DESIGN PRINCIPLES: Passive Solar Techniques

Solar gains
Orientated south to maximise solar heat gain receipts into building.

High Thermal Mass
Exposed concrete floors and walls enable the building to perform as a 'heat-sink' storing solar heat gains, body heat and heat generated by office appliances.

That heat is re-emitted back into the building at times when the external temperature is lower than the internal ambient temperature.

Super Insulation
High levels of perimeter insulation, (no cavity walls), ensure the majority of heat gains are retained longer.

Passive cooling/ventilation
Passively induced cross ventilation via thermal stack vents.

DESIGN PRINCIPLES: Low Embodied Energy Principles

Materials
Environmentally responsibly selected materials and products, increasing recycled ingredients and reducing global environmental impact.

Construction
Reducing impact on local environment by reducing the variety of materials, number of trades and on site excavation.

Passive Solar Design
By introducing passive solar design into new buildings, annual fuel bills can be cut by about a third, with corresponding carbon dioxide savings.

Orientation of the building, the size and position of the glazed areas and the materials used can be designed to maximise free solar gains.

High Thermal Mass
Exposed concrete floors and walls enable the building to perform as a 'heat-sink' storing solar heat gains, body heat and heat generated by office appliances.

That heat is re-emitted back into the building at times when the external temperature is lower than the internal ambient temperature.

Solar Water Heating
The solar panel has a highly transparent, virtually unbreakable polycarbonate cover which has been treated to ensure long life. Behind this is the solar absorber which is made of 0.2 mm copper sheet, covered with a black chromium oxide selective layer, and behind the absorber is 50mm of insulation.

As a result of these measures almost all the solar energy is absorbed and radiation losses are reduced to a minimum, ensuring high efficiency.

The solar panel is quick and easy to install and can be installed in a day. The panel is designed to be roof integrated to sit flush with the tiles.

Materials
Environmentally responsibly selected materials and products, increasing recycled ingredients and reducing global environmental impact..

Construction
Reducing impact on local environment by reducing the variety of materials, number of trades and on site excavation.

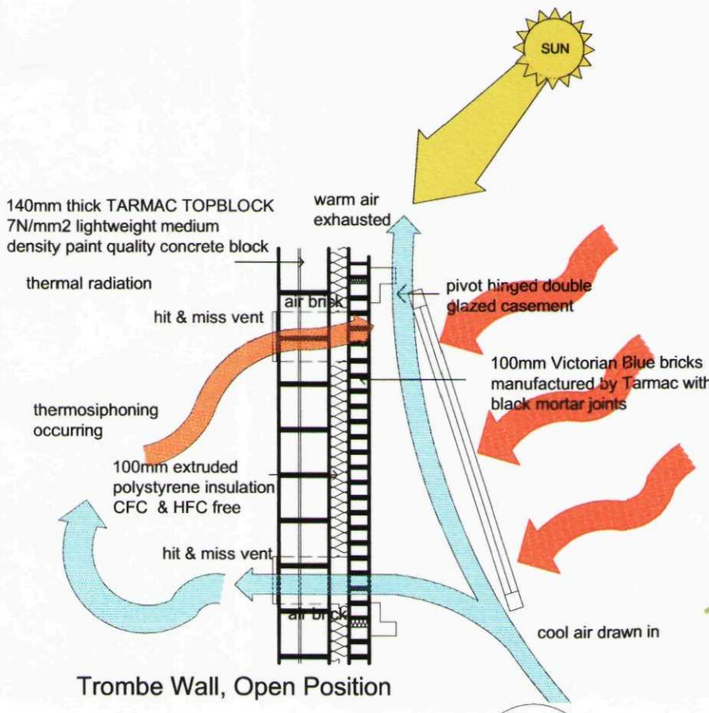
Super Insulation
High levels of perimeter insulation,ensure the majority of heat gains are retained longer.

