

Maryland Department of the Environment

Green Building Features of Montgomery Park

Montgomery Park is an adaptive re-use of the 1.3 million square foot Montgomery Wards Building built between 1925 and 1927. This building is also on the National Register of Historic Places

The Maryland Department of the Environment (MDE) moved into Montgomery Park in September 2002, as the first tenant, and occupies nearly 270,000 square feet.

Montgomery Park is a design model for "green" buildings in Maryland. Its features include: recycling of existing materials as renovations occur; two green roofs encompassing over 30,000 square feet; operable windows with low-E glazing; automatic lighting sensors that adjust to natural light and room occupancy; low energy, glass-backed elevators; recyclable or sustainable materials used for workstations; recycled carpeting; waterless urinals; rainwater runoff used for toilets; and ice storage utilized with Trane " Chillers" which will allow energy to be consumed during off-peak electrical periods.

Frequently Asked Questions:

1. Describe the Green Roof.

The Green Roof will encompass 20,000 sq. feet on the main building and another 10,000 sq. feet on the North Building. The purpose of the Green roof is to minimize runoff, reduce energy costs through increased insulation properties, reduce urban noise and provide an aesthetically pleasing view.

The soil depth on the roof is approximately 4 inches. The weight load is approximately 18lbs per square inch. There is a PVC membrane on the roof, followed by insulation board, then two textile layers that prevent root penetration. Drainage is accomplished via gravity.

The soil is a mixture of 75-80% inert, expanded, slate mixed with 20-25% organic material. In this case, the organic material is composted mushroom substrate that comes from an organic mushroom farm. This mixture is water soluble and nutrient rich.

Expanded slate, which puffs up like popcorn, is from an abandoned quarry. An 80% use of a mineral such as slate is necessary to prevent soil erosion and compaction.

The majority of the plants that are on the roof are from the Sedum, Rosularia chrysanthea, and Sempervivum families with common names such as: Russian Stonecrop, Spider-web Hen and Chicks, Pink Stonecrop and Jellybean Sedum. They are hardy, require no irrigation, maintenance, or fertilization, and spread quickly.

There are approximately 2 plants per square foot, with 61,000 plants overall. These plants only need to be fertilized once per year for the first five years at a very low rate of application (1 oz of 14% strength fertilizer) per square meter. After 5 years, the plants stabilize and they do not need fertilizer again. Maintenance consists of removing any weeds that may grow.

The roof looks sparse now because it was just recently planted. Given a normal amount of rainfall, it will take one year to grow and provide complete roof coverage.

Finally, roof temperatures rarely exceed 80° when planted, compared to 140° on a standard roof. A 3-7% drop in roof temperature equals an approximate 10% reduction in cooling costs.

2. Can you explain the ice storage and cooling features?

The Ice Storage Tank is a model of energy efficiency. The tank, located on the roof, is filled with coiled tubing and water. It contains no moving parts, minimizing breakdowns. At night, when electrical rates are low, a water and glycol mixture that is chilled to 17°F is run through the tubing. This causes the water stored in the tank to freeze,

in effect creating a huge ice cube. During the day, warmer water is circulated through the tank and over the ice, which chills and delivers the water back through at 45°F.

Most systems deliver water at 55-60° F, so less energy is needed to maintain comfortable temperatures utilizing this system. Another key component is an economizer system that utilizes fresh air from the outside. Whenever economizer detects that air levels are enough to provide adequate cooling and venting, it pumps in fresh air rather than artificially cooling the air. In addition, this system is able to monitor CO₂ levels within the building. If necessary, the system will pump in fresh air to purge the building of unacceptable levels of CO₂. Use of the economizer also assists in the reduction of heating/cooling costs.

3. Flooring materials are often overlooked, what about yours?

Our carpeting began its first life in a federal building in Texas. All 230,000 square feet was removed from that building during a renovation and sent to the Milliken Company to begin a new life. "Earth Squares" is Milliken's carpet renewal program that uses 100% post consumer waste. The Milliken Company has patented a process that takes existing modular carpets, super-washes, retextures, and then recolors them. They are then either reinstalled in the existing location or sold to others. This is how carpeting in Texas found a second home in Maryland.

The carpet is comprised of 18" x 18" squares that are easily pulled up to access our raised flooring. If a carpet square is damaged, it is much easier to replace one tile than to try to replace an entire carpet section. Low VOC glue was used to secure the tiles.

Our break rooms have Marmoleum floors. This linoleum product is made from virtually inexhaustible, natural raw materials. Those materials: Linseed Oil is made from flax seed, Wood Flour is derived from trees felled in European controlled forestry zones, no tropical hardwoods are used; Cork Flour that is grown on oak plantations in Mediterranean countries is used and most of the cork is obtained from scrap generated from wine cork makers. Also, bark is peeled every 7-10 years with no impact on the health of the tree; Rosin is obtained from pine trees in a method that does not affect future growth; Pigments are created using ecologically responsible processes. The organic pigments used are ingredients that contain no heavy metals; Jute is spun from fibers of Jute plants in India and Bangladesh. Jute is plentiful and has a renewable supply base.

Bamboo flooring is located in our reception area. The bamboo is 100% Mao Zhu Bamboo. Our bamboo, from Greenwood Products Company, has the lowest formaldehyde emissions in the industry (0.0127 ppm). It exceeds all Internal Air Quality standards and passes German Air Quality standards, some of the strictest in the world. Bamboo is a fast growing grass and has a sustainable supply base. During the manufacture of this flooring, almost 100% of the bamboo is used --materials too small for flooring are turned into paper, chopsticks, or toothpicks.

