- *SUSTAINABILITY* -
LEED COMPLIANT RESTROOMS

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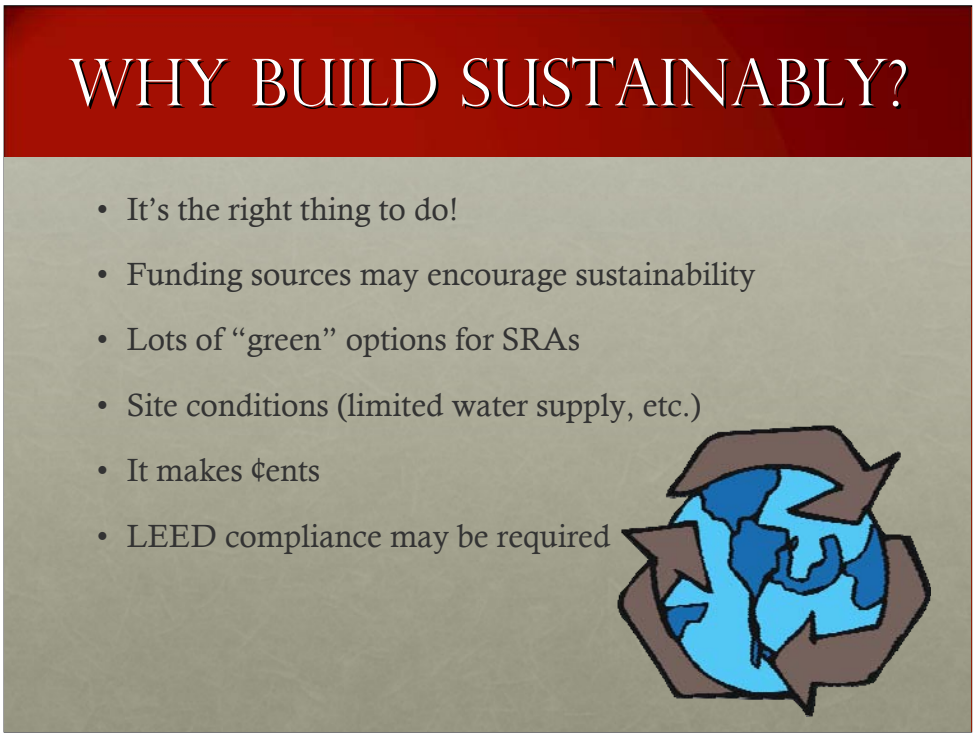


•LEED compliance

- •Becoming more common

•Tax, other benefits for "green" components

- •Specifics would be good here

• Lots of sustainable options for SRAs, particularly in water use, energy, concrete, asphalt

• It makes ¢ents

- Cost savings (less water and electricity used) can be significant

•It's the right thing to do!

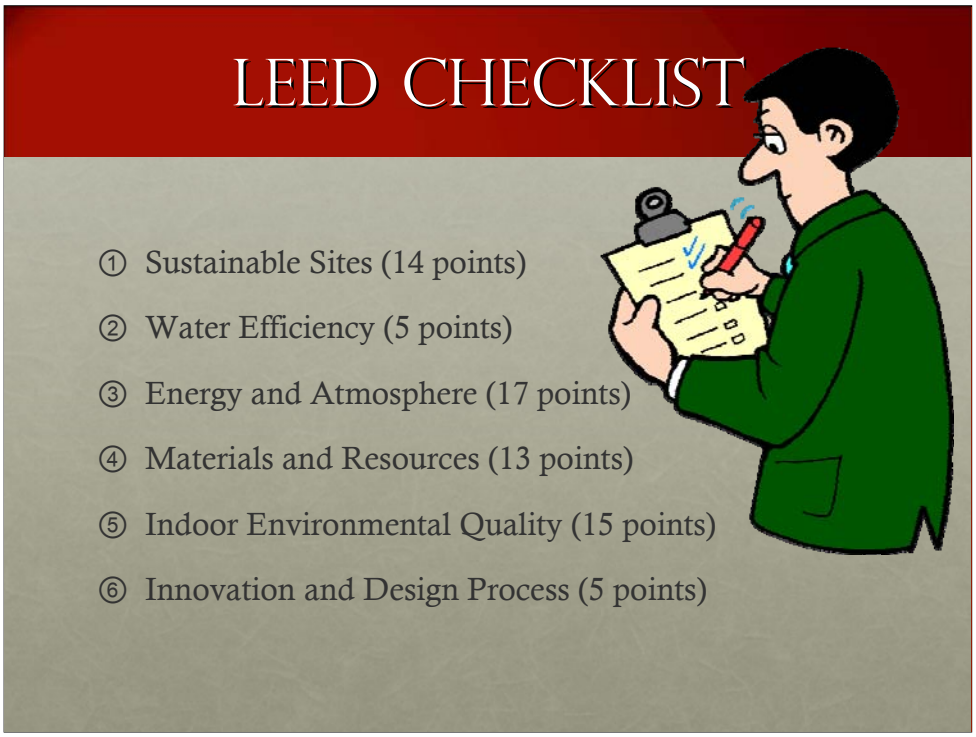
- •Public perception
- •Environmental stewardship

