

Allen Brook Watershed Large Culvert Assessment and Replacement Prioritization Study



Services / Expertise

Watershed Planning
Stormwater Project Scoping
Preliminary/Conceptual Design
Cost Estimation
Project Coordination
Municipal Roads General Permit

Markets

Municipalities
Regional Planning Commissions
Watershed Organizations

Project Location

Williston, Vermont

Date Completed

2018-present

Project Owner

Chittenden County Regional Planning Commission

Project ID#

17-061-D

Project Manager

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Project Team

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Stone documented site conditions at each culvert. Photo shows culverts at Talcott Road looking downstream.

STONE worked with CCRPC and the Town of Williston to assess the condition of four large culverts (greater than five feet in diameter) in the Allen Brook watershed, prioritize their replacement, and develop conceptual designs and costs, such that the Town could proactively plan for replacement in their Capital Improvement Plan.

We completed a desktop review including drainage area delineation, geomorphic context, expected bankfull width and depth, and environmental resources (T&E species, floodplain, wetlands, depth of fill over culvert, fish habitat, etc.). A field assessment performed in accordance with ANR's Bridge and Culvert Assessment Manual (Vermont Stream Geomorphic Assessment Protocols, 2009) followed the desktop review. As part of the topographic survey and assessment, Stone documented site conditions at each culvert and collected data related to structural condition, alignment, scour, perching, ponding, accumulated debris, aquatic organism passage (AOP), bankfull width, and geomorphic conditions.

For each of the four sites, Stone modeled peak flows for a range of design storm events using methods outlined in the 2015 edition of the VTtrans Hydraulics Manual. The hydraulic and hydrologic modeling results were used to identify and size culvert replacement options to match or exceed DEC's recommended geomorphic capability standards, accommodate AOP, mitigate flooding, and produce acceptable water surface elevations for select design storm events. We summarized replacement options, conceptual costs, and anticipated service life for each proposed solution, including traditional concrete bridges, concrete box culverts, aluminum box culverts, aluminum/steel structural plate arches, steel stringer bridges, and other feasible alternatives. In addition, Stone confirmed potential permit requirements with ANR and District 4 Act 250 officials, reviewed replacement options with local, State, and Federal Agencies, and summarized permit requirements. Stone provided 30% designs

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and cost estimates and developed a replacement prioritization with consideration for structural condition, potential remaining service life, frequency of previous repairs, potential for clogging and/or collection of debris, cost of repair/replacement, environmental impacts, and water quality benefits.