Going “Green” in St. Lucie County

September 11, 2006

Board of County Commissioner Workshop

What is “Green” Design?

Defined by USGBC as design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas:

- **Sustainable site planning**
- **Safeguarding water and water efficiency**
- **Energy efficiency and renewable energy**
- **Conservation of materials and resources**
- **Indoor environmental quality**

"Green" Design cont.

- Category 1: Sustainable Site Planning
  - Lot choice (avoid building on prime farmland, parkland, historic sites, listed species habitat, or within 100 feet of wetlands)
  - Native tree and plant preservation
  - Minimize on-site infrastructure (roads, parking lots)
  - Provide easy access to public transit
  - Erosion control/topsoil preservation

“Green” Design cont.

- Category 2: Safeguarding Water and Water Efficiency
  - Water-conserving plumbing fixtures
  - Greywater and stormwater reuse
  - Rainwater harvesting – rain barrels, cisterns
  - Native and drought-tolerant landscaping
  - Water-conserving irrigation (irrigation zones, rain sensors)
  - Drainage/retention (bioswales, green roofs, ponds, man-made wetlands)

“Green” Design cont.

- Category 3: Energy Efficiency & Renewable Energy
  - Use of passive solar space heating and lighting systems
  - Low-emission glazing on windows
  - High efficiency HVAC systems
  - Insulation and sealing of floor joist perimeter
  - Light colored exterior walls
  - Appliances, lights and amenities
  - Energy efficient lighting, incl. motion sensitive lighting
  - Use of landscaping to shade structures
  - Green roofs
  - Solar hot water and PV systems
  - Turn off computers when not in use
  - Set AC higher and hot water heater below 120 degrees

“Green” Design cont.

- Category 4:Conservation of materials and resources
  - On-site use of cleared materials
  - Recycling of construction waste
  - 100% recycled carpeting and heavy steel
  - Furniture with high recycled content

- Category 5 – Indoor environmental quality
  - Sustainable, nontoxic building materials (low and zero VOC paints, linoleum made from jute and linseed oil)

Environmental Impact of Buildings*

- 65.2% of total U.S. electricity consumption
- > 36% of total U.S. primary energy use
- 30% of total U.S. greenhouse gas emissions
- 136 million tons of construction and demolition waste in the U.S. (approx. 2.8 lbs/person/day)
- 12% of potable water in the U.S.
- 40% (3 billion tons annually) of raw materials use globally

