

The LVIP Office Building in LVIP VII is being designed as a state-of-the-art sustainable and “green” building.

Why?

Buildings that are designed, constructed, and operated “green” benefit the environment, the economy, and society.

Building construction and occupancy account for a significant amount of energy, fresh water, and material resource consumption.

- Every year, buildings consume more than 30% of the total energy and more than 60% of the electricity used in the United States. *
- Every day, five billion gallons of drinkable water are used to flush toilets. *
- A typical commercial construction project in the United States generates 2.5 pounds of solid waste per square foot of completed floor space. *

By helping to reduce this consumption, green and sustainable building design strategies help to lessen the negative impacts of buildings on the environment. They also reduce energy and operating costs over the lifespan of the building.

But the benefits of green buildings go even further. Green buildings provide comfortable, healthy indoor environments for occupants. Green design measures have been documented as increasing worker productivity, reducing absenteeism, and reducing the risk of indoor air quality issues. A workplace design that provides occupants comfort, health, and satisfaction can help attract potential employees and retain workforce. As a result, a well-designed, sustainable building provides direct and indirect financial benefits to owners, tenants, and occupants alike.

How?

The LVIP Office Building has been design and constructed using the United States Green Building Council’s LEED Rating System. The United States Green Building Council (USGBC) is a non-profit trade organization that promotes sustainability in how buildings are designed, built, and operated. LEED, which stands for Leadership in Energy and Environmental Design, is an internationally recognized standard for what constitutes a “green building.” Read more about what specific features make the LVIP Office Building Green below.

Build in a Sustainable Location

One of the biggest environmental impacts that buildings have is on the land itself. The development of previously undeveloped sites, sometimes called greenfields, alters ecosystems, consumes natural resources, and uses significant energy. Developing a building in a greenfield can result in the loss of important wildlife habitat such as wetlands or prime farmland.

A building's location also affects ecosystems because people need to travel to and from the building. Vehicles consume fuel and release emissions that contribute to climate change, smog, and air pollution – all of which harm our health as well as the health of the environment. The roadways and parking required for all these vehicles further increase the consumption of land and nonrenewable resources.

Therefore, one of the most important factors in creating a green building is *where* the building is located. The new LVIP Office Building makes wise use of previously disturbed land because it is located on the 1,000-acre site of the former Bethlehem Steel plant, the largest privately owned brownfield in the country. The opposite of a greenfield, a brownfield is a site that was previously developed for industrial or commercial uses. Building new buildings on brownfields is the ultimate in recycling and it is one of the most important ways we can conserve land and natural habitat.

The building's location on the existing Route 412 transportation corridor and within a block of local and regional bus systems, is also beneficial. Occupants can travel to the office building using public transportation and pre-existing traffic corridors. No new roads needed to be constructed and no greenfields developed. In the coming years, as the entire brownfield site is developed as a mixed-use community connected to the existing urban infrastructure, occupants will have easy, walkable access to many services and amenities such as restaurants, coffee shops, etc.

Optimize Energy Use

Buildings consume more than 30% of the energy and more than 60% of the electricity produced in the United States every year.* To reduce the consumption of energy and electricity, green buildings use a variety of integrated, whole building approaches that incorporate both design and technology solutions.

Design strategies such as building shape and orientation, passive solar design, and the use of natural lighting dramatically affect a building's energy performance. The orientation of LVIP's Office Building optimizes natural daylight yet minimizes heat gain and solar glare. Natural daylight makes for a pleasant indoor environment, and careful use of day lighting also reduces the energy used to power artificial lighting. Sunshades on the outside of the building and light shelves on the inside of windows help to control undesirable solar heat gain and glare and direct the daylight deep into the building.

Throughout the building, the walls, windows, and roof have high insulation values to help reduce energy consumption. High-reflectance roofing keeps the building cooler in the summer and prevents the undesirable micro-climate condition known as "heat island effect."

Energy-efficient lighting inside and out also helps to reduce electricity usage in the building. The LVIP Office Building is equipped with a lighting control system and

occupancy sensors so that lights automatically turn ON when they are needed and OFF when a room or hallway or corridor is not being used.

Minimize Water Use

Water, like energy, is a critical resource that is too frequently wasted. Fresh, clean water is becoming increasingly scarce. In the United States, approximately 340 billion gallons of fresh water are withdrawn every day from rivers, streams, and reservoirs to support residential, commercial, industrial, agricultural, and recreational activities. Every year, Americans use 3,700 billion gallons per year more than they return to the natural water system to recharge aquifers and other vital water sources.*

The Energy Policy Act of 1992 established water conservation standards for all toilets, showerheads and faucets, saving the United States an estimated 6.5 billion gallons of water a day. In order to meet LEED standards, the LVIP Office Building had to exceed this standard by reducing water consumption by 30% as compared to the baseline calculated for the building.* To maximize water efficiency, the building is equipped with motion-activated low-flow faucets that use just ½ gallon of water per minute, low-flush toilets that use 1.6 gallons per flush, and waterless urinals.

