Where Trees and Sustainability Meet

presented by

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WRD
ENVIRONMENTAL

The focus of **SUSTAINABILITY** is creating the healthiest, most effective, and most efficient **BUILT ENVIRONMENT**.

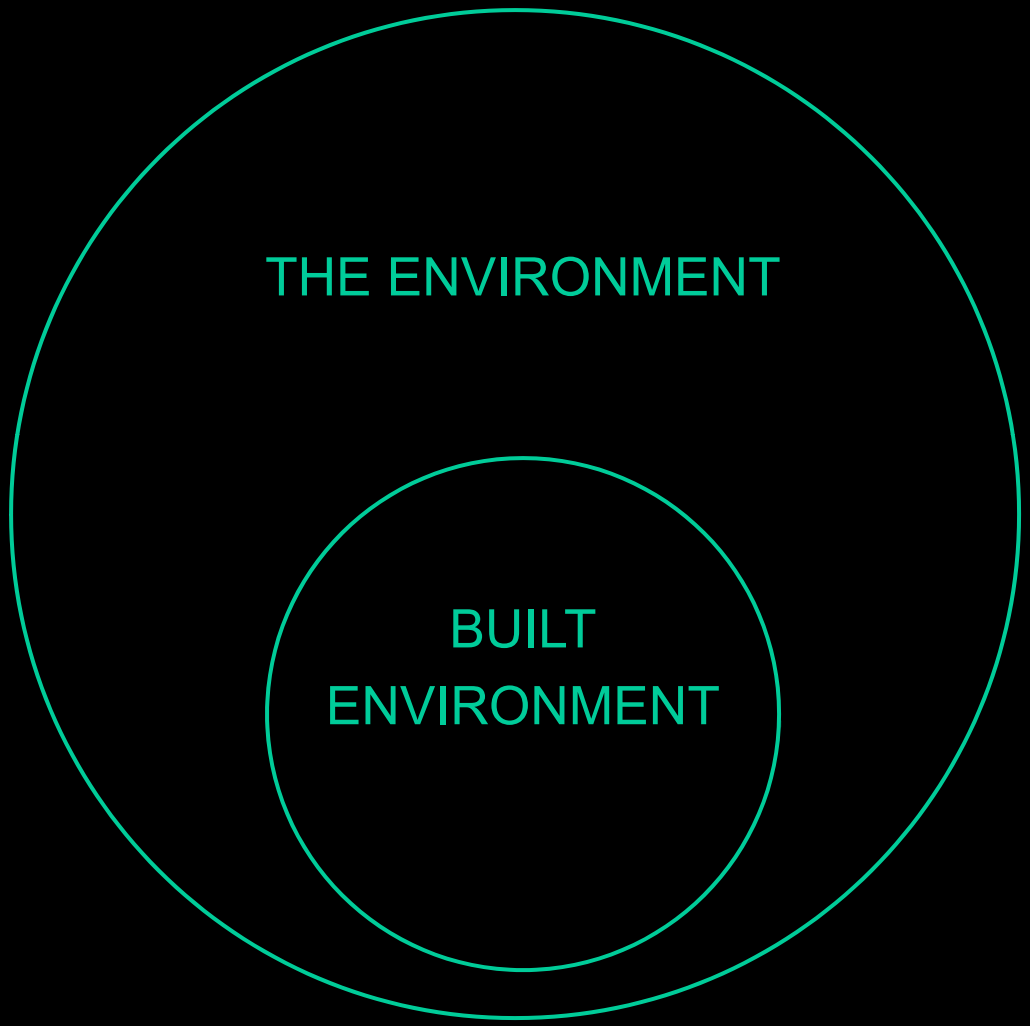
-strives to “meet current needs without jeopardizing needs of future generations”

-exists as an exercise in resource management (water, energy, materials)

-becomes a design goal that translates into a design theory


THE ENVIRONMENT


65 SOUTH
TO DOWNTOWN
Indianapolis
EXIT 123
465 SOUTH
TO
Indpls. Int'l. Airport


THE ENVIRONMENT
BUILT
ENVIRONMENT

SUSTAINABILITY, as a design theory and practice, involves possessing a sound ecological understanding of the greater environment. Only through this knowledge and the implementation of lessons learned can the **BUILT ENVIRONMENT** be truly successful.