* Commercial and residential

Source: USGBC 2005

Benefits of Green Building

Environmental benefits

- **Reduce the impacts of natural resource consumption**

Economic benefits

- **Improve the bottom line**

Health and safety benefits

- **Enhance occupant comfort and health**

Community benefits

- **Minimize strain on local infrastructures and improve quality of life**

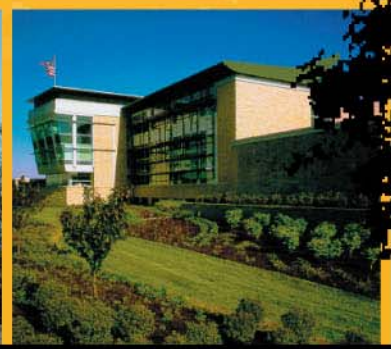
Source: USGBC 2005

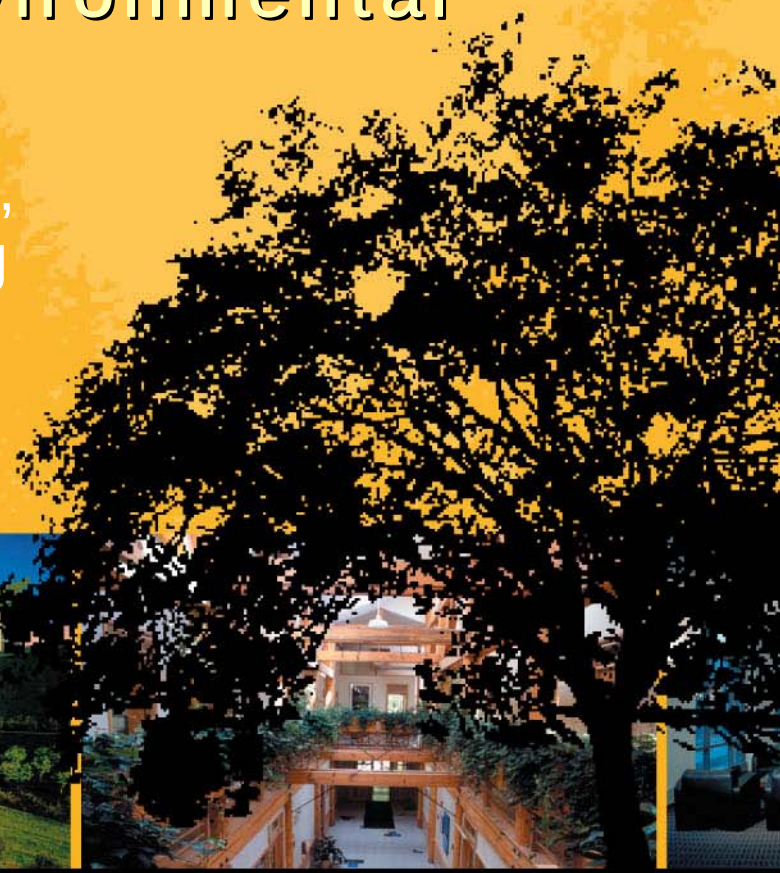
LEED

GREEN BUILDING RATING SYSTEM

Leadership in Energy & Environmental Design®

A leading-edge system for designing, constructing, operating and certifying the world's greenest buildings.





Why Was LEED® Created?

- Facilitate positive results for the environment, occupant health and financial return
- Define “green” by providing a standard for measurement
- Prevent “greenwashing” (false or exaggerated claims)
- Promote whole-building, integrated design processes

Why Was LEED® Created?

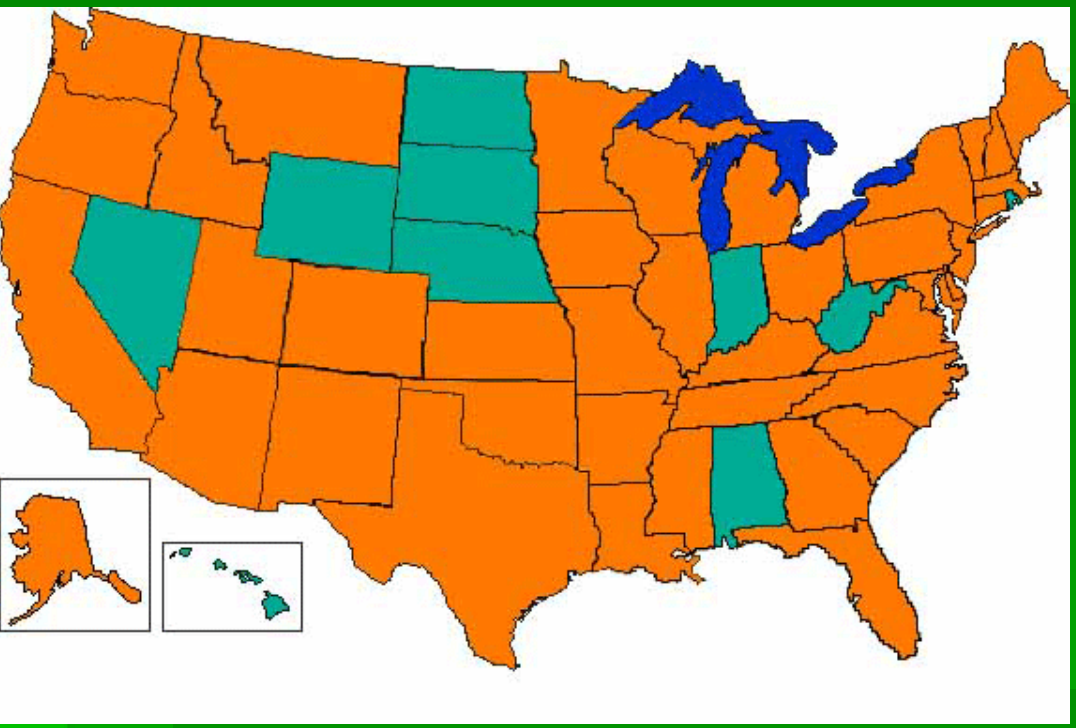
- Use as a design guideline
- Recognize leaders
- Stimulate green competition
- Establish market value with recognizable national “brand”
- Raise consumer awareness
- Transform the marketplace!