WHAT IS LEED?

"The LEED® (Leadership in Energy and Environmental Design) Green Building Rating System is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings."

- Prerequisites plus points: More points = higher rating
- It's the **entire project**, not just the restroom building
- LEED offers framework for considering green options

Even if not going for LEED certification, LEED offers framework for examining sustainable options



Each category has activities worth at least one point each.
Some categories also have prerequisites, which are required but do not earn points.

Well go over the points that apply to restrooms. Top ones are water and energy efficiency. Some do not apply—reducing car usage for example.

•**Construction Activity Pollution Prevention**

•Erosion and sedimentation control t**o minimize construction disturbance**

SUSTAINABLE SITES

- **Site Selection:** based on previous uses and condition of the building site
- **Development Density:** when possible, develop in an area already within an urban environment
- **Brownfield Redevelopment:** remediation of former industrial sites or gas stations

Multi-use building in urban setting

Really quick run-through

SITE SELECTION • This point is a generally a “go / no-go” point based on site criteria. • The FEMA 100-year flood plain is most often the preventative requirement for many projects. Check the FEMA website early. • It is also important to verify that the site is not located in prime farmland as defined by LEED. • In cases where no data is available from FEMA, data from the Army Corps of Engineers is an acceptable alternative. • The 100 foot setback from wetlands includes the location of wastewater treatment systems or other support systems (cooling towers etc.) for the building.

DEVELOPMENT DENSITY: The intent of the credit is to encourage high- density development to preserve open space and reduce urban sprawl. This credit can be difficult to achieve outside of major cities, since the project must be surrounded by the equivalent of two-story downtown development, though some exceptions have been made for smaller communities and for university and college buildings. The key is to develop in an area that is already within an urban environment.

BROWNFIELD: Whether or not a site is eligible for this point depends on its classification by the EPA or local jurisdictions, typically through an ASTM Environmental Site Assessment.

The basic intent is to reduce car usage in or around the site, so these requirements are more suited to office buildings than rest areas. An option that is gaining a lot of interest—we've received several calls lately at our office—are electric recharging stations for smart cars.

•Alternative Transportation

- •Public Transportation: Two routes must be near the building.
- •Bicycle Storage & Changing Rooms" Covered storage, changing rooms
- •Low-Emitting and Fuel Efficient Vehicles
- •Parking Capacity: This credit restricts parking capacity for the project to the minimum amount of parking required by local code and has an additional requirement for designated carpool spaces.

•**Site Development**

•Protect or restore habitat: If your site is undeveloped, the requirement calls for limitation of site disturbance. For previously developed sites, the requirement is to restore 50 percent of the site area (excluding the building footprint) with native or adaptive vegetation.

•Maximize open space: exceed local zoning open space requirements by 25 percent, or open space equal to the building footprint must be designated adjacent to the building.

SUSTAINABLE SITES

- **Stormwater Design**
  - *Quantity* control
    - Pervious paving, green roofs, stormwater re-use
  - *Quality* control
    - Bioswales, filtration basins (filters), detention ponds and vegetated filter strips

Green roof at Coffee Creek Watershed Preserve restrooms in Chesterton, Ind.

