

# Green Building Practices



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# What is “Sustainable” Building

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- ❑ Also called “Green” or “High Performance” Design
- ❑ Use resources (energy, water, materials, land, etc.) more efficiently



# Environmental Impacts of Buildings

- ❑ The construction and operation of buildings have numerous detrimental effects on the local, regional, and global environment:
  - 40% of annual US energy use
  - 30% of US CO<sub>2</sub> production
  - 25% of water use
  - 20% - 40% of solid waste
  - 30% of wood and raw materials
  - 30%+ of buildings have poor indoor air (people spend 90% of their time indoors)



# Benefits of Sustainable Building

## □ Predictable benefits:

- Energy savings
- Waste reduction
- Water savings
- Comfortable environment



## □ Less Predictable benefits:

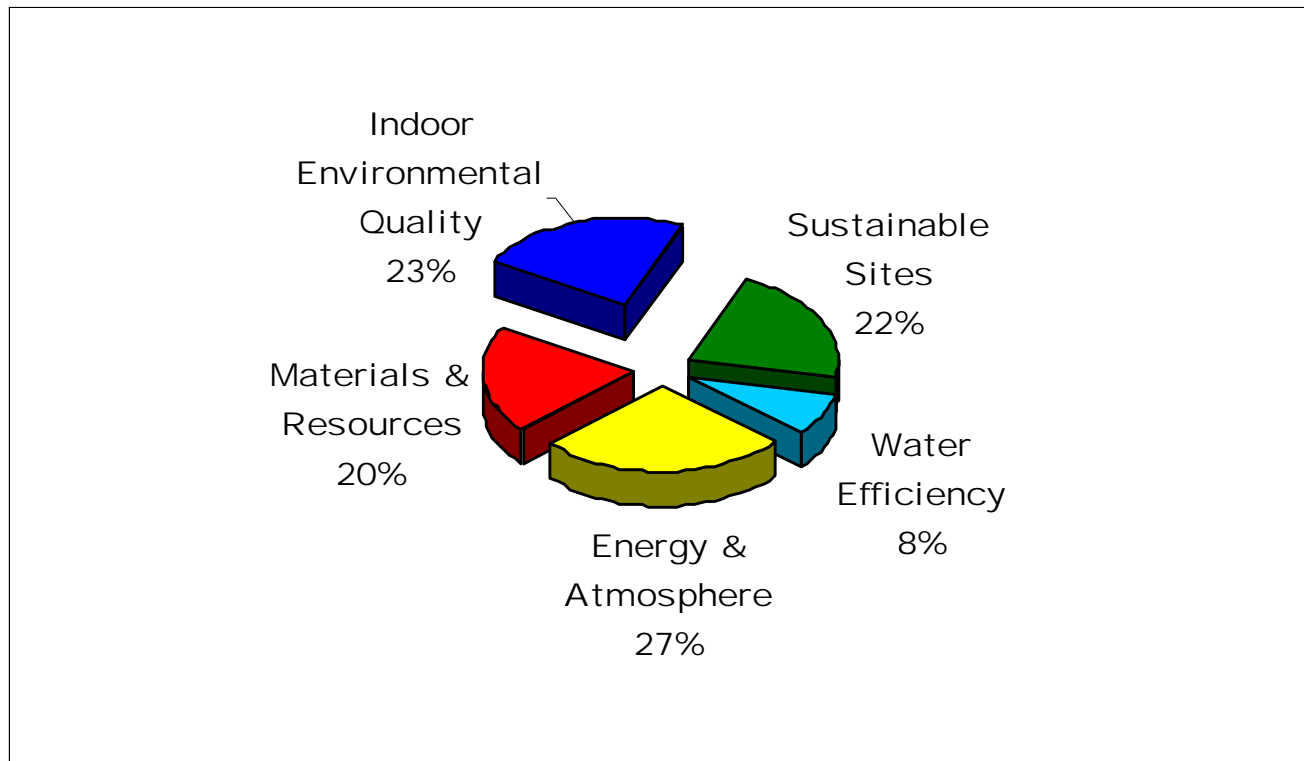
- Improved productivity
- Health benefits



# How to Measure?

## □ LEED™ Rating System

- Most widely accepted benchmark for sustainability
- Five Credit Categories



# Saranac Hotel Renovation

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## Case Study



# Saranac Hotel Renovation

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- ❑ Significant structure in Historic Downtown District
- ❑ Four stories plus basement, and adjacent one-story building
- ❑ Converted to a Mixed-Use facility
  - Theater
  - Restaurant
  - Retail
  - Office
  - Condominiums



- Programming Charrette
- Eco-Charrette
  - Consensus-building process
  - Sustainability = first filter





# Project Goals

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- ❑ *"Make it Sustainable and make it Beautiful"*
- ❑ Set an example for sustainable building practices in the Spokane community
- ❑ Create a facility that contributes to the success of recent projects in the neighborhood
- ❑ Achieve LEED™ Certification