LEED® Products

LEED covers many different types of buildings and construction. These are covered under the following LEED products:

LEED-NC: LEED for New Construction and Major Renovations/Additions (for commercial and institutional buildings, released in 2000)
LEED-EB: LEED for Existing Buildings (released 2004)
LEED-CI: LEED for Commercial Interiors (released 2004)
LEED-CS: LEED for Core and Shell (public release: 2005)
LEED-H: LEED for Homes (public release: 2006)
LEED-NC: LEED for Neighborhood Developments (public release: 2006)

LEED-NC® Market Transformation



- 289 Certified Projects
- 2,069 Registered Projects

235 M gsf

50 States

13 Countries

As of 10.19.05

All statistics exclude pilot projects

LEED-NC® in the USA

Federal Government Use:

- **General Services Administration (GSA)**
  - LEED Certified projects beginning in 2003
- **U.S. Air Force**
  - LEED Application Guide for Lodging
- **U.S. Army Corps of Engineers**
  - Adaptation of LEED: SPiRiT
- **Department of State**
- **Department of Energy (DOE)**
- **Environmental Protection Agency (EPA)**
  - Grant for LEED Existing Buildings
- **U.S. Navy**
  - Grant for LEED Residential

LEED-NC® in the USA

State Government Use*:

- California
- Maryland
- Massachusetts
- New Jersey
- New York
- Oregon
- Pennsylvania
- Washington

Local Government Use*:

- Austin, TX
- Arlington, VA
- Boulder, CO
- Chicago and Cook County, IL
- Los Angeles, CA
- Portland, OR
- San Jose, CA
- San Francisco, CA
- Seattle, WA

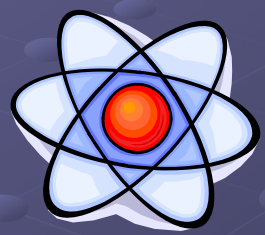
*Not limited to these examples

Global Interest in LEED®

- Australia
- Canada**
- China**
- France
- India **
- Brazil*
- Curaçao*
- Japan*
- Spain*
- Mexico**
- Italy*
- Côte d'Ivoire*
- Guatemala*
- Chile

**Certified Projects
*Registered Projects

ENERGY CONSERVATION
Past, Present, and Future



St. Lucie County

Board of County Commissioners

Energy Conservation in Our County…

- Due to increasing energy demands and costs, energy efficiency has become a major concern.
- The following is an update of what we have done, are doing, and plan to do to conserve energy.

Lighting Efficiency

- Indoor Lighting
  - New light fixtures are more energy efficient
  - Use less bulbs in existing light fixtures
- Outdoor Lighting
  - Photocell change-out for building exteriors and parking lots.
  - Timers on lighting for parks, etc.

