

# ***The Willamette Greenway Pavilion***

***The First Building to Receive LEED  
Platinum Certification in Oregon***

***November 5<sup>th</sup>, 2004***

***Trailblazing***



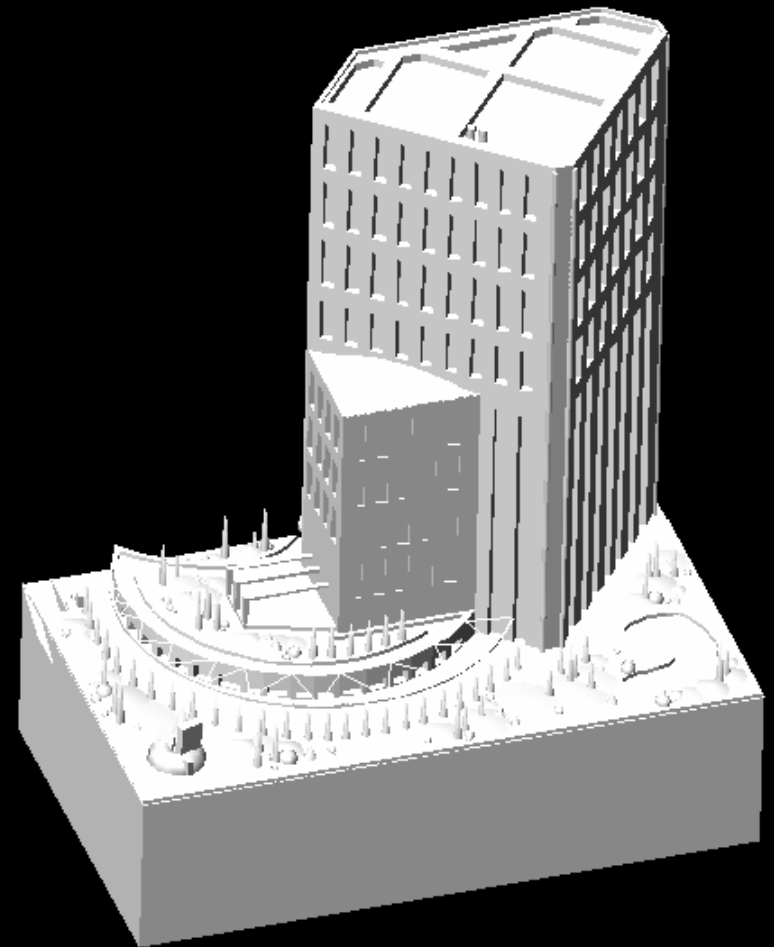
***Consultants***

# ***Trailblazing Consultants Design Team Members***

- ***Anna Carter, Soils/Landscaping Engineer , Ph.D., P.E.***
- ***Grant Rodway, Mechanical/Systems Engineer, Ph.D., P.E.***
- ***Gregory Mockos, Civil Engineer/Architect , Ph.D., P.E.***
- ***Mikel Siemens, Chemical Engineer , Ph.D., P.E.***
- ***Stephen Dent, Environmental Engineer, Ph.D., P.E.***

# *The Willamette Greenway Pavilion Project Objectives*

- *Design a LEED (Leadership in Energy and Environmental Design) Platinum Certified Building in downtown Portland*
- *The building is located on a 5-acre parcel of land adjacent to the Willamette River*
- *The building will serve multiple uses for the Portland community:*
  - *Floor 1: Upscale Commercial/Shopping/Restaurants*
  - *Floors 2-12: Offices/Cloning Research Facilities*
  - *Floors 13-20: Upscale Condominiums*



# *Initial Site Assessment*

- Major site assessment issues:
  - Significant archeological site
  - Wood chips
  - Subsurface characterization
  - Hydrogeologic study
  - Environmental impact on river

