

SLOW DOWN THAT STORM WATER!

LOW-IMPACT DEVELOPMENT TECHNIQUES IN VERMONT

BEST MANAGEMENT PRACTICES

- ✓ PROTECT RIPARIAN CORRIDORS**
- ✓ REDUCE IMPERVIOUS SURFACES**
- ✓ MINIMIZE SOIL DISTURBANCE**
- ✓ PROTECT NATURAL FLOW PATHWAYS**
- ✓ MAXIMIZE SHEET FLOW AND INFILTRATION**
- ✓ PREVENT DELIVERY OF POLLUTANTS**
- ✓ PROTECT SENSITIVE NATURAL AREAS**

STRUCTURED SYSTEMS

BIOSWALE

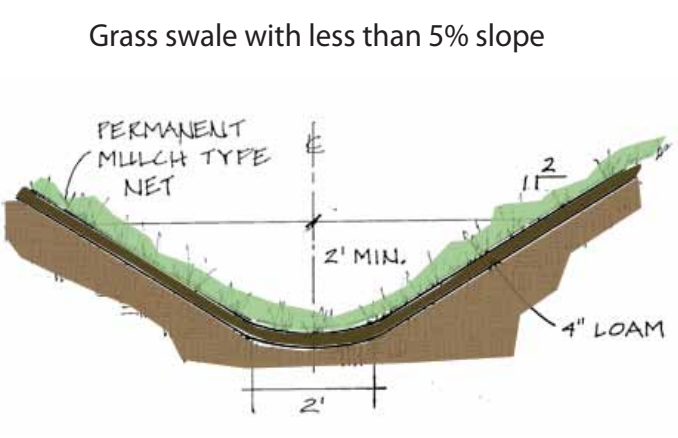
convey and filter



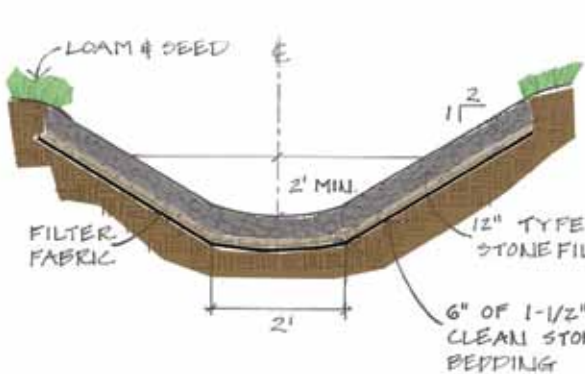
WWW.MASS.GOV



VERMONT BETTER BACK ROADS PROGRAM