4. What are the unique features in your bathrooms?

The bathrooms have many environmentally sound features such as waterless urinals; recycled concrete sink tops; 70% post-consumer ceramic tiling; 100% post-consumer recyclable plastic in the stall doors; and gray water is used in the remainder of the toilets.

The waterless urinals work completely without water and save approximately 45,000 gallons of water and more, per year, per fixture. Urine flows into a special drain insert that has a patented liquid seal

that neutralizes the urine and prevents odor build up, it then flows down the regular drain line. This is the first building in Baltimore City to be approved for the waterless urinal system.

A drain field at the bottom of Monroe Street is used to collect stormwater from drains running along Monroe Street and from runoff of the Montgomery Park property. It is cleaned via a sand filtration system and the treated gray water is then pumped to a cistern on the roof, where it is held and then distributed for use in the remainder of the toilets.

5. With so many windows, how do you maintain energy efficiency?

There are approximately 70,000 windows at Montgomery Park and every third window cluster is operable. The steel windows were preserved and reglazed utilizing glass panes that are low-E, Argon-filled glass. These new windows exceed the State's conservative efficiency guidelines and retain sufficient daylight light transmission (75%) to meet Preservation guidelines.

The floor plans were designed to maximize the opportunity to use natural lighting. This was done by concentrating enclosed offices in the center of each floor and placing open workstations along the perimeter of the building.

In addition, high efficiency lighting combined with occupancy and ambient light sensors add to efficiency savings. The sensors detect how much light is coming in through the windows and adjusts wattage accordingly. If an occupant leaves or enters an enclosed office or conference room, the lights turn off or on accordingly.

The lights utilize low mercury fluorescent lights with electronic 4-tube ballasts. Each ballast will control tubes in multiple fixtures. If there is enough daylight and the required foot-candle level is accomplished without artificial light, the light will remain off. With slightly lower daylight levels, the sensor will cause the center tube (only) to operate. Because one ballast will control 4 lamps this will save 67% of the energy of an energized three-tube fixture. With moderate daylight levels, the sensor will cause the center tube to turn off and the two exterior tubes to light. Should minimum or no daylight occur, the sensor causes all tubes to be utilized.

6. You have so many workstations! Are they "Green" too?

Yes, the workstations are also "Green". Each of the workstations consists of Homasote walls, replenishable ash trim and recycled wheat board on the work surfaces and interior of the partitions. Homasote is durable and has good sound dampening properties. It is made from 100% recycled post consumer newsprint and contains no asbestos or formaldehyde. All of the water removed from Homasote Products during manufacturing - hundreds of thousands of gallons per day - is completely recycled in a "closed loop" system. Additionally, no glues were used in manufacturing the workstations. Instead, UV curing of the sealant on work surfaces was used to prevent off-gassing and sick-building syndrome.

7. What is interesting about the site and the location?

Redevelopment of this Brownfield site was made feasible by Maryland's brownfield redevelopment programs. MDE's voluntary Cleanup Program provides a streamlined process for determining soil and groundwater cleanup requirements and provision of a liability release to the buyer for post contamination the developer did not cause or contribute to.

The location symbolizes Maryland's commitment to Smart Growth. Montgomery Park is the south anchor of the Carroll Camden Industrial Park, a Baltimore City urban renewal plan. Over 60 bus lines serve the location and it also connects to light rail by shuttle. Increasing use of public transportation is a vital component to Maryland's strategy to reduce vehicle miles traveled and in improving air quality. Likewise, projects like this that encourage redevelopment and neighborhood revitalization promote development densities that can better support use of public transit. While all state agencies are required to lease new space within priority funding areas, the reuse of the long vacant Montgomery Wards building is a big boost to local neighborhood revitalization.

8. Are there any other interesting "Green" features?

- *All of the glass panes that were removed were recycled into "glassphalt" and used to pave the entranceway to the "Red" parking lot;*
- *Bio-retention ponds are used in the "Red" parking lot to trap and filter stormwater runoff;*
- *The pavers near the building entrance were once the floor of a factory in Baltimore City;*
- *The site is landscaped with native species plants that require no irrigation;*
- *Acoustical ceiling tiles are formaldehyde free and contain 79% recycled content;*
- *Zero VOC paint was used on all of the drywall. All primer, flat, eggshell and semi gloss paints were from Enviro-Pure by MAB, which is a vinyl acetate/acrylic latex paint that emits zero VOC;*
- *The glass backed elevators are energy efficient and use 66% less energy than standard elevators;*
- *80% of all material removed during construction was recycled. To mention just a few:*
- *3 million pounds of metal, 5,800 cubic yards of wood, and 24,840 pounds of copper were recycled. In addition, 8,036 board feet of wood was reused;*
- *Window shades have pinholes that allow the natural light to come in, but still provide the necessary light deflection;*
- *Re-utilized 90% of existing sprinkler system and piping;*
- *LED "exit" lights provide an 87.5% savings over the standard 40 watt fixture;*

Product Websites:

www.greenroofplants.com

www.milliken.com

www.greenwoodflooring.com

www.homasote.com

www.forbolinoleumNA.com

www.waterless.com

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