont.gov
Please copy scott.dillon@vermont.gov

TO BE COMPLETED BY VDHP:

◯ No Historic Properties/Sites Affected/No Effect
- ☐ No Historic Resource Present in Area of Potential Effect
- ☐ Work will have No Effect on Historic Resource

Comments:

◯ No Adverse Effect

◯ Adverse Effect
- ☐ Project Treatment Plan or other agreement documents executed

Other:

Vermont State Historic Preservation Office Concurrence and Date:

X: _____