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Soil Based Recommendations
For
Storm Water Management Practices

Photo Credit: Tom Ladny, NRCS

CT-TP-2005-3
August, 2005

Soil Based Recommendations
for
Storm Water Management Practices

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This report may be cited as follows:

Krall, Lisa, et al. 2005. Soil Based Recommendations for Storm Water Management Practices. CT-TP-2005-? USDA Natural Resources Conservation Service, Tolland, CT

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Soil Based Recommendations for Storm Water Management Practices

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Soil Based Recommendations for Storm Water Management Practices

Introduction:

This report includes four soil survey interpretations that evaluate the suitability of Connecticut soils for four widely used post construction storm water runoff management systems. They are infiltration systems, detention/retention basins, perennial wetland systems, and intermittent wetland systems.

A soil interpretation refers to the behavior of soils in response to human activities. Interpretations are a guide to use and management of soils in a survey area. Soils with similar responses to a particular use or treatment often are grouped together. These interpretations are designed to be used with the National Cooperative Soil Survey of Connecticut.

According to The U.S. Census Bureau, a full third of Connecticut towns experienced more than 10% population growth in between 1990 and 2000. Growing numbers of homes, garages, driveways, parking lots and other impervious areas have decreased infiltration and ground water recharge and increased discharges of runoff into waterways. (For small streams, increased runoff volumes result in higher flood flows and decreased low flows.) Malfunctioning storm water runoff management practices exacerbate these problems and can lead to surface and ground water degradation. The purpose of these interpretations is to help people use soil survey information as a screening tool for successful selection and implementation of best management practices for storm water runoff. For additional information about urban storm water characteristics, refer to the 2004 Connecticut Stormwater Quality Manual, section 2.

Methodology:

Soil and landscape criteria used to rate soil suitability were identified using specifications in the CT/RI-NRCS Runoff Management System Standard (570) and interviews with engineering staff. The National Soil Information System (NASIS) was used to write queries that access the state's soil survey data and assign ratings and limitations to each map unit in the soil survey legend.

Rating classes indicate the extent to which the soils are limited by the soil properties that affect the management system. A least limited or good rating indicates that the soil has features that are very favorable for the specified system. Good performance and relatively low installation and maintenance costs can be expected. A soil rated somewhat limited or fair has features that are moderately favorable for the system. The limitations can be overcome or minimized by special planning, design, installation, and maintenance. Increased installation costs and maintenance will be required to sustain performance. Most limited or poor indicates that one or more soil feature is unfavorable for the specified system. The limitation generally cannot be overcome. Sometimes expensive design, installation, and maintenance may be employed, but performance may still be poor.

Applications:

The interpretation can be displayed by map unit in a number of tabular formats; from a very simple one showing rating class to one giving all the limitations and the degree of severity of each. It can be imported to GIS and displayed on a map that shows the most appropriate storm water system for an area or that illustrates the soil suitability for one selected system. These can be produced using town lines, watershed boundaries, or some other delineation.

These ratings apply to storm water runoff from residential and commercial areas including driveways, roads, roofs, parking areas, and lawns. They are not intended for the placement of treatment systems for animal waste, domestic or industrial wastewater, or other highly concentrated waste material.

The interpretation is designed to be used by town planning, regulatory, and engineering staff; state and local agencies, consultants, realtors, and individual land owners. It can be used to help guide the selection of storm water practices that best fit the soil conditions in comprehensive planning on a town or watershed basis, site plan review, or for preliminary site selection and design.

Survey based soil interpretations are meant to be used for planning or review and do not replace an on-site soil evaluation for site development. The ratings generated are interpretations of the dominant soil condition. Inclusions of different soils within map units and ranges in characteristics within soil series may influence practice selection and design.

Selected Storm Water Runoff Management Systems

Infiltration systems

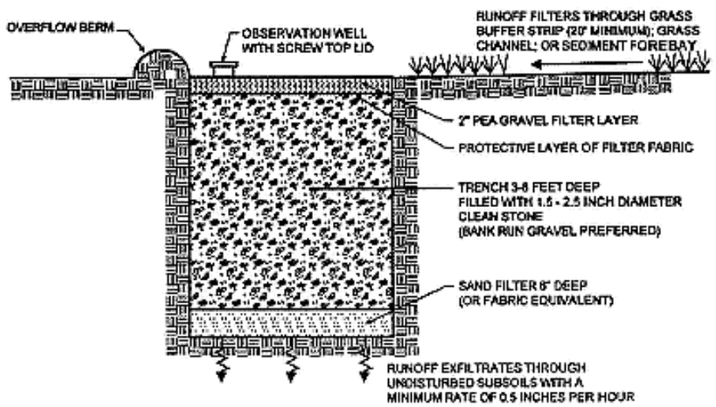
- Infiltration systems receive runoff and allow it to seep into the soil below. Runoff is ponded or stored in the void space between the stones and infiltrates through the bottom and into the soil matrix.
- Infiltration systems capture runoff and provide ground water recharge.
- Soils suitable for infiltration have high permeability rates and are not suitable for runoff that contains contaminants unless it is pretreated.[1]
- Infiltration systems require deep, permeable soils, a deep water table, and a level area.

The following data elements were used to evaluate soil suitability for infiltration systems:[2]

Depth to restrictive layer (bedrock, dense till)
Depth to seasonal high water table
Permeability
Bulk density
Flooding
Slope.

Practices included:

Infiltration systems include infiltration trenches, underground galleries, and engineered, large scale raingardens such as bio-retention systems in parking lots.



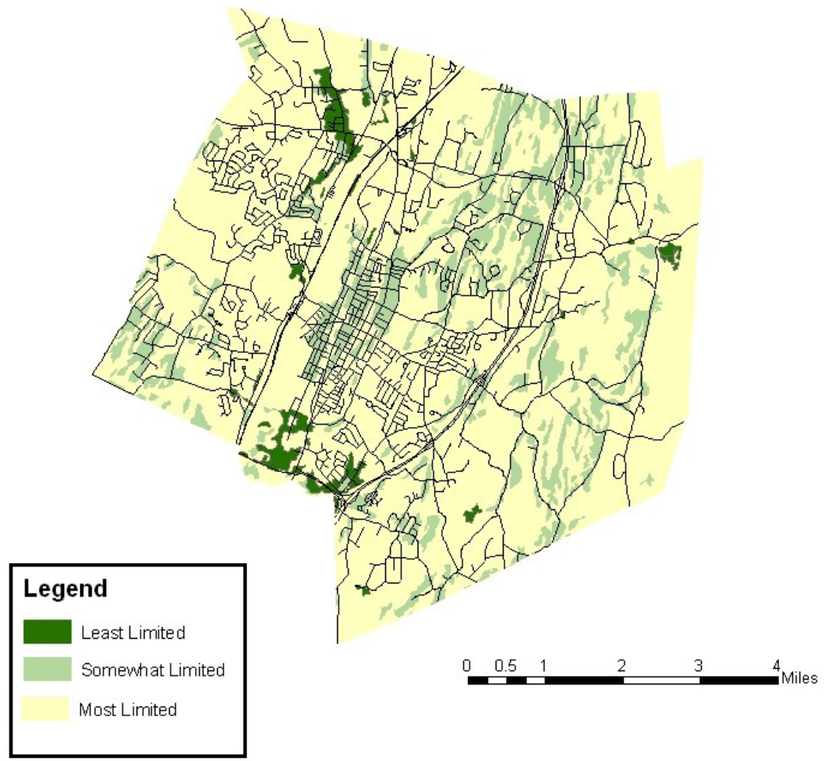
A schematic of an infiltration trench (Source: MDE, 2000)

Fig. #1

[1] The Connecticut DEP requires that field-measured soil infiltration rates be less than 5.0 inches per hour for primary treatment systems. See appendix C: Connecticut Soil Series with high or very high saturated hydraulic conductivity (K_{sat}) in the substratum.

