Green Roof Benefits

People throughout the world are increasingly concerned about our impact on the environment, rapidly rising energy costs, and building safety standards. Mounting concerns about the degraded quality of the urban environment and the rapid decline of green space in urban areas has renewed the interest in green roofs as a ‘green solution’. These are the driving forces that are pushing home builders and buyers to develop and utilize superior building standards. The benefits achieved by a Formworks Building home are numerous and unmatched by any other building system in the world. Formworks green roof homes offer many public, private, and design-based benefits.
Public Benefits-

Green roofs provide storm-water retention, energy savings, heat island reduction by evaporative cooling, acoustical insulation, improved air quality and airflow, water conservation, wildlife habitat and other environmental benefits.

Aesthetic Improvement-

- Urban greening has long been promoted as an easy and effective strategy for beautifying the built environment and increasing investment opportunity.

Minimizing Waste and Maximizing Savings-

Green roofs can contribute to landfill diversion and cut home maintenance costs by:

- Reduce the cost and labor of heating with a wood burning stove.
- Minimizing waste from systematic re-roofing.
  - A roof on a conventional house must be replaced on the average every 20 years, creating a heavy financial burden on the homeowner.
  - Each year, eleven million tons of asphalt shingles is going into landfills in North America and Canada to replace conventional roofs. *Formworks*’ green roof is designed to last as long as the structure.
  - FHA accredited *Formworks* homes as having a useable lifespan of more than a century, compared to 30 years for homes built with common construction.

Storm-water Management-

Many local governments have recognized that they can avoid storm-water related problems by designing and building communities that capture rainfall at source and restore it to natural hydrologic pathways. Metal and Asphalt roofs prevent rainfall from naturally infiltrating into the soil. These impervious surfaces direct storm-water into storm gutters, sewer and engineered channels. Sewers reach maximum capacity more...
quickly and discharge runoff water mixed with untreated sewage tainted by asphalt shingles directly into receiving lakes and streams.

- On a green roof, water is stored by the substrate and then taken up by the plants from where it is returned to the atmosphere through transpiration and evaporation.
- In summer, green roofs retain 75-90% of the precipitation that falls on them; in winter they retain between 25-40%.
- Green roofs not only retain rainwater, but also moderate the temperature of the water and act as natural filters for any of the water that happens to run off.
- The rainfall absorbed into the soil sustains a green landscape and has an added benefit of further insulating the roof, reducing building heating and cooling needs.

**Moderation of Urban Heat Island Effect**

Climate Protection Partnership Division in the U.S. Environmental Protection Agency’s Office of Atmospheric Programs promotes strategies for lowering temperatures in U.S. communities. Across the United States, a diverse group of stakeholders, from government agencies to corporations, have advanced urban heat island reduction strategies to encourage and mandate urban forestry and green roofs to lower summertime temperatures and achieve many energy and environmental benefits. Typically heat island mitigation is part of an energy, air quality, water, and sustainability effort. Through policy actions, such as requiring cool or green roofs via building codes. Some communities have elected to implement both voluntary and policy initiatives. These efforts can complement each other, and sometimes an initiative that begins as a voluntary activity becomes required over time.
• Through the daily dew and evaporation cycle, green roof plants are able to cool urban environments during hot summer months and reduce the Urban Heat Island (UHI) effect. The light absorbed by vegetation would otherwise be converted into heat energy.
• Green roofs can also help reduce the distribution of dust and particulate matter throughout an urban environment, as well as the production of smog. This can play a role in reducing greenhouse gas emissions and adapting urban areas to a future climate with warmer summers.

**Improved Air Quality**

• The plants on green roofs capture airborne pollutants and atmospheric deposition.
• Green roof plants filter noxious gases.
• The temperature moderating effects of green roofs reduce the amount of Carbon dioxide and other polluting by-products being released into the air.

**New Amenity Spaces**

• Green Roofs provide a measurable psychological benefit to urban dwellers by adding tangible, accessible, natural spaces for social interaction, recreation and relaxation.
• Green roofs help to reach the principles of smart growth and positively affect the urban environment by increasing amenity and green space.
• Green roofs can serve a number of functions and uses, including:
  ➢ Community gardens (local food production or co-ops)
  ➢ Recreational space
This vineyard located in California utilizes the added green space to increase the amount of crops produced.
Duplex vacation rental in Alaska

Low visual impact from the back side of the structure. This structure does not interfere with neighbor’s views to the ocean, thus increasing the value of the surrounding homes.
Local Job Creation-

- Energy efficient and sustainable buildings are a potent engine for job creation and economic growth.
- Formworks building system was designed to be built by anyone, anywhere in the world. Our patented building system is erected using local general laborers. No previous earth shelter or green roof construction knowledge is required.

