From Plan to Planted-Part 1
Site Assessment & Planning

Soaking it in: The A-Z of Stormwater Management in the Landscape for Professionals

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Plan for Success
Determine type of site

- Residential
- Commercial/Industrial
- Road/Transportation Corridor
Open your Eyes to Stormwater Design Options

- Downspouts – disconnected or not?
- Existing grading
- Proximity to natural areas
Open your Eyes to Stormwater Design Options

- How much water?
- From where?
- To where?

HILLSIDES
Open your Eyes to Stormwater Design Options

How much water? From where? To where?

PAVED SURFACES
Open your Eyes to Stormwater Design Options

How much water? From where? To where?

ROOFTOPS
Open your Eyes to Stormwater Design Options

• How much water?
• From where?
• To where?

OUTFALLS
Good Detective Work

- Catch potential problems before they occur
- Work with other professionals
- Work with your client
First Steps

- Listen
- Observe
- Investigate
- Problem Solve
Listen

Your client knows their property and challenges best – believe them!
Listen

- Property may already have soakage trenches or other drains installed
- Basement water problems
- Flooding events
- Puddles in the yard
- Soggy lawn
Observe
Wet Spots
Observe
Weeds

- Moss
- Creeping Buttercup
- Horsetail
- Lesser Celandine
- Arum
- Rush
Observe

Drainage trenches
Observe

- Rivulets, water paths and silt deposits
- Erosion
Observe

Potholes
Observe Warning Signs

- Active landslide areas
- Cracks in soil
Observe Warning Signs

Undermined footings
Investigate

- Downspout clogged, unattached or leaking
- Gutters overflowing
Investigate

Positive drainage away from house
Investigate

- Source of water
- Perched water table
- Seeps
Investigate

- Right of ways
- Septic or drain fields
- Utility locations
Investigate

• Permit requirements
• Engineering
• Easements
• Maintenance agreements
Problem Solve

- Can the water be absorbed onsite?
- Is there sufficient drainage for a rain garden?
- Is engineering required – check with your jurisdiction

12” x 12” perc test hole
Problem Solve
What type of Facility?

Infiltration swale
or Rain Garden

- Good drainage
- Relatively flat
- Adequate space
- Weirs slow the flow
- Least expensive

UNLINED/ NO PERMIT in most jurisdictions
Problem Solve
What type of Facility? LINED/PERMITS

Flow Through Planter

- Poor soils
- Unstable slopes
- High water volume
- Tight spaces
Problem Solve
What type of Facility?

Flow Wells

- Increases holding capacity in small spaces
- Hand labor
- Moderate cost
Case Study – Flow Well

Dig out
Case Study
Flow Well
Problem Solve
What type of Facility?

Dry Wells

- For large volumes of stormwater
- Limited space
- Most expensive
Case Study
Dry Well
Dry Well Install
Case Study – Dry Well

- Large volume, small space
- Multi-family property
Case Study – Dry Well

Under impervious driveway
Problem Solve
What type of Facility?  Retention Pond

- Slows high runoff volume
- Prevents erosion
- Reduces contamination threat to natural systems
- Overflows to stream or treatment facility
Case Study – Retention Ponds

Newly Planted
Rain Garden Review

- Do a Percolation Test!!
- 2”/hr or greater infiltration rate is ideal
- Not for low spots that hold water now
- Calculate 10% of roof area serving each downspout
- Prepare for overflow – it will occur
Rain Garden Review

- Shallow bowl shape
- 3:1 sloping sides
- Flat at bottom: How deep?
Rain Garden Review
Practical Considerations

• Careful when excavating around tree roots
• Overflow lower than inlet
• Armor inlet to reduce erosion
• Grade bottom of larger rain gardens away from inlet
Rain Garden Review
if perc rate is \(\frac{1}{2}\)” per hr or less:

- Oversize if necessary-20% of impervious area or more
- Dig deeper to find a more permeable layer
- Make it deeper with more amended soil or drain rock under-gallery or flow well
- Use overflow area for secondary infiltration
Case Study: Adding Capacity

Layout & Construction

Deeper zone
Case Study: Adding Capacity

Layout & Construction

Deeper zone

Overflow pipe
Case Study: Adding Capacity

After planting
Rain Garden Review

if perc rate is $\frac{1}{2}$” per hr or less:

Create a series of small linked rain gardens

Inlet pipes
Rain Garden Review

if perc rate is $\frac{1}{2}''$ per hr or less:

Add capacity across the slope
Rain Garden Review
setbacks + guidelines:

• 10’ from basements
• 2’ from slab foundation or crawlspace
• 5’ from property lines
• Not over drain fields, oil tanks, utilities
• Not in the right of way/parking strip
Case Study: Right of Way
City of Portland Project

- Multi-family high density
- Design, Spec & Permitting by city
- Multiple inlets
- Overflow to street
Case Study: Right of Way
City of Portland Project
Rain Garden Review
setbacks + guidelines:

10’ from retaining walls
Rain Garden Review

• May not be suitable for steeply sloping properties – permit needed!
• Do not over-saturate hillsides
• Consult with a geotechnical engineer
• Know when to walk away

Photo courtesy
Mike Zacchino, The Oregonian
Go with the Flow