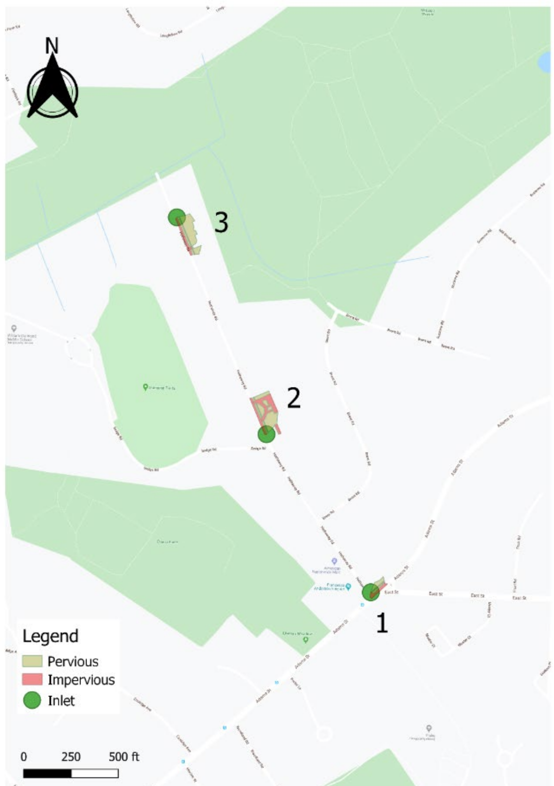
1 Project and Site Overview

After discussions with the Town of Lexington, the town expressed the need for small-scale BMP systems that could be built and maintained by the town in the road and right-of-way to improve stormwater management while keeping costs and maintenance low. The main area of interest is along Hathaway Road. There were three locations indicated for improvement that are shown below. The BMPs are numbered 1-3 from South to North. The inlet locations are existing catch basins. The approximate watersheds for surface runoff are indicated for each site, and the impervious cover is shown as in green (pervious) and red (impervious).



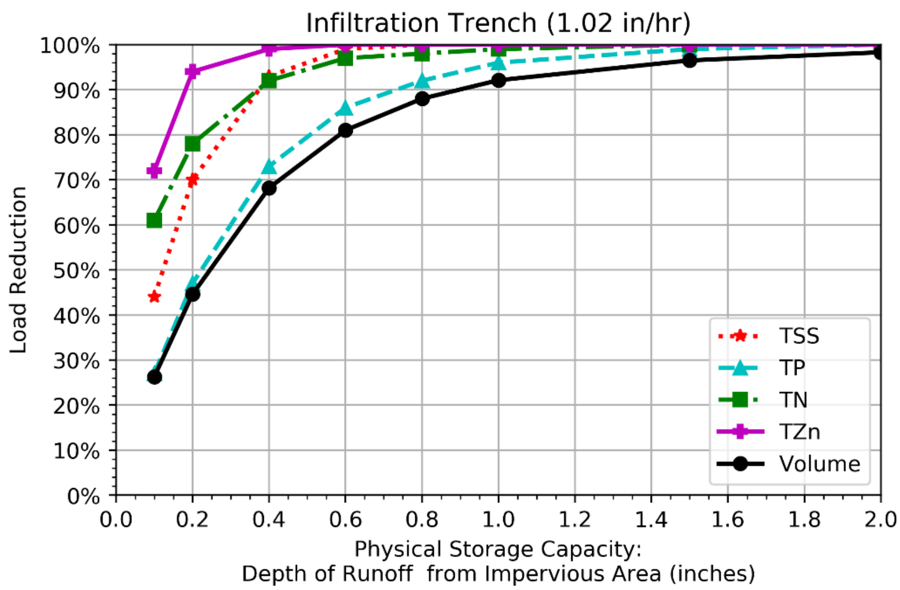
The following table shows the summary of each surface watershed to catch basins 1-3:

Watershed	Location	Pervious (sf)	Impervious (sf)	Total (sf)	% IC
1	South	2,153	2,228	4,381	51%
2	Middle	10,021	10,667	20,688	52%
3	North	10,678	3,627	14,305	25%

