

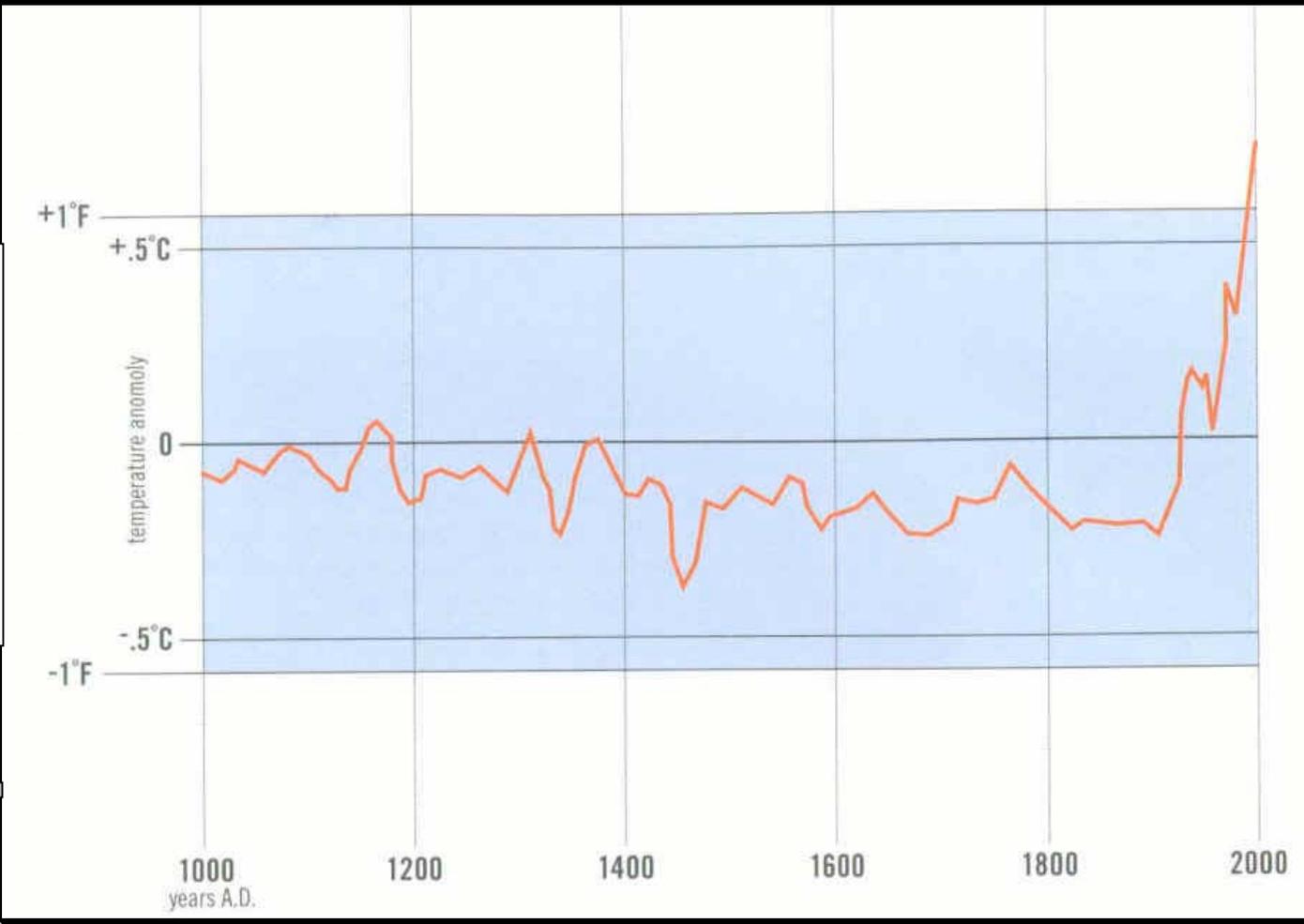
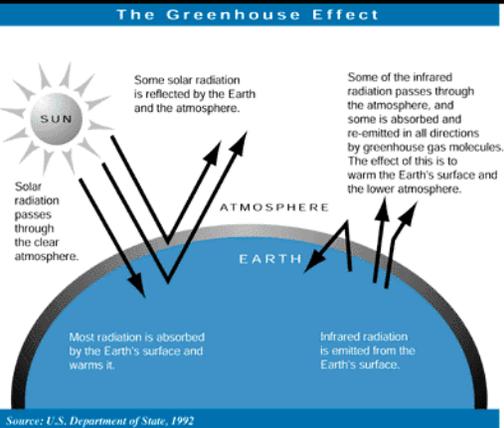


An Introduction to Green Design

WRT

Muscoe Martin, AIA

What is the problem?

