W35

'THE SOCRATES HOUSE'

WORKSHOP GROUP

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Dimitrakopoulou Angeliki

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Koroniotaki Maria-Elisavet

Malezi Evgenia-Christina

Mavrogianni Vasiliki

Vlachou Angeliki

WORKSHOP LEADERS

EuZen Architecture

Theodora Kyriafini

Androniki Lymperiadou

Fotini Lymperiadou

Structural Engineering Consultant

Aristotelis Veniamin

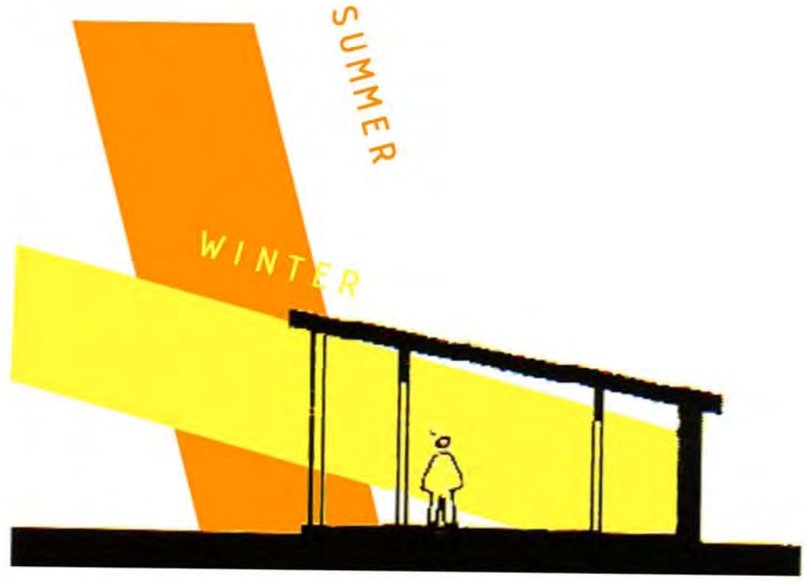
Energy Efficiency Study

Thanasis Manoloudis

Construction Issues

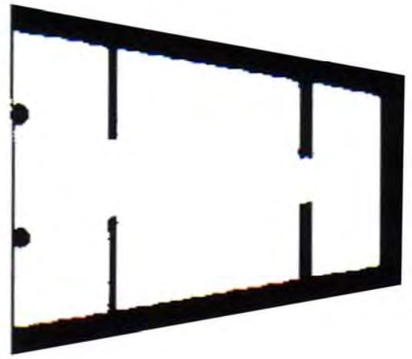
In collaboration with Anelixi

SITE LOCATION



FAMILY HOUSE OUTSIDE OF THESSALONIKI, IN PERISTERA

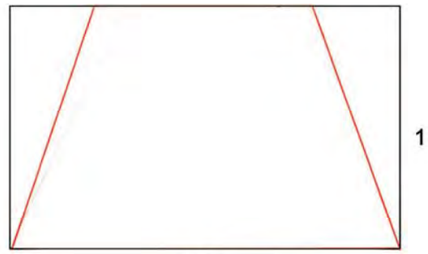
2 children, sculptress, agrobiologist experienced in ecological building, willing to participate in the building process

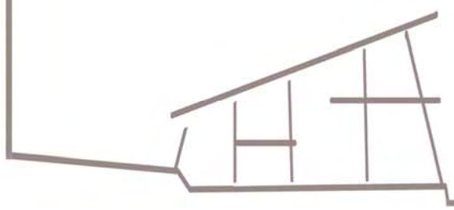


THE 'SOCRATES HOUSE' IS OPEN TO THE SUN AND PROTECTED FROM THE COOL NORTHEN WINDS

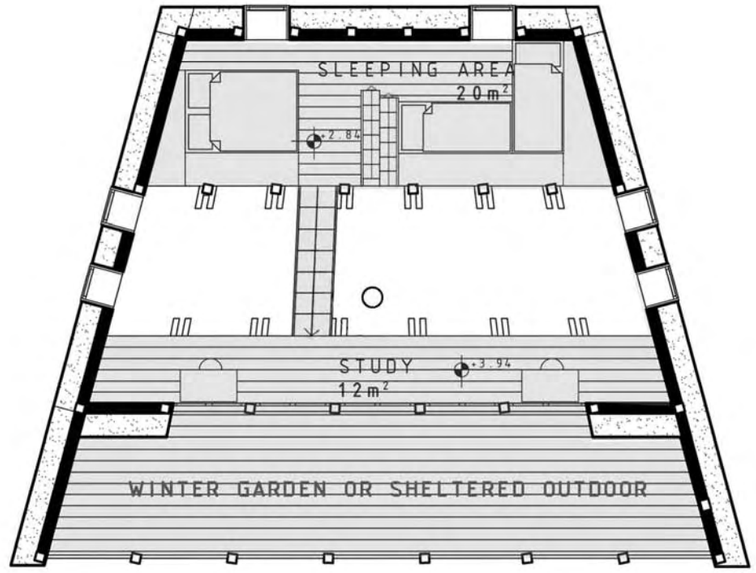
THE AIM IS TO BUILD A 'HEALTHY' HOUSE, ENVIRONMENTAL FRIENDRLY, ECOLOGICAL AND BIOCLIMATIC. ENERGY EFFICIENCY WILL COME AS A RESULT OF THE ABOVE

