

Duke Sustainability

Duke Medicine Pavilion

Building Information

Tenant: Duke University Hospital

Architect: Perkins + Will

Construction: BE&K Building Group

Purpose: Patient Services

Footprint: 608,000 sq ft

The Duke Medicine Pavilion opened its doors in 2013 to patients and staff of the Duke University Hospital to facilitate a major expansion of surgical and critical care services. Duke Medicine Pavilion was awarded LEED™ Gold certification after earning 60 of 62 attempted points under the LEED™-NC v2009 rating system.

[View the Duke Medicine Pavilion LEED™ Scorecard](#)

Sustainable Site Features

In order to offer its users convenient access to amenities, the Duke Medicine Pavilion is located within a half mile distance from 10 different community services and a dense residential area. As a result of this proximity, building occupants can minimize their use of personal automobiles during the day. Access to 31 low-emitting fuel-efficient buses, bike racks and showers, along with minimal added parking spaces further encourage building occupants to reduce their use of personal automobiles.

The Duke Medicine Pavilion's designers substantially lessened the building's overall contribution to the urban heat island effect by ensuring that 100 percent of the building's roofing meets stringent Solar Reflective Index (SRI) standards. In addition, 44 percent of the building site has been dedicated to vegetated open space. This was accomplished in part by locating 80 percent of the Pavilion's allocated parking spaces underground or under cover. As a result, the area of hardscape surfaces on the building site is reduced greatly, which in turn limits runoff and contributions to urban heating.

Other sustainable site features that the Medicine Pavilion incorporates include the implementation of an Erosion and Sedimentation Control (ESC) Plan, a fuel-efficient vehicle-sharing program, and a green roof space.

Water Efficiency

The Duke Medicine Pavilion's water usage systems are designed for efficiency and water reuse, and result in significant water use reductions both indoors and out. Specifically, the installation of advanced water saving technologies like low-flow water closets, low-flow urinals, and low-flow showerheads combine to reduce indoor potable water consumption by 37 percent.

For the Pavilion's landscape, drought tolerant and native plant species were selected for aesthetics as well as minimal maintenance. This choice along with the use of efficient irrigation systems supplied by rainwater catchment systems, serve to eliminate outdoor potable water consumption entirely and reduce total outdoor water consumption by nearly 70 percent.

Energy Efficiency

In order to minimize the Duke Medicine Pavilion's water consumption, project leaders implemented measures that include an improved thermal envelope and high efficiency glazing, both of which help to control heat transfer between the cooled or warmed indoor environment and the outdoors. Because the building is highly insulated, it is important that the HVAC system incorporates a way of providing thorough ventilation, which is accomplished through the use of airside economizer control in combination with an exhaust air energy recovery system. These innovative design features allow maximum ventilation and pretreatment of outdoor air to supplement mechanical heating and cooling. As a whole, these energy efficiency features combine to achieve an energy cost savings of nearly 25 percent.

In addition to reducing energy consumption, the Pavilion earned LEED™ points for enhanced refrigerant management by eliminating CFC-based refrigerants and minimizing the use of other compounds that contribute to ozone depletion and global warming.

Commissioning was performed for all major energy-related systems in the Pavilion in order to ensure that each system functioned as designed and would meet their energy efficiency targets. Continued commissioning was outlined in a Commissioning Plan.

Indoor Air Quality

The indoor environment of the Duke Medicine Pavilion is maintained for the health and comfort of all occupants. This quality was achieved through the careful selection of materials like sealants, adhesives, paints, and flooring that are low emitting and free of certain added resins, as well as the installation of advanced sensors to carefully manage indoor temperature, ventilation and carbon dioxide levels. Room separations and thermal controls for individual workstations allow occupants a high level of control over their personal environments.

Prior to building occupancy, a complete flush-out was performed and sensitive materials were protected from moisture damage throughout the construction process.

Resource Management

Throughout the construction of the Duke Medicine Pavilion, recycling was made a top priority with designated recycling areas for five types of construction waste materials, which resulted in a landfill diversion rate of over 93 percent of on-site generated construction waste. In addition, nearly 15 percent of the total building materials content, by value, was manufactured using recycled materials.

In order to further minimize the carbon footprint of the Pavilion's materials, project leaders sourced 18 percent of the building materials, by value, within a 500 mile radius of the site. A total of 98 percent of the wood used for the project was certified in accordance with the criteria of the Forest Stewardship Council.

A Life Cycle Assessment of Building Assemblies and Materials was completed in order to gauge the comprehensive environmental impact of material use from extraction to disposal.

Integration of Sustainability in Design & Construction Process

The Duke Medicine Pavilion was developed with the needs and comfort of patients and their loved ones in mind. Input was solicited from faculty and staff of the Duke University Health System as well as from world class architects and designers.

The success of the Pavilion was made possible by careful planning and reassessment throughout the construction process. In addition, effective communication between project teams was emphasized.