Passive Stack Ventilation
Central to the design of most natural ventilation systems will be some form of passive stack . Differences in stack temperature and wind pressure provide the driving forces that move air through the building in a carefully designed manner. The sizing and positioning of the stacks and the location of the associated air inlets are all critical in ensuring the correct ventilation performance as well as minimising the risks of draughts.

Passive Cooling
Unwanted moisture from kitchens, utility rooms, bathrooms and w.c's is removed via passive ventilation stacks in the ceiling, terminating at roof level.

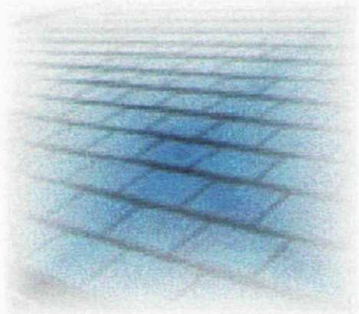
Passive stack ventilation systems work by a combination of the natural stack effect and the effect or wind passing over the roof of the dwelling.

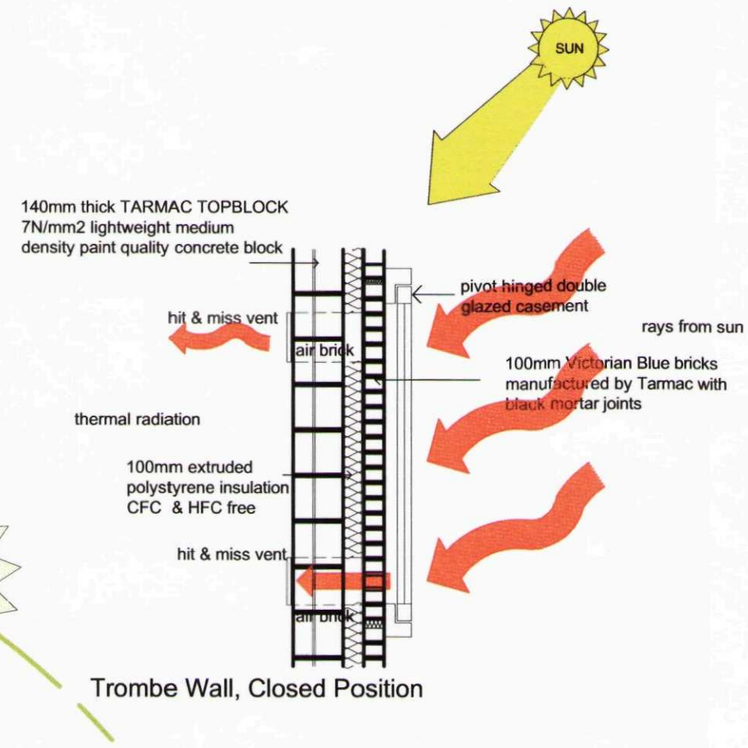
Occupant & Appliance Heat Gains
The heat produced by the occupants and the appliances within the building are absorbed in to the superstructure.
The heat is then re-emitted back into the building at times when the external temperature is lower than the internal ambient temperature.