•**Stormwater Design**

•Quantity control -- pervious paving materials, green roofs and/or stormwater reuse

PHOTO: Green roof at Coffee Creek Watershed Preserve restrooms, Chesterton, Ind.

•Quality control -- bioswales, filtration basins (filters), detention ponds and vegetated filter strips.

•**Heat Island Effect**

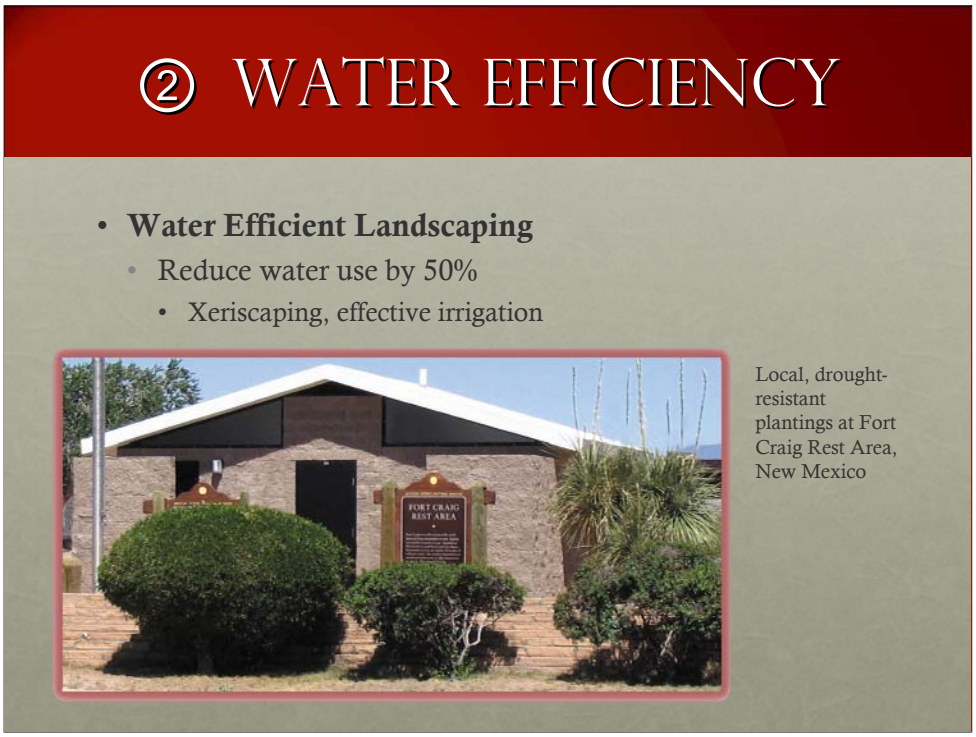
•Non-roof -- There are three main strategies that are most often used to achieve this credit: use of high-albedo impervious surfaces, shading of low-albedo impervious surfaces or underground or covered parking.

• For large asphalt parking areas, its best to supply covered (or shaded) parking.