GOLDEN SECTION DEFINES THE IDEAL PROPORTIONS OF A BUILDING IN THE GREEK CLIMATE REGION

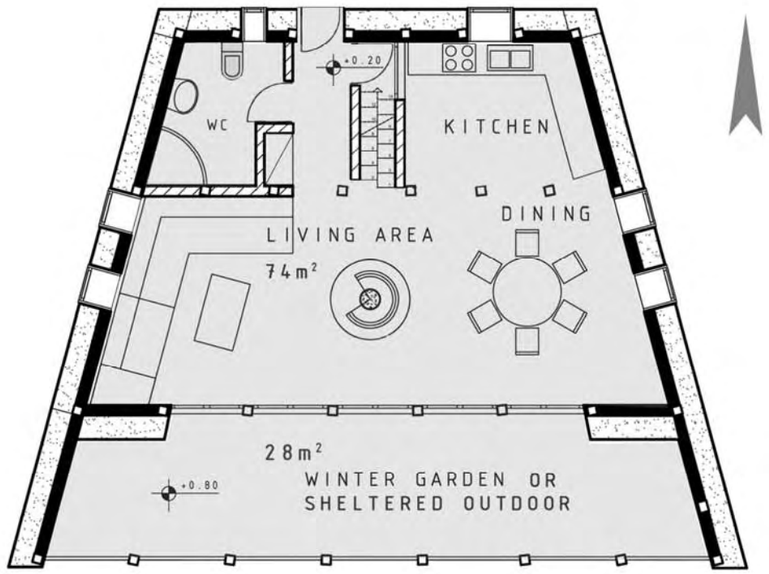




SOLAR GAIN IN THE WINTER



UPPER FLOOR PLAN



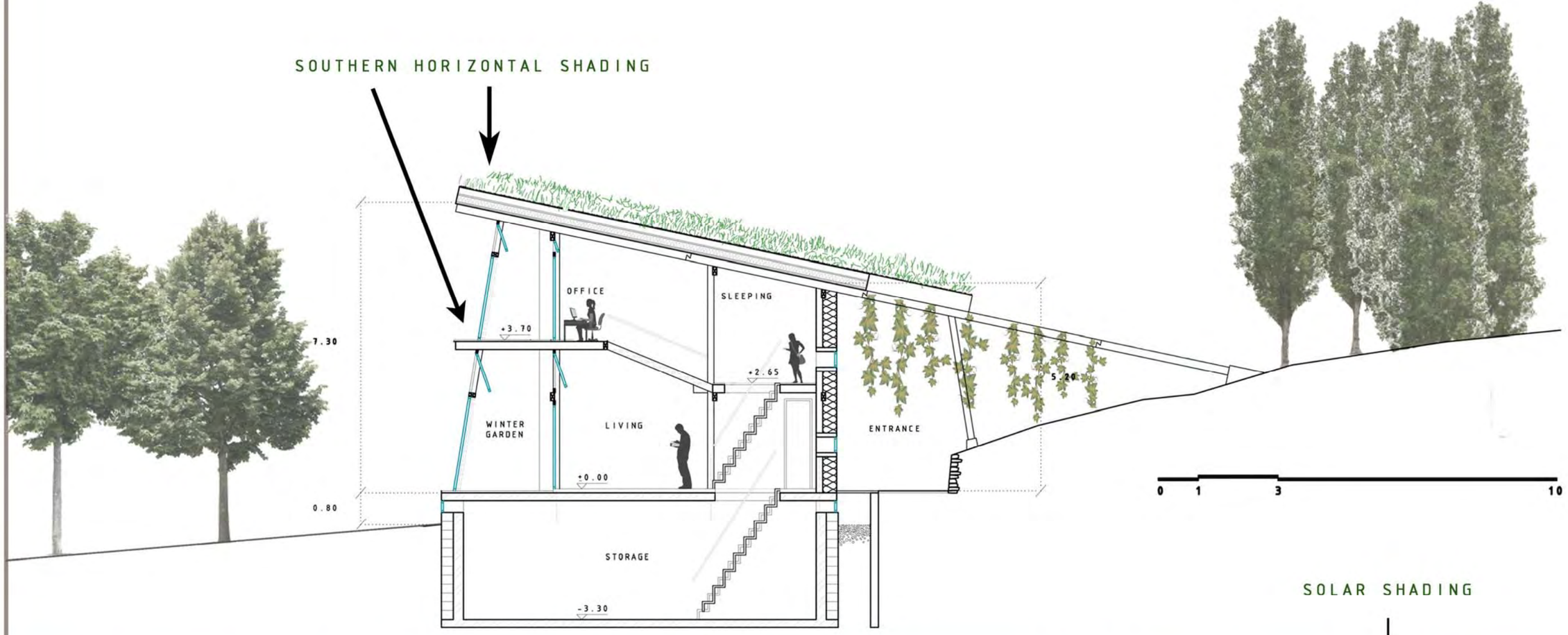
GROUND FLOOR PLAN

RAMMED EARTH WALL

ADOBE WALL WITH CLAY PLASTER

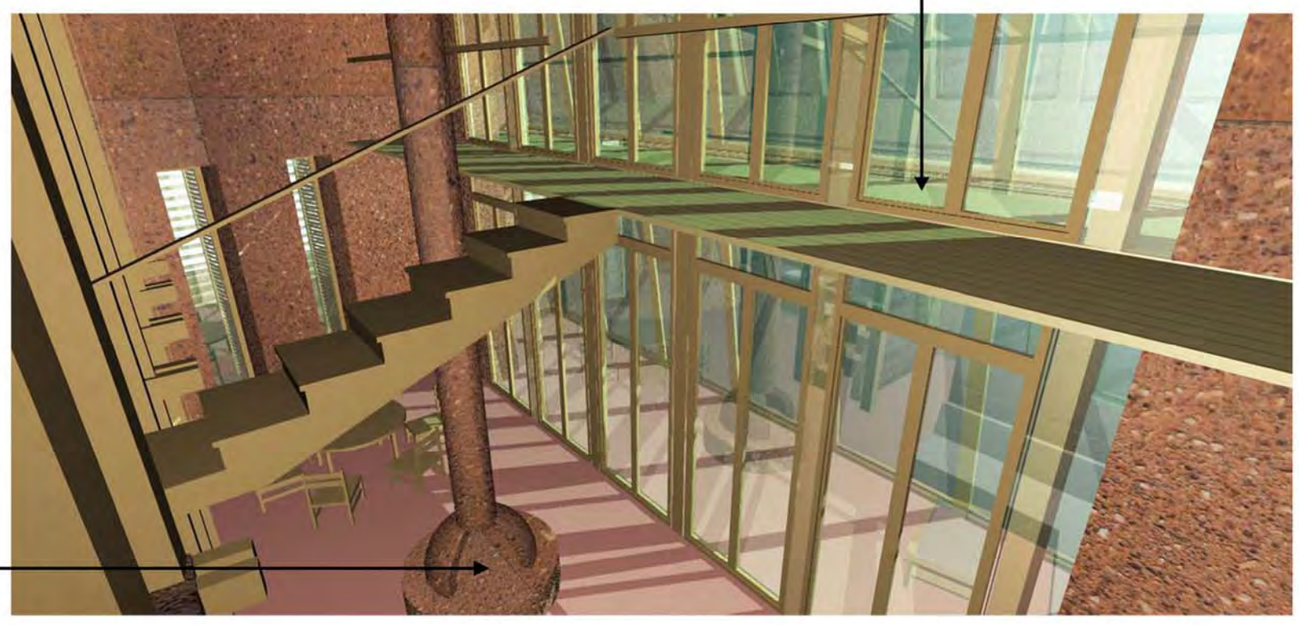
PLANS | 3D

