# Green Rooftops

## A Practical Solution

# Lecture Outline

- Concept - Examples
- Benefits
- Costs
- Details
- Advocacy Goals

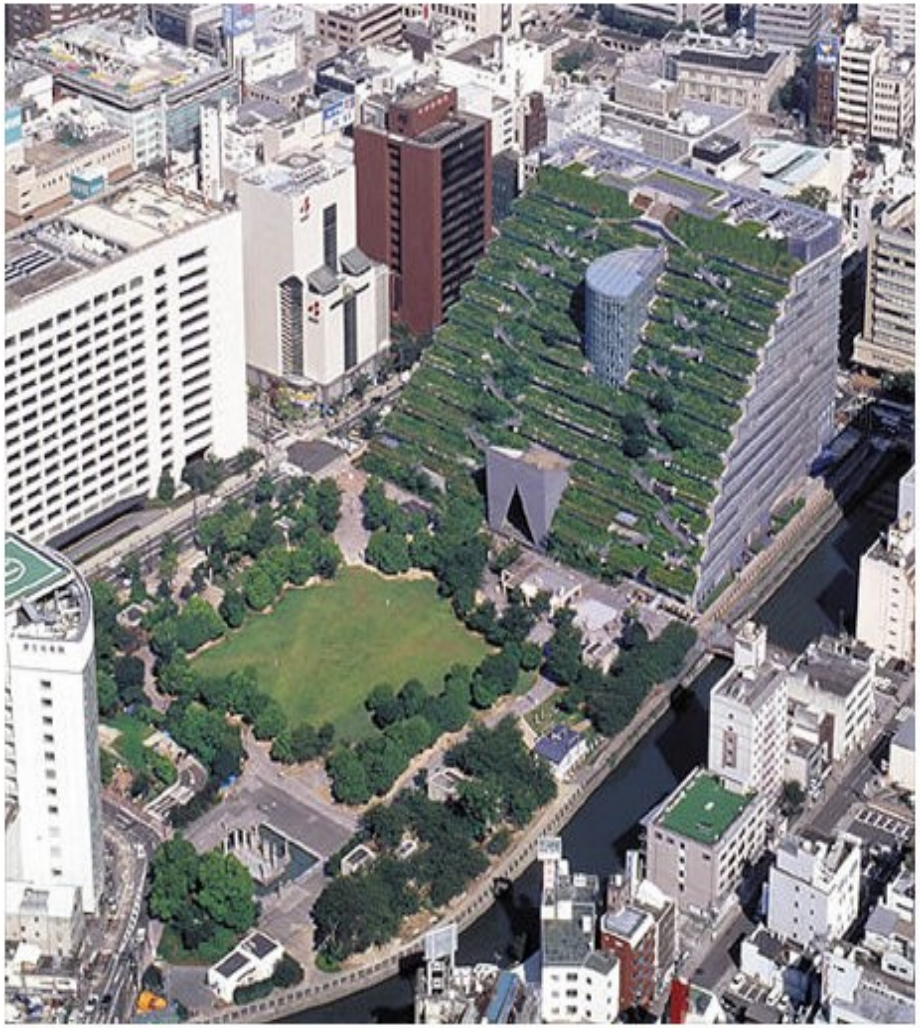
# Green Roof with Goats

# Extensive Residential Green Roofs

# Intensive Commercial Green roofs

Fukoka, Japan

# More Views



# Intensive Multifamily Residential

Huntervasser, Austria

# Vancouver Library

# More Views

# Roof Vegetable Garden

# Benefits of Green Roof

- Thermal Efficiency – 30-50% lower heating/cooling costs
- Reduced HVAC Size for Building
- Reduced Heat Island Effect
- Doubles or Trebles Life of Roof Membrane
- Reduces Storm-water Runoff by 70%
- Aesthetic – Pleasant to the Eyes
- Reduces Building's Impact on Wildlife
- Reduced Storm-water Control Costs

