

**GREEN BUILDING
HIGHLIGHTS**

- 39% reduction in domestic water use
- 100% of heat provided by renewable energy sources
- 4% of electricity provided by renewable energy sources
- Preferred parking provided for car-pools and low-emitting vehicles
- 69% less stormwater runoff post-development
- 90% of total annual rainfall treated
- Collection of 40% of residential recyclables
- Views from 98% of interior spaces

**CREDIT
SUMMARY:**

**Sustainable
Sites**

**Water Effi-
ciency**

**Materials &
Resources**

**Energy & At-
mosphere**

**Indoor Environ-
mental Quality**

**Innovation in
Design**

Providence Township

MUNICIPAL OFFICE BUILDING

AUGUST 20, 2011

LEED Certified Municipal Office Building

Construction on the Providence Township Municipal Complex was completed in August 2011. The complex includes a new 4,040 square foot Office Building, connected to the original office building, a former one-room schoolhouse. The new building provides offices for the staff, a conference room,

and an additional office space which may be leased. The original office building has been maintained and will be utilized as the township meeting room. The original maintenance complex was demolished to make room for a new maintenance build-

ing, salt storage building, and material storage bins.

A wood gasification boiler heating system is centrally

located, supplemental heat source, and utilizes waste oil from municipal vehicles, as well as community-collected waste



Office Building & Meeting House

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located to provide heat to both the maintenance building and the office building. This biomass boiler utilizes the township's roadside tree-trimming waste, as well as community-collected yard waste. A waste oil boiler is used as a backup/

oil. In addition, the Township has installed two 2.4 kw windmills, which feed into the main electrical panel, and help to offset some of the additional energy requirements of the updated facility.

Sustainable Features

Providence Township supervisors decided early in the design process to seek LEED certification for the improvements to their facilities. The

Office Building and the Maintenance Building were both designed to the LEED NC 2009 standards, though the Township is only seeking cer-

tification for the Office Building. The following articles are an abbreviated list of sustainable features incorporated into the project.

Sustainable Sites



Metal roofs reduce heat island effect

Alternative Transportation

Providence Township Municipal Complex is located in a rural area, near 272, but not within walking distance of transit or amenities. Due to the limited environmentally responsible transit options, Providence Township has provided alternative options for the employees and visitors. Preferred parking spaces have been provided for carpools, low-emitting and fuel-efficient vehicles, in order to reduce the use of single occupant vehicles. In addition, bicycle

racks and shower facilities are provided in the Maintenance Building.

Stormwater Management

Providence Township has used the construction of new facilities as an opportunity to improve stormwater management. They have constructed detention basins and grass filter strips to infiltrate all stormwater onsite, improving both the quantity and quality of stormwater runoff.

Heat Island Effect

Providence Township has re-

duced their cooling costs and the heat island effect by installing a metal roof on all of their buildings, which has a Solar Reflective Index of 34.

Light Pollution

All interior lights have occupant- and light-sensing devices set to automatically shut off when employees leave for the day, therefore reducing electricity usage and light trespass from the building. The exterior lighting is designed to minimize light trespass from the site and reduce sky-glow.

“Combined, these efficiency features save 39% of potable water compared to a standard building.”

Water Efficiency

Landscaping

In order to reduce potable water use, landscape architect and civil engineer David Miller/ Associates designed the landscaping to not require permanent irrigation. All of the trees and herbaceous plants are

native to Pennsylvania, and will not require irrigation past the establishment period.

Water Use Reduction

The Office Building is equipped with waterless urinals, dual-flush toilets, and a low-flow kitchen faucet. The toilets

allow a 1.6 gallon “solid” flush and a 1.1 gallon “liquid” flush to reduce water consumption. Combined, these efficiency features save 39% of potable water compared to a standard building.

Materials & Resources

Waste Management

Dolan Construction, Inc. implemented a construction waste management program to recycle or salvage over 50% of total construction waste from disposal in order to divert construction and demolition debris from dis-

posal in landfills and incineration facilities.

Recycled Content

Lewis & Associates Architects specified a minimum of 10% recycled material content for all materials installed on the project. Materials with recycled content include:

- Carpet Tile
- Fly Ash in Concrete
- Ceiling Tile

- Metal Roof & Wall panels
- Porcelain Tile

Regional Materials

Over 10% of construction materials were sourced from within 500 miles of the site. The use of locally manufactured materials reduces environmental impacts associated with transportation of heavy building materials.



Carpet tile contains a minimum of 66% total recycled content

Energy & Atmosphere



Commissioning

Providence Township has employed Reynolds Consulting Engineers, an independent commissioning agent, to review all mechanical, electrical and plumbing designs. In addition, they will verify the instal-

Windmills provide 4% of electricity needs for the Office Building

lation and performance of these systems to ensure energy efficiency opportunities are realized.