[2] See appendix A for additional information about individual practices and soils information.

Soil Ratings for Infiltration Systems



Advantages of Infiltration Systems:

Increases groundwater recharge and stream baseflows
Reduces runoff volumes and peak flows
Requires a relatively small area

Limitations:

Require frequent inspection and maintenance
Use restricted to small drainage areas
Reduced performance during winter months
Not suitable for runoff containing high sediment loads
Requires careful construction to prevent clogging or compaction

Perennial Wetland/Pond Systems

- Stormwater runoff flows into the system and is held there for long periods.
- Pollutant removal is achieved through settling, biological uptake, decomposition, and volatilization.
- Perennial wetland/pond systems require deep soils with slow permeability, permanent water tables and a level site.

The following data elements were used to evaluate soil suitability for perennial wetland systems:[3]

Seasonal high water table
Permeability
Hydrologic soil group
Slope.

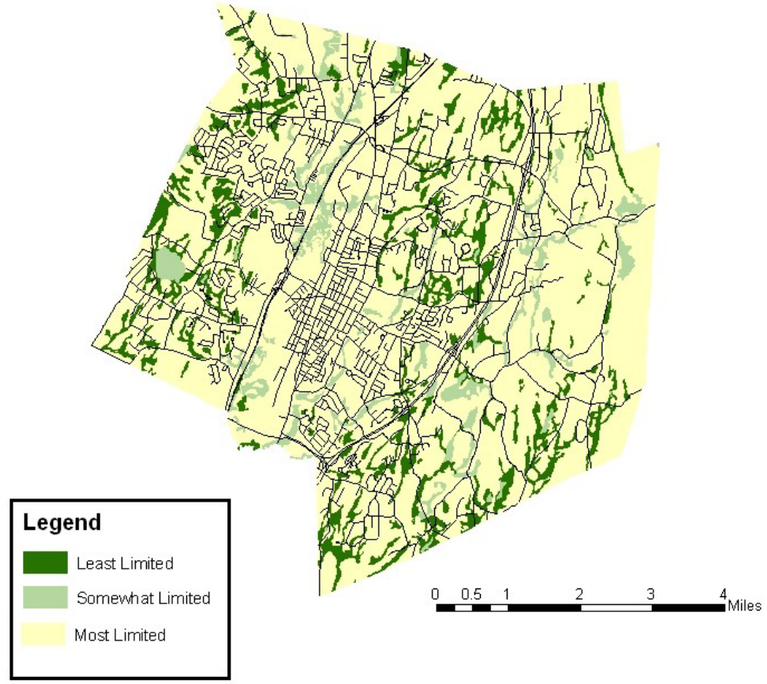
Practices included:

Practices included in this interpretation are ponds, shallow marsh systems, and constructed wetlands.

Fig. #2 **Storm water pond**
Photo Credit: Tom Ladny, NRCS

[3] See appendix A for additional information about individual practices and soils information.

Soil Ratings for Perennial Wetland Systems



Advantages of Perennial Wetland Systems:

One of the most effective practices for treating soluble pollutants
Open water provides aesthetic benefit and wildlife habitat.
Reduces peak flows

Disadvantages:

Relatively large land area required for drainage area.
May cause thermal impacts to receiving water
Efficiency can be affected by cold weather
Potential mosquito breeding habitat
Deep ponds may present safety concerns

Intermittent Wetland Systems

- Intermittent wetland systems are similar to perennial systems except that they may dry out for some periods(s) during the year.
- Soils may have slightly more rapid permeability or lower water tables than those required for perennial systems.
- Detension/retention basins installed in soils with high permeability rates are not suitable for runoff that contains contaminants unless it is pretreated.[4]

The following data elements were used to evaluate soil suitability for intermittent wetland systems:[5]
Seasonal high water table
Permeability
Hydrologic soil group
Slope.

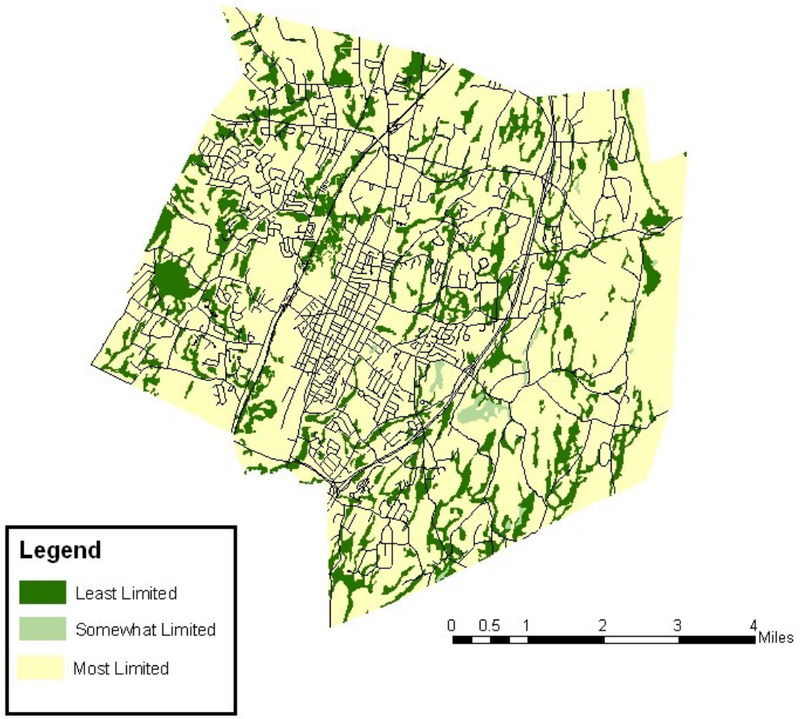
Practices included:
These systems include pond/wetland systems, extended detention wetlands, rain gardens, and pocket wetlands.

Fig. #3 **Extended Detention Shallow Wetland**
Photo Credit: Tom Ladny, NRCS

[4] The Connecticut DEP requires that field-measured soil infiltration rates be less than 5.0 inches per hour for primary treatment systems. See appendix C: Connecticut Soil Series with high or very high saturated hydraulic conductivity in the substratum.

[5] See appendix A for additional information about individual practices and soils information.

Soil Ratings for Intermittent Wetland Systems



Advantages of Intermittent wetland Systems:
Efficient at removing particulate matter
Can provide treatment of soluble pollutants
May provide aesthetic benefits and wildlife habitat elements
Reduces peak flows

Limitations:
Relatively large land area required for drainage area
May not maintain wet conditions during dry weather periods
May cause thermal impacts to receiving water
Potential mosquito breeding habitat
Deep ponds may present safety concerns

Detention/Retention Basins

- These basins detain the storm water runoff to allow particles and associated pollutants to settle. They may reduce peak flows, remove particulate pollutants, and provide flood control.
- Of all the practices evaluated, they are practical on the widest range of soils. Only soils with shallow bedrock, ponding, or very steep slopes cannot be used.
- Detension/retention basins installed in soils with high permeability rates are not suitable for runoff that contains contaminants unless it is pretreated.[6]

The following data elements were used to evaluate soil suitability for detention/retention basins:[7]

