

To: Planning & Sustainability Commission
Bureau of Planning and Sustainability
1900 SW 4th Ave, Suite 7100
Portland, OR 97201

From: Elizabeth Hart, CDT, GRP
Manager, Sustainability Programs, Tremco Roofing
Executive Director of GRiT
| 4135 SE 67th Ave, Portland, OR 97206

Subject: Ecoroof Incentive - Summary of Green, White, and Blue Roofing Benefits

Dear Planning & Sustainability Commission,

As a sustainable roofing subject matter expert, employed for over 8 years with an international commercial roofing manufacturer, and as the Executive Director of the Green Roof info Think-tank, I'd like to provide clarity to the benefits of various sustainable roofing systems, in consideration of an Ecoroof Requirement. Please see the overview below, and feel free to contact me for more information, including cited research, building owner references, and tours of local commercial green, white, and dark roofs.

Green Roofing

Main Benefits: Reverses urban heat island effect, cleans air pollution, and manages storm water as one of the EPA's top methods for Low Impact Development. Provides often the only source for urban habitat, and reduces building energy use. Also called Ecoroofs, Vegetated Roofing, and Roof Gardens.

- **Green roofs actively reverse the urban heat island effect and global warming.** This is due to sequestration of carbon dioxide and air pollution, along with the cooling effects of evaporation from the plants and soil. Green roofs are cooler than the ambient temperature on hot days, where white reflective roofs are generally hotter than green roofs by 50 degrees or more.
- **Ecoroof are in the EPA's top 5 recommendations for Low Impact Development.** The plants and soil filter the water on green roofs, using it in their metabolic processes, and evaporate much or all of it back into the air, creating a cooling effect. Depending on the system design, the amount of runoff exiting the roof through the drains can be significantly reduced or eliminated with green roofs.
- **Building energy is conserved, also PV is enhanced with green roofing.** Our own Portland State University research shows that the soil and leaf cover of plants on green roofs provide additional R-value for energy conservation, and the use of green roofs significantly enhances the performance of photovoltaic panels through passive cooling.
- **Real Estate Value is enhanced on buildings with ecoroofs.** Studies show that Portland buildings with green roofs filled faster and sold or leased for at least a 5.5% increase in sale prices compared to similar non-ecoroofed buildings.
- **Ecoroofs provide abundant habitat for beneficial insects, birds and native plants.** While bioswales and ground-level green spaces can also offer habitat, they are less protected and often unavailable in denser areas. They also do not offer the multiple, compounding building benefits of ecoroofs.

- **On-structure vegetation enhances human health, education, and productivity.**

The benefits to human health of viewing the greenspaces from windows while recovering in a hospital, learning in a classroom, or working in an office building, are widely researched and shown to be immediate and highly effective. For this reason, healthcare and education facilities are two of the fastest growing sectors for green roofing.

White Roofing

Benefit: Reduces the temperature of the roof compared to darker roofs, by reflecting sunlight back into the atmosphere. Clean, qualified reflective roofs can be cooler by 50 degrees or more than dark roofs. However, they are still very hot and offer no other benefits to the surrounding environment. Also called Cool or Reflective Roofing.

- Even on new white roofs, the temperature can reach over 120 degrees on a 90 degree day, where a green roof will be closer to 77 degrees on a 90 degree day.
- Cool roofing requires expensive washing to maintain reflectivity – impacting water use, and storm water runoff quality from use of the detergents.
- White roofs reflect sunlight back into the atmosphere where it is absorbed by pollution and particulate matter, which is then heated, thereby actually contributing to the global warming effects we are attempting to reduce with this same technology.
- A National Academy of Sciences study shows that reflective roofs also keep buildings cooler in the winter leading to more energy use, and energy impacts are mostly seen in southern climates with extremely hot summers and mild winters.

Blue Roofing

Benefit: Slow the flow of precipitation into storm water drains during peak rain events.

Blue roofs retain precipitation on the roof to slow the release of storm water. This adds enormous structural weight loads, so buildings that can support blue roofs have already cleared the biggest hurdle for green roofing, which is structural weight capacity. Additionally, it is against best practices in roofing to hold water in ponding conditions, as it greatly accelerates deterioration of the membrane and introduces mosquito habitat among other concerns. On blue roofs, all the water is eventually released into the drains except for what little can evaporate in the hours before it exits the roof.

Please see the enclosed local photos. Thank you for your consideration, and please feel free to contact me for more information.



Elizabeth Hart, CDT, GRP
elizabethkhart@comcast.net
404-725-1602



East Multnomah County Courthouse, compounding benefits of ecoroofs with PV.
Photo courtesy of Alan Proffitt



Multnomah County Building Ecoroof and Hope Veggie Garden, 500 lbs of veggies per season for the foodbanks.
Photo courtesy of Jason King



Portland Central Library. Photo courtesy of Macdonald Environmental Planning