

Step Pool Storm Conveyance System Design and Construction in Enosburg Falls, Vermont



Services / Expertise

Stormwater Management
Retrofit Planning and Design
Hydrogeologic Evaluation
Engineering Services

Markets

Local Government
Watershed Organizations

Project Location

Enosburg Falls, Vermont

Date Completed

October 2013

Project Owner

Friends of Northern Lake Champlain

Project ID#

12-145



Photo of the step pool stormwater conveyance system, following construction and a rain event.

STONE developed comprehensive stormwater management plans (SWMPs) for eight communities in Franklin County, including the Village of Enosburg Falls, while working for the Friends of Northern Lake Champlain (FNLC). Each SWMP identified a suite of high priority stormwater management projects, including a stormwater outfall near the Enosburg Village Garage. The outfall drains approximately 11 acres of largely impervious residential area in the downtown. Improvements to the channel below the outfall had been made in the 1990s as part of a sewer separation project, but heavy sediment loads, and a lack of proper maintenance had led to clogging of the stone-lined channel. Recently, flows had begun to leave the banks of the existing stone-lined channel, causing significant erosion and damage to a walking trail.

FNLC hired Stone to design and oversee the construction of a retrofit practice to replace the failing channel with funding from a Vermont Ecosystem Restoration Program grant. A step pool stormwater conveyance (SPSC) system was identified as the preferred approach to address the existing erosion problem and to provide additional water quality benefits. The SPSC system is designed to safely convey peak stormwater flows while attenuating and treating for quality.

The system utilizes a series of constructed shallow pools, riffle grade control structures native vegetation, and an underlying filter bed composed of a sand/woodchip mix to convert surface storm flow to shallow groundwater flow. The project helped to reach water quality goals by reducing the amount of nitrogen, phosphorus, and sediment entering the nearby Missisquoi River.

Stone's work involved performing hydrologic analysis of the drainage area, designing the step pool system including the sizing of pools and riffles, developing construction drawings, and overseeing construction. The stormwater modeling software HydroCAD was used to estimate discharge intensities for sizing purposes.