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K. Praslowicz

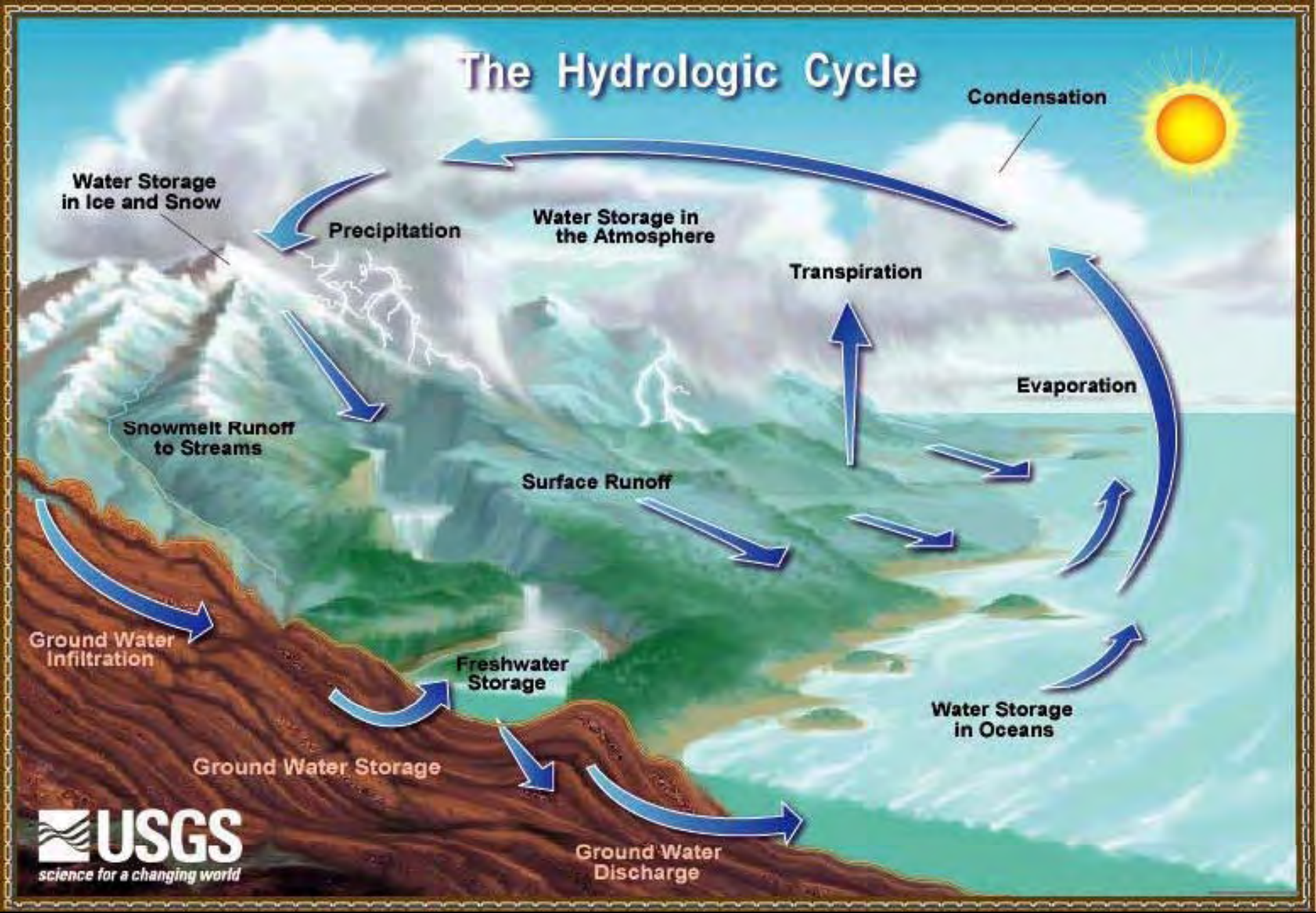
WATER

Storm Water
Fertilizer & Pesticides
Irrigation

-concerned customers

-lead the landscape industry

-goal for this section



Cycle disrupted, ground water cut off, surface water overloaded

URBAN STORM WATER TSUNAMI

CAUSES:

-impermeable surfaces

-storm sewers

-turf grass

CONSEQUENCES:

-flooding and drought

-water speed, pollution, and temperature

-erosion and sedimentation

Paul Nichols

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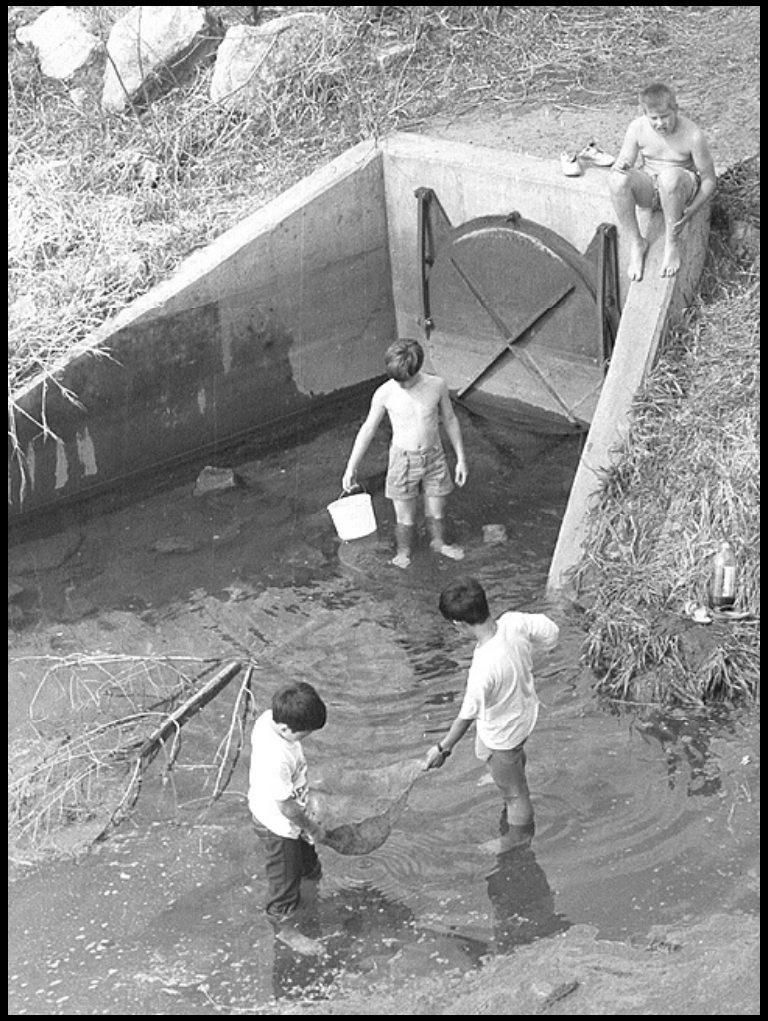

Douglas Connel

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Lilly House at the Indianapolis Art Museum

Atlanta's Lake Lanier

Gurnee, IL

FLOODING AND DROUGHT

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Peter Klaver

Natural waterways:
-meandering
-spring-fed
-vegetated
-consistent
-floodplains

Water on pavement:
-hot
-dirty
-fast
-dead
-variable

IMPERVIOUS SURFACES, CHANNELIZED RIVERS

Where the storm sewer ends:
- -steeper
- -muddier
- -warmer
- -polluted
- -dryer, out of reach