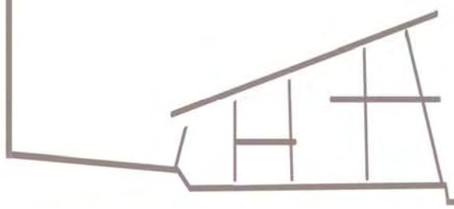
SOUTHERN HORIZONTAL SHADING

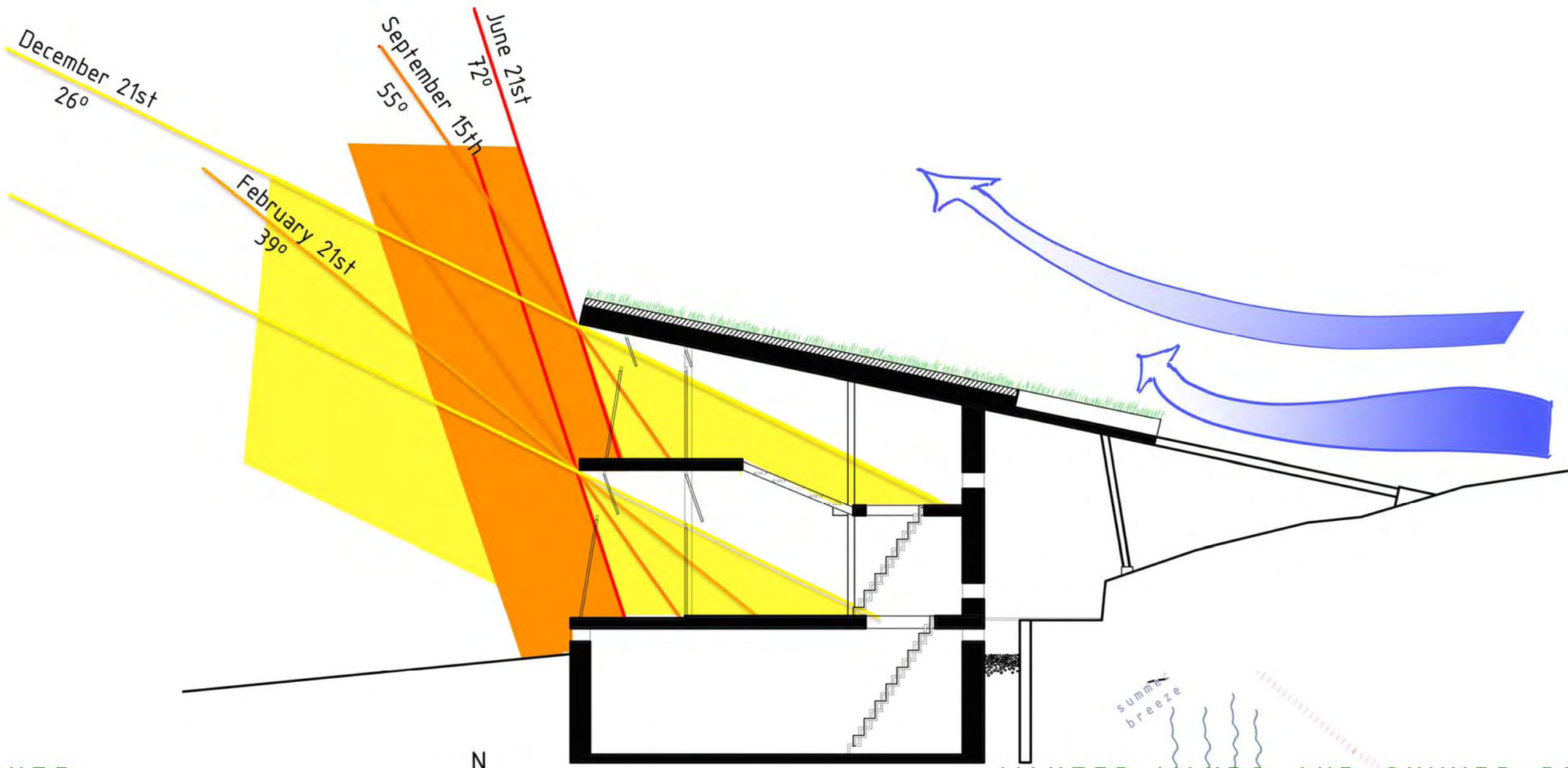


SOLAR SHADING

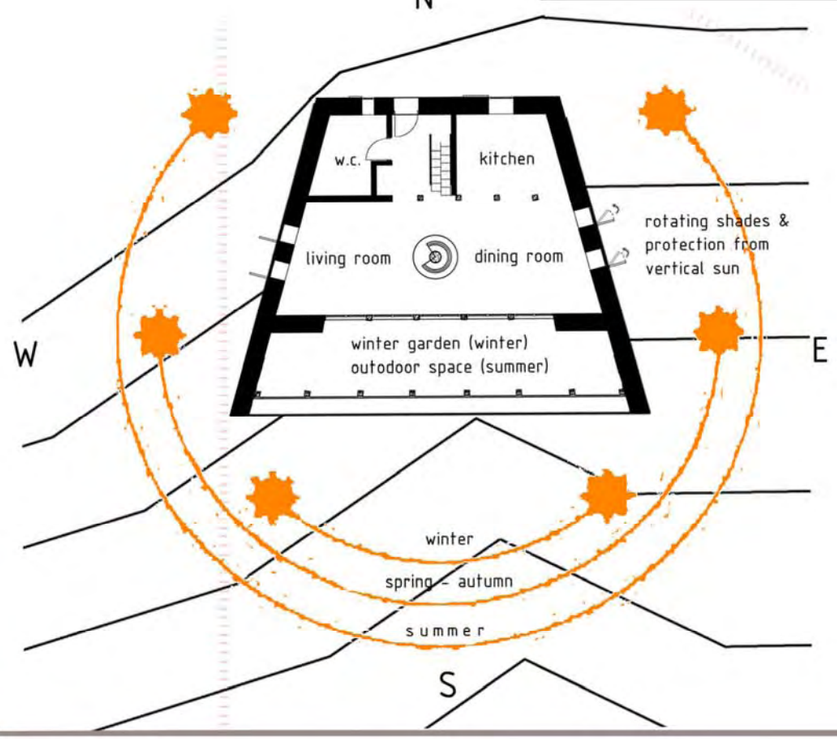
FIREPLACE







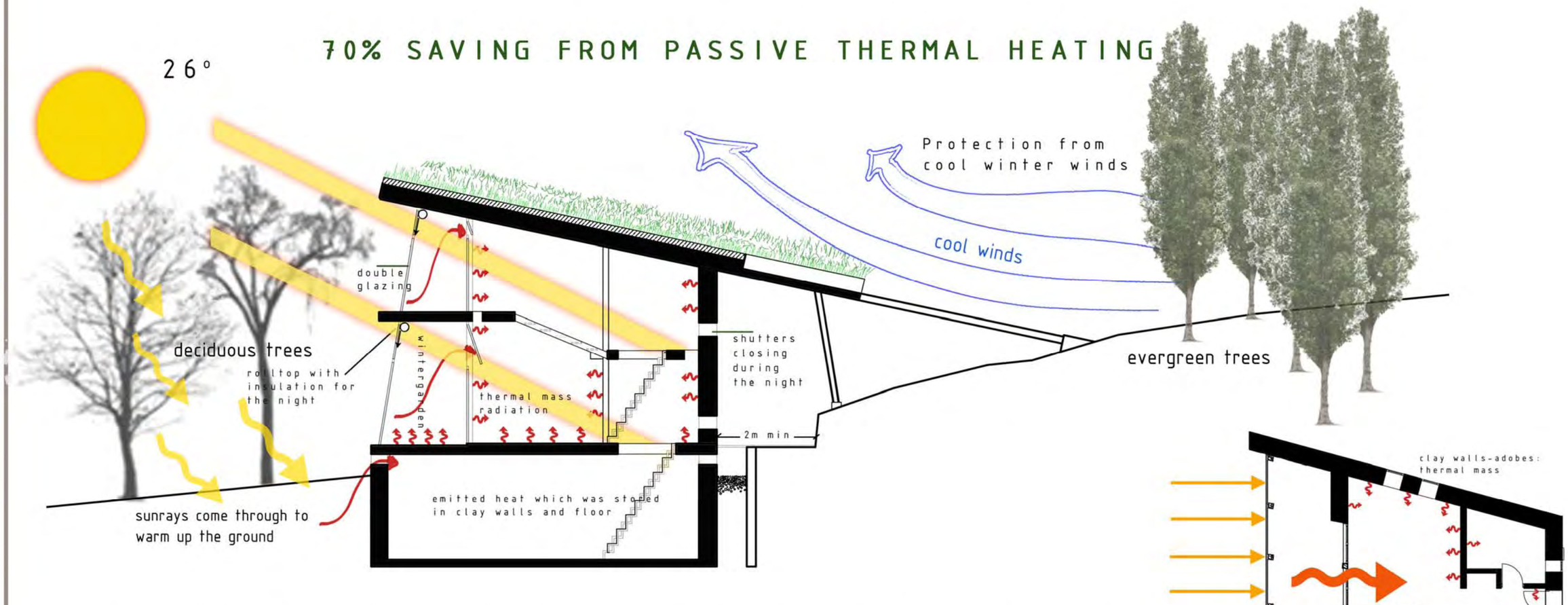
SOLAR ROUTE



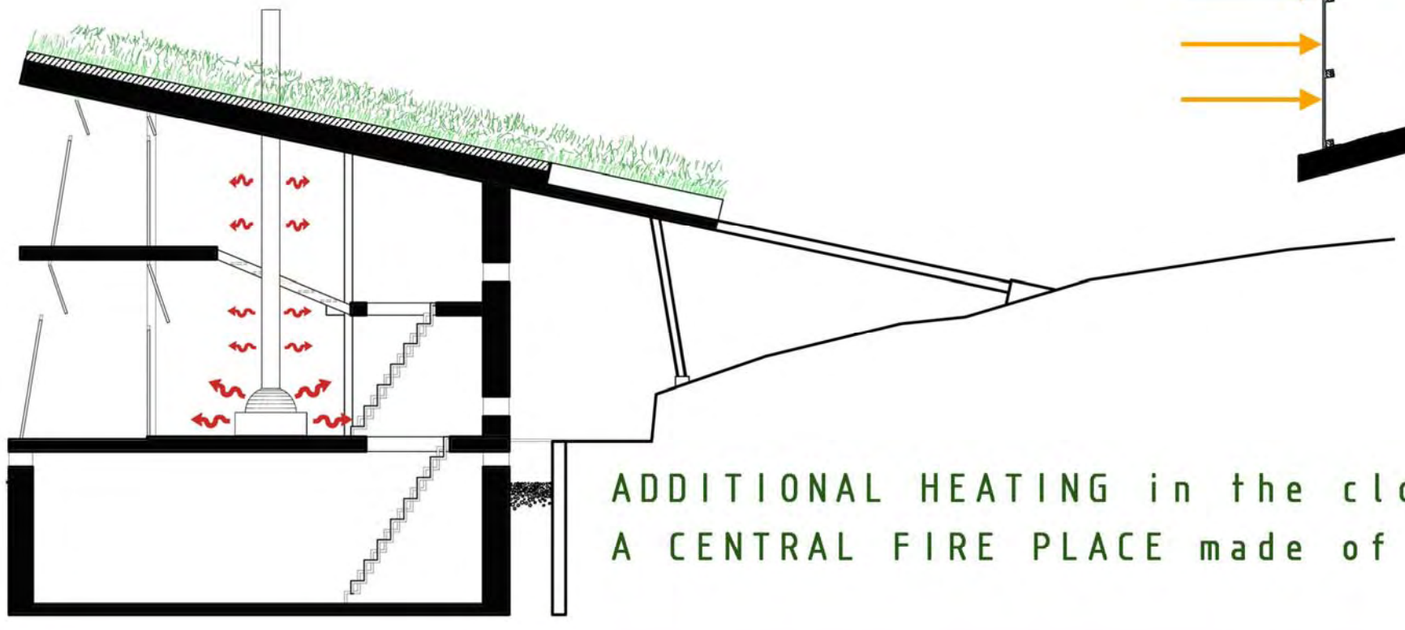
WINTER WINDS AND SUMMER BREEZE

ORIENTATION

