

## CONCEPTUAL SUSTAINABLE APPLICATIONS

### 1. RENEWABLE ENERGY

#### A) GEOTHERMAL

- I) GROUND SOURCE HEAT PUMPS ARE ONE OF THE FASTEST GROWING APPLICATIONS OF RENEWABLE ENERGY IN THE WORLD. UTILIZING CONSTANT GROUND AND GROUND WATER TEMPERATURES, GSHP'S CAN EXTRACT EITHER HEAT OR COLD THROUGH THE SAME SYSTEM, DEPENDING ON DEMAND.

#### B) WATER COLLECTION

- I) WITH APPROXIMATELY 40,000 SQUARE FEET OF ROOF; 440,000 GALLONS OF WATER CAN BE COLLECTED ANNUALLY TO BE USED ON SITE FOR IRRIGATION, LAVATORY, AND LAUNDRY USE
- II) COLLECTION SYSTEMS ARE CELEBRATED WITH EXPOSED CISTERNS AND TROUGH MATRIXES

#### C) SOLAR ENERGY

##### I) PHOTOVOLTAIC SYSTEMS

- 310 - 350 DAYS OF SUN IN NEW MEXICO MAKE THE IDEAL LOCATION FOR HARNESSING THE ENERGY OF THE SUN
- TODAY'S TECHNOLOGIES IN PHOTOVOLTAIC EXPAND WELL BEYOND THE TRADITIONAL ROOF MOUNTED ARRAY. FROM TRACKING ARRAYS THAT CAN DOUBLE AS SHADING DEVICES TO PHOTOVOLTAIC GLAZING, A LARGE VARIETY OF INNOVATIVE TECHNOLOGIES ARE AVAILABLE.

##### II) SOLAR HOT WATER

#### D) WIND GENERATED ELECTRICITY

- I) WIND ENERGY IS THE CLEANEST AND MOST COST EFFECTIVE SOURCE OF ENERGY
- II) A SINGLE WINDMILL CAN GENERATE UP TO 19,270 KWH ANNUALLY

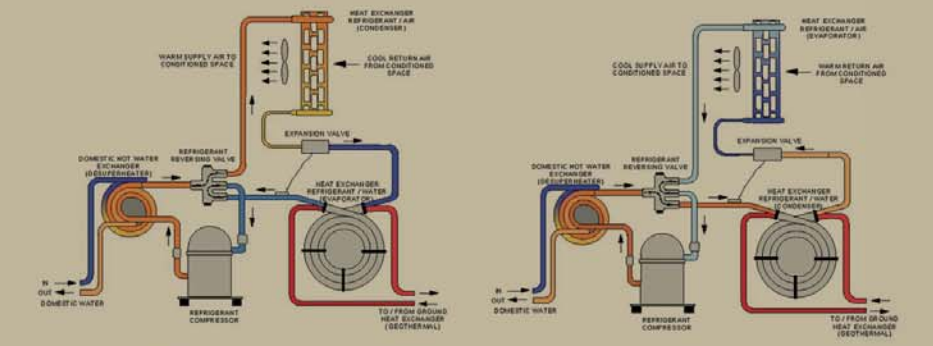
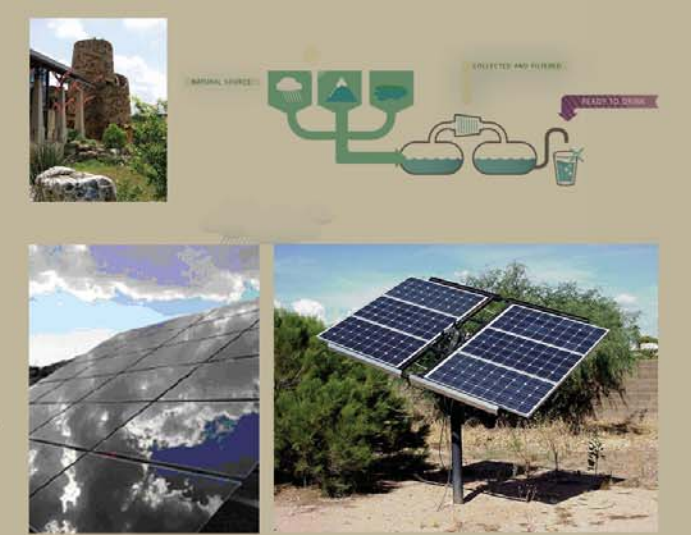
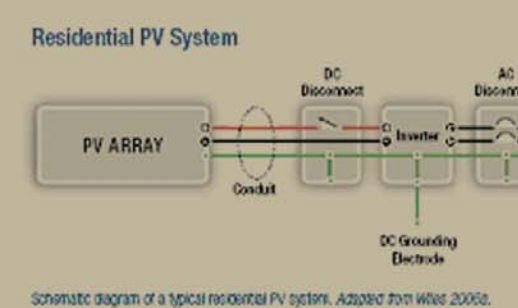
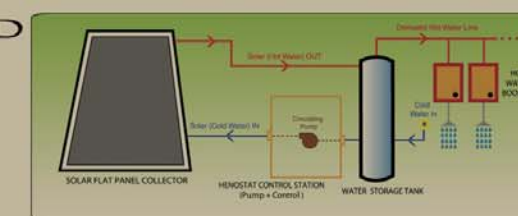