URBAN WATER DOWNSTREAM

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- -deltas
- -algae blooms

URBAN WATER DOWNSTREAM

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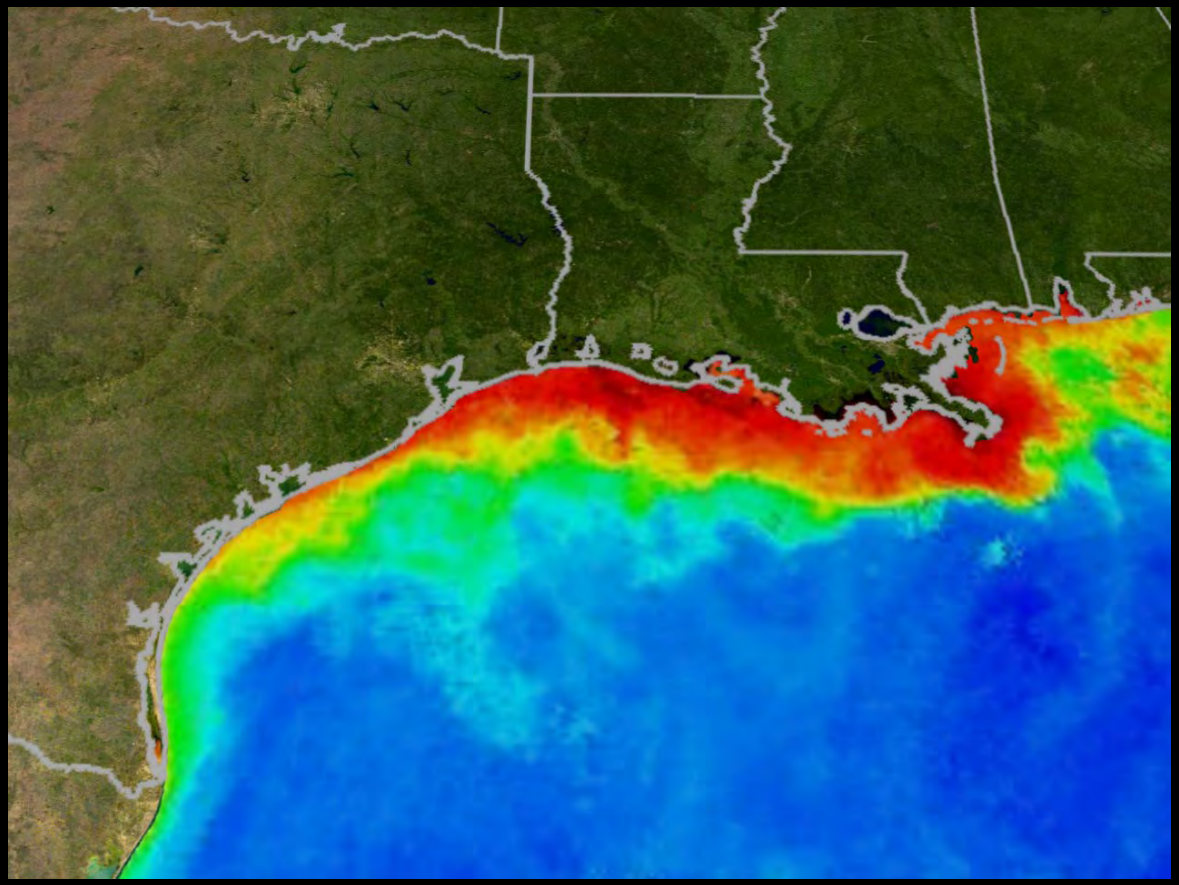

URBAN WATER DOWNSTREAM

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URBAN STORM WATER SOLUTIONS

-Trees **stabilize** stream banks from erosion and **shade** streams, cooling water and restoring habitat.

-Trees **use up** storm water on leaf surface area and through evapotranspiration.

-Trees **slow** storm water runoff and **break up soil**, encouraging infiltration. Forests infiltrate water ten times better than lawns.

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Chicago's City Hall

City vs. County

Arborists on design teams:
- -irrigation
- -species selection
- -soil
- -maintenance
- -weight prediction

Green roof types:
- -extensive
- -intensive

GREEN ROOFS

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PAVING:

- -porous pavement
- -gravel reservoir
- -uncompacted subgrade
- -structural soil
- -broken curb

VEGETATION:

- -swale shape
- -deep roots
- -flood plain species
- -urban-tolerant
- -ornamental
- -shade trees

FILTER STRIP AND BIOSWALE

FERTILIZER, PESTICIDE and HERBICIDE OVERKILL

CAUSES:

-wrong tree, wrong place

-amending soils after planting

-better safe than sorry over-application

-we've **always** done it this way

-compensating for biologically dead soils

-turf grass

-chemical drift

FERTILIZERS:
- -phosphorus
- -nitrogen
- -plant clippings

IMPACTS:
- -darkness
- -low oxygen
- -anaerobic bacteria
- -methane
- -death of aquatics

FERTILIZER FED ALGAE BLOOM

Eutrophication

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LANDSCAPE DAMAGE:

- -drift
- -root zone
- -dead soils
- -monocultures
- -cycle of dependence

LARGER SCALE:

- -pets
- -wildlife
- -children
- -applicators
- -manufacturers
- -farm workers

Shopbeyondpesticides.org

HERBICIDES AND PESTICIDES

Cheap and easy? Until you consider the true costs…

FERTILIZER, PESTICIDE & HERBICIDE SOLUTIONS

-Use tree species adapted to the site.

-Moderation! Help customers develop specific plans for their needs and understand the consequences

-Use new technology and research, products like slow release fertilizer and Hydrosorb etc. Experiment!