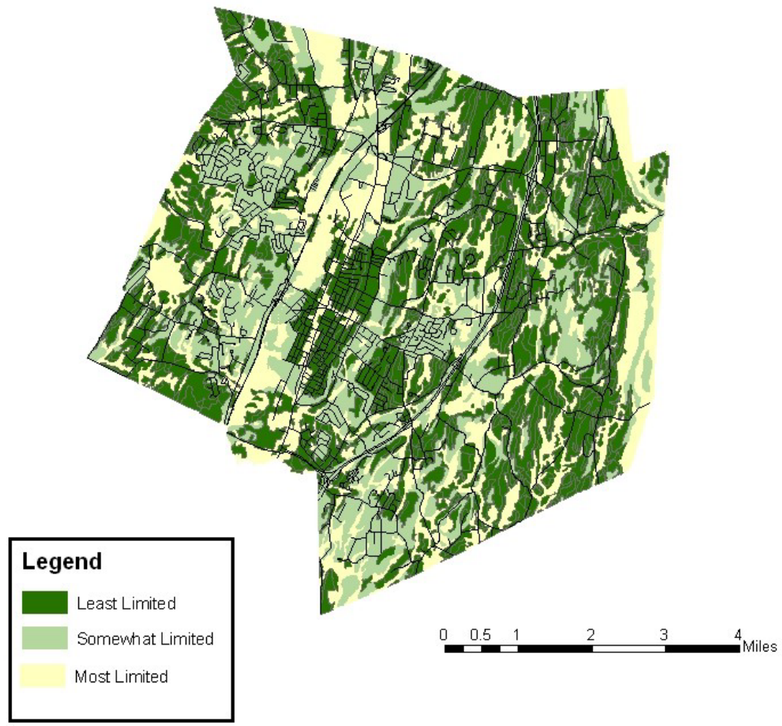
Depth to bedrock
Hydrologic soil group
Flooding
Slope

Fig. #4 **Dry Detention Basin**
Photo Credit: Tom Ladny, NRCS

[6] The Connecticut DEP requires that field-measured soil infiltration rates be less than 5.0 inches per hour for primary treatment systems. See appendix C: Connecticut Soil Series with high or very high saturated hydraulic conductivity in the substratum.

[7] See appendix A for additional information about individual practices and soils information.

Soil Ratings for Detention / Retention Basins



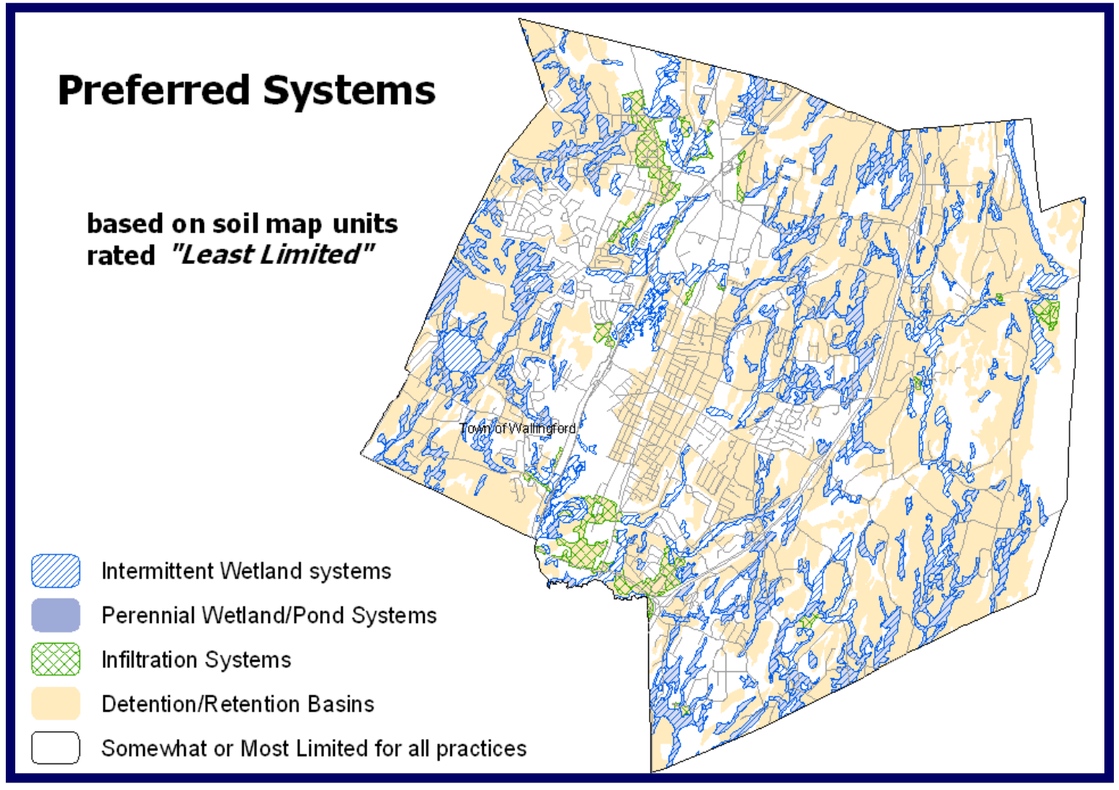
Advantages of Detention / Retention Basins:

Suitable on a wide range of soils and sites
Reduces peak flows

Disadvantages

Treatment benefits vary widely due to detension times
Settled material may be re-suspended by subsequent storms.
Requires frequent mowing where a lawn appearance is desired

Stormwater runoff management practice ratings for planning or preliminary site review.



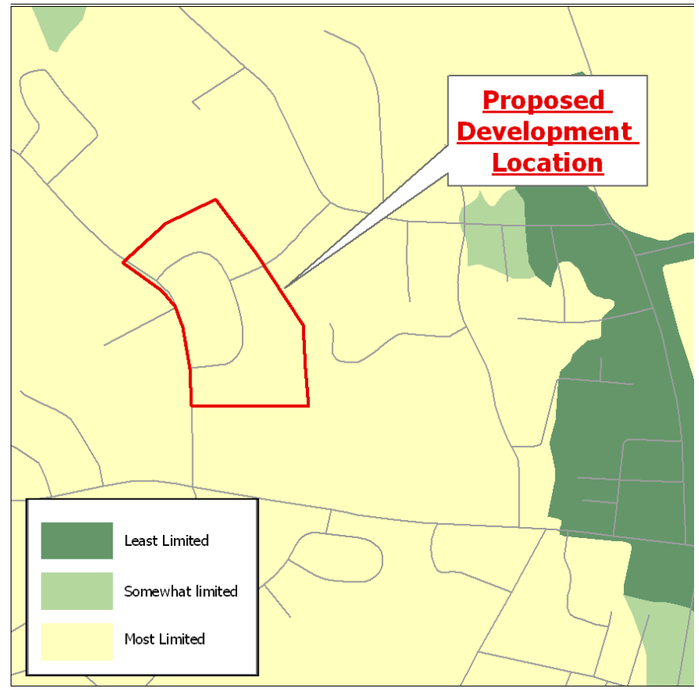
Another way to present these soil based ratings is on one map showing all four practice types and the areas where they are most suitable. Areas displayed on this map show where each practice rated "least limited." In white areas, some practices may have been rated somewhat limited. These areas also include very shallow bedrock, steep slopes, and soils altered by urban land use. Use this map to identify the best choice for a selected area.