•Roof

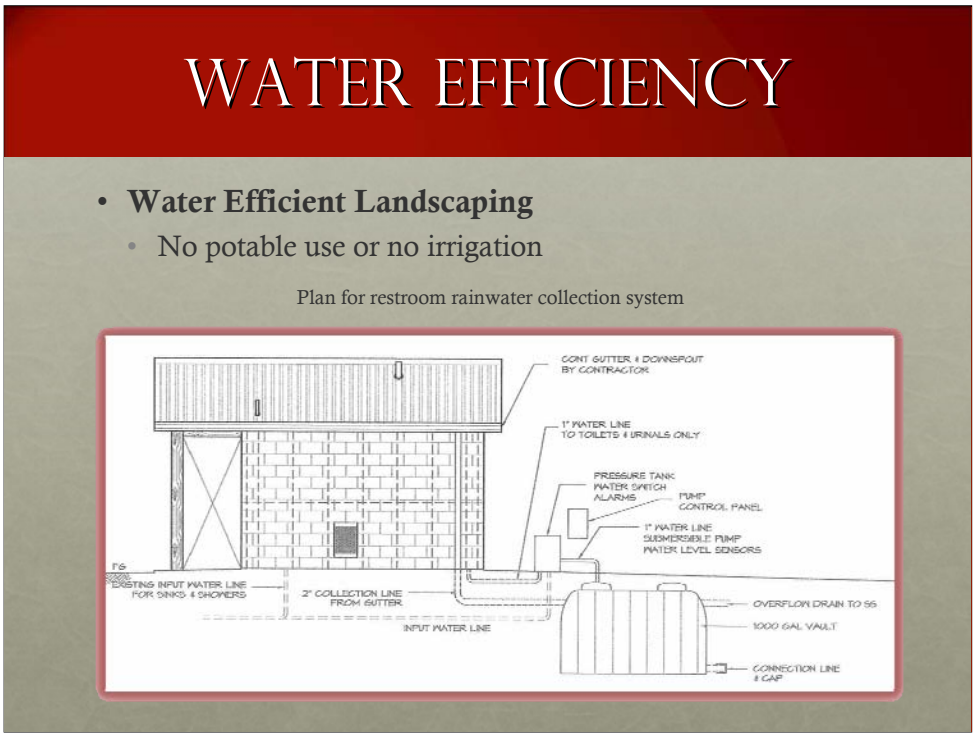
•**Light Pollution**

•This credit requires the electrical engineer or lighting designer to produce a photometric plan which plots the footcandles of light on the site. Romtec recently changed its light fixture offerings to add a hood and satisfy this requirement.



Water efficiency is one area that can really benefit restrooms. Saves money, meets LEED requirements, helps the environment.

- **Water Efficient Landscaping**
  - Reduce by 50%
    - Zeroscaping—native, drought resistant plantings
    - Irrigation: strategies include low-volume or drip systems (water applied directly to the root zone through surface piping), sub-irrigation (water delivered to root zone through underground systems), and "smart" control systems (central/satellite controls, weather based, soil-moisture systems). The LEED calculator provides credit for "drip" or "other" systems as alternatives to the traditional sprinkler system.



Water Efficient Landscaping

No potable use or no irrigation

Rainwater collection systems

Zoo—grey water from hand wash sinks and floor drains go to French rain outside and waters the landscape around the building.

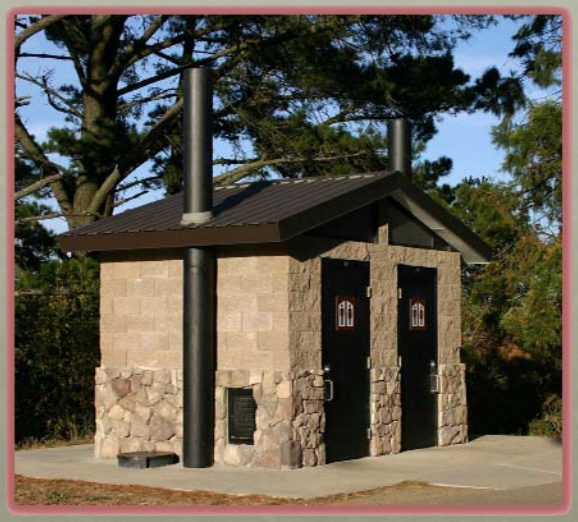
Misc on Zoo:

The foam-flush toilet looks and functions much like a conventional toilet fixture. It uses a mixture of bio-compatible soap and water to carry toilet waste to the composting system below via a conventional 4" drain line.Each flush uses only about 3 oz. of water, making it fully compatible with the composting process. Since the foam-flush fixture is using water to carry the waste, it is possible to have it slightly offset from the compost system.Our foam-flush toilet is currently being used in commercial buildings, rest areas, golf courses, and residences.

This credit requires a reduction in wastewater, specifically in the amount of potable water used for sewage conveyance. The two main strategies for earning this credit are reducing the need for sewage conveyance through the use of water- saving flush fixtures and/or meeting the reduced conveyance load through the use of non-potable water such as graywater or stormwater.

In addition to the flow rates for fixtures, automatic controls, such as infra-red sensors and flow restrictors, contribute to credit achievement.