> “For safety and value, it will not get better than this. Anyone who can swing a hammer or use a drill can do this.” -Travis C. of Florida

> “The simplicity of the building system made it possible for my wife and I to do the majority of the work ourselves. We saved thousands, finished our dream home and own much more than we could normally afford.” –Doug & Susan H. of California

- Subcontractors such as concrete workers, framers, plumbers, electricians, etc. will be hired locally.
- There is significant potential for new growth in areas that were previously unusable.

Private Benefits-

Formworks green roof homes are better for the environment, built stronger than your typical built to code structure and have greatly reduced heating and cooling needs.

Energy Efficiency-

- The thermal mass offered by green roofs reduces the amount of heating and cooling needed to moderate the temperature of a building, as roofs are the sight of the greatest heat loss in the winter and the hottest temperatures in the summer.
- Formworks homeowners are routinely using 90 percent less energy to heat and cool their homes compared to their conventional counterparts.
- Keeping the home at comfortable indoor temperatures during the cold winter months, could be achieved by simply by cooking the day’s meals. The heat created during cooking will give the home much of the heat it will need.

> “Despite outdoor temperature extremes, our home remains comfortable with no heating or cooling. I would never live in a different type of home.” –Keith B. of Arizona
**Fire Retardation**

- Green roofs have a much lower burning heat load (the heat generated when a substance burns) than conventional roofs.

> “The wildfire came within 10 feet of the back of the house, and the flames were 50 feet high. Since there was no danger of the house catching fire, they just let the brush burn and didn’t need to put a drop of water on my property. Many fire officials on scene during these fires stated that this is the way all homes in this area should be built.” -Eddie C. of California

**Noise Reduction**

Green roofs have excellent noise attenuation, especially for low frequency sounds. A green roof can reduce sound from outside by 46-50 decibels (Peck et al. 1999).

> “The noise from the freeway behind our house used to wake us up in the middle of the night. In our Formworks home we can’t even hear the loudest trucks going by.” –Glen C. of Kansas

**Increased Biodiversity**

- Green roofs can sustain a variety of plants and invertebrates, and provide a habitat for various bird species. By acting as a stepping stone habitat for migrating species they can link species together that would otherwise be fragmented.

> “Most people who build houses do so because they want a green footprint. They have an urge to plant something. So the idea of a vegetated roof and why it’s good for the environment would appeal to most people.” –Green Roof movement goes domestic

- Washington Times

- Increasing biodiversity can positively affect three realms:
➢ Ecosystem: Diverse ecosystems are better able to maintain high levels of productivity during periods of environmental variation than those with fewer species.

➢ Economic: Stabilized ecosystems ensure the delivery of ecological goods (e.g. food, construction materials, and medicinal plants) and services (e.g. maintain hydrological cycles, cleanse water and air, and store and cycle nutrients).

➢ Social: Visual and environmental diversity can have positive impacts on community and psychological well-being.

**Improved Health and Well-Being**

- Reduced pollution and increased water quality.
- Green roofs can serve as community hubs, increasing social cohesion, sense of community, and public safety from natural disasters.

**Urban Agriculture**

- Using green roofs as the site for an urban agriculture project can reduce a community’s urban footprint.
- These projects can serve as a source of community empowerment, give increased feelings of self-reliance, and improve levels of nutrition.
- We have been doing business, designing and building energy-efficient homes and businesses, for over 34 years. Our homes are spread throughout the U.S. and Canada. Our designs meet all current building codes and can be designed to fit into neighborhood around the world.

“We can help protect the environment by supporting the development of energy efficient buildings. Our research shows more than 80 percent of our consumers think environmental issues are important. Environmental education and awareness, and environmentally sustainable development are critical to help ensure that economic development is not in conflict with the environment.” -Mary Wenzel, director of Environmental Affairs

**Demand for Green-Roof homes**

Green roof infrastructure promises to become an increasingly important option for building owners and community planners. As we move into the 21st century, green roofs can address many of the challenges facing urban residents.
Formworks homes are building for approximately the same cost as a well-built, conventional home. They propose a less risk to the homeowners because of their immense energy-efficiency, low maintenance and security from natural disasters. They are an investment which provides a significant number of social, environmental, building security and economic benefits that are both public and private in nature.

“Green infrastructure is an investment that is showing real benefits. Green roofs play a major part in turning the vision into a sustainable reality.” – Steven Peck, Green Roofs for Healthy Cities

“It is our collective responsibility as a Nation – nonprofit organizations and the public and private sectors – to implement effective standards and codes that sustain safe and resilient structures.... To utilize state-of-the-art safety, energy efficiency, and fire prevention standards are important to our national resilience and our ability to compete in the 21st-century economy.” – President Barack Obama, Presidential Proclamation 2011

The time has come to embrace Living Green Infrastructure technologies through policies and public infrastructure investments that protect, renew and restore ecosystem functions to our communities and generate local employment. Thanks to education, public and policy support, the green roof industry continues to grow rapidly.

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Although the interior spaces appear distinctive, the exterior or facade, can be designed to depict any architectural styling, for the purpose of blending into existing neighborhoods.