70% SAVING FROM PASSIVE THERMAL HEATING

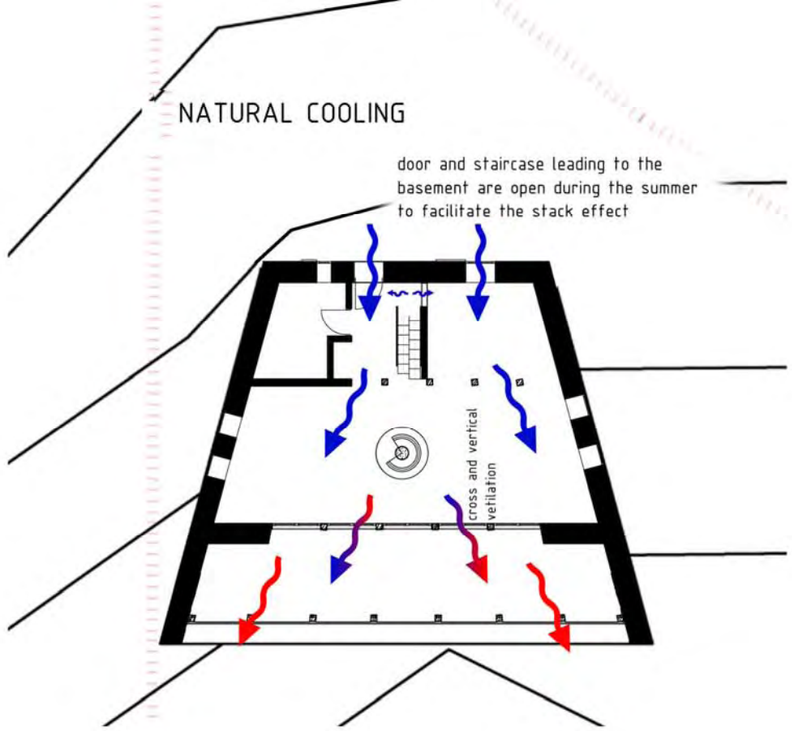


EXPLOITATION OF WINTER DAY SUNSHINE FOR COVERING NIGHT HEATING



ADDITIONAL HEATING in the cloudy winterdays:
A CENTRAL FIRE PLACE made of clay

NATURAL PASSIVE HEATING | ADDITIONAL HEATING



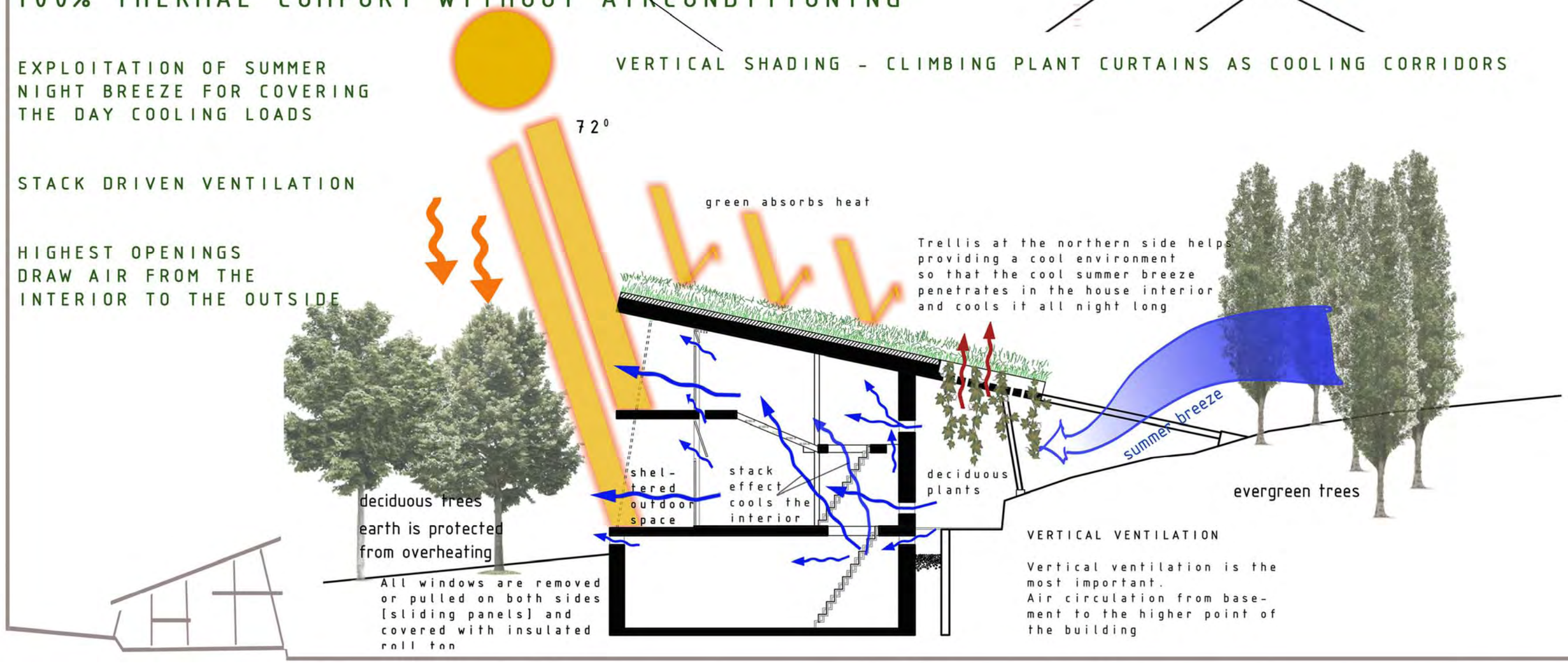
100% THERMAL COMFORT WITHOUT AIRCONDITIONING

