

MASTERTHESIS SABINE BÖTTGER
RELATORE: GIULIANA SALMASO

*Poetic episodes
about space and identity*

SPAZIO PER LA PAUSA IN PUGLIA
A PROJECT OF ARCHITECTURE WITHIN
PRODUCT-SERVICE-SYSTEM DESIGN

Politecnico di Milano - Facoltà di Design

International Master in Product Service-System Design AA 2005/2007

Master thesis of Sabine Böttger mat. 204180

Relatore: Giuliana Salmaso

Co-Relatore: Bruno Briseghella

Session Date: 19/12/2007



Poetic Episode of Space and Identity

Spazio per la pausa in Puglia
A project of *Architecture in Product Service System Design*

content

7 Acknowledgements
8 Abstract
10 Preface

1

The Brand

14 **I** Brief introduction of Branding
16 **2** Branscaping
22 **3** Creating a brand of Giuliana
Salmaso and Claudio Silvestrin

2

Location

58 **I** Brief history of the region
Puglia
70 **2** Vernacular architecture in
Puglia and their construction
techniques
96 **3** Characteristic of the ground
of the project
100 **4** Insight of Salento
106 **5** Climate and wind of the
project area

3

Spazio per la pausa

109 **I** Location
112 **2** The project site
114 **3** The project scope

4

Implementation of brand identity through Poetic Episodes

- 120 **I** Introduction
- 122 **2** development of seven episodes
- 150 **3** the system

5

Aspect of the brand values: Sustainability*

- 158 **I** Sustainability of vernacular architecture
- 162 **2** Sustainability in architecture today

6

Wooden lightweight architecture*

- 228 **I** Introduction: Aim of the research
- 184 **2** Timber construction development - tradition to modernity
- 186 **3** Timber constructions today
- 187 **4** Construction trends
- 192 **5** Construction basics
- 196 **6** Case Studies

7

Innovative building insulation*

- 228 **I** Introduction: Aim of the research
- 229 **2** Insulation basics
- 232 **3** Innovative insulation
- 233 **4** Innovative building insulation research

8

Conclusion and Application of technical researches*

- 272 **I** Lifecycle Design
- 273 **2** Phases - Application of Lifecycle Design

9

Backcheck house – verifying brand personality in architecture of house

- 284 **I** Design Scope
- 286 **2** Structure
- 288 **3** Interiors
- 288 **4** Conclusion

-
- 292 Bibliography
 - 298 Picture Credits

** chapters revised by Co-relatore Bruno Briseghella*

Huge thanks to my Relatore Arch. Giuliana Salmaso as well as to Arch. Claudio Silvestrin and the staff of their studio in Milan, in particular Maria Chiara and Ceren, who supported me with information.

Special thanks to Nicole Frank for motivating and supporting me as well as for her “Duktus”; thanks to Dina Mavoidakos for her structural advices; to Patrick Beeker for borrowing me his Computer while mine was broken; and Juli Mata for general assistance and especially for her company on the Road Trip. I also want to express my gratitude to all those nice people in Puglia: Giuseppe for showing us his beautiful piece of property; Lucy, Grottaglies’ artist, for driving us around and arranging meetings with important people; Luca, Museum Director of Alberobello for the information about Trulli; Arch. Enrico Romano for information regarding Salentine vernacular architecture and all the others, who hosted us, showed us their land, told us its stories and made thus this journey to an unforgettable impression.

Thanks also to my Corelatore Ing. Bruno Briseghella for supervising the engineering part of my thesis. And also thanks to Roberto for reviewing as “local” the locality part of my thesis.

Abstract – english

In March 2007 I started an internship in the Architectural Studio ClaudioSilvestrinGiulianaSalmaso architects. From this experience born the idea to develop my master thesis from one of their projects.

The project is Spazio per la pausa, which Giuliana Salmaso and Claudio Silvestrin are project for them.

The first part of the thesis is the development of a brand of Giuliana Salmaso and Claudio Silvestrin. Starting from a brand analysis I filter out image/brands values and propose their way of communication.

The point of “communication”, I focused on most is the architectural Implementation of the brands Identity – expressing the brands’ values in Space. The brand analysis helped me to understand the both characters better To understand the chosen projects’ place better I studied Puglias’ history, rural architecture, the geography and the climate. This study is accompanied with a Road Trip through Puglia, to live in “close-up” view the intensity of the colours, the taste, the smell, and the Mediterranean people and for getting to know the project area.

One aspect of the brand identity is sustainability and a life in harmony with the nature, which will be always present on the developed project.

Starting from this aspect I develop three technical researches:

- Technical research of sustainability in the field of architecture
- Technical research of wooden architecture
- Technical research of innovative sustainable insulation materials

The results I apply on the project to achieve a sustainable architecture.

The love for Poesy and Philosophy of the protagonist is another brand value. For its implementation I choose the garden to develop Poetic Episodes. Episodes, which implements on “steps-wise” the couple values as well as it connects them with the elements of the new together-chosen piece of territory.

Abstract - italian

Io ho fatto il mio stage nello studio *ClaudioSilvestrinGiulianaSalmaso Architects*.

Da questa esperienza e' nata l'idea e la voglia di sviluppare la mia tesi di laurea partendo da un progetto attualmente in corso presso lo studio.

Il progetto e *lo spazio per la pausa* che gli architetti Giuliana Salmaso e Claudio Silvestrin stanno progettando per se stessi in Puglia.

La prima parte della tesi e la costruzione della brand identity dei due progettisti.

Partendo dall'analisi del loro lavoro, delle loro personalita', del loro stile di vita e delle impressioni di chi e' entrato in contatto con loro, io ho sviluppato la mia proposta di brand identity.

Questo mi ha portato a conoscere meglio le personalita' dei due progettisti, a scoprire le motivazioni che sottendono questo progetto e a definire i valori che i due architetti condividono e vogliono esprimere attraverso il loro lavoro.

Ecco che quindi nei capitoli successivi vengono approfonditi e argomentati vari aspetti del brand image.

Dall'esigenza di un luogo per la pausa scaturisce una ricerca sulla storia, l'architettura rurale, la geografia e il clima della Puglia. A questa ricerca io ho affiancato un road trip della regione per vivere in prima persona l'intensita' dei colori, dei sapori, dei profumi, delle persone del Mediterraneo e per conoscere l'area di progetto in vista del suo intervento di progettazione degli episodi del giardino.

Un altro aspetto del brand image e la sostenibilita e l'armonia con la natura, temi sempre presenti nei progetti della coppia e che ovviamente si ritrovano nel progetto del loro spazio per la pausa.

Da questi aspetti si sviluppano tre ricerche tecniche:

- Ricerca tecnica sulla sostenibilita in architettura;
- Ricerca tecnica su architetture in legno;
- Ricerca tecnica sui materiali isolanti sostenibili.

Un ulteriore aspetto del brand image e' l'amore per la poesia e la filosofia che accomuna la coppia di progettisti.

Io ho espresso quest'aspetto del brand con il mio progetto di un sistema di episodi poetici nel giardino che circonda *lo spazio per la pausa*.

Preface

In October 2005 –attracted by the Master of Product-Service-System Design I came to Italy, to Milan Politecnico. I came with an architectural background and was interested so much in the PSS Master, because in my opinion Architecture nowadays should be involved in a whole design process to create an environment for “identities” – those can be persons as well as companies. The Master gave me the possibility to get to know other Design areas, like graphic-, interiors-, product- and communication design, which allows me to face architecture with a holistic Design System approach. This professional and personal development is reflected and resulting in my thesis is based on an architectural project –as my architectural background, but the project in the meantime is developed within the PSS approach in order imbed it into the Design-System and so manifesting an identity.

Drawn by the good experience of the Concept Design Studio in the second semester hold by Giuliana Salmaso and Claudio Silvestrin and by the meaningful design of their Studio I asked to do my internship at ClaudioSilvestrinGiulianaSalmaso Architects.

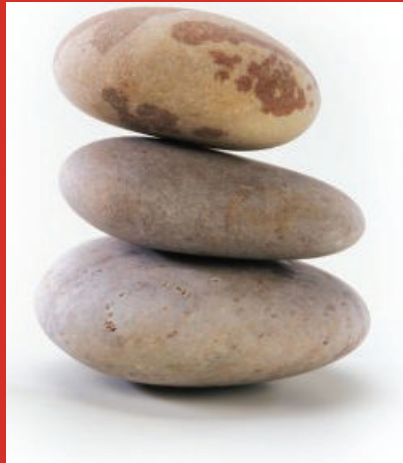
One project I liked especially –the private residence of Giuliana and Claudio in Puglia. And the idea came in my mind to elaborate this project for my master thesis. In general I decided to focus on one part of the Product-Service System Design and develop it detailed.

This project gave possibility to get to know both personalities better and to understand how they transform their personal philosophy in architecture, design and lifestyle. To understand their decision of the choice of the territory I went down to Puglia. I got to know locals peoples life and opinions, I tasted the rich food, I felt the sea, I saw the colours and I smelled the aromas and thus I understood very well what Giuliana and Claudio attracted to this piece of land. Before I never went so far in Southern Italy and it was also for me a new positive experience what Italy also is about.

In the Studio I worked on the planning permission drawings of the house, for the master thesis I designed individually Episodes in the Garden. The garden as

piece of wild Salentine nature has a special meaning to Giuliana and Claudio. The Episodes explain the meaning and the personalities.

My thesis also symbolizes what I want to do in my future professional life: to apply the knowledge and experiences of the Master in Product-Service-System Design to focus among Product-Service-System on architecture in forms of Architectural branding and Brandscaping, always from the Product-Service-System Design approach.



- 1 - Brief introduction of branding
- 2 - Brandscaping
- 3 - Creating brand of Giuliana Salmaso and Claudio Silvestrin

branding I

“The wisest men follow their own direction.”

Euripides (484 BC - 406 BC)

1- Brief introduction

Definition:

A brand is a combination of names, slogans, logos, product design, packaging, advertising and marketing that together give particular products or services a physical, recognisable form.¹

The term branding derives from the agricultural world. Cattle was marked to allow the classification to their proprietary.



One reason to create a new brand is the addition of product-life cycle to products. A Products-life-cycle divides product life in four stages: introduction, growth, maturity, and decline.

Another reason for brand development is the demands of technology to change. Or moreover it could be the need to grow.¹

In the increasingly global competition for the customer's eye, wallet and above all, heart, brands are the number-one success factor. Brands stand in the consumer's consciousness for values, which are sent out by powerful signals, communicate images and promise to provide the key to new experiences.

Nowadays brands became important landmarks. We define our own identity more and more through brands. "Brands are the main source of identity.

The brand fills the vacuum and forms a kind of amour, taking over the part once played by political, philosophical or religious ideas. Logos are becoming fetishes."² Brands signal a membership of certain in-groups, they function as status symbol, and they guarantee relationship and security. Brands create emotions; they promise happiness and provide kicks.³

To sum up, branding is relevant and successful, because

- 1 Brands give a feeling of possessing something original (*real things vs copies*), thus mythologies and idols may be created.
- 2 Brands promise security, they gain our trust and believe, that they are thoroughly researched and tested, we rely of their innovations (*appliance of science*).
- 3 Brands are used to show our status (*"excessories"*).
- 4 Brands define our social affiliation.
- 5 Brands suggest us to be successful with them especially sportive brands. They communicate status based on empowerment.

Brand Identity

The brand identity is considered as the core concept of a brand and provides direction, purpose and meaning for a brand. Brand identity can be defined as a unique set of brand associations that the brand strategist aspires to create. These associations create the core values of the brand and provide promises to the customer from the organization members. The main aim of the brand identity is the creation of a relationship between the customer and the brand. Based on this relation the brand identity works on the establishment of the relationship by generating a value proposition with the involvement of benefits in different levels like functional, emotional and self- expressive.

The Company, society, culture, values and programs of the company create attributes like innovation, quality concerned, environmental-fair is created by. So the whole context surrounding the product has influence on the brand identity aspect.

Attributes related to the organization contribute to a value proposition, so the brand identity gains more profile by associations like customer focus, environment concern, technological commitment, or local orientation. These factors are creating emotional and self-expressive benefits on the customers mind by admiration, respect, or simple linking.

For a richer and more interesting brand identity the brand has to be regarded as a person. Like a person, a brand can be perceived with a wide range of attributes, the brand can be seen as a person with specific characteristic. So the brand moves now from a flat descriptive appearance to an emotional personality. This changes creates a stronger brand in different ways. At first, customer is using the created self-expressive benefit to express their own personality by using the products or services.

Second, as a person the brand can have influence on the relation and relationships of people. The brand personality will become the basis of the a relationship inbetween the customer and the brand. ²



The implementation of the *Nike* swoosh in a ski resort. Very simple clear message of the brands logo and identity. The building is also used as meeting point and snowboarding ramp and skiing school.

2- Architectural branding - brandscaping

A decisive paradigm shift took place among the emotional level of branding experience. The conventional and traditional forms of client-communication are not anymore enough for holding on today's market. The new quality of brand-experience is based on direct interaction and unique experiences. What we can say, is that there occurred the paradox phenomena that in today's IT world the real space contributes a major part for the promotion and manifestation of the brand experience. The brands identity is not experienced virtually through the internet or websites, but tangible on real locations staged and enacted. There the brands identity and products can be experienced in their proper unique way. Architectural branding or brandscaping gets more and more important and thus investments are increasing in this field.

Brandscaping means that the brand itself becomes a space, a location. "Space" is becoming a structural component of brand strategy, because today it is necessary to define a product connected to the proper environment in which it will be not only a "shared experience" but more and more an event. Therefore the location itself as a concept acquires a lot of meanings: retail or shopping environments are not anymore the only "place" in which "to share an experience".

Architectural branding (“brandscaping”) should provide:

- to make a product/service out of a brand
- to make a space out of a brand
- to make a communication/marketing strategy out of a brand ⁴

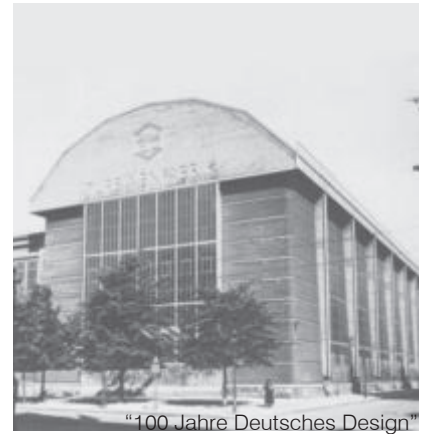
This ongoing trend includes disciplines once very distant from marketing strategy, like Architecture. Nowadays buildings like museums are already “state of the art” of design, technology and iconic research. They soon become landmarks in the territory. They make visible the philosophy and moreover the identity of their promoters. ⁵

It is not a recent idea to connect Space with a brand. One of the first examples where a building got the logo and symbol of a brand is Peter Behrens Headquarters of *Hoechst Chemical Industry* in Frankfurt as well as the *AEG Turbinenhalle* designed by the same Architect. Also in Italy the futurist inspired Architect Giacomo Matte-Trucco with his Fiat factory Lingotto in 1920 with its racing track on top of the roof got Symbol for speed and dynamic of the brand.

Moreover the Swiss beer producer *Feldschlösschen* well-informed about the power of brand imaginary constructed a little castle with towers like barrels to give the brands identity a its “barrelled” image.

Brandscaping has been also gaining an additional value: beneath the industrial functionality the buildings got an extra value as symbols.

Nowadays Architecture and Interior Architecture became more and more independent from their functional use towards direct brand communication tool for the clients. The term Brandscaping stands for three-dimensional brand-experience: Cooperate Theme Parcs, Flagshipstores, modular Shop Systems and Mall-concepts.



above: The AEG Turbinenhalle by Peter Behrens in 1909. He was the responsible Architect for the whole cooperate identity design of AEG. The Turbinenhalle is one of the first example of brandscaping.

below: Disney -one of the most successful brands- implemented their brand identity into Theme Parcs.



Case Studies:

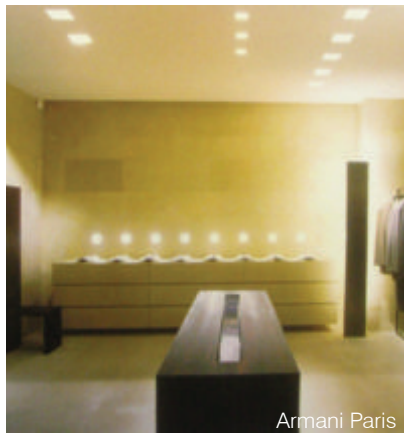
Armani Stores by Claudio Silvestrin

Armani stands for sleek lines, minimalist fashion and his own token black, dark blue or grey uniform and Giorgio Armani choose for the store design the Architect Claudio Silvestrin –philosophical, minimalist, elegant and also Italian. Silvestrin designed worldwide Armani-stores, his first in 1999. Armani's clean lines combined with Silvestrin's own minimalist and elegant expression results in almost monastic-like spaces. Beautiful cloth is in symbiosis with raw stones makes those to timeless gallery-like places. The clothes are solemnly exhibit and staged through light. Together with the used material –refined like ebony and oxidized brass on the one side and raw stone like granite and limestone on the other side– Armani's core values exclusivity and simplicity/pureness are translate into space.

All stores may be distinguish by their location, exterior and special features, but they typically echo each other in their interior architecture, with a shared palette of materials, details and features reinforcing the identity of the international brand.⁶



Armani Paris



Armani Paris



Armani Paris



Armani London



Armani London



Armani Milan



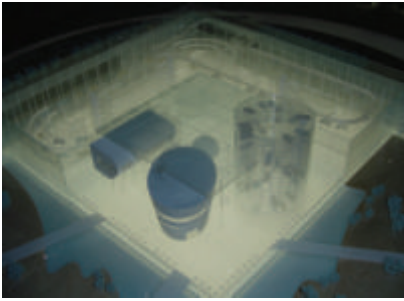
Armani Milan



Armani Sao Paulo



Armani Sao Paulo



Model of the manufactory: the L-shape manufactory part, car tower, office building, clients centre and information "bowl".



The VW manufactory. Arrival through bridges, which creates an image of entering a "town".

VW-Manufactory by HENN Architects, Dresden

Also called the transparent manufactory; this manufactory was built by the Munich Architectural Studio Gunter Henn. It is placed in the middle of the Inner town in Dresden. There everybody can watch the finishing of VW Phaeton-production, since it is a transparent building.

Values of the company which are transmitted are: CLOSENESS TO ORDINARY PEOPLE'S LIFE AND NEEDS which is transmit through TRANSPARENCY: the building is made of glass and in the middle of the town, thus the production process is exhibit. VW (translated folk/people car) stands for populism, what can be more closed to ordinary people's everyday-life than a production in the middle of the city centre.

On the other hand the VW model Phaeton (actually a model which is a bit outstanding from VW concept, but used to increase their image as not being the cheap car, but high-quality cars for a moderate price), which is manufactured over there, is status symbol, because it belongs to the higher price class. To provide clients the feeling of the extra-exclusivity they are invited to watch or even to finish together with the engineers their own car. Hosted in special VIP areas and a restaurant they get an additional value.

As building construction materials mainly glass and steel is used, as symbol for the brands values MODERNITY and HIGH TECHNOLOGY.

People who are not clients can book guided tours through the building.

After an informative tour through the building, there is the possibility to experience VW new technologies through interactivities. As well as experience the Phaeton, by sitting inside real cars, driving with a simulator; virtually composing own cars and take a picture together with it in front of the building as gadget. (Cooperate theme park-like).

The architecture of the building in combination with the service provided are expressing:

1. *exclusivity for clients*
2. *guided tour for getting theoretical knowledge and feeling treat like experts*
3. *interactivity*

A complex experience and reveals emotional relationship towards the brand is created.



You are invited to compose your own VW Phaeton. As remembering you get a picture with you and your virtual car in front of the VW manufactory.

3- Creating a brand of Giuliana Salmaso and Claudio Silvestrin

Aims of branding the two persons

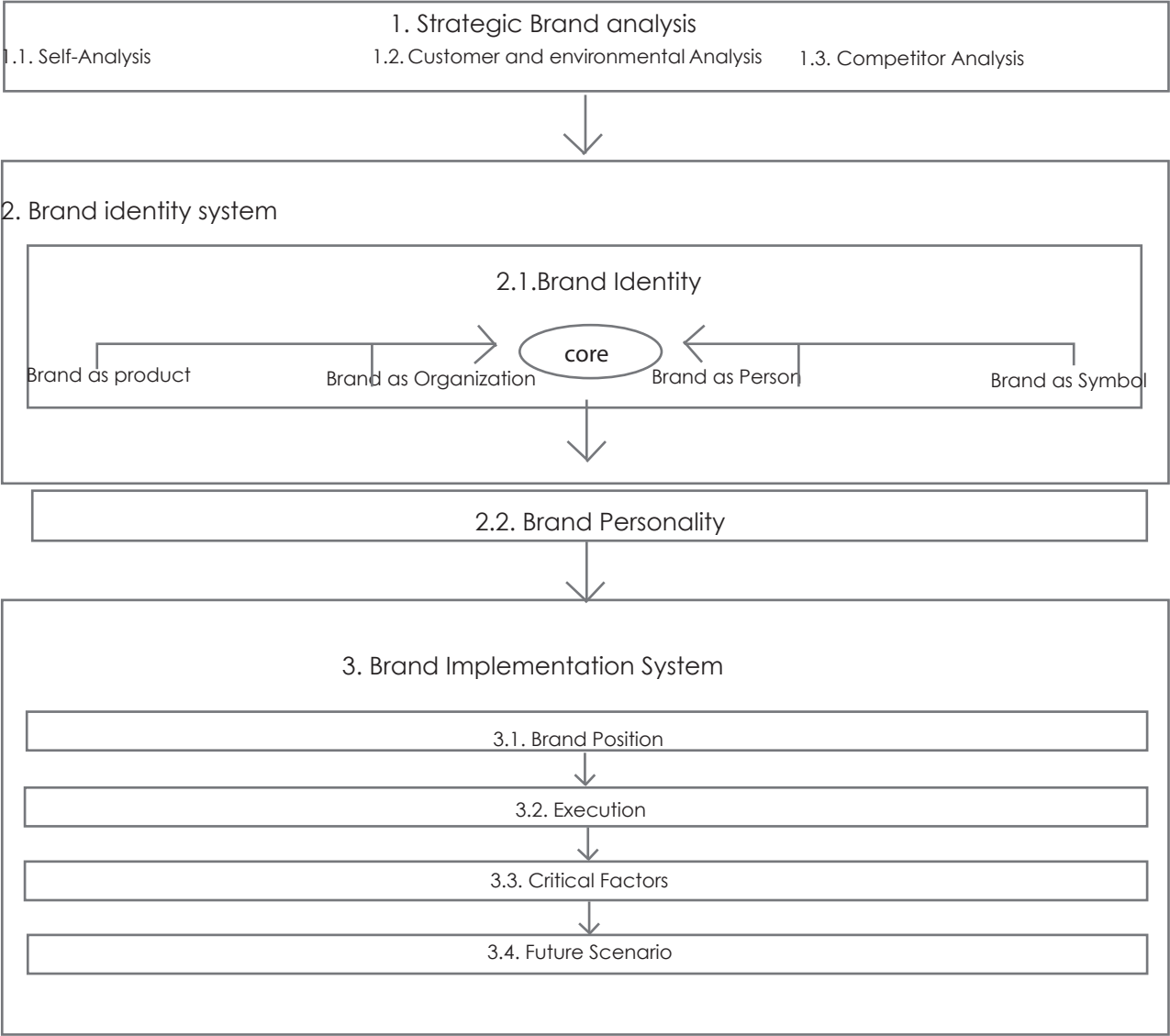
Nowadays branding gets more important. An ongoing trend –Youniversal branding, which means personal branding (further explanation follows below), underlines this movement. But nevertheless one can say that personal branding already existed long time ago, private persons could have been seen as brands and later they become Icons. Personalities such as Gaius Julius Caesar, Louis IX, J.F. Kennedy are examples of persons who became icons during their lifetime and are still Icons today. They developed their own lifestyle, had their particular way to communicate their lifestyle. An – maybe extreme- example is that Louis IX aligned his Residence Versailles even in urban scale with his bed. So its bed became the middle of France. This was one of his ways to communicate his values.

This kind of branding was certainly just living ideas of personal lifestyle and personality. But this had been less based on coordinated branding strategies. Nowadays arose a lot of branding strategies in the world of marketing. Those are mainly used for companies. In my master thesis I transform the ideas of branding strategies in marketing into a branding of private person and apply it. Since the two persons from whom I want to create a “brand” both already have a company I try to separate the private “brand” from the company as brand. Which means I try to differentiate their private life from work.

As project of my master thesis I propose a “shape” of the brands identity, in form of a space.

As branding strategy model-base I choose the Strategy model of David A. Aaker. It seemed to me the most fitting to brand private person, since it is less oriented on customer in general. Many other schemes (eg according to B. Holt) are much more based on customer experience and therefore focusing the customer a lot. The branding of persons in my opinion is also based on experience, but shouldn't be driven by it. Branding of private persons should be driven by the character and lifestyle of the persons.

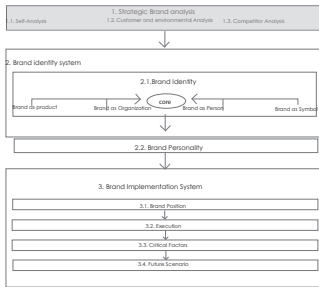
According to the model of David A. Aaker:



1 Strategic brand analysis

1.1. Self Analysis

The self analysis helps to find out, what's the brand's core values, on which a brand identity proposal in form of a space will be developed.



1.1.1. the soul:

The soul of the brand in fact exist of two persons: Giuliana Salmaso and Claudio Silvestrin. Both personalities composes the brand. They met 1998 in London when Giuliana started to work at Claudio Silvestrin Architects. Both of them live and work now between London and Milan. They are owners of the two companies Claudio Silvestrin Architects and CSGS.

They are also working as professors at the Politecnico di Milano, thus I got to know them.

The Self analysis refers first to each personality singulary. After that it will conclude with an analysis of “their way together”.

1.1.2. background/heritage:



Giuliana Salmaso

*09/II/I970

education:

1997 Graduation University
of Architecture in Venice

work:

- 1997-1998 Architecture
Studio in Padua
- 1998-2004 Claudio Sil-
vestrin Architects, London
- 2004 Fondation of
GiulianaSalmasoClaudio-
Silvestrin Architects
in London
- 2005 opening of the Milan
branch CSGS
- since 2005 teaching at
Politecnico di Milano



Claudio Silvestrin

*05/09/I954

education:

- Architecture studies in
Milan taught by his Master
A.G. Fronzoni
- University of Philosophy
in Bologna
- completing studies at
Architectural Association,
London

work:

- 1986-88 Partnership with
John Pawson
- 1989 establishment of own
office in London
- October 2005 opening of
the Milan branch of CSA
- since 2005 teaching at
Politecnico di Milano

1.1.3. existing image

1 - Giuliana Salmaso

Private life

Lifestyle:

FLEXIBLE - SPONTANEOUS

- NATURAL

Literature:

PHILOSOPHICAL

Art:

CONTEMPORARY-

EXPERIMENTAL - DEEPER

SENSE

Movie:

POETIC - SOCIO-CRITICAL

Music:

INTELLECTUEL MIX

Food habits

NATURAL-TRADITIONAL

CUISINES -CULTURAL

ADVENTURE

Fashion:

SPORTIVE-ELEGANT

Perfect Sunday:

VISIT ART GALLERIES, DINNER

WITH FRIEENDS

Vacation:

CULTURE-RELAX

Work

MINIMALIST-POETIC/

PHILOSOPHICAL-SYMBOLIC-

NATURE-LIGHT

To fill in for Giuliana:

These questions are about personal opinions and stance.

If you feel uncomfortable, because you think the question is too private, please leave it blank!

Thank you!