WATER EFFICIENCY



And the ultimate in water efficiency …

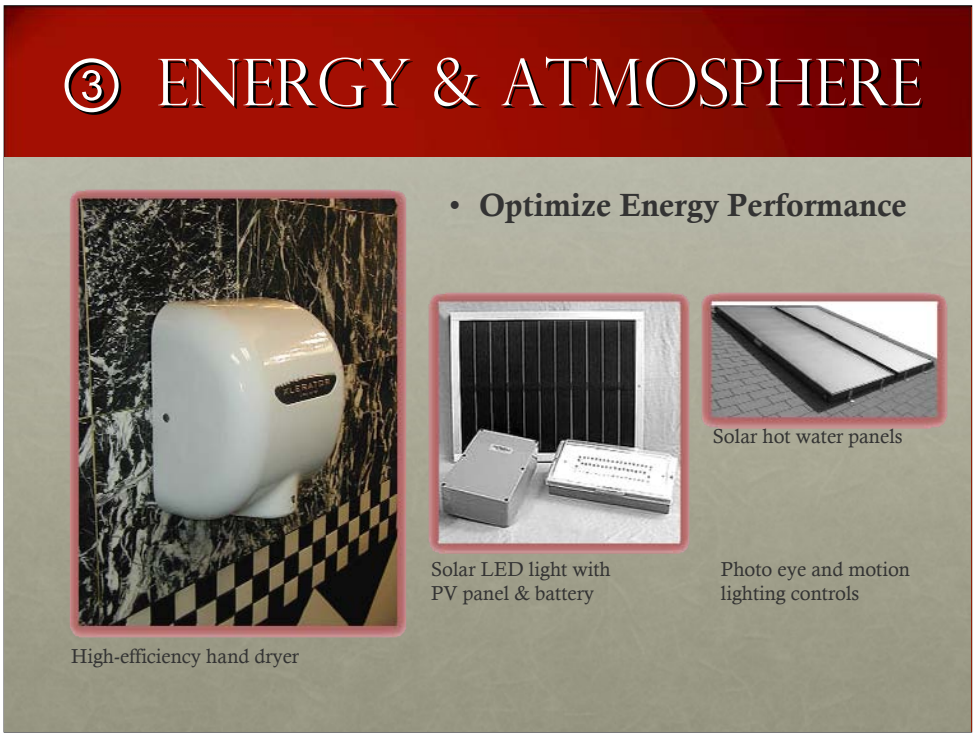
the waterless restroom

In addition to the flow rates for fixtures, automatic controls, such as infra-red sensors and flow restrictors, contribute to credit achievement.

Ryan: Here's something interesting from the Sloan site: Sloan introduces an industry first: sensor-operated Sloan SOLIS® Flushometers that are powered by natural or artificial light. Solar-powered Flushometers come in single- and dual-flush models for urinals and water closets. The dual-flush models offer the added advantage of automatically initiating either a regular or reduced flush, based on how long the restroom visitor stays in sensor range. Sloan SOLIS® Flushometers use light to charge a highly efficient capacitor, providing power even in rooms with occupancy-controlled lighting. The solar panel powers the unit without the need for moving parts in the waterway. No moving parts in the waterway mean superior hydraulic performance and reduced maintenance.

Uppercut flushometer:

rainwater collection system – underground tank –flushes uppercut flushometer. Up .5, down 1.6