Figure 1a. GHP in the heating cycle (source: Oklahoma State University).



### 2. ENVIRONMENTAL CONTROL

#### A) NATURAL VENTILATION

NATURAL VENTILATION CAN DRAMATICALLY LOWER COOLING AND MECHANICAL VENTILATION COSTS

##### I) CROSS VENTILATION

- PROPERLY SIZED AND PLACED OPERABLE WINDOWS FOR LEEWARD AND WINDWARD SIDES OF BUILDING
- BUILDING ORIENTATION TO ENHANCE NATURAL VENTILATION

##### III) STACK VENTILATION

- PROPERLY EXHAUST HEATED AIR
- STRATEGICALLY PLACED COOLING TOWERS
- ATRIUMS ALLOW NATURAL STACK VENTILATION

##### IV) NIGHT COOLING

- ALLOW BUILDING TO OPEN UP TO FLUSH OUT HOT AIR DURING COOL HOURS

##### V) THERMAL MASS

- STRATEGICALLY PLACED CONCRETE AND MASONRY ABSORB AND STORE NIGHTS' COOLER TEMPERATURES

##### VI) UTILIZE PASSIVE COOLING

- STRATEGIC WINDOW AND SHADE DEVICE PLACEMENT TO MINIMIZE SOLAR HEAT GAIN

#### B) INTERIOR AIR QUALITY

##### I) LOW VOC MATERIALS

##### II) PROPER VENTILATION DURING AND AFTER CONSTRUCTION

#### C) INSULATION

##### I) POLYURETHANE CLOSED-CELL FOAM INSULATION PROVIDES HIGH THERMAL RESISTANCE WITH AN R VALUE OF 8 PER INCH

##### II) CELLULOSE INSULATION, CONTAINS LESS V.O.C.'S THAN ANY OTHER INSULATION

##### III) LOW E GLAZING

#### D) WATER USE REDUCTION

##### I) DUAL FLUSH TOILETS

##### II) LOW FLOW SHOWER HEADS

##### III) UTILIZE NATIVE LANDSCAPING

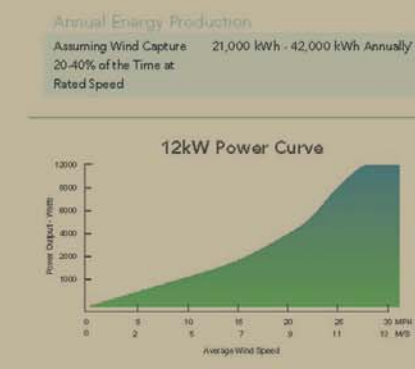
#### E) LIGHTING

##### I) L.E.D AND FLORESCENT FIXTURES

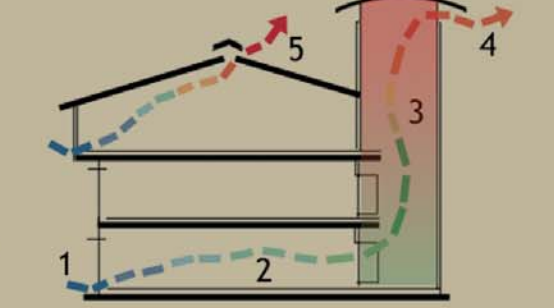
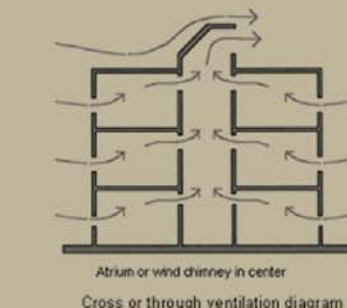
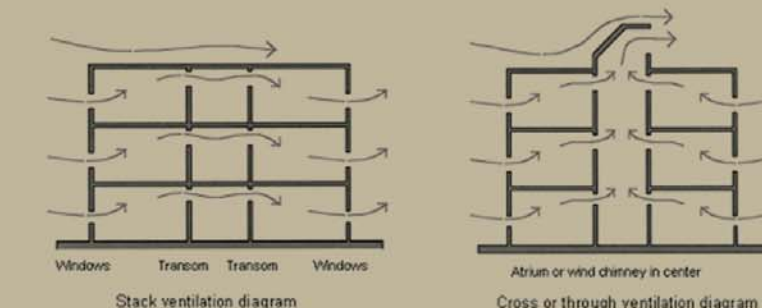
##### II) MAXIMIZE NATURAL LIGHTING

##### III) MOTION SENSORED LIGHTING SYSTEM

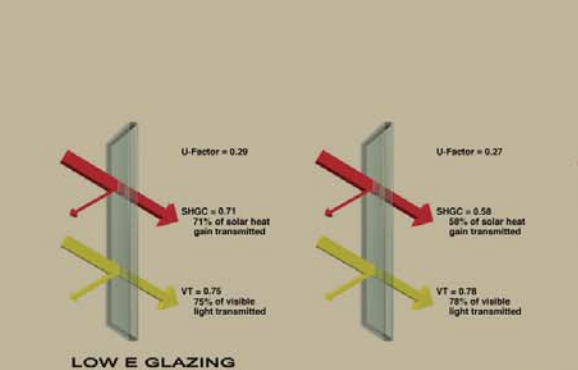
##### IV) DAYLIGHT SENSORED MONITORING SYSTEM



