



PROJECT:
Druk White Lotus School, Ladakh, India

CLIENT:
Drukpa Kargyud Trust

ARCHITECTS:
Jonathan Rose (later with Arup Associates)

BM SERVICES:
Concept Structural, MEP and Environmental Analysis

VALUE:
€1 million

DESIGN BRIEF

The Shey School Project (renamed Druk White Lotus School upon completion) was an initiative of the Drukpa Kargyud Trust under the directorship of His Holiness Gyalwang Drukchen Rinpoche, the head of the Drukpa Kargyud School of Tibetan Buddhism. The Trust is under the patronage of His Holiness the Dalai Lama, the spiritual and exiled political leader of Tibet.

The aim of the project was to build and sustain a new school for up to 750 mixed pupils in the village of Shey, near Leh in Ladakh, Northern India. The school offers a modern academic curriculum combined with an education based on the practical needs of the local community. It welcomes all children from the surrounding villages but also importantly to children from nomadic families who currently receive no formal education.

The project has received a number of World Architecture Awards including Best Green Building, Best Education Building and Best Asian Building in 2002.

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DESIGN INITIATIVES/ACTIONS UNDERTAKEN

Environmentally Responsive Engineering

The prevailing climate in Ladakh is harsh, and yet also benefits from many climatic advantages. The engineering design developed for the scheme is in direct response to the particular climatic characteristics of the site.

Rather than being environmentally rejecting, turning its back on the cold winds and highly variable temperature changes, it is environmentally selective.

The design is unique for its responds to the changing climate taking advantage of the climatic benefits whilst moderating the adverse effects of the weather. Rather like the lizard which raises its scales towards the warming winter sun, or the polar bear that has fibre optic hairs to transport the sun's heat to its skin, so the Skey School responds to environmental changes.

Activities and Timetable

The term times are adjusted so that during very cold periods the school is unoccupied and therefore needs no heating.

Orientation

The whole scheme is orientated to the south to allow maximum solar penetration both to the buildings as well as the external social spaces in between.

Building Form

The shape of the building has been adapted to permit maximum solar penetration whilst reducing the harsh effects of the cold, winter winds. Filtered light is permitted into the depths of the building and wind towers are used to provide good controllable ventilation in summer.

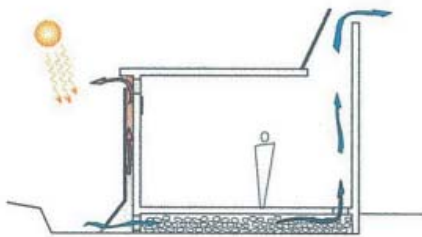
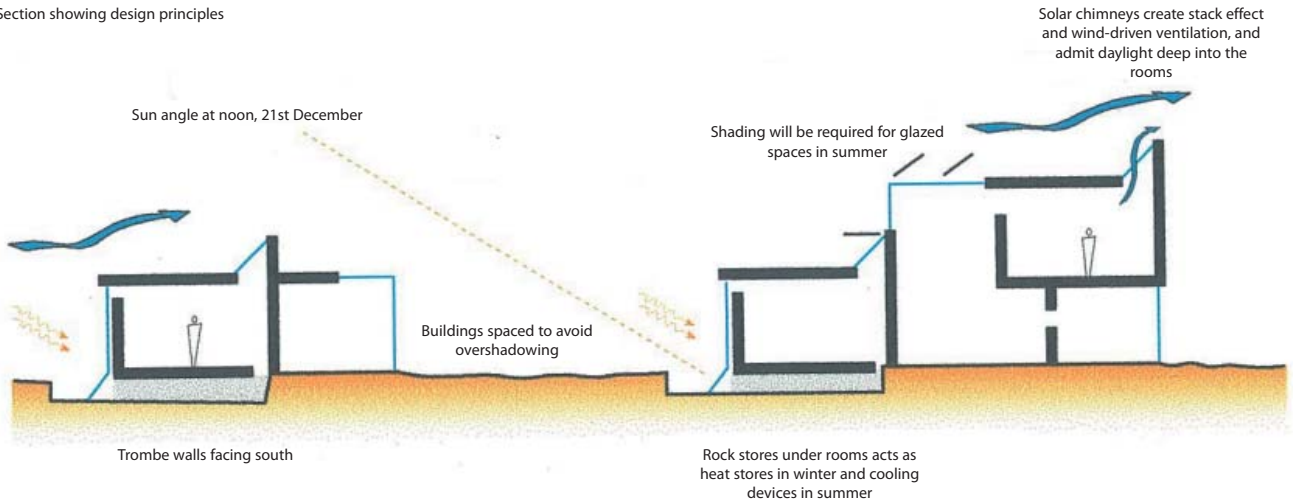
Building Systems

Passive solar heating systems thermosyphon and trombe wall are used to provide heating during occupied periods. There will be no additional requirement for mechanical heating systems.

Building Materials and Construction Techniques

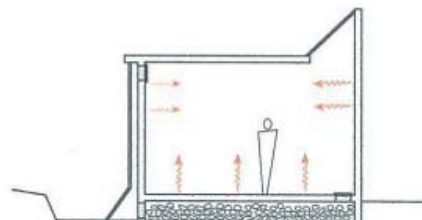
Glass, thermal insulation and thermal mass are used in combination to collect solar radiation, reduce heat loss and store solar heat.

Section showing design principles



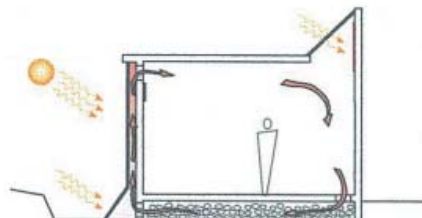
SUMMER DAY

Thermal and wind-driven stack effect draws air through the space creating a cooling effect. Incoming air is drawn through the rock store, cooling it down. Heat collected in the trombe wall is released to the outside



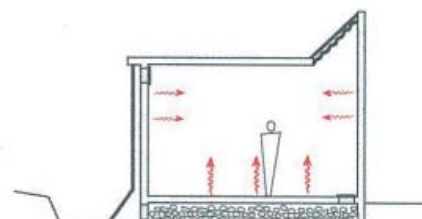
SUMMER NIGHT

The mass of the building provides thermal inertia on cold nights. The rock store cools down so that it can provide cooling the following day.



WINTER (SPRING/AUTUMN) DAY

The trombe wall works as the sun heats the air under a sheet of glazing, creating a tyhermosyphon in the room. The warm air rises and is drawn into the room. Cooler air at the other side of the space is drawn down through the rock store to be warmed by the trombe wall.



WINTER (SPRING/AUTUMN) NIGHT

During the day, the rock store warms up gradually. At night, all air vents are closed and insulating curtains are hung. The rock store then re-radiates its heat into the room.