2 BMP Sizing

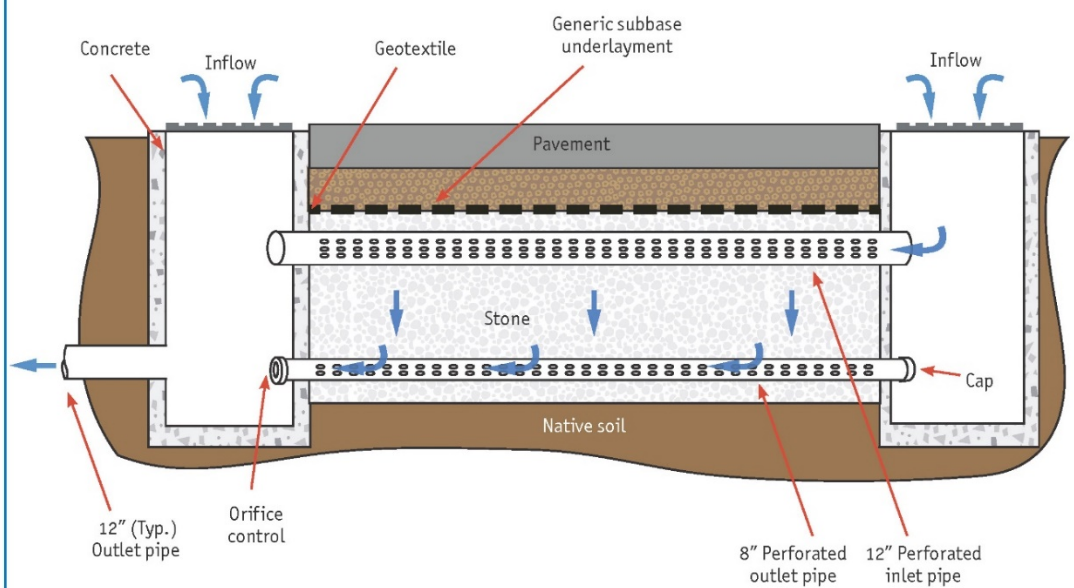
For this version 2 concept designs, only surface runoff is used to size the systems. To tie into existing storm lines to include additional runoff, these proposed designs could be made proportionally larger.

The proposed infiltration trench designs are shown with the optimized performance sized for 0.4 inches of precipitation on the impervious cover. The sizing of 0.4-inch provides the cost-optimized sizing. This size optimizes the removal efficiency vs cost of the system and would be the cost-optimized solution if applied wide-spread. An infiltration rate of 1.02 in/hr was assumed for this site without having performed any in-situ soil tests. The graph below shows the performance curve for an infiltration trench with an infiltration rate of 1.02 in/hr (BMP Performance Fact Sheets, UNH Stormwater Center, 2019).



3 Proposed Designs

Generic Infiltration Trench Design Detail



Notes

1. Similar to subsurface gravel filters, infiltration trenches tend to be linear and are best used in narrow sites.
2. The storage layer (stone shown here) can be comprised of natural or manufactured materials to hold the design storage volume (DSV).
3. Locate the bypass to drain through the outlet pipe to existing drainage. The elevation may vary to meet existing infrastructure inverts, and flow is controlled through orifices and weirs.
4. Hydraulic inlets should drain by gravity where possible.
5. Surface cover may vary—pavement, grass, soil, or any combination of these can be used to meet end user needs and site requirements.
6. Add cleanouts and/or inlet protection, such as a snout or the Eliminator, as needed.

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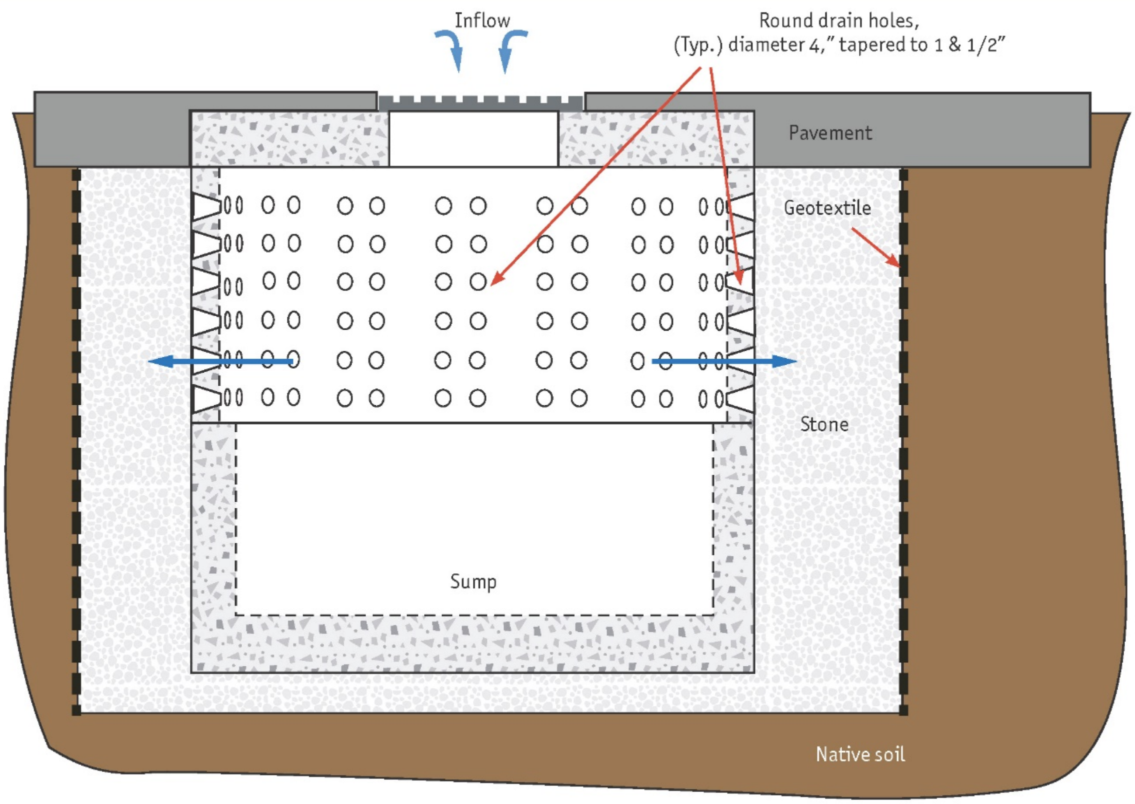
Generic Leaching Catch Basin Design Detail

