



TOWN OF WINHALL
VERMONT

115 Vermont Route 30
Bondville, VT 05340
Tel: 802-297-2119
townadmin@winhall.org
www.winhall.org

Request for Proposals ~ Culvert Project

March 27, 2024

The Town of Winhall is seeking proposals for the design and installation of a culvert to replace an existing culvert located on South Road within the Town of Winhall, Vermont.

South Road Culvert #14 Replacement:

- ◆ Location coordinates: 43.204405 -72.877058 (2.4 miles south of VT Route 11)
- ◆ Design and construct a replacement structure (plans must be engineered and stamped).
- ◆ Must meet applicable regulations and hydraulic standards (see attached Hydraulic Study issued by the Vermont Agency of Transportation Structures and Hydraulics Section dated 03/21/2024).
- ◆ State permitting will be the responsibility of the contractor in conjunction with the Town of Winhall.
- ◆ Pre-bid meeting attendance will be required.
- ◆ Mandatory Pre-Bid Meeting will be held on-site on **Monday, April 29, 2024 at 10:00AM.**

Responses to this Request for Proposals should consist of:

- 1) A letter expressing interest in working with the Town of Winhall on this project.
- 2) A description of the approach to be taken to carry out the proposal (specific to above-mentioned list).
- 3) Documentation of relevant experience, qualifications, and licenses.
- 4) Proposed fee structure, including total project cost.
- 5) Timeline, benchmarks, and anticipated completion date.
- 6) Traffic Control Plan(s) and Signage Plan(s).

Period of Performance

Multiple contracts may be awarded for work associated with this RFP. Work shall commence upon the date that said contract(s) have been fully executed. Work shall be completed by October 1, 2024.

Submissions

Proposals from interested parties must be received by the Winhall Town Administrator no later than 1:00PM on **Monday, May 13, 2024**. Submissions must be emailed to: townadmin@winhall.org. Proposals will be evaluated based upon the contractor's experience, background, and ability to perform the requested services at an affordable price. Cost will not be the sole determining factor in the award of this contract. The Town of Winhall reserves the right to reject any proposal that does not meet the criteria specified in this RFP, is received after the deadline, or is not complete. The Town of Winhall reserves the right to reject any and all proposals if adequate funding is not available. The Town of Winhall also reserves the right to seek clarification from any contractor that submits a proposal.

Submit all submissions and direct all inquiries to: Lissa Stark, Town Administrator
Town of Winhall
115 Vermont Route 30
Bondville, VT 05340
Telephone: (802) 297-2119
E-Mail: townadmin@winhall.org
Website: www.winhall.org

State of Vermont
Structures and Hydraulics Section
Barre City Place
219 North Main Street | Barre, VT 05641
vtrans.vermont.gov

[phone] 802-371-7326
[fax] 802-828-3566
[ttd] 800-253-0191

Agency of Transportation

TO: Patrick Wilson, District 1 Project Manager
Greg Krizan, District 1 Technician

CC: Josh Carvajal, ANR River Management Engineer

FROM: Keith Friedland, Hydraulics Technician

DATE: March 21, 2024

SUBJECT: Winhall, TH-2, South Road, over Cook Brook
Site location: C14, 2.4 miles south of VT-11
Coordinates: [43.204405, -72.877058](#)

We have completed our hydraulic study for the above referenced site and offer the following for your use. The structure size recommended is large enough that when a survey of the site becomes available, a more detailed model should be developed for this structure. The town should retain engineering services to design and prepare engineering bridge plans, the plans should be retained by the town and a copy should be furnished to VTrans bridge inspection team.

Hydrology

The following physical characteristics are descriptive of this drainage basin:

Drainage Area	3.07 square miles
Land Cover	Forest with rural residential areas
Water Bodies and Wetlands (NLCD 2006)	0.15 %
Mean Annual Precipitation	54.6 inches

Using the USGS hydrologic method, the following design flow rates were selected:

Annual Exceedance Probability (AEP)	Flow Rate in Cubic Feet per Second (cfs)
50 % (Q2)	200
10 % (Q10)	430
4 % (Q25)	590 Design Flow – Local Road
2 % (Q50)	720
1 % (Q100)	870 Check Flow

Channel Morphology

The channel for this perennial stream is straight to sinuous with an estimated local channel slope of 1.4%. Field measurements of bankfull width varied from 19 to 21 feet upstream and downstream of the structure.

