



Country Pond Watershed Based Plan

Conceptual Design Report

DRAFT: August 4, 2020

Prepared by: Horsley Witten Group, Inc.



Introduction

This report presents stormwater management conceptual designs for five sites within the Country Pond Watershed. These sites and the proposed site improvements were selected through a process of desktop analyses, field reconnaissance, and stakeholder consultation. Stakeholders include the Rockingham Planning Commission, Country Pond Lake Association, and New Hampshire Department of Environmental Services.

In October 2019, the design team from Horsley Witten Group (HW) and University of New Hampshire Stormwater Center (UNHSC) visited sites that had been identified as opportunities for structural best management practices (BMPs). Those sites included public parcels with higher potential phosphorus loads, private parcels with interested owners, and locations with known erosion issues. After the project team observed site conditions and evaluated BMP opportunities, stakeholders selected five priority sites to advance to conceptual design. These sites are shown in Figure 1.

The conceptual designs presented herein represent planning-level recommendations for stormwater management improvements at each site, along with planning-level estimates of costs¹ and potential phosphorus load reduction². The overall goal of proposed improvements is to reduce phosphorus loading into Country Pond. These designs seek to accomplish phosphorus reduction by reducing erosion and by treating stormwater runoff using structural BMPs. Secondly, these designs aim to maintain existing site uses, preserve and enhance ecological resources, minimize long-term maintenance requirements, and educate the public about water quality and stormwater management.

Figure 1. Locations of Proposed Stormwater Management Improvements



¹ Except as noted below, costs were estimated using EPA Region 1 (2016) *Methodology for Developing Cost Estimates for Opti-Tool*, escalated to 2020 dollars and doubled to account for site complexity and scale.

² Phosphorus reduction was estimated using NH MS4 Permit Appendix F and EPA Region 5 Erosion Control Model.

Newton Boat Ramp

Existing Site Description:

- The boat ramp is located near 36 Country Pond Rd, on a narrow Town right-of-way (ROW) between two private parcels – vacant/beach property to the northeast and Camp Tasker to the southwest.
- Runoff from Country Pond Rd collects in a depression to the southwest of the ramp entrance, just downhill from the Camp Tasker driveway, and flows down the ramp.
- The ramp is eroding along both edges and down the approximate center.
- Soils at the site are categorized as hydrologic soil group (HSG) A³.

Proposed Improvements:

- At the boat ramp entrance, install a concrete dip pitched from east to west to direct road runoff toward the ramp's western edge. Ensure concrete dip is accessible for truck and trailer traffic.
- Enhance existing depression where water currently ponds. Consider installing a permeable paver, such as "Drivable Grass" Plantable Concrete System® by Soil Retention.
- Install Soak up the Rain educational signage.
- Construct a swale along the western edge of ramp. Swale should include periodic check dams, using reclaimed rocks and filter fabric. Consider terracing if space allows. Plant with low maintenance plants, such as Common Rush (*Juncus effuses*), Blueflag Iris (*Iris versicolor*), and Northern Sea Oats (*Chasmanthium latifolium*). Alternatively, install 6-inch depth of open-graded crushed stone underlain with filter fabric.
- Transition swale to meet level spreader and stone apron for energy dissipation.
- Plant dense groundcover vegetation from swale termination to meet shoreline. Potential plants to consider may include: *Juncus effuses*, *Iris versicolor*, *Dryopteris marginalis*, and *Carex stricta*.
- Resurface and regrade the ramp to super-elevate and pitch towards the western edge of ramp. Refer to UNHSC gravel specifications for ramp resurfacing.
- Install concrete paver system such as Drivable Grass® on lower portion of ramp to shoreline.
- Coordinate limits of disturbance and wetland resource protection with local permit authorities for approval.



Photo 1: View up the boat ramp with erosion along edges and down the approximate centerline.



Photo 2: View at boat ramp entrance where runoff ponds along the southwestern edge of pavement.