-Use Mulch! Where bulky mulch is not appropriate, use compost tea to promote soil microorganisms

-Filter out fertilizer pollution before it enters water bodies with Plantings and infiltration

-Reduce turf grass, ring trees with mulch

-Buy from nurseries and suppliers that are environmentally responsible

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WATERING WASTED

CAUSES:

-technology from a more abundant age

-human-operated irrigation systems

-evolving landscape needs

http://www.flickr.com/photos/whitebeard/

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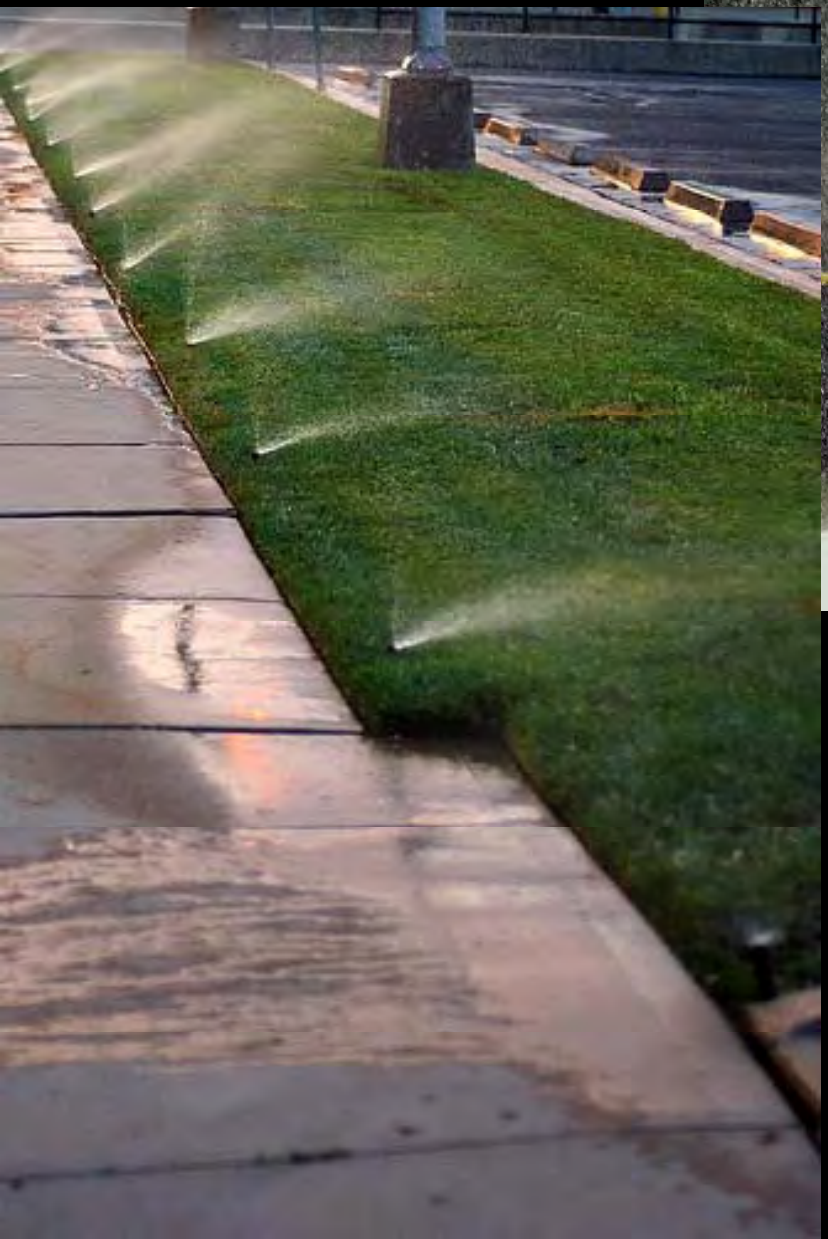