1. Which book/Author you would like to meet and want would you like to ask him? Which are your last read books? Which book inspired/impressed you most?

i would love to have a private lesson about lightness by Italo Calvino
i would love to meet Gandhi and Krishnamurti -
last book read:
- Alto si e di gloria by T. Tzetzani
- L'edon americana by Italo Calvino (this is the 3rd time i read it!)
- The last freedom by Krishnamurti
- L'arte di vivere by Gandhi

2. Who is your architecture / design maestro? How do you think got you influenced by her/him?

i love the work of Kazuyo Sejima
she is not a maestro because i do not know her -
~~monstrous~~ but she has a personal and essential
poetry that i admire -
~~she is not a maestro because i do not know her -~~
~~she is not a maestro because i do not know her -~~
i love her lightness -

3. With what kind of art-style could you identify yourself? Which paintings could you contemplate for hours, still impressed and interested? What paintings do you consider as important for our society?

i believe that the dia foundation in Beacon - NYC - is
heaven on earth - i love minimal art! art that makes
the spirit to fly - art that plays with perception -
i love James Turrell - Dan Flavin - Gonzales Torres

4. Which movies do you think are well addressed to our recent lifestyle and could it influence positively? Which movies influenced your way of thinking?

i do not think a movie influenced my way of thinking -
i like movies that make i think but to be honest
i do not have good memory of movies -
i like movies with poetry - movies that are
announcing the poetry in everyday life -
discovering
i do not like action movies -
Torres is also good i am looking forward for his
new movie about the health system in the states -

- capitol fm } in London while driving
virgin radio }
magic }
2. What kind of music do you listen to, when you want relax yourself? And which one are you listening while driving? How changed your music preference from youth to now?
- when i want to relax i love silence -
once i used to listen to pop music on the
radio - in the 80's - 90's Boy George was my idol -
When i was 20 years old i was a dj on a local radio.
i would love to work on the radio again -
~~that's~~ But Nothing - Luther Ingram - Jazzy - what i most
like now.
3. What car are you currently driving? What kind of car you think fits most to you or would you like to drive?
- i have no car - sometimes i use claudio's -
it is a beetle -
i would love a sport car - convertible -
a peche!
4. When you go shopping, where are you normally going? Do you have a preferred fashion designer label? How would you define your clothing style?
- i do not like to go always to the same place -
i do not have much time for shopping -
if i could afford it i would love to buy:
Bill Sander } spring/summer
Yohji Yamamoto }
Guy Laroche }
5. For whom would you once like to cook? And what kind of food you would prepare?
- for my mother - she always cook for me -
i would cook some kind of pasta because she
likes pasta - but very light - i would also
prepare a lot of little appetizers because she likes
little delicious surprises -
6. Ideas/wishes for future life
- less travelling
less work
more study/reading

2- Claudio Silvestrin:

Private life

Lifestyle:

PHILOSOPHIC, ENERGY

Literature:

PHILOSOPHIC

Art:

TRANSCEND

Movie:

POETIC-ACTION

Music:

RELIGIOUS-SPIRITUAL

Food habits

SIMPLE-NATURAL

Fashion:

SPORTIVE-ELEGANT

Perfect Sunday:

FAMILY

Vacation:

CULTURE-RELAX

Work

MINIMALIST- CALM-ARCHAIC-

PHILOSOPHICAL-NATURE-

LIGHT-SYMBOLIC

To fill in for Claudio Silvestrin:

These questions are about personal opinions and stance.
If you feel uncomfortable, because you think the question is too private, please leave it blank!
Thank you!

1. Which book/Author you would like to meet and want would you like to ask him? Which are your last read books? Which book inspired/impressed you most?
the greatest philosophers - Plato, Nietzsche, Seneca, Schopenhauer, Heidegger, Melan, Foucault
lastest book Seneca letters at Lucilio Krishnamurti
a would ask: to go for a walk with me, possibly in a park or on the seaside and have a chat, nothing too heavy just - being with -
2. Who is your architecture / design "master"? How do you think got you influenced by him/her?
My master was A G Fontana, tutor at the Design & Architecture during the 70's who introduce me to the of essence, Japanese Zen architecture and the job of - being a man -
3. With what kind of art-style could you identify yourself? Which paintings could you contemplate for hours still impressed and interested? What paintings do you consider as important for our society?
Art that transcends, beyond matter
Art 1200 - 1500
and contemporary art: Serra, de Maria, Turrell, Fontana, Mondrian, Malevich, Klee
4. Which movies do you think are well addressed to our recent lifestyle and could it influence positively? Which movies influenced your way of thinking?
No movies are influential in thinking
Movies are about visual-vision mainly.
Perhaps, my favorite film - Andrei Rublev by Tarkovsky but I like also Action movies for fun like Matrix

- 5 What kind of music you listen to, when you want relax yourself? And which one are you listening while driving? How changed your music preference from youth to now?

Arvo Part N. 1 then religious chant & music
but also Ludovico Einaudi

- 6 What car are you currently driving? What kind of car you think fits most to you or would you like to drive?

Bettle convertible
or me would be nice maybe when I retire

- 7 When you go shopping, where are you normally going? Do you have a preferred fashion designer label?

- Issey Miyake
- Yohji Yamamoto
- Ann Demeulemeester
- for summer casual Prada sport

- 8 For whom would you once like to cook? And what kind of food you would prepare?

I am not good at cooking
I like, however, to cook for my children - ~~they~~ if makes
them happy pasta

- 9 Ideas/wishes for the future life:

to make a beautiful world - less materialistic
and more spiritual through architecture

3-Their way together

“She is like water and movement, he is like the earth and stability; together they compose a renew vigour” 1

Private Life:

Claudio and Giuliana are living between London and Milan, besides they are travelling for work a lot.

Claudio has two children: Max 12 years, Maja: 10 years.

Habits and stance:

Sustainability: apart from airplane-use, they consider their life sustainable;

Giuliana *eg* walks and takes public transportation system. They try to avoid producing a lot of waste.

Giuliana uses no television, in her opinion it is a waste of time: “[...] it is like going to the discothèque and sitting in the armchair[...]”.

They love to shower, but not to take a bath.

They both like the warm, in winter 24° (the less sustainable)

Moreover they love lot natural light.

Giuliana wakes up one hour earlier than Claudio, because she likes to enjoy the morning tranquil: [...] I am “superslow in the morning”[...].

Apartments:

They have two flats one in London and one in Milan.

London:

The apartment in London has a Loft-character. Open space is dominating.

Claudio: Doesn't think about it, has the essential, this is sufficient to get on with his work.

Milan:

The Milan apartment is rented. It is an apartment for two with a lounge, kitchen, and bathroom. They wanted to make one open space, but the landlord didn't allow this.

Case Study Apartment in London:

The house in London is located in Huckney. This is a previous industrial quarter, with a cultural mix and diversity –the local black community is making space to immigrants from east Europe, young artist and designers are coming from the neighbourhood nowadays not yet convenient and a small community of white young single banking attracted by the contemporary development on Kingsland Road. The apartment is on the same building like the office – in the Kingsland Road. The apartment is at the top level, because Giuliana and Claudio prefer always to live lift from the earth.

The flat has a size of around 80qm and has the concept of open space. This open space is divided in zones: living room, bedroom, and kitchen. There is only one door inside the whole apartment; it is the one of the bathroom. Additionally to the open-space preference they like to have light, which gets reinforced through it. Giuliana and Claudio bought the flat and designed it partly themselves.

Critics: They say that they do not put a lot of afford in the apartment and that it is too small for them, it doesn't work for four persons.



the environment: London-Huckney. A previous industrial area, now an artist quarter.



3



4

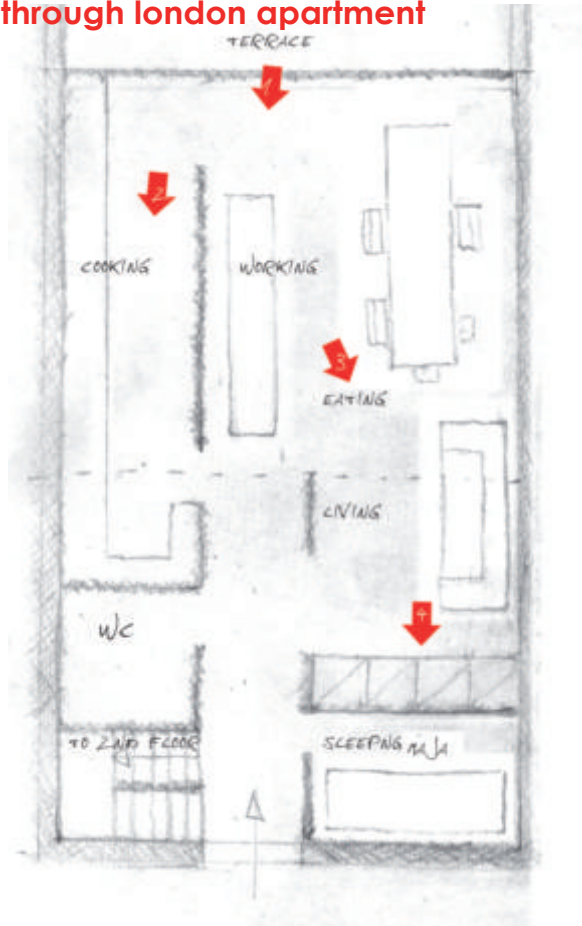


2

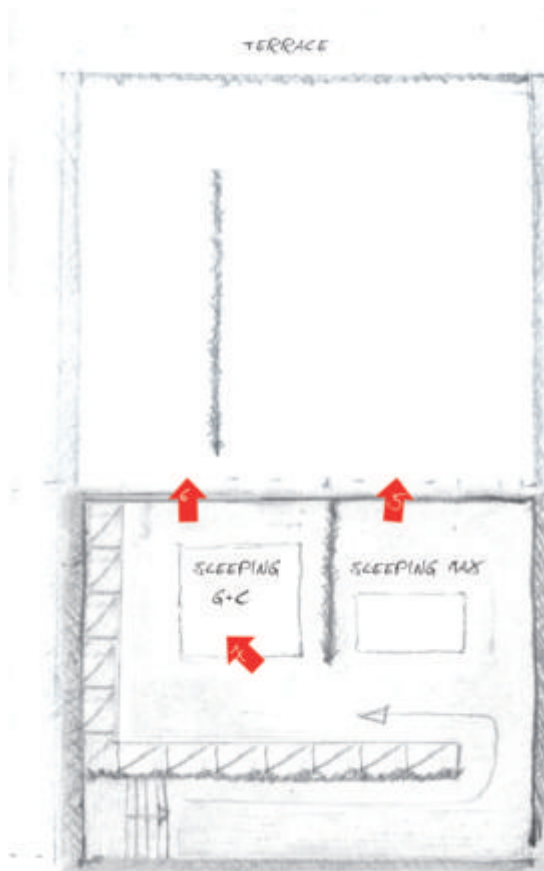


1

a walk through london apartment



1st floor



2nd floor

keywords: **OPEN SPACE-TOP
FLOOR - FUNCTIONAL**

But it also seems that the apartment is more functional and does not much reflect their personalities.

Food

Lunch: In Milan Giuliana is eating in the office; in London she goes home and cooks for Claudio and herself, also because the office is very closed to their living place.

Dinner: When they are cooking, they prepare always simply and plain food (rice, pasta, steamed vegetables) to avoid fatty and unhealthy food, since they eat 75% of the time in restaurants, where food is not very healthy.

Giuliana and Claudio are preparing dinner both the same amount of times.

Claudio even uses in contrast to Giuliana the oven and cooks from time to time chicken.

Both enjoy slow family-eating; but this occasions are very rare.

- QUALITY-PLAIN-ESSENTIAL-NATURAL

Transportation:

In Milan they have no car, they always use taxi or public transportation system.

In London Claudio has a *Beetle* convertible, which Giuliana also is using sometimes. Both of them would love to have a sport car – a Porsche.

SPORTIVE – CLASSIC

Work

In 2000, after two years working at *Claudio Silvestrin Architects*, Giuliana “broke the tabu” and ask the “maestro” – Claudio Silvestrin, if she could participate in the design process.

Since 2004 they established in London a partnership called *GSCSA* – Giuliana is mainly involved in the projects of the partnership since Claudio divides his energy between the two companies.

In October 2005 a branch in Milan was found. There is an intensive cooperation between the office in London and Milan.

GSCSA is located in the same office-space with *Claudio Silvestrin Architects* in Milan and London. The Milan office is in the quarter Brera. Working there I experienced very friendly atmosphere among the people working there.

Realized projects of *GSCSA* are Pie’n Polus in Seoul. A current project is the interiors of *La Rinascente*

The projects perform an architecture which not just integrates, but connects the human being with the space, quiet and leaving strong impression, but never crying for attention. It gives the space a soul.

Important for them is that the human being is identifying himself again with nature and by that finds back to its origins, to humanity and his spirit. This idea is transferred by the application of the “antic” and “pure” materials: stone, metal, wood, water and fire always together with the “sixth element” –the light. The architecture generates a performance of light and space.

It wants to provide the metropolitan or even cosmopolitan people an opportunity to take a break and get a rest during the chaotic life.

This is achieved by rediscovering the purity of materials in architecture, its use inspired on those times when man still lived more in harmony with nature.

Different Design/work approach:

Giuliana about Claudio:

“Claudio very masculine, using often the “mass” of material

Together more gentle in forms”

Giuliana uses lighter material and in her opinion they don’t have together a body of work which is consistent

Claudio: “Giuliana pushes for innovation and changes to obsession. This is good as long as it is not a change for the sake of it. Principles and disciplines must be preserved and must govern the flow of change the danger being that one loose focusing, foundation and purpose. The flow of change is positive as long as its power does not make one arbitrary decisions.”

After everybody had is own idea, they normally discuss those ideas together to develop a project scope.

keywords:

CHARGED-HONEST-LONG LASTING-POWERFUL-SENSUAL-SYMBOLIC-UNIQUE

1.1.4. Guidelines among brand heritage

- Elements, which are relevant in both persons life and thus they are the guidelines.

Time luxury:

Having an own company requires that your professional occupation is also your live. That brings along a lot of secondary work like managing projects, meetings in all over the world. It is not just the creative part which is content of the work. According their own view design and architecture are their hobby, but often they miss a gap of time for new inspiration and ideas. In responding the answer of private future wishes Giuliana said, she would like to less work and would like to use her time for reading and studying. She searches for a rest, quietness and relaxing her soul and body.

Sustainability

Both are aiming a less materialistic world. Privately: "I am happy without a lot of materialist things"⁷ as well as in the society: In their life and projects they involve nature and natural products *eg* food is plain, material used in projects are pure and rough.

They tend to produce as less waste as possible.

Concentration towards less materialist, but spiritual

Claudios' and Giulianas' architecture is very inspired on spirituality. This is transferred to the exterior/visual and touchable part of the architecture (inspiration on monastery architecture: simplicity and pureness); as well as the "interior" part of the architecture, which gives through symbolism and poetry the space a deeper sense and holiness. Examples are the use of the cross in the Installation in the *Segheria* for *Salone mobile* 2007 or Princi bakery use of the symbols water, fire, flavour "... to make a beautiful world –less materialistic and more spiritual through architecture"⁸.

Not only in their architecture concept they are following this idea, also parts of their lifestyle are oriented towards it.

For example in fashion the preference is for simple clothes and affinity towards black and white. Those colours symbolizing purity and virginity according to the liturgical chromatics.⁹ Moreover they prefer simple plain food to keep and be aware of natural taste.

Introducing spirituality to the most everyday life things shows the awareness of those substances which are really concerning our life – giving value to the most simple and most necessary things.

Travel exited *vs* travellers-tiredness (cultural enrichment *vs* distance-passing)

On the one hand Giuliana and Claudio are fascinated by different culture and like to learn. The vacation is used to learn and live other culture richness combined with relaxing.

On the other hand Giuliana wishes to travel less. Since their office is working global there is a lot of travelling for business included.⁷



Architectural implementation

Case study Princi Bakery in Milano in Piazza XXV Aprile.

The use of poetry in architecture, open space

Case study – idea transformation into space

Princi Bakery in Piazza XXV Aprile in Milan

A project realized by the team of Claudio Silvestrin and Giuliana Salmaso – according to Giuliana the project which reflects most their way of team work. Concept: The place shows us the way bread is made: firstly by the implication of symbolic elements. The main elements are fire, water and flavour, essential for the bread-baking process; they are shown as unit and oppositional elements. Secondly the concept of the space: It is an open space that is divided in three areas: Bread- making, sales and disposal as well as a customer's stay. Combining all these features in one room makes the bakery a fascinating laboratory and showroom.

Characteristic materials are rough porphyry, bronze and the lightness of glass in a severe, elegant minimalist interplay. It gives the place an archaic, honest as well as essential character, like bread is also a natural and essential source of substance.

The place amazes with all its worked-out details.

The bakery is located on a corner; both sides facing the street are complete window, allowing also the people from the street watching the bakers at their work. Inside to the left a bronze counter disposes the products in baskets –baskets also as element of natural antic pureness– and clients can purchase their bread-products there. On the right a rough porphyry stone forms a table, where clients can eat on. This stone bench connects the two elements fire and water: on the one end the oven is located on the other end, which is already outside of the shop, water flows down. Behind the table there is the bakery workshop, divided through glass. The customers while eating their food may observe how it became food.

A place, which invites the visitor to contemplate about the meaning of bread or further the substances of human life and its values for human being.



The elements fire and water as essential for bread-making are implemented in space.



1.2. Customer and environmental analysis

The perceiving environment are people being in touch with them unless from work, free time, university, visiting their exhibitions or being friends as well as press who is beneath their projects also interested in their private life and therefore also those people which are the media-perceivers.

1.2.1. Customer survey

To compare how people perceive the brands personality with the own lifestyle concept I prepared interviews who know both of them from different context –from work, university and free time. The people had to define their perception of them among various aspects.

The surveys result I submit in forms of keywords:

General impression: MINIMALIST, ENERGY, WELL ORGANIZED, OPEN FOR CHALLENGES, CULTURAL INTEREST/INVOLVEMENT, SIMPLICITY, QUALITY FOCUED, SUPPORTIVE

Private life:

Lifestyle:

BUSY, WORK-DEDICATION, MEDITATION, CREATIVE, ELEGANT, ESSENTIAL, PASSIONATE

Literature:

PHILOSOPHY, WRITERS, SPIRITUAL, MEANINGFUL, POETIC

Art:

CALM, CUBISM, CONTEMPORARY/EXPERIMENTAL, AMBIENT, EASTERN “CHILLOUT”, “BUDDHALAR”, SOUNDS OF NATURE

Movie:

ACTION, JAPANESE MOVIES, SHORT MOVIES

Music:

PIANO, JAZZ, CLASSIC, EXPERIMENTAL, GREGORIAN CHORALS

Food habits:

LIGHT, JAPANESE (SUSHI), ORGANIC, , TRADITIONAL CUISINES, GIVING SESPECT

Fashion:

CLASSICAL, ELEGANT; CLAUDIO: DOESN'T CARE, GIULIANA: GOOD; LIGHT, EARTHY COLOURS

Perfect Sunday:

ART EXHIBITION, BRUNCH WITH FRIENDS, WORK

Vacation:

CULTURE, FAMILY, QUIET, SILENT, PUGLIA, RELAXATION, COMFORT, DETAILS, AMBIENT DIVERSITY

Work:

COOL, $1+1=1$, MINIMALIST

Evaluation:

General impression: is more or less quite similar: the balance between calm and movement. That many people have this impression like this means the two personalities transmit a clear stable identity

The aspect **lifestyle** is split: some persons see in them more the busy working persons; others the spiritual contemplative characteristics are more obvious.

In the following categories literature, art, movies, music, food habits, vacation and work agree the self-image. One point again –similar to the general impression– which differs both among the asked persons as from the self image is the perfect Sunday: some persons think work can be part of a perfect Sunday others assess it very right: family, eating together with friends, exhibitions.

To sum up, points which does not agree with the self-image concern most the definition which means relaxation for them or rather the busy/work engaged aspect in their life is taken to mainly.

So the brands identity communication should be more develop in showing the aspects meaningful life *vs* busy life. They are do not want to be and to be seen as busy, just doing projects, more that contemplation and artistic and spiritual inspiration determine their way of think, living, enjoying time and work.

1.2.3. Trends - in order to integrate brands personality in society and recent needs

The following trend research comprehends trends, which are occurring in society. Since branding depends always on perception by the environment and society, relevant trends need to be observed. The trends are always relevant to the persons' interest and lifestyle, also they show possibilities to meet recent needs optimal.

Youniversal Branding

At the core of this trend is control. Human being gains to be in charge for its own destiny. Or at least have the illusion of being in charge. At the core is control: psychologists don't agree on much, except for the belief that human beings want to be in charge of their own destiny. The consumer is longing to live their own creativity, compose its own playground, own comfort zone, own universe.

This trend is connected to a creativity revolution and individualism: the consumer tends to stop the main-stream presets. To maintain control about private and commercial live an extreme transparency is necessary. The internet facilitates nowadays independence from the mass; it provides liberty to choose own combination of "life-ingredients" at anytime and anywhere. It depends on extreme transparency to maintain control of their private and commercial lives

Source: Trendwatching Site: www.trendwatching.com, December 2006

Status skills

No single status symbol is safe from devaluation, as these symbols are mere agreements: the moment 'society' would agree on a car just being a utilitarian method to safely move from A to B, and not one of the dominant indicators of one's standing (as it is now), luxury car manufacturers would have a problem. Shifts like that could occur in societies that are no longer exclusively about consumption. Mature consumer societies in which many consumers have 'out-consumed' themselves, and have started to truly value and promote creativity as a necessary ingredient for innovation and competition on a macro-economic level.

source: Trendwatching site, September/October 2006, www.trendwatching.com

Branded brands

Certain branded goods are well respected; they are symbol for coolness and quality. Now they start to be integrated into other, more all-encompassing brands are arising. The result: branded brands.

It leads towards cooperation among brands as well as a increasing consumer-fixing on the “big” brands.

source: Trendwatching site, September/October 2006, www.trendwatching.com

Eco and ethnics

Unlimited production and consumption is followed by a mounting pollution, finally nowadays consumers, business leaders and governments are feeling the pressure and responsibility to confront and act upon this fact *eg* the former US presidential candidate.

The tendency to solve these environmental problems tends to two mega-trends: the greening of consumption and the proliferation of alternative status symbols. local vs. global

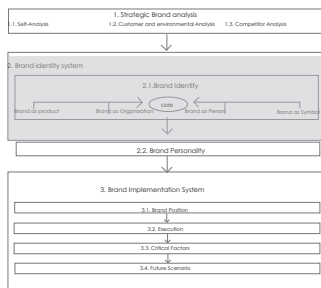
In these days where the globalisation is changing everybody live, one can find a growing return of all things local, all things with a sense of place. However, globalisation comes often along with pollution, easy transportation of goods and persons is a notable add to the *carbon footprinting*.

Source: Trendwatching Site, June/July 2007, www.trendwatching.com

Giving value to “essential” things (snobmoddities)

The issue of this trend is turning mundane commodities into popular luxury, chic goods or items *eg* Princi bakery-bread. On the one hand it is the result of an overfilled market, instead of purchasing new goods the consumer is re-concerned of “simple life substances”; on the other hand it ties up with the trend to design our complete environment.

Source: Trendwatching Site, November 2004, www.trendwatching.com



1.3. Possible competitor analysis

Competitors in its sense don't exist. Their own company could be considered as a competitor, since it is located on some opposite position leisure-work, financial limited-financial independence. But since designing and their work is also a major part of their personality it is not competing but a mutual adding.

2. Brand Identity System

Brand identity is composed by two components: the core identity and the extended identity. These identity elements are positioned as long-lasting patterns of meaning around the core identity elements and add value to the core identity concept.

The essence of the brand is the core identify that is timeless and the heart of the identity structure. If all layers of the extended identity are removed the core identity become visible and clear. This structure can be compared with the layers of a onion where the heart is reached after peeling away the levels of the onion. The core identity itself stand first of all for the meaning of the brand, but at the same time for the success of a brand because it remains constant especially regarding time-based changes and travels of the brand to new markets and products, the core identity has to show more resistance to changes than the elements of the extended identity which can follow the new market tendencies. Also other parts of the brand like the brand position and the communication strategy can be readjusted but the core identity is more timeless. For defining the core identity four key issues are important. First of all the definition of the soul, then the fundamental beliefs and values that drive the brand, as next the competences of the organization behind the brand and the meaning of the brand organization. But these element seen as the values of the organization have to be in close contact with the core identity to create a strong connection. As a base for this connection the core identity has to fulfil to two needs, on one hand the uniqueness and on the other hand the value of the brand. This is manifested in the slogan or the claim of the brand. ²

2.1. Brand identity

Brand as person

1. Personalities: natural and friendly, contemporary, stable yet movement
2. brand-customer relationship: there can be a friends-relationship; they can also be regarded or be an adviser

Brand as organization:

3. Organization attributes: lifestyle (natural, philosophical, elegant)
4. Local vs Global: because of work and personal interest they travel a lot, and thus they meet a lot international people, what they seem to enjoy. They should adapt to local culture but keep in the same time their Italian roots

Brand as Symbol

5. Visual imagery and metaphors: nature (color-expression, shape, behavior) , water-earth, lifestyle
6. Brand heritage: architecture/design philosophy and expression, Italian-roots

Brand as product:

7. Product scope: Architecture, expressed in their *casa per la pausa*
8. Product attributes: sustainability, elegance, philosophy
9. Quality/ Value: use of local material, innovative knowledge connected with natural material, enclosing in environment, philosophical concept (elements: fire, water, stone, wood ...)

10. Uses: house for vacation to relax from work, metropolitan life and to concentrate on thinking, reading , people who are coming as friends will also enjoy staying their holidays there together with Giuliana and Claudio.

11. Users: Themselves and their friends as visitors to stay their; also it is regarded by other, it is a good example for locals and as well general in architecture for aesthetic architecture, which is on the same time respecting tradition: for themselves it like a business card.

→ 2.2. Brand personality:

Brand personality driver:

Lifestyle and sustainability is the non-product-related characteristics personality driver.

Attributes like Elegance, sustainability, philosophy are the product-related characteristic-personality driver.

Core values:

essential – elegant – natural – philosophical

3- Brand Identity Implementation system

3.1. Brand position

The brand is actively communicated through the two characters living it. Their house is somehow a manifestation of this lifestyle and image.

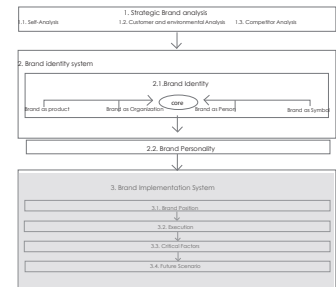
The location of the project *Spazio per la Pausa* is in a way the symbol of both. They choose this territory as lets say most private place – a place for contemplation, rest, and relax and enjoying free time. – a symbol of both private life, disconnected from work.

The communication of the brands’ identity symbolized by the location and the “new product” – the episodes in the garden and the house- could be in form of an inauguration party.

People from Milan, London ... as well as local friends could be invited to stay together with Giuliana Salmaso Claudio Silvestrin one weekend on the project areas. Since both persons are connected so much to nature and purism, this inauguration can have as content the perception of the area: to feel, to touch, to smell, to taste the piece of land.

Every of these episodes should be connected with one perception. The guest should make a walk through all episodes and perform the perceptions themselves. In the end of this “journey of feeling Salento”, people get a guided tour through the house and will have a dinner on the terrace all together.

There is no need to use competitive advantage, since there exist no real competitor.





3.2. Proposals of the execution of Brand Personality:

3.2.1. Symbols and metaphors:

The territory of the project is a very strong symbol, as both, Giuliana and Claudio were attracted by the elements of the area: the colours and materiality of the location, the red earth, the blue water and green olive trees, the tranquillity and silent environment, the wild almost “untouched” nature. The essence of the place “caught both hearts”

3.2.2. Visual Communication:

in General

– both persons seemed to be best expressed in natural materiality and essence of things, that is why the choice of material with natural structure is essential.

Colours:

Since the expression is more based on materiality the colours should not be too strong (more in the world of pastel) and colours expressing simplicity like

Black and white

- to symbolize Simplicity and also because both like to wear those colours.
- Could be used in the world of fashion (visual appearance of the persons).

The proposal for colours is the use of the colours of the Apulian territory.

