

## Introduction to LEED

Cleveland State University has designed and built a green residential complex. Conscious decisions were established early on, to ensure that Euclid Commons qualify for LEED-NCv2.2 (Leadership in Energy and Environmental Design for New Construction) certification under the US Green Building Council. LEED is a green building rating system based on national standards for developing sustainable buildings. LEED was created by the US Green Building Council (USGBC) to provide a framework for meeting sustainability goals and assessing building performance. The USGBC is the nation's foremost coalition of leaders from every sector of the building industry working to promote buildings that are environmentally responsible, profitable and healthy places to live and work.

LEED™ is a voluntary, consensus-based, market-driven building rating system based on existing proven technology. It evaluates environmental performance from a "whole building" perspective over a building's life cycle, providing a definitive standard for what constitutes a "green building." The LEED™ rating system applies to new and existing commercial, institutional, and high-rise residential buildings. It is a feature-oriented system where credits are earned for satisfying each criterion. Different levels of green building certification are awarded based on the total credits earned. To learn more about LEED™, please visit: [www.usgbc.org](http://www.usgbc.org).

The LEED-NCv2.2 rating system is comprised of 5 different credit categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality.

### Sustainability within Euclid Commons

Cleveland State University has incorporated the following "green" elements in fulfillment of the LEED-NCv2.2 requirements:

#### ***Sustainable Site***

Strategic decisions were made just in the site selection process, and then to protect the natural integrity of the surrounding environment such as:

- Avoid development on an inappropriate site and reduce the overall environmental impact a building has on a site;
- Encourage alternative transportation by building in an urban area with existing infrastructure such as municipal mass transit and pedestrian access to the downtown Cleveland area.
- Protect pre-existing vegetated open space to provide habitat and more biodiversity in the area;
- Lessen heat islands by installing a high reflective, energy efficient roof
- Minimize the amount of polluted stormwater runoff which can have a negative impact on the local environment.

#### ***Optimized Energy Performance***

Cleveland State University has taken measures to optimize the energy efficiency through the use of commissioning, installing energy efficient lighting systems, and establishing a minimum threshold for cooling, air circulation and filtration systems.

The buildings will achieve energy savings of at least 29% compared to conventional buildings of similar characteristics. By reducing energy consumption, the housing facilities will be cutting back on the amount of greenhouse gas emissions (a leading cause of global warming) released into the atmosphere. Another benefit of minimizing electrical usage is that heat generation within the interior space will be reduced, resulting in less of a need for air conditioning and cooling, which further reduces green house gas emissions.

### **Materials & Resources**

The environmental impact of construction at *Euclid Commons* has been lessened through responsible management of construction waste, reusing existing resources, selecting products with recycled content, using locally manufactured or harvested materials and designing for the collection of recyclables.

More than 50% of all the construction and demolition waste generated on the project was diverted from the landfill, and instead sent to a recycling facility. The Environmental Protection Agency (EPA) estimates that 136 million tons of building-related C&D debris was generated in the United States in 1996. Through effective construction waste management, it is possible to extend the lifetime of existing landfills, avoiding the need for expansion on new landfill sites.

More than 10% of the materials and furnishings that are used in these student housing facilities were manufactured within a 500 mile radius of the project site, and half of those materials and furnishings were extracted or harvested within a 500 mile radius. An increase in demand for locally extracted and manufactured building materials and products supports the regional economy and reduces the environmental impact resulting from transporting materials around the country (and sometimes around the world). By reducing transportation activities, there is a reduction of pollution (global warming emissions) and traffic that is associated with delivering materials to the job site.

### **Indoor Environmental Quality**

Conscious measures to enhance the indoor environment for occupants have been implemented at *Euclid Commons* such as ensuring ventilation effectiveness, control of contaminants, use of low-emitting materials, thermal control, and a connection to the outdoors through daylight views.

Smoking is not permitted in or near these housing facilities. Further, Cleveland State University has taken a step to improve the quality of its indoor environment by using low-emitting materials. All adhesives, sealants, paints, coatings, and carpet installed have low-VOC content, or are considered "low-emitting". VOCs, or Volatile Organic Compounds (i.e. the "new car smell"), are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors. More information can be found about VOCs at <http://www.epa.gov/iaq/voc.html>.

Thermal comfort is enhanced through the individual capability of controlling lighting and temperature. Each one of the regularly occupied rooms has a direct view to the outdoors. The buildings have been designed with operable windows and mechanical systems which provide adequate ventilation to meet ASHRAE Standard 55-2004. A survey will be distributed to the occupants to assess their level of thermal comfort.

To maintain a healthy indoor environmental quality, green housekeeping practices are being implemented. Green housekeeping is characterized by the use of environmentally and human friendly cleaning products and practices. Specifically all cleaning products are certified by Green Seal which are safer for cleaning personnel and building occupants (i.e. they don't have malodorous fumes) and they are manufactured in an environmentally responsible manner. More information about green housekeeping practices and a list of approved chemicals can be found at <http://www.greenseal.org>.

### **Building Safety in Euclid Commons**

*Euclid Commons* provides safety features over-and-above standard requirements found in typical apartment complexes. Cleveland State University has included the sprinkling of closets and other incidental spaces not required under NFPA 13R residential code. Some of the features are:

- NFPA 13 sprinkler system--fully sprinklered building with dry system in areas that are not climate controlled by an HVAC system.
- HVAC systems provided with smoke detector interface to the fire alarm system.
- Full fire alarm system; manual and automatic
  - Manual pull stations at building exit paths
  - Smoke detection in dorm suites, exit paths, air-handling systems, etc.
  - Heat detection in all mechanical rooms.

Each unit has fire prevention partitions from floor to ceiling between the units. In addition, the ceilings are 1-hour UL rated and have an additional layer of drywall in excess of code requirements. The additional layer improves acoustic isolation and extends fire performance. Stair towers are 2-hour rated fire barriers having membrane protection for all floors. The towers are also sprinklered and the central stair in all buildings has an area of rescue assistance with call buttons.

***Water Use Reduction***

A combination of water efficient plumbing fixtures was utilized to conserve water usage throughout the student housing complex. A reduction in water usage results in less of a burden on the municipal water supply and waste water systems. Water savings, as it relates to LEED, is based on the guidance of the Energy Policy Act of 1992 (EPAc). Euclid Commons incorporated low-flow lavatory faucets (0.5 gpm), dual-flush toilets (1.6/0.9 gpf), low-flow showerheads (2.0gpm), and low-flow kitchen sinks (1.5gpm) to achieve a water reduction of more than 30% below baseline EPAc measures.

To minimize the use of potable water for irrigation purposes, drought tolerant shrubs were planted for landscaping and no permanent irrigation systems were installed.