

# Woodbine Blue-way Drainage Improvements

A Summary of Proposed Improvements to Reclaim the Pathway



Presented by: Lee Hixon, Town Engineer

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## Woodbine Has a DRAINAGE Problem!

The runoff from the Maple Ridge housing development has left our community with walking paths covered with mud, slime, and stagnant water

A health hazard

A detriment to our real estate values

And a problem that keeps many of us from enjoying the amenities that led us to Woodbine in the first place.

Source: Woodbine HOA Flyer for tonight's meeting

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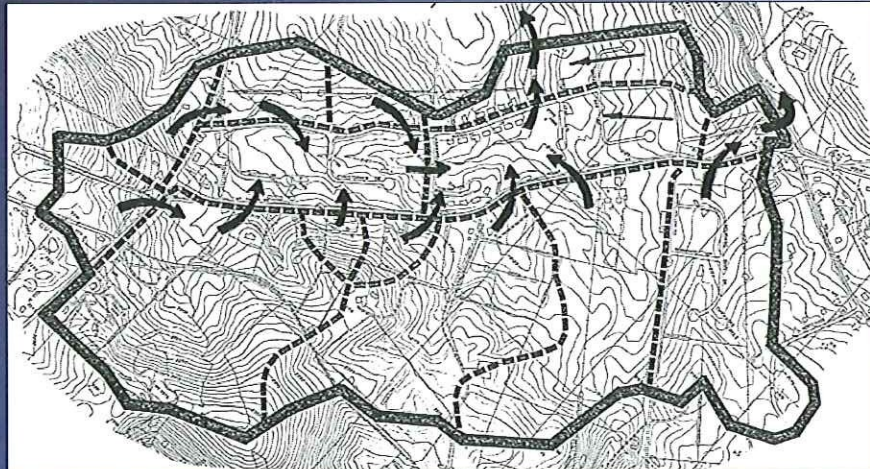
# Outline

- I. History & Current Conditions
  - A. Plans & Maps
  - B. 2008 Review & Implementation Plan
  - C. Maple Ridge Pond
- II. Proposed Improvements
  - A. Maple Ridge Pond Control Structure
  - B. Culvert crossings & Re-establish swales
- III. Moving Forward
  - A. Stakeholders
    - a. Cost Estimate

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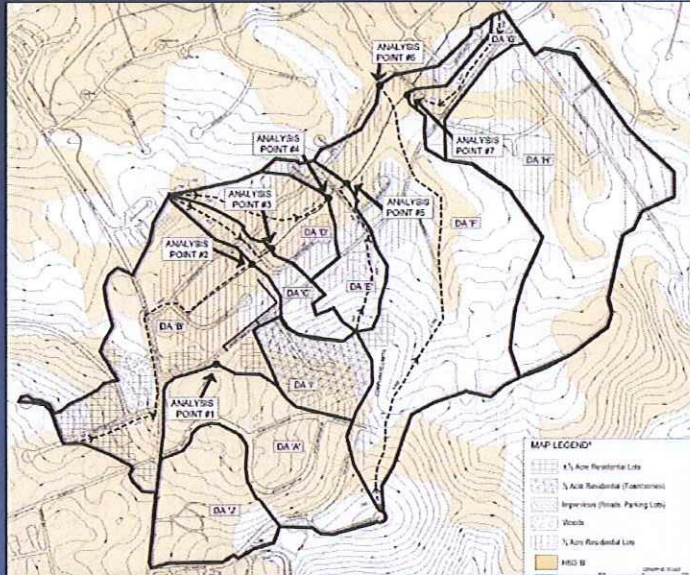
## Plans & Maps

