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 CO2 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

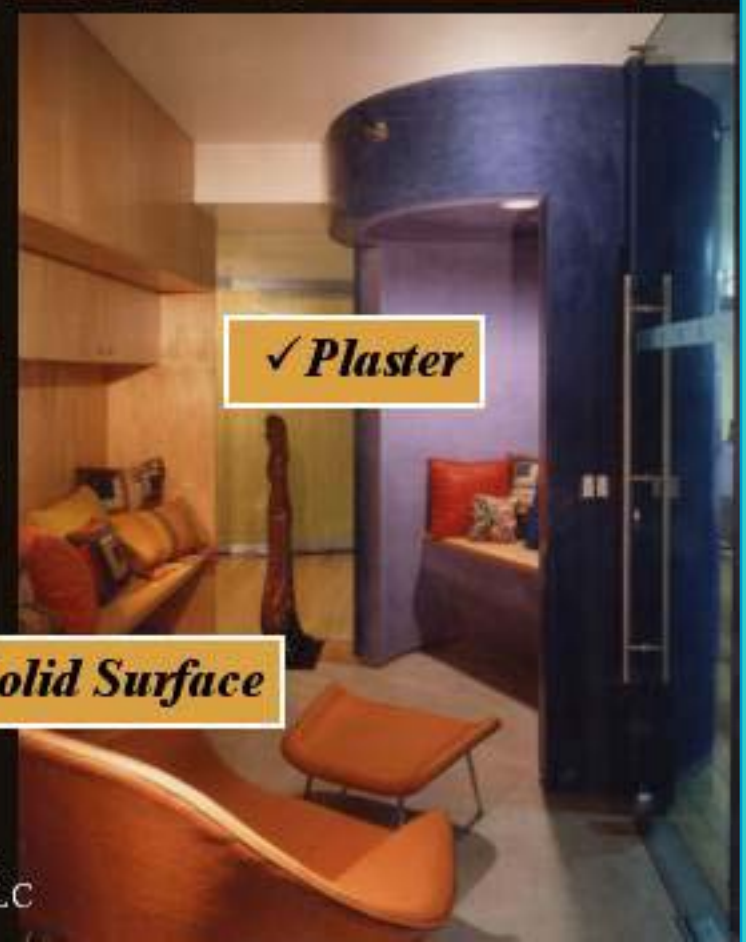
Green Buildings

✓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 7th 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
- 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

- **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)
Total 20-Year NPV (Certified & Silver)	**$47.87**
Total 20-Year NPV (Gold & Platinum)	**$66.31**

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

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