Grass swale with less than 5% slope



Drain rock swale for slopes 5%-10% slope

RAIN GARDEN

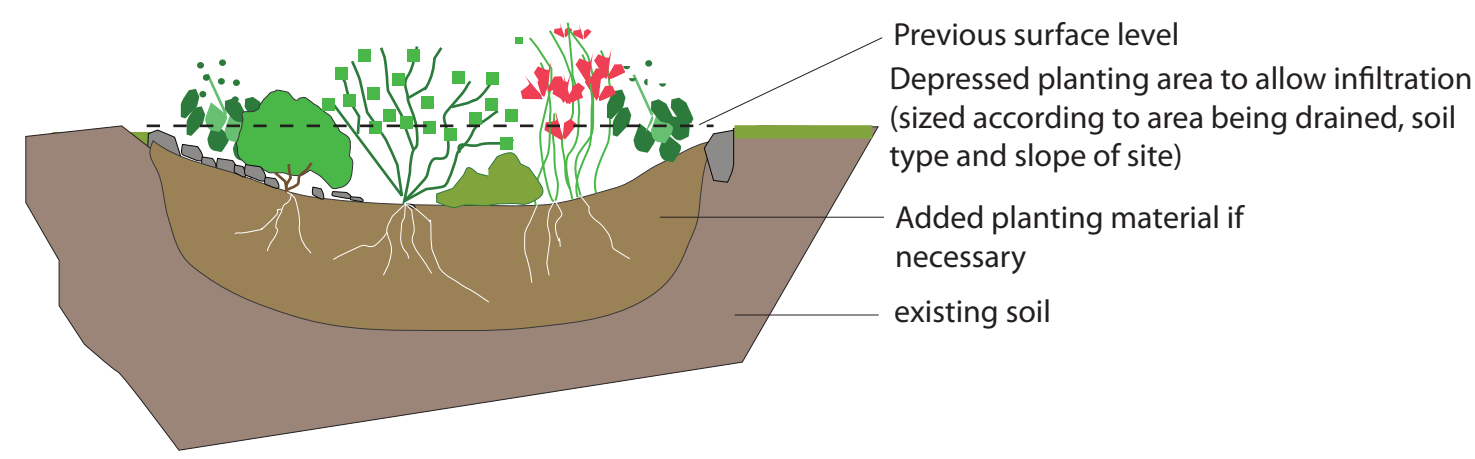
filter and infiltrate



VERMONT ACHIEVEMENT CENTER, RUTLAND, VERMONT
RUTLAND NATURAL RESOURCE CONSERVATION DISTRICT



RUTLAND, VERMONT
RUTLAND NATURAL RESOURCE CONSERVATION DISTRICT



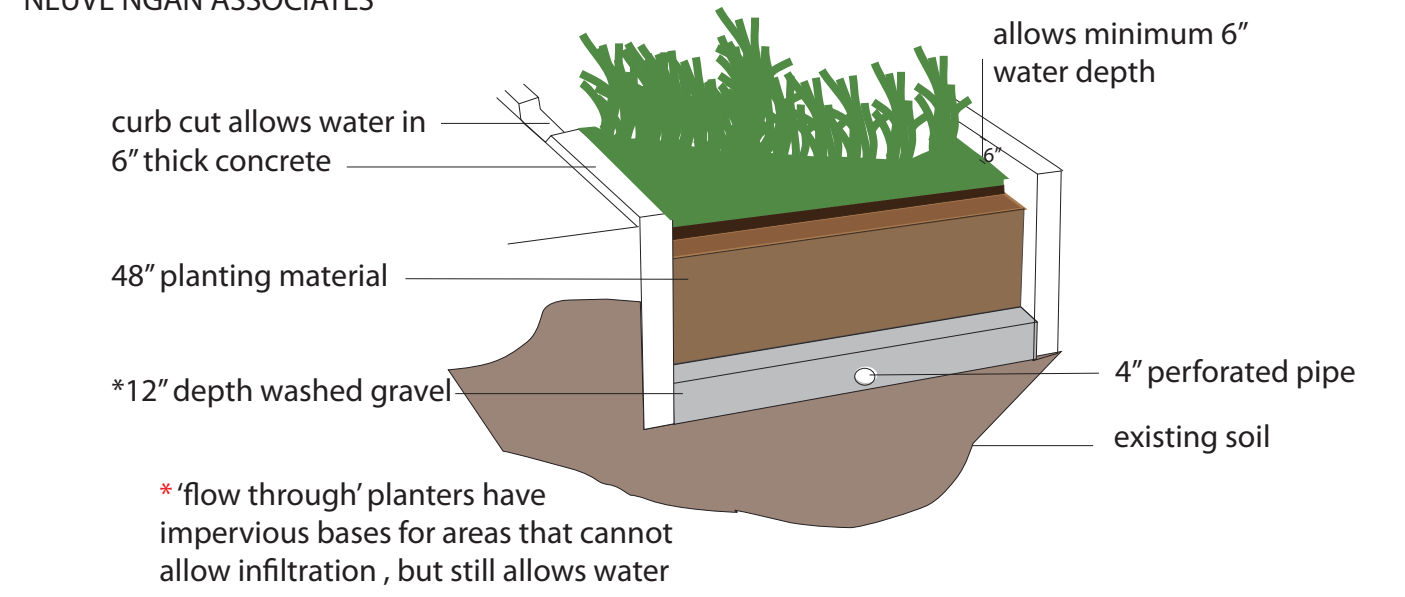
Previous surface level
Depressed planting area to allow infiltration (sized according to area being drained, soil type and slope of site)
Added planting material if necessary
existing soil