# Intensive vs Extensive

Intensive Roof

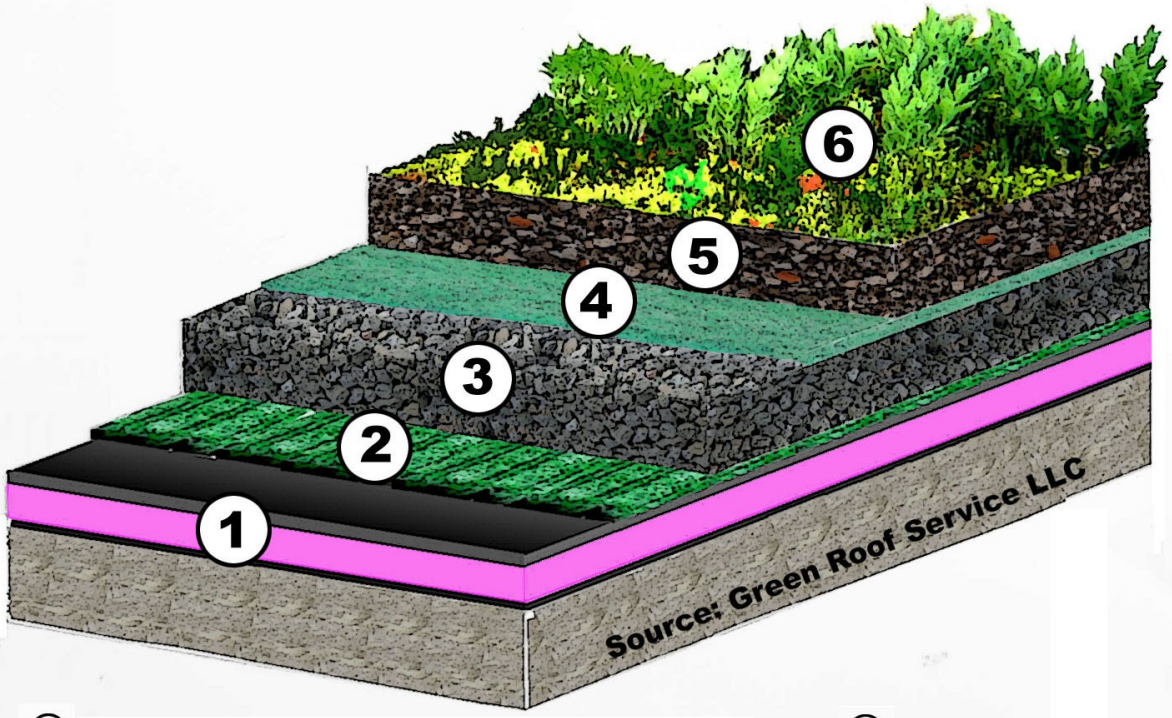
- 6” or more soil depth
- Can support shrubs & trees
- Requires Concrete Deck

Extensive Roof

- 4”-6” soil depth
- Can be supported with wood or steel trusses
- Costs about $8 per sf
- Requires irrigation
- Drought resistant plants