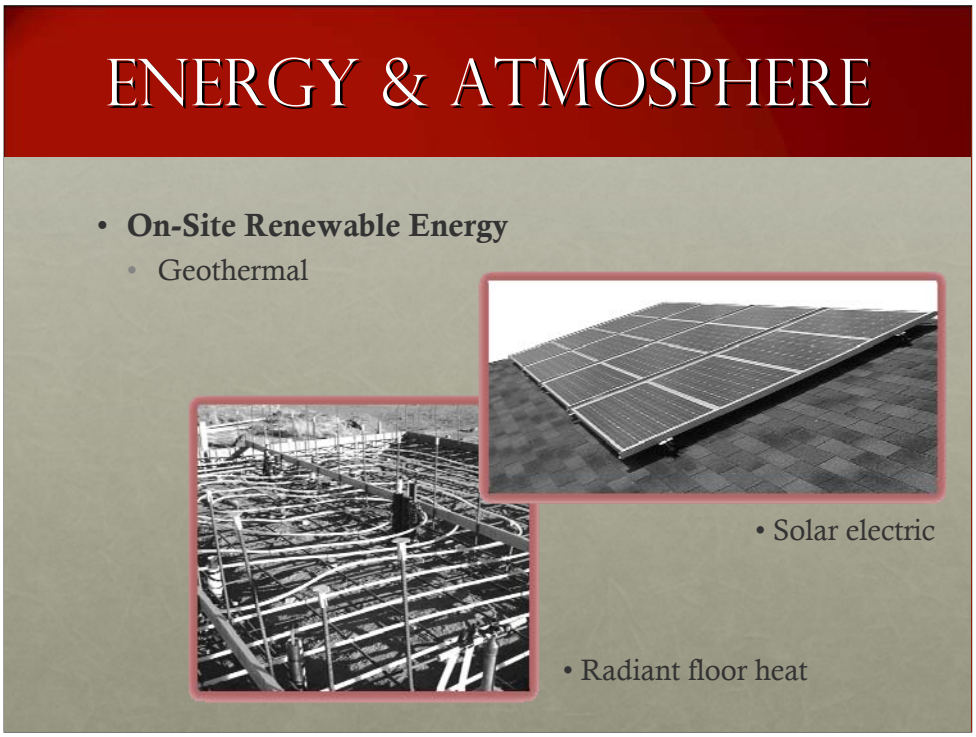


Optimize Energy Performance

1 to 10 points depending on percentage of optimization

This credit poses the largest potential for point accumulation within the LEED system. It accounts for mechanical system performance, lighting power densities, solar hot water contributions and many other strategies which enhance energy performance. It is important to note, however, that LEED awards credit based on energy cost savings rather than energy use savings.

- Fixtures
- LED lights
- Accelerator
- Hand dryer
- locktechnic



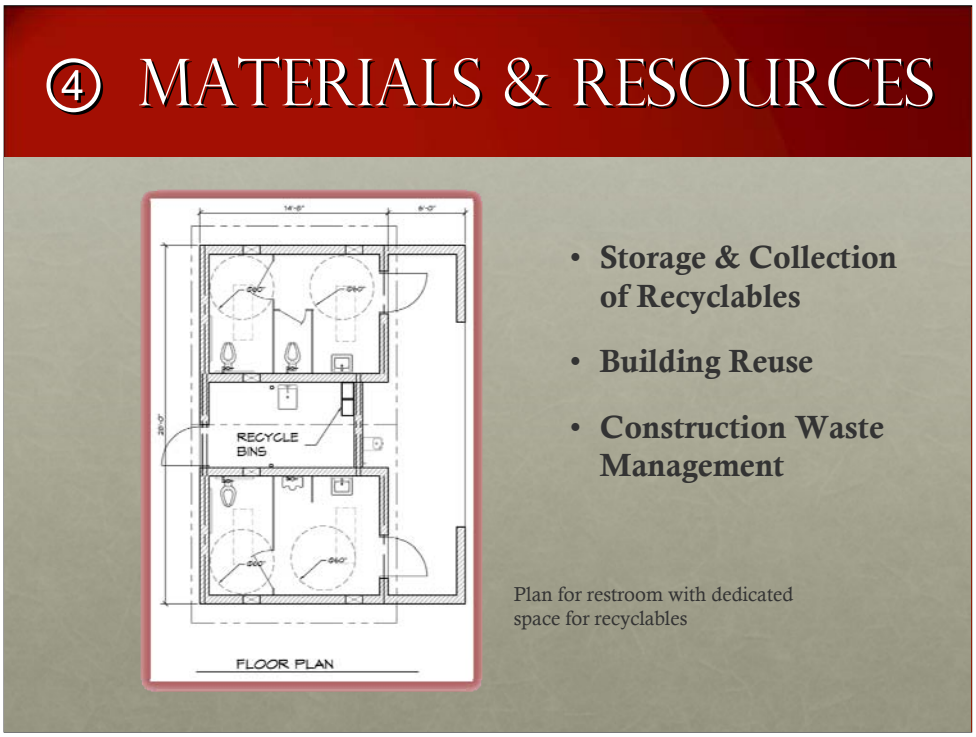
solar powered parking lot lighting

NM geothermal

Solar

Wind

Radiant floor heating



Storage & Collection of Recyclables

This credit is achieved with a twofold approach: interior recycling collection areas and storage of recyclables for disposal. Materials recycled must include, at a minimum, paper, corrugated cardboard, glass, plastics and metals. Minimum footprint?

