

US EPA ARCHIVE DOCUMENT

# *Green Casinos Workshop*



*Red Hawk Casino*  
*Shingle Springs Rancheria*

*September 2, 2009*

*Michelle Baker*  
*U.S. Environmental Protection Agency*  
*Region 9*



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# Outline

- Terminology: High Performance Building = Green Building = Sustainable Building
- What is High Performance/Green Building ?
- Why Build Green ?
- How to Build Green
- Cost
- Resources (throughout)

# So what is “Green” Building?

Design & Construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants



Sustainable site planning



Safeguarding water and water efficiency



Energy efficiency and renewable energy



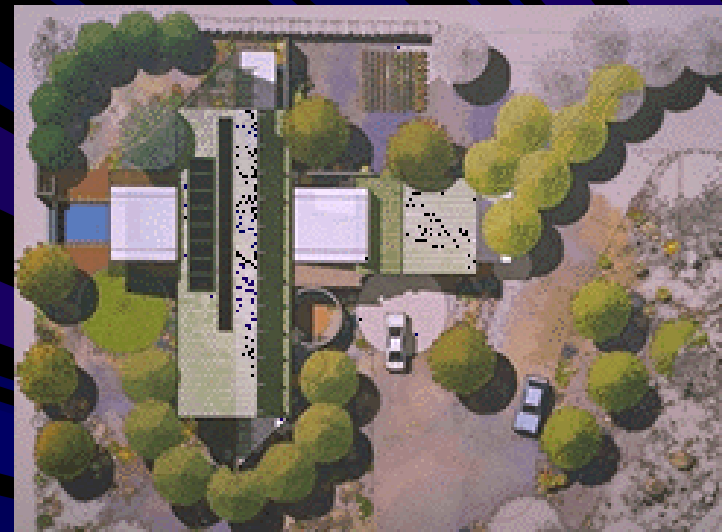
Conservation of materials and resources



Indoor environmental quality

# Green Building is More Sustainable

- Designed appropriately for location
- Consume less resources
- Generate less waste
- Cost less to operate
- provide healthier living and working environments than traditional *contemporary* buildings.



# Environmental Impact of Buildings

In the US, buildings account for:

- 39 % of total energy use
- 12 % of the total water consumption
- 68 % of total electricity consumption
- 38 % of the CO<sub>2</sub> emissions
- 60 % of total non-industrial waste generation (C&D)
- 60% of all materials (excluding food and fuel)

Sources: DOE, EPA, U.S. Geological Survey, Worldwatch Institute

# Key Health Issues

- 90% of our time spent indoors
- Air pollution is one of the top five environmental risks
- Exposure to indoor air pollutants can be 2 to 100 times higher than outdoor levels
- Poor air quality health effects: headaches, dry eyes, nausea, dizziness and fatigue
- A majority of cancers are environmentally induced



# New Construction or Renovations Can be Green

- New Buildings

- Renovations

- Repair or Rehabilitation

- Can retrofit several features such as insulation, plumbing, lighting

# Tribal Green Building Examples

- The Turtle Creek Casino & Hotel



- Other Examples?

# Examples of Green Features: Energy

- Energy efficient heating and cooling systems
- Energy efficient lighting
- Occupancy sensors
  - restrooms
  - guest rooms
  - storage area
- Energy efficient computers, kitchen and laundry appliances



# Green Buildings



✓ *Carpet Tile*



✓ *Linoleum*



✓ *Polyolefin*



✓ *Wood/ Solid Surface*



✓ *Plaster*

*Material Choices:*

- *Natural*
- *Recyclable*
- *Durable*
- *Renewable*
- *Conducive to green cleaning*
- *Low emitting materials*

# Green Construction Practices

- ✎ Protect the immediate health of building occupants
- ✎ Protect the health of the surrounding local community
- ✎ Protect the health of the global community and natural resources
- ✎ Include recycling/reuse of construction and demolition debris



# Benefits of Green Building

 Financial

 Health and Productivity

 Environmental

# Financial Benefits of Green Building

- Reduced energy, water and waste costs
- Lower operating and maintenance costs
- Lower insurance and risk costs
- Enhanced productivity and health

# Health and Productivity

- 🏢 Poor Indoor Environmental Quality (IEQ) has health and productivity costs valued at many billions of dollars per year
- 🏢 ***Over 1,000 studies and reports*** link green building attributes such as air quality and thermal comfort to human health and productivity
- 🏢 Improved IEQ:
  - 🏢 Decreased absenteeism
  - 🏢 Improved performance
  - 🏢 Employee/student satisfaction



# Environmental: Energy

- Green buildings average - 28% more efficient
- Generate 2% of their power on-site, typically from photovoltaics (solar)
- Green buildings can average kWh reduction of 30% and an average peak kW reduction of 40%



# Additional Benefits

- Access additional funding sources
- Community goodwill
- Good stewardship
- Meeting customer needs and demands
- Others? (Time to roll dice again!!)