# Urban Redevelopment

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- ▣ Intent: Channel development to urban areas to protect reduce impact and protect resources
- ▣ Strategy: Renovate existing urban site & structure



# Stormwater Management

- ❑ Intent: Minimize stormwater runoff and reduce contaminants
- ❑ Strategies: Rainwater and spring water capture, retention & reuse



# Reduce Heat Island Effect

- ❑ Intent: Reduce heat islands to minimize impact on microclimate
- ❑ Strategies:
  - Extensive green/garden roof systems
  - Other roofs highly reflective
  - Naturally reflect solar radiation to atmosphere



# Water Efficient Landscaping

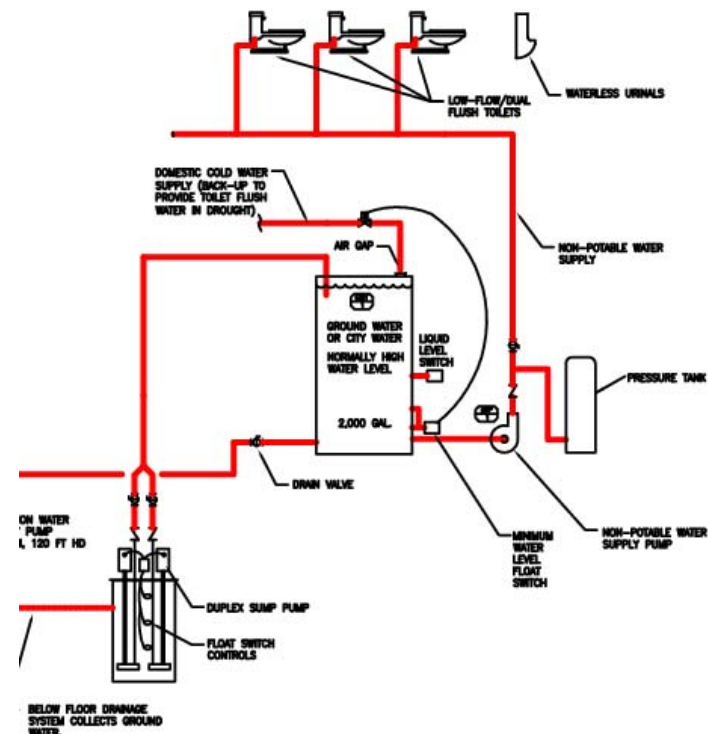
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- ❑ Intent: Limit the use of domestic water for landscape irrigation
- ❑ Strategies:
  - High-efficiency irrigation system
  - Drought tolerant plantings



# Innovative Wastewater Technologies

- Intent: Reduce use of municipally provided water for sewage conveyance
- Strategy: Utilize captured site water (rain & spring) for flushing





# Water Use Reduction

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## □ Intent:

- Reduce burden on municipal water supply and wastewater treatment facilities

## □ Strategies:

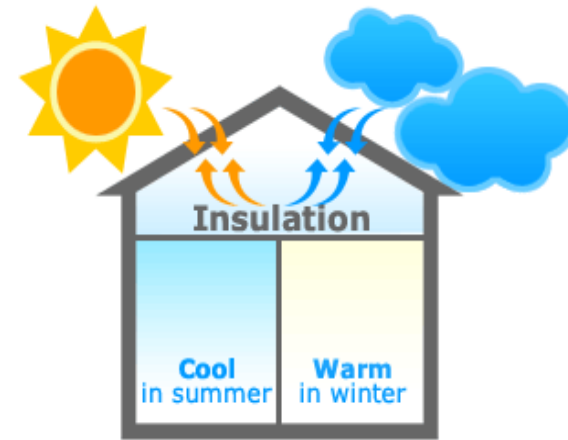
- Waterless urinals
- Dual-stage toilets
- Site water capture and re-use





# Optimize Energy Performance

- ❑ Intent: Reduce environmental impacts associated with excess energy use
- ❑ Strategies:
  - Super-insulated building envelope
  - Ground-source heat pump system
  - Photo-voltaic array
  - Efficient Lighting Design



# Water-Source Heat Pump

- ❑ Two 250' deep wells in basalt rock
- ❑ \$100,000 premium for system
- ❑ 1/3 less total energy than conventional system
- ❑ Payback from energy savings is about 10 years



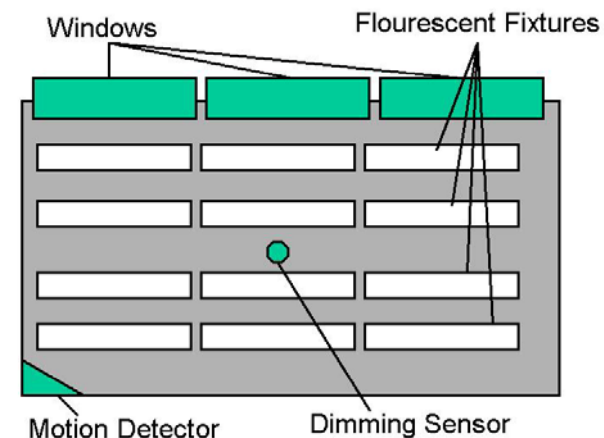
# Photo-Voltaic (PV) Array

- Will generate as much as 10% of building's electrical demand
- "Net Metering" when more kW-hrs are produced than can be used