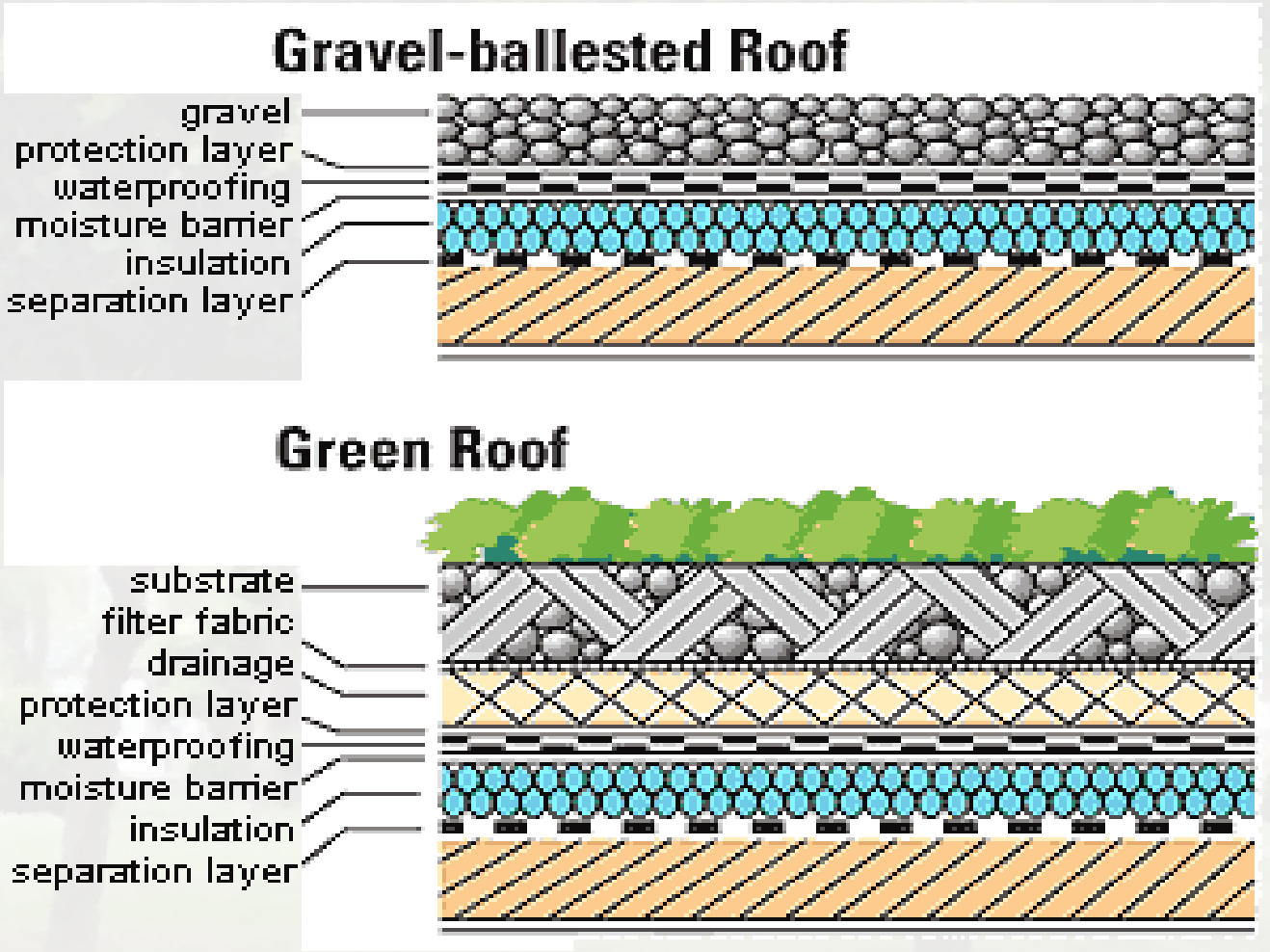
# Components – Extensive Green Roof

**Functional layers of a typical extensive Green Roof**




① Roof deck, Insulation, Waterproofing
② Protection- and Storage Layer
③ Drainage- and Capilarity Layer
④ Root permeable Filter Layer
⑤ Extensive Growing Media
⑥ Plants, Vegetation

# Green Roof vs. Gravel Ballast



# Advocacy Techniques

- Rapid Permitting
- Sewer Connection Discounts
- Sewer Bill Discounts

# Room for Improvement

- More Emphasis on Beauty
  - (Grey-water Irrigation allows Prettier Plants)
  - Patterns of Plants and Flowers
- Simplified Roof Systems
  - Integrated Connecting Panels
  - Anti-Soil Slumping Systems