

What are the benefits of Green Roofs?

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Example of a Green Roof

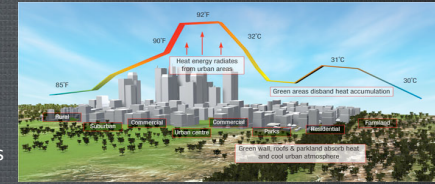


Overview:

Green roofs are a form of green architecture used to provide a natural insulation for a residential or commercial building. The green roof replaces the traditional roofing shingles. The roof is composed of soil and vegetation. It can support grasses, bushes, and trees. They have been popular in Europe for centuries and have made their way to the United States.

Urban Heat Island Effect:

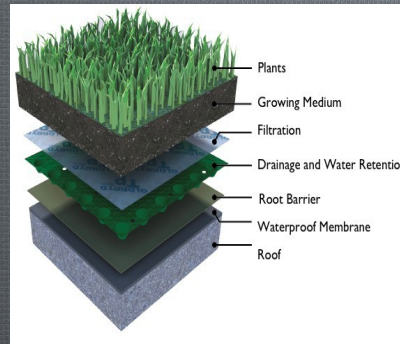
- What is Urban Heat Effect?
 - * The temperature difference in a city versus the temperature in a rural area
- Depending on the size of city the temperature difference can range from 5.4 degrees to 22 degrees Fahrenheit
- It can cause other problems to happen:
 - * Air pollution: gases, dust, and fumes
 - * Greenhouse gas emissions
 - * Over heating



Green Roofs help save money:

- Homeowners use less of their heating and cooling system because of the natural thermal insulation
- They can last longer than cheap roof shingles
- Not a lot of maintenance is required

What is a Green Roof made of?

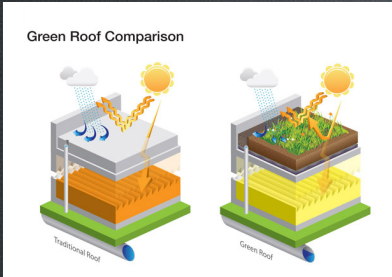


Improves air quality:

- Reduces carbon emissions in the atmosphere
- They remove:
 - * Heavy metals
 - * Particles

Improves thermal insulation:

- Green roofs keep a building naturally insulated
- Less A/C needed in the summer
- Less heat needed in the winter
- Deflects solar rays from the structure



Eliminates water runoff:

- Summer months store up to 70 to 80 percent of storm water
- Winter months stores up to 25 to 40 percent of storm water
- Keep water runoff from contaminating near by areas and water sewers

Which is better?

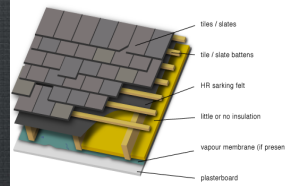
Green Roofs:

VS.

Roof shingles:

- Provides a natural insulation
- Decreases rainwater runoff
- Looks aesthetically pleasing
- Decreases urban heat island effect
- Eliminates greenhouse gases

- Provides minimum insulation
- Increases rainwater runoff
- Doesn't look aesthetically pleasing
- Increases urban heat island effect
- Absorbs UV rays and heat



Do Green Roofs require maintenance?

- Yes, but mostly during the first year of installation
- First year requires weeding and watering every few months
- The second year requires only 3 to 4 months of maintenance
- Must be fertilized once a year



Who is using Green Roofs in America?

- Chicago is one of the largest cities to use green roofs
- They use them on several buildings included the City Hall which is pictured below
- They also have a university using them and plan on designing more



Who is using Green Roofs in Europe?

- Germany has many structures with green roofs
- The apartment green roofs supports grown trees
- Picture below is an image of Hundertwasser's apartments called Waldspirale



Types of vegetation:

- Most popular is succulents, pictured left
- Grasses, wildflowers, and herbs are widely used
- Bushes may be grown on top
- On some buildings there are full grown trees

Disadvantages:

- Up front cost is expensive
- Can cause water leakage problems including damages to roof structures
- Roof has to be stronger than normal roofs to support the weight of a Green Roof

Green roofs have been known to last twice as long as regular shingles. The green roof also reduces heat by 75% when compared to shingles. Asphalt shingles are made from tar material and also coated in a petroleum-based coating. These harmful chemicals can runoff the roof and pollute the nearby soil and environment. Green roofs have no harmful chemicals and they also help keep water runoff from happening.

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