# Drainage Area



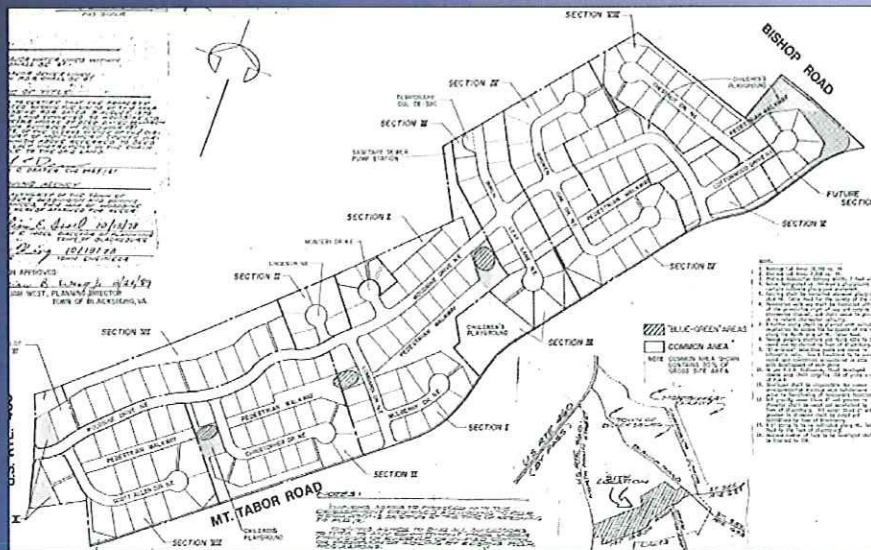
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# Drainage Area

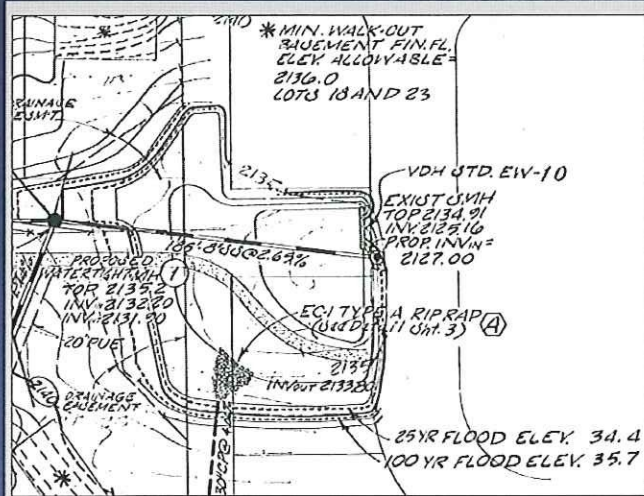


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# Drainage Planning



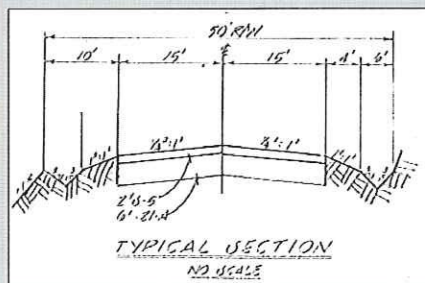
# Drainage Planning



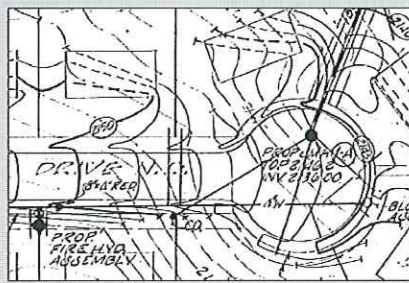
Site Grading, Drainage & Utility Plan,  
Woodbine, Section VII (1984)

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# Drainage Planning



Woodbine Dr., Woodbine -  
Section V & Phase V (1986)  
Chestnut, Cottonwood, Woodbine Dr.



Grading Plan -  
Section VII (1984)  
Scott Dr.

