

Rain Garden and Green Roof Operation and Maintenance

Kevin Tungesvick, Restoration Ecologist, Spence Restoration Nursery



Tips for Choosing Plants

- Two planting zones for most infiltration BMPs – one for slopes and rim using species that prefer better drainage and one for the bottom of the basin using plants that are more inundation tolerant
- Grasses and sedges should be spread throughout
- Swales or other areas with flowing water should be dominated (75%) by grasses and sedges due to their effectiveness at erosion control

Appropriate Species can Survive Unusual Weather Patterns

- Plants may go dormant during droughts but will survive if established
- Persistent heavy rains like those of June 2008 may cause longer duration ponding that can result in losses of less tolerant species



Items to Check Prior to Final Completion

- Medium is percolating as designed – this will require a significant rain event to evaluate
- No sedimentation or clogging of the medium has occurred
- Underdrain (if present) functioning as expected
- Plants and mulch are properly installed and not suffering from washout or other problems
- Provisions are in place to irrigate plants for establishment during the first growing season

Typical Establishment During 1st Two Growing Seasons



Long Term Infrastructure Maintenance of Infiltration BMPs

- Remove accumulated sediment
- Remove trash and debris monthly
- Inspect soil and repair eroded areas
- Verify drain out time of system
- Check underdrain for debris
- Clear overflow of leaves or debris
- Add mulch as needed

Long Term Vegetation Maintenance of Infiltration BMPs

- Remove annual weeds, especially during the first growing season (mulch greatly reduces this)
- Monitor for mortality after extreme drought or flood
- Mow and remove previous years herbaceous growth in March of each year for an attractive appearance
- Check trees and shrubs for health
- Monitor for invasive species

Invasive Species of Infiltration BMPs

Grasses and Grass- Like Species

- Reed Canary Grass (Phalaris arundinacea)
- Common Reed (Phragmites australis)
- Cattails (Typha spp)
- Lawn grasses

