



# GREEN BUILDING ELEMENTS

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Renewable Energy and Energy Efficiency  
for Tribal Community Development

Forest County Potawatomi Bingo & Casino  
Milwaukee, MN

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# Overview

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- Introduction
- Green Building
- Elements
- Benefits
- Green Building in Indian Country
- Conclusion



# INTRODUCTION

# Connecting Green Building to Renewable Energy



Power  
Generation

- Distribution
- Transmission

R & D

- Highly technical
- Nerd work

Energy  
Efficiency

- Less technical
- People work

# Where Do We Start?

## Current Practices

- Energy Use
- Population & Consumption



## Tribal Housing

- Housing Stock
- Housing Need



## Sustainability

- Who's definition?
- What does it mean?

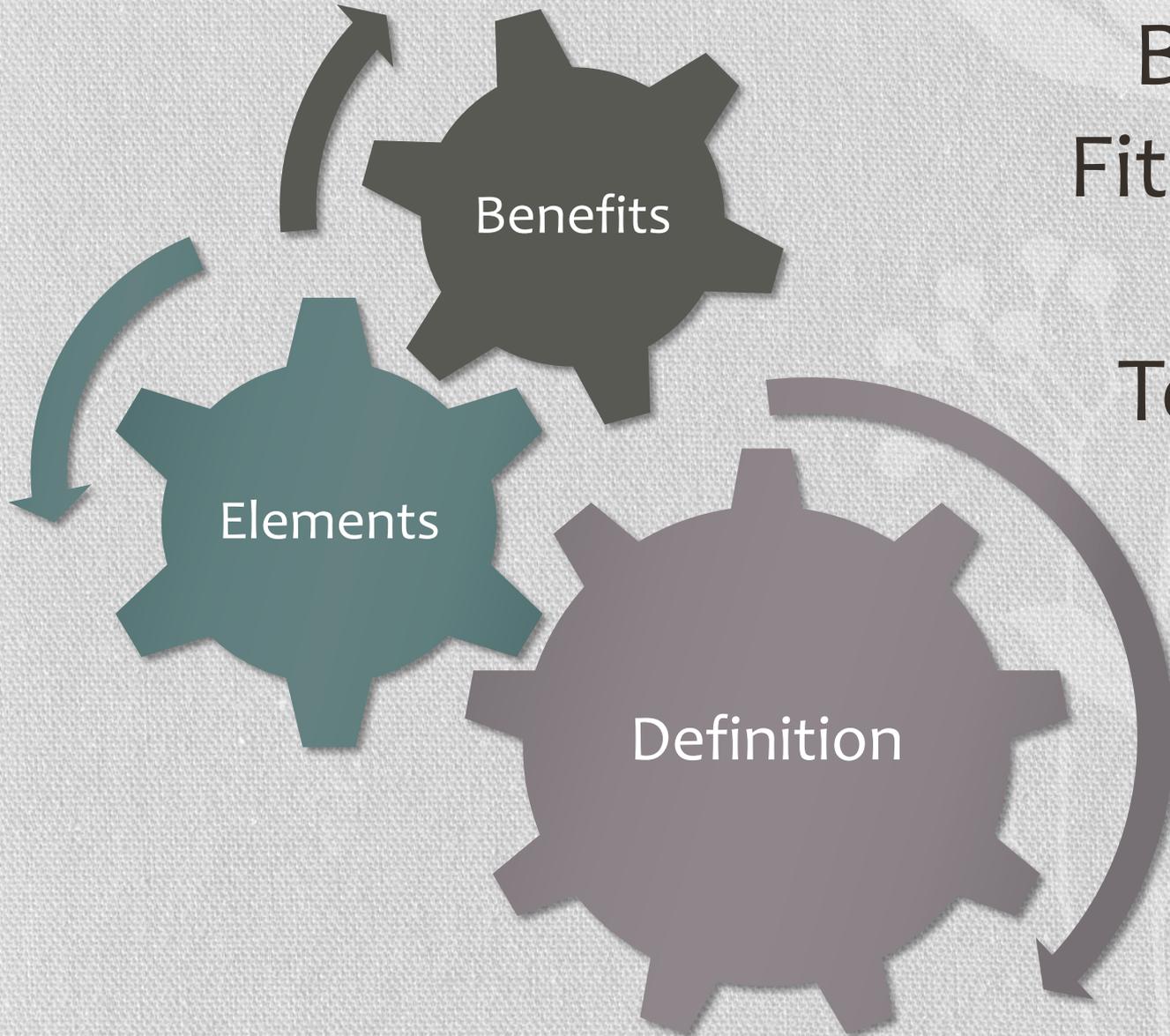


## Sustainability & Tribes



# GREEN BUILDING

# Green Building: Fitting the Pieces Together



# Defining Green Building

*We did not inherit the Earth from our parents.  
We are borrowing it from our children.*  
~ Chief Seattle

