Today's Talk
- Introductions
- Benefits of Green Roofs
- Types of Green Roofs
- Two Local Examples
- Time for Questions

Who is here today?
- Landscape Architects?
- Planners?
- Civil Engineers?
- Developers?
- Architects?
- Arborists?
- Others?

Rob Harrison AIA
- Founding member of the Northwest EcoBuilding Guild
- Given workshops and talks on green design throughout Washington and Oregon since 1993.
- Graduated from the University of Toronto in 1979, and after practicing in New York City for eleven years, relocated to Seattle in 1990.
- In 1992 opened Robert Harrison Architects, specifically to focus on “lyrical sustainable design.”
- Since then RHA has completed more than thirty built projects, each of which has incorporated a broad range of energy- and resource-conserving, healthy building approaches.

Benefits of a Green Roof
- Slows & filters rainwater run-off
- Reduces urban heat island effect
- Extends life of roof membrane
- Reduces heating and cooling loads
- Absorbs sound
- Provides habitat and food for birds & insects
- Additional slug-free garden space
- Beautiful!
Green Roof Types

- Intensive = Thick
  - soil 12" - 18" deep or more
  - walkable
  - can support varied landscape
  - ~60 lbs/SF
  - requires serious structure
  - more expensive

- Extensive = Thin
  - lightweight soil 2 1/2" - 5" deep
  - not walkable on a daily basis
  - plants must be chosen carefully
  - ~17 lbs/SF
  - fairly easy to upgrade structure
  - less expensive

Extensive Green Roof Assembly

- Framing
- Structural sheathing
- Self-adhesive waterproof membrane at edges (Ice & Water Shield)
- Single ply membrane (EPDM or TPO)
- Drainage layer (Enkadrain)
- Filter fabric/root barrier
- Lightweight soil
- Plants
Building Design Considerations
- Slope
- Orientation
- Access
- Drainage

Two Projects
With Green Roofs

Sproull-Radke Garage/Workshop
Kirkland, Washington
- Architect: Robert Harrison Architects
- Structural Engineer: Swenson Say Faget
- General Contractor: Sunshine Construction
- Interior Fit-out: Jim Sproull

Sproull-Radke Garage/Workshop
Green Roof Team
- Hadj Design
- NW EcoBuilding Guild Green Roof Project
- Snyder Roofing
- American Hydrotech
- Local 54 Roofers & Waterproofers Union
- King County & City of Seattle

Existing Site
Planted Roof

View from North

Earth Hero Award

**Barbat-Harrison Garage**

*Seattle, Washington*

- Owners: Rob Harrison and Frith Barbat
- RHA Project Team: Rob Harrison AIA, Dan Johnson
- Pro-Bono Structural Engineering: SlideRule Engineering Works
- General Contractor: CJR Associates
- Metal Shelving & Pegboard: Nathan Moss
- Electrical: Tri-Star Electric
- Garage Door: Cressy Door
- Salvage Person-Door: Earthwise
- Post-Industrial Waste Concrete Skull: Scot Hasenkamp
- Photography: Rob Harrison AIA

**BARBAT-HARRISON GARAGE**

*Seattle, Washington*

- Green Roof Assembly Design, Sedum Selection, Installation & Planting: Hadji Design
- Flashing Roof Edge: design RHA, fabrication Pacific Sheet Metal
- Lightweight Soil: Soil Dynamics
- Roof Membrane: Firestone TPO
- Landscape Advice: Linnea Ferrell, Landscape Architect
- Eco Turf Seed Mix: D. F. Marks
Things to Remember
- easy access for maintenance & fun
- provide irrigation for first season
- use SMACNA detailing
  - Roof Drain
  - Scuppers
  - Roof Edge
- keep organics in the soil low
- vary plant heights and types

Net Resources
- www.ecobuilding.org
- www.greenroofs.com
- www.hadj.net
- www.harrisonarchitects.com
- www.seattle.gov/dpd/Sustainable_Building

Sensitive New Age Garage

A Norman Rockwell Moment
Live, design and work in a way which is consistent with deeply held values and ideals. Recognize personal responsibility for the diverse implications of design decisions. Build consensus, share ideas, cooperate and collaborate.

Find inspiration and models in ongoing ecological processes. Accommodate and celebrate the cycle of the seasons, days and nights, and other natural rhythms. Value all stages of human life. Honor diversity.

Preserve, enhance and express the unique and special qualities of each site, region and climate; local history and culture. Make site-specific works which, like maps, orient their inhabitants and allow them to “place” themselves, and to dwell, in that context.

Think locally, act locally. Maintain existing community ties and support the development of new ones. Work towards making local life as independent and self-sufficient as possible.
Make the sources of materials, food, water and energy understandable and controllable. Make the processes and cycles of production, consumption, “waste” and re-production visible.

Ask “What is enough?” Be frugal and humane in the acquisition and use of energy, and natural and financial resources. Live on the interest of the natural world instead of depleting its capital. Allow for expansion and change of use without extensive or expensive remaking.

Begin design with poetic dreams and memories of lived experiences and ideal places, rather than with abstractions of art, science or technology. Make places that reflect the passage of time and allow their stories to be told.

Gracefully support the activities of everyday life. Make places that engage all of the senses. Make evocative places that invite modification, enhancement and embroidery to suit the personal needs and desires of the people who use them. Make places that respond to affection.

Techniques

Lyrical Sustainable Design

Settlement Ecology

Preserve and responsibly manage agricultural land, wildlife habitat, watersheds, and groundwater.

Infill existing urban fabric before building on undeveloped rural land.

Accommodate and support local manufacturers, food producers, craft and tradespeople; walking, bicycling, and public transit; home occupations and mixed-use zoning; community-based living and ownership arrangements such as shared housing, co-housing, & community land trusts.
A Healthier Life

- When choosing a building material, consider its effects on the health of the people who will produce, install, use, maintain, remove and dispose of it, as well as the environmental effects of its production and transportation.

- Install heating and ventilation systems that maintain high-quality indoor air.
- Reduce ambient and equipment noise.
- Rely on the energy of the human body (a form of solar energy) before turning to technological sources.
- Support organic farming and urban gardening.
- Reduce financial burdens.

Resource Conservation

- Make smaller places. Remodel before building new.
- Use durable, high-quality materials in well-crafted assemblies.
- Specify long-lasting appliances and equipment.
- Use renewable materials acquired from sustainable sources.

- Build-in places for home and workplace recycling.
- Plan for easy disassembly of buildings and components for re-use or recycling.
- Specify water-conserving appliances and plumbing fixtures. Plan for gray-water systems. Collect and re-use rainwater.
- Plant native, perennial, drought tolerant and edible landscaping. Recycle nutrients.

Energy Conservation

- Specify super-insulation, and super-insulating windows. Use air-tightening techniques.
- Use energy-efficient household and office equipment and heating and ventilating systems.
- Use local materials. Specify materials with low embodied energy.

- Make the most of natural light. Use energy-efficient artificial lighting.
- Where appropriate, use energy derived from decentralized, localized and renewable sources such as passive and active solar, photo-voltaic, wind and bio-mass.
Robert Harrison Architects

Incorporated

Robert Harrison Architects Incorporated is dedicated to helping our clients build high-quality green architecture in the Northwest. We offer a full range of architectural and interior design services for residential and small commercial new construction and renovation.

We base our work on principles of "lyrical sustainable design" - conserving energy and resources; using healthier materials and finishes; reducing long-term costs; and making poetic places.