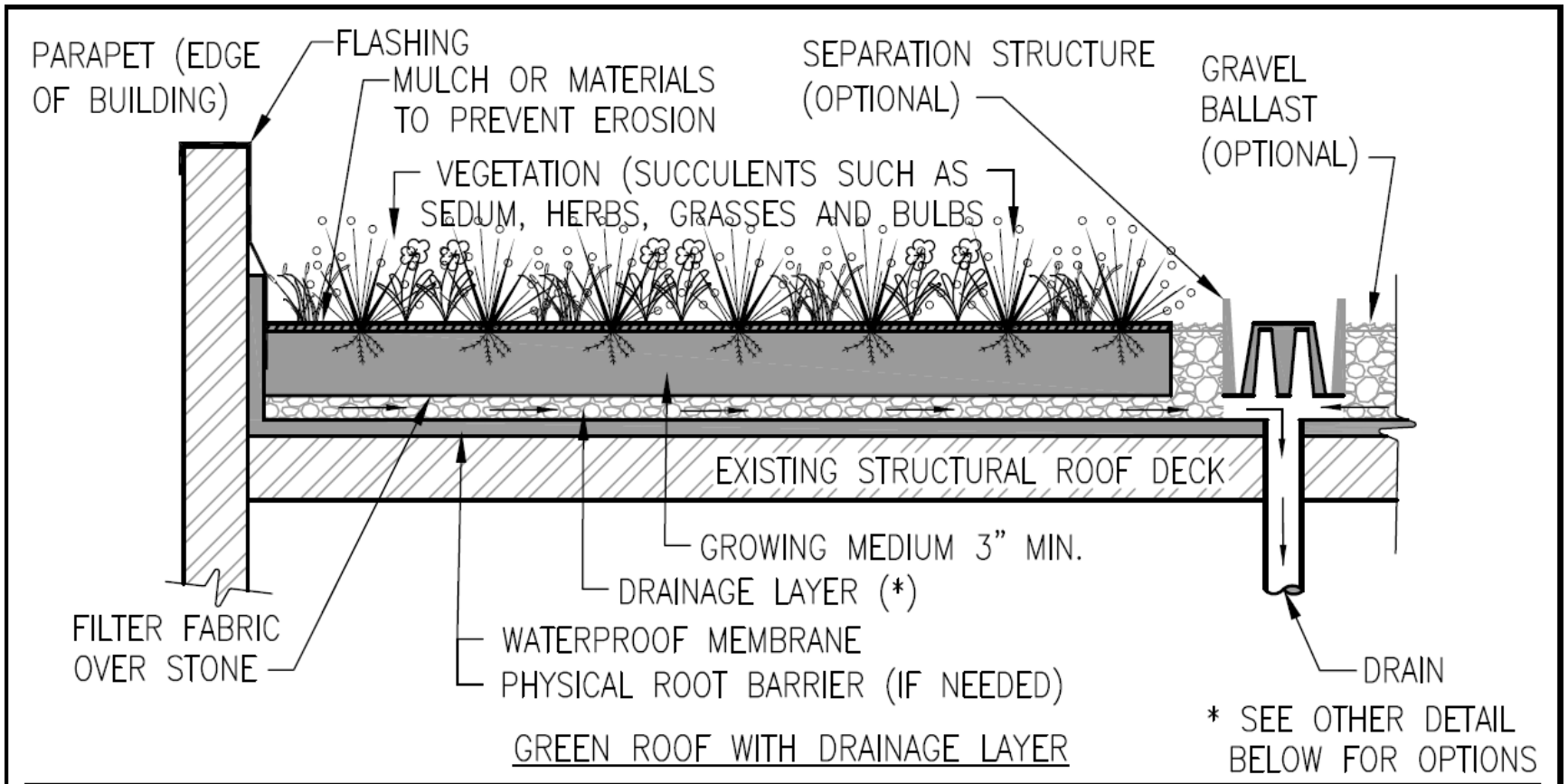
Broadleaf Species

- Purple Loosestrife (Lythrum salicaria)
- Woody Shrubs (Buckthorn, Honeysuckle etc)
- Trees (Cottonwoods, Willows, Silver Maples)

Green Roof Operation and Maintenance



Typical Green Roof Cross Section



Green Roof Case Study

- Location: Portland, Oregon
- Constructed: 2003
- Type: Extensive- 4" growing medium



Green Roof Case Study

- Failure Areas
 - Drainage
 - Plant Selection
 - Soil
- How were the failures addressed?

Green Roof Case Study

- An improved drainage system
- Regionally appropriate plants
- Improved soil mix
- “Success is not final, failure is not fatal, it is the courage to continue that counts.”



Post-Construction Green Roof Inspection and Maintenance

- Inspect to ensure that the green roof was installed and is working properly
- Inspect membrane for leaks and tears – repair or replace if necessary
- Inspect areas for potential erosion or sediment accumulation
- Inspect to see that plants were installed properly and are providing adequate coverage

Green Roof Structural Inspection and Maintenance

- Foundation checks for any leaks or structural deficiencies
- Check for tear or perforation of membrane
- Check for clogged inlets or outlets after significant storm events
- Check for standing water after significant storm events. Record time/date, precipitation quantities, and duration of ponding
- Relay this information to the engineer for possible modifications/repairs

Green Roof Vegetation Inspection and Maintenance

- Provisions to water plants if needed for establishment
- Maintain 90% vegetation coverage
- Check for dead or stressed vegetation
- Check for tall or scorched grass
- Monitor for weeds and invasive plants including woody species

Additional Green Roof Inspection and Maintenance Items

Growing/Filter Medium

- Check for exposed soils (poor vegetative cover)
- Check for gullies
- Check for obstructions or debris

Other

- Are mechanical units free of leaks and spills
- Is there any threat to Public Health such as ponding (for mosquito larva), excessive bird droppings (lack of peregrine falcons)

Additional Resources

- Green Roofs are complex systems that involve knowledge in many areas
 - Green roofs for healthy cities offers courses and a certification (www.greenroofs.com)
 - Training for Inspection and Maintenance

Contact Information

Kevin Tungesvick

Restoration Ecologist

Spence Restoration Nursery

2220 East Fuson Road

Muncie, IN 47302

Phone (765) 286-7154

Fax (765) 286-0264

Email : kevin@spencenursery.com