To further conserve water, the landscape around the building features native, drought-tolerant, and non-invasive trees, shrubs, and grasses. These native plantings eliminate the need for an irrigation system, minimize the need for fertilizer and pesticides, and establish a supportive ecosystem for birds and other urban wildlife.

Create a High Quality Indoor Environment

Americans spend on average 90% of their time indoors, where the US Environmental Protection Agency reports that levels of pollutants may run two to five times ... and sometimes more than 100 times ... higher than outdoor levels.* These pollutants can contribute to a range of comfort and health issues from allergies to asthma to sick building syndrome. Buildings with high indoor air and environmental quality can enhance occupant comfort and performance while reducing the rate of respiratory diseases.

The LVIP Office Building incorporates a number of measures, both simple and technological, to create a high quality indoor environment. For example, special care was taken in the types of construction materials and interior finish products used in the building to minimize indoor air contaminants.

High-quality heating and cooling systems within the building ensure adequate ventilation and proper filtration of the air. Walk-off mats at each entry help to prevent outdoor pollutants from being tracked into the building. During construction, a special plan was implemented to prevent air quality problems that can result from construction activities and can linger long after construction is complete.

There is also a Smoke-free Building policy in place for the building. This no-smoking policy helps to minimize exposure to environmental tobacco smoke, also known as second hand smoke. Outdoor smoking areas are located so that non-smokers can use the main entrances of the building without being exposed to secondhand smoke.

Use Sustainable Materials

The materials that go into a building, from the floor joists to the ceiling panels, are important in green and sustainable design because of the energy and activities required to extract, process, and transport them.

Throughout the LVIP Office Building, construction and finish materials were selected based upon careful evaluation of several characteristics, including reused and recycled content, zero or low off gassing of harmful air emissions, zero or low toxicity, sustainably harvested, high recyclability, durability, longevity, and local production.

Use Recycled Materials

Recycled-content materials reuse waste products that would otherwise be sent to landfills. As a result, the impact from the extraction and processing of virgin materials is reduced. Using materials with high recycled content also increases the demand for materials manufactured with recycled content, thereby advancing the market for recycled goods.

In the LVIP Office Building, more than 20% of the building materials are made up of recycled content. Interestingly, most of these materials are indistinguishable from their non-recycled counterparts: the structural steel, gypsum board (drywall), and ceiling tiles are all examples of materials with high recycled content in the building.

Use Regional Materials

Building materials, components, and systems sourced from local or regional suppliers and manufacturers save energy and resources in transportation to the project site. The use of local and regionally sourced and manufactured materials reduces transportation and can also help to support the local and regional economy.

In the LVIP Office Building, numerous materials were manufactured within 500 miles of the site, including brick, ceiling panels, and fiberglass insulation. One of the most visible of the regionally sourced material is the beautiful cherry wood paneling seen in the lobby. These panels were created from Pennsylvania cherry trees.

Build with Certified Wood

Forest ecosystems -- trees, soil, undergrowth, all living things in a forest -- are a vital part of the web of life on earth. Forests create oxygen and filter pollutants from the air we breathe. They soak up rainfall and purify the water that we drink. They also absorb carbon

dioxide, helping to regulate the climate. They are home to 90% of the plant and animal species on land. Forests are also commercially important because they yield valuable resources like wood, rubber, and medicinal plants.

To protect the world's forests from destructive logging practices and help consumers identify wood and paper products that come from forests managed in accordance with strict environmental and social standards, the Forest Stewardship Council (FSC) was formed. FSC is an independent, international nonprofit organization that has established a set of international forest management standards. It also accredits and monitors certification organizations that evaluate on-the-ground compliance with these standards in forests around the world.

Over 50% of the wood used in the LVIP Office Building, including wood substrates and wood blocking, is certified by the Forest Stewardship Council as having been sourced from sustainably grown and harvested forests.

Reduce the Impact of Construction

The process of constructing a building can have considerable negative environmental impacts, from increased erosion on site to waste generated in the shipping of construction materials to the airborne dust created during construction activities.