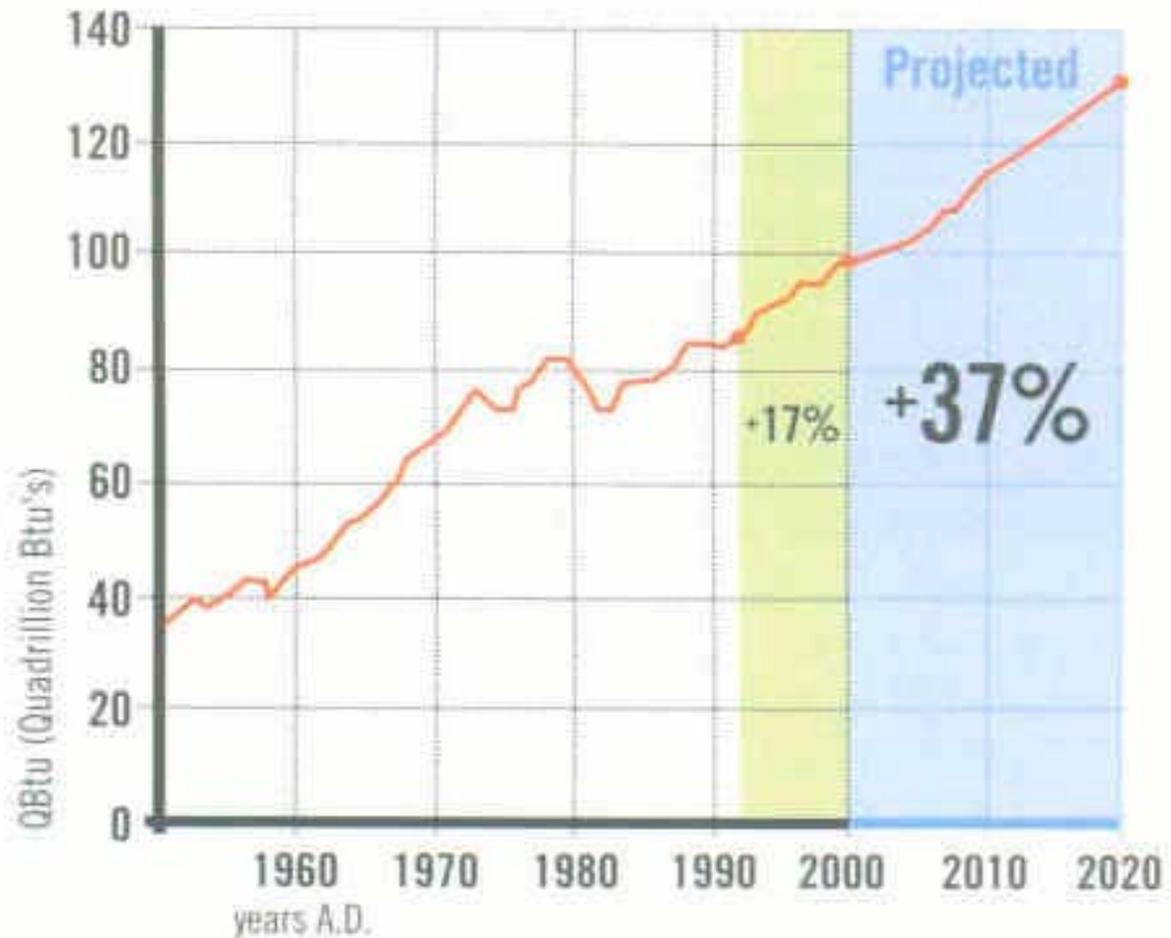


PRACTICAL

SOCIAL

ENVIRONMENTAL

What is the problem?