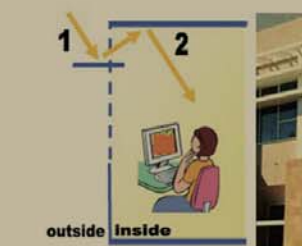
ALTERNATIVE ENERGY



NATURAL VENTILATION



THERMAL BUILDING ENVELOPE



NATURAL DAYLIGHTING

### 3. MATERIAL SELECTION AND USE

#### A) USE OF RECLAIMED MATERIALS

#### B) USE OF LOCAL MATERIALS

##### I) UTILIZATION OF SITE HARVESTED MATERIALS IF APPLICABLE

##### II) LOCAL VENDORS AND SUBCONTRACTORS

#### C) USE OF RENEWABLE MATERIALS

#### D) USE OF RECYCLED MATERIALS

#### E) "CRADLE TO CRADLE" MATERIALS (CONSIDERING WHAT MATERIALS CAN BE RECYCLED AT THE END OF THEIR USEFUL LIVES)

#### F) ENVIRONMENTALLY FRIENDLY MATERIALS

##### I) FLY ASH CONCRETE

##### II) FURNITURE MADE FROM SUSTAINABLE MATERIALS

##### III) ORGANIC MATERIALS FOR LINENS

#### E) AUTOCLAVE AERATED CONCRETE (AAC)



INDIGENOUS MATERIALS