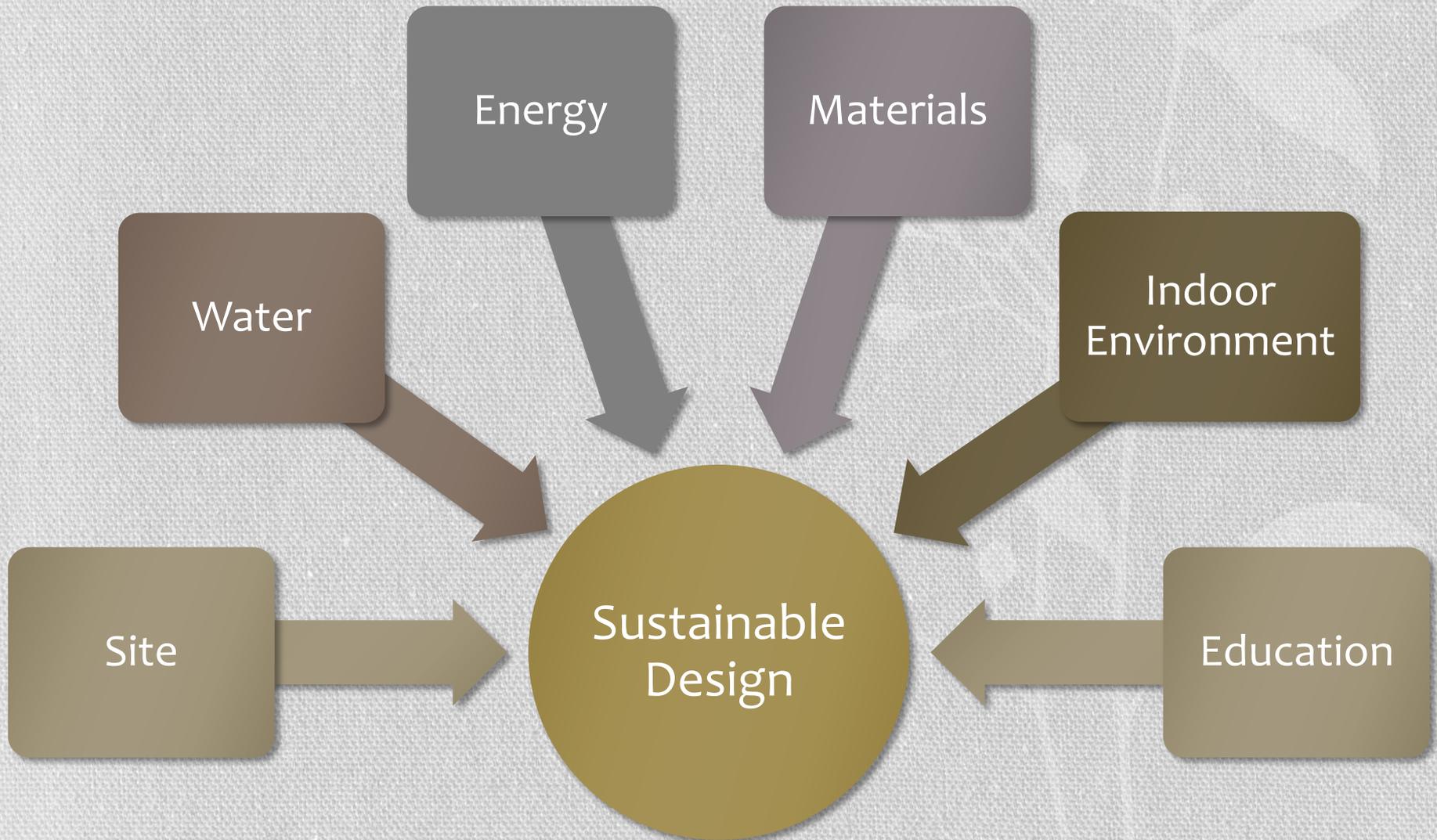


Hozhó



Green Building  
**ELEMENTS**

# Six Green Building Elements



# Site

## Green Building Strategies



Use appropriate building sites

Preserve open space

Reduce sprawl

Develop brownfields

Safeguard endangered species

Restore damaged environments

Design to optimize sun, wind, and light

# Water

## Green Building Strategies



Developing a water use management plan

Indoor water conservation

- Using low-flow plumbing fixtures
- Using high-performance appliances

Outdoor water conservation

- Using rainwater collection systems
- Using sustainable landscaping techniques
- Using high-efficiency irrigation systems

Innovative waste water management

- Using gray water recovery systems
- Using waterless urinals

Using biological treatment or other “off grid” systems

# Energy

## Strategies to Consider

Passive solar design