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## 2008 Implementation Plan

- Town effort to assist Woodbine with drainage issues
  - subdivision design
  - location within watershed (drainage swale)
  - increased volumes of runoff due to development
- Town assistance related to plan
  - identify issues
  - evaluate solutions
  - identify resources (grants, labor)
  - evaluation of upstream SWM & ESC implementation
  - engineering assistance
  - Improvements related to Town R/W (public works)

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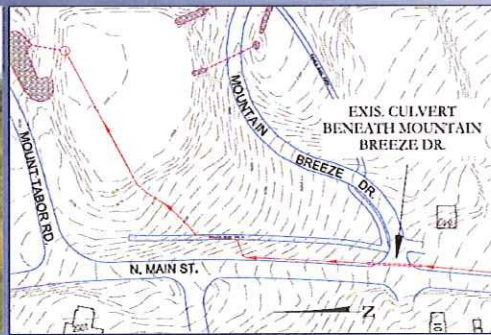
## 2008 Implementation Plan

- Issues & solutions identified:
  - Issue: Poor drainage at Scott Drive cul-de-sac
    - ✓ Solution: Re-establish swales between 2002 & 2000 Scott Dr. and add asphalt curb
  - Issue: Erosion & damage to asphalt path (flows cross path)
    - ✓ Phase I Solution: Outlet protection/velocity dissipation
    - ☐ Phase II Solution: raise/relocate path with install culverts and redefine sections of swale
  - Issue: Culvert discharging behind 2009 Christopher
    - ☐ Solution: Recommend min. grading to direct flows between houses
  - Issue: Concern that a large storm could overtop Mt. Tabor
    - ✓ Solution: Maintain channel, clean culvert; add curbing in Mt. Tabor
  - Channel adequacy between 2000 & 2002 Birchleaf Lane
    - ✓ Survey and plan review to verify adequacy for 10-yr storm



Plans & Maps

# Maple Ridge Pond



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Photo & Image courtesy Dan Phipps, VT Graduate Student

Plans & Maps

## Maple Ridge Pond

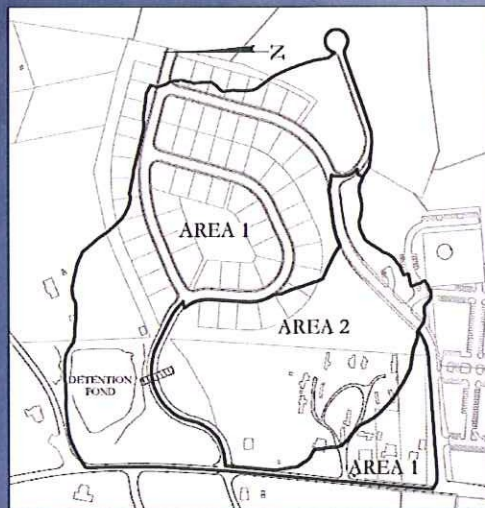


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Photos courtesy Dan Phipps, VT Graduate Student

Plans & Maps

## Maple Ridge Pond – Drainage Area



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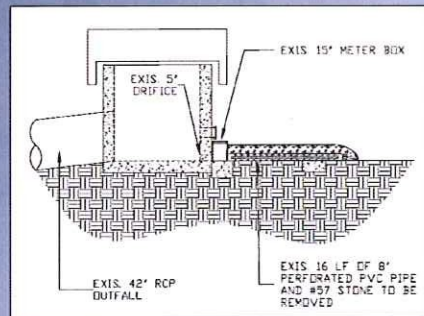
Image courtesy Dan Phipps, VT Graduate Student



Plans & Maps

## Maple Ridge Pond – Control Structure

- Base elevation – 2165'
- Top elevation – 2171.69'
- Primary orifice – 5" diameter at pond invert
- Secondary orifice – 72" diameter opening on top of riser with trash rack
- Emergency spillway elevation – 2172.65'



Slide courtesy Dan Phipps, VT Graduate Student

Proposed Improvements

## Maple Ridge Pond - Control Structure

- Control structure modifications
  - Reduce duration of out-flow to < 2 days
  - Will raise peaks slightly
- Water Quality regulations
  - Extended detention

	Pre-development	Current Condition	Proposed Condition
Storm	(cfs)	(cfs)	(cfs)
2-yr	28.4	1.2	0.89
10-yr	90.47	1.6	4.9
100-yr	163.57	25.4	20.2

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# Upslope SWM Facilities



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## Maple Ridge Pond - Control Structure