VERTICAL SHADING - CLIMBING PLANT CURTAINS AS COOLING CORRIDORS

EXPLOITATION OF SUMMER NIGHT BREEZE FOR COVERING THE DAY COOLING LOADS

STACK DRIVEN VENTILATION

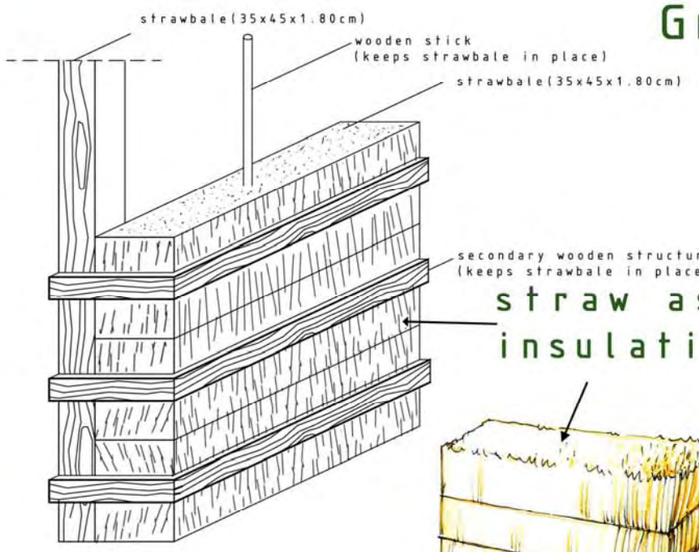
HIGHEST OPENINGS DRAW AIR FROM THE INTERIOR TO THE OUTSIDE



NATURAL COOLING | SUN PROTECTION

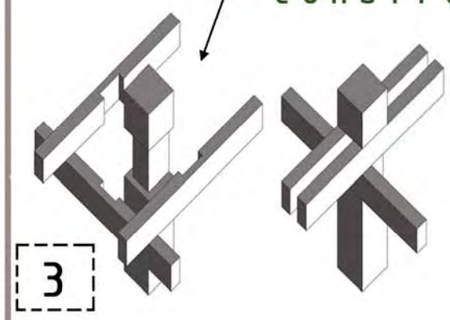
Groundfloor plan

LOW EMBODIED ENERGY•
NO WASTE•
NO TOXIC EMISSIONS•
NO CONSUMPTION OF NATURAL RESOURCES•



straw as insulation

timber supporting construction



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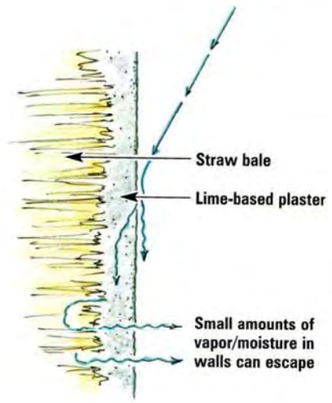
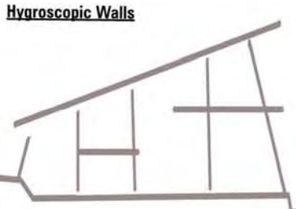
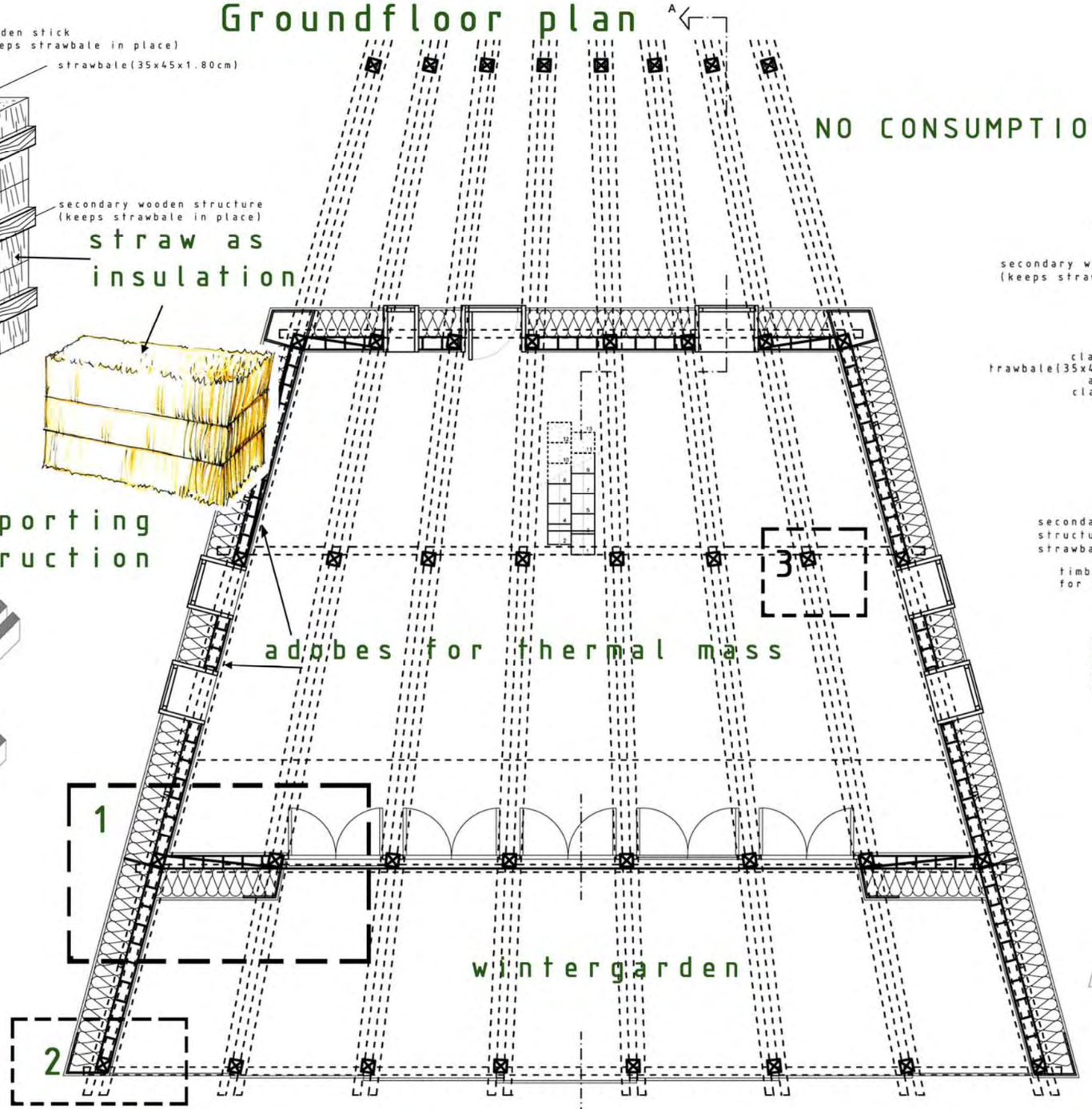
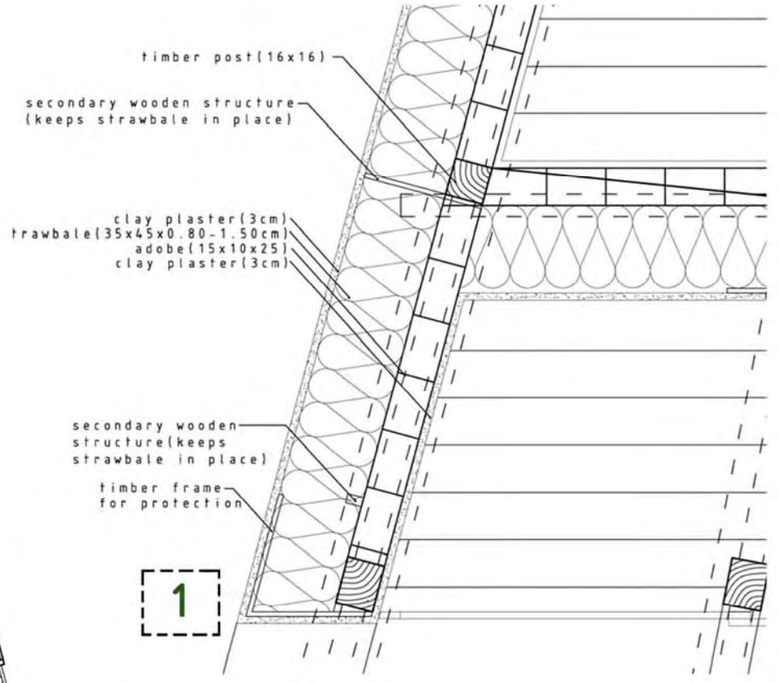
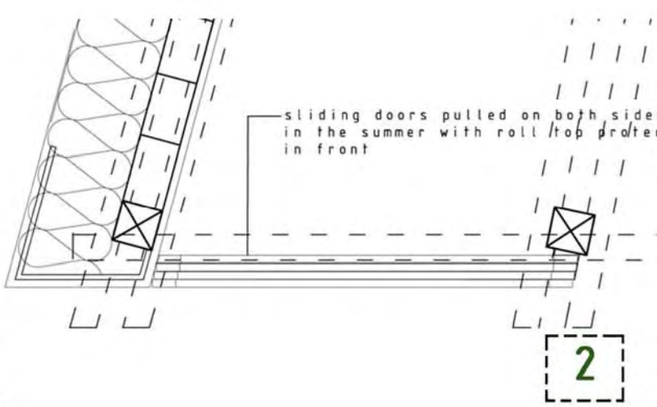