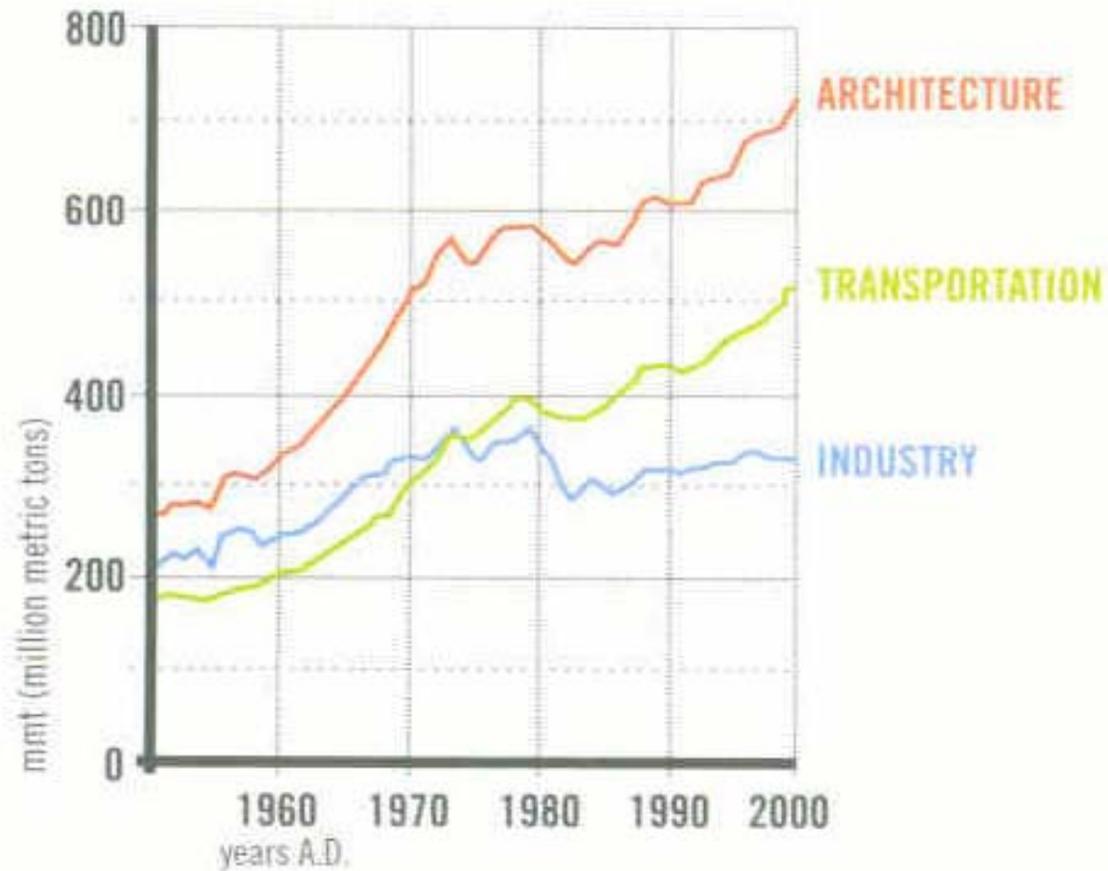
U.S. Energy Consumption

PRACTICAL

SOCIAL

ENVIRONMENTAL

What is the problem?



U.S. CO₂ Emissions by Sector

PRACTICAL

SOCIAL

ENVIRONMENTAL

What is the problem?

- **1/3 of total energy use**
- **2/3 of electricity consumption**
- **1/3 of greenhouse gas emissions**
- **12% of potable water consumption**
- **30% of raw materials use**
- **30% of waste output/136 million tons/yr.**

PRACTICAL

SOCIAL

ENVIRONMENTAL

**BUILDINGS
POLLUTE!**

METROPOLIS

GEHRY • HERZOG & DE MEURON

ARCHITECTURE < CULTURE > DESIGN

October 2003



ARCHITECTS

POLLUTE

An alarming new analysis of global warming says architects are the problem—and our best solution.