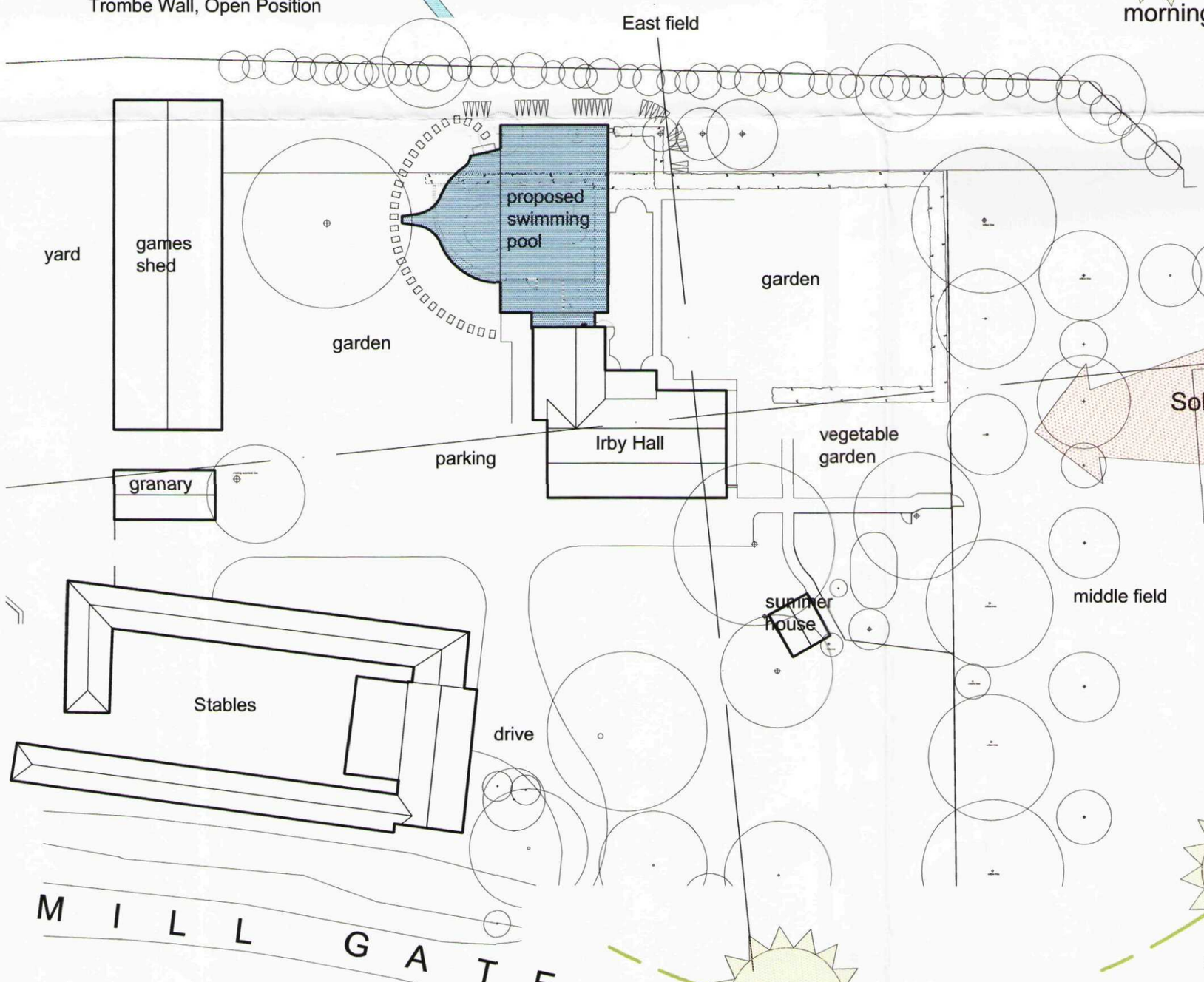
Trombe Wall, Open Position

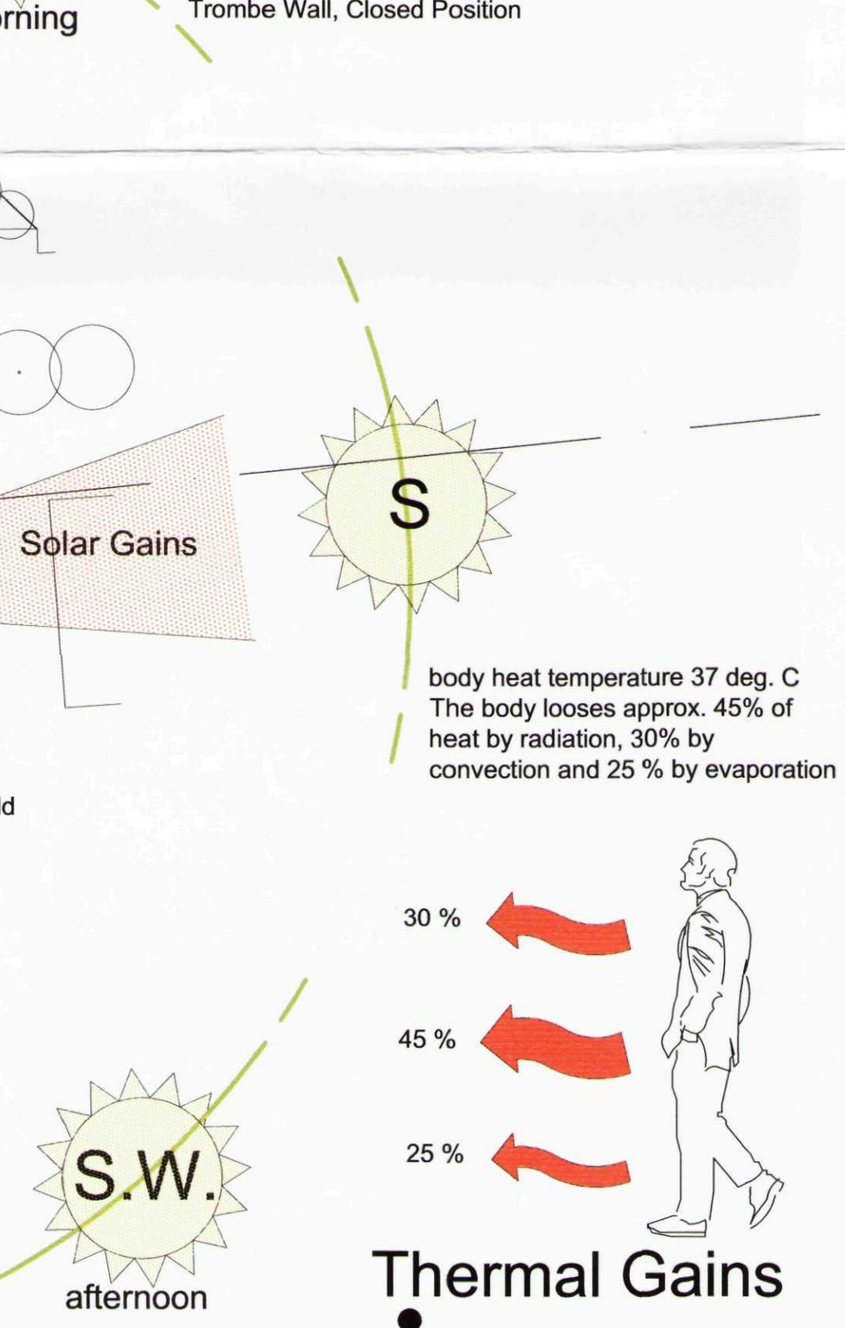

Solar Water Heating


Photovoltaics



Trombe Wall, Closed Position





Block Plan 1:500

Thermal Gains

THIS DRAWING IS THE COPYRIGHT OF THE ARCHITECT AND IS NOT TO BE REPRODUCED WITHOUT PRIOR PERMISSION.

ALL DIMENSIONS AND PARTICULARS ARE TO BE CHECKED ON SITE BEFORE WORK COMMENCES. DO NOT SCALE OFF THIS DRAWING.

SHDC
PLANNING & DEVELOPMENT
14 NOV 2003
Ref 1370/03

Proposed Replacement Swimming Pool, Irby Hall, Whaplode

1:500

Scheme Drawing (Design Principles)

373/04

Mr and Mrs H Myers

Novemeber 2003

JOB

SCALE

TITLE

REVISED

DETERMINED PLAN

89 Gedney Road, Long Sutton, Spalding, Lincs. PE12 9JU.
Tel: (01406) 364646. Fax: (01406) 364471. Email molearch@tinyworld.co.uk

SEARCH
Sustainable Ecological Architecture Ltd