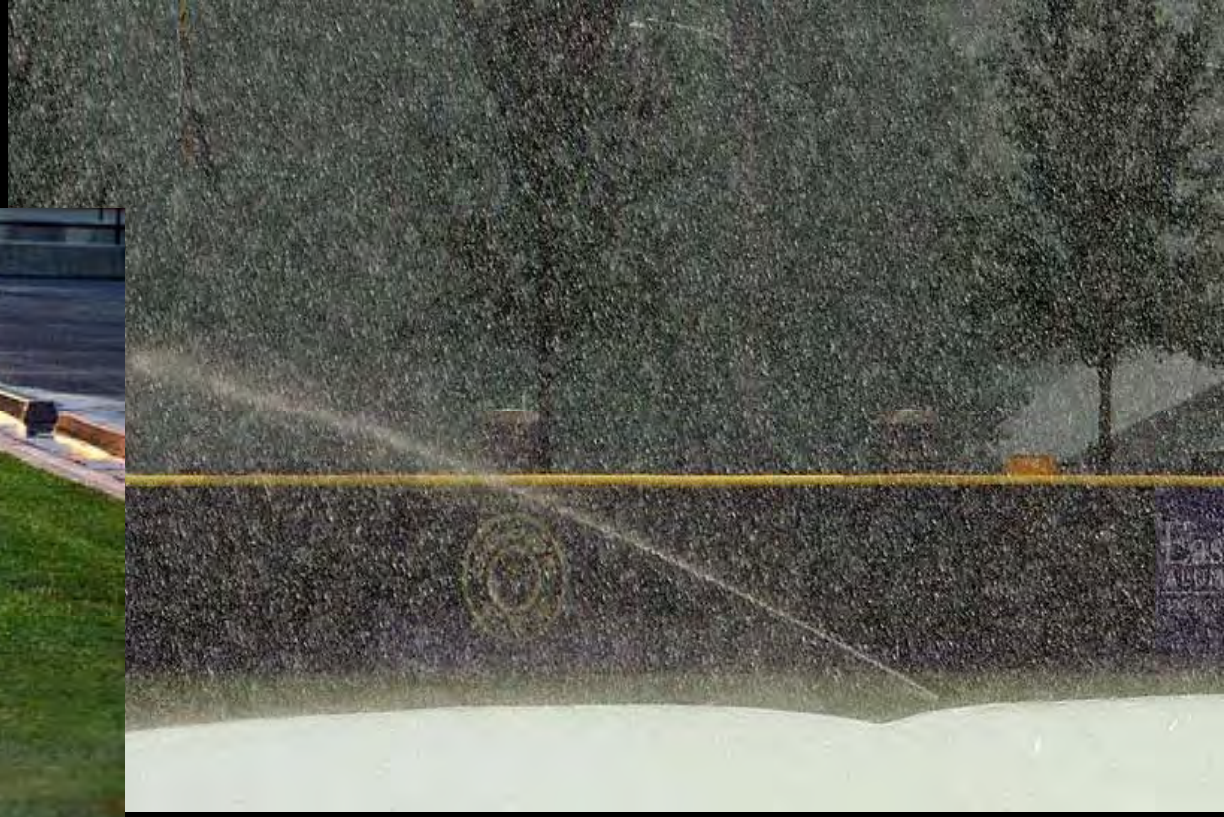

Sprinklers in the rain and watering the sidewalk

Downspouts, rain barrels, and cisterns

IRRIGATION SOLUTIONS

-drip irrigation

-drought-tolerant tree species

-cisterns and rain barrels

-timers, weather computers, sensors

-early morning watering

-mulch

*No one expects plants to go without watering in the first year or in special cases.

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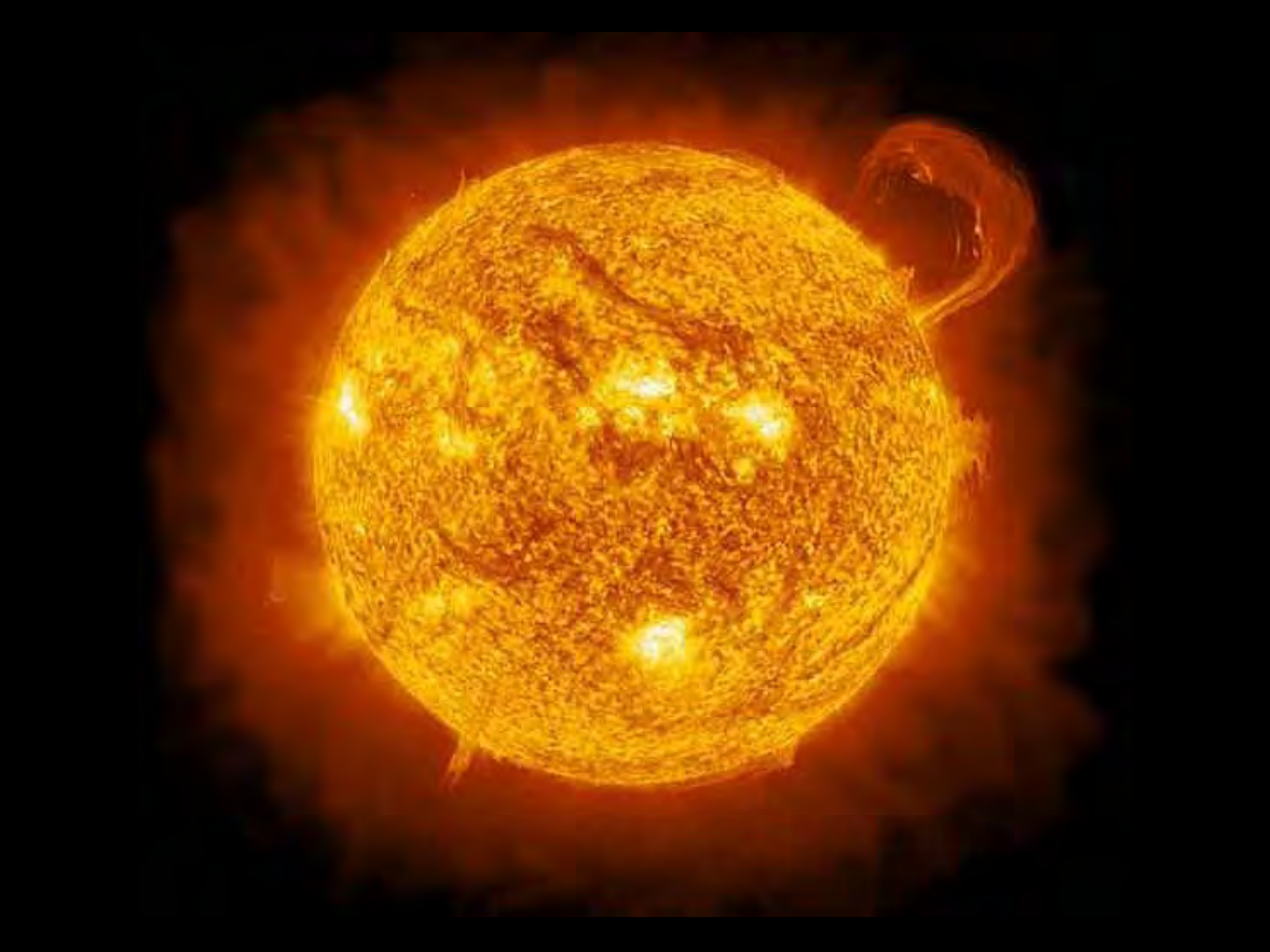

ENERGY is *the* universal currency.

COST OF MILK (simplified):

-solar and material input for grazing fields that feed cows
-milk extraction, processing, and packaging
-refrigerated transportation and storage
-local distribution
-local processing and consumption
-waste removal

ENERGY is *the* universal currency.