# ***Archeological Assessment***

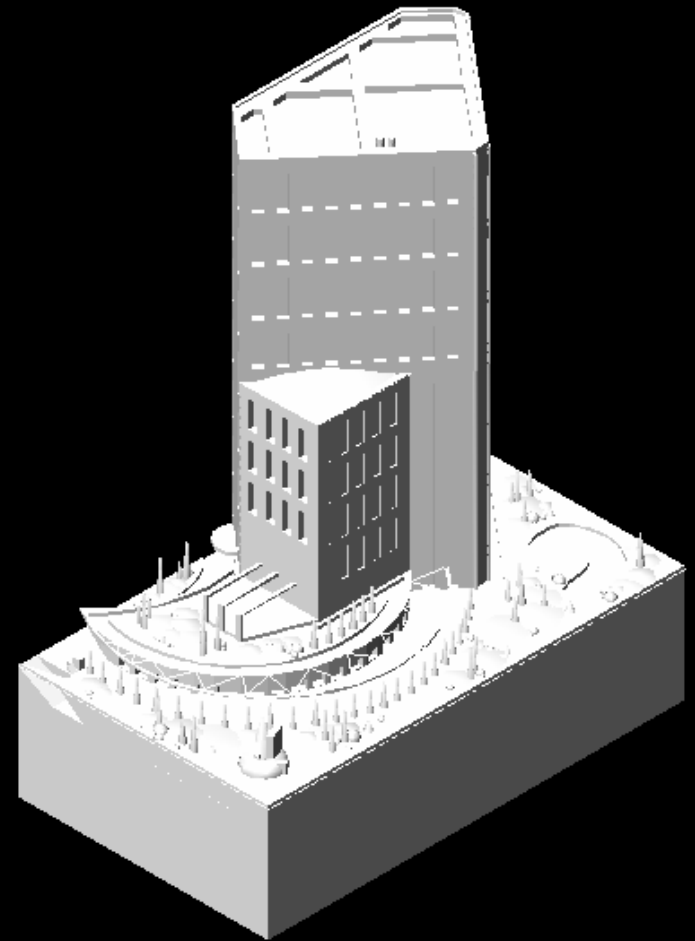
- Discovered trade hatchet, gun flint, and a fire ring
- Historical significance determined
  - Consulted with:
    - Lewis and Clark Preservation Society
    - Dean of Archeology at Portland State University
    - Elders from local Native American tribes
- Measures taken to preserve site during and after construction
- Monument erected

# ***Incorporating The Wood Chips In The Design***

- Excavate site to include underground parking lot
- Stock pile wood chips for later landscaping use
- Wood chip characterization
- Jet grouting remaining chips for additional stability