HVAC
(Heating, Ventilation, Air Conditioning)

- HVAC Systems Change-Out using units with higher Seasonal Energy Efficiency Ratio (SEER)
- Chilled Water System Expansion
- Higher Efficiency Pump and Fan Motors
- Variable Frequency Drives on Fan Motors and Water Pumps
- Temperature Regulation using Timeclocks & Sensors
- Building Management Systems

Solar Reflective Roofing

- Factory prefabricated white single-ply membrane reflecting 80-85% UV rays, ideal for our geographical region
- Environmentally safe
- Rooftop labor reduction
- Can reduce peak cooling demand by 10-15%
- Downsizes cooling equipment
- Increased roof life

Lawnwood Recreation Division Office Re-Roof – April, 2004

Walton Road Annex
May 17, 2004

Future Plans & Possibilities…

- Install motion sensors on indoor lighting
- Control irrigation through ground dampness sensors
- Plant more trees to increase shading of property and equipment
- Use “Green Building Technology” on new construction and renovation.

Green Building Technology

- Practice of creating healthier, more resource-efficient models of construction, renovation, operation, maintenance, and demolition
- Environmental, economic, and social benefits

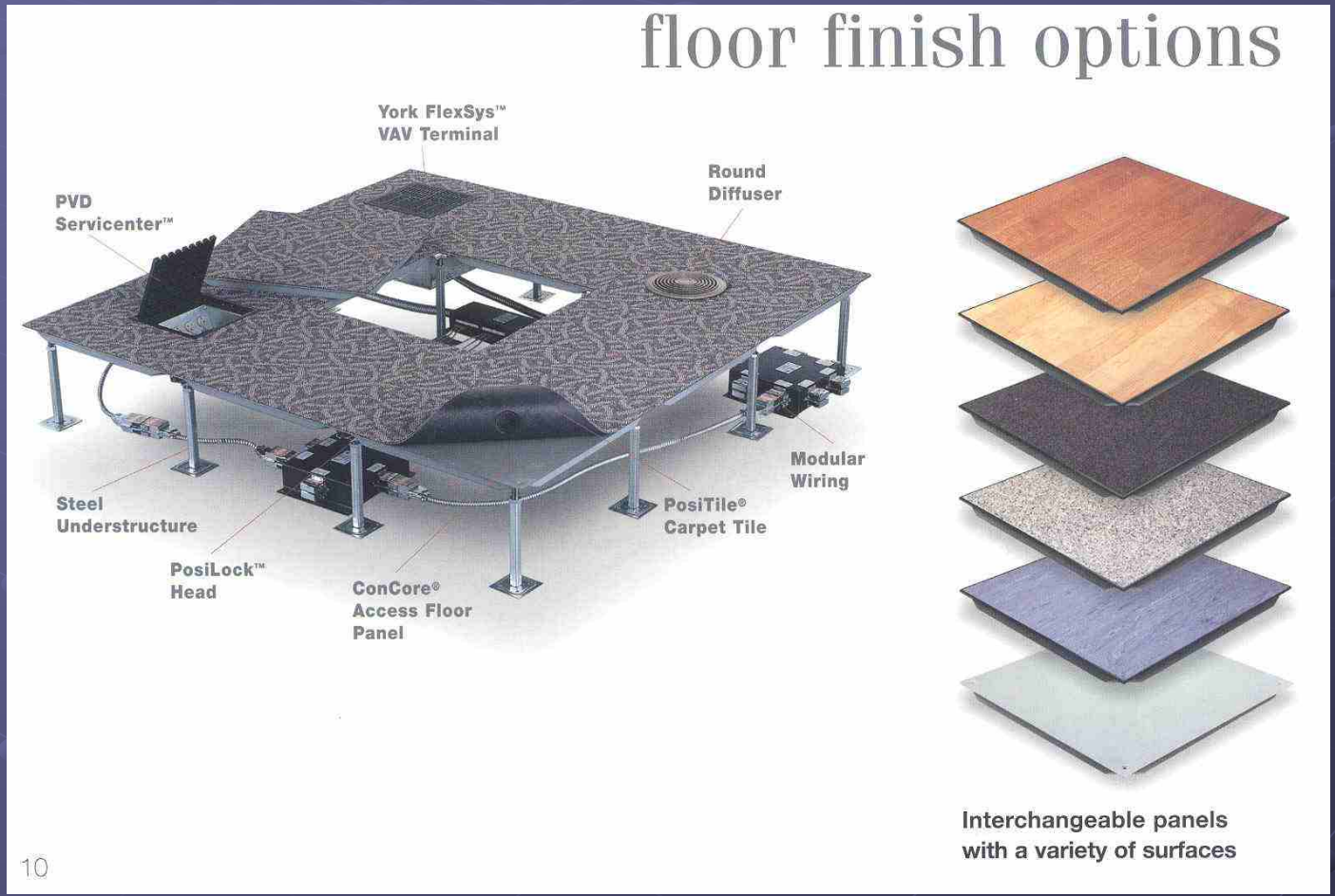
Green Building Benefits….

