VEGETATIVE ROOFS, PHOTOVOLTAIC ROOFS AND SPF

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The comments and opinions in this presentation do not necessarily represent or reflect those of SPFA.
Vegetative Roof Systems

- Environmentally friendly, generally speaking
- Create a usable outdoor space in an area that generally isn’t usable. Safety is an issue.
- Positive marketing position for roofing industry.
- New market segment – the “green and sustainable movement”
Vegetative Roof Systems – Possibilities

- Increase thermal efficiency
- Reduce interior noise levels
- Extend membrane service life
- Provide storm-water management, aesthetic benefits, LEED™ benefits
- Reduce rooftop temperatures
- Mitigate heat island effects
- Improve PV efficiency, urban air quality, wildlife habitats, community green space
Vegetative Roof Systems—Codes

- Code language is now in the International Building Code (IBC) 2009 Edition
  - Vegetative roof systems must meet fire and wind requirements for roof systems.
  - And hail requirements in certain locations.

- The issue: Test protocols are not in place!
Vegetative Roof Systems—Codes

- SPRI is developing 2 tests
  - VF-1, External Fire Design Standard for Vegetative Roofs
  - RP-14...Wind Design for Vegetative Roofs (not the exact title)
- For fire resistance, use the fire-resistance classification of the membrane
- For wind resistance...??
Vegetative Roof Systems—Codes

- Use requirements in IBC, Section 104.11 which allows the use of alternative materials not specifically mentioned in the code.

- Manufacturers should be able to provide information to verify vegetative systems meet the intent of the roof system requirements in IBC.
The NRCA Vegetative Roof Systems Manual--Second Edition
Vegetative Roof Systems

- Types
  - Intensive
  - Semi-intensive
  - Extensive
Vegetative Roof Systems

- Waterproofing membrane (not a roof membrane)
- Adhered to the deck/substrate
- Insulation above the membrane
- Use protected, but traditional construction details for roof systems
Vegetative Roof Waterproofing Membranes

- Hot-fluid-applied Polymer-modified Asphalt Membrane
- APP- and SBS-polymer-modified Bitumen Sheet Membrane
- EPDM membrane
- PVC membrane
- One- and Two-component, Fluid-applied Elastomeric Membrane
Could SPF be a vegetative roof waterproofing “membrane”?
Rooftop Photovoltaic Systems
Photovoltaic Systems

- Rack-mounted
- Framed
- Adhered/BIPV
Photovoltaic Terminology

Photovoltaic Types

- Crystalline (rigid)
- Thin Film (rigid or flexible)

Photovoltaic Technologies

- Crystalline silicon (c-Si)
  - Mono
  - Poly
- Amorphous silicon (a-Si)
- CIGS (Copper Indium Gallium diSelenide)
- Cadmium Telluride (CdTe)
Photovoltaic Panel Types

- Rack-mounted
  - Commonly glass-faced, rigid and crystalline silicon (c-Si)
- Thin Film
  - Rigid or flexible
  - Can be adhered to roof covering or rigid substrate
  - Amorphous silicon (a-Ci)
  - CIGS (Copper Indium Gallium diSelenide)
  - Cadmium Telluride (CdTe)
Photovoltaic Panel Types

- **Framed**
  - Commonly glass-faced, rigid and crystalline silicon (c-Si)

- **BIPV (Integrated)**
  - All technologies possible
PV installation options
Photovoltaic Systems

- No specific requirements in the International Building Code
- Electrical code requirements are in NEC, National Electric Code (NFPA 70), specifically in Article 690.
- NRCA believes a roofing contractor and an electrical contractor are necessary for a proper PV installation.
Photovoltaic Systems

Also check out the SPFA’s Industry Excellence Awards submission for an excellent example a rooftop PV system in conjunction with an SPF roof system.
Why a Roofing Contractor for PV Systems?

- Trained and insured to work safely on rooftops. Falls are still a concern for working at heights!

- Roofing Contractors understand:
  - proper flashing techniques
  - local codes
  - rooftop loading concerns
  - roof system protection during PV installation
Vegetative and PV systems

Photo courtesy of National International Roofing Corp. Huntley, Illinois
NRCA’s Guidelines for Roof-mounted Photovoltaic System Installations
Additional NRCA Documents


- Quality Control Guidelines for the Application of Sprayed Polyurethane Foam Roofing (NRCA / SPFA, 2003)

- A Field and Laboratory Assessment of Sprayed Polyurethane Foam-based Roof Systems (R. Dupuis, 1998)

- Performance of Sprayed Polyurethane Foam Flashings on CD-ROM (R. Dupuis, 2003)
Rooftop Photovoltaics:
Energizing Your Business

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April 8 ........ Chicago
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Vegetative Roof Systems for Roofing Contractors: Your Rewards, Responsibilities and Risks

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THANK YOU!

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