COST OF BUILDING OPERATION (simplified):

-initial construction (machinery, human labor, material transportation)

-general operations

- heating/cooling
- lighting
- appliance/electronic powering
- maintenance (cleaning, internal/external upkeep)

-user transportation

-materials transportation

-waste removal

enhancement of renewable energy sources

hybrid cars

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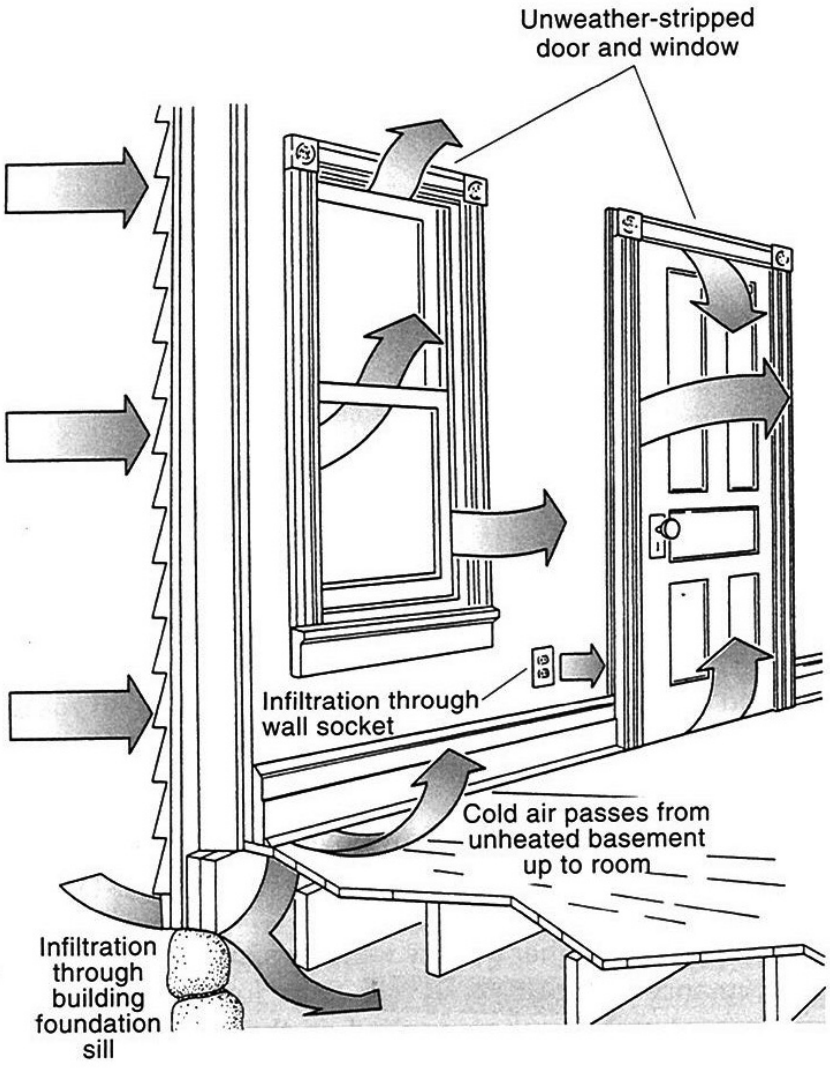

FIGURE 5.6

Energy: Its Use and the Environment (p. 134)


on-site energy production


on-site water management

on-site waste management

localize

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ARBORICULTURAL considerations:

GENERAL OPERATIONS

-hybrid vehicles

-biodiesel

-4-stroke vs. 2-stroke engines

-clean equipment (diseases)

-plant-based (soy) lubricants

-mulch (cypress, pine, dyes)

ARBORICULTURAL considerations:

DESIGN

-species selection
    native adaptation
    ecological placement
    contextual placement
    disease tolerance
-shading to combat urban heat island effects
-residential heating/cooling
-wind barriers
-waste management (reduce, reuse, recycle)

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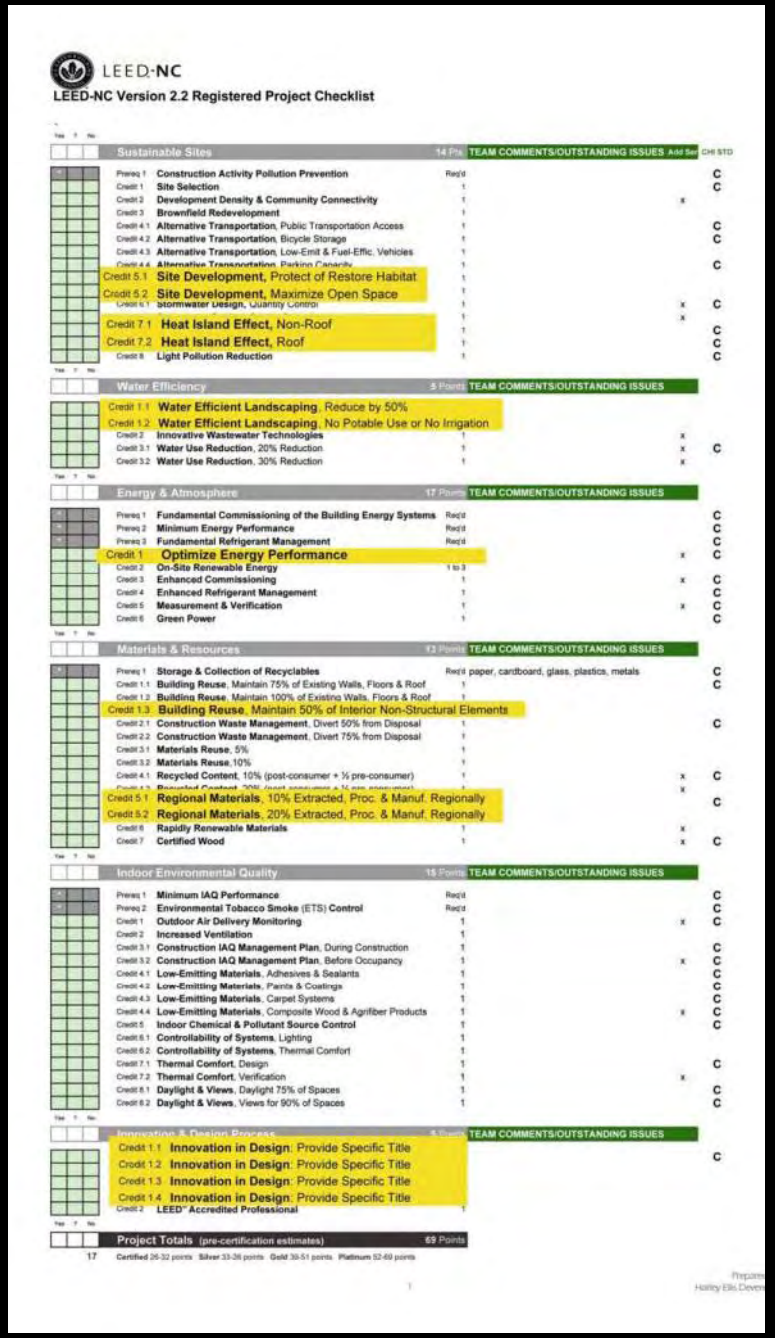
ARBORISTS IN LEED