³ Natural Resources Conservation Service Web Soil Survey <https://websoilsurvey.nrcs.usda.gov>

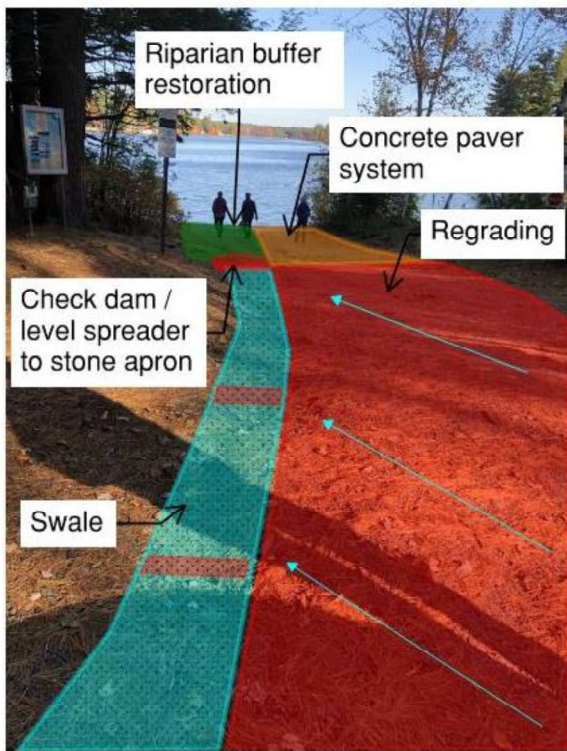
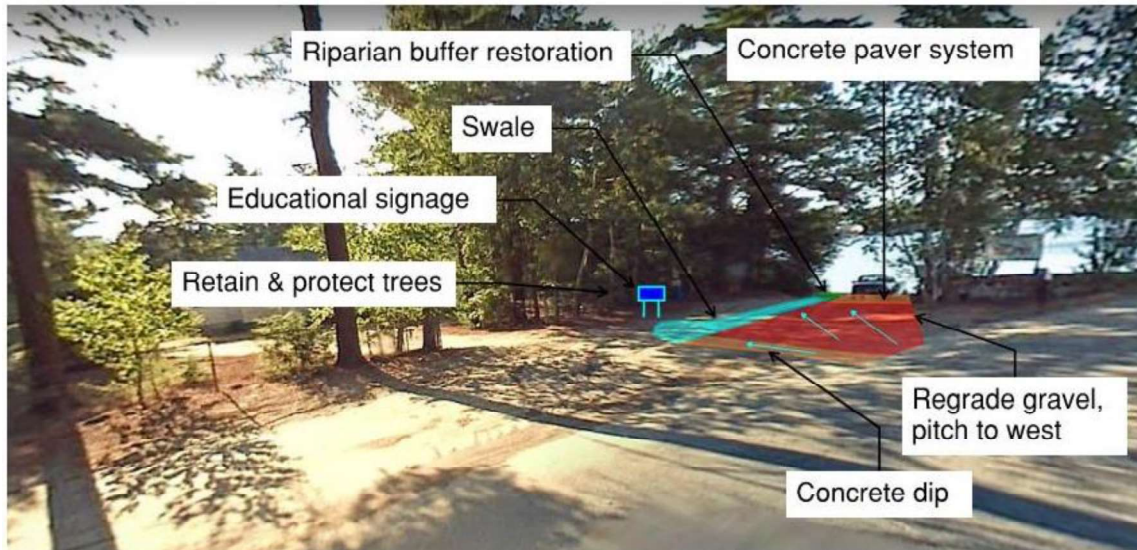
Phosphorus Load Reduction: 1.8 lbs/year

Costs⁴: Capital costs (design, permitting, and construction): \$17,000-\$25,000

Annual operation and maintenance costs: \$2,000

20-year life cycle cost: \$61,000

Figure 2. Newton Boat Ramp Proposed Improvements



⁴ Capital costs for Boat Ramp were estimated based on similar past projects and professional judgement.