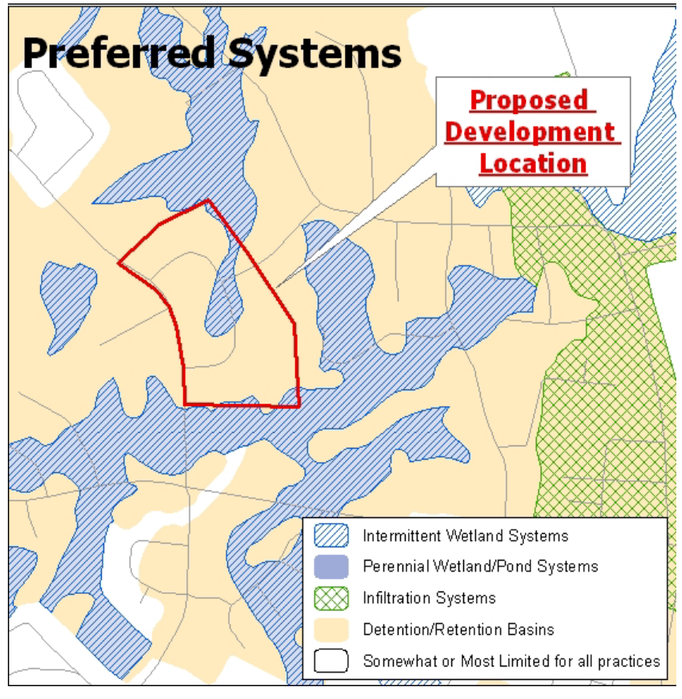
Planning scenario using soil based ratings for storm water runoff management practice recommendations:

A developer comes before your town planning board with a subdivision proposal.

The development proposal includes infiltration trenches to handle storm water runoff from the impervious surfaces.

Looking at your soil suitability map for infiltration systems, you realize that the soils in this area may not perform well for this practice.





On the preferred systems map, it appears that a system using detention/retention basins would function more effectively on this site.

The board recommends an on-site evaluation to confirm the soil condition and adjust the storm water management plan, if appropriate

Appendix A: Specific soil criteria used to develop each interpretation

Infiltration Systems

Depth to restrictive layer (bedrock, dense till):
Soils with <100cm (40") to a restrictive layer are most limited. Soils with >100cm to a restrictive layer are least limited.
Seasonal high water table:
Soils with a water table within 180 cm (71") of the surface are rated increasingly poorly as the water table approaches 100cm (40"). Water tables less than 100 cm from the surface are most limiting. Soils with no water table within 180 cm are least limited.
Permeability[8] in the top 40" or above a restrictive layer :
Permeability of 4µm/s (.6in/hr) or less is most limiting, soils become less limited as permeability reaches 40 µm/s. (6in/hr) Soils with permeability above this are least limited.
Bulk density:
Soils with bulk densities of 1.8g/cm^3 or above are rated most limited. Limitation decreases as bulk density decreases. Soils with bulk density below 1.63g/cm^3 are least limited.
Flooding:
Soils that flood very frequently, frequently, or occasionally are most limited. Soils that flood rarely are somewhat limited. Soils that flood very rarely are somewhat less limited, and soils that do not flood are least limited.
Slope:
Slopes less than 2.5% are least limited. Slopes become more limiting until at 8% they are most limited.

Detention / retention basins

Depth to bedrock:
Soils are increasingly limited by depth to bedrock. Soils with less than 50 cm (20") to bedrock are most limited. Bedrock below a depth of 152 cm (60") is least limiting.
Hydrologic soil group:
Soils in Hydrologic Soil Group "D" are most limited. All others are least limited
Flooding:
Soils that flood very frequently, frequently, occasionally, rarely, or very rarely are most limited.
Slope:
Soils with slopes under 15% are least limited. Soils are increasingly limited by slope until 35% is reached. Slopes above this are most limiting.

[8] Permeability was determined using saturated hydraulic conductivity (ksat)

Perennial wetland / pond

Seasonal high water table:
Soils with 15cm (6") or less to a water table during the growing season (May – Oct.) are least limited. Soils become gradually more limited until those with no water table within 200 cm (78") of the surface are most limited.
Permeability:
Soils with permeability less than 1.4µm/s (.2in/hr) are least limited. Soil limitations increase as permeability increases. Soils with permeability over 4µm/s (.6in/hr) are most limited.
Hydrologic soil group:
Soils are weighted by hydrologic soil group with "A" being most limited, "B" being somewhat severely limited, "C" being somewhat limited, and "D" being leastb limited.
Slope:
Slopes less than 2.5% are least limited. Slopes become more limiting until at 8% they are most limited.

Intermittent wetland systems

Seasonal high water table
Soils with 15cm or less to a water table during the growing season (May – Oct.) are least limited. Soils become gradually more limited until those with no water table within 200 cm of the surface are most limited.
Permeability
Soils with permeability less than 4µm/s are least limited. Soil limitations increase as permeability increases. Permeability over 141µm/s (4in/hr) is most limiting.
Hydrologic soil group
Soils with hydrologic group A are most limited, all others are least limited
Slope
Slopes less than 2.5% are least limited. Slopes become more limiting until at 8% they are most limited.

Appendix B: Definitions of Hydrologic Soil Groups and Flooding classes

Hydrologic soil groups

A. Soils with low runoff potential. Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep well drained to excessively well-drained sands or gravels.

B. Soils having moderate infiltration rates even when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well drained to well drained soils with moderately fine to moderately coarse textures.

C. Soils having slow infiltration rates even when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine textures.

D. Soils with high runoff potential. Soils having very slow infiltration rates even when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material.

Flooding frequency classes

Flooding frequency class is the number of times flooding occurs over a period of time. The classes of flooding are defined as follows:

None: No reasonable possibility of flooding; less than .2 percent chance of flooding in any year (averaging less than 1 time in 500 years).

Very Rare: Flooding is very unlikely but possible under extremely unusual weather conditions; less than 1 percent chance of flooding in any year (averaging less than 1 time in 100 years but at least 1 time in 500 years).

Rare: Flooding is unlikely but possible under unusual weather conditions; 1 to 5 percent chance of flooding in any year (averaging 5 times in 100 years).

Occasional: Flooding is expected infrequently under usual weather conditions; 5 to 50 percent chance of flooding in any year (averaging 50 times in 100 years).

Frequent: Flooding is likely to occur often under usual weather conditions; more than a 50 percent chance of flooding in any year, but less than a 50 percent chance of flooding in all months in any year, (averaging 600 times in 100 years).

Very Frequent: Flooding is likely to occur very often under usual weather conditions; more than a 50 percent chance of flooding in all months of any year.

Appendix C: Table 1: Connecticut Soil Series with "high" or "very high" permeability (over 6"/hr) in the substratum.

Agawam	Medomak
Beaches	Merrimac
Boscawen	Millsite
Branford	Moosilauke
Brimfield	Narragansett
Bucksport	Ninigret
Canton	Occum
Chatfield	Ondawa
Copake	Pawcatuck
Deerfield	Penwood
Ellington	Pootatuck
Enfield	Raypol
Fluvaquents	Rippowam
Fredon	Rumney
Gloucester	Saco
Groton	Scarboro
Hadley	Sudbury
Halsey	Suncook
Hartford	Taconic
Haven	Timakwa
Hero	Tisbury
Hinckley	Udifluvents
Hollis	Udipsamments
Ipswich	Walpole
Leicester	Wapping
Lim	Westminster
Loonmeadow	Windsor
Macomber	Yalesville
Manchester	

Appendix D: Soil Suitability Ratings and Limitations for Stormwater Runoff Management Practices