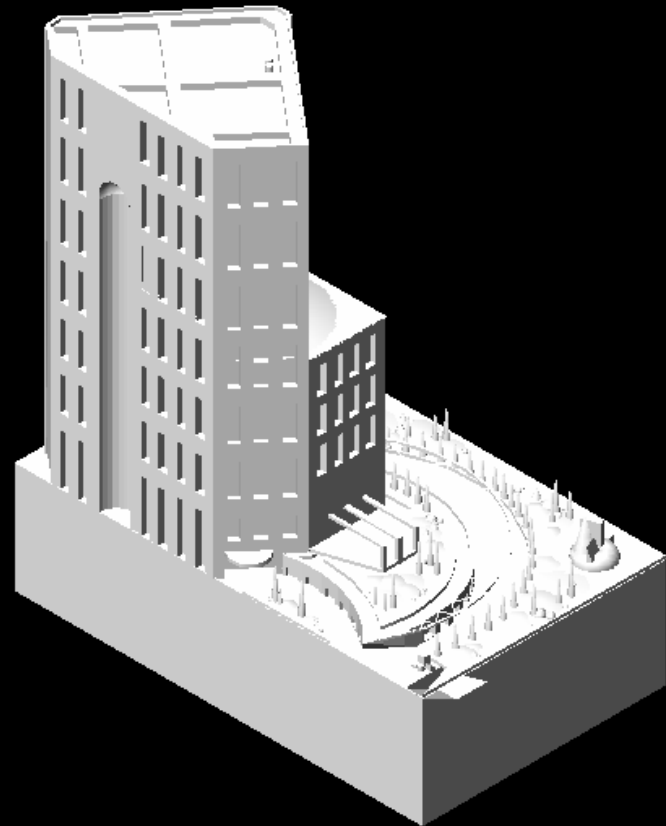
# ***Building Design***

- **Materials and Resources**
  - Resource Reuse
  - Recycled Content
  - Local/Regional Materials
  - Construction Waste Management
  - Storage and Collection of Recyclables



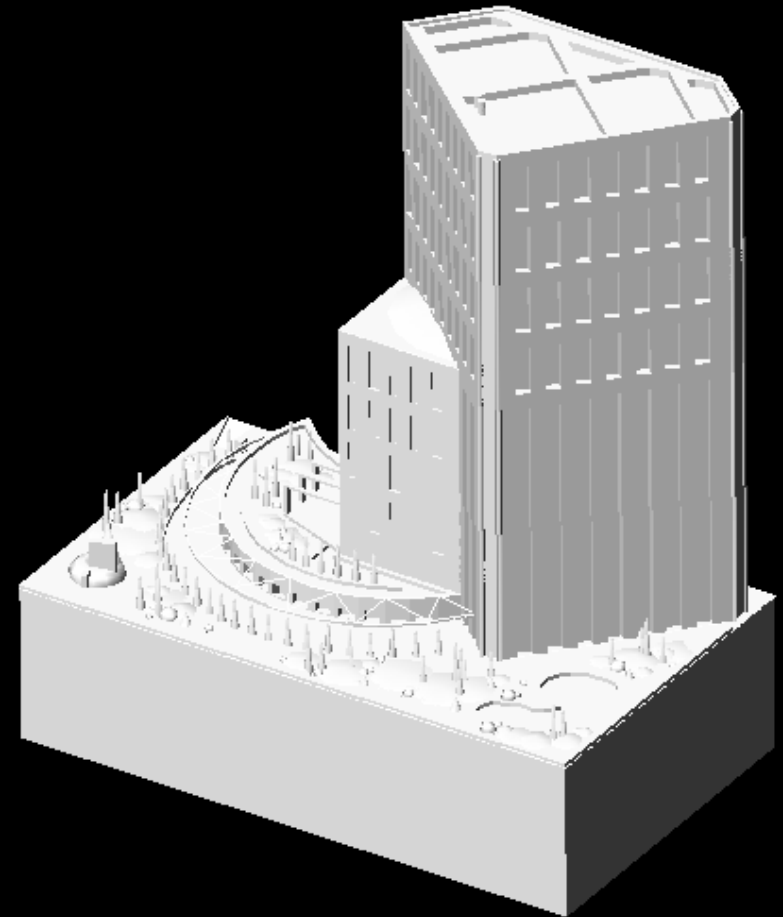
# ***Building Design***

- Thermal Comfort
- Efficient Lighting
- Daylight and Views
- Solar Panels
- Light Pollution Reduction
- Reduced Water Use