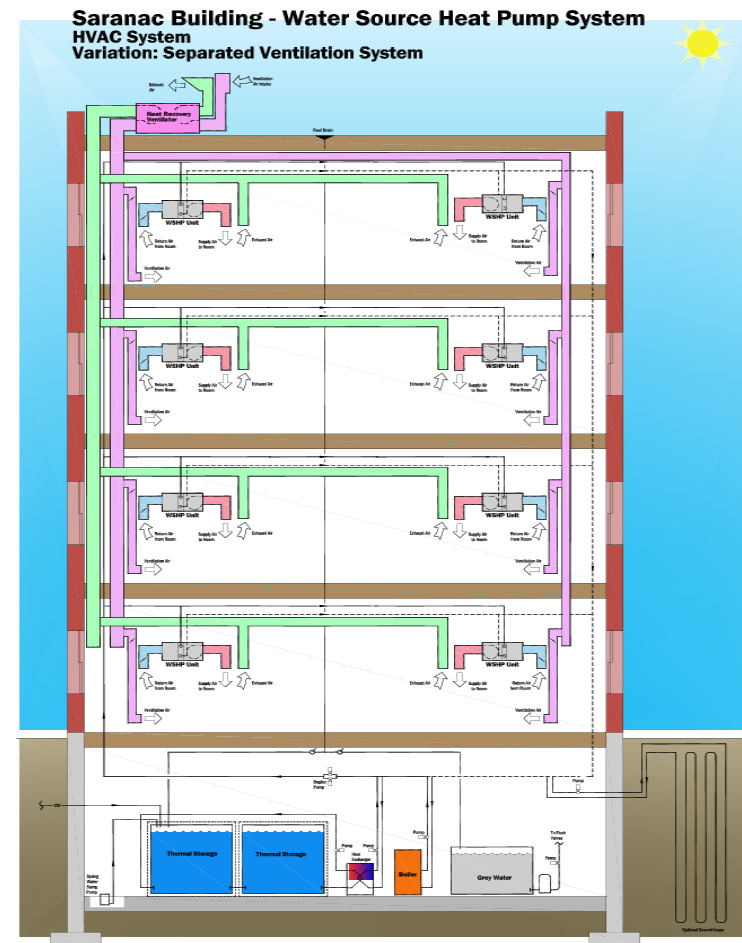
# Efficient Lighting Design

- Occupancy sensors control light fixture switching
- Daylight sensors dim lighting as response to available daylight
- Uses about 40% less energy than standard (ASHRAE 90.1) design



# Optimize Energy Performance

- Overall Performance Estimates:
  - Use 45% less energy than ASHRAE Standard
  - Will cut annual energy costs by 33% to 50%



# Optimize Energy Performance

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- Incentives:
  - Avista Utilities incentive for LEED™ Certification = \$1.25 per SF
  - Photo Voltaic Array incentive





# Building & Resource Reuse

- ▣ Intent: Extend the lifecycle of existing buildings and materials to conserve natural and cultural resources & reduce waste
- ▣ Strategy: 95% of the existing structure and up to 30% of the existing interior finishes will be reused, reducing the demand for new materials





# Local & Regional Materials

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## □ Intent:

- Reduce environmental impacts resulting from transportation of building products
- Support local economy

## □ Strategy:

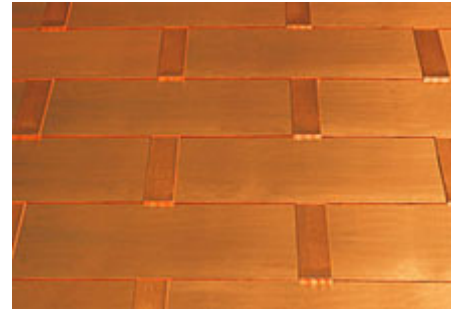
- Utilize local materials for concrete, wood products, masonry, ceramic tile, metal panels, etc.



# Recycled Content

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- ❑ Intent: Reduce impacts resulting from the harvest and extraction of new materials
- ❑ Strategies:
  - Fly ash in concrete
  - Steel structural frame
  - Recycled denim insulation
  - Copper wall panels



# Certified Wood

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- Intent: Encourage environmentally responsible forest management
- Strategy: Minimum 50% of all wood-based materials are FSC-certified



# Low-Emitting Materials

- ❑ Intent: Reduce indoor air contaminants to provide occupant health & comfort
- ❑ Strategies:
  - Low VOC adhesives, paints & carpets
  - No urea-formaldehyde resins in wood & agrifiber composites



# Daylight & Views

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- ▣ Intent: Provide a connection between indoor spaces and outdoor environs
- ▣ Strategy: Existing window openings & interior relites provide access to daylight & views throughout building





# Saranac Hotel Renovation

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