Hygroscopic Walls





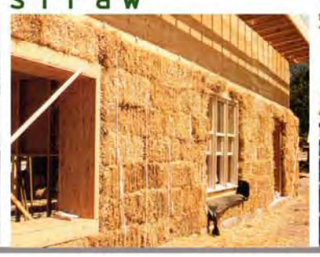




earth floor

adobes

straw

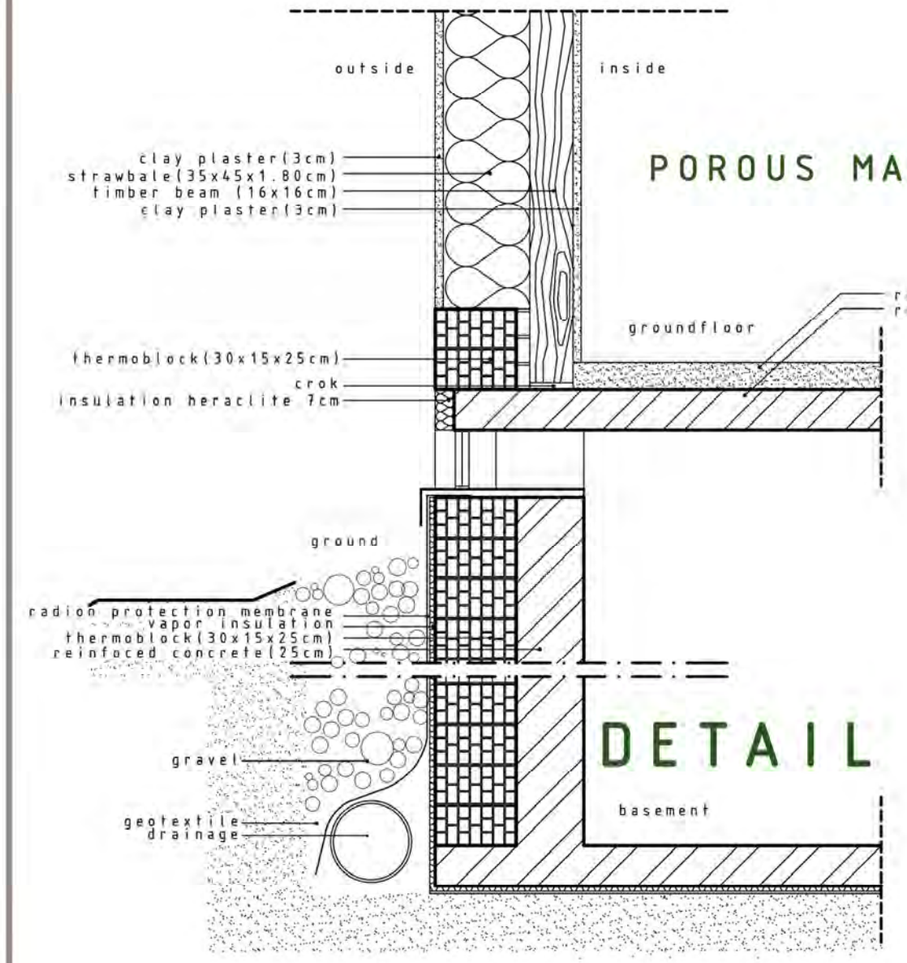


woodwool

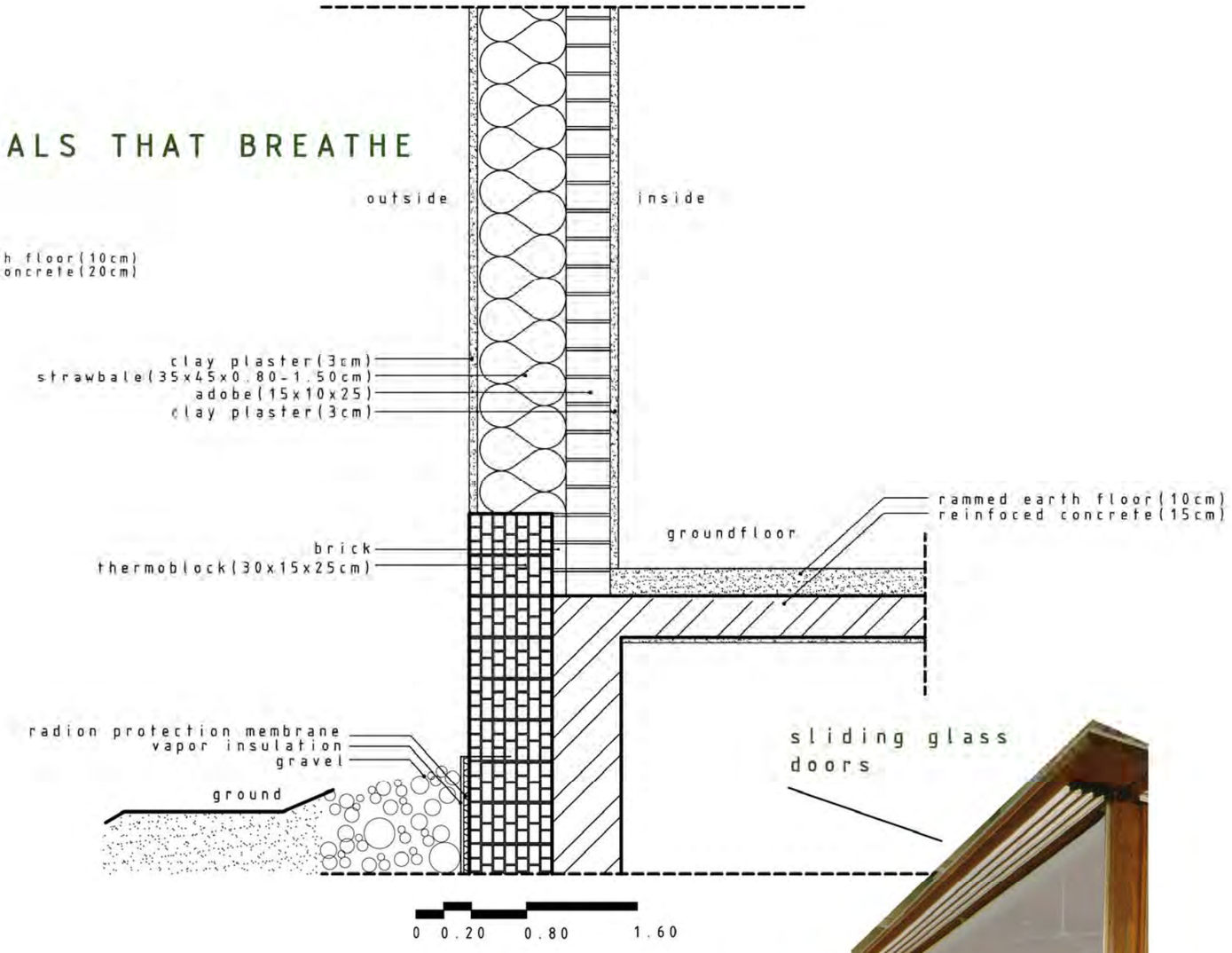
green roof

CLEAN MATERIALS | CONSTRUCTION 1

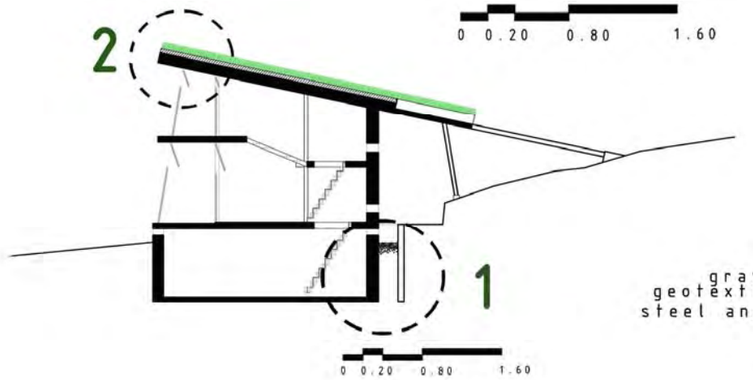
POROUS MATERIALS THAT BREATHE

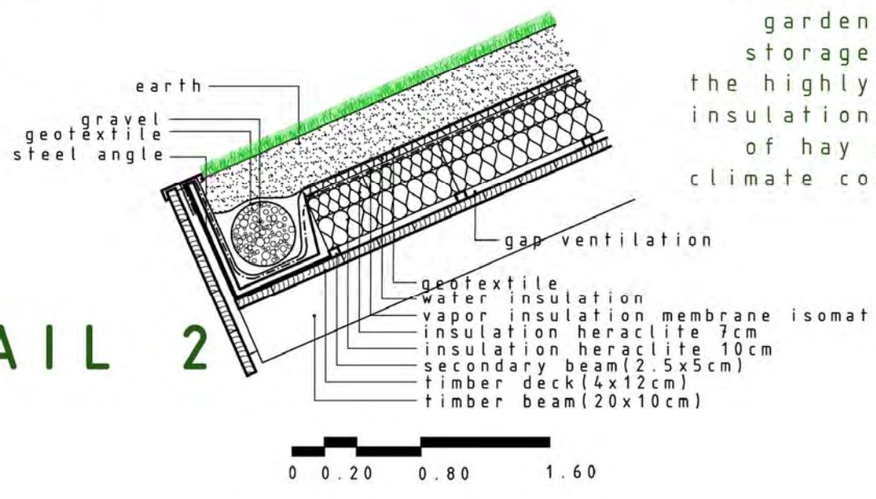


DETAIL 1

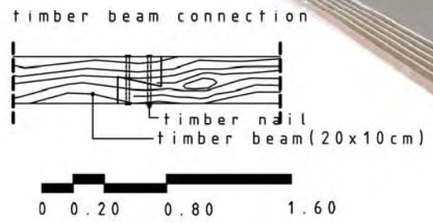


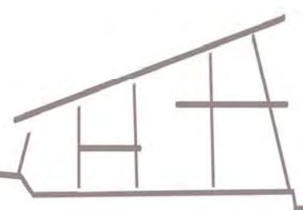