WWW.METROPOLISMAG.COM

USA \$4.95 | CANADA \$6.95

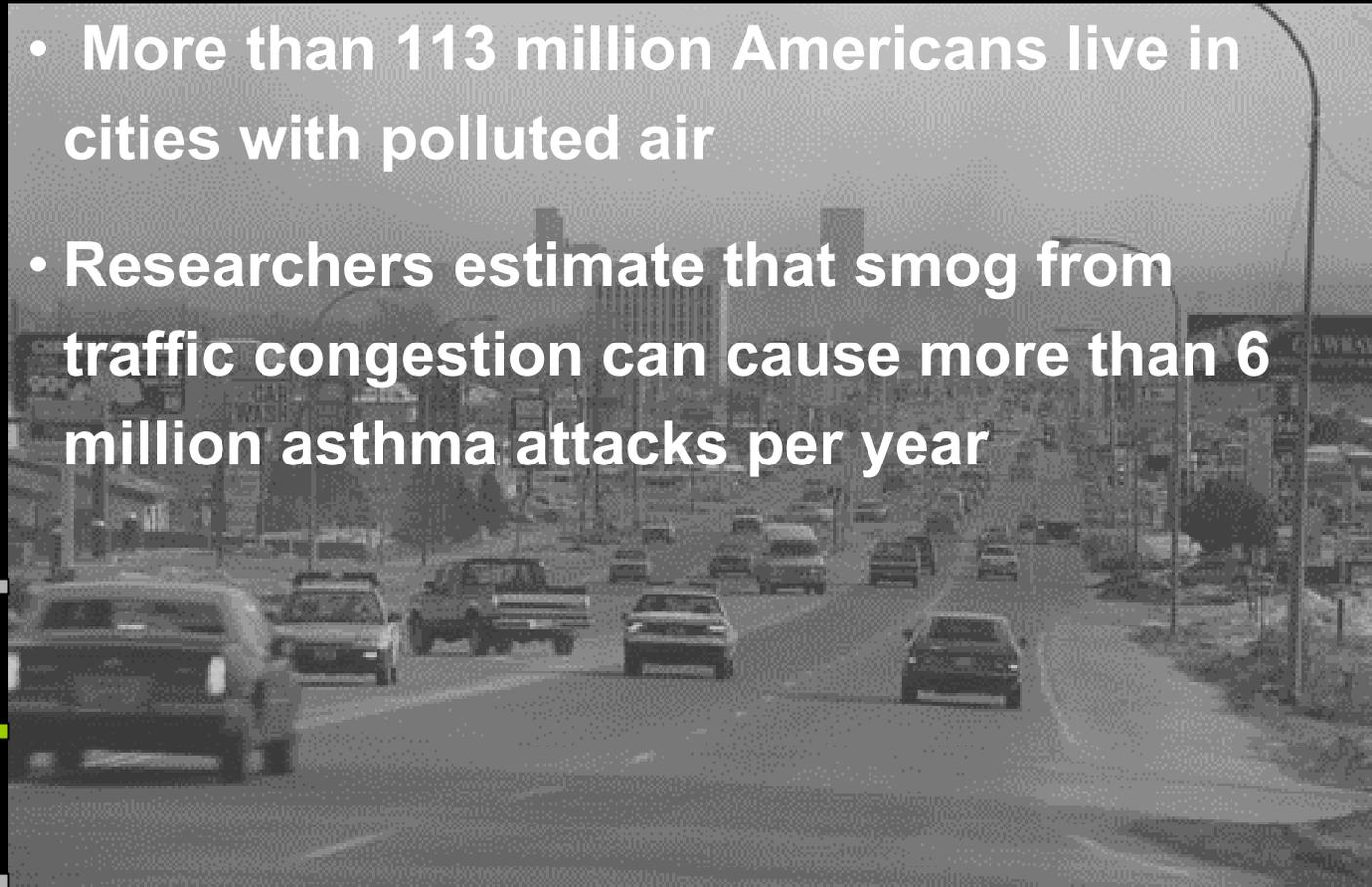


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What is the problem?

HEALTH

- More than 113 million Americans live in cities with polluted air
- Researchers estimate that smog from traffic congestion can cause more than 6 million asthma attacks per year



PRACTICAL

SOCIAL

ENVIRONMENTAL

What is the problem?

HEALTH

LAND-USE PRACTICES

- Development that increases car use and/or reduces tree cover, accounts for roughly half of the total climate impact in the U.S.
- Vehicle miles traveled rose 80 percent from 1980 to 2000 yet the population rose by only 22 percent
- 55% of Americans do not exercise enough (~ 1/3 are obese, 1/3 are overweight).

PRACTICAL

SOCIAL

ENVIRONMENTAL

What is the problem?

- Buildings are not performing well
- Reliance on external power sources means many buildings must close during power outages.
- Quality of construction decreasing – buildings are not lasting very long

PRACTICAL

SOCIAL

ENVIRONMENTAL

Can we fix these problems?



These are all Design Problems

Ecological Approach Needed

- Root of the work ecology is “oikos” = house

This is not a new approach



What is a green building?



QUESTIONS TO ASK

- Does it really need to be built?
- Is it in the right location?
- Does it respect the land?
- Does it conserve energy and resources?
- Is it a healthy place?
- Will it have a long life?

What does a green building look like?



What does a green building look like?



IT DEPENDS

- Requires life cycle cost approach.
- Some strategies must be seen as investments with paybacks.
- Integrated design approach can yield synergies with little or no cost increase.

The Wilderness Retreat of the Diocese of Pennsylvania

A camp & retreat center that will provide a unique place for deepening our relationship with God, each other, and the environment.



A Sustainable Camp & Retreat Center

- Forest Easement
- Assess carrying capacity of site
- Analyze site systems
- Locate development to preserve ecologically important areas