STORMWATER PLANTER

filter and *infiltrate



CAPITOL PARKING LOT, MONTEPELIER, VERMONT
NEUVE NGAN ASSOCIATES



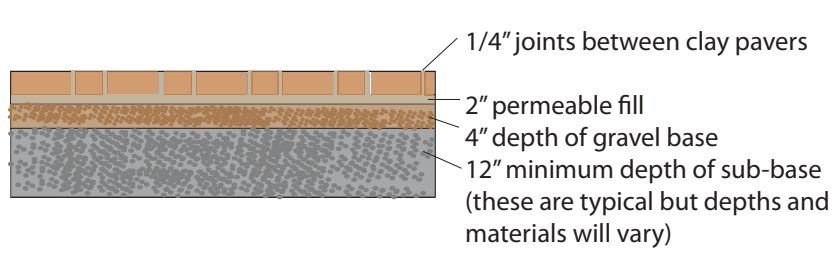
*flow through planters have impervious bases for areas that cannot allow infiltration, but still allows water to slow down and sediments to drop out

PERVIOUS PAVEMENT

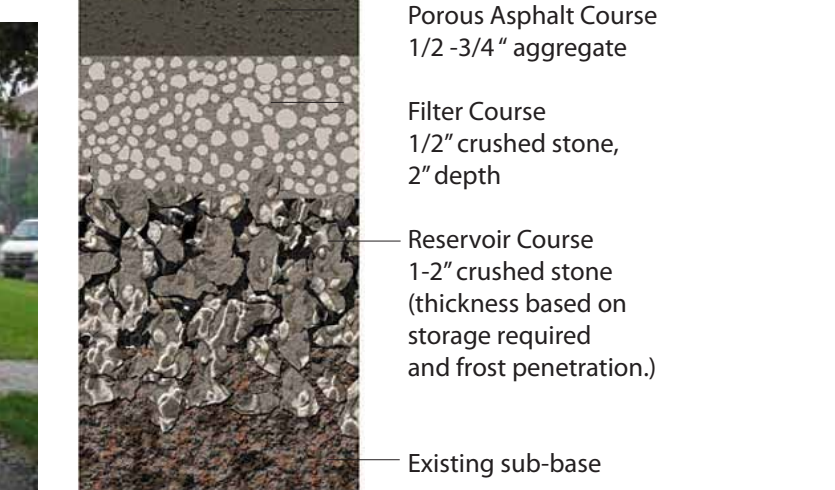
infiltrate and filter



PERMEABLE CLAY PAVERS, WATERBURY VERMONT
STATE OF VERMONT, WATER QUALITY DIVISION



POROUS ASPHALT SIDEWALK
CITY OF ST. ALBANS, VERMONT



CISTERNS

collect, store and reuse

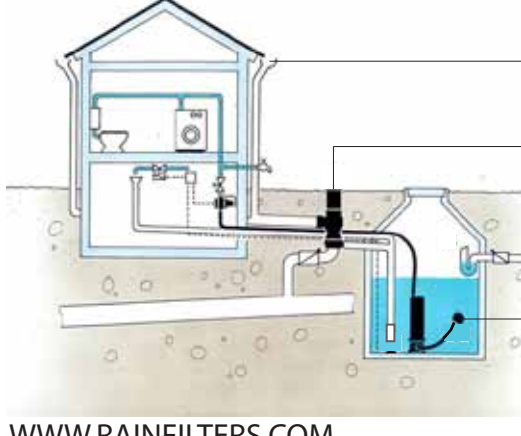


HERITAGE AVIATION ROOF WATER STORAGE
H.KEITH WAGNER I PARTNERSHIP



TOWN OF MIDDLEBURY, STORMWATER COLLECTION
VHB INC.