Map symbol and soil name	Retention/ Detention Basin *(Single home rain garden)*	Infiltration Systems *(Commercial rain garden /bioretention system)*	Perennial Wetland Systems	Intermittent Wetland Systems
Codes for Limitations (in parentheses in order of importance) **W**: high water table; **R**: restrictive layer within 40"; **P**: restricted permeability; **F**: flooding; **S**: slope; **A**: subject to seepage; **D**: depth limited due to bedrock or water table; **Q**: limited water quantity; **B**: limited depth to bedrock				
2 Ridgebury----	Poor (D)	Poor (W,R,P)	Suitable	Suitable
3 Ridgebury----	Poor (D)	Poor (W,R,P)	Suitable	Suitable
Leicester------	Poor (D)	Poor (W)	Fair (A)	Suitable
Whitman------	Poor (D)	Poor (W,R)	Suitable	Suitable
4 Leicester------	Poor (D)	Poor (W)	Fair (A)	Suitable
5 Wilbraham----	Poor (D)	Poor (W,R,P)	Suitable	Suitable
6 Wilbraham----	Poor (D)	Poor (W,R,P)	Suitable	Suitable
Menlo----------	Poor (D)	Poor (W,R,P)	Suitable	Suitable
7 Mudgepond--	Poor (D)	Poor (W,P)	Fair (A)	Suitable
8 Mudgepond--	Poor (D)	Poor (W,P)	Fair (A)	Suitable
Alden----------	Poor (D)	Poor (W,P)	Suitable	Suitable
9 Scitico---------	Poor (D)	Poor (W,P)	Suitable	Suitable
Shaker---------	Poor (D)	Poor (W,P)	Suitable	Suitable
Maybid--------	Poor (D)	Poor (W,P)	Suitable	Suitable
10 Raynham----	Poor (D)	Poor (W,P)	Fair (Q)	Fair (Q)
12 Raypol-------	Poor (D)	Poor (W)	Fair (A)	Suitable
13 Walpole-----	Poor (D)	Poor (W)	Fair (A)	Suitable
14 Fredon-------	Poor (D)	Poor (W)	Fair (A)	Suitable
15 Scarboro----	Poor (D)	Poor (W)	Fair (A)	Suitable
16 Halsey-------	Poor (D)	Poor (W)	Fair (A)	Suitable
17 Timakwa----	Poor (F,D)	Poor (W,F)	Fair (A)	Suitable
Natchaug---	Poor (F,D)	Poor (W,F)	Suitable	Suitable
18 Catden-------	Poor (F,D)	Poor (W,P,F)	Fair (A)	Suitable
Freetown-----	Poor (F,D)	Poor (W,P,F)	Fair (A)	Suitable
20A: Ellington--	Suitable	Poor (W)	Poor (A,Q)	Poor (Q,A)
21A: Ninigret--	Suitable	Poor (W)	Fair (A,Q)	Suitable
Tisbury---	Suitable	Poor (W)	Fair (A,Q)	Suitable
22A: Hero-------	Suitable	Poor (W)	Poor (A,Q)	Poor (Q,A)
22B: Hero-------	Suitable	Poor (W,S)	Poor (A,Q,S)	Poor (Q,S,A)
23A: Sudbury--	Suitable	Poor (W)	Poor (A,Q)	Poor (Q,A)
24A: Deerfield--	Suitable	Poor (W)	Poor (A,Q)	Poor (A,Q)
25A: Brancroft-	Suitable	Poor (W,P)	Fair (A)	Suitable
25B: Brancroft-	Suitable	Poor (W,P,S)	Fair (S,A)	Fair (S)
25C: Brancroft-	Suitable	Poor (W,P,S)	Poor (S,A)	Poor (S)
26A: Berlin------	Suitable	Poor (W,P)	Fair (A)	Suitable
26B: Berlin------	Suitable	Poor (W,P,S)	Fair (S,A)	Fair (S)
27A: Belgrade--	Suitable	Poor (W,P)	Poor (A,Q)	Poor (Q)
28A: Elmridge--	Suitable	Poor (W,P)	Fair (A)	Suitable
28B: Elmridge--	Suitable	Poor (W,P,S)	Fair (S,A)	Fair (S)
29A: Agawam--	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
29B: Agawam--	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
29C: Agawam--	Suitable	Poor (S)	Poor (S, A,Q)	Poor (S,A,Q)
30A: Branford-	Suitable	Suitable	Poor (A,Q)	Poor (Q,A)
30B: Branford	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S,A)
30C: Branford	Suitable	Poor (S)	Poor (S, A,Q)	Poor (S,Q,A)
31A: Copake---	Suitable	Suitable	Poor (A,Q)	Poor (Q,A)
31B: Copake---	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S,A)
31C: Copake---	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
32A: Haven-----	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)

Appendix D: Soil Suitability Ratings and Limitations for Stormwater Runoff Management Practices

Map symbol and soil name	Retention/ Detention Basin *(Single home rain garden)*	Infiltration Systems *(Commercial rain garden /bioretention system)*	Perennial Wetland Systems	Intermittent Wetland Systems
Codes for Limitations (in parentheses in order of importance) **W**: high water table; **R**: restrictive layer within 40"; **P**: restricted permeability; **F**: flooding; **S**: slope; **A**: subject to seepage; **D**: depth limited due to bedrock or water table; **Q**: limited water quantity; **B**: limited depth to bedrock				
Enfield-----	Suitable	Suitable	Poor (A,Q)	Poor (Q,A)
32B: Haven	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
Enfield-----	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S,A)
32C: Haven	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,A,Q)
Enfield	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
33A: Hartford---	Suitable	Suitable	Poor (A,Q)	Poor (Q,A)
33B: Hartford---	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S,A)
34A: Merrimac	Suitable	Suitable	Poor (A,Q)	Poor (Q,A)
34B: Merrimac-	Suitable	Fair (S)	Poor (A,Q)	Poor (Q,S,A)
34C: Merrimac-	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
35A: Penwood-	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
35B: Penwood	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
36A: Windsor	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
36B: Windsor---	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
36C: Windsor	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
37A:Manchester	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
37C: Manchester	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
37E: Manchester	Poor (S)	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
38A: Hinckley	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
38C: Hinckley	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
38E: Hinckley-----	Poor (S)	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
39A: Groton-------	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
39C: Groton-------	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
39E: Groton-------	Poor (S)	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
40A: Ludlow-------	Suitable	Poor(W,R,P)	Poor (Q,A)	Poor (Q)
40B: Ludlow-------	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
41B: Ludlow-------	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
42C: Ludlow-------	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
43A: Rainbow	Suitable	Poor (W,R,P)	Fair (A)	Suitable
43B: Rainbow---	Suitable	Poor (W,R,P,S)	Fair (S,A)	Fair (S)
44B: Rainbow-----	Suitable	Poor (W,R,P,S)	Fair S,A)	Fair (S)
45A: Woodbridge	Suitable	Poor (W,R,P)	Fair (A)	Suitable
45B: Woodbridge	Suitable	Poor (W,R,P,S)	Fair (S,A)	Fair (S)
45C Woodbridge:	Suitable	Poor (W,S,R,P)	Poor (S,A)	Poor (S)
46B: Woodbridge	Suitable	Poor (W,R,P,S)	Fair (S,A)	Fair (S)
46C: Woodbridge	Suitable	Poor (W,S,R,P)	Poor (S,A)	Poor (S)
47C: Woodbridge	Suitable	Poor (W,R,S,P)	Poor (S,A)	Poor (S)
48B: Georgia------	Suitable	Poor (W,P,S)	Fair (A,S)	Fair (S)
Amenia------	Suitable	Poor (W,P,S)	Fair (A,S)	Fair (S)
48C: Georgia-----	Suitable	Poor (W,S,P)	Poor (S,A)	Poor (S)
Amenia------	Suitable	Poor (W,S,P)	Poor (S,A)	Poor (S)
49B: Georgia	Suitable	Poor (W,P,S)	Fair (A,S)	Fair (S)
Amenia	Suitable	Poor (W,P,S)	Fair (A,S)	Fair (S)
49C: Georgia-----	Suitable	Poor (W,S,P)	Poor (S,A)	Poor (S)
Amenia------	Suitable	Poor (W,S,P)	Poor (S,A)	Poor (S)
50A: Sutton	Suitable	Poor (W,P)	Poor (A,Q)	Poor (Q)
50B: Sutton	Suitable	Poor (R,W,S,P)	Poor (A,Q,S)	Poor (Q,S)
51B: Sutton-------	Suitable	Poor (W,S,P)	Poor (A,Q,S)	Poor (Q,S)
52C: Sutton	Suitable	Poor (W,S,P)	Poor (A,S,Q)	Poor (S,Q)

