

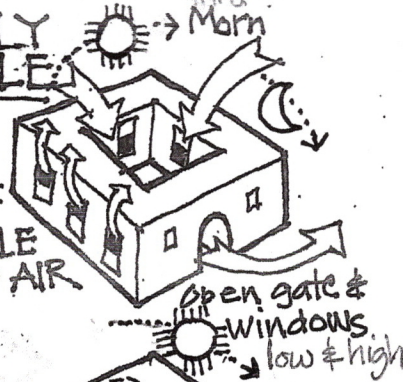
THE SOUTHWESTERN COURTYARD HOUSE

A Timeless Integrated Design as a Passive Cooling System

DAILY CYCLE:

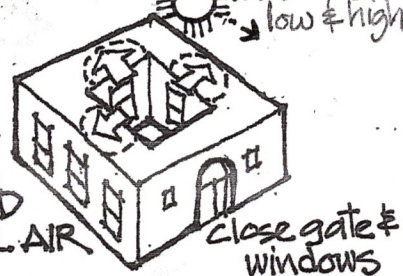
1

Night
INHALE
COLD AIR



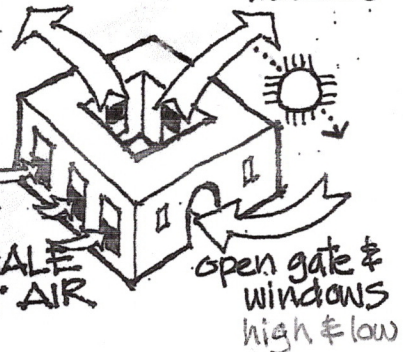
2

After
noon
HOLD
COOL AIR



3

Eve
EXHALE
HOT AIR



PASSIVE COOLING ACTIONS & DEVICES

AVOIDING HEAT

Shading of windows, walls & roof
Landscape for shade & windbreak
Self-shading building forms
Colors & reflectivity
Evaporative cooling fountain

SLOWING HEAT

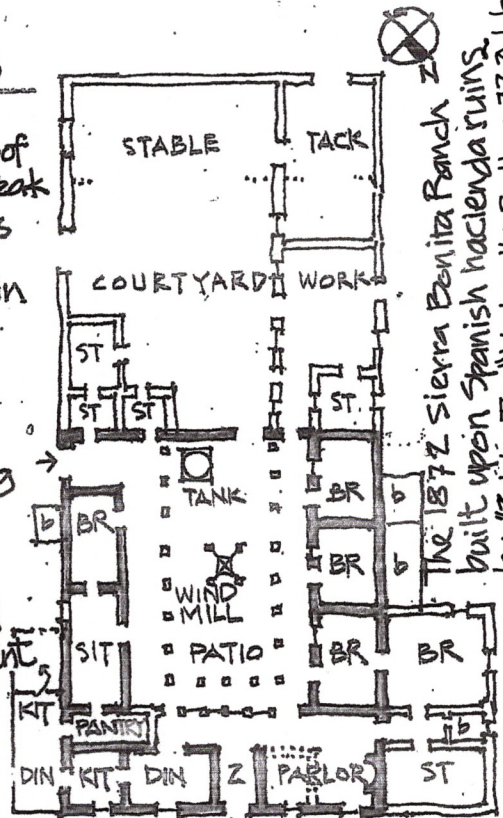
Insulation
Double glazing
Weatherstripping & caulking
Attic ventilation

STORING HEAT

Courtyard & zaguan hall
Earth integration & basement
Thermal masses

REMOVING HEAT

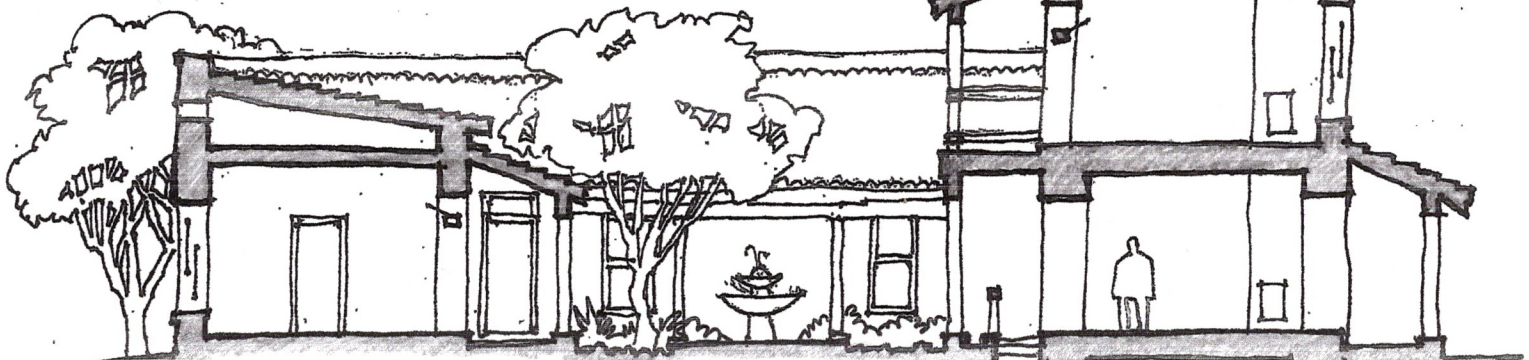
Ventilation
Solar chimney & cool tower
Windows, doors & transoms
Courtyard & zaguan hall
Breeze-block screens



DESIGN INTEGRATION
OF PRINCIPLES & DEVICES
for the arid desert

THE COOLING COURTYARD

The lungs & heart of a Spanish house
based on the 1680
Laws of the Indies



HEAT TRANSFER

Radiation
Conduction
Convection
Human activity

AIR MOVEMENT PRINCIPLE

Venturi Effect
Bernoulli's Principle
Gravity Stack Effect

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