During the construction of the LVIP Office Building, the construction team developed and implemented a plan to prevent pollution by controlling soil erosion, waterway sedimentation, and airborne dust generation. On site, sorting bins for all construction debris facilitated a comprehensive recycling program, which helped to divert material from the local landfill. A construction indoor air quality management plan was also implemented to prevent indoor air quality issues that otherwise would occur during the construction process.

Encourage Recycling

Recycling is one of the easiest and most effective ways to help the environment and the community. Most obviously, recycling saves landfill space because materials that are turned into new products don't go into landfills or incinerators. Recycling also saves natural resources, energy, and clean air and water. When products are made from recycled materials instead of virgin materials, land is conserved. It usually takes less energy to make recycled products and also creates less air and water pollution. Recycling is also cost-effective, because it is one of the least expensive waste management methods for cities and towns.

To encourage recycling throughout the LVIP Office Building, a comprehensive recycling management program is in place to facilitate collection and appropriate disposition of recyclable materials. Specific areas in the building are dedicated to the collection and storage of paper, corrugated cardboard, glass, plastics, and metals.

Encourage Alternative Transportation

The LVIP Office Building's location on an existing transportation corridor, Route 412, and within a block of local and regional bus systems make public transportation a convenient way for occupants to travel to and from the office. To encourage the use of other forms of alternative transportation, bicycle racks are conveniently located next to the building and first-floor showers are provided to encourage occupants to bicycle to work. Preferred parking spaces for low-emitting fuel-efficient vehicles encourage occupants to choose environmentally friendly transportation options.

Make Sure the Building is Operating Properly

Green building measures cannot achieve their goals unless they work as intended. To be sure that the LVIP Office Building was operating properly once it was constructed, the building was commissioned at the Basic and Advanced levels established by the LEED program.

Commissioning is a process that includes testing and adjusting the mechanical, electrical, and plumbing systems to ensure that all equipment meets design criteria. It also includes instructing the staff on the operation and maintenance of equipment.

Reduce Light Pollution

Light pollution is excessive or obtrusive artificial light. Like air and water pollution, light pollution has both local impacts and far-ranging environmental repercussions. Lighting the sky instead of walkways and parking lots provides no benefit and can disrupt ecosystems and harm the nighttime environment for all species. It also washes out the nighttime sky and views of the stars while wasting a significant amount of energy.

The lighting for the LVIP Office Building has been carefully designed and installed to help reduce light pollution. Interior lighting is automatically controlled to turn OFF during non-business hours. Exterior lighting on walkways and parking lots uses full cutoff lighting fixtures, which direct light where it is needed while preventing light from escaping above the horizon. LVIP's full cut off fixtures also use the lowest wattage necessary, further reducing uncomfortable glare, unnecessary energy consumption, and detrimental sky glow.

Promote Green and Sustainable Practices

In addition to building the first "green" office building on LVIP VII, Lehigh Valley Industrial Park is helping tenants that lease space within the LVIP Office Building to make their own offices green with the development and publication of Tenant Guidelines. These guidelines document the green strategies within the building. They also outline effective ways that tenants can take advantage of the core and shell building's architecture, infrastructure, and engineering to make their own office spaces green. The Guidelines ensure that future tenants understand the sustainable design and practices (and

the larger design intent) within the building and encourage them to continue these practices.

LVIP is also spreading the word about green building through the development of this website as well as a series of informative graphics within the building, which detail many of the green features occupants encounter in the building every day.

Participate in the USGBC's LEED Program

To demonstrate Lehigh Valley Industrial Park's commitment to energy efficiency, responsible use of resources, and workplace quality and health, the LVIP Office Building is registered with the United States Green Building Council's LEED for Core & Shell program (LEED-CS). *

LEED for Core & Shell is a green building rating system for designers, builders, developers and building owners who want to bring a sustainable design approach to new "core and shell" construction. Core and shell addresses base building elements such as structure, envelope, common spaces, and aspects of the building's infrastructure including the HVAC system.

The LEED for Core & Shell Rating System acknowledges the challenges that developers face and encourages the implementation of green design and construction practices in areas over which the developers have control. Developers can often implement green strategies that indirectly benefit future tenants. Conversely, developers can inadvertently implement strategies that prohibit tenants from executing green fit-outs. LEED for Core & Shell allows owners to build a building that allows future tenants to capitalize on green strategies implemented by the developer.

LVIP is proud to lead the way as one of the first Lehigh Valley developers to register a project under the LEED for Core & Shell Rating System.

* Special thanks to the USGBC's Leadership in Energy and Environmental Design, *Reference Guide for New Construction* and *Reference Guide for Core & Shell Construction*, the source for the statistics and background on which much of the information for this website is based.