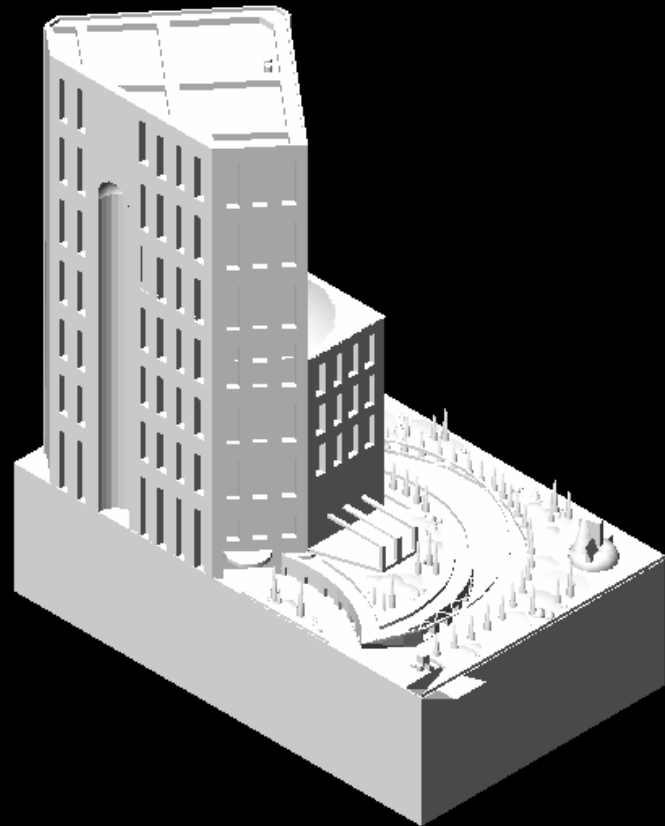
# ***Building Design***

- **Alternative Transportation**
  - Parking Capacity
  - Alternative Fuel Vehicles
  - Bicycle Storage and Changing Rooms
  - Public Transportation Access



