

Green Design Guidelines

Ray Nichols
Hopewell Township
Environmental Commission

March 30, 2009



Green Building Topics

- o Sustainable Sites**
- o Water Efficiency**
- o Energy & Atmosphere**
- o Materials & Resources**
- o Indoor Environmental Quality**
- o Innovation & Design**



Sustainable Sites Considerations

- Steep Slope Ordinance
- Existing Tree Ordinance
- Bicycle & Pedestrian Amenities
- Stream Corridor Protection Ordinance
- Porous Pavement



Steep Slope Ordinance

- Municipalities can enact a steep slope ordinance to regulate development on steep slopes (15% grade or $>$).
- See Hopewell Township, Ordinance 07-1411.



Stream Corridor Protection Ordinance

- The New Jersey Municipal Land Use Law authorizes each municipality to plan and regulate land use in order to protect public health, safety and welfare by protecting and maintaining native vegetation in riparian areas.
- See Hopewell Township, NJ Stream Protection Corridor Ordinance



Porous Pavement

- A municipality can require that the "surface treatment of driveways shall maximize, to the greatest extent practicable, the use of pavement materials for that include porous stone, porous bituminous concrete, porous Portland Cement concrete, other porous pavement treatments or any other surface such as open-jointed pavers, "soft" paving materials including wood mulch and crushed shell, and plastic geocells or lattice-like materials that hold aggregate or topsoil in their cells to prevent displacement and compaction or base construction such that the design and construction maximizes infiltration of rainfall runoff." –



Porous Pavement

- Hopewell's Revised Design Standards cites RSIS alternative pavement design standards:
 - conform with one of the following:
 - AASHTO Method of Flexible Pavement Design,
 - Caltrans Method of Flexible Pavement Design,
 - Asphalt Institute Method,
 - AASHTO Method of Rigid Pavement Design,
 - Fatigue Strength Method of Design,
 - Multilayer Elastic Analysis, or
 - National Crushed Stone Association Design.



Bicycle & Pedestrian Amenities

- Municipalities can require building and site plans to include site amenities that enhance safety and convenience and promote walking or bicycling as an alternative means of transportation.
- Site amenities may include bike racks and/or benches for a designated percentage of building occupants or site visitors.



Protect Existing Trees

- Adopting ordinances for the protection of trees is a valid exercise of the municipal police power for the protection of the health, safety and welfare of its residents.
- Considerations:
 - Public or private land
 - Contiguous woodlands / forests
 - Specimen or historic trees
 - Endangered or threatened species habitat
 - wetlands



Protect Existing Trees

- **However**, the methods for achieving this must relate directly to the stated goal of the ordinance and the ordinance must be clear and explicit in its terms.
- *NJ Shore Builders vs. The Township of Jackson* showed found that payments to a Tree Escrow Fund can not be made in lieu of replacing removed or protecting existing trees.



Water Efficiency

- ● ● | Manage rainfall & snow melt

**Start with
the Site
Plan**



Nonstructural Strategies

Stormwater Rules N.J.A.C. 7:8-5.3(b)

- 1. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.**
- 2. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.**
- 3. Maximize the protection of natural drainage features and vegetation.**
- 4. Minimize the decrease in the pre-construction “time of concentration”**



5. Minimize land disturbance including clearing and grading.

6. Minimize soil compaction.

7. Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.

8. Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.

9. Provide preventative source controls.

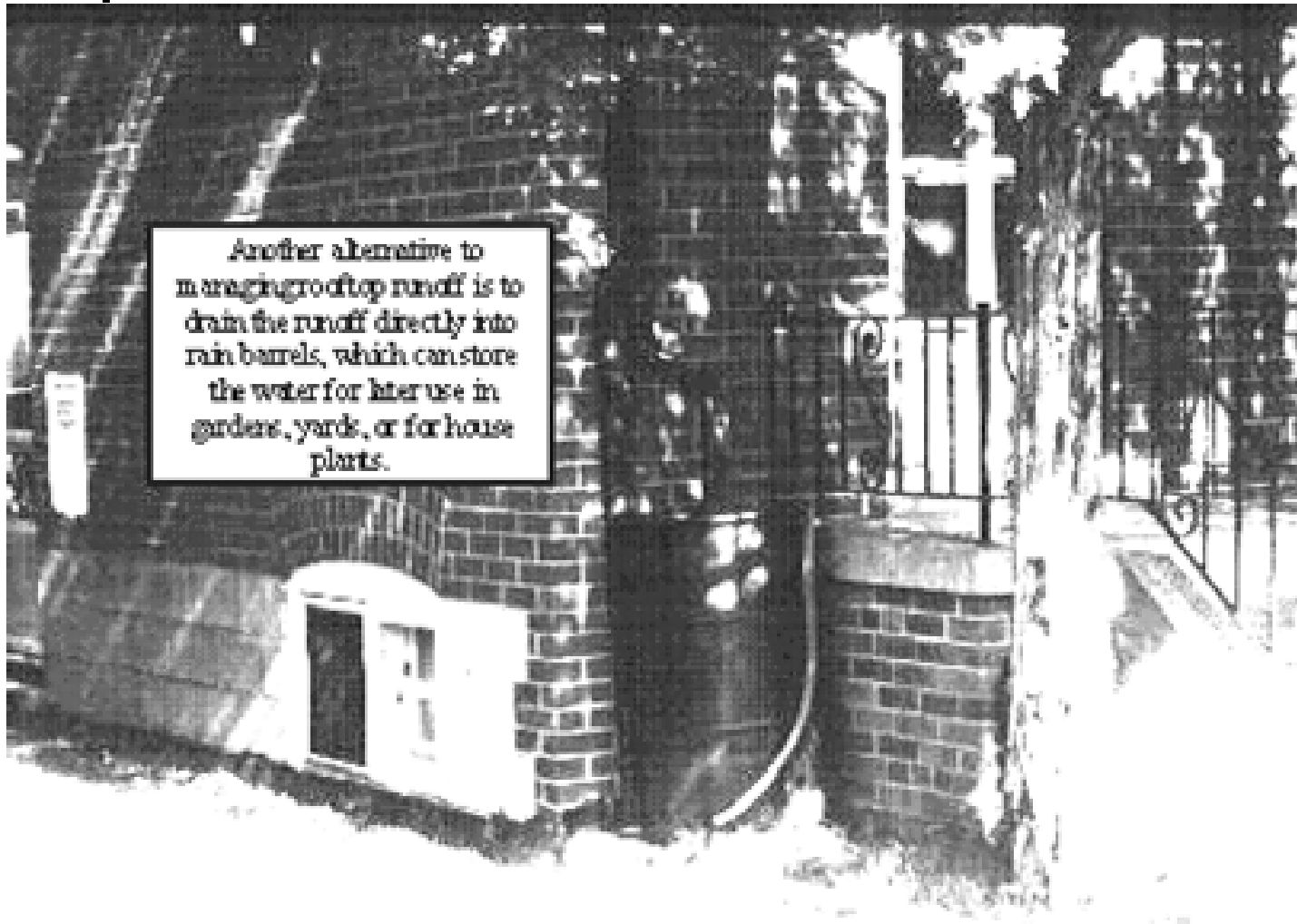
- minimize disturbance of natural drainage features and vegetation,
- minimize clearing, grading,
- promote low maintenance landscaping, encourage sheet flow,