The passive harvesting of solar energy by the winter garden, the massive loam storage walls(adobes) and the highly effective thermal insulation provided by balls of hay result in adequate climate control in the house

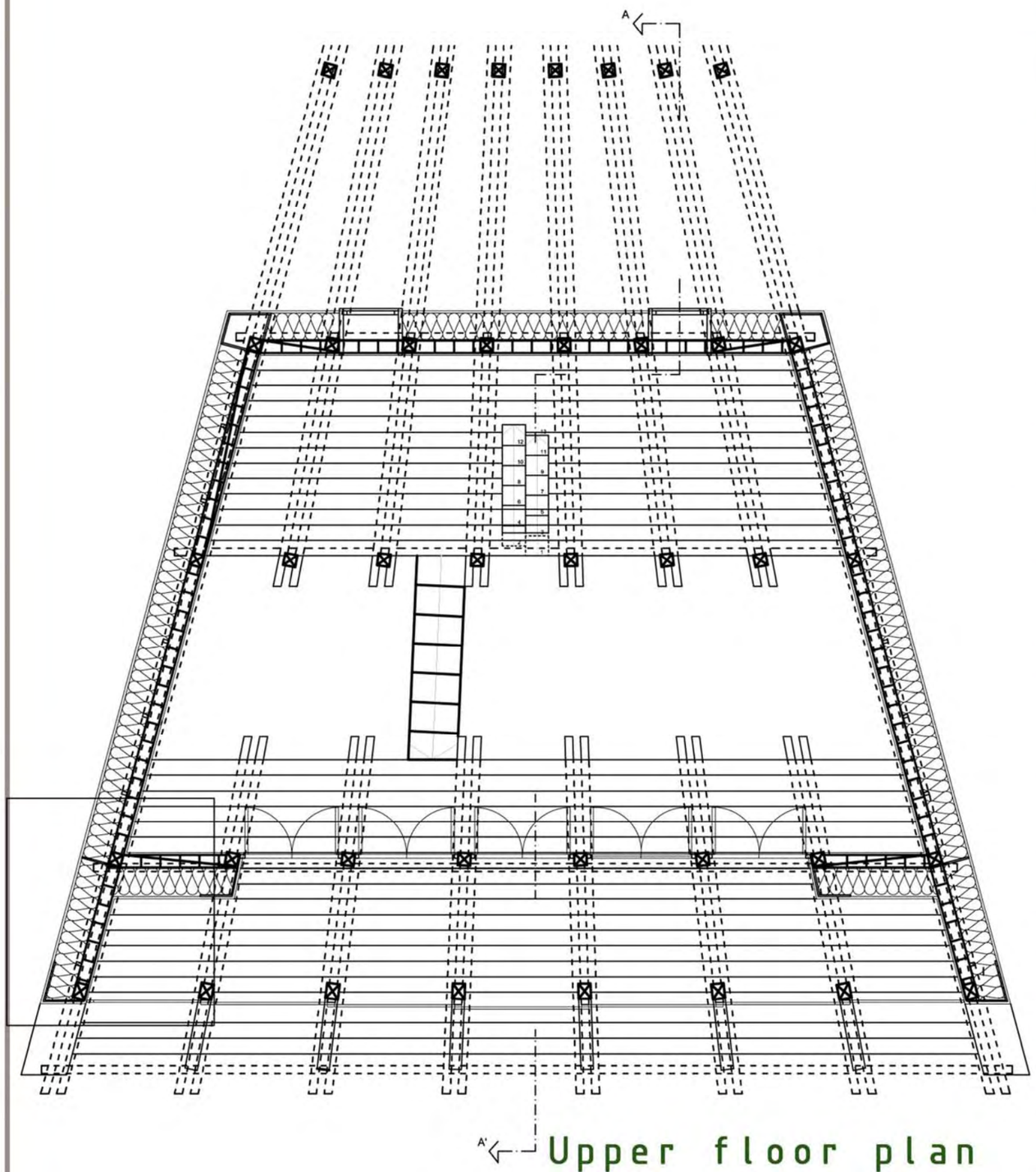




DETAIL 2







Upper floor plan

North elevation

TIMBER AS SUPPORTING SYSTEM

-renewable building material
-low embodied energy
-2-3 times longer life than concrete
-timber waste is recycled in biomass
-earthquake elasticity
-fire resistance time greater than metal