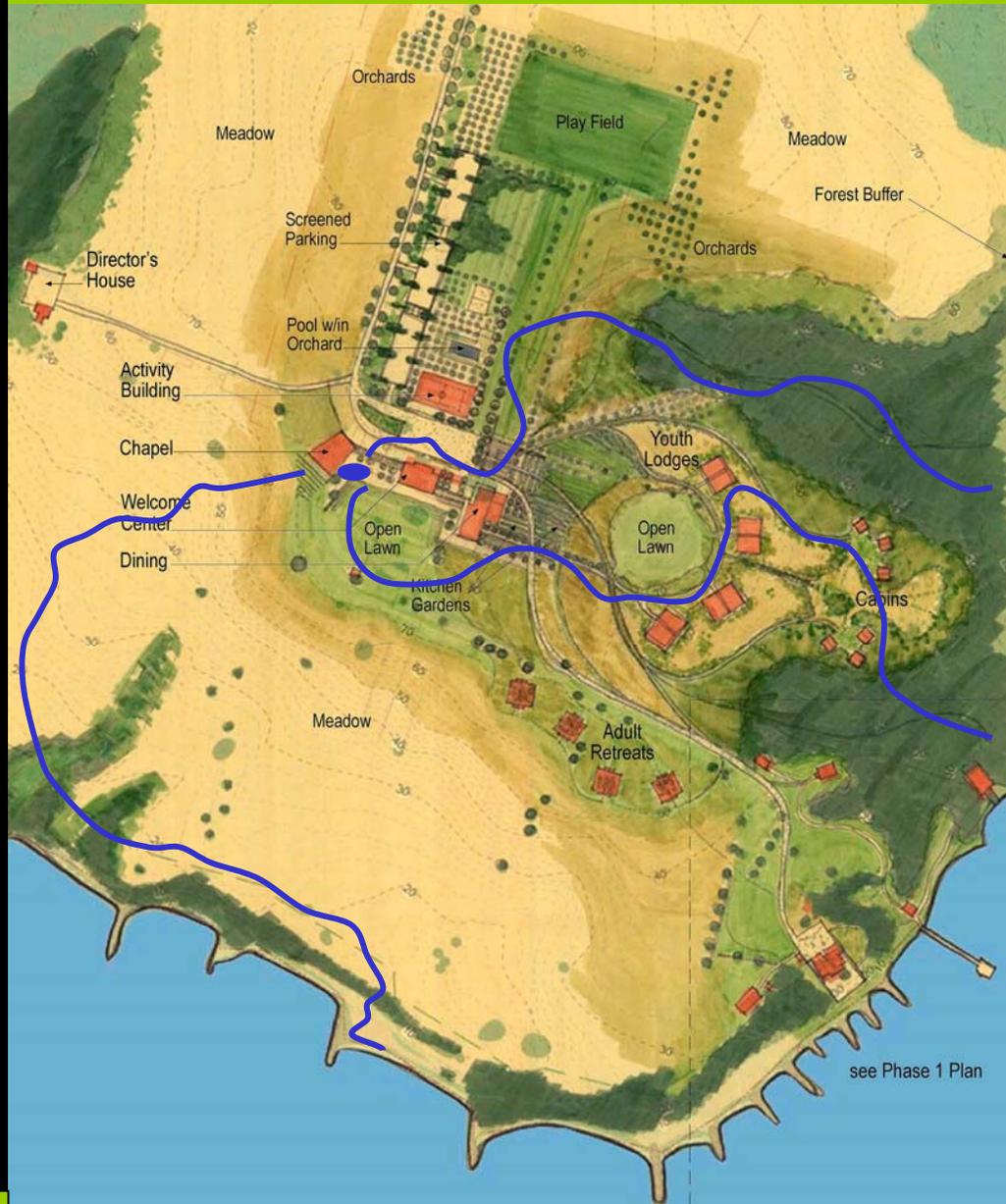


EXISTING CONDITION



A Sustainable Camp & Retreat Center

- A series of “nested” human communities within a natural community
- Green architecture
- Environmental education
- Where does the food come from?
- Ecological waste treatment
- Water as spiritual and ecological symbol