# *Stormwater Management*

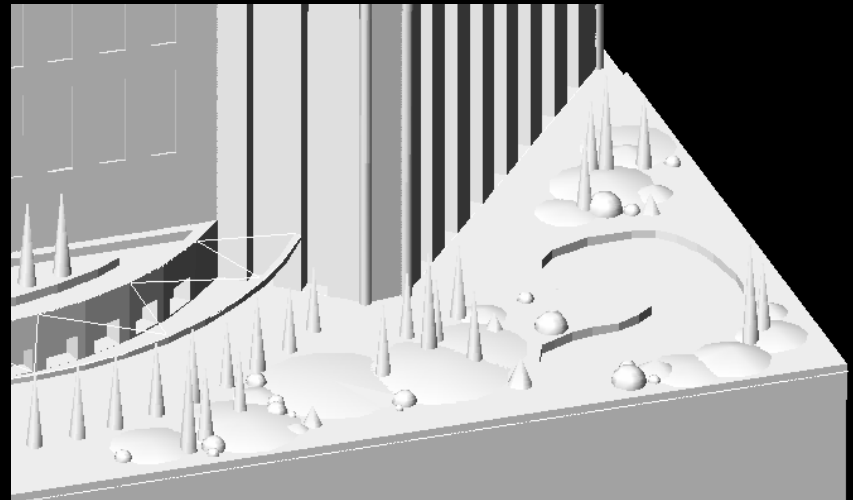
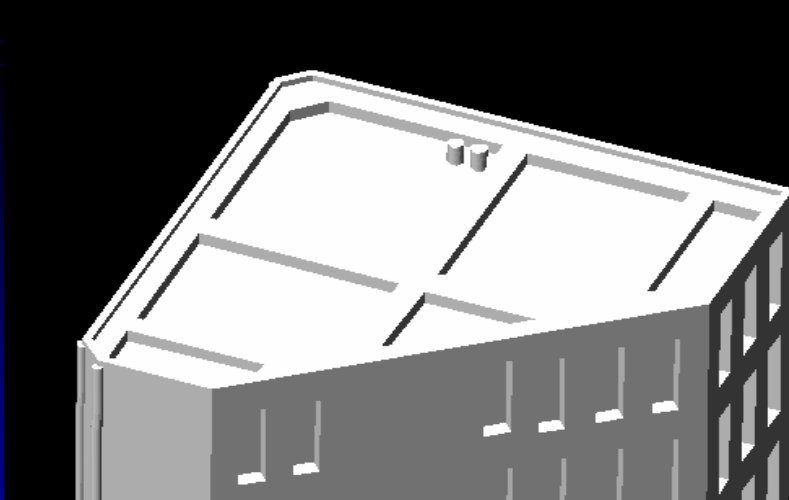
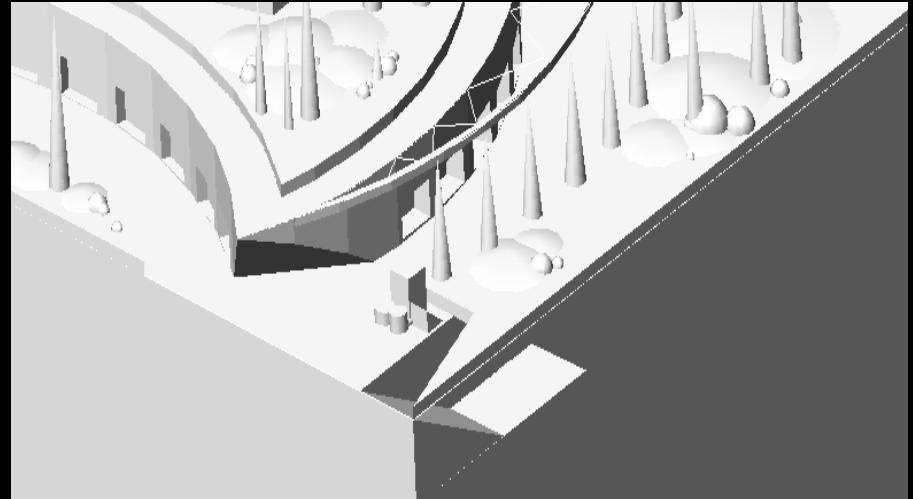
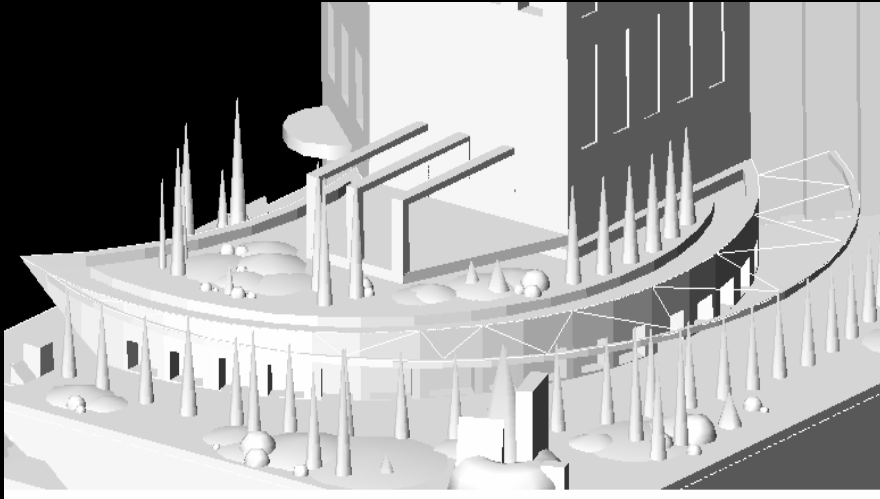
- Ecoroof
  - Reduces heat islands
  - Absorbs major storm runoff
- Water collection oriented architectural designs
  - Secondary roof
  - Private garden
  - Steel scuppers



# *Landscaping*

- Stones below scuppers (impact points)
- Private gardens and swales with native vegetation (Oregon sedum, Oregon grape, licorice ferns, Globe flowers, iris, etc.)
  - hold flow capacity and capture 68% of pollutants
- Wood filings excavated from site used for soil aeration and providing nutrients and garden cover
- Soil Erosion prevented with the use of clover-mixed grasses
- Bioretention pond to catch any overflow