- Environmental Benefits
  - Improves air and water quality
  - Conserves our natural resources
- Economic Benefits
  - Reduces operating costs
  - Improves occupant productivity
- Social Benefits
  - Enhances occupant comfort and health
  - Improves overall quality of life

Leadership in Energy & Environmental Design (LEED)

- Rating system developed by US Green Building Council
- National standard for development of high-performance, sustainable buildings
- Prevents “green-washing” (false or exaggerated claims)
- Promotes whole-building, integrated design process, creates successful high-performance building

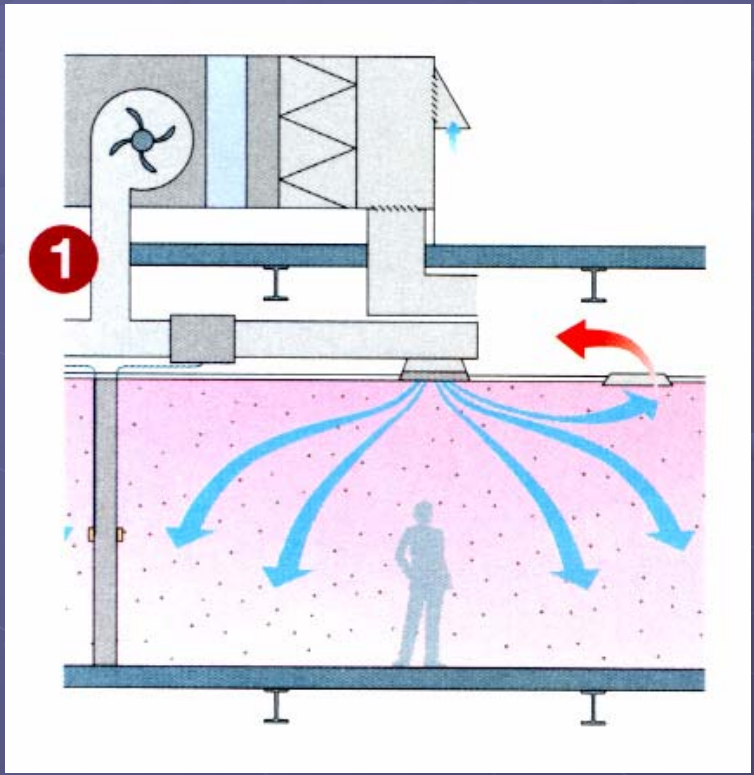
Access Flooring



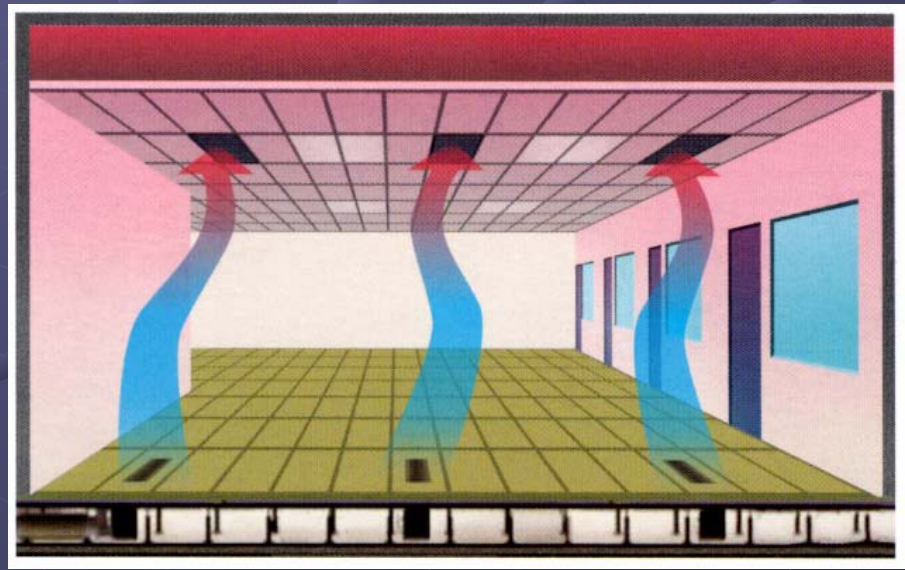
Underfloor Air Distribution, Wire & Cable Management System

- Eliminate costly overhead ductwork
- Reduce fan energy use and energy consumption
- Reduce cooling energy requirements and chiller size
- Improve ventilation efficiency

Conventional versus Convection



Conventional Overhead HVAC



Convection Enhanced Ventilation

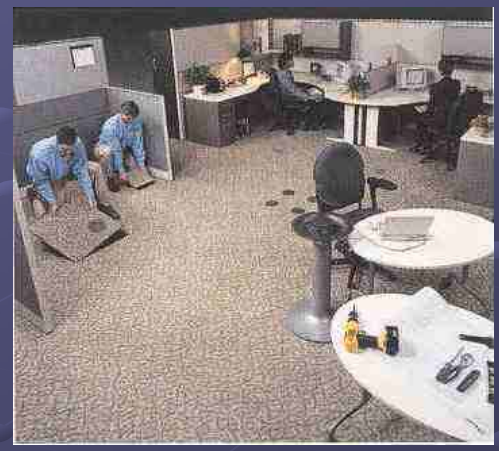
Movable Walls

- Cost effective, environmentally friendly drywall alternative
- Movable and reusable
- More privacy than standard drywall
- Less time to install, saves on labor costs
- No painting or finishing required
- Panels are pre-wired
- No screws or nails, eliminates repair work

Reconfigure Office Space

Re-route modular wiring

Relocate air diffusers



Assemble new desk

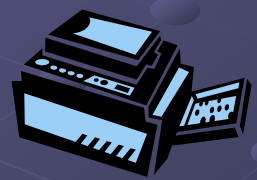
Changes completed with minimum disruption to work flow