Home Scale Cistern



roof water collection
rain water debris filter
overflow infiltrates through soil to ground water
floating suction filter, water pumped up for house use (not for drinking water)

WWW.RAINFILTERS.COM

GREEN ROOF

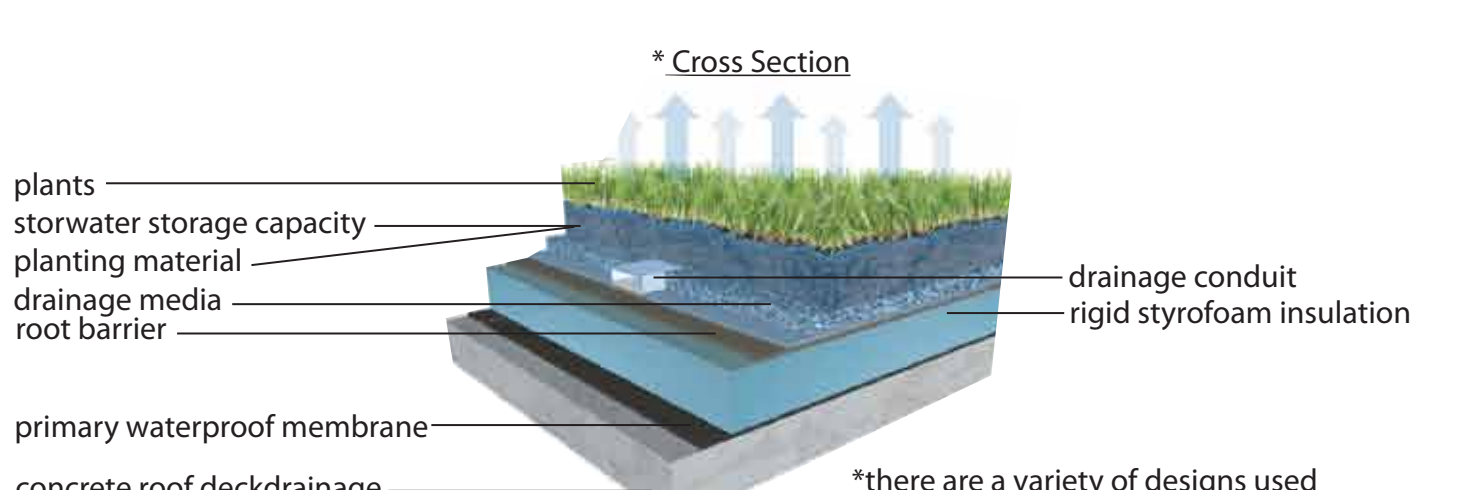
catch, disperse, filter and cool



FLETCHER ALLEN HOSPITAL, BURLINGTON, VERMONT
H.KEITH WAGNER I PARTNERSHIP



WARREN, VERMONT
CYNTHIA KNAUF LANDSCAPE DESIGN INC



plants
storwater storage capacity
planting material
drainage media
root barrier
primary waterproof membrane
concrete roof deck drainage

*there are a variety of designs used for green roof structures, varying in depths and materials