Architecture

see chapter 9 Backcheck house - verifying the brand values in architecture

Design

see chapter 3

Graphic

see graphical manual



The graphic manual

Logo:

the **S**element



Inspiration

... Water and earth as symbols for the both characters. Those are two basic, natural elements, which fit very well to the characters; Claudio is calm and stable, Giuliana vivid like the movement of water. So the logo should include the dynamic *vs* calmness. But the general impression should be balanced (like the Giuliana and Claudio appear together). Not to have the dynamic part to overwhelming (because dynamic is always more flashy) I decided to make the water like the tide on the beach, going back and fore, as symbol for the movement. The colours are symbolic for the red earth and the blue of the water.

Slogan:

- element S -

inspiration:

Element... stands for natural and essential/pureness. Both persons' life is oriented towards natural pureness.

S ... is for the common Initial of the last name

S ... for Simplicity

And it is similar to the digit 5. The 5th element as symbol for being with and living among those essential elements

Using the logo

The logo can be used for private letterheads, cards *etc.*

Art work

The element S logo consists of the logo type and the mark. The mark represents what element S is about—both persons and their characteristics being like “water and earth” and being together strong. The sea stands symbolically for this “symbiosis”, it is the natural phenomenon that is also combining these two elements.

The two lines stand for the symbolised section through the sea. It consists of two elements, the earth and the water. Since the logo is developed for the union of two private persons, these two lines symbolise them. The upper line stands for water and dynamic like the female part of the brand and the lower line stands for the earth, the calmness, the male part.

This arrangement is not meant as a hierarchy, it is only positioned like that because of the section of the sea.



the **S** element



Placement

The element S logo is a clear and strong logo which should be treated with respect in all usage. A minimum of white space around the logo is required. For the minimum white space, use the width of the “S” in element S as the unit by which to measure the white space on all sides of the logo. The area of the isolation projects the logo from other imaginaray, graphics, and page trim. Examples of tagline can be found on page.



Size of the element S logo

Depending on the usage, the size of the logo will change. The logo should be placed with the minimum of white space around it. This will often be more visually appealing than the logo that is sized too large for the space available, making it clutter and hard to read.

Minimum size requirements

The minimum width of the logo is 4.2 cm and the minimum height is 1.7 cm.



Typographia

Typeface

Century Gothic is critical when creating clear and consistent brand communications. This typeface will provide a clear and recognizable brand voice. The typeface chosen to communicate the S element voice is Century Gothic. This font should be used in all graphical communications.

Century Gothic offers many weights available which offers a tremendous design flexibility in style and application. From headlines to bullet points to body copy, this typeface will cover all design needs.

Century Gothic regular

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 0123456789 (.,:;!?'&\$%)

Century Gothic italic

*ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 0123456789 (.,:;!?'&\$%)*

Century Gothic bolt

**ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 0123456789 (.,:;!?'&\$%)**

Century Gothic bolt italic

***ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz 0123456789 (.,:;!?'&\$%)***

Colors

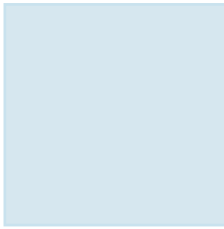
Colors Palette

Color is a strong and emotional componet to any brand identity.



Pantone 160M

- inspired by the red soil of the area



Pantone 9401C

- inspired by the colour of the sea in this region.

3.3. Future Scenario

Casa per la Pausa with territory and environment to relax from everyday' work.
Poetic Episodes in the garden, to manifest their love to nature and poetry.

Demands regarding the location and the project:

1- Use of the house: During the whole year, basically the week-end, app. 2 weekends per month, summertime vacation

Arrival: flight from London/Milan → not too far, easy and cheap booking
Eventually renting car over there

2- Location –a place, closed, nature, silence which offers cultural diversity,
Connection to the place: through the people over there

3- Staying there 90% alone and 10% coming with friends (from Milan, London, ...parents, Claudio's children)

With friends from region: spending 30% of the time

A guesthouse on the territory also used for the children

4- Occupation: reading, thinking, doing projects (but not office-work-like, more inspiration), writing, personal research, inspiration

5- Kitchen for preparing food, 50% is cooking Claudio/50% cooking Giuliana;
among seven days a week they go three times to the restaurant

6- Garden maintained by a gardener

House: going to take for cleaning and maintenance

Puglia as place, show Italian roots but internationalized/global influence, it is closed, but cultural very diverse (it is like a world trip)

3.4.– Critical Factors

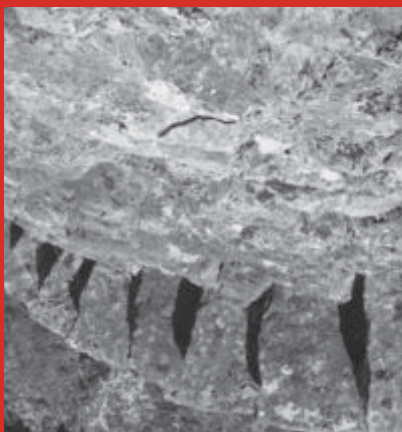
Restrained Spontaneity: The avenue to the territory by airplane restrains the spontaneity of going there.

Credibility: The frequent use of airplane results an increasing emission of kerosene. When kerosene is deflagrated it converts in toxic gasses, mainly water vapour, carbon dioxide and nitrogen oxides, which are contributing to the greenhouse effect. The condensation trails increase the heating up of the atmosphere. All in all airplane transportation accounts 4% of the global warming. (*source: German Federal Environmental Agency, 2002*)

Thus the use of airplane is in contradiction to one of the core values: sustainability.

Footnotes

- 1 Gareth Williams, *branded – products and their personalities*, London: V&A Publications
- 2 **David A. Aaker**, *Building Strong Brands*, London: Free Press Business, 1996
- 3 **Noami Klein**, *No logo*, Rotterdam : Lemniscaat, 2002
- 4 according to **O. Riewoldt**, *Brandsaping: Worlds of Experience in Retail Design*, Basel-Berlin, Boston: Birkhauser Verlag AG, 2002
- 5 according to **S. Colli, R. Perrone**, *Space-identity-company*, Barcelona: Gustavo Gilli, 2003
- 6 **Riewoldt O.**, *Retail design*, Laurence King Publishing, London (GB), 2000
- 7 Giuliana in her interview 07/2007
- 8 Claudio in his Interview 07/2007
- 9 K. Goldhammer: *Reallexikon zur Deutschen Kunstgeschichte*, München: Zentralinstitut für Kunstgeschichte München, 1981



- 1 - Brief history of the region Puglia
- 2 - Vernacular architecture in Puglia and their construction techniques
- 3 - Characteristic of the ground of the project area
- 4 - Insight of Salento
- 5 - Climate and wind of the project area

location II

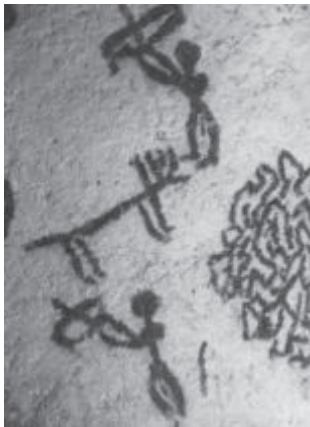
“La Puglia possiede esempi architettonici incomparabili: villaggi neolitici, dolmen e trulli, alcune fra le più squisite cupole romaniche, palazzi super barocchi, castelli svevi, e recentissimi motel. Ma il suo fascino singolare sta nel suo carattere vernacolare – inconsapevole, insuperato e, speriamo eterno.”

Bernardo Rudofsky 1965 in Domus

1 - brief history of the region Puglia

Since very early times Apulia has been inhabited. Evidence of a protolithic culture was found in the Grotta Romanelli, closed to Otranto. Also at Torre Testa, on the Adriatic coast closed to Brindisi remains of a paleolithic village twenty to twenty-five thousand years old have been discovered. Trade between Apulia and countries of the Aegean Sea has taken place since at least the second millennium B.C. First the richer coastal plains became populated, afterwards the inside areas; for example in *Murgia of the trulli*, one of the more internal part of Apulia, was found evidence according to human settlement dates only from twelve to fifteen centuries B.C. . When colonization did take place the settlers did not ascend the steep cliff facing the Adriatic, but rather the southern slope. In the age of Bronze, numerous pastoral settlements developed in the southern area of the Puglia. They raised cattle, horses, sheep, and swine, spun wool, and made decorated pottery.

The earliest recognizable tribes of Apulia are known only as names: *Ausoni*, *Chones*, *Morgeti*. Later the *Iapygians* migrated from the north of Italy and settled in Apulia. Subgroups developed within the *Iapygians*: the *Daunians* in northern Apulia and the *Peucetians* in the central region, which was therefore once named *Peucetia*. The Salentine Peninsula was inhabited by another tribe, the *Messapians*. That is why Salento was called *Messapia* by the Greek. In times later the Romans called the *Iapygians* *Apuli* and from this gave the region its name. The Salentine Peninsula and the neighbouring region of Calabria took their titles from Salentine and the Calabrian subgroups which the Romans identified within the Messapian tribe.



These graffiti and similars were found in the caves Romanelli di Castro and grotta dei Cervi in Porto Badisco. Shown is a deer hunting scene with stilized figures. The human being are armed with arrows and dogs, deer fighting, horses put on strap and andromorphic symbols. It is made of ocre painting.

The Mycenaeans founded early colonies in Apulia on the Adriatic as well as on the Ionian shores. Later, in 706 B.C., the city of Taranto, christened by the Greeks, was founded by colonists from Sparta. Its relations with the native tribes were not very good. By this time warfare were recorded against both, the Messapians and Peucetians. In 473 B.C. the Greek *Tarantines* were overwhelmed and slaughtered by the *Ipygains*. A recovery was therefore made and so all major *Iapygain* cities came under an uneasy control of the Greek. Meanwhile, the Romans had become involved in Apulian affairs. In 302 B.C. Rome sided with the *Messapians* against the *Tarantines* and their newest enemy, the Spartan Prince *Cleonymus*. In wars of 326 and 299 B.C., the *Peucetians* were allied with Romans against the Greeks. During that time the Roman army plundered an Apulian town called Murgantia, perhaps the source for naming this area *Murgia*.



This map is supposed to be the oldest found one of the world, discovered in Soleto (Lecce) from the 5th century A.C. It shows Salento meridionale. It is a fragment of a Greek vase from terra cotta. The piece has a size of 5 cm x 2,7 cm and indicates the Adriatic and the Ionian Sea and coastal line and 13 locations: one Greek (Taras-Taranto) and 12 Messapian.



In the year 280 B.C. the death struggle of the Greek colonies began. The Spartan king Pyrrhus of Epirus arrived with troops and Elephants. They defeated the Romans successfully and marched to within 40 miles of Rome. But one year later the Greek troops had to come and aid the Greek colonies in Sicily, where they spent their last resources. Abandoning Sicily with an unsuccessful campaign he was also beaten by the Romans in *Beneventum*. Therefore by 272 B.C. the Greeks were driven to *Tara* and the Romans reigned in all of Apulia.

Two centuries under Roman domination Apulia grew in population and wealth, but on the same time lost gradually its former Eastern flavour, since it adapted to the Romans culture. For the Romans Apulia was the key to eastern trade and expansion. Infrastructurally it was connected by the Via Appia, connecting Rome with the harbour of Brindisi; and the Via Traiana running from Rome through Northern Apulia to Bari harbour. From these two harbours the Romans fleets sailed to Macedonia; Greece, Asia Minor, Syria, and Egypt, the riches from the East were than brought by the two *Vie* up to Rome. Also the Roman times were marked by several civil insurrections and also threat from exterior by Hannibal of Carthage. After Hannibal crossed the Alps and arrived almost in Rome, he and his troops were trapped by the Roman army and had to escape and withdraw in Apulia for the winter. He attempted several times by terrible battles to get the Greek Taras, which he could get, as well as the Roman Capua near Naples, which was constantly besieged by the Romans. In 203 B.C. his troops collapsed finally and Hannibal returned by ship to Carthage. 1





Still today some parts of Puglia look
Greek -like Ostuni.



St. Peter's Church of Otranto. It was erected in the IX century D.C. The characters who of it evidence the nature Greek-bizantina, are the plan to Greek cross and the cupola centers supported them from lucifere small monofore.

right: The Ornamentic of Ostuni Cathedral demonstrate what is Puglia about: the meeting point of Occident and Orient. The Gothic lancet arch and the Islamic rose.

After the eventual fall of the Roman Empire, some northern Barbarian conquerors harassed Apulia. During the Gothic-Byzantine War of 535 to 553 A.D. it came under Byzantine control. During the fights the population was decimated and the countryside ravaged, the little that was left was taken away by Byzantine for its enrichment.

By 590 Longobards were attacking from the north and captured *Apulian* territory. So the Byzantines had to withdraw in the lower part of the *Salentine* Peninsula after the wars of 662 to 669. For many years wars flared sporadically between those two powers. The countryside felt in ruin and there was little navigation on the sea. Those days were the darkest time for Apulia.

By the ninth century outsiders began to join the conflict: German emperors, Dalmatian slave pirates and Saracens. The Saracens took Bari in 840 and Taranto in 843. Ludwig II captured Bari in 871. But four years later the Byzantine recaptured most Apulia from Longobards and Saracens and regained Bari.

During wars with the Langobard prince, the German emperor Otto I and Otto II, the pope, the Saracens, the Byzantine kept somehow control and even established trade ties until in the 11th century when the *Normads* came. Among them Robert Guiscard and his brother Roger I, from the *Hautville*-dynasty became important. They used the confused situation and attacked strategic the Saracen and Byzantine territory –possessions in bad-controlled Southern Italy. Robert Guiscard conquered Apulia and Calabria, in the meanwhile Roger I took Sicily. Their follower Norman Roger II reunited in 1130 those conquests to the Kingdom Sicily one of the best organized and cultural most flowering part of Europe by its time. In fact, the Norman times were very good for Apulia, it continued to grow in wealth, Lecce became the commander of the Norman fleet; the crusade filled Apulia with travellers; and with skills of the Middle East magnificent cathedrals were built.

By the marriage of Konstanze –daughter of Roger II- with Frederick II of





The inner yard of Castel del Monte: The casted shadow of the this inner wall defines the shape of the castles floor plan. It is working like a Gnomon. The different shadow length marked the position of all main elements of the building.

Hohenstaufen, Apulia fell to the dynasty of *Hohenstaufen*. Frederick II was highly well-educated and spoke several languages and was also seen as “the first modern man on throne” (Jacob Burckhardt, Swiss Historian of Art and Culture). By contemporary standards, Frederick was a ruler very much ahead of his time, being an avid patron of science and the arts. Even Frederick II was Holy Roman Emperor of the German Nations he spent a most time in Apulia, being represented by his sons in Germany. Apulia continued to flower: agriculture, art and trade raised; imposing castles were built on many hilltops. The most important castle among them was the octagonal-shaped Castel del Monte in 1240. The octagon is thought to be an intermediate symbol between a square (representing the earth) and a circle (representing the sky). In the recent times a theory came up, which says that the edges indicate the directions towards architecture, which were important for Frederick II like Chartres’ cathedral; and that it is supposed to be also erected in relationship with the Cheops pyramid, indicating the treasure chambers and constructed by using the same dimensions. The Castel di Monte is considered as a combination of Astrology with Architecture, floor plan dimension are depending on the shadow casted by the inner court yard wall. When the sun enters a new zodiac-sign, the shadow of that wall performs another dimensions of floor plan elements from the castle boundary until the fountain wall. This makes the castle a symbol for science and makes it to a huge astronomical calendar.²

Apulia kept on growing until in 1266 control passed to Charles I of Anjou,



Castell del Monte, Frederick II residence castle in Puglia; also on the back of the 1 Euro Cent coin.



ruling from the throne of Naples. Exploitation and declination once again started and Apulias' conditions reached its lowest point in 1442 under the Aragonese kings. They introduced Feudalism and sold the once-rich sea trade off as concessions to Venice, Florence and Genoa.

Around 1480 the Turks started to attack the unhappy region, and - using the warring situation between France and Spain over the Neapolitan throne - they sacked entirety of Apulia.

The French and Spaniards drove out the Turks and did some sacking for there own meanwhile fighting between them. In the end Spain gained the full control in 1503 and sponsored the extension of the Feudalism lasting to 1707 when a Bourbon dynasty was established in Naples. By this time the Apulian region flowered once again. Unfortunately this rising ended already in 1799 by the fall of the Spanish reign and plunging into confused six decades of fighting among French, Spaniards, Royalist, and Italian patriots, which ended with the vote for the Italian unification in 1860. Even then, for a decade afterwards, Royalist brigands continued to keep the region in confusions until they were finally driven out or killed.³

With the opening of the Suez-channel Apulia got again important. Brindisi as transit harbour for the route London-Bombay became a global player by that time. During the Fascist period (1922-1943) the Acquedotto Pugliese which was started in 1905 was completed and Puglia developed as the big wheat-“granary” of Italy developed. The economical build-up Puglias' was driven by the foundation of the “Cassa per il Mezzogiorno” in the 1970ies. As Touristic region Puglia was discovered in the 80ies and enlarged until today.⁴

Puglia today



The intergration of Spanish Baroque in profane architecture.



GIUSEPPE, GROTALGIE:

"IL MIO MOTIVO DELLA VITA? IO CERCO DI NON FARE ALIENATE."



VALENTINA, FARMER:
FARMING IS OUR PASSION!



LUCY, GROTALGIE (44 YEARS OLD):
"DOWN HERE EVERYBODY LOOKS 10 YEARS YOUNGER THAN HE IS. IL SEGRETO: QUI SI STA BENE!"



SIG. APOLLONI, TELEVISION REPORTER:
IN THE LAST YEARS FUSULA DISCOVERED THAT ITS FUTURE IS NOT IN THE INDUSTRY, BUT IN ITS NATURAL ENVIRONMENT: TOURISM, AGRICULTURE AND THE AGRI-TOURISM.



Jul:
"THE PEOPLE ARE SO FRIENDLY OVER HERE. THEY FEEL LUCKY TO
HELP AND SPEAK TO YOU. RANDOM PEOPLE ON THE STREET START
TALKING TO YOU!"



FRANCESCO AND DANIELLE, STUDENTS:
"AFTER UNIVERSITY IT IS HARD TO FIND WORK DOWN HERE. AND
YOUNG PEOPLE HAVE NO WORK FOR A CAREER AND ACADEMIC WORK.
YOU BETTER GO NORTH!"



MASSIMO, BUTCHER:
"ONE OF OUR SPECIALTY, WHICH YOU KNOW THE BARGE
MEAT!"



ANTONIO, PHOTOGRAPHER:
"BUT CUISINE DECORING, BARGE MEAT, FINE IN CAFE, HAVE A
CIDER - THE VERY TASTY!"

2 - Vernacular architecture in Puglia and their construction techniques

Stone constructions have always been determining the Apulian architecture landscape. Archaeological studies discovered many type of stone-made “architecture” long time ago: caves, natural, manmade or combinations of both during the Neolithic times; megalith stone structures, including *dolmens* and *menhirs*; and microlithic stone structures such as the cairn-like *specchie*, a great stone wall dividing once Messapia from Peucetia, serving for military purpose with watchtowers and fortresses constructed in the Iron age; including *capanne*, which are huts with wooden roof and – of course – the *trulli*, the age of those both is difficult to determine.⁵

dry walls

The simplest constructions in the Puglia area had probably been dry walls. Apulia has always been living on agriculture. To benefit from the stony land and to transform the territories to fields it had to be cleaned by single stones lying on the surface. Often stones were left over and just piled up into heaps in the fields.

In later times an expenditure of agricultural land took place. Therefore new farming land was “created”: firstly the little soil layer was displaced, than the lime stone layer slimed by breaking out stone ashlar from the first layer and finally covered with the previous soil and soil carried from other places. After these operations, enough squared material was left over.

Several types of walls were developed with particular characteristics formed by their different functions.

Stone boundary fences:

All over the region one can find those dry stone walls. Some of them look very professional while others just seem casual stone accumulations. Those casual very functional walls resulted often from putting away the loose stone on the fields.

Most dry walls in Puglia are from this kind of casual dry walls.

Poor farmers, who had to focus on growing products used those kinds of



1 - Rests of the Paretone, the great stone wall deviding once Messapia from Peucetia. Standing in the South of Cisternino.



2- A Menhir about 3,5 meters high upright at an ancient crossroad.

simple walls also to define there little peace of land, that is why they are sometimes also called *Muri plebei*. Those walls are mostly quite low, achieving maximum a altitude of 1m.

The more professional walls are also served as status symbols to show wealth and skills. Farmers who were wealthy enough had time to care about more advanced building methods, mostly they employed educated workers for the construction. That is why they are also called *Muri patrici*. They often served as outer boundaries for their property. The used stones were neat blocs from the stone pit or from the mentioned land expenditure. The construction technique was quite simple: the base is composed by two parallel rows, where there were put on the stone layers also in two rows. The battered stone faces of the both rows were put inside and carefully assembled around a loose core of rock fragments, often reaching so a great thickness. The top of the walls was covered with big stone slates to avoid water coming in. Incoming water could destroy the construction since it makes the soft stone porous. Thus they could last very long time, when well maintenance. Maintenance in this case means to cover the walls with the stones in a mode, that rainwater would flow down outside instead of sucking inside and destroying it. Furthermore by this construction mode there could be achieved a higher altitude.

Another type of walls served as levelling walls. Especially in the South Salento and in Northern Puglia (the Sub-Apennian Range) where the land is sloping and even sometimes steep, farmers needed to create terraces to use the land for agriculture. Therefore they used the loose stones or stone blocs to create so-called *Levelling walls* performing terraces which were enclosing little fields with an acceptable gradient. If the altitude to overcome was very high those walls had to be constructed by the mentioned proper construction way.

In general all of those dry wall-types are still build and used for agricultural, but also aesthetical purposes by the Apulian people.

Besides these specific uses the walls also were often built to protect the trees from the wind and, in the coastal places, from the saltiness.



top:

Dry wall closed to Castel del Monte

bottom:

levelling wall



ncurtaturu or curtale

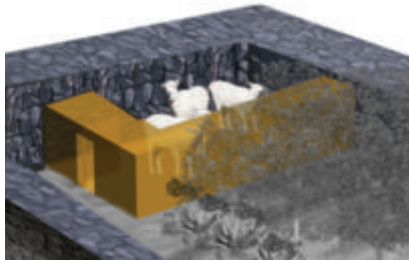
A *ncurtaturu* means in Salentine dialect courtyard, those are rectangular walls enclosing a little yard and inside a stall with a roof cover of wood. It is composed by walls which are protruding towards outside. In contrast to the downer part, where big stone slates or blocs were taken on the top part the stone were whether sharp or little. This system was meant as protection against wolfs and other savage animals. When they would try to climb in the protruding wall was difficult to overcome, moreover those animals would whether injure themselves because of the sharp stones or slip down because of too little stone. Those walls were until 4 m height. Towards the edges the form of the wall resembles to the shape of a boat. Inside there were domestic animal like goats, sheep, and chicken organized in little stalls as well constructed of stonewalls, sometimes also fruit trees and vegetables were planted, little farming for the cropper families' self-supply. Especially towards the Cap of Leuca, Gagliano, Catrignano, Salignano, Patú where the territory just offered little agricultural space this kind of pasturing connected with little farming had been the main activities of the inhabitants.

The *ncurtaturu* with its protruding walls is an all –surround protection against the savage animals and weather.

Sometimes inside propriety boundaries one can find an *ncurtaturu*, as shelter for the animals as well as a *trulli*, as refuge for the farmer family.⁶

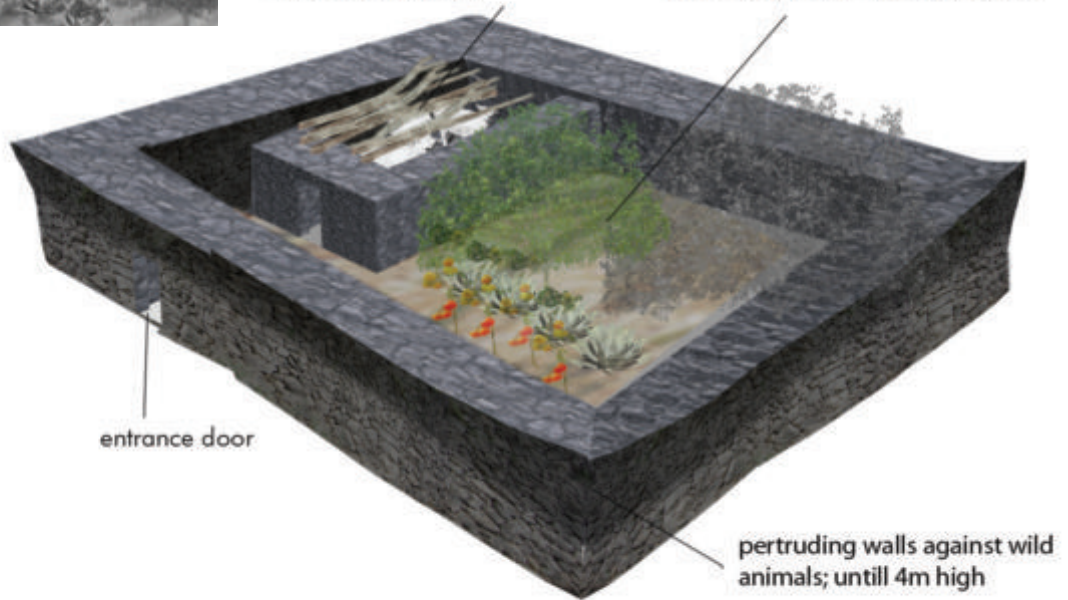
Thanks to pertruding wall, wild animals could not penetrate inside thencurtaturu.

Inside one can find sometimes stoves and other niches for food storage etc.



stall for domestic animals
covered with wood

vegetable garden for farmers'
self-supply: vegetables, fruit trees



entrance door

pertruding walls against wild
animals; untill 4m high



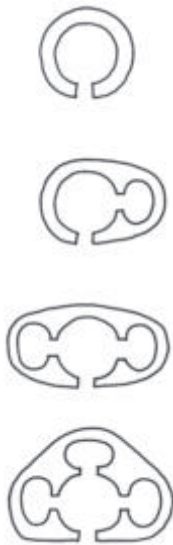
Trulli

Trulli or the older term *capanne* are the traditional Apulian stone refuge with a conical roof. The construction is made in the same way like the one of the dry walls and also without any mortar. The exact origin of the *trullo* form is not clear and has always been a subject for disputations. Shelters that are structurally similar have been found in areas such as Egypt, Mesopotamia, Greece, Dalmatia, Sicily and Sardinia, therefore the concept could have been easily imported from them.

Capanne were generally constructed as *casedde* (refuges) and *pahiari* (barns) and are staying dateless on many fields in Puglia. Just in the Val d'Itria they became permanent houses and got the name *trullo*.

Responsible for the origin and spreading of *trullo*-houses is Gian Girolamo II di Aquaviva, duke of Conversano. His family supported the turnout of the Turks in Ótranto in 1481 and got therefore the fallow Val d'Itria as a gift. Farmers were attracted by low feudal taxes. *Gian Giacomo* (1600–65), also known as “Guerico” (cock-eye) in Puglia, raised the taxes. But on the same time he tried to avoid the taxes imposed for its government. One of those was a tax for mortared dwelling on the land. Therefore the avariciously Guerico gave the order to its subjects to live in the dry-wall-constructed stone refuges. The legend says that in case of an inspection they could be easily demolished. Just by taking off the capstone the whole *trullo* is destroyed and looks like an ordinary stone accumulation. In reality that wouldn't work, since the cone is a false dome, but anyway Gian Giacomo didn't had to pay taxes, since the dwelling of the people were not considered as “houses”.

Practical advantage kept the inhabitants living in the landscape – and climate suitable architecture. The building construction technique didn't changed, just the use of mortar is long ago allowed.⁷



A single typical trullo with round floorplan. An exactly and neat positioning of the stones is required.

Single Trulli were often combined to create bigger space, how the illustration shows.

The *trulli* housed several functions and different forms were developed: Single, crude domes serving as day-shelters for animal herders or field workers, or as sheets for sheep and goats as well as permanent living place. A hay-barn can be recognized by its truncated roof-cone, covered with a flat large, removable stone, through which the straw had been filled in the barn. To allow the farmer

an easy access to this hatch stone, a stairway were built in the wall and the roof.