# *Architectural/Functional Details*



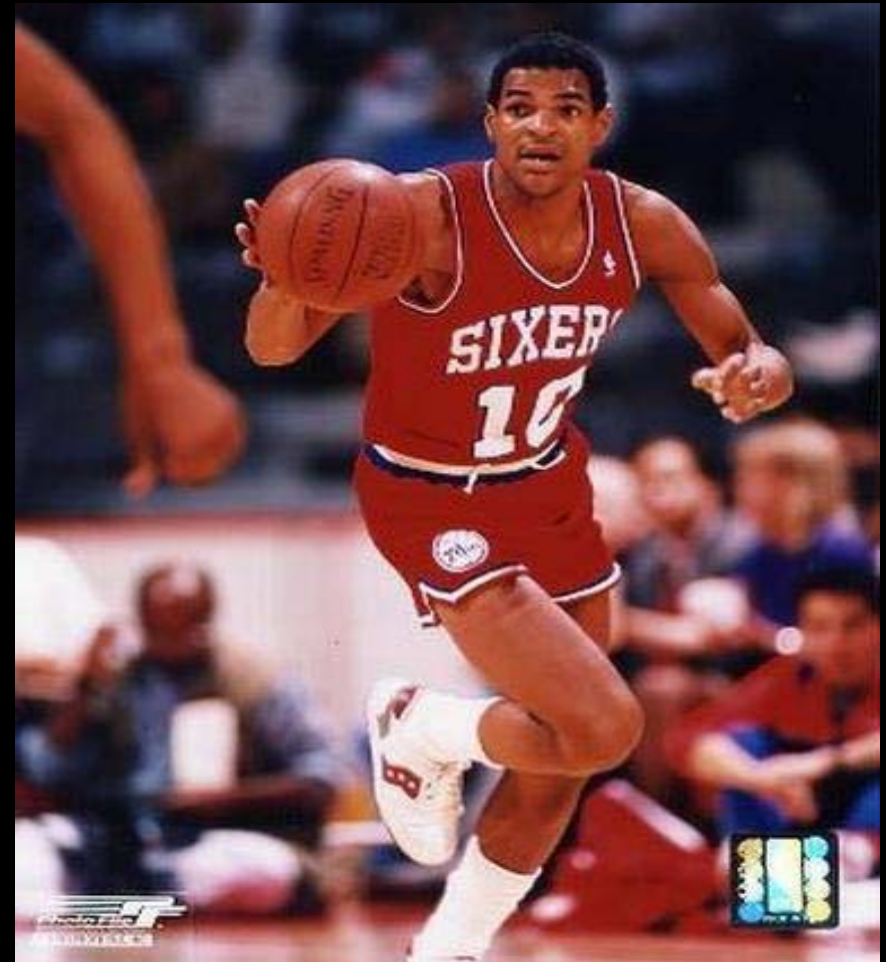
# ***Biodiesel Backup Generators***

- *Transesterification laboratory will be located in the basement.*
- *The laboratory will utilize waste vegetable oil generated by restaurants in the building.*



# *Maurice Cheeks is interested in having a restaurant in the Willamette Greenway Pavilion.*

- *Maurice's restaurant, "Cheeks" will specialize in exquisite food that will produce tremendous amounts of waste vegetable oil.*
- *Supplementary oil will be provided by the local company Baker Commodities, if needed.*