Appendix D: Soil Suitability Ratings and Limitations for Stormwater Runoff Management Practices

Map symbol and soil name	Retention/ Detention Basin *(Single home rain garden)*	Infiltration Systems *(Commercial rain garden /bioretention system)*	Perennial Wetland Systems	Intermittent Wetland Systems
Codes for Limitations (in parentheses in order of importance) **W**: high water table; **R**: restrictive layer within 40"; **P**: restricted permeability; **F**: flooding; **S**: slope; **A**: subject to seepage; **D**: depth limited due to bedrock or water table; **Q**: limited water quantity; **B**: limited depth to bedrock				
53A: Wapping	Suitable	Poor (W)	Poor (A,Q)	Poor (Q)
53B: Wapping	Suitable	Poor (S,W)	Poor (A,Q,S)	Poor (Q,S)
54B: Wapping	Suitable	Poor (W,S)	Poor (A,Q,S)	Poor (Q,S)
55A: Watchaug	Suitable	Poor (W,P)	Poor (A,Q)	Poor (Q)
55B: Watchaug-	Suitable	Poor (W,S,P)	Poor (A,Q,S)	Poor (Q,S)
56B: Watchaug	Suitable	Poor (W,S,P)	Poor (A,Q,S)	Poor (Q,S)
57B: Gloucester-	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S,A)
57C: Gloucester	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
57D: Gloucester	Fair (S)	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
58B: Gloucester	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
58C: Gloucester	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
59C: Gloucester	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
59D: Gloucester	Fair (S)	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
60B: Canton	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S,A)
Charlton	Suitable	Fair (S,P)	Poor (A,Q,S)	Poor (Q,S)
60C: Canton---	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
Charlton	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
60D: Canton	Fair (S)	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
Charlton	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
61B: Canton	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S,A)
Charlton	Suitable	Fair (S,P)	Poor (A,Q,S)	Poor (Q,S)
61C: Canton	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
Charlton	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
62C: Canton	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
Charlton	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
62D: Canton	Fair (S)	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
Charlton	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
63B: Cheshire	Suitable	Fair (S,P)	Poor (A,Q,S)	Poor (Q,S)
63C: Cheshire	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
63D: Cheshire	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
64B: Cheshire	Suitable	Fair (S,P)	Poor (A,Q,S)	Poor (Q,S)
64C: Cheshire	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
65C: Cheshire	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
65D: Cheshire	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
66B:Narragansett	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S)
66C:Narragansett	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q)
67B:Narragansett	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S)
67C:Narragansett	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q)
68C:Narragansett	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q)
68D:Narragansett	Fair (S)	Poor (S)	Poor (A,S,Q)	Poor (S,Q)
69B: Yalesville	Fair (B)	Poor (R,S,P)	Poor (Q,S,A)	Poor (Q,S)
69C: Yalesville	Fair (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
70C: Branford	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
Holyoke	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
71C: Brookfield	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Brimfield	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
71E: Brookfield	Poor (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Brimfield-	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
73C: Charlton	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)

Appendix D: Soil Suitability Ratings and Limitations for Stormwater Runoff Management Practices

Map symbol and soil name	Retention/ Detention Basin *(Single home rain garden)*	Infiltration Systems *(Commercial rain garden /bioretention system)*	Perennial Wetland Systems	Intermittent Wetland Systems

Codes for Limitations (in parentheses in order of importance) **W**: high water table; **R**: restrictive layer within 40"; **P**: restricted permeability; **F**: flooding; **S**: slope; **A**: subject to seepage; **D**: depth limited due to bedrock or water table; **Q**: limited water quantity; **B**: limited depth to bedrock

Chatfield	Poor (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
73E: Charlton	Poor (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Chatfield	Poor (B,S)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
74C:Narragansett	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q)
Hollis	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
75C: Hollis	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Chatfield	Poor (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Rock Outcrop	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
75E: Hollis	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Chatfield	Poor (B,S)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Rock Outcrop	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
76E:Rock Outcrop	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Hollis	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
76F:Rock Outcrop	Poor (S,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Hollis	Poor (S,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
77C: Cheshire	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Holyoke	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
77D: Cheshire	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Holyoke	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
78C: Holyoke	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Rock Outcrop	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
78E: Holyoke	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Rock Outcrop	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
79E:Rock outcrop	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Holyoke	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
80B: Bernardston	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
80C: Bernardston	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
81C Bernardston	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
81D Bernardston	Fair (S)	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
82B Broadbrook	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
82C Broadbrook	Suitable	Poor (W,S,R,P)	Poor S,Q,A)	Poor (S,Q)
82D Broadbrook	Fair (S)	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
83B Broadbrook	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
83C Broadbrook	Suitable	Poor (W,S,R,P,)	Poor (S,Q,A)	Poor (S,Q)
84B Paxton	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
Montauk	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
84C Paxton	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
Montauk-	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
84D Paxton	Fair (S)	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Montauk-	Fair (S)	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
85B Paxton	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
Montauk	Suitable	Poor (W,R,S,P)	Poor (Q,S,A)	Poor (Q,S)
85C Paxton	Suitable	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Montauk	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
86C Paxton	Suitable	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Montauk-	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
86D Paxton	Fair (S)	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Montauk-	Fair (S)	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
87B Wethersfield	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)

Appendix D: Soil Suitability Ratings and Limitations for Stormwater Runoff Management Practices

Codes for Limitations (in parentheses in order of importance) **W**: high water table; **R**: restrictive layer within 40"; **P**: restricted permeability; **F**: flooding; **S**: slope; **A**: subject to seepage; **D**: depth limited due to bedrock or water table; **Q**: limited water quantity; **B**: limited depth to bedrock