Slightly more refined were the ones served as seasonal houses, especially used during harvesting time. They were single domes or combinations from two or three domes equipped with *cucine a terra* (open fireplace).

In wine-growing areas the *trulli* were – in addition to a basic home – used for the olive press, equipped with subterranean storage tanks, and an aging room for the annual autumn production of wine.

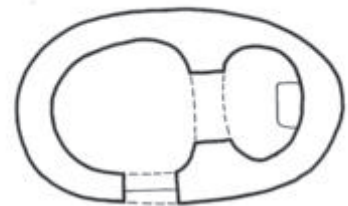
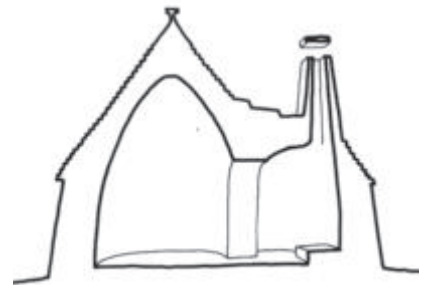
The *trulli* for a year-round use are often larger or more complex. They can be found in towns but also entire farms created by a *trulli* cluster and housing all those features above: hay-barns and animal barns, storehouses, dwelling units for the farmer and its clan. But the sizes of the *trulli* had been never bigger than just sufficient for its required functional space.

Even if the general term for the forms is *trullo* they are called by the Apulians just in Val d'Itria *trullo*. In other areas exists other names: Along the coastal plain they were named *caselle/casedde*; on the Salentine Peninsula they were called whether *pajare* or *chipuri* (which derived from a Greek term with the meaning “Guardian of the field”). The term *trullo* is just used in educated Italian and mostly not used among Apulia, in the Murgian dialect they are called *Trudd*, *truddu* and *truddo*.

There exist several similar hypotheses for the origin of the term *trulli*:

Firstly, it could be based on the Greek *tholos*, which defines this style of vernacular architecture over there. Secondly, the term *thorullos*, which is a cupola of a Palace in Constantinople, where the pope Giustiniano II create a council called *Trullano*. Or thirdly, the Latin term *turris*, which indicates a little tower.

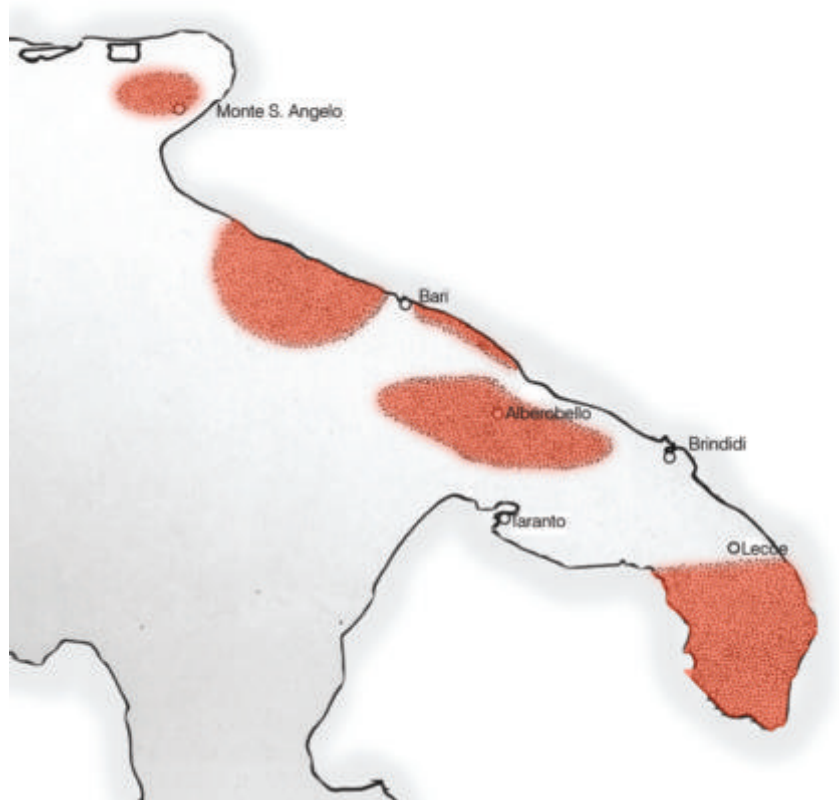
The Greece *tholos* form is well known and its Greek spelling **τρουλλοζ** lends some etymological support to a theory of importation from that country.⁸ But it could have been also invented by the Apulian themselves. This kind of constructions are considered as obvious solution of building a stone shelter since it occurs in any part of the world when there is enough stone as raw material available.⁷



Transitional form of a field shelter trullo. To the main space a smaller one with a fire-place is connected. This kind of shelters were often found joining three or more additional spaces.

Trullo shelters appear as dense forms of settlement in four centres and separate areas of Apulia: the Salentine Peninsula; the Murgia of the *trulli*; the coastal plain around and to the north of Bari; and near Monte Sant'Angelo in the mountains of Gargano. The gaps among these areas can be explained by the discontinuity of the occurrence of suitable stone. Different forms developed with regionally characteristics. Of course there exists many variations.

The *trulli* for permanent living are situated only in *Murgia of the trulli*. In the other three areas they served just as agricultural day shelters, toolsheds, or lodges during harvest time. Of course there are also in other area Trulli, but not in such dense concentration.



Map of Apulia, indicating the Areas of trulli-occurrence.



Trulli form near Monte Sant'Angelo in the mountains of Gargano:

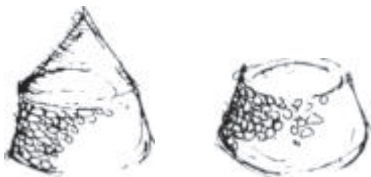
1- A lone trullo positioned between his terraced fields.

2- Since they were mostly for agricultural seasonal use, they were pretty simple and less developed regarding the interior accomodation.

There are just small stone slates available, therefore the roof is often made of tiles.

Trulli forms:

single dome trulli forms of the following type are predominant:



Trulli form of the coastal plain in the north of Bari:



A typical casella in the coastal plain north of Bari is roofed in concentric terraces. Outside stairs allow the use of the terraces for drying of produce. The exterior door lintel is flat made of stone slabs; the interior is corbelled. The four niches, one exterior and three interior, are spanned with corbels. Projecting flat stones form interior shelves.

single dome trulli forms of the following type are predominant:



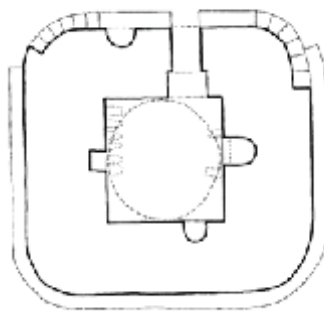


Fig. 1. Plan and section of the structure.

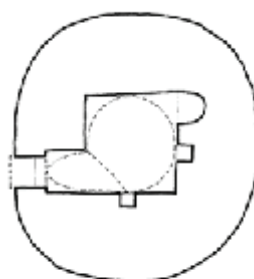
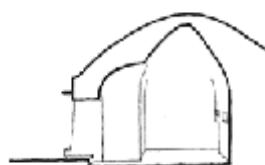
Trulli form of the coastal plain in the south of Bari:

Closed to Castel del Monte on the Northern Murgia occurs a small concentration of trulli. This examples has a unique half-vault over the entrance doorway; the floor is just dirt and not fortified.



single dome trulli forms of the following type are predominant:





Trulli form of Murgia of the trulli:

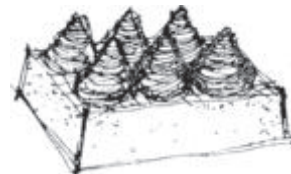
Those trulli were the most developed ones, served often for a year round use.
The city of Alberobello is completely made of trulli.
To extend living space the trulli were connected to big complexes.



single dome trulli forms of the following type are found:



But often combinations with several domes are predominant:





Alberobello - the whole town exist of trulli, connected to big complexes.

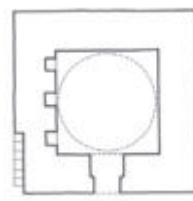
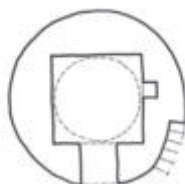
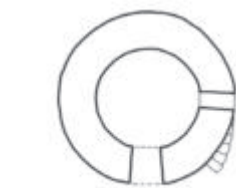


Trullo forms in Salento:

- 1 - Typic Trulli on the Salentine Peninsula have often a truncated cone shape like this pajare with round floor plan inside as well outside and a little window opening.
- 2 - This pajare has an external square one, but still a round internal one. In its wall a niche is insert.
- 3 - A Liame with square plan.

single dome trulli forms of the following type are predominant:





Pajare, Pagghiari, chipuri, furni, furnieddhi, caseddhe, turri, calavaci

Those terms above are all used to describe the Salentine trulli forms. In spoken language there is no clear distinction among them. Dialects differ regionally a lot. One of the terms maybe most used is *Pajara* .

Pajara is the Salentine term for *trullo* and originating from “paje” that means in dialect straw and probable used primarily to store straw.

Chipuri originally is deriving from the Greek language with the meaning “guardian of the field” and refers more to a usage as living place for human beings. *Chipuri* is a very old term.

They were used as temperate or daily refuges and had pyramid or quadratic, truncated conical or truncated pyramid shapes, organized as single or double in the centre of the parcel of land as well as on the boundaries to avoid loosing agricultural land.

They are characteristics of the Salentine Peninsula and testimonial of the once huge farmer society.

Liàme

Another kind of temporal housing or barn can be found in Salento: the *Liame*. Those houses are rectangular. The sidewalls are constructed in the same way like the *trulli*: one layer outside, one layer towards the inside and in the middle a layer of loos material. The difference to the *trulli* is that the roof is not becoming a dome but a barrel vaulting. The use of *tufu* stone which were available in bigger and more flat forms allowed to overdraw greater distances. The term *Liàme* describes a refuge in the countryside with a quadratic or rectangular floor plan and a barrel vault. *Liame* means in Salentine dialect terrace. It could be that this is because those houses offered a bigger terrace, which were especially used to dry the harvested products like figs or tomatoes. To reach the terrace there was always built an outside stair leading to the roof. People mostly used them as seasonal housing or -more common- as barn for storing products. *Liame* can be found in areas where-whether beneath farming or only- vegetables were grown. ⁹



A typic Salentine trullo with big and well accessable terrace. The lower part looks from outside like a Liàme but the roof shape indicates the dome -typic for chipuri. One can also see that all material used for building the shelter was taken from the ground, just the base for the chipuri remained the previous ground level.

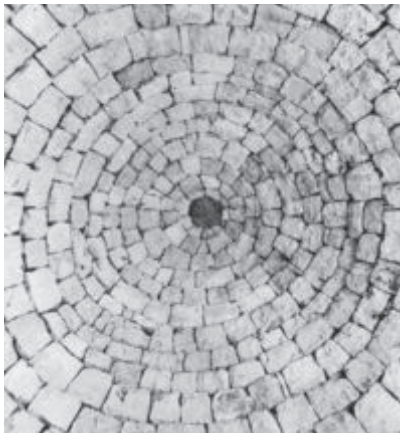


top:

This picture of a demolished trullo shows the wall assembly: 2 layers of stone blocks; inbetween smashed stones; the roof made of shingled chiancarelle.

bottom:

Upward view on the dome inside a devoloped trullo shwos the constructions skills.



Trulli and trulli-shape constructions building techniques

The art of the *trulli* and trulli-shape construction were practised approximately until 1900. From the beginning of the development until this time many changes of the construction mode, forms etc. took place.

One reason for the surviving of these simple constructions was that the inhabitants themselves – a population always closed to their origins- preferred them as living space.

The population has always been rely on the geologically constitution of the earth since they had to use it for agriculture. The raw material had several possible sources: the loose stones from the fields as well as quarried stones. When there was built a rainwater cistern or wine tank and by later times when the expenditure of agriculture land was taking place, there came up enough quarried construction material.

The dry wall architecture of Apulia, especially in Murgia, was built 90 % by chalky stone, sedimentation rock. It gets determining of a carbonic stone having its origins in the Cretaceous, in zones of lower levels like valleys.

Those stones are in the ground covered by around 5m with red clayey earth, originating from the dissolution of those stones itself. The surface of the territory is covered by a fertile soil.

There can be defined two kinds of stones used in the area of Murgia:

The first one has a parallel structure to the stratification plan and with very fine even grain. It is used especially in the area of *Murgia of the trulli*. At the construction of *trulli* it is preferentially used for the cover layer.

The second type composed of organic origin chalky material, often the first type is as well inserted. It is used in the rest of the territory and for its compactness primarily used for the supporting structure.

The walls were constructed stone by stone without tying them together. The more simple ones were directly built on the ground not using any fundament or base. The stone material in the more advanced *trulli* were taken from a hole dig on the place where the *trulli* would be placed. The hole afterwards is used as a cistern. So the *trulli* are self-supplying constructions.^{6a} The more professional

ones were built by the *trullista*: after being supplied by stone he would start to dig until the bedrock. The bedrock would serve as a fundament. If a cistern had been dug it was covered by a lime mortared barrel vault or dome, which often supported the floor of the house.

They were constructed in two layers, an inner plump layer and an exterior layer mostly from neat-squared and un-mortared masonry. In between those a filling of flakes, little stones and soil were put. Discontinued was this structure from time to time with big blocks of stones, crossing both layers. By-and-by the stone blocks became more and more accurately square. Sometimes tiny window openings were left and usually spanned with a lintel stone.

To resolve the problem of creating the cupola there was developed a construction system of protrusion, which means, beginning from a certain height, the size of each stone row was slightly reduced and so the created stone rings becomes tighter by each layer. The tendency of the entire conical construction to collapse inward was resisted by the horizontal arch effect of each ring and by horizontal friction forces between the rings. The pitch of the dome depended on the length of the stones used; longer stones could produce a flatter pitch.

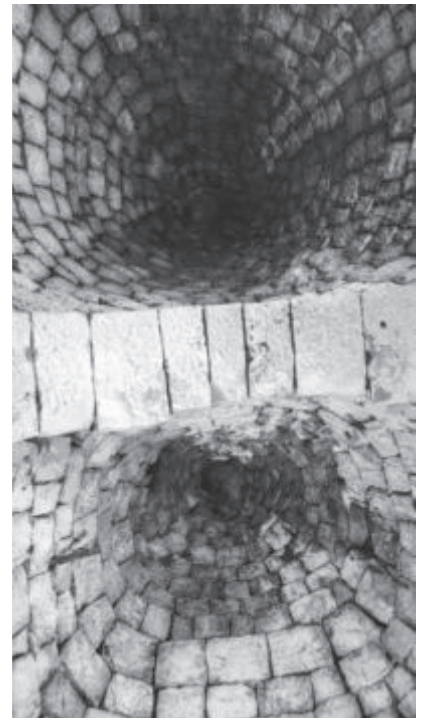
Some of the *trulli* had a square ground plan. In order to help to get the change from square to circle shape and so starting the vault, a pole was erected and plumbed in the exact centre of the room. A knotted cord attached to the pole gave an accurate radius to guide the placement of each stone. In the first rings just the corners of the room were bridged by rings until layer by layer a full circular ring had been achieved.

Those stone rings forming the vault gave the construction a coned shape and formed the cupola. It is considered as a false cupola. The first part of the cone has an inclination of 30° the upper part has an inclination of 60° .¹⁰ Sometimes the capstone was on the same time a decorative pinnacle (*cucurneo* or *tintinule*) in some geometric or symbolic shape. Also on the roof one can find often symbols drawn in white chalk painting. They are whether symbols of the family or have religious origin and purpose. The Apulian people are still quite superstitious. With symbols on the roofs daemons should be impede to enter inside the *trullo*.



Above: The capstone as a decorative element is occurs often in the Murgia of the trulli.

Bottom: Topview of the domes of two connected trulli





above: A detail view of a trullo with square floor plan: the transition from the square floor to the round dome would be started in the corners.

bottom: several niches were include the thick walls. They served as fireplace, as cupboards or as beds.

In the end the construction of the roof was not rain proof. Therefore the constantly inhabit *trulli* had some kind of third cover: the exterior of the cupola was covered by a replenishment of flakes of the same kind of stones and tiles exactly put with an angle of 4° , with a density similar to slates. The tiles are called *chianche* or *chiancarelle*. They were also used to cover the floor finishes. The newer *trulli* there was also put in the second layer instead of stoneflakes mud or dung, so the inner part was denser and kept the inside of the *trullo* drier. The limestone shingles on the roofs of the trulli have weathered to a dark grey and so the roofs easily absorb and re-radiate solar heat, and are universally used for the drying of tomatoes, *fave* beans, figs and other produce. That is also a reason, why to its end the *trullo* was often provided with one or two stairways to access the roof, constructed in the exterior wall.

To avoid growing fauna there was put chalk inside – a method which was already used by the Romans. The same type of stones, like for the construction, were taken and heated up with a high –temperature oven, and so CaCO_3 (carbonate of chalk) was extracted. Normally it was used for the interior and exterior surfaces.

Moreover the white chalk surface helped to bring in some light through reflection from the open door, because the *trulli* had often no windows or very little window openings, since they were not “born” as domestic residences but as simple refuges.

Because of having no window another air circulation system was necessary. Therefore there has been a hole under the entrance door and additionally on the farthest place from the door there was often a fire place in form of an oven for example. The contrast of the warm and cool air zones allows an air exchange.

Inside was often built a gallery called *solaio* or *tavolato* with two or three wooden trunks. This was used as storage and was accessed with a ladder.

Except for the entrance door and lintel, this was the only wood used in the construction.

Thanks to the thickness of the walls it was possible to create niches in the supporting walls for beds or for cooking places. Those niches were spanned with un-mortared barrel vaults, certainly laid up with the aid of wood frame work. By that the constructions stability was not influenced negatively.

There exist two kinds of pavement: one, used for the interior, which is very well worked and smooth is called *pietra viva*; and the other one, more used for the exterior, barns and stalls is rough and non-worked *pietra carparo*.

A problem in this area has always been the sufficient water supply and having water reserves. Therefore a canalisation system conducts the raining water from the roof through the wall to the cistern in the ground.


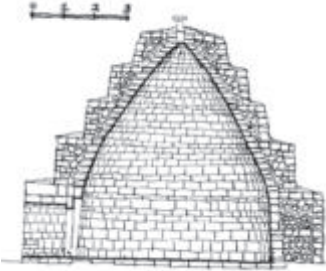



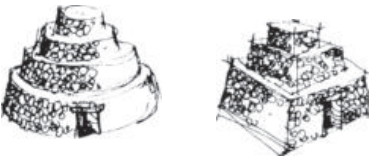


The entrance door mostly is very low in order to protect against weather. In the primitive constructions there is just an architrave supported by two vertical elements. In the more developed and more recently ones the entrance is mostly an arch. The door itself is made by olive timber.

Because of the very thick stone walls and the dome the *trullo* is during the summer pleasantly cool; in contrast to the winter months, when it gets unpleasantly cold. The immense *building mass* of the stone caused condensing the moisture given off by cooking and breathing and making it difficult to feel warm even in front of the fire.


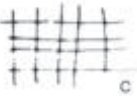


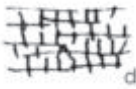

Very old *trulli* are hardly to find. The structure had to be closely fit together from bottom to top, if there had been any damage the *trullo* would be destroyed and a new, more improved one would be erected, since this was more easy than to repair it. The oldest *trulli* shelters in Alberobello date from around 1400. Nevertheless *trullo* constructions can last for very long time, if the maintenance











construction modes of the different types of trulli

Type	A	B	C	D
Section				
Exterior Shape Options - Perspective				

Legend of exterior covers

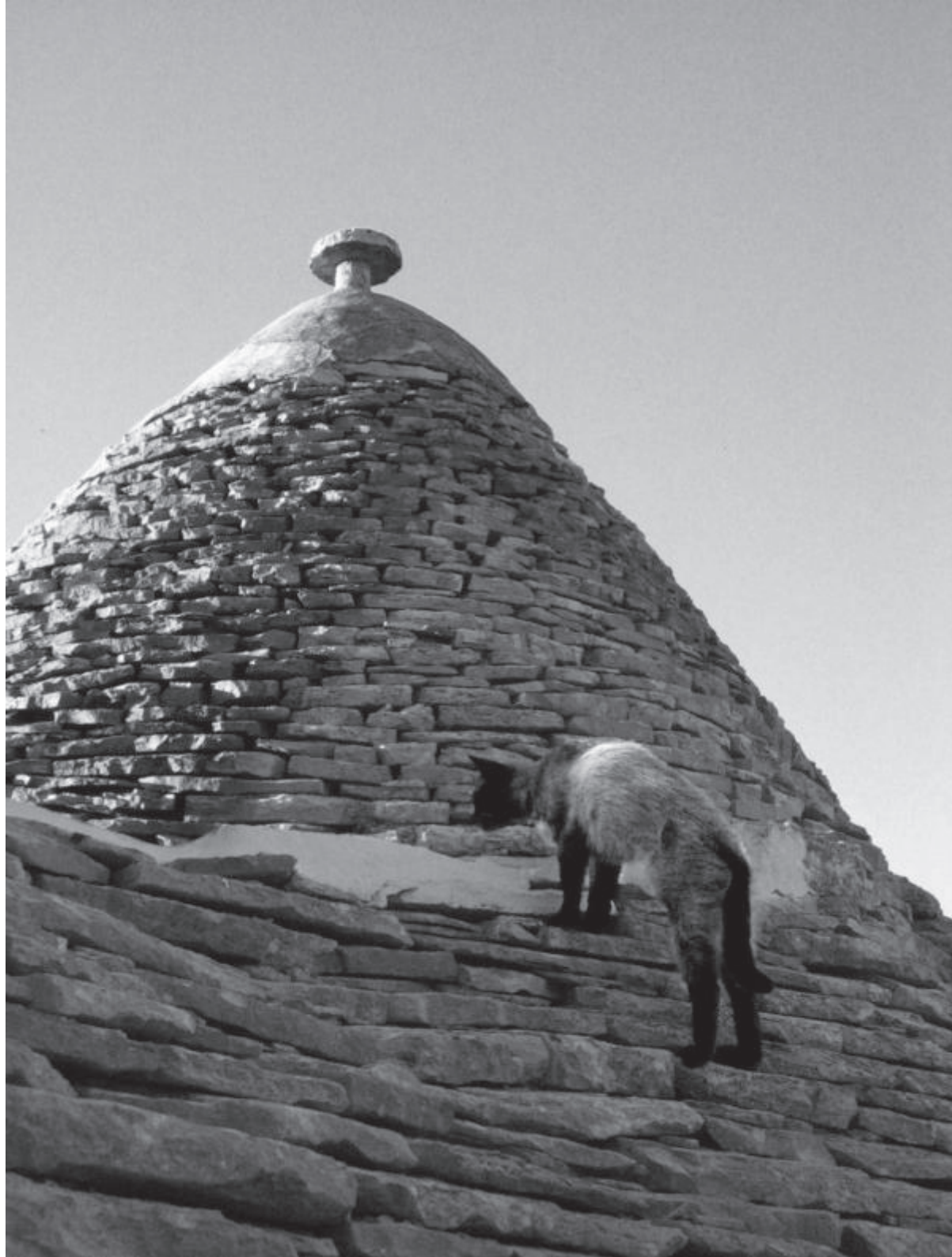
	chianche - tiles		stone plate		rough-worked stone structure
	tufo-plates used like tiles		square tufo stone		plasterwork

E	F	G	H
			
			

is effect well. Maintenance means to avoid water to enter in the construction. In Alberobello the trullo-walls have the white chalk layer for a water repellent effect must be renew from time to time. The tiles on the roof have to be perfectly steep to conduct the water down. The People of Alberobello still live in *trulli*, just ten years ago they felt ashamed of that fact, whereas nowadays they are proud of it. Alberobello is UNESCO world-culture heritage. Today trulli were not anymore built, because they can be seen as monuments.¹⁰

The first ones which can be nevertheless still occasionally found on the Murgia had a structure with thick, low walls, a round floor plan, and no openings except for a low doorway, a *trullo* shelter of a more primitive type. After developing more and more technique the walls became thinner and taller, and often the interior shape became rectangular (eg. the *capanne*). Relatively late innovations in this method of construction were smoke holes, chimneys, fireplaces, alcoves, and windows as well as the practice of joining together two or more domes to form a more complex set of spaces.¹¹





3 - characteristic of the ground in Apulia



Top:

The typical plain landscape of Apulia, at Taranto

Bottom:

The territory of Puglia is widely used for agriculture, especially olive trees are cultivate.

The Apulia region is situated in the eastern part of Southern Italy and comprehends a surface area of approximately 19,500 km². The region is relatively long (350 km) and narrow (60 km), extended from Northwest to Southeast and it is largely opened to the Adriatic and Ionian Sea with a coastal zone of nearly 700 km. Statistically it is supposed by 1% mountains, 45% karst hilly land and 54% fertile plains.

Southwest boundary of Apulia is Apennine Range. Northeast edge is the Adriatic coast. As southern most extremity of the heel of the “Italian boot” the Salentine Peninsula divides the Adriatic Sea from the Ionian Sea and the Gulf of Taranto.¹²

The Apulian foreland is formed by Mesozoic ocean-sediments, which were lifted as big chalkboards when the African and European Plate clashed together but weren't include in the Apennine range folding.

Five physiographic units may be distinguished in the Apulia region. Three of them (Sub-Apennian Dauno, Tavoliere delle Puglie and Gargano) are situated in the North. One river is crossing the middle of Puglia: the Ofanto, which was called Aufidus by the Romans.

In the southeast of the river the *Murge* covers predominantly the Central part of the region, and the Peninsula of Salento is located in the South.

The Murge is a chain of three high, rocky plateaus behind the coastal plains and again divided in three parts: the *Northern Murgia*, the *Murgia of the trulli*, and the *Salentine Murgia* to the south covering parts of the Salentine Peninsula.

The Apulia region is prevalently levelled to slightly sloping, with more than 60% of territory below 200 m above sea level. The high and steep land zones are located only in northeast (Gargano) and northwest (Sub-Apennian Dauno) with several peaks of more than 1,000 m above sea level.

The dominant soils are *Cambisols*, *Luvissols* and *Vertisols*, characterised by cretaceous limestone, marl and clayey to sandy deposits.

Since the Neolithic Puglia has been Agricultural land. After the deforestation during the antiquity and again during the late medieval age the forest area is reduced to 4% whereas the 79% are agricultural land. Instead of oak forests

olive groves are found. The most important agricultural land for production of cereals and vegetables is situated in the Central Northern zone (*Tavoliere delle Puglie*), while olive trees and vineyards dominate Central and Southern parts of the region.

Geologically the ground of this area shows often cavity, where rainwater is collect and directly dip to the earth. Into the ground the water flows very deep and so even rich of nether water the groundwater is very difficult to reach. In its origin the limestone layer of South and Central Puglia was flat and impermeable. Small irregularities in its surface tapped and held pools of rainwater. But the water, slightly acid from carbon dioxide absorbed during its passage through the air, ate away chemically at limestone over a period of many thousand years. Gradually that was forming the shallow basins, where it was seeping out and took its corrosive way through gaps in the stone to produce the slots, fissures and subterranean passage. This left in the landscape (especially in Murgia) distinctive basins, with fissures on their bottom indicated by vegetation; and limestone caves, such as at Putignano and the Castella Grotte. Some of those basins are filled with red soil called bolo, which is a decomposition product from limestone, rich in hydroxides of iron and calcium. The rest of the area is covered with a thin layer of rock-fill organic soil above a limestone bed.

In the more southern part of the *Murgia* – the northern part of Salento were the *Murgian* slopes upward from the flat plain of the shoreline, its limestone-layer is encircled by a deep band of *tufò*, which is an soft stone-like, homogenous sedimentation produced by volcanic debris and mollusc shells. Through its occurrence ravines called *gravine* were eroded. Thanks to its softness it is easy to treat and therefore used in quarried blocks as building material. The *tufò* stone and the lime stone is originally white but exposed to the weather it darkens and hardens.