BLUE BALL BARN

Delaware State Parks



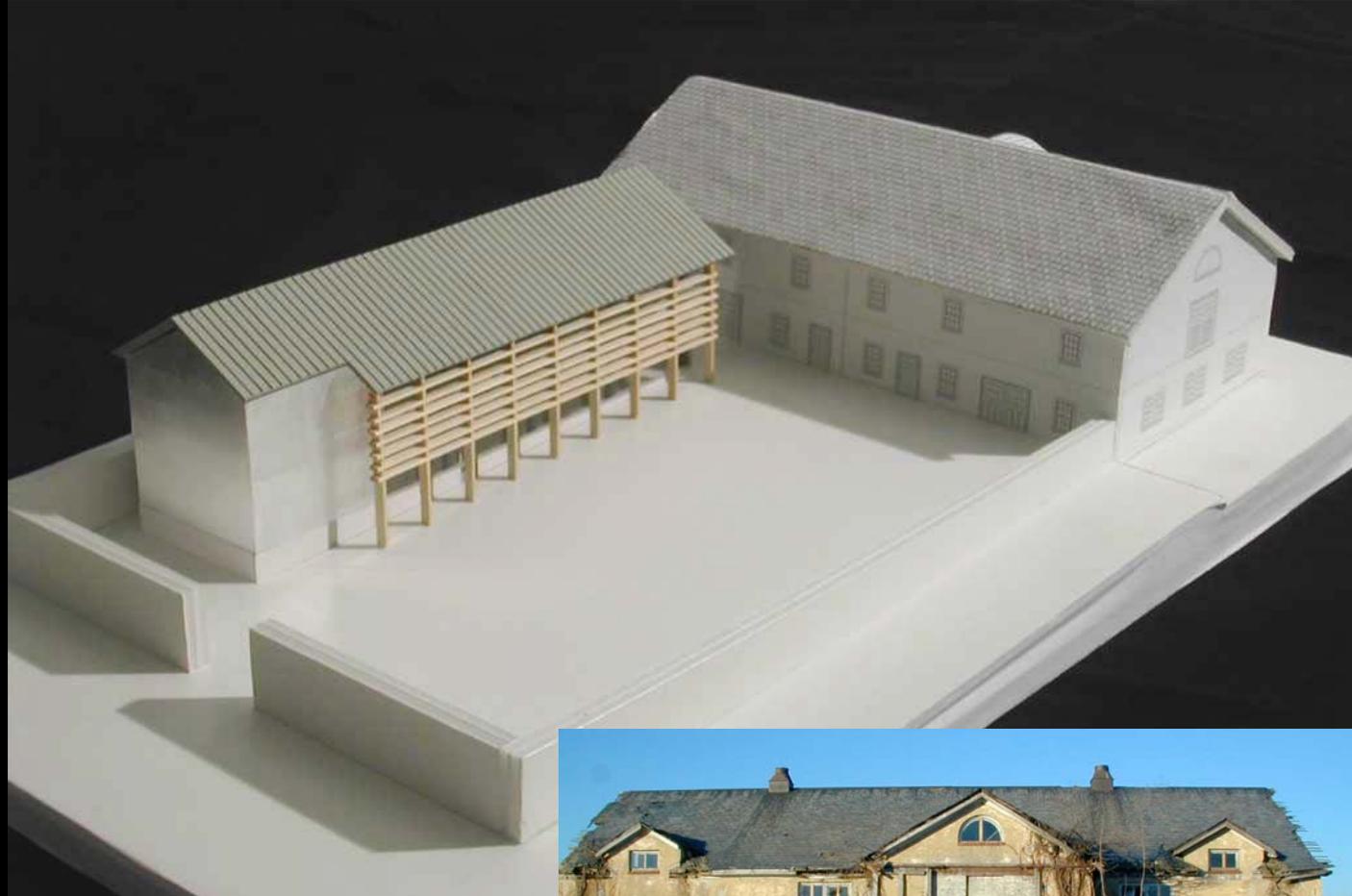
BLUE BALL BARN

Delaware State Parks

Blue Ball Barn

Historic Restoration and
Addition for Visitor Center
and Event Barn

LEED™ Registered
Energy Study

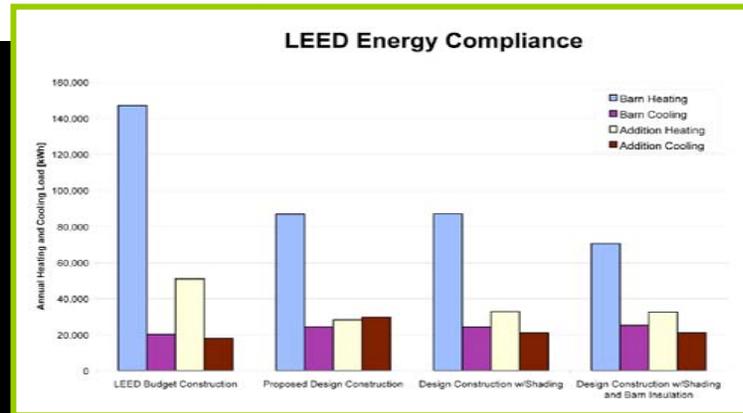
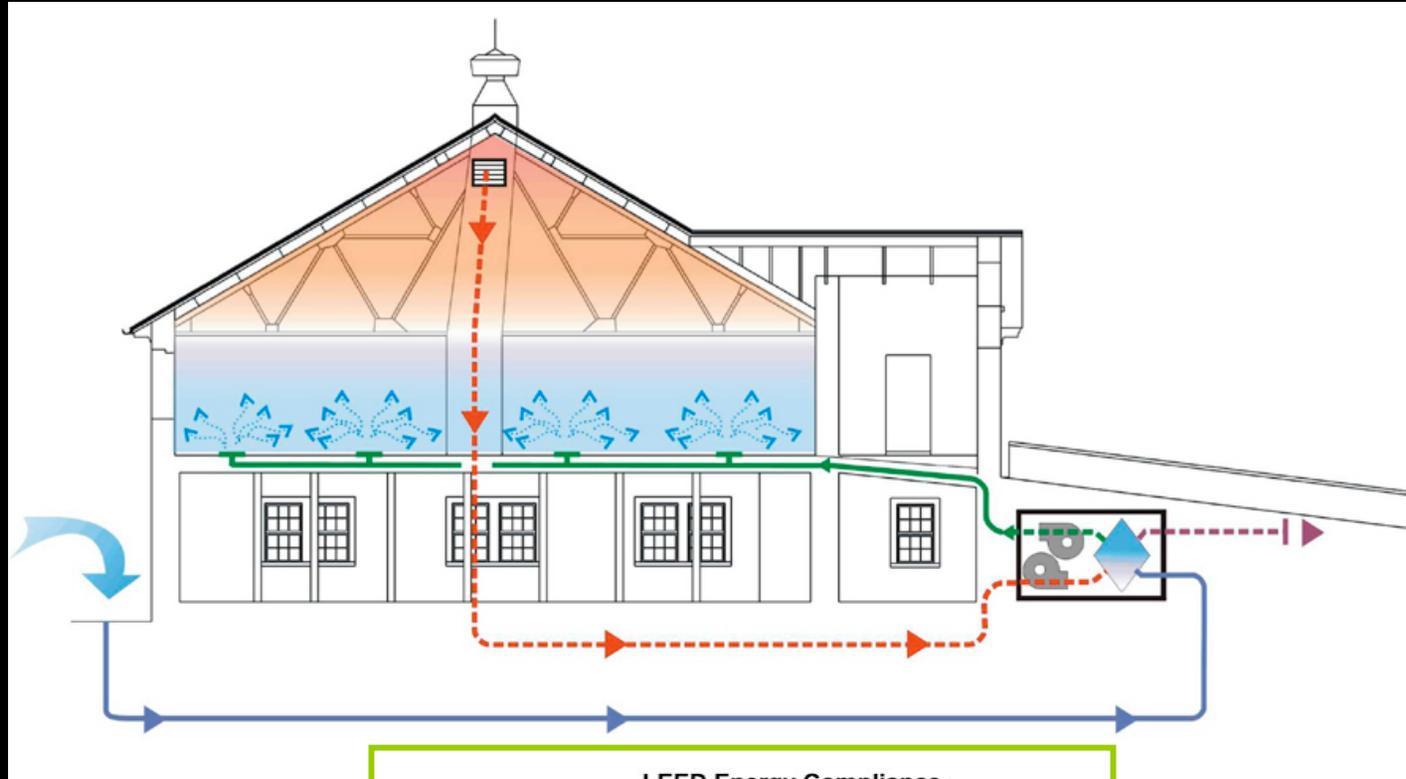


BLUE BALL BARN

Delaware State Parks

Energy Study

Optimizing energy performance in balance with historic preservation goals.



