

MARSTON-FINN CONSERVATION DAM

WINDHAM, NEW HAMPSHIRE

American Council of Engineering Companies
New Hampshire Section
2021 Engineering Excellence Awards
Entry Category: Water Resources



PROJECT FOCUS:

A unique and challenging engineering solution to address dam operational and functional deficiencies, site and environmental constraints, and environmental degradation, with a sustainable, environmentally sensitive, and economically competitive design.



Previous dam: Deficiencies and non-responsive actions to NH DES notices of deficiencies led to the draining of the impoundment area. Waterfowl lost their feeding grounds, silt washed downstream, fish and turtles were gone, a beautiful New Hampshire pond was lost.



New dam: A decade since it was drained and the new dam constructed, Moeckel Pond has been restored to the wildlife-haven that it once was and will provide the community and residents with recreation and natural beauty for years to come.



Newly constructed Marston-Finn Dam labyrinth weir spillway

UNIQUE AND INNOVATIVE

Due to area constraints and the client's desire to maintain the historic water surface elevation, the Project Team was tasked with developing a solution to increase the spillway capacity without increasing the dam footprint, lowering the impoundment or increasing the downstream flood flows. Marston-Finn Conservation Dam is unique in that it is only the third labyrinth weir spillway and the largest to be built in the state of New Hampshire.

ENHANCING PUBLIC AWARENESS

The new Marston-Finn Dam serves as an example to future dam engineering projects as a reliable method to increase spillway capacity where area constraints exist. The aesthetically pleasing finished dam has restored the greatly missed pond that had been drained for a decade to the delight of the client and the surrounding community.

ECONOMIC, ENVIRONMENTAL, AND SUSTAINABLE SOLUTION

This design met the NHDES Dam Bureau regulations while limiting impacts to the surrounding conservation land, wetland areas, downstream areas and the historic elements of the previous dam. Labyrinth weir spillways are generally much better than conventional spillways in self-cleaning and improving debris handling and are therefore more sustainable. They are economical solutions for increasing spillway capacity, since they provide increased discharge over conventional weirs for a given head.

COMPLEXITY

Through the use of a discharge formula by Crookston and Tullis, which was developed from model trials in research laboratories, the design team developed a unique solution consisting of a 5.5-cycle labyrinth weir with a length of 80 feet but with an effective length of 167 feet.

SUCCESS

"Wanted to take an opportunity to express our thanks and appreciation for the dam you designed for us. The dramatic changes in flow over our dam demanded an extraordinary solution to meet the State of New Hampshire Dam Bureau requirements. We have our pond back without the fear of flooding or drought as the town of Windham continues to grow and develop." Source: Letter from Norm Young, Treasurer, Friends of Moeckel Pond, to Milone & MacBroom, now part of SLR

Designed by: Milone & MacBroom, Inc. (Prime), now part of **SLR**
and The H.L. Turner Group Inc. (Subconsultant)

Contractor: George R. Cairns & Sons, Inc.