- Optimizing site, design and orientation
- Landscaping to provide natural shade
- Using natural day lighting
- Using natural heating and ventilation

Energy management plan

- Evaluating tradeoffs & minimizing projected energy costs
- Training building occupants
- Tracking and optimizing performance over time
- Employing an energy management system

Energy efficient or high performance materials

- Thermal insulation
- Roofing and glazing
- Lighting
- Heating, ventilation, and air conditioning systems

Indoor appliances

- Energy Star
- Renewable energy

# Materials

## Green Building Strategies



Prepare a Green Building Product Selection Plan



Use Salvaged Building Products



Use Recycled-content Building Products



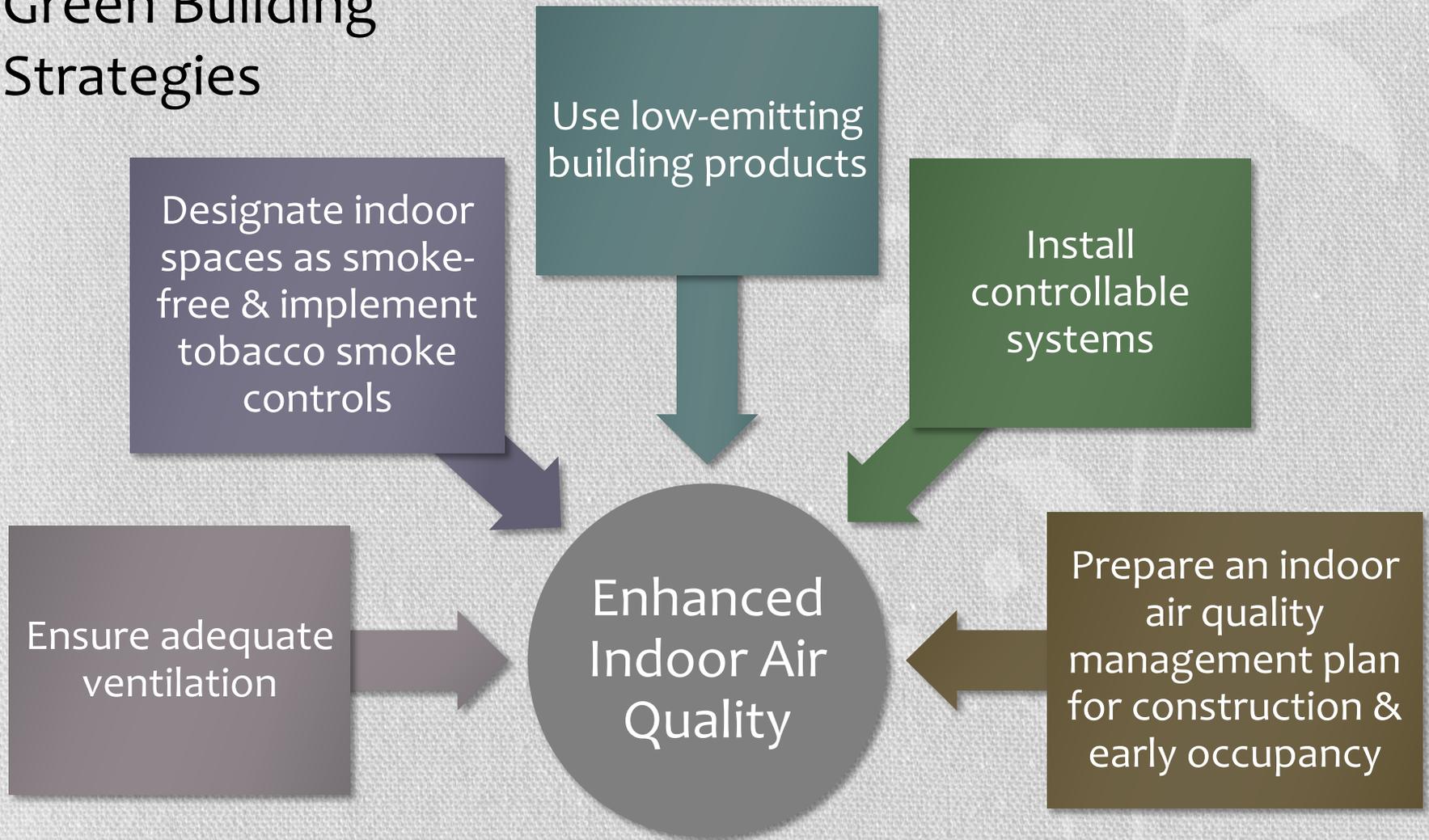
Use Locally Available or Naturally Occurring Building Products



