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

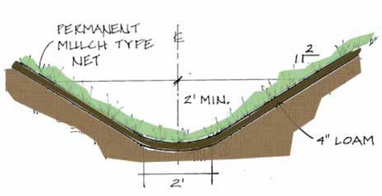
BIOSWALE

convey and filter

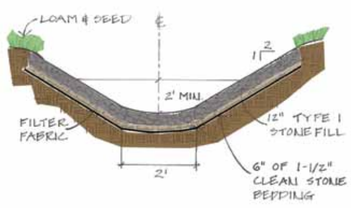
WWW.MASS.GOV

VERMONT BETTER BACK ROADS PROGRAM

Grass swale with less than 5% slope



Drain rock swale for slopes 5%-10% slope

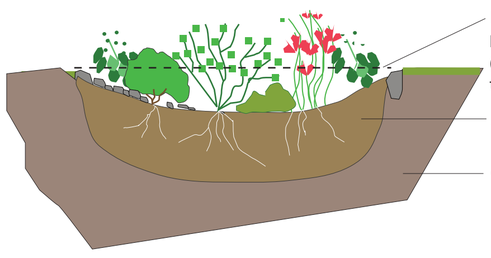


RAIN GARDEN

filter and infiltrate

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

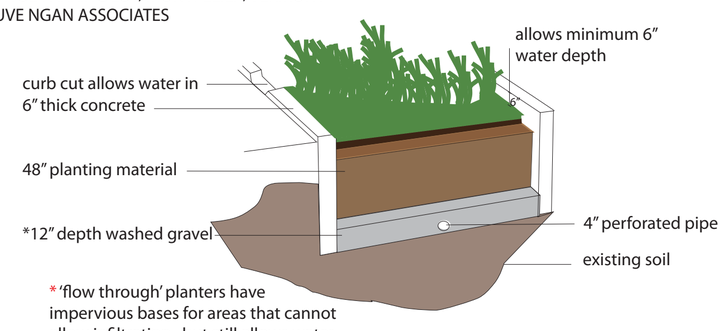
RUTLAND, VERMONT
RUTLAND NATURAL RESOURCE CONSERVATION DISTRICT



STORMWATER PLANTER

filter and *infiltrate

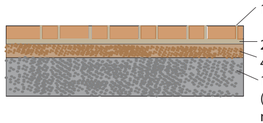
CAPITOL PARKING LOT, MONTPELIER, VERMONT
NEUVE NGAN ASSOCIATES



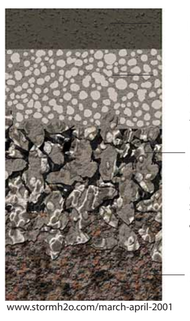
*'flow through' planters have impervious bases for areas that cannot allow infiltration , but still allows water to slow down and sediments to drop out

PERVIOUS PAVEMENT

infiltrate and filter



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



www.stormh2o.com/march-april-2001

POROUS ASPHALT SIDEWALK
CITY OF ST. ALBANS, VERMONT

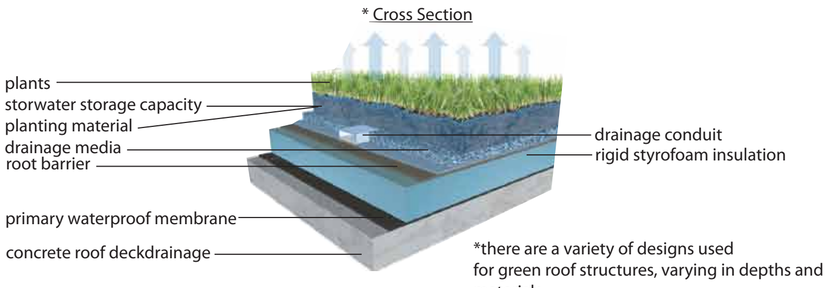
GREEN ROOF

catch, disperse, filter and cool

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

WARREN, VERMONT
CYNTHIA KNAUF LANDSCAPE DESIGN INC

* Cross Section



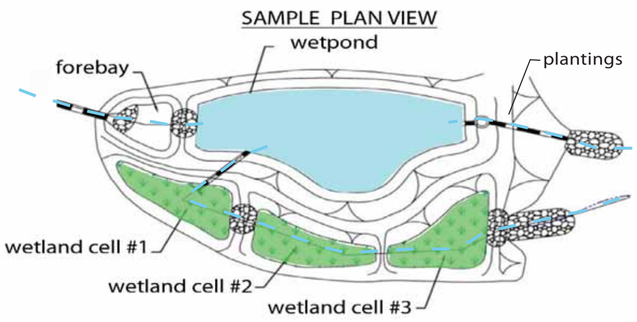
*there are a variety of designs used for green roof structures, varying in depths and materials

CONSTRUCTED WETLANDS

filter, infiltrate, habitat

JAMAICA, VERMONT
TERRAGENEOUS LANDSCAPE ARCHITECTS

CHAMPLAIN COLLEGE, BURLINGTON, VERMONT
ORW LANDSCAPE ARCHITECTS AND PLANNERS



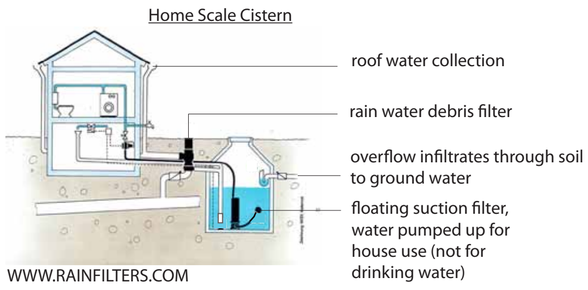
CISTERNS

collect, store and reuse

HERITAGE AVIATION ROOF WATER STORAGE
H.KEITH WAGNER I PARTNERSHIP

TOWN OF MIDDLEBURY, STORMWATER COLLECTION
VHB INC.

Home Scale Cistern



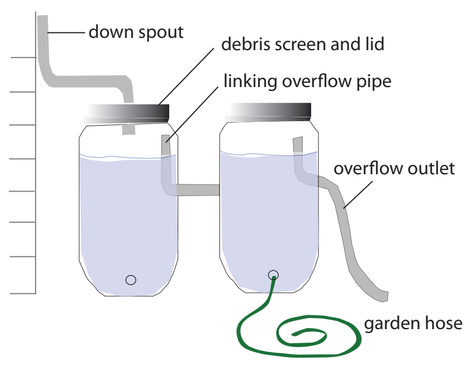
WWW.RAINFILTERS.COM

RAIN BARRELS

collect, store and reuse

WINOOSKI NATURAL RESOURCE CONSERVATION DISTRICT

Rain Barrel with Overflow Barrel



SILVA CELLS

support tree growth, infiltrate

healthy tree provides shade and absorbs stormwater

typical planter above ground

strong structural support, and ample space for healthy root growth and water infiltration

WWW.DEEPROOT.COM

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 exisitng 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