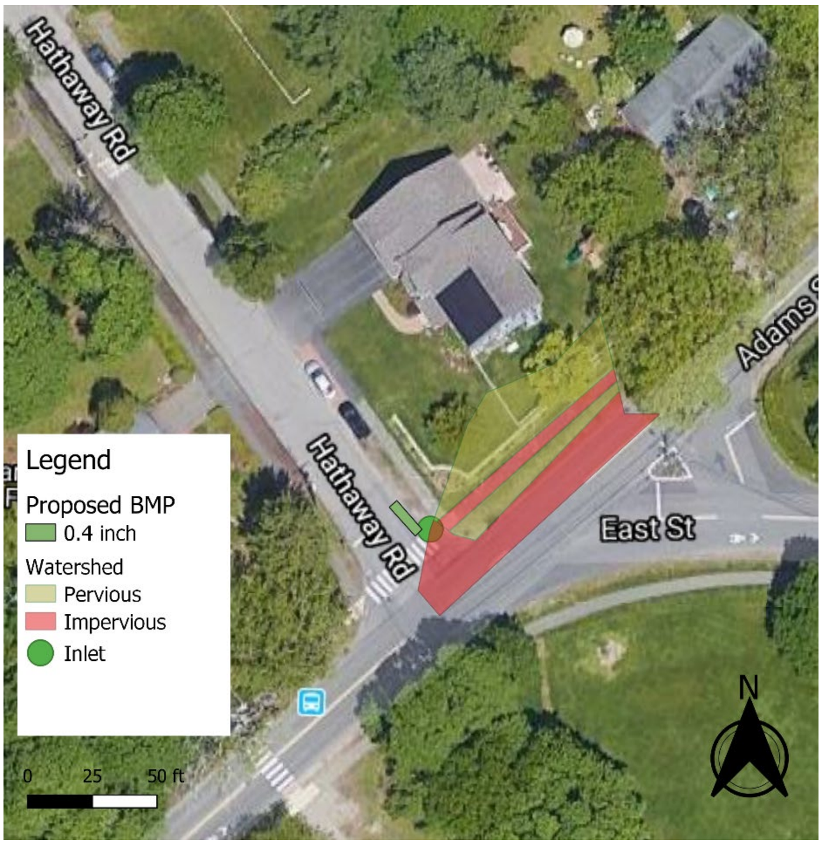


Notes

1. Leaching catch basins are appropriate for sites with higher conductivity soils or where infiltration is suitable.
2. These systems can replace conventional deep sump catch basins where infiltration is appropriate.
3. The bottom should remain solid (as shown here) to function as a deep sump catch basin and to facilitate long term maintenance.
4. The excavation may be oversized and backfilled with stone to accommodate larger design storage volumes (DSV).
5. As with other infiltration systems, to limit clogging a geotextile may be used to curtain the excavation sidewalls but not on the bottom of the excavation.

4.1 Site 1 (South)

The estimated WQV for BMP 1 was 185 cf. The optimized 0.4-inch size gives a trench that is 16 ft in length.



0.4-inch sizing			
	Parameter	**Value**	**Units**
	BMP ID	1	
Site	Location	1 Hathaway Rd	
	Watershed Area	0.10	ac
	Impervious	51%	
	Inf. Rate	1.02	in/hr
Design	L	15	ft
	W	4	ft
	D	3	ft
Performance	PSC	0.40	in
	Vol_{RE}	68%	
	TP_{RE}	73%	

	TN_{RE}	92%	
	TSS_{RE}	93%	
	TZn_{RE}	99%	
Nutrient Loading	P - Pre-BMP export	0.10	lb/yr
	N - Pre-BMP export	0.72	lb/yr
	TSS - Pre-BMP export	22.46	lb/yr
Removal	**P Reduction**	**0.07**	**lb/yr**
	N Reduction	**0.66**	**lb/yr**
	TSS Reduction	**20.88**	**lb/yr**
	Volume Reduction (By infiltration)	**5,533**	**cf/yr**
	Volume Reduction (depth on IA)	**29.8**	**in/yr**