Use Smart Wood or Alternative Lumber Products

# Indoor Environment

## Green Building Strategies



# Education

Since the homeowner knows how to best run their households, it is also important for them to understand how to run the house itself.

## Successful Implementation of Sustainable Design Strategies

### Prepare A Handbook For Homeowners

- Water Use Management Plan
- Benefits
- Responsibilities

### Provide A Homeowners Orientation

- Common Sense Steps
- Low-Cost Water Conservation Techniques
- Energy Efficiency Techniques



Green Building  
**BENEFITS**

# Benefits of Incorporating Green Building Design Strategies

## Environmental

Enhances & Protects Biodiversity & Ecosystems

Improves Air & Water Quality

Conserves & Restores Natural Resources

Reduces Energy Consumption & Climate Impacts

Reduces Waste

## Financial

Reduces Energy Costs

Reduces O&M Costs

Creates & Expands Local Markets for Green Products & Services

## Social

Enhances Community Values

Increases Aesthetic Qualities

Enhances Occupant Comfort & Health

Minimizes Strain on Local Infrastructure

Improves Quality of Life

## Cultural

Is in sync with Traditional Practices

Respects & Observes Cultural Values & Practices

Increases Community Participation



# GREEN BUILDING IN INDIAN COUNTRY

# Mescalero

Mescalero, New  
Mexico



# Seeing is Believing

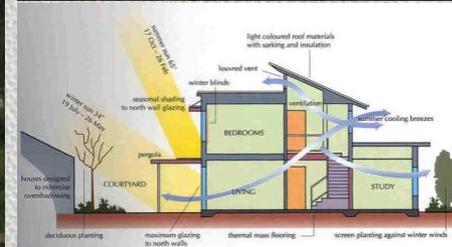
*“Every home that is built is a blessing for our people, we still have work to do to accommodate all the people who have a need. I wish and pray we get more houses in here very soon.”*

*- Carleton Naiche-Palmer, Former Tribal President*



I-Sah'-Din'-Dii Housing Development  
Mescalero Apache Reservation

# I-Sah'-Din'-Dii, Design



“... this housing development has been designed to have as minimal an impact as possible on Mother Earth. .”

- Tim Horan, Former MAHA Exec. Direct.