-What is LEED?

-LEED rating systems:

- -new construction
- -homes
- -neighborhood development
- -among others



LEED-NC

LEED-NC Version 2.2 Registered Project Checklist

Sustainable Sites	14 Pts	TEAM COMMENTS/OUTSTANDING ISSUES	Add Sel	CHI STD
Prereq 1	**Construction Activity Pollution Prevention**	Req'd		C
Credit 1	**Site Selection**	1		C
Credit 2	**Development Density & Community Connectivity**	1	x	
Credit 3	**Brownfield Redevelopment**	1		
Credit 4.1	**Alternative Transportation**, Public Transportation Access	1		C
Credit 4.2	**Alternative Transportation**, Bicycle Storage	1		C
Credit 4.3	**Alternative Transportation**, Low-Emit & Fuel-Effic. Vehicles	1		
Credit 4.4	**Alternative Transportation**, Parking Capacity	1		C
Credit 5.1	**Site Development**, Protect of Restore Habitat	1		
Credit 5.2	**Site Development**, Maximize Open Space	1		
Credit 6.1	**Stormwater Design**, Quantity Control	1	x	C
Credit 6.2	**Stormwater Design**, Quality Control	1	x	
Credit 7.1	**Heat Island Effect**, Non-Roof	1		C
Credit 7.2	**Heat Island Effect**, Roof	1		C
Credit 8	**Light Pollution Reduction**	1		C
Water Efficiency	5 Points	TEAM COMMENTS/OUTSTANDING ISSUES		
Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1		
Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1		
Credit 2	**Innovative Wastewater Technologies**	1	x	
Credit 3.1	**Water Use Reduction**, 20% Reduction	1	x	C
Credit 3.2	**Water Use Reduction**, 30% Reduction	1	x	
Energy & Atmosphere	17 Points	TEAM COMMENTS/OUTSTANDING ISSUES		
Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Req'd		C
Prereq 2	**Minimum Energy Performance**	Req'd		C
Prereq 3	**Fundamental Refrigerant Management**	Req'd		C
Credit 1	**Optimize Energy Performance**	1 to 10	x	C
Credit 2	**On-Site Renewable Energy**	1 to 3		
Credit 3	**Enhanced Commissioning**	1	x	C
Credit 4	**Enhanced Refrigerant Management**	1		C
Credit 5	**Measurement & Verification**	1	x	C
Credit 6	**Green Power**	1		C
Materials & Resources	13 Points	TEAM COMMENTS/OUTSTANDING ISSUES		
Prereq 1	**Storage & Collection of Recyclables**	Req'd	paper, cardboard, glass, plastics, metals	C
Credit 1.1	**Building Reuse**, Maintain 75% of Existing Walls, Floors & Roof	1		C
Credit 1.2	**Building Reuse**, Maintain 100% of Existing Walls, Floors & Roof	1		
Credit 1.3	**Building Reuse**, Maintain 50% of Interior Non-Structural Elements	1		
Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1		C
Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1		
Credit 3.1	**Materials Reuse**, 5%	1		
Credit 3.2	**Materials Reuse**,10%	1		
Credit 4.1	**Recycled Content**, 10% (post-consumer + ½ pre-consumer)	1	x	C
Credit 4.2	**Recycled Content**, 20% (post-consumer + ½ pre-consumer)	1	x	
Credit 5.1	**Regional Materials**, 10% Extracted, Proc. & Manuf. Regionally	1		C
Credit 5.2	**Regional Materials**, 20% Extracted, Proc. & Manuf. Regionally	1		
Credit 6	**Rapidly Renewable Materials**	1	x	
Credit 7	**Certified Wood**	1	x	C
Indoor Environmental Quality	15 Points	TEAM COMMENTS/OUTSTANDING ISSUES		
Prereq 1	**Minimum IAQ Performance**	Req'd		C
Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Req'd		C
Credit 1	**Outdoor Air Delivery Monitoring**	1	x	C
Credit 2	**Increased Ventilation**	1		
Credit 3.1	**Construction IAQ Management Plan**, During Construction	1		C
Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1	x	C
Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1		C
Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1		C
Credit 4.3	**Low-Emitting Materials**, Carpet Systems	1		C
Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1	x	C
Credit 5	**Indoor Chemical & Pollutant Source Control**	1		C
Credit 6.1	**Controllability of Systems**, Lighting	1		
Credit 6.2	**Controllability of Systems**, Thermal Comfort	1		
Credit 7.1	**Thermal Comfort**, Design	1		C
Credit 7.2	**Thermal Comfort**, Verification	1	x	
Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1		C
Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1		C
Innovation & Design Process	5 Points	TEAM COMMENTS/OUTSTANDING ISSUES		
Credit 1.1	**Innovation in Design**: Provide Specific Title	1		C
Credit 1.2	**Innovation in Design**: Provide Specific Title	1		
Credit 1.3	**Innovation in Design**: Provide Specific Title	1		
Credit 1.4	**Innovation in Design**: Provide Specific Title	1		
Credit 2	**LEED™ Accredited Professional**	1		
Project Totals (pre-certification estimates)	69 Points			