TOM RIDGE VISITOR CENTER

Presque Isle, PA

- LEED Registered
- Integration with site
- Water Conservation
- Energy Efficiency

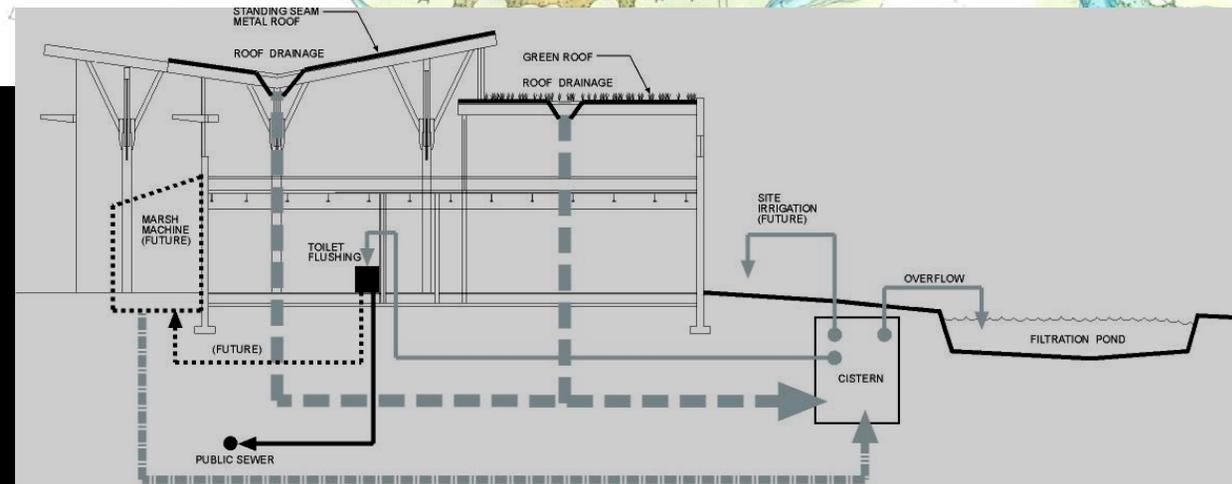
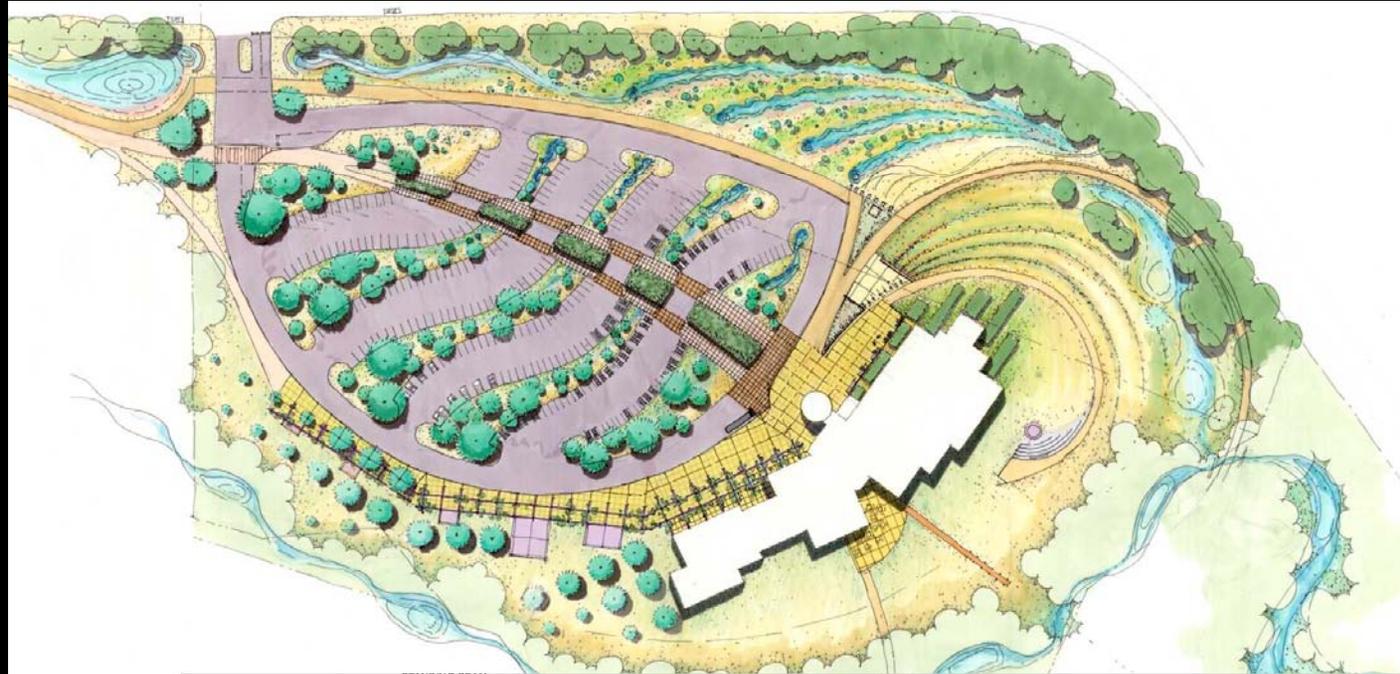