Energy Star

- Products bearing Energy Star label are more energy-efficient than standard products, saving money and energy
- Voluntary labeling program jointly managed by EPA and DOE
- Over 40 product categories and 14,000 product models

Energy Star Qualified Product Categories

- Lighting
- Heating & Cooling
- Windows & Roofing
- Transformers
- Traffic Lights
- Office Equipment
- Appliances
- Consumer Electronics
- Food Service Equipment



Energy Conservation

- Reducing energy use and increasing energy efficiency is a proven strategy for cutting and controlling costs with good returns.
- Success is based on regularly assessing energy performance and implementing steps to increase energy efficiency.
- The common element of successful energy management is commitment to allocation of staff and funding in order to achieve continuous improvement.

Additional energy saving suggestions…

- Change power settings on computers
- Turn lights out when leaving a room or office
- Arrange back-to-back meetings
- Maintain vehicles for optimal efficiency
- Rotate vehicle use for better mileage
- Eliminate non-essential use of fuel
  - Consolidate errands when driving
  - Carpool to jobsites when possible
- Analyze new vehicle purchase

Alternative Fuels/Hybrid Vehicles

- Ultra Low Sulfur Diesel
  - Cleaner emissions, cleaner air
- Ethanol
  - Some newer model vehicles run on E85 ethanol and regular gas, saving natural resources
- Hybrids Vehicles
  - Gas/electric powered, energy efficient

In conclusion….