CONSTRUCTED WETLANDS

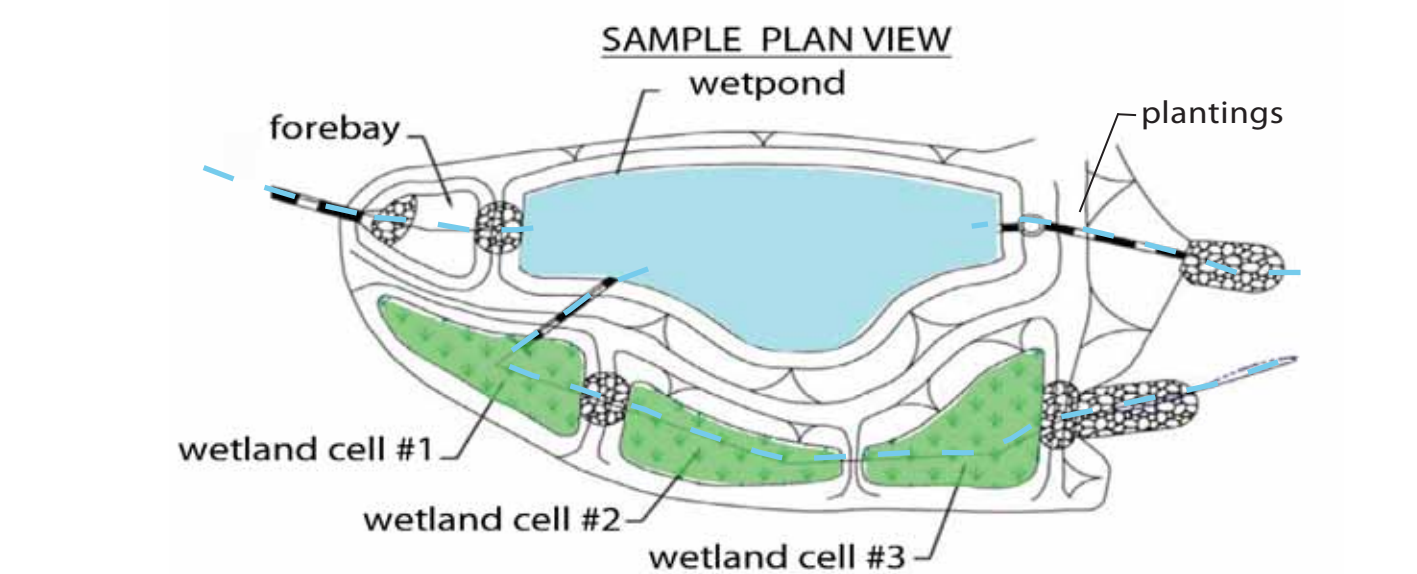
filter, infiltrate, habitat



JAMAICA, VERMONT
TERRAGENEUS LANDSCAPE ARCHITECTS



CHAMPLAIN COLLEGE, BURLINGTON, VERMONT
ORW LANDSCAPE ARCHITECTS AND PLANNERS



SUPPORTING TOWN PLAN AND ZONING POLICY FOR LOW IMPACT DEVELOPMENT

NATURAL RESOURCES

- Create inventory, analysis and protection tools for the following:
 - Surface water
 - Ground water
 - Wetlands
 - Forests and village trees
- Enforce riparian buffer regulations
- Adopt fluvial erosion hazard zones

ROADS

- Follow VTRANS water quality best management practices
- Identify impaired ditches and culverts
- Follow 'Vermont Better Back Roads' manual
- Incorporate LID stormwater techniques into street networks
- Protect and plan for healthy trees in village centers

BUILT ENVIRONMENTS

- Limit run-off from developed areas and construction sites
- Minimize new impervious surfaces
- Require construction practices to conserve water and collect stormwater on-site
- Impose limitations on where development can be sited
- Access existing stormwater infrastructure and ways to improve it with LID techniques
- Prohibit development in flood plains

MUNICIPAL WATER SYSTEMS

- Create inventory and analysis of sewage and septic systems in area
- Identify development limitations for sensitive sites
- Identify drinking water supply, quality and protection tools

RESOURCES

- ▶ **Water Quality Division**, Vermont Department of Environmental Conservation, www.vtwaterquality.org (802)241.3777
- ▶ **Vermont LID Atlas and Map**, Winooski Natural Resource Conservation District, www.vacd.org/~winooski/ (802)865-7895
- ▶ **Model Low Impact Development Bylaw**, Vermont League of Cities and Towns Resource Center, www.resources.vlct.org/ (802)229.9111
- ▶ **Vermont Better Back Roads Pocket Guide and Manual**, Natural Resource Conservation Service, www.vt.nrcs.usda.gov (802) 388-6748
- ▶ **Stormwater Center**, University of New Hampshire, www.unh.edu/unhsc/ (603)767.7091
- ▶ **Center for Low Impact Development**, www.lowimpactdevelopment.org/ (301)982-5559



Addison County
Regional Planning Commission