### 4. INNOVATION SYSTEMS & TECHNIQUES

#### A) REGENERATIVE-DRIVE ELEVATORS

#### B) MASTER CONTROL KEY CARDS (ROOM KEY REQUIRED TO POWER ROOM)

#### C) NATURAL VEGETATION ROOF GARDENS

##### I) REDUCE SOLAR HEAT GAINS

##### II) PRODUCES OXYGEN

##### III) HELPS REDUCE URBAN ISLAND HEAT EFFECT

#### D) ENERGY STAR APPLIANCES

#### E) GEOTHERMAL CONTROLLED POOL SYSTEM

#### F) ELECTRIC SERVICE VEHICLES

#### G) RECYCLING STATIONS LOCATED THROUGHOUT

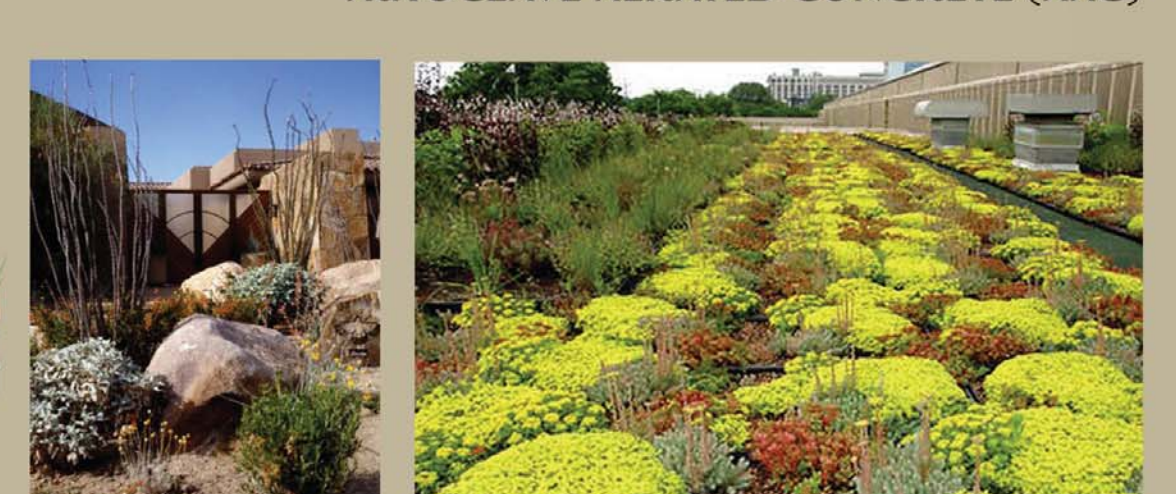
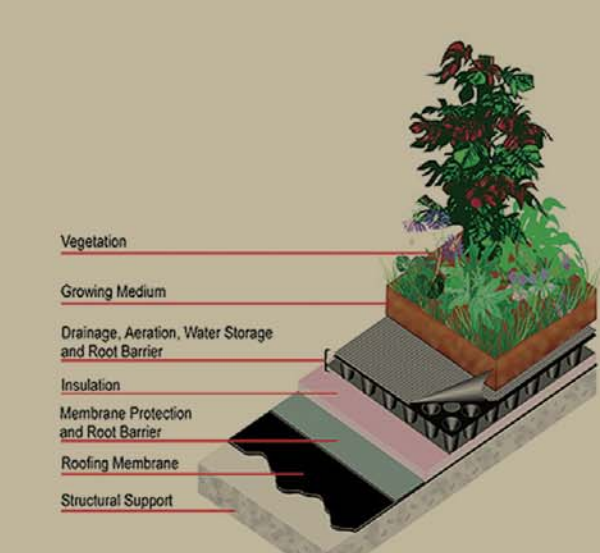
#### H) CONSTRUCTION WASTE CONTROL THROUGH STRATEGIC DESIGN PRACTICES

#### I) ORGANIC CLEANING PRODUCTS

#### J) INDIVIDUALLY SOLAR POWERED LANDSCAPE LIGHTING



AUTOCLAVE AERATED CONCRETE (AAC)



NATURAL VEGETATED ROOFS



CENTRE SKY  
ARCHITECTURE LTD