- St. Lucie County Central Services continues to strive for energy efficiency.
- For us to continue to become more energy efficient, the County needs to come together as a team dedicated to this cause.

What are other communities doing?

- Sarasota County
  - All County buildings built to the highest standards (LEED and Florida Green Building Certification)
  - Participation by the public is voluntary with incentives such as fast tracked building permits, reduced building permit fees, and marketing of the project

What are other communities doing?

- Sarasota County – continued
  - Buildings are certified by a third party or County employee trained and certified as a Green Home Certifying Agent or a LEED Accredited Professional
  - County has established a Golf Course Technical Manual

What are other communities doing?

- Sarasota County - continued
  - County has a Green Housekeeping Policy that requires cleaners used have an independent, non-profit third party certification through the Green Seal standard for Industrial and Institutional Cleaners

What are other communities doing?

- The Department of Environmental Protection has committed to administratively working with other state agencies to improve energy diversity, sustainability, efficiency and conservation statewide as part of Florida's Energy Plan, released in January 2006. The commitment includes requiring that all new state government buildings meet the LEED standard.
- http://www.dep.state.fl.us/energy/fla_energy/files/energy_plan_final.pdf

Premier Automotive Group North American Headquarters

Ford Motor Company

Irvine, California

LEED® v2 Certified 2001

Building Statistics

Completion Date:	*November 2001*
Cost:	*$60 Million*
	(construction contract only)
Size:	*253,000 gross square feet*
Footprint:	*74,000 square feet*
Construction Type:	*Commercial/Industrial*
Use Group:	*Office and Design Center*
Lot Size:	*11.5 acres*
Annual Energy Use:	*24,356,010 kBtu/h*
Occupancy:	*700*

Project Highlights:

Sustainable Sites

•Alternative Transportation: Three bus routes are located within ¼ mile; bicycle racks and showers provided; 30 electric vehicle recharging stations provided.

Water Efficiency

•Innovative Wastewater Technologies: All toilets use reclaimed water, accounting for more than 50% of total sewage conveyance.

Energy and Atmosphere

•Optimize Energy Performance: Exceeds ASHRAE 90.1-1999 by 40% using a high efficiency glazing system, high efficiency lighting with T5 lamps, an underfloor air distribution system in office tower, increased chiller efficiency and a variable speed drive on one chiller.

Materials and Resources

•Construction Waste Management: 57% of all construction waste was recycled including concrete, asphalt, paper, metal and cardboard.

Indoor Environmental Quality

•Construction IAQ Management Plan: All ducts and permeable materials were protected against contamination during construction; all construction filtration media was replaced before occupancy.

New York State Department of Environmental Conservation

Office Complex at 625 Broadway Avenue

Albany, New York

LEED® v2 Silver 2002

Owner:	**Picotte Companies**
Building Statistics	
Completion Date:	*September 2002*
Size:	*471,000 gross square feet*
Footprint:	*45,600 square feet*
Construction Type:	*Commercial*
Use Group:	*Office*
Lot Size:	*2.18 acres*
Annual Energy Use:	*22,232,209 kBtu/year*
Occupancy:	*1700 Staff*

Project Highlights:

Sustainable Sites

- Urban Redevelopment: Urban infill site was previously a gravel parking lot.
- Alternative Transportation: Located 80 yards from 4 bus lines; bicycle racks and showers; 15 electric vehicle charging stations; priority carpool parking.

Energy and Atmosphere

- Optimize Energy Performance: Exceeds ASHRAE/IESNA 90.1-1999 by 23.7%.
- Additional Commissioning: Verified that the building is designed, constructed and calibrated to operate as intended.

Materials and Resources

- Construction Waste Management: 51% of construction waste was recycled.

Indoor Environmental Quality

- CO_2 Monitoring: CO_2 monitoring system has 83 sensors integrated with the building's building management system.
- Low-Emitting Materials: All adhesives, sealants, paints, coatings, carpeting, composite wood emit low or no volatile organic compounds.