# I-Sah'-Din'-Dii, Conservation



*“This project is a wonderful example of how truly sustainable housing can be built on New Mexico’s tribal lands.”*

*- Diane Denish, NM Lt. Governor*

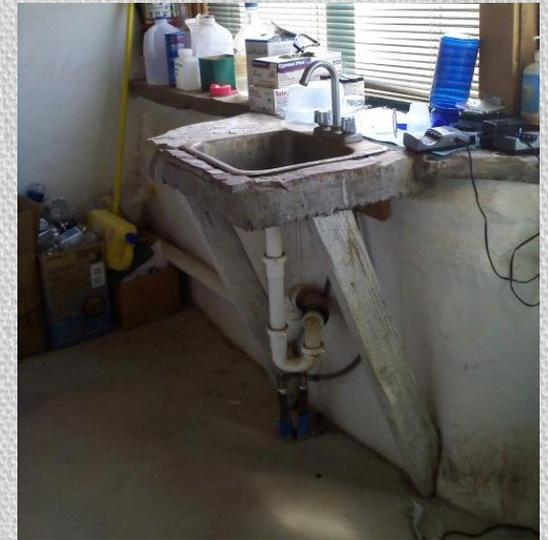
# Hualapai

Peach Springs, Arizona



# Earthship

*Peach Springs, AZ*



# Hualapai Social Services Building



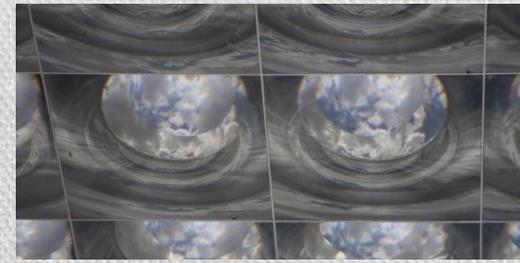
Summer 2008



Summer 2009

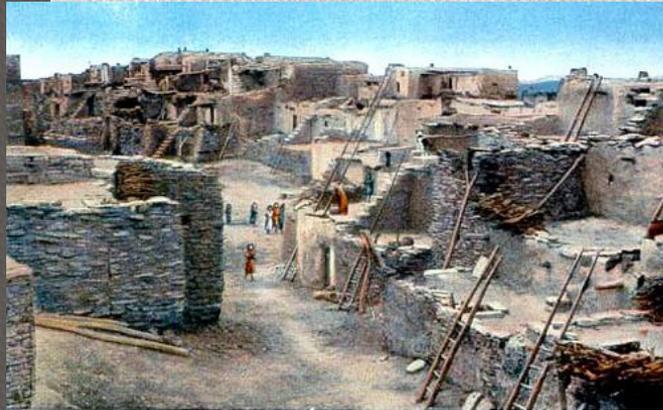


# Hualapai Cultural Center



# Hopi

Hopi, Arizona



# Moore Residence

## Hopi, AZ



# Santo Domingo

Santo Domingo Pueblo,  
New Mexico



# Santo Domingo Pueblo Safety Complex



10,000 square feet

Volunteer Fire & Police  
Substation

LEED Silver 08/30/2011

The Safety Complex is designed to demonstrate the high technology requirements of today's emergency response teams, but also to respect traditional values and architectural heritage of Santo Domingo Tribe.

# Safety Complex Features



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Six Bays: Ambulance & Fire Trucks

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Equipment Storage

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Residential Quarters

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Kitchen

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TV Room

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Fitness Area

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Office Space

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Small Holding Cell

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Community Conference Room

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Space for Long-term Training Facilities

# Kewa Pueblo Safety Complex

Water Catchment System

Low Flow Fixtures

Dual Flush Toilets

Permeable Pavement

Xeriscaping



Water



# Materials

Rastra Building Material (ICF)

Local Material (Within 500 mi)

Construction Waste Management System (Separate bin for contaminated materials)



# Natural Lighting Recycling Program





Honoring Tradition



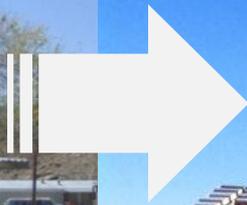
# CONCLUSION

# Why Green Building?

Fills Housing  
Need

Facilitates tribal  
people's ability to  
work toward  
achieving healthy,  
livable  
communities

Allows tribal  
people to  
reconnect with  
the natural world



# Ahé' héé'

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