Due to early springtime, warm summers and humid winters, the landscape in this part is marked by oak forests (*leccete*) and grassland, once managed to grow on the spare soil, and used for hunting and pasturing.



above: Fruits of *Quercia spinosa* - the predominant natural tree in Salento Meridionale forests.

bottom: The Leccete-tree, *Leccio Querico ilex*.

The Salentine landscape in particular, is in general rather plain, except for the most Southern area where characterized by the *Serre*, some small mountain ridges not very elevated, long and with strong subsidence. The highest mountain among them is *S. Eleuterio* 195 m above the sea level.¹³

***Salento Meridionale* – focused on the project**

The *Salento Meridionale*, the down part of the Salento, where there is the project located, is considered as a morphologic quite variable area from gently undulation to markedly undulation and with low flat areas. The altitude varies from sea level to about 140 m above the sea level. The slopes partly are accentuated or even transforming to steep escarpments. But in general the landscape is rather plain, except for the most Southern area. The soil is quite fine and profound; its deepness is limited by chalky rocks, with a very good drainage effect. The grounds' surface is generally not very chalky, but it is becoming so in the deeper parts.

In the *Salento Meridionale* woods of *Quercia spinosa* (*Quercus calliprinos*), belonging to the beech family, are abundant and in prevalence regarding to the *leccete*, woods composed by the *leccio* tree, which are predominating in the rest of Salento. In some parts the *leccete* is even completely substituted by the *Quercia spinosa*.

While the natural scrubs are the same like in the *lecceta* forest Fillirea (*Phillyrea latifolia*), Lentisco (*Pistacia lentiscus*), Alaterno (*Rhamnus alaternus*).

The predominating agricultural plants are olive trees and seldom vegetables crops in the more fertile areas. While in the less fertile parts one can find pastured land, Mediterranean woods and scrubs. In general the *Salento Meridionale* is considered as not very excessively compromised by anthropologic interventions.¹⁴

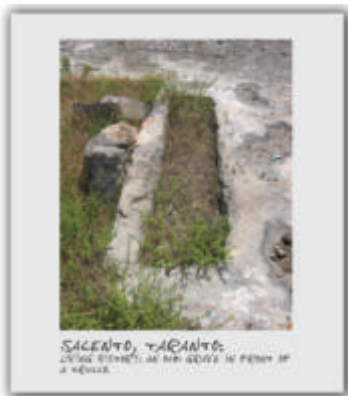
4 - insight on salento

The area of the Italian boot-heel top is defined as the Salentine Peninsula, in vernacular language just called Salento. It is composed by the administrative areas of Brindisi, Lecce and Taranto provinces. Historically it is the area of the ancient *Terra d'Ortonto*. In ancient times it was also called *Salentina* and *Messapia* by the Greek. Geographically it is dividing the Adriatic Sea from the Ionian Sea. It is configured by geographically different zones: the first relief of the *Tarantine Murgia*, the *Tavoliere di Lecce* and the undulation of the *Serre*.

It is considered as a cultural island. The region is actually absolutely different from the rest of Puglia. Salentine dialect is spoken, which is quite different from the *Pugliese* and resembles to Sicilian language in particular to the dialect of Catania. In particular in the centre of Salentine, exist little grecòfone enclaves probably because of medieval migration, populated by people speaking an ethnic group of Greek language, a Neo-Greek known as *greco* or *griko*. In the southern part Arbëreshë enclaves can be found. These were migrated Albanese led by Giorgio Castriota Skanderberg from the 15th century on. They still live their own Albanese culture and speak their proper language. Also in terms of architecture the region is very different to the other parts of Puglia. It is somehow similar to the Greek architectural landscape with its predominating white houses “*a calce*” (chalked) and with a flat roof mainly found in the countryside and along the coast.



In Pogliano al Mare the rivers washed out deep valleys.



The historical centres are characterized on the one hand by Spanish Baroque: characterized by an overabundance of interior paintings and transformation of the churches' or palaces' exteriors into a tapestry. Important for this architecture had been always the use of the local stone *pietra leccese*, tender and adaptable with cold reddish yellow.

On the other hand the territory is defined in art history as „*terra Bizantina per eccellenza*“. For a long time it has been the last stronghold of Byzantine on the Italian territory. Several times it had been recaptured by it after the conquest in 1060 by Robert Guiscard, until in 1156 Byzantine was finally driven out. But nevertheless especially the many Basilica monasteries remained as beacons for Byzantine culture, art and science, being under particular protection by the new emperors, the Normans and the Hohenstaufen dynasty. The continuing influence of the Byzantine art can be proofed by frescos in the caves of eremites as well as in some churches.

In contrast, the rest of Puglia represents a Romanic architecture.

Great parts of Salentine surface is rock. The rock is very soft and easily to remove. Especially during land expediteure the first rock layer was ablated to use the land for agriculture. In this mine stone was dismantled, bad stone was left over and today one can see the diffrence of the levels.



5 - climate and wind

Climate

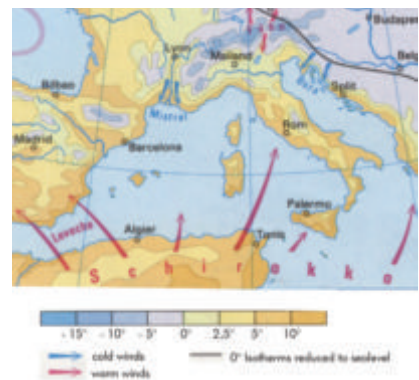
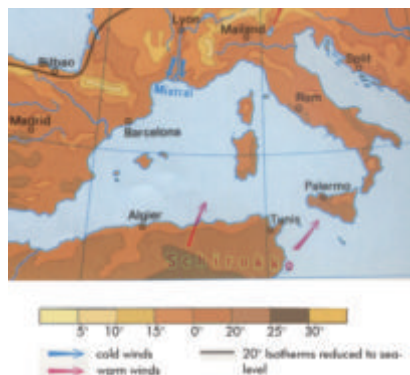
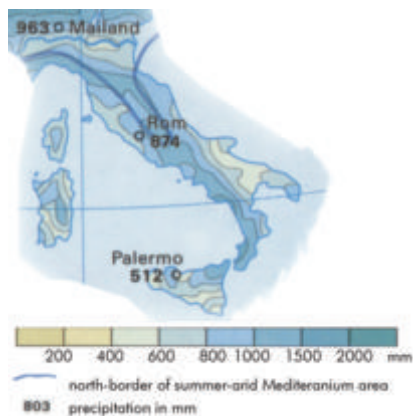
The Apulian climate is mainly of the Mediterranean semi-arid type, characterized by hot and dry summer and moderately cold and rainy winter season.

The territory of the upper Salento also shows pretty the Mediterranean climate, but with mild winters and hot humid summers, because of its quite even morphology and its geographic position in between the Adriatic and the Ionian Sea.

The average winter temperature is around 9 °C while the summer average is around 25 °C. Normally the temperature changes in spring and autumn are low.

The climate is considered as one of the most stable one.

month	Temp. max	Temp. min	Temp. average	Humidity average
	°C	°C	°C	%
January	12,4	5,6	9,0	79,0
February	13,0	5,8	9,4	78,9
March	14,8	7,3	11,1	78,6
April	18,1	9,6	13,9	77,8
May	22,6	13,3	17,9	75,7
June	27,0	17,2	22,1	71,1
July	29,8	19,8	24,8	68,4
August	30,0	20,1	25,1	70,2
September	26,4	17,4	21,9	75,4
October	21,7	13,7	17,7	79,3
November	17,4	10,1	13,7	80,8
December	14,1	7,3	10,7	80,4
Average or sum	20,6	12,3	16,4	76,3



wind

Wind which influence the area are the *Scirocco*, *Tramontana*, and sometimes the *Grecale*.¹⁵

month	Wind speed (m/s) h 5 m	Wind speed (m/s) h 10 m	Relat. sunshine %	precipitation mm
January	5	3,8	0,39	80
February	4,9	3,8	0,4	60
March	4,8	3,7	0,41	70
April	4,2	3,2	0,47	40
May	3,8	2,9	0,54	29
June	3,6	2,8	0,62	21
July	4	3,1	0,72	14
August	3,8	2,9	0,7	21
September	3,7	2,8	0,6	53
October	4,1	3,1	0,49	96
November	4,7	3,6	0,4	109
December	4,9	3,8	0,39	83
Average or sum	4,3	3,3	0,5	676

Footnotes

- 1 History from 218 B.C. through the ninth century is according *Attraverso l'Italia: Puglia*, Milano:Touring Club Italiano, 1967
- 2 Apulias Norman history is according to Carl A. **Willemsen**, *Apulien, Kathedralen und Pastelle; Ein Kunstführer durch das normannisch-staufische Apulien*, Köln: M. DuMont Schauberg, 1973
- 3 From Hohenstaufen rule until vote for unification in 1860 according to *Attraverso l'Italia: Puglia*, Milano:Touring Club Italiano, 1967
- 4 Historical development from the beginning 20th century until today according to Peter **Amann**, *Apulien, Gargano, Salento*, Bielefeld:Verlag Peter Rump GmbH, 2006
- 5 Historical stone construction according to David **Trump**: *Central and Southern Italy before Rome*, London:Thames and Hudson, 1966 and Edward **Allen**, *Stone Shelters*, Cambridge:The Massachusetts Institute of Technology, 1969
- 6 Dry wall types and ncurtaturu accordino to Luigi **Ponzi**, *Monumenti della civiltà contadina del Capo di Leuca*, Galatina:Congedo Editore, 1991
- 7 according to the Trulli-museum director Luca
- 8 Origin of the term *trullo* according to Edward **Allen**, *Stone Shelters*, Cambridge:The Massachusetts Institute of Technology, 1969
- 9 *Liáme, Pajare, Chiupuri* accordino to Antonio **Costantini**, *Guida ai monumenti dell'architettura contadina del Salento*, Congedo Editore, 1996
- 10 roof tiles construction and trulli as monuments today according to the Trulli-museum director Luca
- 11 Construction according to Giorgio **Simoncini**, *Architettura contadina di Puglia. Le forme a trullo*, Roma:Vitali e Ghianda, 1960 and Edward **Allen**, *Stone Shelters*, Cambridge:The Massachusetts Institute of Technology, 1969
- 12 characteristic of the ground according to Peter **Amann**, *Apulien, Gargano, Salento*, Bielefeld:Verlag Peter Rump GmbH, 2006
- 13 Subdivisions of the regions *Attraverso l'Italia: Puglia*, Milano:Touring Club Italiano, 1967

- 14 Vegetation of Salento meridionale, Climate and wind according to
Istituto Agronomico Mediterraneo di Bari



- 1 – Locatiopn of the project
- 2 – Project site
- 3 – Project scope

Spazio per la pausa III

1 - Location of the project

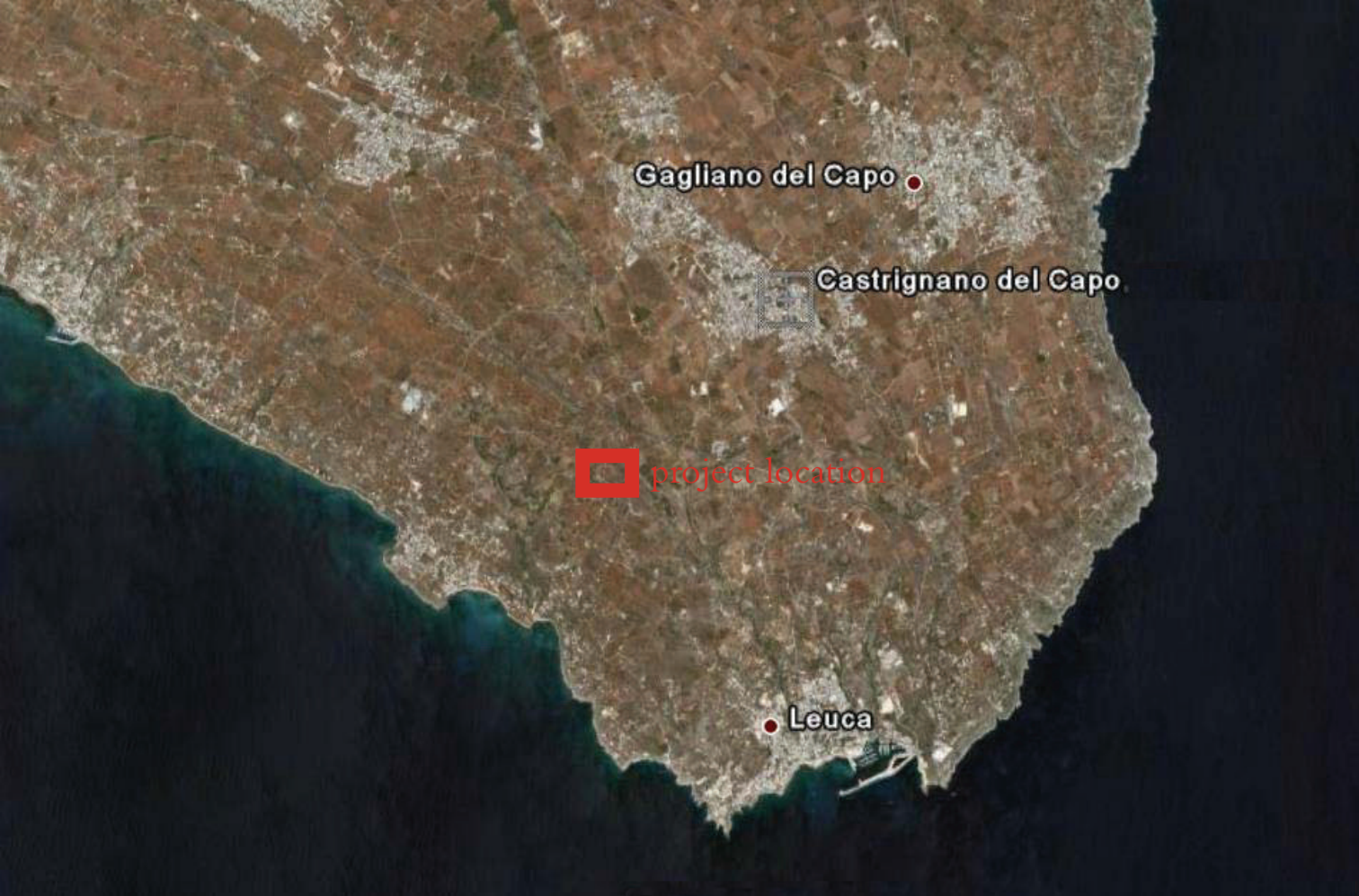
The project is located in the commune of Castrignano del Capo. Castrignano del Capo is located between the Serra di Vereto and the Adriatic coast, 68 km from Lecce, 42 km from Gallipoli and 3 km away from Leuca. The place has already been inhabited in the Paleolithic, proofed through the fossils found in the caves *del Diavolo*, *Tre Porte*, *Titti* and *Cala dell'Elefante*.

Castrignano developed itself around a fort, which was built in order to defend against the Barbarian. By 1456 it was destroyed by an earthquake, but in 1557 it was rebuilt.

First getting feudal property of the Conti de Alneto della Ratta in 1280, it belonged afterwards by and by to the *de Caniano*, *Pignatelli*, *Bilitta*, *Ayerbo*, *della Gatta*, *della Barliera*, *de Frisis* and *Fabrizio Guarini*, to the *die Balzo*, *Di Capua*, *Gonzaga*, *Brayda* and in the end became property of Aragona.

Today the commune has a population of 5.588 Inhabitants and a surface of 20,36 km².

The estate is located around 0.6 km in the south of the *Strada Statale* N° 274 and is infrastructural by it indirectly connected. Access on it provides an entrance by the local street as well as a *servitù di passaggio* (right-of-way) through the neighbours' territory.



Satellite view on the projects area, between Capo Santa Maria di Leuca and Castrignano di Capo.

2- The project site

Located three km to the south of Castrigno del Capo village, the projects' territory was once used for little farming and pasturing purpose. Dry walls and olive trees mark the area. Two bigger dry walls are enclosing the territory: one in the north of the estate, in which centre an *ncurtaturu* is located. The other dry wall is the boundary of the south part and looks like a former extension of the first dry wall boundary; probable it was bought afterwards and so added to the estate. On the parcels' south border, insert in the boundary dry wall a *trullo* is situated.



The project area with views.



3- The project scope

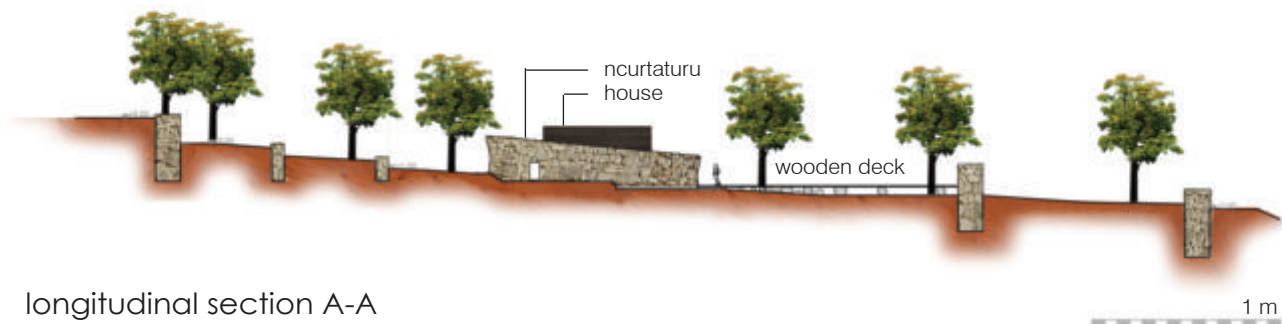
Claudio Silvestrin and Giuliana Salmaso designed their own residence , to be used as a place to recharge, to design, to read, to write and to think in a quiet and inspirational environment. The intention is to use the house one week per month.

They choose the site because of its location, imbedded in the hills and facing the sea and for the beauty of the colours –the red soil and the green of the olive trees. Moreover they are fascinated by the unique and powerful architecture of the ncurtaturu.

They developed the house itself inside the old ncurtaturu. This creates a symbiosis of both –vernacular and contemporary architecture. The insert house will be slightly taller than the ncurtaturu. It will be made of wooden light structure in greyish wood.

In the south of the territory there will be also a guesthouse, which provides place for guests and the children.

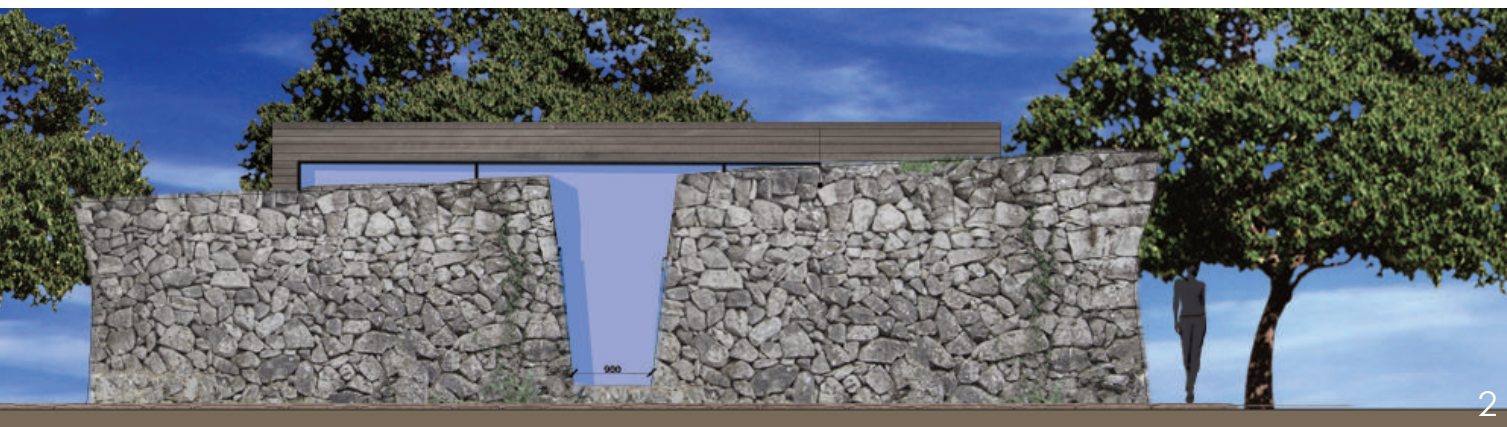
The entrance of the site is in the northwest, where also a car parking place is foreseen. A pedestrian path is leading through the olive trees to a wooden deck attached on the south side of the ncurtaturu. The access to the house is by the deck.



The design concept is, to leave the territory in its own “savage beauty” and the garden with its walls and stones is almost not going to be influenced.



site plan





1 elevation north-west

2 elevation north east

3 elevation south-east

4 elevation south west with open windows

5 elevation south west with closed windows

1 meter



{7 episodes}

IV

Implementation of brand identity through
Poetic Episodes

The garden was chosen to manifest the “brands” identity.
The garden marks a metaphor for nature and essential.
Seven Episodes explain the territory existence and the brand consistence.
A path made of stone slabs connects the episodes. Each location of the Episode marks a different aspect of the territories beauty and characteristics, symbolized in natural elements.
Those elements are connected with the “elements” of the brands identity.
The Seven Episodes shows the relation of the two personalities with the area as well as they state the sites’ creation and the brands values.

This area in Italy has been always influenced by the Orient, since it was occupied by the Byzantine and connected through its harbours with the Oriental world. That is why it is considered as the “meeting point” of western and eastern culture.

To reflect this relationship with the Far East, I decided to mix two natural Elements models: The western Element Model (fire-water-sand-air) and the Asian (Chinese) Model (metal-water-wood-fire-earth).
Also the brand personality shows this “meeting”. Even they have western roots they are strong involved in the spiritual and cultural side of eastern culture, for example on there own website the use the Chinese-Five-Elements Model.





episode I

element metal



The first Episode is located by the entrance of the property.

For Giuliana Salmaso and Claudio Silvestrin natural light is very fundamental and they consider it as “5th Element”. As well astronomy in architecture takes an important place within their projects.

That is why I decided to dedicate the first episode on those two points: natural light and astronomy.

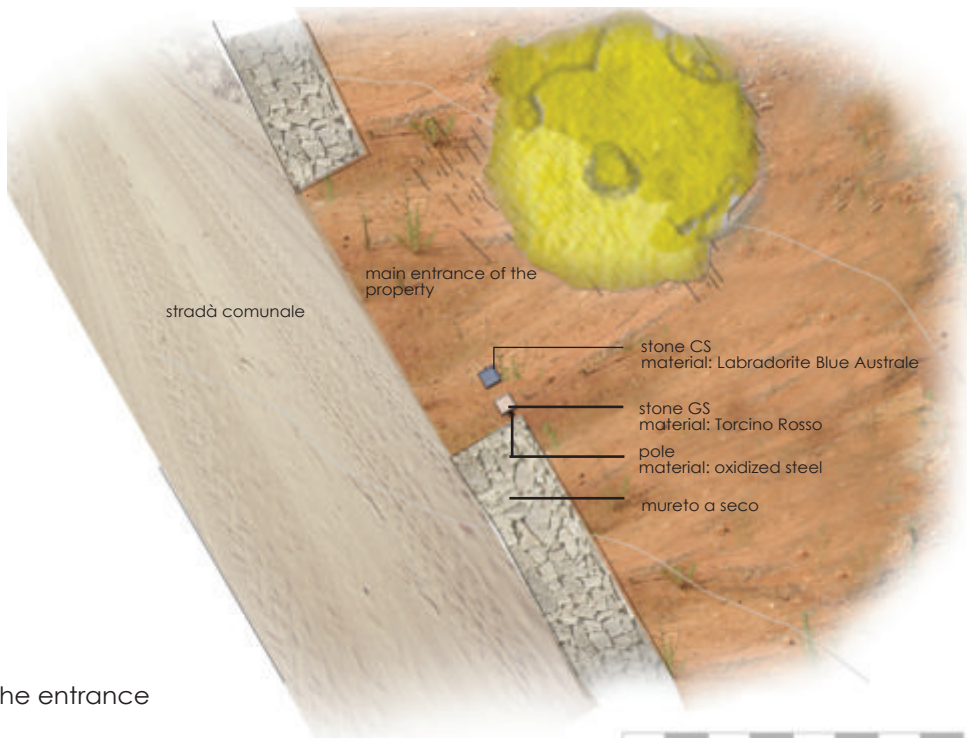
In researching those aspects I found their connection in gnomonic – time measurement by calculating shadow cast. It is the oldest of the sciences and the most ancient measurement method, which were amongst others used by the Egypt to construct the pyramids.

The episode is composed of two stones and a pole.

On the birthday of Giuliana Salmaso the cast shadow of the pole will cover exactly the first stone, on which are written the initials GS. Beneath there astronomic meaning they are also meant to serve as name plate.

The second stone is covered by the poles’ shadow on the birthday of Claudio Silvestrin. On this stone the initials CS are written.

The calculation of the shadow cast I based on Vitruv’s Analemma. Where he describes the method in his 9th book of Architecture (accomplished in 22 BC).



plan of the entrance

Materials: One stone is from polished Torcino Rosso, the other one from polished Labradorite Blue Australe. The pole is made of oxidized steel. The pole underlines the metal element, which is characteristic for the area. The soil of the area is red caused by a high iron concentration, also iron particles can be found.

The stones are a metaphor for birthdays and existence. Both personalities have “their” own stone.