Building Reuse

Maintain 75% of existing walls, floors & roof

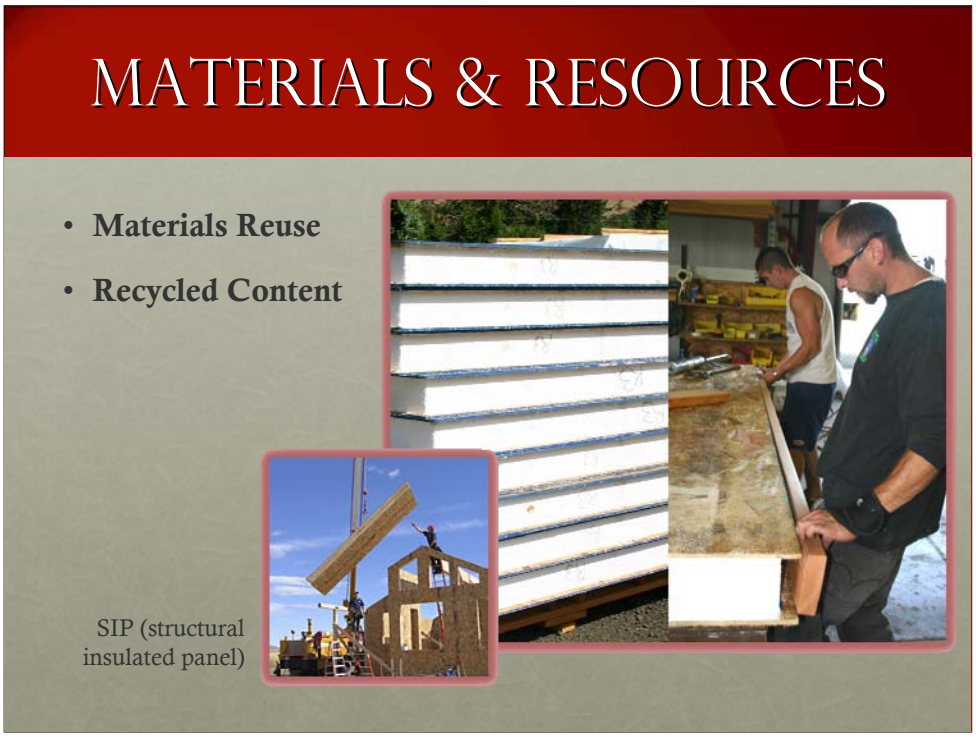
Maintain 95% of existing walls, floors & roof

Maintain 50% of interior non-structural elements

Construction Waste Management

Divert 50% from disposal

Divert 75% from disposal



Materials Reuse, 10%

Recycled Content

10% (post-consumer + 1/2 pre-consumer)

20% (post-consumer + 1/2 pre-consumer)

Regional Materials

10% Extracted, Processed & Manufactured

20% Extracted, Processed & Manufactured

Rapidly Renewable Materials

Certified Wood

MATERIALS & RESOURCES

Constructed with local materials: stone, wood trusses

- Regional Materials
- Rapidly Renewable Materials
- Certified Wood

Fly ash in concrete; local stone

Outdoor Air Delivery Monitoring

Increased Ventilation

Construction IAQ Management Plan

During construction

Before occupancy

Low-Emitting Materials

Adhesives & sealants

Carpet systems

Composite wood & agrifiber products

Indoor Chemical & Pollutant Source Control

Controllability of systems not applicable to public restroom scenario

Daylight & Views

Daylight 75% of spaces

Views for 90% of spaces

⑥ INNOVATION & DESIGN

- Innovation in design:
  - Strategies not covered in LEED checklist
- LEED-accredited professional

CASE STUDY: NEW MEXICO DOT

- Sustainable features
  - Geothermal
  - Local stone
  - White roofs
  - Xeriscaping

FOR MORE INFORMATION

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