Energy Efficiency

- Post Frame Construction with 1" expanded polystyrene (EPS) exterior insulation yields U-value of .040 versus ASHRAE 90.1 standard of .064 — a 37% improvement
- Glass: Solar heat gain coefficient of .36; U-value of .26
- Interior lighting operates on daylight and occupant sensors
- Heat pumps with 16 SEER efficiency

- Deep south overhang to reduce solar heat gain in summer months, while allowing sun penetration in the winter

Renewable Energy

Providence Township has installed a wood gasification boiler heating system, which allows them to utilize the municipal tree trimming waste, as well as a waste oil boiler, which will be used as a backup/supplemental heat source. The boiler is located in the Maintenance Building and provides hot water via an underground line to air handlers in the office building. 100% of the facility heating requirements will be provided by renewable energy sources.

In addition, two windmills have been installed, which will feed into the main electrical panel and offset some of the energy requirements of the updated facility.

"100% of the facility heating requirements will be provided by renewable energy sources."

Indoor Environmental Quality

According to the USGBC, Americans spend an average of 90% of their time indoors, so the quality of the indoor environment has a significant influence on their well-being, productivity, and quality of life.

Low-Emitting Materials

Lewis & Associates specified low-VOC adhesives, sealants, paints, carpets and composite wood for the project. Working with Dolan Construction, they were able to use materials with very little off-gassing of volatile organic compounds (VOCs).

Air Quality Management

Construction measures taken to improve the indoor air quality included protecting HVAC systems, controlling sources of contamination, employing excellent jobsite cleanliness, and by scheduling the use of potential contaminants prior to the installation of absorptive materials that would slowly off-gas the contaminates overtime.

Tobacco Smoke Control

In order to improve the indoor air quality, Providence Township has prohibited smoking in the Office building, and within 25' of the perimeter of the building.

Daylight and Views

The clerestory windows in the office building and the perimeter windows in all office spaces provide ample daylight and views to the outside. Glass was selected with a high visible light transmittance to ensure abundant daylight penetrates the building's interior. In addition, 98% of regularly occupied spaces have a direct view of the outdoors.



Interior spaces have superior daylighting, providing a comfortable atmosphere, and reduced energy usage

Providence Township

200 Mount Airy Road

New Providence, PA 17560

Phone: (717) 786-7596

Zoning Office: (717) 786-1060

Fax: (717) 786-2565

E-mail: vicki@providencetownship.com

Website: www.providencetownship.com

Township Hours:

Monday—Thursday

6:30 a.m.—4:30 p.m.



Design Team

Architect: Lewis & Associates Architects

Civil Engineer: David Miller/Associates

Structural Engineer: Double Tree Structures

MEP Engineer: Paragon Engineering Services

LEED Consultant: Above Green

Commissioning Agent: Reynolds Consulting Engineers

Contractors

General Contractor: Dolan Construction

Mechanical/Plumbing Contractor: CMC, Inc.

Electrical Contractor: McCarty & Son Electrical Contractors

Innovation in Design

Community Recycling Program

In addition to providing recycling within the office building, Providence Township is committed to providing recycling opportunities within the community. In addition to the standard municipal recycling, Providence Township will now offer drop-off locations for yard waste, wood scrap and waste oil. Not only will these waste materials be diverted from landfills, they will be used to heat the facility. Residents are asked to call ahead to schedule a drop-off.

Visitor Education Program

An actively instructional public education program has been designed to focus on the green building strategies and solutions

employed in the project. This case study is intended to inform the design of future projects based on the successes of the Providence Township Municipal Office Building. The case study is made available to the USGBC, as well as Providence Township residents and visitors. In addition, the township has conducted a guided, public tour of the building and site at their open house. Additional information can be found on the Providence Township website at www.providencetownship.com.

Post-Occupancy Survey

Providence Township will conduct a post-occupancy survey of the employees within 6-18 months after occupancy. This survey will gauge the occupant comfort over time as it relates to acoustics, thermal comfort, indoor air quality, lighting levels, building cleanliness and other comfort

issues. If more than 20% of occupants are dissatisfied, corrective actions will be taken.

Low-Mercury Light Fixtures

Fluorescent lamps are one of the most affordable, efficient, and common lighting technologies. Along with metal halide and other gas-discharge lamps, however, they contain mercury, a toxic element that contributes to water pollution and poses significant human health risks. Use of low-mercury fluorescent lamps, or other mercury-free lighting technologies, reduce the risk of mercury exposure in buildings from broken lamps, and reduces overall mercury consumption. Providence Township has committed to purchasing at least 90% of lamps with overall average mercury content less than 90 picograms/lumin-hour.



Areas have been designated for resident drop-off of yard waste and waste oil