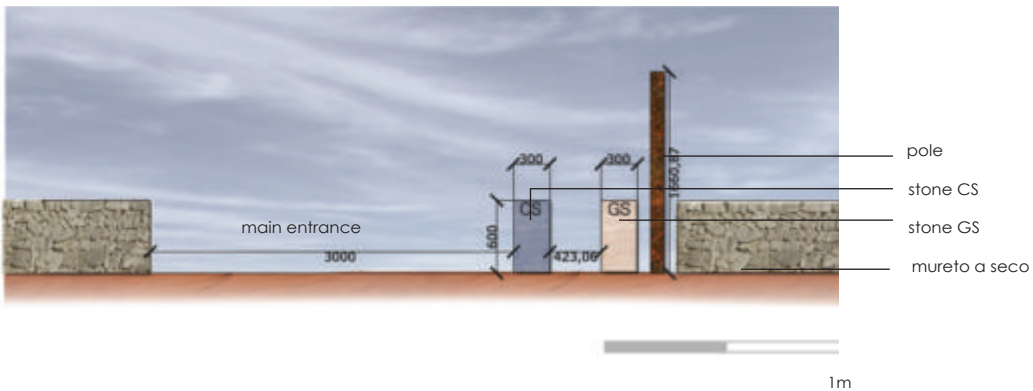
In Castel del Monte, in Puglia Federico Svevo used the same method for defining the dimensions of the castles’ floor plan.



shadow cast on the 9th of November



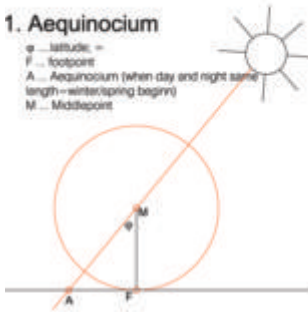
shadow cast on the 5th of September



elevation of the entrance

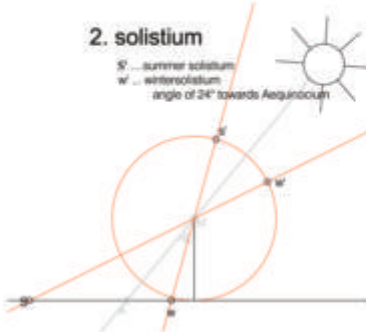
1. Aequinocium

e ... latitude =
F ... footpoint
A ... Aequinocium (when day and night same
length - winter/spring beginn)
M ... Midpoint



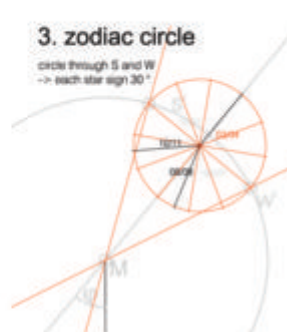
2. solistium

S' ... summer solistium
W' ... wintersolistium
angle of 24° towards Aequinocium



3. zodiac circle

circle through S and W
→ each star sign 30°



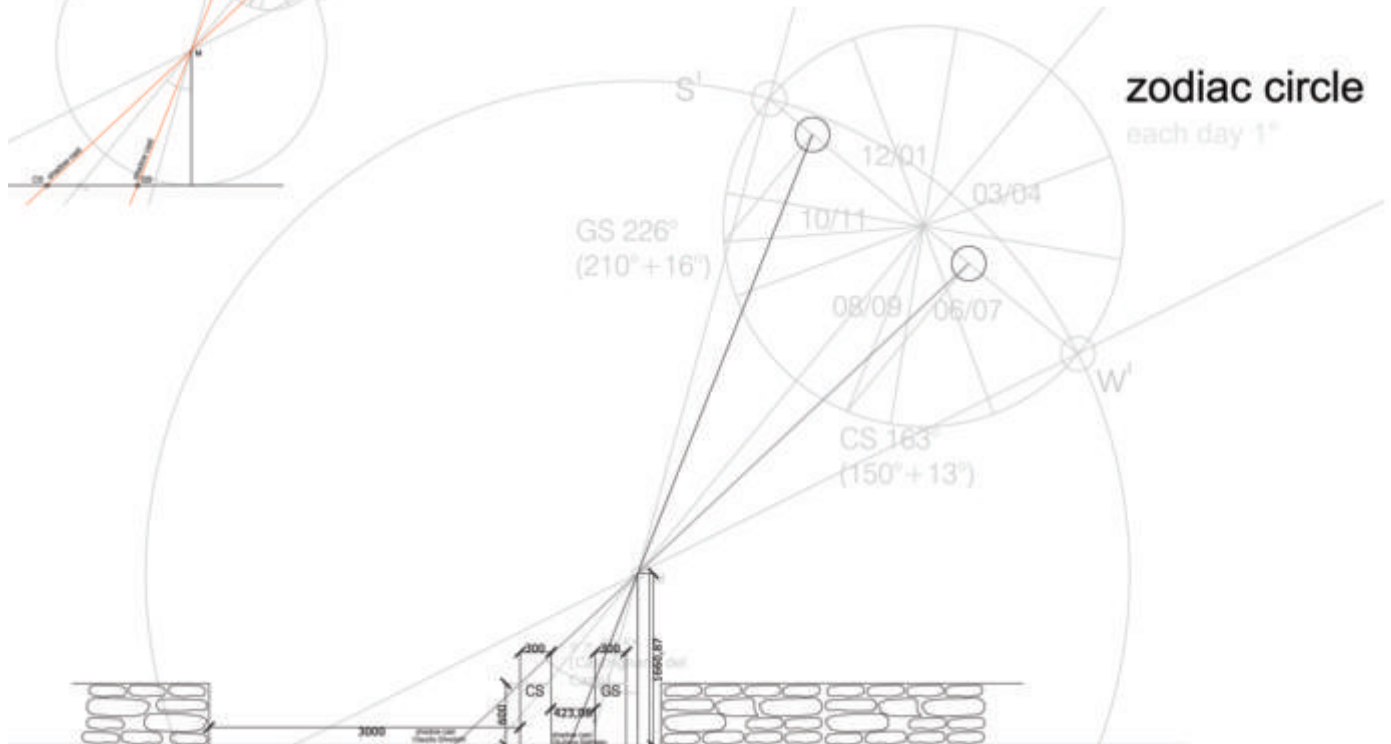
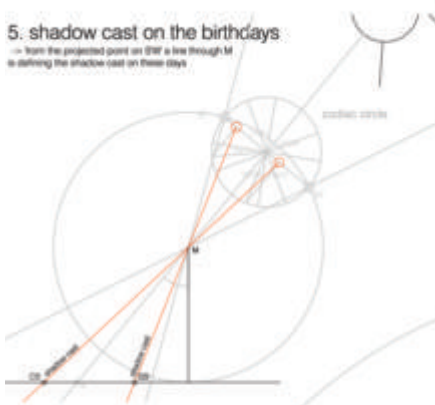
4. projection on zodiac

birthdays: 05/09 and 08/11 for each day one degree in the
projection orthogonal on SW (line parallel to MA)



5. shadow cast on the birthdays

→ from the projected point on SW a line through M
is defining the shadow cast on these days





episode 2

element water



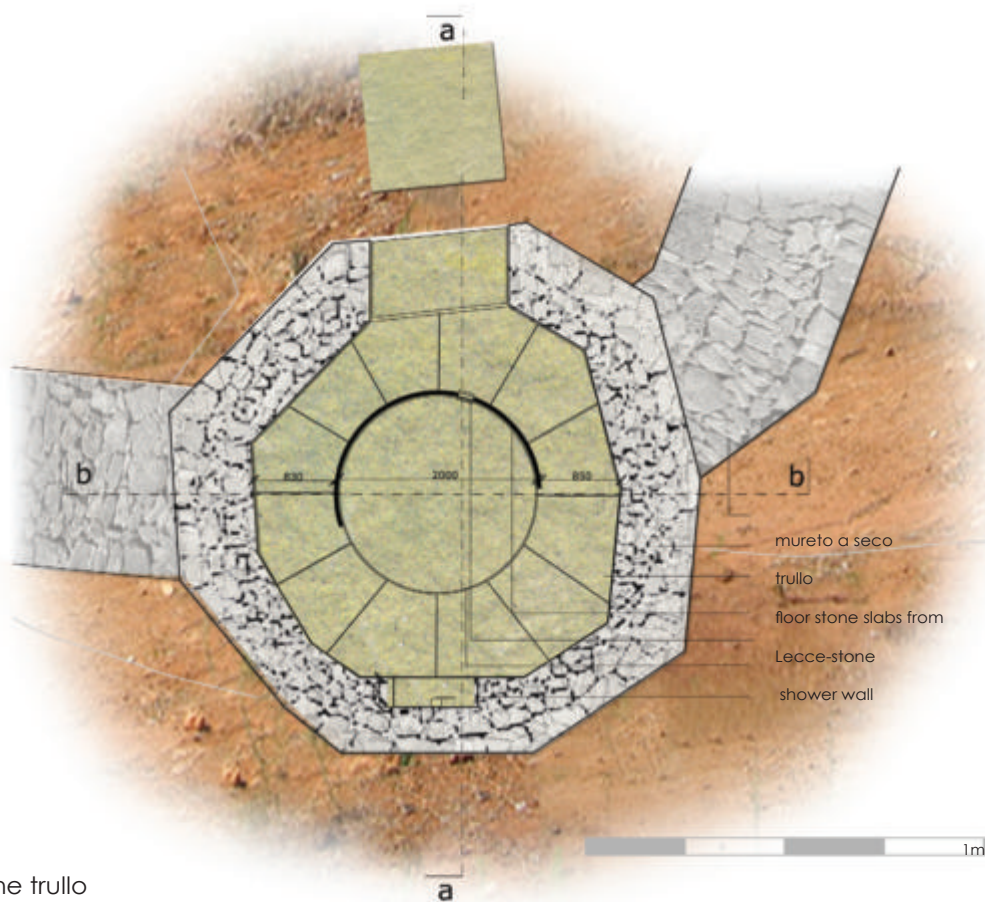
On the boundary of the territory there is an old Trullo. A basic concept of the projects ideas has always been the integration and harmony with the vernacular architecture. This relation – the respect of architectural history – can be found also in many other projects. Both of them enjoy a lot showering –a form of relaxation

Those are the reasons for the decision of using the Trullo as a shower.

To protect visually the person who is showering I designed a translucent object serving as an optical protection wall and for giving sense of privacy when inside the trullo. A band on top of the object that transforms itself to a niche provides space for shower accessories and outside hooks to hang on clothes and towels.

Materials: The object is made of stacked float glass stripes. With its layered structure it adopts the structure of the trullo. It lets light going through and hinders the view inside.

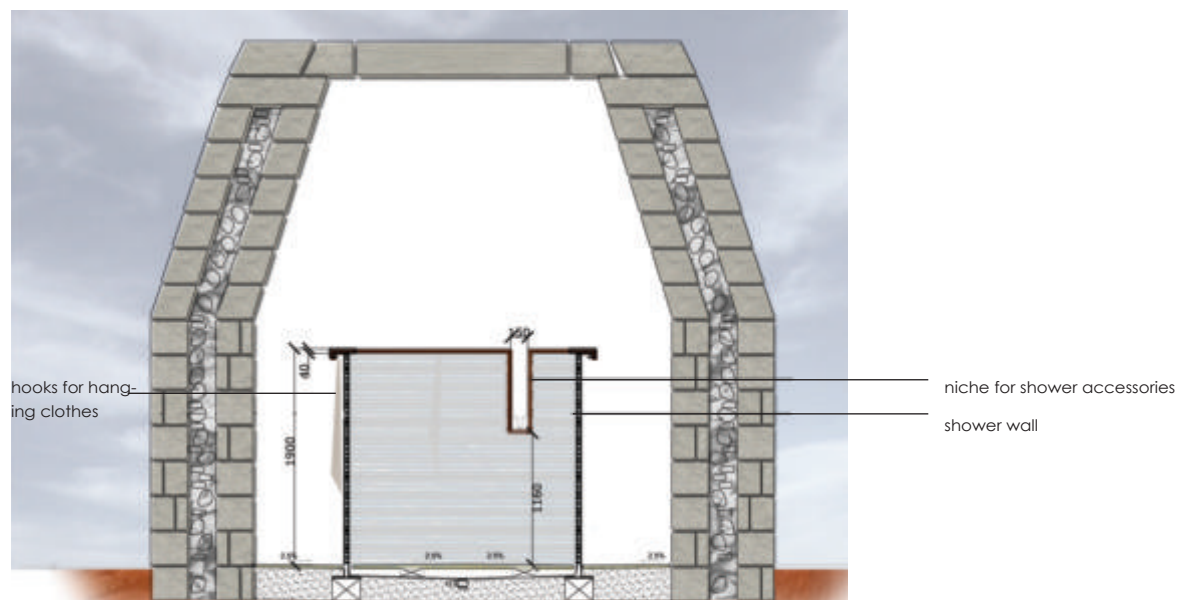
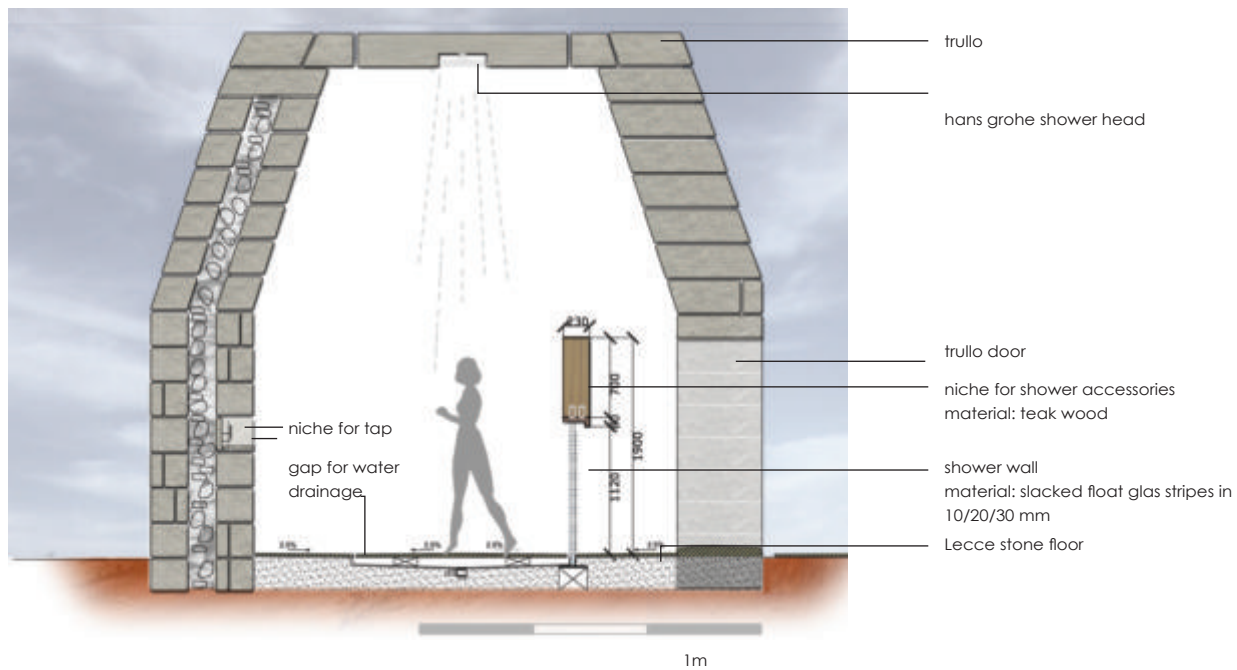
The band is made of teak wood. The wood is highly water resistant and an elegant material.



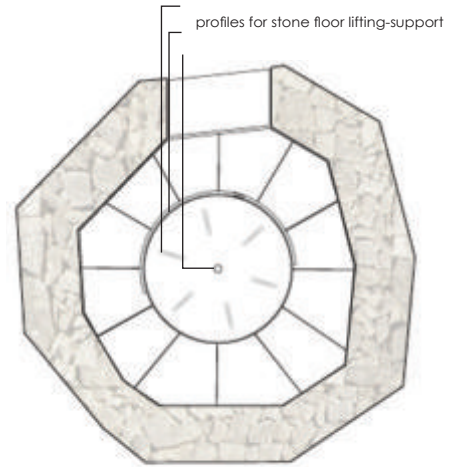
This location on the territory is closed to the sea – to the water. Also Trulli were built with a cistern and water conducting elements and served so for water collection.

“She is like water and movement, he the earth and stability; together they compose a renew vigour” was said by Roberta Simone in In Design.

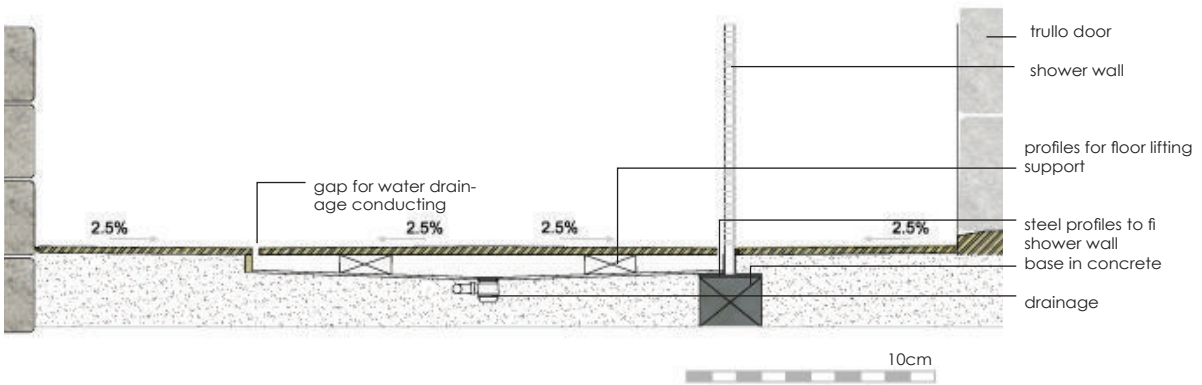
This episode is dedicated to the water and united with the contrast – the wall as stable element.



section b-b



floor lifting support
plan



floor details



episode 3

element water



The third episode is located in a stone field on the Southern boundaries of the territory. It is a pavilion for doing yoga. The floor plan is a square of 3,30m x3,30m. The square includes also 2 stone steps for entering the pavilion.

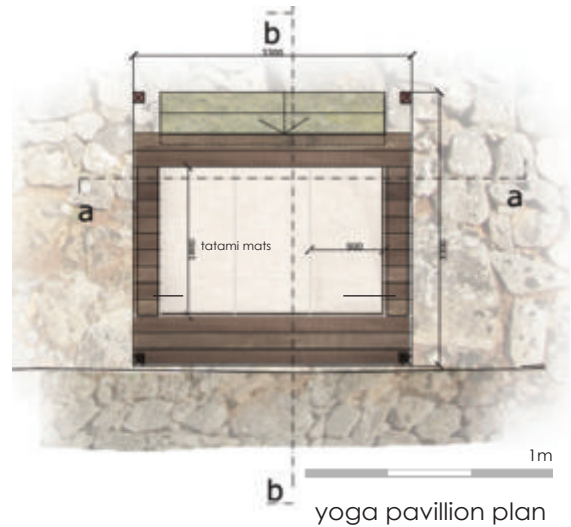
The pavilion is lifted up half a meter. In front of it there is a dry wall. The dry wall is hiding the view towards the new built houses, which are spoiling the landscape. With the lift of the pavilions the persons on it will see in sitting position the sky and in standing position just the sea, and not the neighbour houses.

The height of 2,70m provides sufficient space to perform the yoga exercises. Four columns support the roof-frame. Inside the pavilion there are three tatami mats (1,8m x0,9m).

To protect from the strong sun there is a curtain on the roof and on the west and east side, the sides-membranes are adjustable individually according to the angle of the sun. The adjustment-system is working manually via pulling a ribbon. The structure of the ribbons on the membrane is creating a structure with ken dimension, which is a dimension in eastern cultures- a module with side a width-to-height ratio of 2:3.



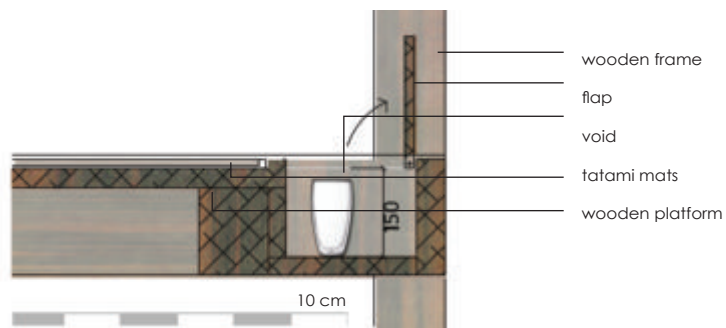
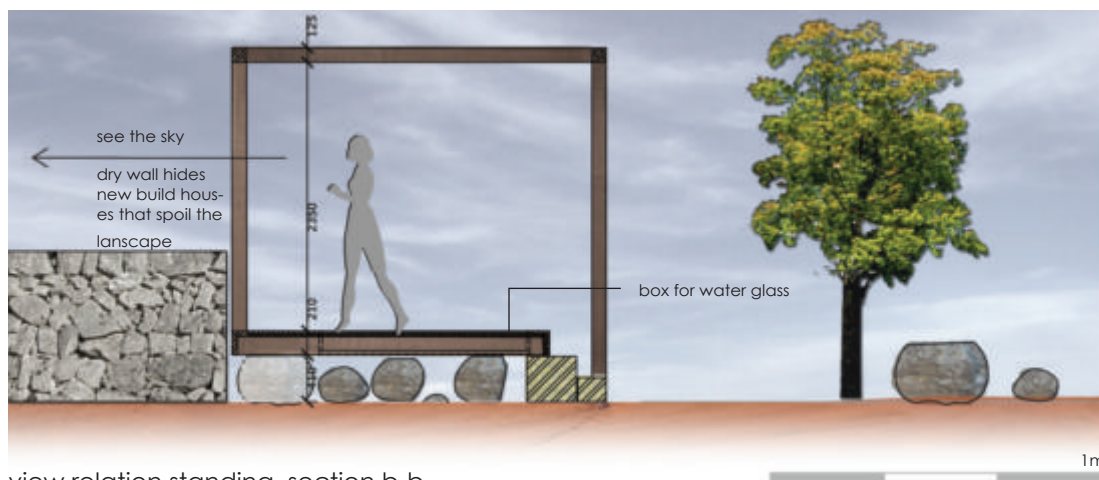
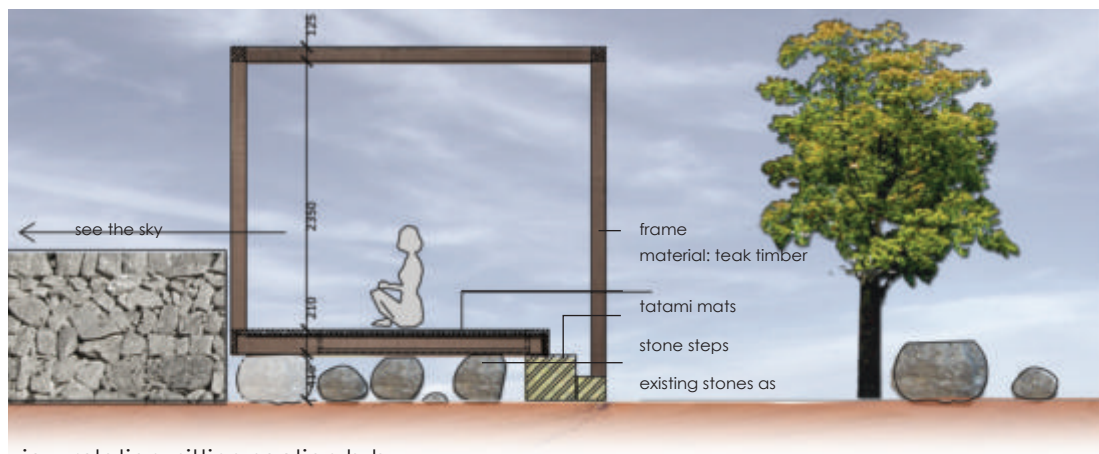
stonefield plan



yoga pavillion plan

Materials: The pavillion is made of teak wood, as an elegant and precious material. The curtain is made of texyloop a sustainable material (hemp fibres).

The stone field is metaphor for the stability of stone and earth. In contrary there is put the flowing of the yoga-performance.

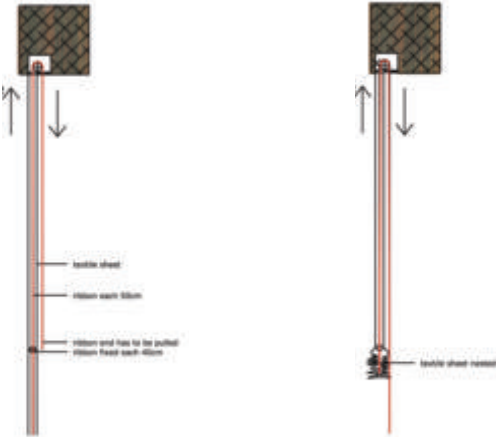
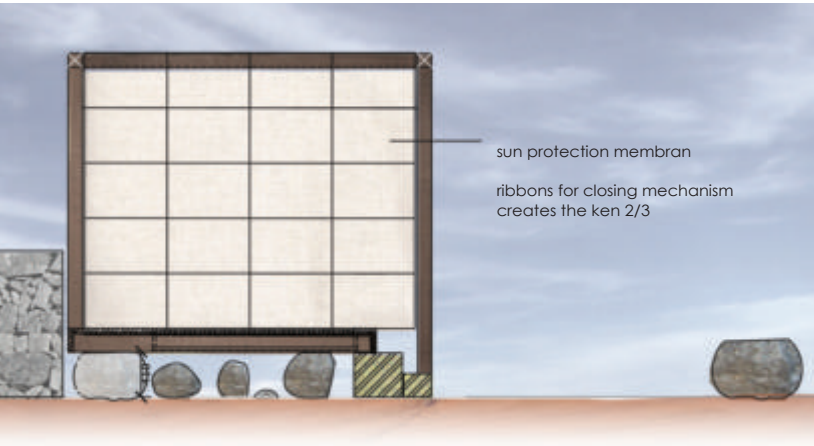




yoga pavillion with open sun protection



yoga pavillion with closed sun protection



closed sun protection

mechanism to open sun protection





episode 4

element air



The fourth episode is placed on the point of the territory where it is possible to have the largest view towards the sea.

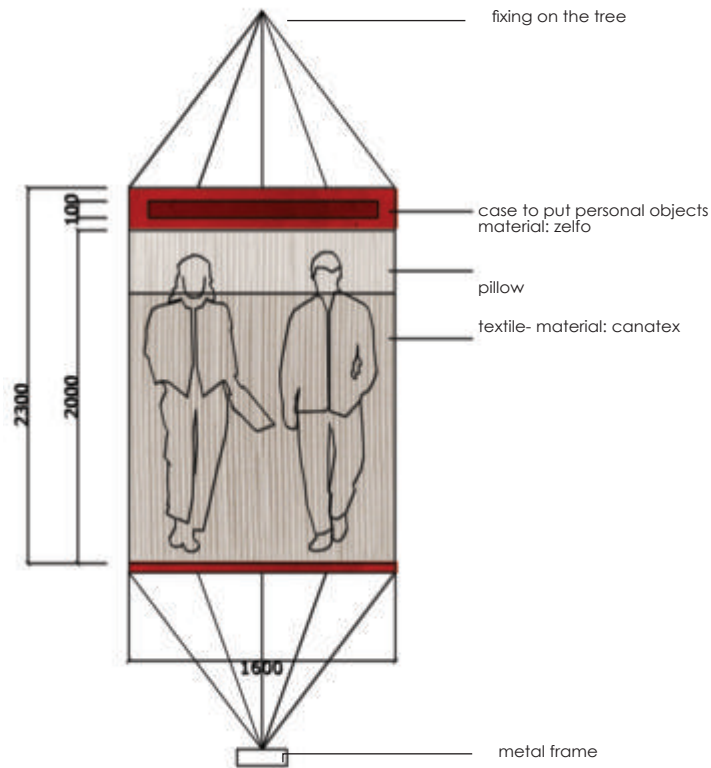
Therefore I decided to underline this feeling of wideness and being “detached” with the design of a hammock. This hammock is made for two persons. It is meant to contemplate and enjoy the view of this place.

The hammock is made for two persons. On the top of the hammock there is a box for putting personal objects.

The hammock is fixed on one end on the tree; the other end is fixed on a metal frame. The metal frame is slightly lifted from the ground and therefore seems to float. An LED lighting insert in the metal frame allows accomplishing the location during the night and to invite to use the hammock also during the night to gaze on the stars.

Materials: The metal frame consists of pre-rusted steel, which reminds the colour and materiality of the territories’ red soil.

The textile parts of the hammock is made of Canatex a new eco-friendly material made by coating a blend of natural fibres with hemp reinforced PVC. Beneath being sustainable, it is water resistant and durable.



hammock top view

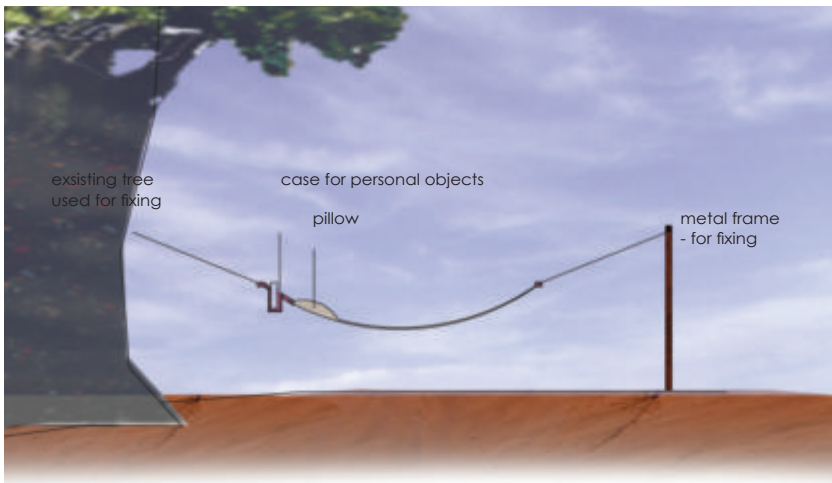
The stable parts of the hammock are made of Zelfo, a biodegradable material with an attractive patina made from cellulose.

The materials are chosen among the sustainable guidelines, since this is an important aspect in the life of Giuliana and Claudio.

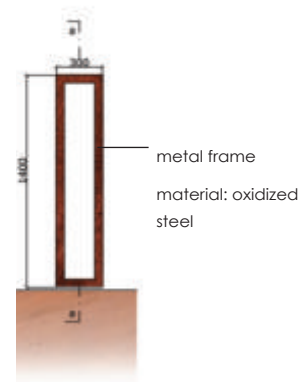
Being a metaphor for open view, wide and freedom; the Episodes' location is dedicated to the Air Element and "breath". With the new meaning and design of the hammock it becomes a place of contemplation – an occupation Giuliana and Claudio are longing for on the "new" place.