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Proposed Improvements

### *Flows in Asphalt Path*

- Per design: Pedestrian walkway weaves to cross asphalt pathway
  - Persistent issue for a number of years
  - Topsoil/sediment build-up over the years has made pathway lower than surrounding grade
    - Flows get into trail, stay in trail



Proposed Improvements

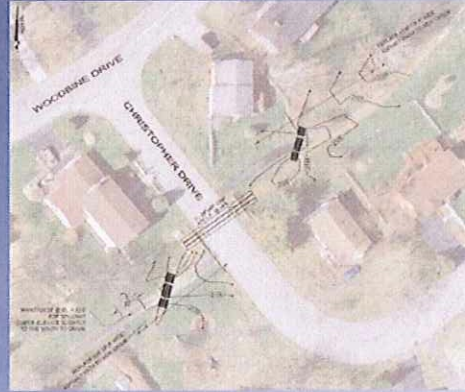
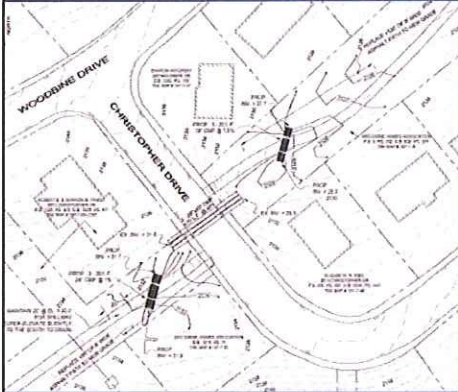
### *Flows in Asphalt Path*



Proposed Improvements

## Flows in Asphalt Path

... near Christopher Drive (drainage area = 81.4 & 88.4 acres)



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Proposed Improvements

## Flows in Asphalt Path

... near Lombardi Drive (drainage area = 98.6 & 107.7 acres)

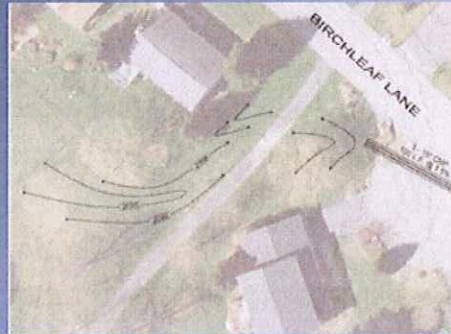
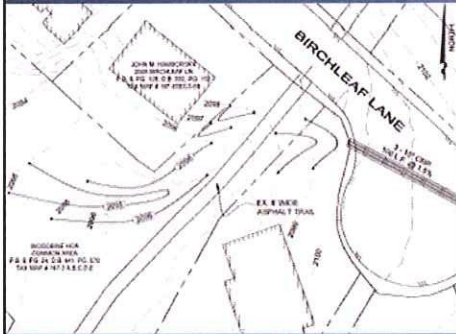


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Proposed Improvements

## Flows in Asphalt Path

... near Birchleaf Lane (drainage area = 55.5 acres)



\* Crossing at Woodbine Dr. drains  $\pm$  220 acres

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Moving Forward

## Stakeholders

- Woodbine
  - Homeowners Association
    - Neighborhood Matching Grant recipient
  - Woodbine & other residents
    - Participation in discussion/decisions
- Town of Blacksburg
  - Public Works
    - IP Plan and provides assistance throughout Woodbine on as needed basis.
  - Stormwater Taskforce
    - Reviewing & recommending more stringent/effective ESC & SWM regulations
  - Engineering Department
    - Providing engineering assistance



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## Implementation

- Agreeing on solution (Tonight's goal)
- Work needed:
  - Control structure modification
  - Pathway improvements at 5 locations
    - 3 locations: culvert crossings
    - 1 location: grading
    - 1 location: relocate path
- Cost of improvements
  - Engineering plans by Town (est. value = \$5,000 - \$7,000)
  - Control structure modification by Town
  - Remaining cost for pathway improvements ± \$20,000
    - Neighborhood matching grant = \$3,000 Town Funds
    - Neighborhood funds/labor match = \$3,000
    - Balance ± \$14,000 (Source TBD)

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## Woodbine Blue-way Drainage Improvements

### Questions?



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