- ● ● | Nonstructural Stormwater Management Strategies
N.J.A.C. 7:8-5.3

Nonstructural strategies shall be incorporated to the maximum extent practicable to meet the recharge, quality, and quantity criteria

- ● ● **Treat runoff as a reusable resource**



Copyright 2000 Center for Watershed Protection



Vegetation and Landscaping

- Vegetated Filter Strips
 - Filter stormwater runoff
 - Provide location for re-infiltration
 - Increase time of concentration
 - Can be preserved or created
- Deed Restriction for vegetation
 - Specific portion of parcel OR
 - Percentage of parcel or lot



Native Landscape Ordinance

- Municipalities can create a native landscape ordinance to increase retention of native plants in all developments and prevent use of invasive exotics.
- See Sarasota, FL example University of Florida,
<http://edis.ifas.ufl.edu/UW253>



Low Impact Landscaping

- In order to gain freedom from all the expenses (time and money) and environmental impacts:

Create a yard with native plants.

They will need:

- *few, if any, chemicals*
- *less water*
- *infrequent, if any, mowing*



Low Impact Landscaping

- The cost of maintaining a landscape for a year averages \$500 or more including pesticides, fertilizers, water, and mowing.
- The pollution created from a gas-powered mower in one year is equivalent to a car driving 14,000 miles
- A lawn mower pollutes in one hour as much as a car driving 350 miles
- Between 30 and 60 percent of fresh water is used on lawns
- With careful planning, landscapes could require less irrigation, no need for mowing, and reduced dependence on chemical fertilizers and pesticides.



Xeriscape Landscape Ordinance

- Xeriscape or water efficient plantings
- Ideal for coastal communities
- **For examples see-**
 - Boulder, CO Title 9 Land Regulation, Chapter 3.3: Site Development Standards
 - U of Florida, <http://edis.ifas.ufl.edu/UW253>



Water Conservation

- Graywater recycling systems



Water Protection

- o Integrated Pest Management



Water Conservation

- o Low-flow fixtures



Energy & Atmosphere

- o Reducing **Energy Consumption and Atmospheric Pollution (Greenhouse Gas Generation)**
means considering: Minimum energy performance; Window glazing factor; Programmable thermostats;



Energy & Atmosphere

Encourage Energy Efficiency:

- **Energy Star appliance standards**
- **Energy Star Home/Building Rating Standard**
- **R-value of Insulation**
- **R-value of windows**

Note: Municipality can not mandate tougher standards than State's Standards



Energy & Atmosphere

Possible Local Ordinances:

- Reflective Roofing
- Small Windmill Ordinance
- Solar Access
- Light Pollution Reduction



Water Protection

- o Integrated Pest Management



Materials & Resources

- o Construction Waste: Divert 50%



Materials & Resources

- o Green Purchasing



Materials & Resources

- Use Local & Regional Materials
- Reuse Materials on site wherever possible



Materials & Resources

- Re-use materials from site



Indoor Environmental Quality

- o Radon



Indoor Environmental Quality

- o Low/No VOC paints, sealants, and sealant primers



Innovation & Design

- Green Building Operations & Maintenance Manual
- LEED Certification
- Incentives for LEED Certification
- Green Building & Green Point System Ordinance
- LEED for Neighborhood Development Pilot Draft Project Checklist



Thank You

Ray Nichols

Hopewell Township Environmental
Commission

Acer-Nichols@verizon.net

(609) 737-7442

<http://www.hopewelltp.org/>