17 Certified 26-32 points Silver 33-38 points Gold 39-51 points Platinum 52-69 points

Prepared by: Hailey Ellis, Devereux

CAPTURING LEED BUSINESS

Set yourself apart. Your website could say:

"We can help you achieve **LEED credits SS 5, 7; WE 1; MR 3,5,7.** Ask us how!"

LEED ACCREDITED PROFESSIONAL

The U.S. Green Building Council

hereby certifies that

Meredith Sessions

has successfully demonstrated knowledge of the green building design and construction industry and the Leadership in Energy and Environmental Design (LEED®) v2 Green Building Rating System, Resources and Process required to be awarded the title of

LEED® v2 Accredited Professional

LEED

Kevin Hydes, Chairman

S. Richard Fedrizzi, President, CEO and Founding Chairman

LEED AP:

-further qualification to work on a LEED project
-commitment to green
-recognition

USGBC MEMBERSHIP:

-networking
-new business
-a voice in future LEED
-educational programs
-discounts

http://chapters.usgbc.org/indiana/
Indiana's Chapter of the USGBC

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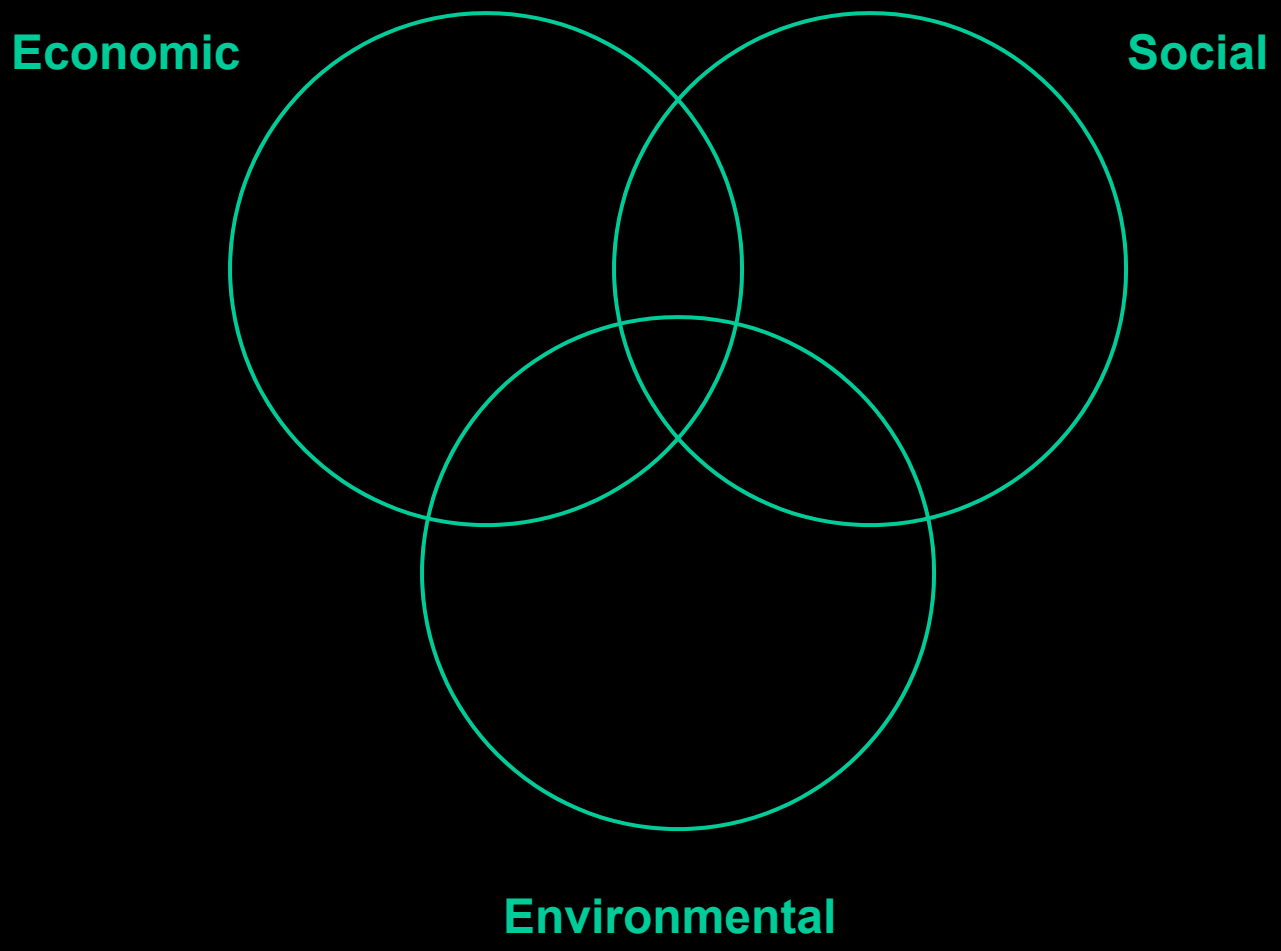
“We shall never achieve harmony with land, any more than we shall achieve absolute justice or liberty for people. In these higher aspirations, the important thing is not to achieve but to strive.”

-Aldo Leopold


Economic
Social
Environmental

…AUDIENCE QUESTIONS…

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