Issaquah Highlands Fire Station #73

City of Issaquah

Issaquah, Washington

LEED® v2 Silver 2003

On October 30, 2003, Issaquah Highlands Fire Station #73 in Issaquah, Washington, was awarded LEED® v2 Silver and became the first LEED certified fire station. This 2 story 3 bay fire station incorporates many water efficient technologies for both the building and landscaping to maximize efficiency. Within the building, the project achieves 55% potable water use reduction for waste conveyance and 36% water use reduction for flush and flow fixtures. In addition, the landscape design does not require a permanent irrigation system, further reducing the need for potable water on site. During construction, a waste management plan was implemented to divert 76% of materials from the landfill. Fire Station #73 supports the regional economy as 44% of building materials are locally manufactured, and of those, 55% are locally harvested, demonstrating exemplary performance. For the interior, the project includes several indoor environmental quality strategies, such as carbon dioxide monitoring systems and the use of low-emitting materials. Furthermore, a construction IAQ management plan was implemented during construction as well as before occupancy to help sustain the comfort and well-being of the fire fighters. A biodiesel fuel storage tank supplies the building's emergency generator and also has the capability to provide fuel for the fire service vehicles based at the station. To further demonstrate innovative performance, a rain water catchment system and underground cistern provide non-potable water for truck washing, conserving 4,500 gallons of water annually.

West Coast & Alaska Tsunami Warning Center

National Oceanic and Atmospheric Administration/ National Weather Service

Palmer, Alaska

LEED v2 Certified 2004

The West Coast and Alaska Tsunami Warning Center in Palmer, Alaska, achieved LEED® v2 Certified on December 23, 2003. As the first LEED certified building for Alaska, this one story 6,690 sf building monitors potential tsunamigenic earthquakes occurring in the coastal areas of California, Oregon, Washington, Alaska, and British Columbia. The project reused an existing site, relocating the old warning center building and storage facility for reuse at another site. By planting adaptive vegetation which does not require irrigation, more than half of the site was restored, and within the building, water usage is reduced by more than 30%. Additional commissioning helps the building to achieve 28% energy efficiency over ASHRAE 90.1-1999. Through the implementation of a construction waste management plan, 82% of materials were diverted from the landfill. To improve indoor air quality, the project includes carbon dioxide monitoring, a construction IAQ management plan during construction and before occupancy, and installation of low-emitting adhesives, sealants, and paints. To connect staff to the beautiful Palmer scenery, the building is designed with views from 90% of spaces.

What should we consider for St. Lucie County

- Model our program after Sarasota County's (ordinances already written)
- Train and certify at least two building inspectors in LEED and USGBC standards
- Join the USGBC
- Require all remodeling, and new county-owned construction be built to the highest standards
- Create green housekeeping policy
- Immediately retrofit existing buildings
- Consider hybrid vehicles for light fleet and convert diesel fleet to bio diesel

Technical Overview of LEED®

- Green building rating system, currently for commercial and institutional new construction and major renovation.
- Existing, proven technologies
- Evaluates and recognizes performance in accepted green design categories
- LEED product development includes existing buildings, commercial interiors, multiple buildings, core & shell, and homes

LEED® Certification Benefits

Recognition of Quality Buildings and Environmental Stewardship

- Third party validation of achievement
- Qualify for growing array of state and local government incentives
- Contribute to growing knowledge base
- LEED certification plaque to mount on building
- Official certificate
- Receive marketing exposure through USGBC Web site, case studies, media announcements

Resources

- LEED Green Building Rating System
- Training Workshops
- Reference Guide
- Professional Accreditation
- Welcome Packet
- Credit Rulings
- Website (www.usgbc.org/leed)
- Email (leedinfo@usgbc.org)

References

Harvard Business Review

U.S. Green Building Coalition. 2005. An Introduction to the U.S. Green Building Council and the LEED Green Building Rating System. Powerpoint slide presentation.