TOM RIDGE VISITOR CENTER

Presque Isle, PA

Site Design

- Porous paving
- Appropriate planting
- Shaded parking lot
- Rainwater harvesting.

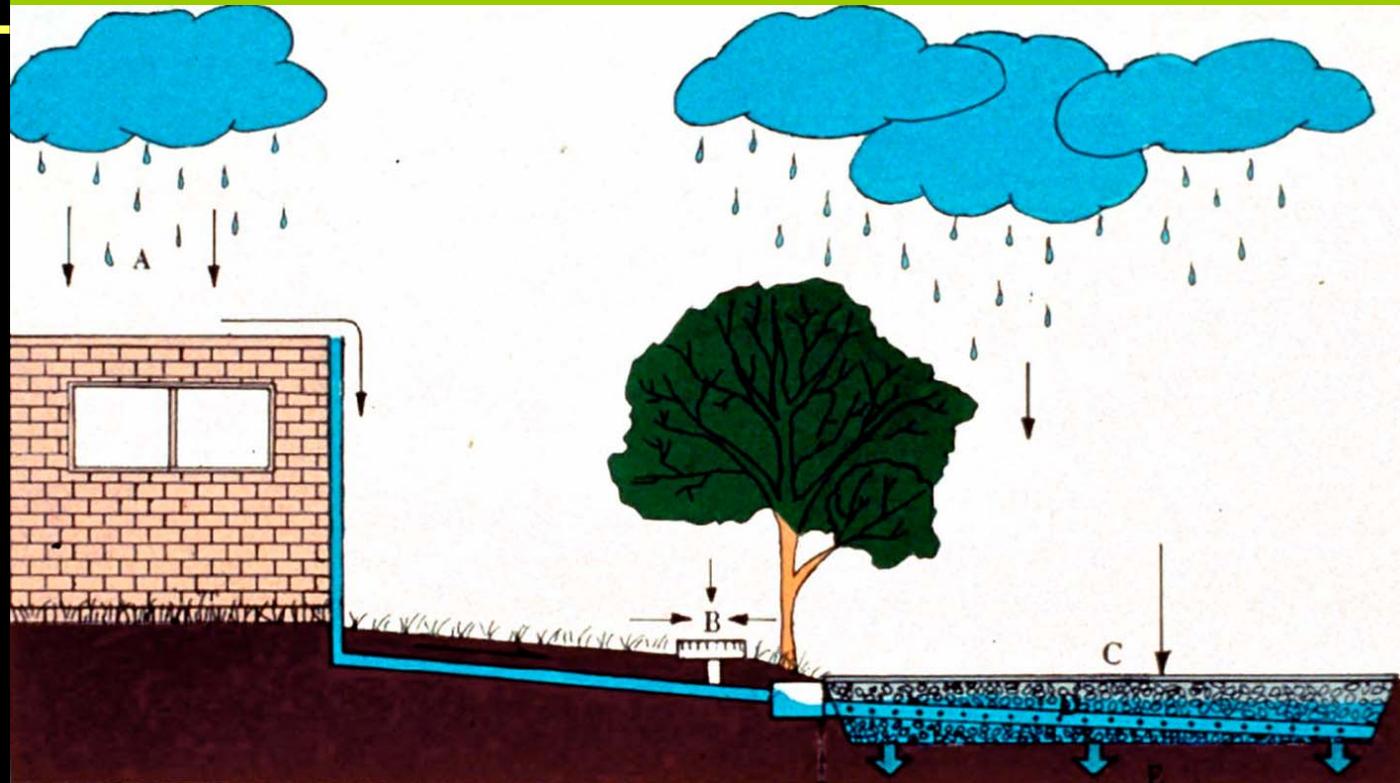


TOM RIDGE VISITOR CENTER

Presque Isle, PA

POROUS ASPHALT PAVING

- Permits stormwater recharge into groundwater
- Durable and tested technology





Leadership in Energy & Environmental Design



**Developed by the
U.S. Green Building Council**



www.USGBC.org



What Is LEED?



- ❑ Green building rating system
- ❑ Versions for new construction, interiors, existing buildings.
- ❑ Application guide for Lodging
- ❑ Third party endorsement of green design
- ❑ Helps define a green building.
- ❑ Useful checklist for clients and design team
- ❑ Clients asking for it. (NPS, DOD, etc.)
- ❑ Scoring system takes advantage of our natural competitiveness. (I want platinum!)