Existing Conditions

The existing structure is a pipe arch with a span of 12 feet and a height of 6 feet, providing an approximate waterway opening of 56.6 square feet. The structure invert is heavily rusted and damaged with some sections “peeled up”. Our calculations, field observations and measurements indicate the existing structure does not meet current standards of the VTrans Hydraulic Manual nor does the existing structure meet state stream equilibrium standards for bankfull width (span length). The existing structure constricts the channel width, resulting in an increased potential for debris blockage. This complication is known to cause ponding at the inlet, increase stream velocity and scour at the outlet, and may lead to erosion and failure of channel banks.

This structure results in a headwater depth of approximately 9.2 feet at 4% AEP, with water overtopping the roadway before the 2% AEP.

Replacement Recommendations

In sizing a new structure, we attempt to select structures that meet both the current VTrans hydraulic standards, state environmental standards with regard to span length and opening height, and consider roadway grade and other site constraints.

Based on the above considerations and the information available, we recommend any of the following structures as a replacement at this site:

- An open bottom rigid frame or bridge with a clear span of 20 feet and clear height of 7 feet, providing 140 square feet of waterway area. This structure results in a headwater depth of 5.2 feet at the 4% AEP and 6.8 feet at the 1% AEP.
- A concrete box with an inside opening span of 20 feet and minimum height of 9 feet. The box invert should be buried 2 feet. This will result in a clear height of 7 feet above streambed, providing 140 square feet of waterway area. Bed retention sills should be added in the bottom of the structure. Sills should be 12 inches high at the edges of the box and 6 inches high in the center, creating a V-shape across the full width of the box. Sills should be spaced no more than 8 feet apart throughout the structure with one sill placed at both the inlet and the outlet. The structure should be filled level to the streambed with E-Stone, Type II, allowing flow to be kept above the surface, providing the conditions necessary for aquatic organism passage. This structure results in a headwater depth of 5.2 feet at 4% AEP and 6.8 feet at 1% AEP.
- Any similar structure that fits the site conditions could be considered.

Please note that for open bottom structures the VTrans Hydraulics Manual requires a minimum of 1-foot of freeboard at the design AEP. If an open bottom structure is installed, the bottom of abutment footings shall be at least 6 feet below the channel bottom, or to ledge, to prevent undermining. Abutments on piles should be designed to be free standing for a scour depth at least 6 feet below channel bottom.

To match the approximate local stream slope, the structures recommended above have been modeled with a culvert slope of 1.4%. **The local stream slope should be verified prior to installation of the new culvert.**

Stone Fill, Type III or E-Stone, Type II 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.

Prior to any action toward the implementation of any recommendations received from VTrans, structure size must be confirmed, and may be modified, by the VT ANR River Management Engineer to ensure compliance with state environmental standards for stream crossing structures. This structure is within the mapped FEMA Zone A

flood insurance study floodplain. If the size is modified an engineering evaluation should be done.

General Comments

It is always desirable for a new structure to have flared wingwalls, matched into the channel banks at the inlet and outlet, to smoothly transition flow and protect the structure and roadway approaches from erosion. It is also recommended that full height concrete headwalls be constructed at the inlet and outlet.

Any closed bottom structure should also be equipped with cutoff walls, extending to a depth equal to the culvert rise, up to 4 feet, or to ledge, to serve as undermining prevention. E-Stone thickness plus the bottom of structure thickness should be included when determining the total cutoff wall depth.

Any new structure should be properly aligned with the channel, span the natural channel width, and be constructed on a grade that matches the channel.

Please note 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 replacement of this structure must comply with state regulatory standards, and should take into consideration matching natural channel conditions, roadway grade, environmental concerns, safety, and other requirements.

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