Map symbol and soil name	Retention/ Detention Basin *(Single home rain garden)*	Infiltration Systems *(Commercial rain garden /bioretention system)*	Perennial Wetland Systems	Intermittent Wetland Systems
87C Wethersfield	Suitable	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
87D Wethersfield	Fair (S)	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
88B Wethersfield	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
88C Wethersfield	Suitable	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
89C Wethersfield	Suitable	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
89D Wethersfield	Fair (S)	Poor (W,S,R,P)	Poor S,Q,A)	Poor (S,Q)
90B Stockbridge	Suitable	Poor (P,R,S)	Poor (Q,A,S)	Poor (Q,S)
90C Stockbridge	Suitable	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
90D Stockbridge	Fair (S)	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
91B Stockbridge	Suitable	Poor (P,R,S)	Poor (Q,A,S)	Poor (Q,S)
91C Stockbridge	Suitable	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
91D Stockbridge	Fair (S)	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
92B Nellis	Suitable	Poor (R,P,S)	Poor (A,Q,S)	Poor (Q,S)
92C Nellis	Suitable	Poor (S,R,P)	Poor (A,S,Q)	Poor (S,Q)
92D Nellis	Fair (S)	Poor (S,R,P)	Poor (A,S,Q)	Poor (S,Q)
93C Nellis	Suitable	Poor (S,R,P)	Poor (A,S,Q)	Poor (S,Q)
94C Farmington	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Nellis-	Suitable	Poor (S,R,P)	Poor (A,S,Q)	Poor (S,Q)
94E Farmington	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Nellis	Fair (S)	Poor (S,R,P)	Poor (A,S,Q)	Poor (S,Q)
95C Farmington	Poor (B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Rock Outcrop	Poor (B)	Poor (R,S)	Poor (S,Q)	Poor (S,Q)
95E Farmington	Poor (B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Rock Outcrop	Poor (B,S)	Poor (R,S)	Poor (S,Q)	Poor (S,Q)
96 Ipswich	Poor (F,D)	Poor (W,F,R)	Fair (A)	Suitable
97: Pawcatuck	Poor (F,D)	Poor (W,F,R)	Fair (A)	Fair (A)
98: Westbrook	Poor (F,D)	Poor (W,F)	Suitable	Suitable
99: Westbrook	Poor (F,D)	Poor (W,F)	Suitable	Suitable
100 Suncook	Poor (F)	Poor (F)	Poor (A,Q)	Poor (A,Q)
101 Occum	Poor (F)	Poor (F)	Poor (A,Q)	Poor (Q,A)
102 Pootatuck	Poor (F)	Poor (W,F)	Poor (A,Q)	Poor (Q,A)
103: Rippowam	Poor (F,D)	Poor (W,F)	Fair (A)	Suitable
104 Bash	Poor (F,D)	Poor (W,F,P)	Suitable	Suitable
105 Hadley	Poor (F)	Poor (F,P,W)	Poor (A,Q)	Poor (Q)
106: Winooski	Poor (F)	Poor (W,F,P)	Poor (A,Q)	Poor (Q)
107: Limerick	Poor (F,D)	Poor (W,F,P)	Fair (A)	Suitable
Lim	Poor (F,D)	Poor (W,F)	Fair (A)	Suitable
108 Saco	Poor (F,D)	Poor (W,F)	Fair (A)	Suitable
109 Fluvaquents	Poor (F,D)	Poor (W,F)	Fair (A)	Suitable
Udifluvents	Poor (F)	Poor (F)	Poor (A,Q)	Poor (Q)
221A Ninigret	Suitable	Poor (W)	Fair (A)	Suitable
Urban Land	Poor (D)	Poor (P)	Poor (A,Q)	Poor (A,Q)
224A Deerfield	Suitable	Poor (W)	Poor (A,Q)	Poor (A,Q)
Urban Land	Poor (D)	Poor (P,)	Poor (A,Q)	Poor (A,Q)
225B Brancroft	Suitable	Poor (W,P,S)	Fair (A,S)	Fair (S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
226B Berlin	Suitable	Poor (W,P,S)	Fair (A,S)	Fair (S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
228B Elmridge	Suitable	Poor (W,P,R,S)	Fair (A,S)	Fair (S)

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Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
229B Agawam	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
229C Agawam	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,A,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
230B Branford	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,A,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
230C Branford	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,Q,A)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
232B Haven	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
234B Merrimac	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,A,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
235B Penwood	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
236B Windsor	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
237A Manchester	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
Urban Land	Poor (D)	Poor (P)	Poor (A,Q)	Poor (A,Q)
237C Manchester	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
238A Hinckley	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
Urban Land	Poor (D)	Poor (P)	Poor (A,Q)	Poor (A,Q)
238C Hinckley	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
240B Ludlow	Suitable	Poor (W,R,P,S)	Poor (Q,A,S)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
243B Rainbow	Suitable	Poor (W,R,P,S)	Fair (A,S)	Fair (S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
245BWoodbridge	Suitable	Poor (W,R,P,S)	Fair (A,S)	Fair (S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
245CWoodbridge	Suitable	Poor (W,S,R,P)	Poor (S,A)	Poor (S)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
248B Georgia	Suitable	Poor (W,P,S)	Fair (A,S)	Fair (S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
250B Sutton	Suitable	Poor (W,P,S)	Poor (A,Q,S)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
253B Wapping	Suitable	Poor (W,S)	Poor (A,Q,S)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
255B Watchaug	Suitable	Fair (W,P,S)	Poor (A,Q,S)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
260B Charlton	Suitable	Fair (S,P)	Poor (A,Q,S)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
260C Charlton	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
260D Charlton	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Urban Land	Poor (D,S)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
263B Cheshire	Suitable	Fair (S,P)	Poor (A,Q,S)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)

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263C Cheshire	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
266BNarraganset	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
269B Yalesville	Fair (B)	Poor (R,S,P)	Poor (Q,S,A)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
269C Yalesville	Fair (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
273C: UrbanLand	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
Charlton	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Chatfield-	Poor (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
273E Urban Land	Poor (D,S)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
Charlton	Poor (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Chatfield-	Poor (B,S)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
275C: UrbanLand	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
Chatfield-	Poor (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
275E: UrbanLand	Poor (D,S)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
Chatfield-	Poor (B,S)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Rock Outcrop	Poor (D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
282B:Broadbrook	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
284B: Paxton	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
284C: Paxton	Suitable	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
284D: Paxton	Fair (S)	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
287B Wethersfield	Suitable	Poor (W,R,P,S)	Poor (Q,S,A)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A,Q,S)
287C Wethersfield	Suitable	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
287D Wethersfield	Fair (S)	Poor (W,S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Urban Land	Poor (D,S)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
290B Stockbridge	Suitable	Poor (P,R,S)	Poor (Q,A,S)	Poor (Q,S)
Urban Land	Poor (D)	Poor (P,S)	Poor (A,Q,S)	Poor (A.,Q,S)
290C Stockbridge	Suitable	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
290DStockbridge	Fair (S)	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
301: Beaches	Poor (F,D)	Poor (W,F,S)	Fair (A,S)	Fair (A,S)
Udipsamments	Poor (F)	Poor (F,S,W)	Poor (A,S,Q)	Poor (A,S,Q)
302: Dumps	Poor (D)	Poor (S,P)	Poor (S,A,Q)	Poor (S,A,Q)
303:Pits,Quarries	Poor (D,B,S)	Poor (R,P,S)	Poor (S,Q)	Poor (S,Q)
304: Udorthents	Poor (S)	Poor (S,W,P)	Poor (S,Q,A)	Poor (S,Q)
305: Udorthents	Poor (D,S)	Poor (S,W,P)	Poor (S,Q)	Poor (S,Q)
Pits-	Poor (D,S)	Poor (S,)	Poor (A,S,Q)	Poor S,Q,A)
306: Udorthents	Fair (S)	Poor (S,W,P)	Poor (S,Q,A)	Poor (S,Q)
Urban Land	Poor (D)	Poor (S,P)	Poor (S,Q,A)	Poor (S,Q,A)
307: Urban Land	Poor (D,S)	Poor (P,S)	Poor (S,A,Q)	Poor (S,A,Q)

Appendix D: Soil Suitability Ratings and Limitations for Stormwater Runoff Management Practices

