

Morehouse Brook Flow Restoration Planning, Stormwater Scoping, Design, and Construction Oversight



Services / Expertise

Best Management Practice Implementation
TMDL Compliance and Modeling
Municipal System Improvements
Stormwater Retrofit Identification & Design
Stormwater System Management
Water Quality and Watershed Planning
MS4 Permit Compliance
Construction Oversight

Markets

Local and Regional Government

Project Location

Winooski, Vermont

Date Completed

2014-2019

Project Owners

Chittenden County Regional Planning
Commission
City of Winooski

Project ID#

13-239

Project Managers

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Project Team

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Map detailing the Morehouse Brook watershed.

MOREHOUSE Brook has been designated impaired by the Vermont Agency of Natural Resources (ANR) due to uncontrolled stormwater runoff. The TMDL for Morehouse Brook requires a 15% increase in stream flows at the mouth of the Brook during low flow conditions, and the high flow target requires a 54% reduction in flows at the mouth during the one-year storm event. The TMDL assumed that up to 10 acres of non-jurisdictional impervious surface will be created in the brook's watershed during the next 10-15 years and included an 11.3% reduction in peak flows to account for this future growth. Stone worked with an engineering partner for the City of Winooski to evaluate recent changes in land use, demonstrating that the impervious growth rate in the watershed was much lower than projected in the TMDL – an increase of 0.15% per year, or approximately 0.7 acres of new sub-jurisdictional impervious cover between 2010 and 2025. Stone assisted the city in evaluating the BMP DSS baseline and credit models for Morehouse Brook. A suite of potential BMPs and retrofit projects were identified for flow restoration scenario planning, including:

- Two stormwater infiltration basins in Landry Park;
- Infiltrating bioretention practices in the neighborhoods along and to the west of North Street (e.g., Dufresne Drive, Brisson Court, Cedar Street);
- A retrofit of the existing detention pond serving the Pine Grove neighborhood; and

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- A new bioretention area to the west of Brisson Court.

Sketch plans were developed for each retrofit project and presented to the Winooski and Colchester MS4s. Infiltration basins in Landry Park and infiltrating practices along Brisson Court and southern Cedar Street were prioritized for implementation, as they could be completed wholly within land already owned by the City and, as modeled, were sufficient to meet the high-flow target. A 30% engineering design and planning level cost estimate was prepared for the infiltration basins, while a spreadsheet cost calculator was used to estimate the cost of the GSI practices and the Pine Grove Terrace pond retrofit. The Morehouse Brook Flow Restoration Plan was accepted by Vermont DEC in 2017.

In 2018, Stone worked with the CCRPC and the City of Winooski to develop a concept (30%) design for stormwater improvements to address runoff from public highways and directly connected residential impervious surfaces in the Pine Grove Terrace development. The concept design maximized water quality and peak flow control benefits, including control of the 1-year storm from an approximately 30-acre drainage area, of which 5.2 acres is impervious cover. The conceptual design was advanced and adjusted from the Morehouse FRP sketch plan to include infiltrating bioretention bump-outs in the right-of-way, enhanced detention/retention capacity in the existing extended detention pond, and redesign of the pond outlet structure and outfall pipe. Together, the improvements were targeted to address both the high flow target established in the Morehouse Brook FRP and Phosphorus Control Plan (PCP) requirements included in the Municipal Separate Storm Sewer System (MS4) General Permit issued in 2018.

After completing the 30% design, Stone worked with the City and CCRPC to develop grant applications for final design and construction, determine VTDEC's Ecosystem Restoration Grant eligibility, and ultimately, to secure a Design/Implementation Block Grant in late 2018. In January of 2019, Stone began to provide final design and construction oversight on an accelerated project schedule. We completed an additional topographic survey, coordinated soil investigations, and finalized design and estimates of probable construction cost by the end of June 2019. Stone assisted the City with requesting and reviewing bids and with construction contractor selection. Construction commenced in August 2019 and was complete in October, meeting the VTDEC Design-Implementation Block Grant requirements. During that time, Stone oversaw construction, coordinated compaction testing, provided important input and communication to the project team, and provided project close-out documentation, ensuring a high-quality and easily maintainable project.



Curb extension bioretention feature on Pine Grove Terrace, after construction and prior to planting.