# How to Build Green

- Certification Programs
- Specifications
- Global Green or other assistance providers
- Green Architects, Designers, Community members

Strategies to use in any combination

# Certifications:

## Green Building:

- Leadership Energy Environmental Design (LEED)
- Green Native Council
- National Green Building Standard
- Local Green Building Programs
  - Build it Green

## Energy Efficiency:

- Energy Star with Indoor Air Package

# Routes to Building Green: Specifications

- ✦ Require designer to include green building specifications - which you can select
- ✦ Can be included in any project, with or without a certification program
- ✦ Good systems often available from state, local governments

# Routes to Building Green: Specifications

## Green Spec Directory 7<sup>th</sup> Edition

<https://www.buildinggreen.com/ecommerce/gs.cfm?>

- ✎ Includes product listings and guideline specifications
- ✎ Detailed listings for more than 2,100 environmentally preferable building products with descriptions and manufacturer information
- ✎ All listings are screened
- ✎ Organized by CSI Division: Suggestions and sample language to incorporate into your project specs.
- ✎ You pick and choose specifications to use

# Routes to Building Green: Specifications

## ✦ Federal Green Construction Guide for Specifiers

✦ Model green construction specification language to be used to supplement full project specifications

✦ <http://www.wbdg.org/>

## ✦ Energy Star with Indoor Air Package

✦ also had certification option

✦ [http://www.energystar.gov/index.cfm?c=bldrs\\_lenders\\_raters.nh\\_features](http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_features)

## ✦ Sustainable Building Guidelines – CIWMB

✦ <http://www.ciwmb.ca.gov/GreenBuilding/Design/Guidelines.htm>

# Routes to Building Green: Technical Assistance Providers

## **Global Green**

<http://www.globalgreen.org/greenbuilding/index.html>

## **Native Green Council**

[http://www.greennativecouncil.com/certification\\_training\\_information](http://www.greennativecouncil.com/certification_training_information)

## **State and local programs such as Build it Green**

<http://www.builditgreen.org/>

## **LEED Accredited Professional**

<http://www.usgbc.org/LEED/AP/ViewAll.aspx>

## **Local Energy Utilities** - many offer programs and assistance

Pacific Gas and Electric <http://www.pge.com/pec/>



# Routes to Building Green: Green Building Professionals

## Green Home Guide

 <http://www.greenhomeguide.com/index.php/>

## Build It Green

 <http://www.builditgreen.org/green/index.cfm?fuseaction=locate>

## Building Concerns

 <http://www.buildingconcerns.com/nocal/arch.htm>

## Green Builder

 <http://directory.greenbuilder.com/search.gbpro>

# Costs of Green Buildings

- Studies have shown an average cost premium of nearly 2% or about **\$4-5/square foot**
- Some recent studies show **no difference in cost**
- **Costs premiums continue to decrease**

# Summary: Financial Benefits of Green Buildings (per square foot)

Category	20-Year NPV
Energy Value	\$5.79
Emissions Value	\$1.18
Water Value	\$0.51
Waste Value (construction only – 1 year)	\$0.03
Commissioning O&M Value	\$8.47
Productivity & Health Value (Certified & Silver)	\$36.89
Productivity & Health Value (Gold & Platinum)	\$65.33
Less Green Cost Premium	\$(5.00)
<b>Total 20-Year NPV (Certified &amp; Silver)</b>	<b><u>\$47.87</u></b>
<b>Total 20-Year NPV (Gold &amp; Platinum)</b>	<b><u>\$66.31</u></b>

# Strategies for the Best Green Building Results:

- ◆ Start early !
- ◆ Get educated about Green Building
- ◆ Identify environmental goals and strategies
- ◆ Use an integrated design process
- ◆ Hire a knowledgeable green building consultant
- ◆ Maintain sense of respect, purpose and humor

# Contact Us



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