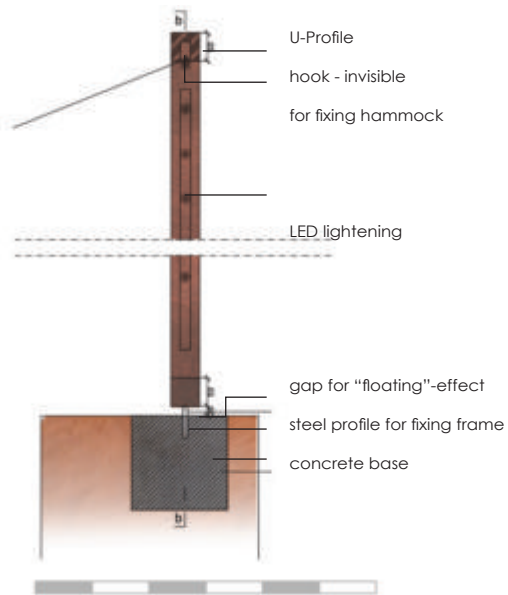
perspective hammock



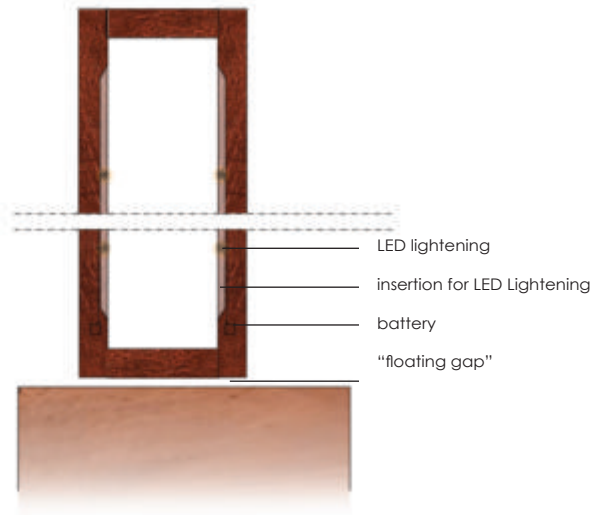
hammock section



frame elevation



section a-a frame



section b-b frame



episode 5

element wood



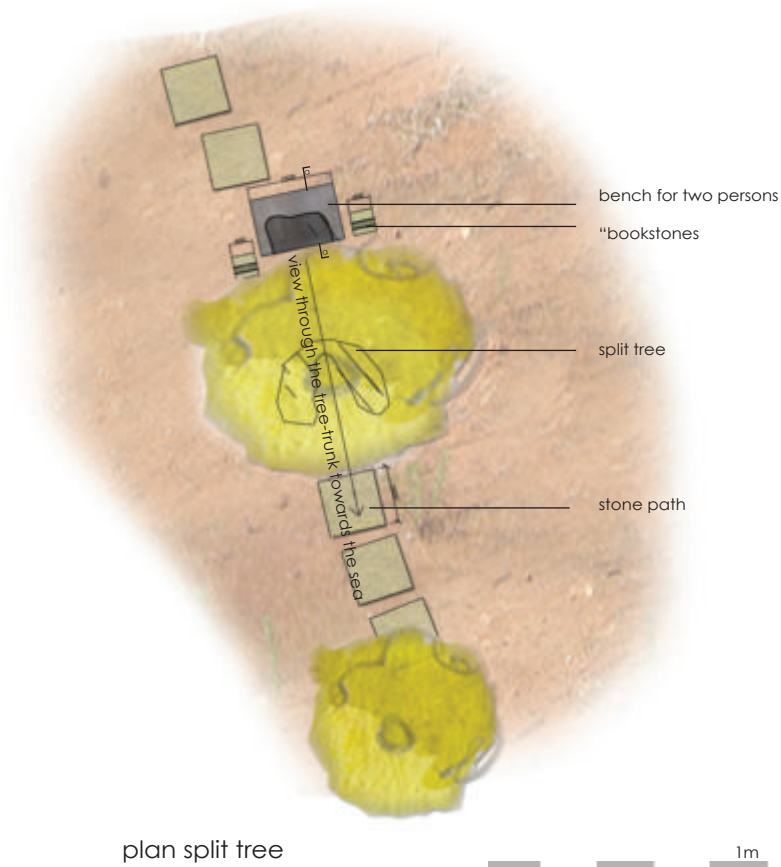
On the site there is found a very noticeable tree. This tree has a split trunk but unites itself again on the crown.

The stone path leads through the arc made by the trunk and on the other side there is a bench and two “bookstones”.

Sitting on the bench the view is automatically directed through the split trunk towards the sea. This place is meant to be for reading. The bench with its shape visually seems to be part of the path. It provides place for two persons. It is manufactured in a special way: a metal-grid pre-formed according to Claudio's and Giuliana's bodies is inserted in a base made out of concrete. After that this metal grid is covered by concrete, so the shape solidified. In the end the concrete will be polished. So each seat is individually made for each person.

The seats will be warmed up by the sun and the tree spends shadow.

The book stone has a slot for inserting a book opened at the page someone is reading. This is designed in order not to lose the current page and also taking in consideration the strong mind at the area.

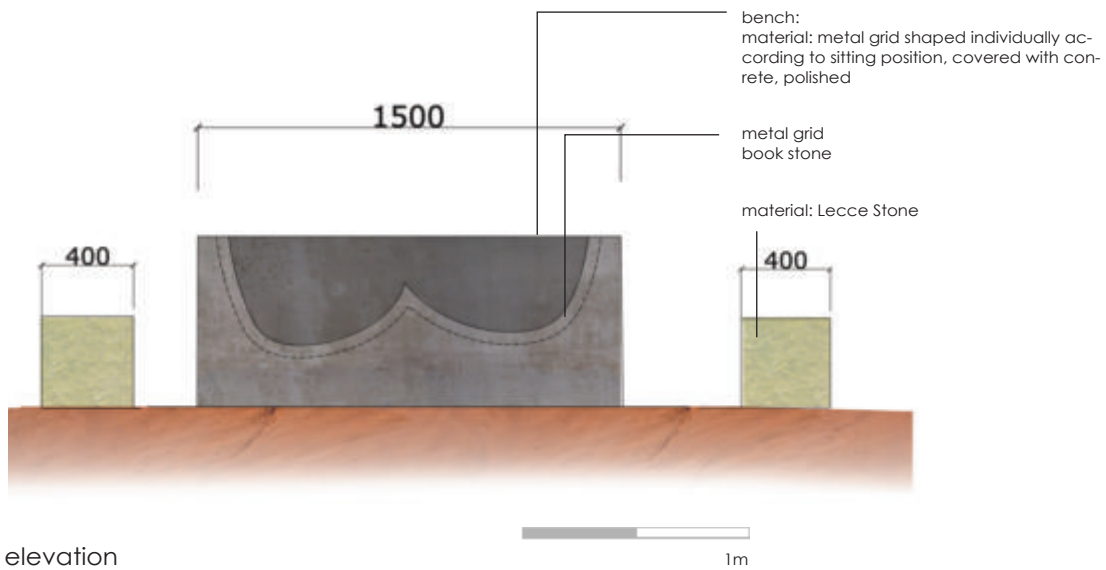


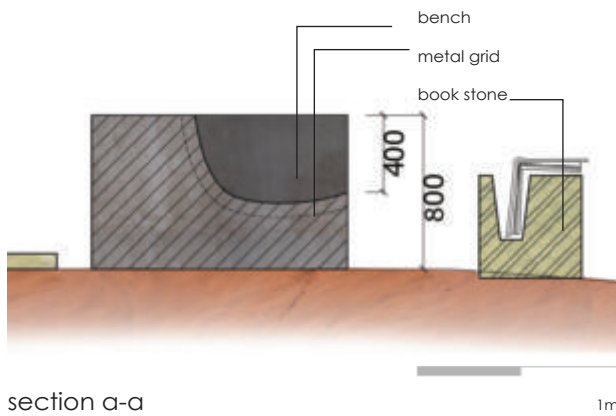
Materials: The bench is made of polished concrete. Concrete is a liquid material which can perform the individual shapes.

The "bookstones" are made of Lecce stone.

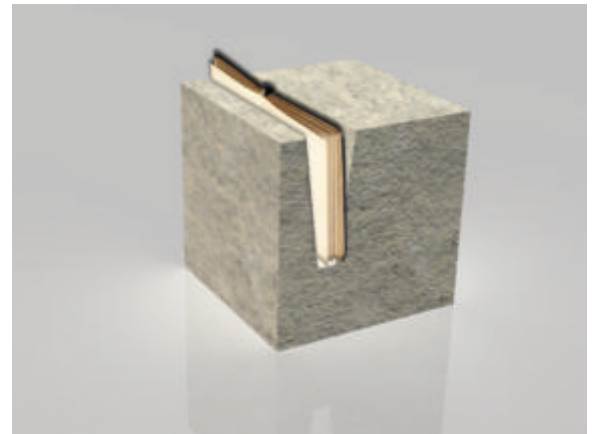
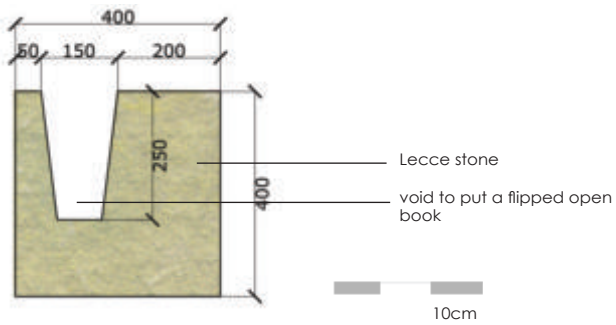
This episode performs the Wood Element and stands for life, as well as for the union of the two personalities.

It is dedicated to reading.





bookstone



bookstone with book



episode 6

element fire

The ncurtaturu is in the centre of the plot of land and it can be seen as symbol for settlement.

The Fire element is the element is connected to settlement, since it was predominantly “put” from the sky on earth by the human being when they were settling down. That is why this place is devoted for the fire element.

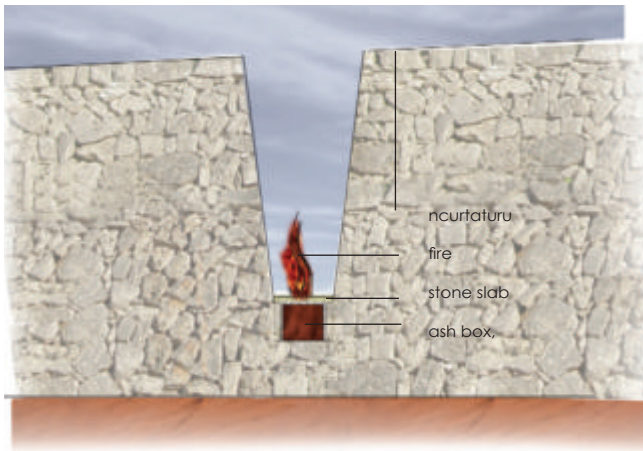
A fireplace is placed in the opening of the ncurtaturu and is visible also from inside of the house. The fire itself is placed inside a bowl shaped stone slab with a gap on the bottom, which can be closed by a stone lit. When the fire is off, the stone lit can be removed and the ash is falling down in a box. This box is placed in a hole in the ncurtaturu. Those holes in the walls were also traditionally made and used as niches for storing objects.

The box can be pulled out and the ash removed.

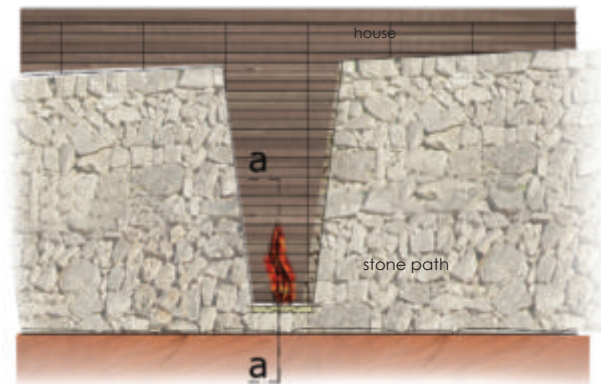
The design is driven by the poetic idea of looking at the fire while in bed.

Materials: The Stone slab with insert bowl is made by the local Lecce stone.

The metal box consists of oxidized steel, which is referring on the fires’- chemical activity –burning which is oxidizing.

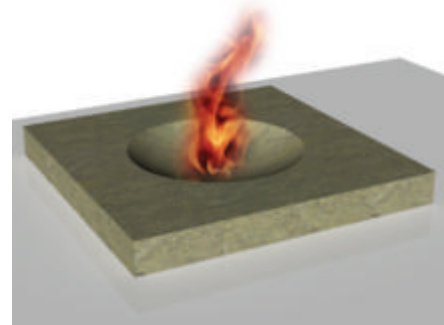
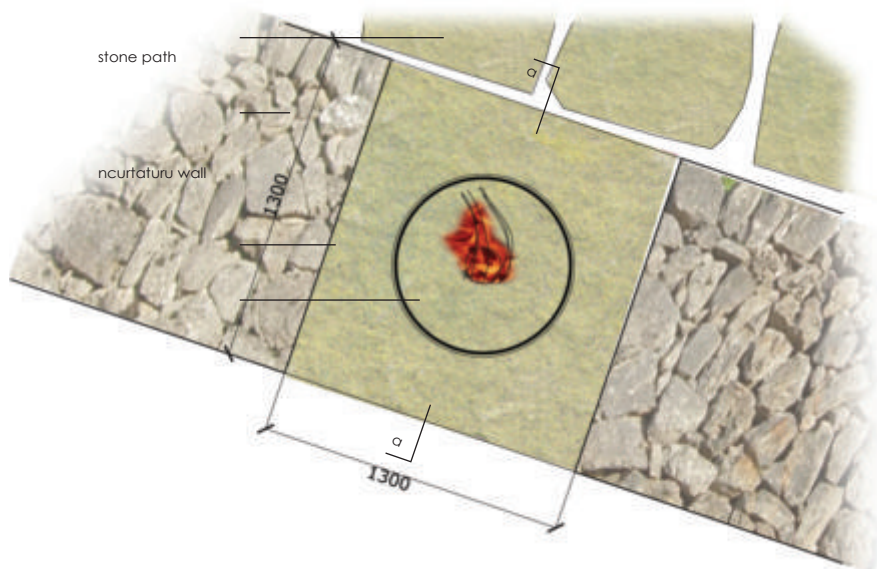


elevation inside ncurtaturu

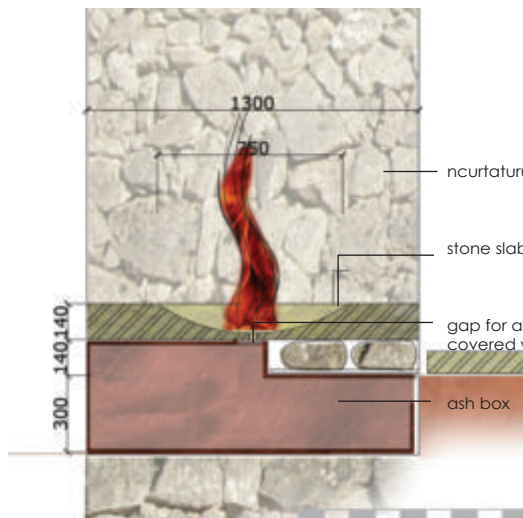


elevation outside ncurtaturu

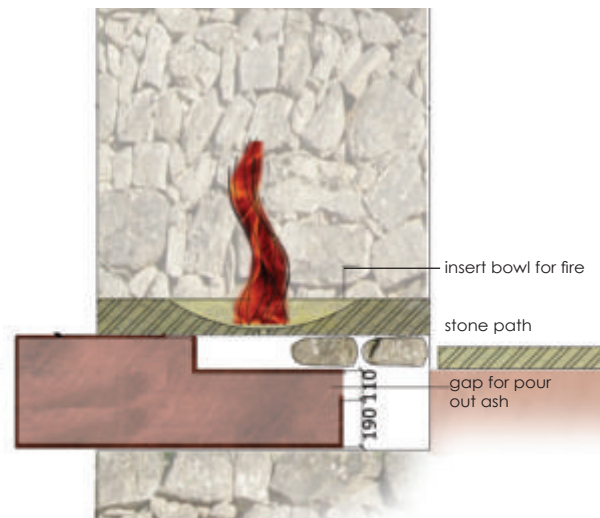
The Fire Element stands for process. Fire is burning and therefore destroying, but with this “activity” it also provides space for “new” things. The ash is fertile and is the base of new life. (according to the Chinese Element model). In contrast to the “active” process, the action of the persons is to observe. Observing is fundamental for humans to understand and to create “new things”.



fireplace plan



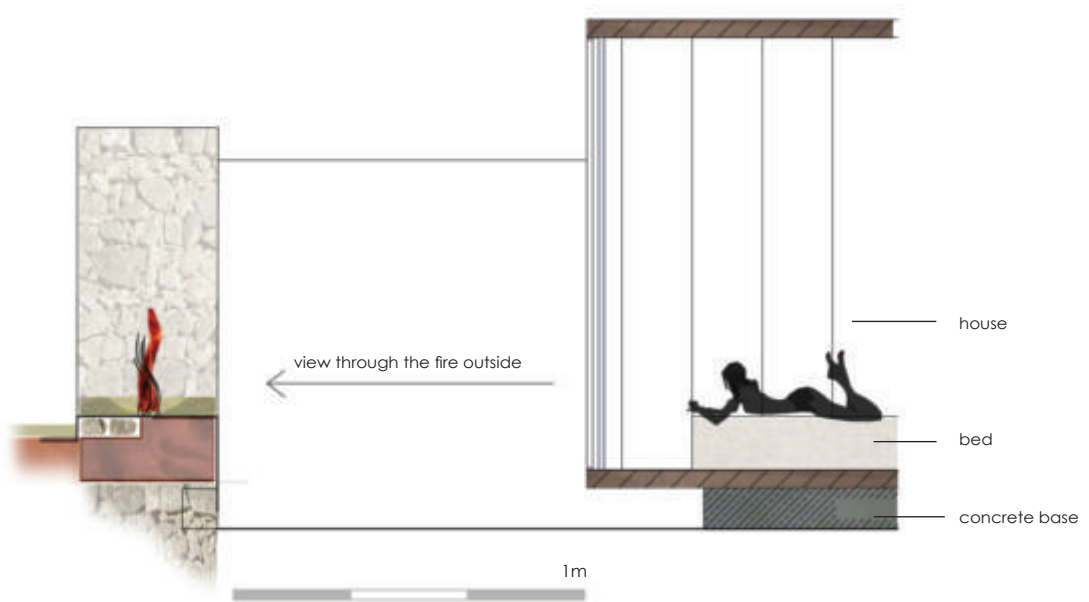
section a-a



section a-a



view from inside towards fireplace



view relation from inside of the house section a-a



episode 7

elements' centre



The last Episode is the “meeting point” and conclusion of all elements. It is placed where all elements “meet”: on the wooden deck.

I designed a lounge, dining area and relaxation area, which is inserted in the wooden deck.

Each of those three areas performs a square plan.

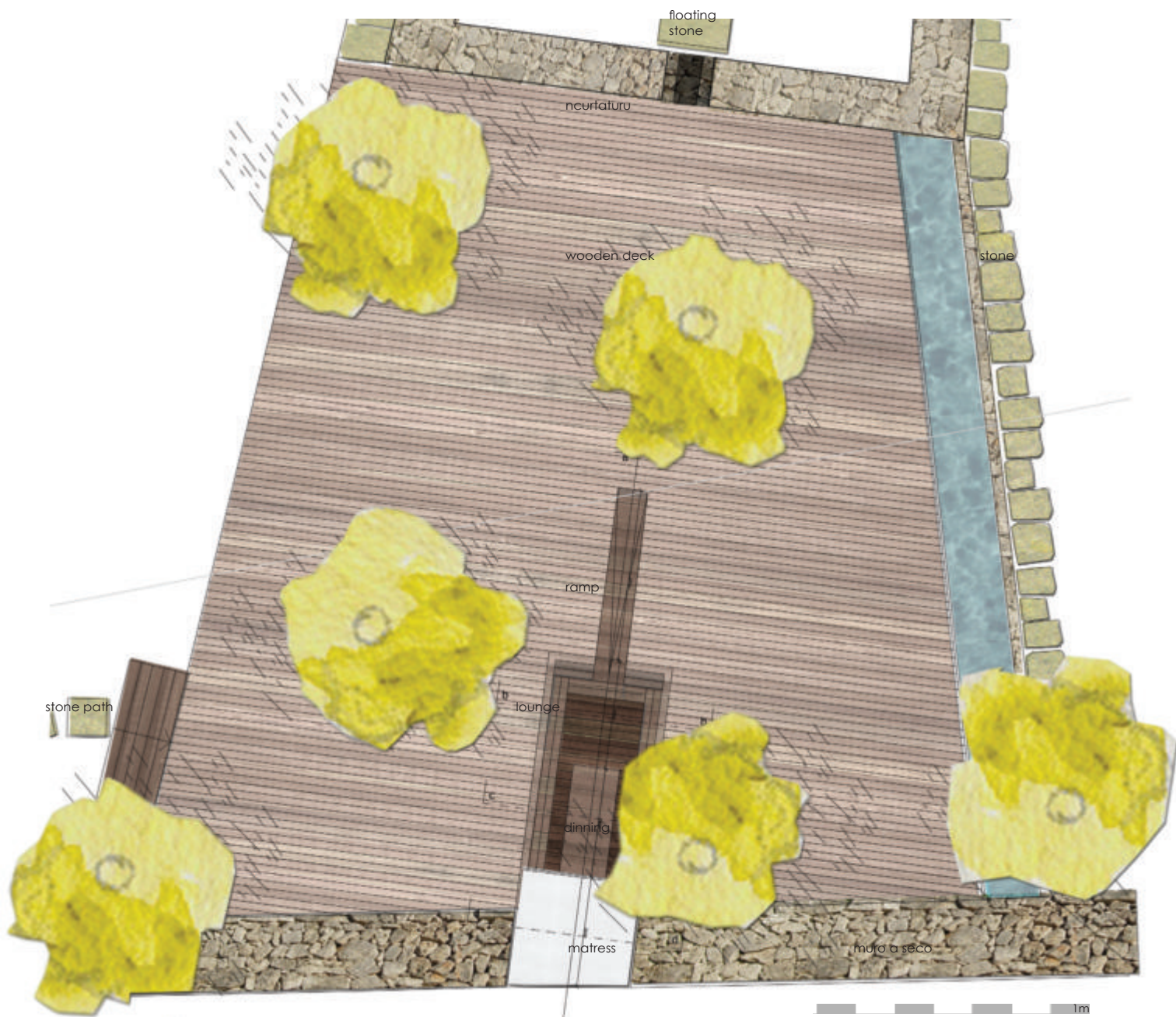
A ramp leads down the Lounge; on the sides are sitting benches. These sitting benches devolve in the dining area, a cantilevered table plate, which is supported through steel-profiles, performs the table.

This is joined by a big mattress.

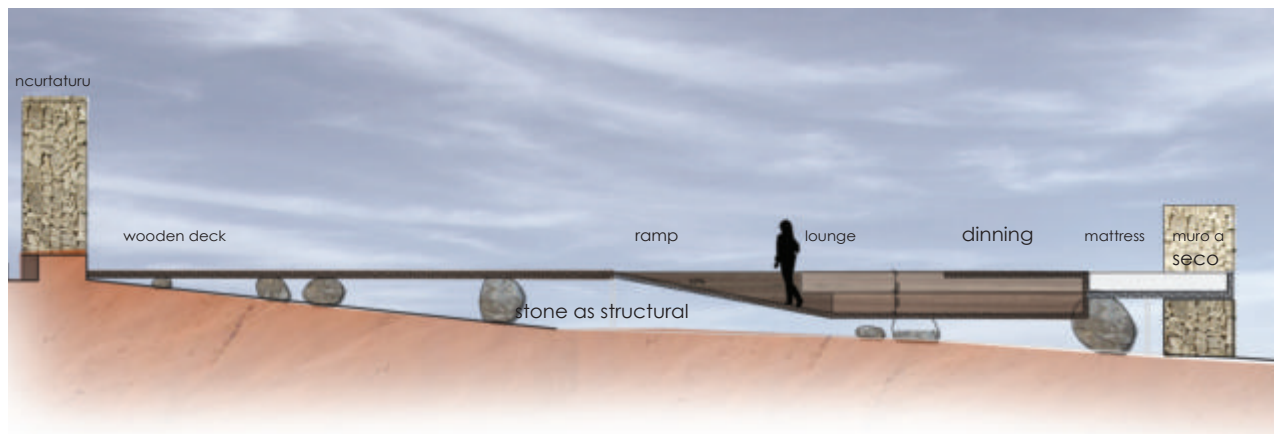
Inside the attached dry wall is a hole to provide a view towards the territory and the sea.

Materials: The Lounge and dining area are made of the same wood as the terrace –local oak timber, which underlines visually the fact that it is inserted.

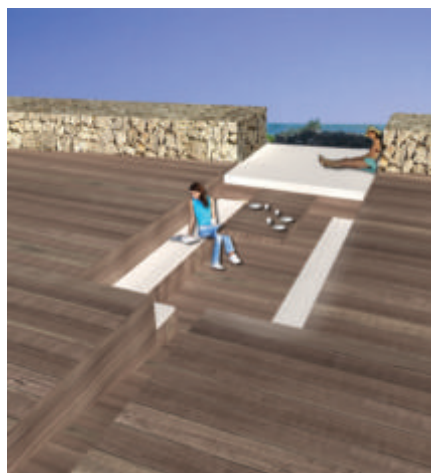
This Episode which connects all elements stands for including in social and private life.



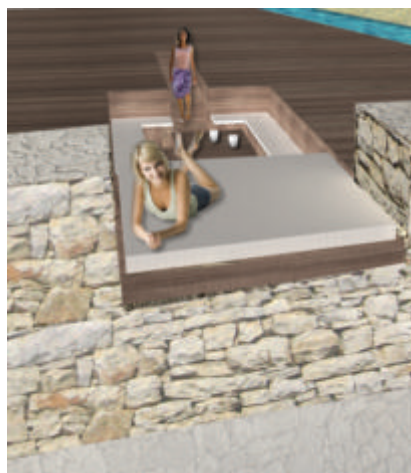
wooden deck plan



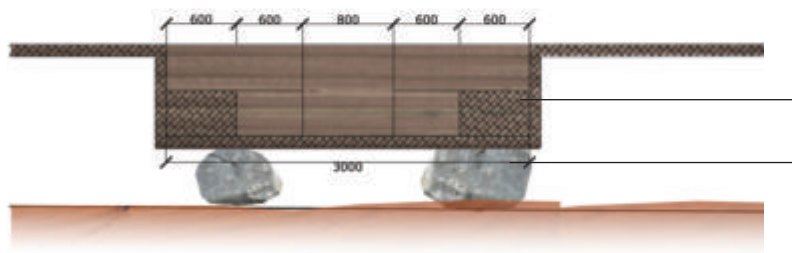
wooden deck section



perspective view southwards



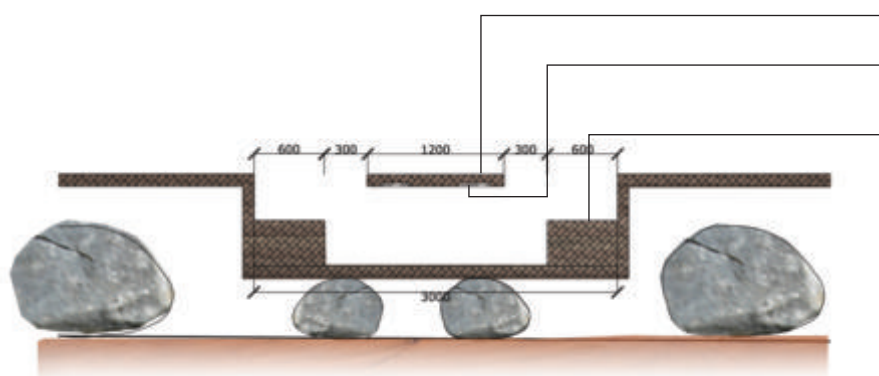
perspective view northwards



bench
material: local oak wood

existing stone lift the terrace

lounge - section b-b

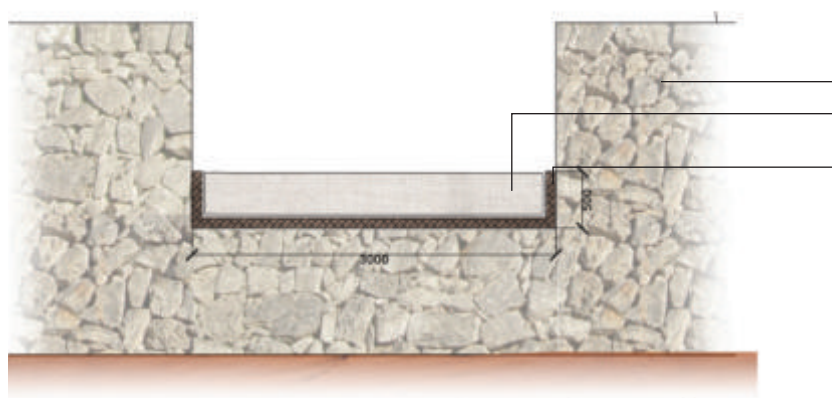


table

steel profile as
structural support

benches

dinning - section c-c



muro a seco

mattress

material: texilooop

wooden frame
material: local oak wood

mattress - section d-d



{the system}

- The Elements as Metaphor for the brands' values
- The Elements as Metaphor the "essence" of the region

natural elements

the place

„meeting-point“ of occident and orient

the persons

western roots, but strongly involved in other cultures through including in their personal philosophy

cultural bind

expressed in combining the two main „elements systems“:

the western four-element theory and the chinese five-element theory to explain the territorie's existence and to explain the consintence of the brand.