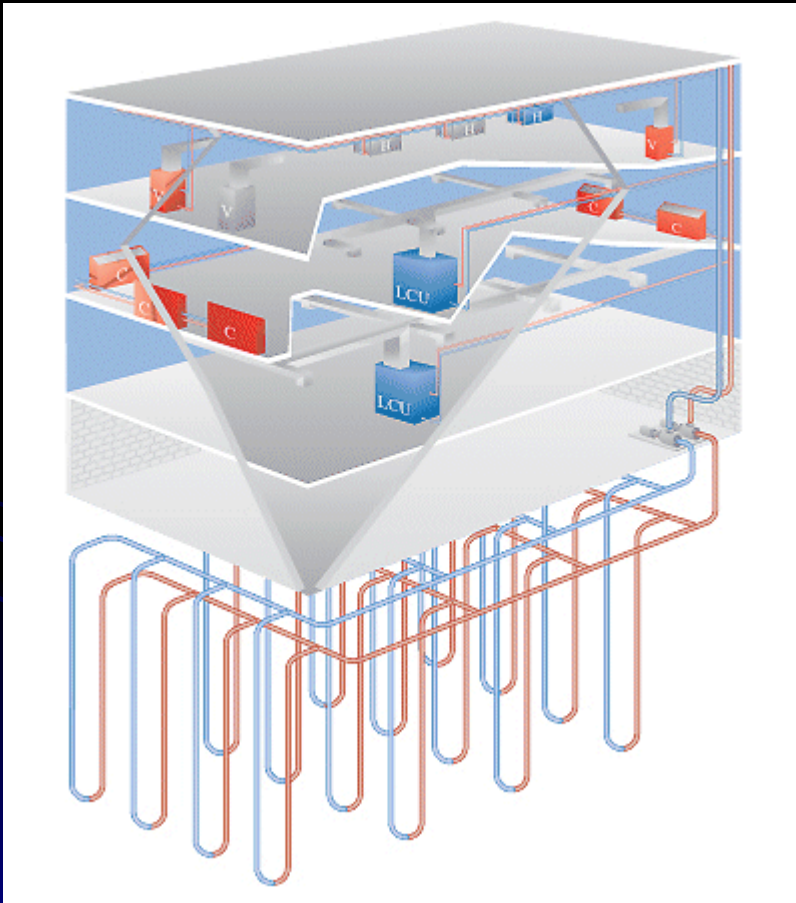


# ***Biodiesel Fueled Fleet***

- Fuel station will be located near the entrance to the parking garage.
- Biodiesel fuel benefits:
  1. Unburned hydrocarbons reduced by 20%
  2. Carbon monoxide reduced by 12%
  3. Particulate matter reduced by 12 %

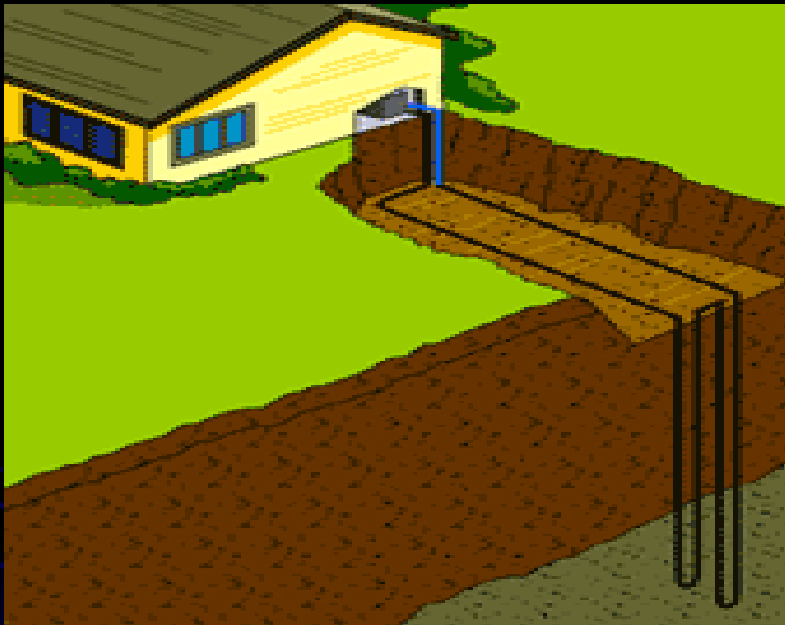


# *Geothermal Conditioning System*



- *Geothermal heat pump systems are the most environmentally clean, energy efficient, and cost effective space conditioning systems available according to the EPA.*