Map symbol and soil name	Retention/ Detention Basin *(Single home rain garden)*	Infiltration Systems *(Commercial rain garden /bioretention system)*	Perennial Wetland Systems	Intermittent Wetland Systems
Codes for Limitations (in parentheses in order of importance) **W**: high water table; **R**: restrictive layer within 40"; **P**: restricted permeability; **F**: flooding; **S**: slope; **A**: subject to seepage; **D**: depth limited due to bedrock or water table; **Q**: limited water quantity; **B**: limited depth to bedrock				
308: Udorthents	Fair (S)	Poor (S,W,P)	Poor (S,Q,A)	Poor (S,Q)
309: Udorthents	Poor (F,D)	Poor (S,W,P,F)	Poor (S,Q)	Poor (S,Q)
310: Udorthents	Poor (F,D,S)	Poor (F,S,W,P)	Poor (S,Q)	Poor (S,Q)
401C Macomber	Poor (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Taconic	Poor (D,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
402D Macomber	Poor (B,S)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Taconic	Poor (D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
RockOutcrop	Poor (D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
403C Taconic	Poor (D,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
RockOutcrop	Poor (D,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
403E: Taconic	Poor (D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
RockOutcrop	Poor D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
403F: Taconic-	Poor (S,D,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
RockOutcrop	Poor (S,D,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
405C:Dummerston	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
405E:Dummerston	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
407C: Lanesboro	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
407E: Lanesboro	Poor (S)	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
408C: Fullam	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
409B: Brayton	Poor (D)	Poor (W,R,S,P)	Fair (S)	Fair (S)
412B: Bice------	Suitable	Fair (S,P)	Poor (A,Q,S)	Poor (Q,S)
412C: Bice----	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
412D: Bice	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
413C: Bice-----	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Millsite	Poor (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
413E: Bice----	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
Millsite-------	Poor (B,S)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
414: Fredon, cold	Poor (D)	Poor (W)	Fair (A)	Suitable
415C Millsite------	Poor (B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Westminster	Poor (D,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Rock Outcrop	Poor (D,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
415E Millsite------	Poor (S,B)	Poor (S,R,P)	Poor (S,Q,A)	Poor (S,Q)
Westminster	Poor (D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Rock Outcrop	Poor (D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
416E:RockOutcrop	Poor (D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Westminster	Poor (D,B,S)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
416F:RockOutcrop	Poor (S,D,B)	Poor (R,S,P)	Poor (S,Q)	Poor (S,Q)
Westminster	Poor (S,D,B)	Poor (R,S)	Poor (S,Q)	Poor (S,Q)
417B: Bice------	Suitable	Fair (S,P)	Poor (A,Q,S)	Poor (Q,S)
417C: Bice----	Suitable	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
417D: Bice	Fair (S)	Poor (S,P)	Poor (A,S,Q)	Poor (S,Q)
418C: Schroon	Suitable	Poor (W,S,P)	Poor (A,S,Q)	Poor (S,Q)
420A: Schroon	Suitable	Poor (W,P)	Poor (A,Q)	Poor (Q,A)
420B: Schroon	Suitable	Poor (W,S,P)	Poor (A,Q,S)	Poor (Q,S,A)
421ANinigret, cold	Suitable	Poor (W)	Fair (A)	Suitable
423ASudbury,cold	Suitable	Poor (W)	Poor (A,Q)	Poor (Q,A)
424B: Shelburne	Suitable	Poor (W,R,S,P)	Poor (Q,S,A)	Poor (Q,S)
424C: Shelburne	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
424D: Shelburne	Fair (S)	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)

Appendix D: Soil Suitability Ratings and Limitations for Stormwater Runoff Management Practices

Map symbol and soil name	Retention/ Detention Basin *(Single home rain garden)*	Infiltration Systems *(Commercial rain garden /bioretention system)*	Perennial Wetland Systems	Intermittent Wetland Systems
Codes for Limitations (in parentheses in order of importance) **W**: high water table; **R**: restrictive layer within 40"; **P**: restricted permeability; **F**: flooding; **S**: slope; **A**: subject to seepage; **D**: depth limited due to bedrock or water table; **Q**: limited water quantity; **B**: limited depth to bedrock				
425B: Shelburne	Suitable	Poor (W,R,S,P)	Poor (Q,S,A)	Poor (Q,S)
425C: Shelburne	Suitable	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
426D: Shelburne	Fair (S)	Poor (W,R,S,P)	Poor (S,Q,A)	Poor (S,Q)
427B Ashfield	Suitable	Poor (W,R,S,P)	Fair (S,A)	Fair (S)
427C Ashfield	Suitable	Poor (W,R,S,P)	Poor (S,A)	Poor (S)
428A Ashfield	Suitable	Poor (W,R,P)	Fair (A)	Suitable
428B Ashfield	Suitable	Poor (W,R,S,P)	Fair (S,A)	Fair (S)
428C Ashfield	Suitable	Poor (W,R,S,P)	Poor (S,A)	Poor (S)
429AAgawam cold	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
429BAgawam cold	Suitable	Fair (S)	Poor (A,Q,S)	Poor (A,Q,S)
429CAgawam cold	Suitable	Poor (S)	Poor (A,S,Q)	Poor (S,A,Q)
433 Moosilauke	Poor (D)	Poor (W)	Fair (A)	Suitable
434AMerrimac, cold	Suitable	Suitable	Poor (A,Q)	Poor (Q,A)
434BMerrimac, cold	Suitable	Fair (S)	Poor (A,Q,S)	Poor (Q,S,A)
434CMerrimac, cold	Suitable	Poor (S)	Poor (A,S,Q)	Poor (Q,S,A)
435 Scarboro	Poor (D)	Poor (W)	Fair (A)	Suitable
436 Halsey	Poor (D)	Poor (W)	Fair (A)	Suitable
437: Wonsqueak	Poor (F,D)	Poor (W,P,F)	Suitable	Suitable
438: Bucksport	Poor (F,D)	Poor (W,F,P)	Suitable	Suitable
440A Boscawen	Suitable	Suitable	Poor (A,Q)	Poor (A,Q)
440C Boscawen	Suitable	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
440E Boscawen	Poor (S)	Poor (S)	Poor (A,S,Q)	Poor (A,S,Q)
442 Brayton	Poor (D)	Poor (W,R,P,S)	Fair (S)	Fair (S)
443 Brayton	Poor (D)	Poor (W,R,P,S)	Fair (S)	Fair (S)
Loonmeadow	Poor (D)	Poor (W,R,P)	Suitable	Suitable
448B Hogansburg	Suitable	Poor (W,P,S)	Fair (A,S,Q)	Fair (S,Q)
448C Hogansburg	Suitable	Poor (W,S,P)	Poor (S,A,Q)	Poor (S,Q)
449B Hogansburg	Suitable	Poor (W,P,S)	Fair (A,S,Q)	Fair (S,Q)
449C Hogansburg	Suitable	Poor (W,S,P)	Poor (S,A,Q)	Poor (S,Q)
450B Pyrities	Suitable	Poor (P,R,S)	Poor (Q,A,S)	Poor (Q,S)
450C Pyrities	Suitable	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
450D Pyrities	Fair (S)	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
451B Pyrities	Suitable	Poor (P,R,S)	Poor (Q,A,S)	Poor (Q,S)
451C Pyrities	Suitable	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
451D Pyrities	Fair (S)	Poor (S,P,R)	Poor (S,Q,A)	Poor (S,Q)
457 Mudgepond	Poor (D)	Poor (W,P)	Fair (A)	Suitable
458 Mudgepond	Poor (D)	Poor (W,P)	Fair (A)	Suitable
Alden	Poor (D)	Poor (W,P)	Suitable	Suitable
501 Ondawa	Poor (F)	Poor (F,P,R,W)	Poor (Q,A)	Poor (Q)
503 Rumney	Poor (F,D)	Poor (W,F)	Fair (A)	Suitable
508 Medomak	Poor (F,D)	Poor (W,F)	Fair (A)	Suitable

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