EARTH AS BUILDING MATERIAL

-use of local earth/ reduce transportation cost
-low embodied energy
-low cost
-recycable/ reusable/ do it yourself
-absorbance of pollutants
-loam balances air humidity
-loam stores heat/ balances indoor climate
-loam allows building breathing
-loam is a long lasting material

STRAW AS INSULATION MATERIAL (walls)

-natural waste with low cost

WOODWOOL AS INSULATION MATERIAL (roof)

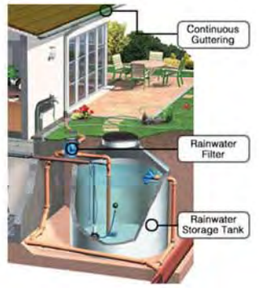
-a product of woodwaste

wooden path

protection from the western summer sun —— deciduous trees

evergreen trees

winter winds



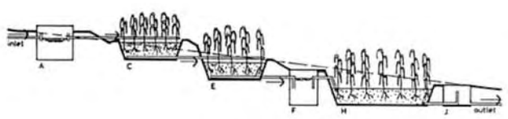
underground rainwater collection tank

oven made of clay

vegetable garden

summer breeze

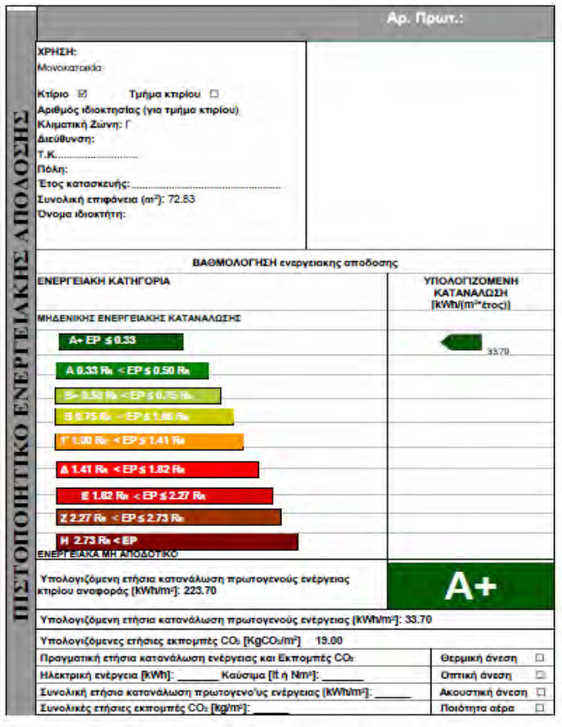
trees enable the summer breeze to penetrate the house



reed bed sewage treatment systems
(biological filtration-aerobic bacteria)

photovoltaic cells

solar panel



ΠΙΣΤΟΠΟΙΗΤΙΚΟ ΕΝΕΡΓΕΙΑΚΗΣ ΑΠΟΔΟΣΗΣ

Αρ. Πρωτ.:

ΧΡΗΣΗ:
Μονοκατοικία:

Κτίριο ☑ Τμήμα κτιρίου ☐
Αριθμός ιδιοκτησίας (για τμήμα κτιρίου)
Κλιματική Ζώνη: Γ
Διεύθυνση:
Τ.Κ.:
Πόλη:
Έτος κατασκευής:
Συνολική επιφάνεια (m²): 72.83
Όνομα ιδιοκτήτη:

ΒΑΘΜΟΛΟΓΗΣΗ ενεργειακής απόδοσης

ΕΝΕΡΓΕΙΑΚΗ ΚΑΤΗΓΟΡΙΑ	ΥΠΟΛΟΓΙΖΟΜΕΝΗ ΚΑΤΑΝΑΛΩΣΗ [kWh/(m²·έτος)]
ΜΗΔΕΝΙΚΗΣ ΕΝΕΡΓΕΙΑΚΗΣ ΚΑΤΑΝΑΛΩΣΗΣ	
A+ EP ≤ 0.33	33.70
A 0.33 Rʜ < EP ≤ 0.50 Rʜ	
B+ 0.50 Rʜ < EP ≤ 0.75 Rʜ	
B 0.75 Rʜ < EP ≤ 1.00 Rʜ	
Γ 1.00 Rʜ < EP ≤ 1.41 Rʜ	
Δ 1.41 Rʜ < EP ≤ 1.82 Rʜ	
E 1.82 Rʜ < EP ≤ 2.27 Rʜ	
Z 2.27 Rʜ < EP ≤ 2.73 Rʜ	
H 2.73 Rʜ < EP	
ΕΝΕΡΓΕΙΑΚΑ ΜΗ ΑΠΟΔΟΤΙΚΟ	

Υπολογιζόμενη ετήσια κατανάλωση πρωτογενούς ενέργειας κτιρίου αναφοράς [kWh/m²]: 223.70 — **A+**

Υπολογιζόμενη ετήσια κατανάλωση πρωτογενούς ενέργειας [kWh/m²]: 33.70

Υπολογιζόμενες ετήσιες εκπομπές CO_2 [$KgCO_2/m^2$] 19.00

Πραγματική ετήσια κατανάλωση ενέργειας και Εκπομπές CO_2	Θερμική άνεση ☐
Ηλεκτρική ενέργεια [kWh]: _____ Καύσιμα [lt ή Nm³]: _____	Οπτική άνεση ☐
Συνολική ετήσια κατανάλωση πρωτογενο'υς ενέργειας [kWh/m²]: _____	Ακουστική άνεση ☐
Συνολικές ετήσιες εκπομπές CO_2 [kg/m²]: _____	Ποιότητα αέρα ☐

-Energy for heating 70% from solar passive architecture
-Estimated cooling 100% from passive natural cooling system

Additional heating system:

-ONE CENTRALLY LOCATED **FIREPLACE** MADE OF CLAY
-INSTALLATION OF CENTRAL HEATING UNIT WITH **BIOMASS**-THERMAL POWER 18 KW

-INSTALLATION OF 6 m2 **PHOTOVOLTAIC PANELS** (POWER 1KW)
-INSTALLATION OF 3 m2 **SOLAR PANELS** FOR HOT WATER USE

▷ ENERGY RATING ACCORDING THE NEW BUILDING'S PERFORMANCE REGULATION (KENAK): **A+**

Specific energy use 33,70 kwh/m2
Specific energy use of KENAK's benchmark building= 223,70kwh
We exceed by 85% KENAK's reference building

ACCORDING TO THE GREEK REGULATION STANDARDS THE BUILDING'S ENERGY PERFORMANCE IS CONSIDERED TO BE VERY GOOD

W35

'THE SOCRATES HOUSE'

THANK YOU!