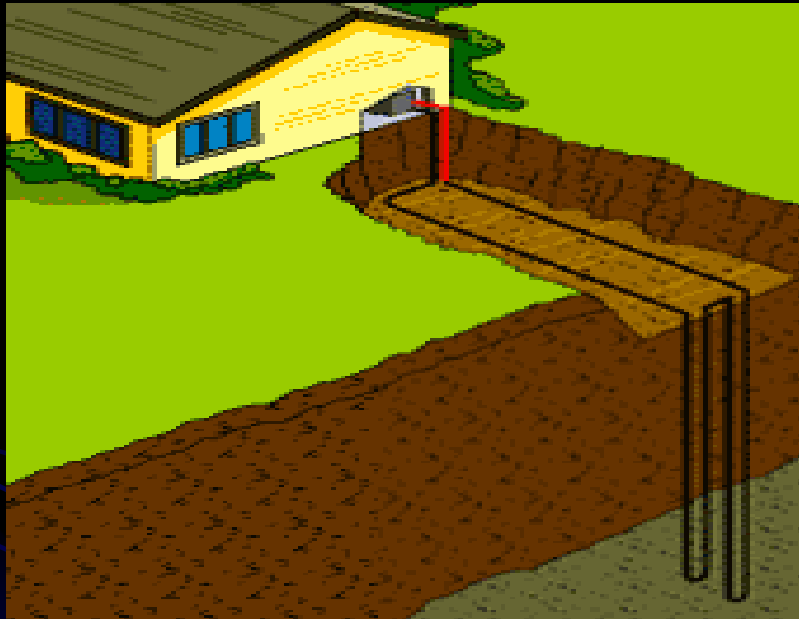
# Heat Exchanger in Winter



In winter, fluid passing through this vertical, closed loop system is warmed by the heat of the earth; this heat is then transferred to the building (select image to enlarge).

- Fluid passes through the underground piping system and is warmed by the earth's heat.
- Collected heat is extracted and concentrated by the heat pump.
- The captured heat is distributed throughout the ductwork in the Pavilion.

# *Heat Exchanger in Summer*



In summer, the fluid removes heat from the building and transfers it to the relatively cooler ground in order to cool the building (select image to enlarge).

- Process is reversed during the summer.
- Heat pump moves heat from the indoor air through the underground loops.
- The ground cools the fluid and is utilized to cool the building.

# *Supplemental Green Tag Power*



- Green Tags are energy credits that homeowners and businesses can purchase.
- The energy provided comes from renewable energy sources such as solar and wind power.

# *Laboratory Refrigerators*

- Liquid nitrogen, non-halon, and non-HCFC refrigerants will be utilized.
- Refrigerant fluids will be non-toxic, non-ozone depleting, and made from organic materials to reduce environmental impact.
- Duracool 22a



# ***Environmental Quality***

- Negative pressure storage
- Chemically inert linoleum flooring
- Intrinsically safe lighting
- Building wide environmental quality monitoring
- Chemically specific safety cabinets
- Emergency response safety plan
- MSDS

# ***Ventilation***

- Natural Ventilation
  - Local microclimate design
  - EXPO “98 Administration Building”
- Standard Ventilation
- Class II; B1 (VS-35-11)
  - “Total Exhaust Systems”
  - HEPA Filter

# ***LEED Platinum Certification***

● Sustainable Sites	12
● Water Efficiency	3
● Energy and Atmosphere	15
● Materials and Resources	9
● Indoor Environmental Quality	12
● Innovation and Design	1

***Total***

***52***

The Lewis and Clark archeological site inspired this team to confront the aspects of this design with the same trailblazing mentality that the Corps of Discovery depended upon in the early 1800's.

***Trailblazing***



***Consultants***

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