The western four element model known as the greek classical model, is based on the elements::



fire



water



earth



air

The Chinese Five-Element Model is based on the elements:



fire



water



earth



metal



wood

fire

as symbol for the process and development, since it is
always –through „destroying“- restarting the process



wood

As a result of the previous elements
„life started“; tree as symbol for



air

Place on the highest point with the
best view, symbolically for view and



earth/stone

stonefield as symbol for earth and

the elements

the characteristic location of the
territory



metal

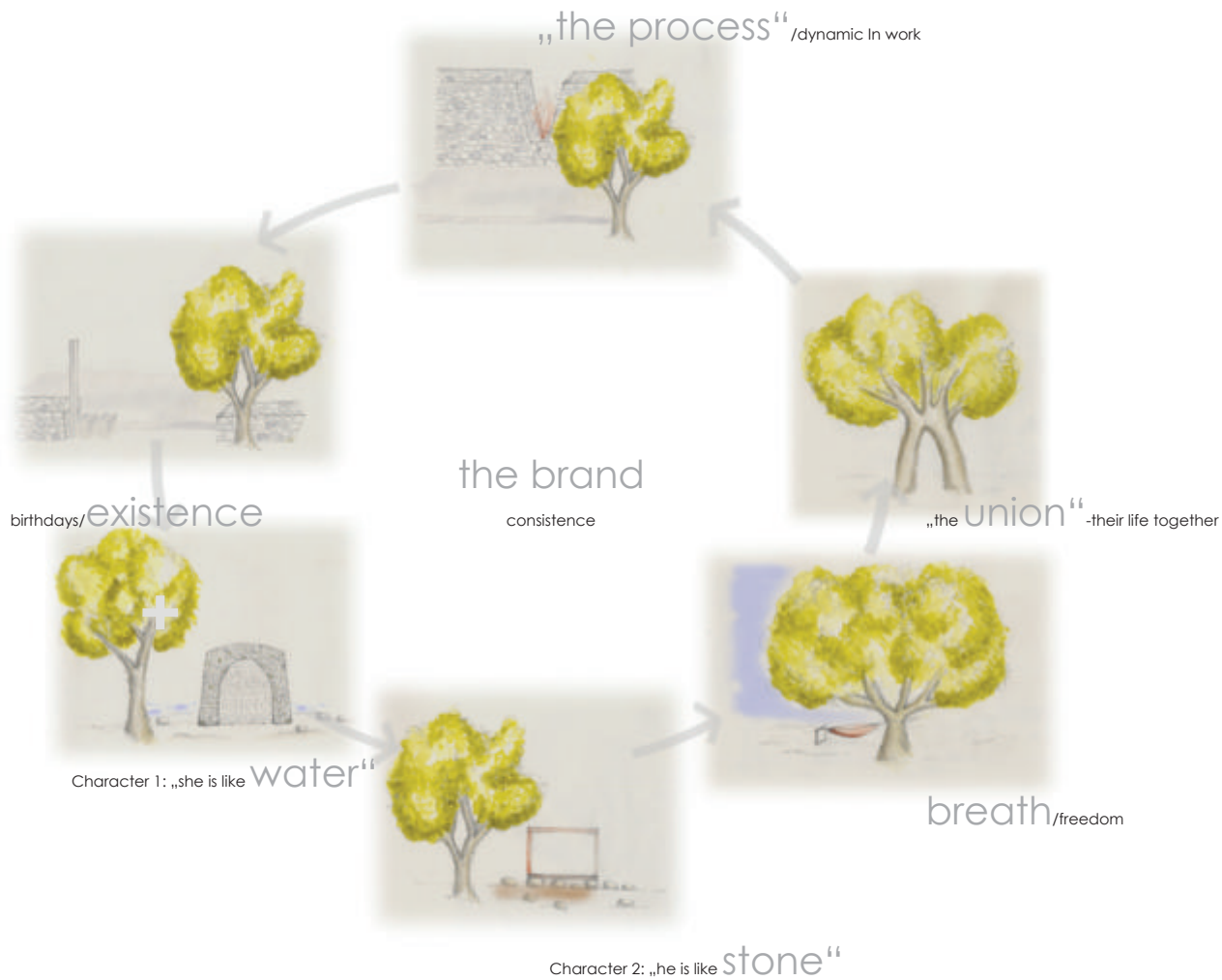
the whole area is red from iron



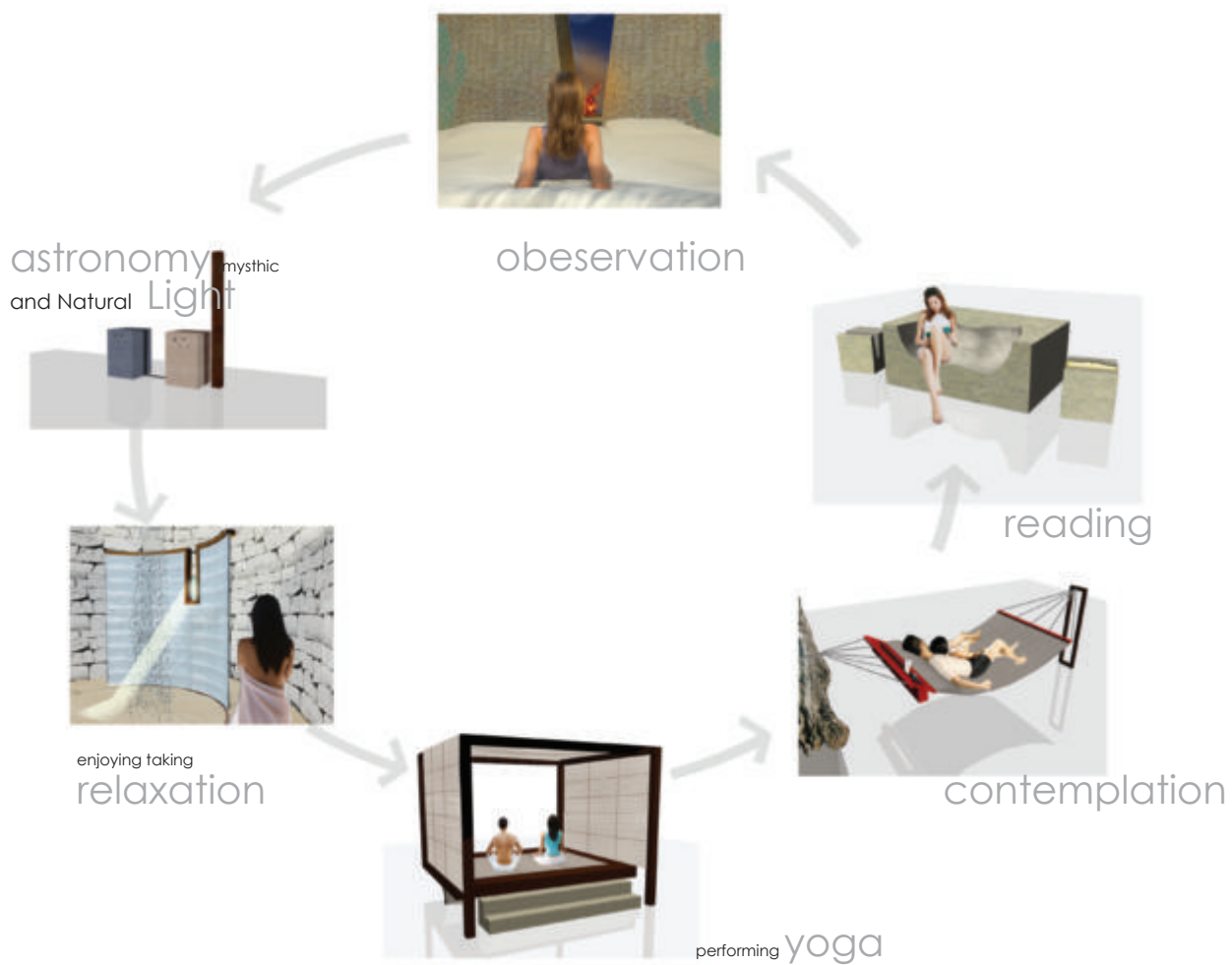
water

chose location closest to sea

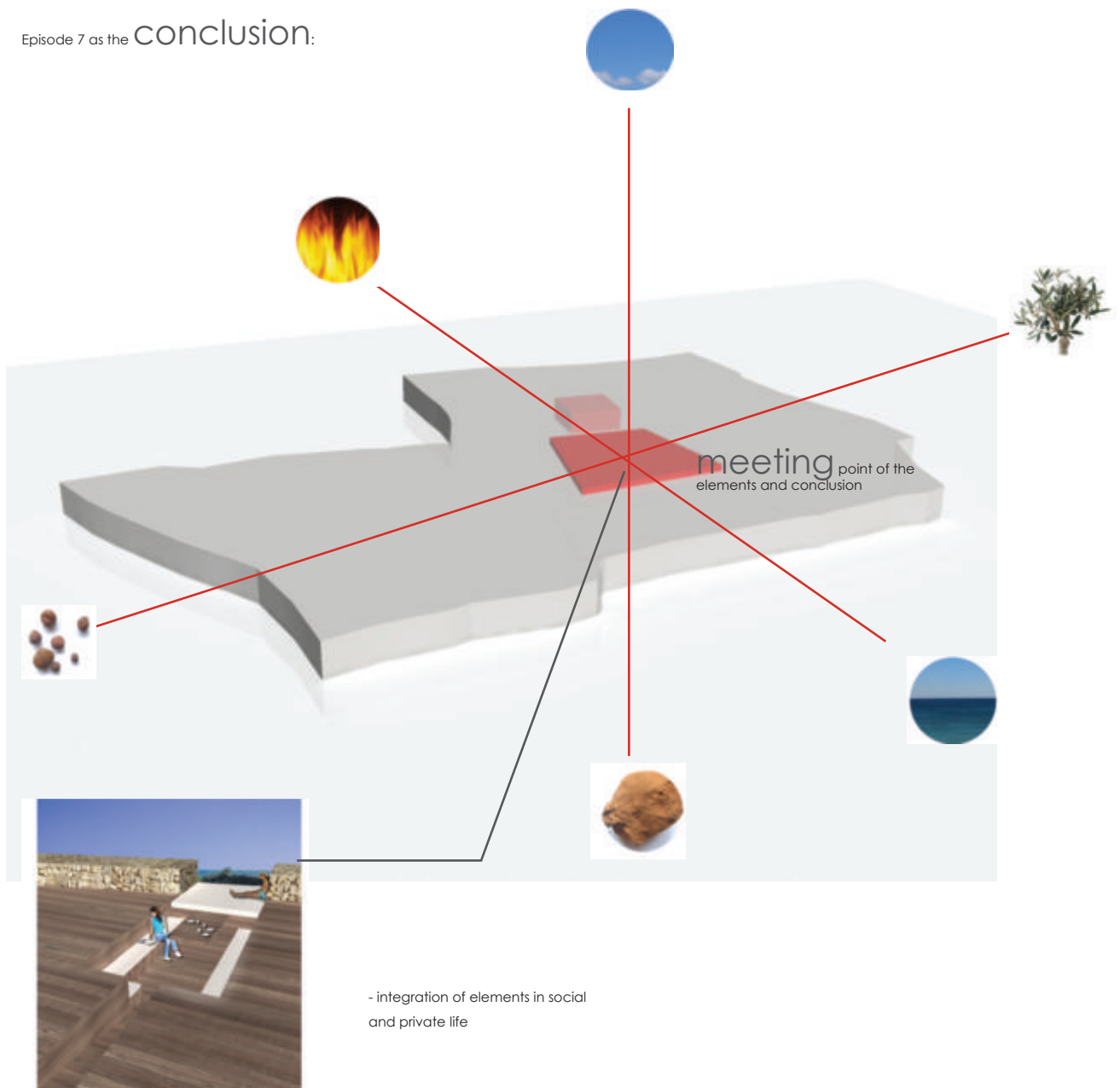




connected with an essential interest or action in their life:



Episode 7 as the conclusion:





1 – Sustainability of vernacular
architecture

2 – Sustainability in architecture today

sustainability V

“In all things of nature there is something of the marvelous.”

Aristotle (384 BC - 322 BC), Parts of Animals

1- Sustainability of vernacular Architecture in Apulia

Vernacular architecture is considered as very sustainable since it has been adapted for centuries to the local climate, location and available material. Through that it consumes the less energy for construction and maintenance.

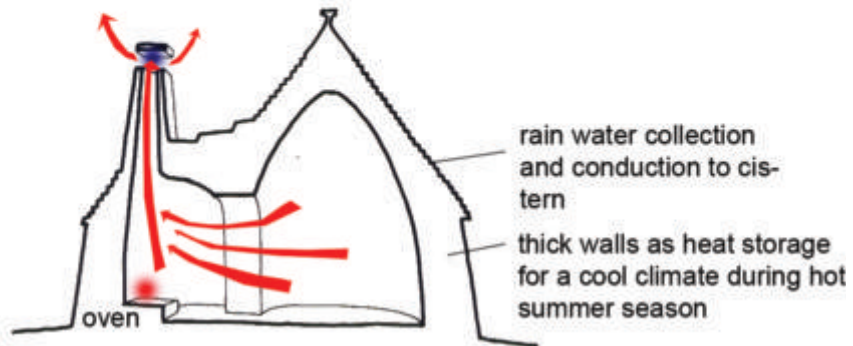
The available material of this region is stone; wood is limited. That is why there is been used just stone, even the roof is completely made of stone. The stone blocs had been also “rest”-material in form of loose stones from the fields or the agricultural expenditure. So in a way it has been “recycling”. Moreover, the material again, after being used as building material was easy to “recycle”, since it has not been mortared, it could be used for example for the construction of new dry walls or a new *trullo*. Even if it would be just left on its place, it would have been a part of the landscape.

The most obvious solution to span a floor plan with the available material –stone slates and blocs- is a copula- without any mortar. That is considered as the reason of the conical roof shape of trulli.

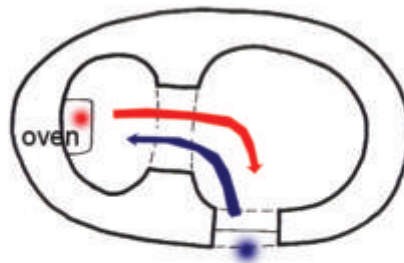
The vernacular architecture did not need any cooling system during the warm summer season. Thick walls for achieving a great “construction mass” served as heat storage and made the room climate pleasantly cool. The *trulli* that were meant to be a permanent shelter had an air – exchange system. By creating two opposing thermal sources- the stove and a hole under the entrance door- a natural air exchange is taking place. The stove was always put in the corner which was most far away from the entrance door with its hole underneath as cold-air-source, to maximize the air exchange streams. During the quite humid winter seasons the inhabitants just adapted there lifestyle: wearing layers of clothes and leaving the entrance door open, they were protected against the cold and the houses protected against condensation and humidity.



Raingutters on a Alberobello -trulli house often lead to a box. The drain hole to the outside is plugged until the subfloor cistern has been filled through an intern pipe.



vertical air circulation



horizontal heat storage

The trulli had no big window openings in order not to weaken the constructions. The problem of having enough light in spite of the little windows, was solved by painting the inside with a white chalk colour. The entrance door was left open to transport the light inside the trullo. Electric light was not available, so a solution of natural lighting was found.

On the developed ones the rainwater is collect by an eaves gutter. A channel is conducting it through the walls to the cistern, which was built under the *trullo*. So also, in dry periods rain water was available.

The *Trulli* serving for pastors and as seasonal shelter had often a less inclined roof, which was also used to dry fruits like figs, vegetables like tomatoes or straw on it. The dark colour of the stone-roof improved the drying process – like nowadays with roof-solar cells, sun energy was used.



Chimneys served as fume-outlet as well as for a good air-circulation.

2- Sustainability in architecture today

The Sustainability concept has developed itself in almost every aspect of human activities. This shows the growing awareness and conscious about nature and environment and can be considered as a positive thinking direction. It is becoming a business sector. The demands for energy-efficient buildings will evitable increase.

Facts:

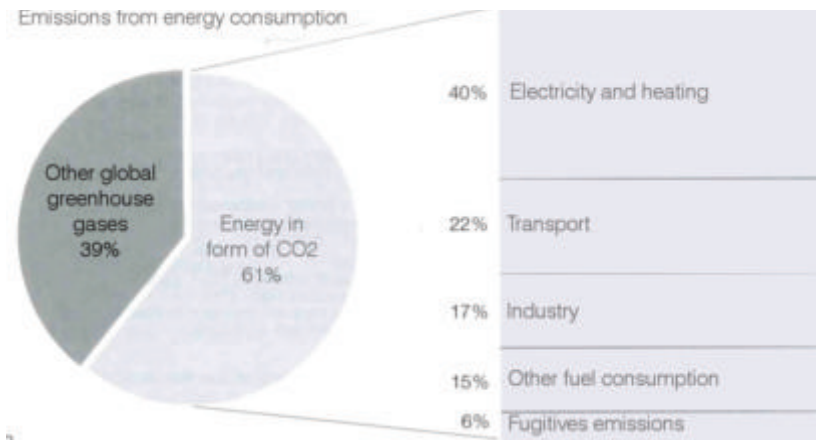
The major environmental issues connected to Built Environment Design and Construction are:

- Climate change
- Ozone depletion
- Soil erosion
- Desertification
- Deforestation
- Eutrophication
- Acidification
- Loss of biodiversity
- Land, water and air pollution
- Dispersion of toxic substances
- Depletion of fisheries

Climate changes are more dramatically than most scientist, were stating. An increase in the average surface temperature of the earth by more than two to three degrees course compared to pre-industrial times serious socio-economic effects. One outcome could be an arising sea-level and with it the loss of the habitable space. If the global warming is continuing with the same speed like until now, this critical value would be reached before the end of the present century. We can not stop this development, we just can decrease it.

The main aim of sustainable architecture is to reduce the huge pressure on planetary ecosystems caused by human activities.

The greatest single cause of greenhouse gas emissions is the use of energy generated from fossil fuels, which are about two thirds of the emission worldwide. In global terms, industry, transport and buildings are responsible for



Total emissions resulting from different forms of energy use

this in roughly equal parts.

To prevent disastrous climatic developments, greenhouse-gas emissions must be lowered and their concentration stabilized. That presupposes the reduction of the worldwide fossil-fuel consumption by the factor of 10.

The sole way out of this energy-crisis, is the integration of our civilization in natural energy cycles. But it is not about turning back into a non-industrialized society, it is more its achievement by the use of modern technology and the exploiting of renewable forms of energy like wind, geo-, water, solar, tidal, biomass and waste energy. Nowadays this includes just 14% of global of global primary energy production. To achieve the mentioned reduction of the worldwide fossil-fuel consumption by the factor of 10, this has to be increase each year by 11%, meanwhile the use of fossil fuels would have to be reduced by two per cent. All the required technology for reaching this aim is already known to us.³

In the EU 40% of the energy consumption is made up by building and their maintenance, including heating, air conditioning, lightening and electrical installations.⁴ This fact is demonstrating the responsibility of the architect today.

Opportunities

sustainability

Sustainability is a term which can be widely defined. In the book “Our Common Future” written by the Commission on Development and Environment (WCED) defined sustainable development as “a development which meets the needs of the present without compromising the ability of the future generation to meet their own needs.” In other words sustainable development is a way in improving or advancing our culture in a way that can be maintained over the long haul. Our environment is essential to satisfying the needs of presents and future generations –as well as other species–, environmental protection is the key to its success.²

Resource Conscious Design

Resource-conscious design focuses the same features as sustainable construction, ultimately leading to a minimization of natural resource consumption and the resulting impact on ecological systems.

Resources include land, materials, water, energy and ecosystems.

Life cycle Design

The life cycle of buildings include the extraction of resources, the manufacturing process, installation in a building and the item’s ultimate disposal. As well the resource needed to transport components from extraction to disposal is considered.

Life cycle of materials or *closed material loops*, as components of the building, define the process of recycling materials rather than disposing them as waste and so keeping them in productive use. Products in closed loops should be easily disassembled, recyclable without toxic emission and worth to recycle. Sustainable construction provides synergetic services by integrating ecosystems with the built environment. Materials selection, closing material loops and avoiding solid, liquid and gaseous emissions are the key targets.

Design for Disassembly (materials: life extension; components: building life optimization)

- Building life optimization (extending building life span; intensifying building material use)
- Material life extension (recycling, energy recovery, composting)
- Resource minimization (designing for resource conservation (future generations)
- low impact resource selection (environmental impact avoidance)

Life Cycle Assesment

LCA is a method to determine the environmental and resource impacts of a material, product, or whole building. All environmental impacts (energy, water, and material resources, as well as the emission to air, water, and land are tabulated over the entity’s life cycle.⁵

Eco-Efficiency

The concept of eco-efficiency includes environmental impacts and costs as a factor in calculating business efficiency; it describes the delivery of competitively priced goods and services that satisfy human needs and enhance quality of life, while progressively ecological impacts and resource intensity throughout the products’ life cycles are reduced.⁵

Embodied Energy:

Embodied energy refers to the total energy consumed in the acqisition and processing of raw materials, including manufacturing, transportation, and final installation. Usually, the greater embodied energy the higher the environmental impact due to the emissions and greenhouse gases associated with energy consumption. There exists also another calculation, which divides the embodied energy by the number of times the product is utilized, resulting a truer indicator of environmental impact. More durable products will have will have a lower embodied energy time per use. For example aluminium has very high embodied energy, but since it is durable and could be used several times its embodied energy factor will get much lower. Moreover aluminium has relatively low embodied energy when recycled.⁶

	Em- bod- ied En- ergy	
Material	MJ/kg	MJ/m²
Concrete	1.3	3180
lumber	2.5	1380
brick	2.5	5170
cellulose In- sulation	3.3	112
Mineral Wool Insulation	14.6	139
Fibreglass In- sulation	30.3	970
Polystrene Insulation	117.0	3770
Gypsum Wallboard	6.1	5890
Particleboard	8.0	4400
Plywood	10.4	5720
Aluminium	227.0	515700
Aluminium (recycled)	8.1	21870
Steel	32.0	251200
Steel (recy- cled)	8.9	37210
Zinc	51.0	371280
Copper	70.6	631164
PVC	70.0	93620

Sustainable constructions:

The Conseil International du Bâtiment (CIB), an international construction research networking organization, defined the goal of sustainable construction in 1994 as « ...creating and operating a healthy built environment based on resource efficiency and ecological design. » The CIB lists Seven Principles of Sustainable Construction, which would ideally perform decision making during each phase of the design and construction process, continuing throughout the building's entire life cycle; as well as when evaluating the components and other resources needed for. During the whole constructions' life-cycle the Seven Principles apply, that means from planning to disposal, in terms of architecture more referred to deconstruction rather than demolition. Moreover, the principles apply to the resources needed to create and operate the built environment during its entire life cycle. Important is to achieve a balance between social, Economic and environmental Aspirations.

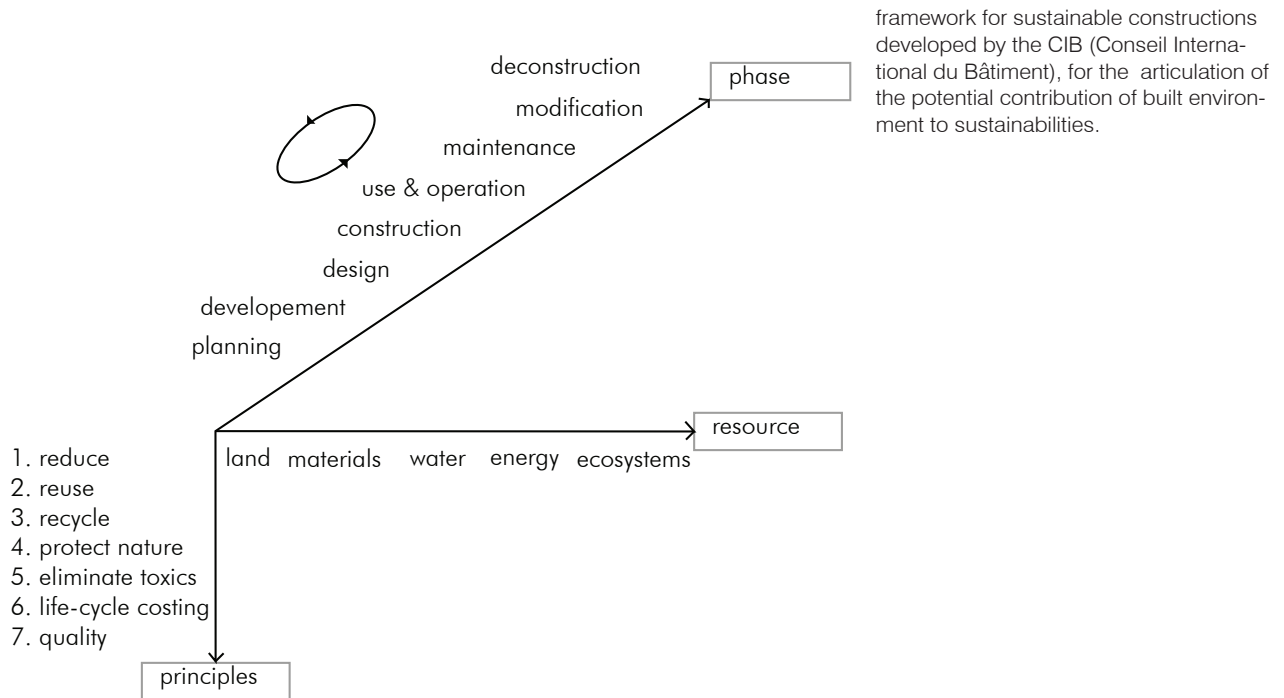
The seven principles of sustainable construction by CIB:

- reduce resource consumption (reduce)
- reuse resources (reuse)
- Protect Nature (nature)
- Eliminate toxics (toxics)
- Apply life-cycle costing (economics)
- Focus on quality (quality)

That energy efficiency need not conflict with architectural quality can be seen in many positive examples today.

Issues sustainable constructions should face are: Energy, that means how we use resources and the energy efficiency in buildings; the air quality; noise; waste; Biodiversity, regarding how our intervention will influence eco-systems; Transport; Economic development; culture; water; Land utilization; Microclimate; Materials and Construction, but inter-counting the transport-energy, unless you are using local materials.

Sustainable construction should not be construed as new architectural language. With an optimum use of materials, energy-efficient buildings will be conceived



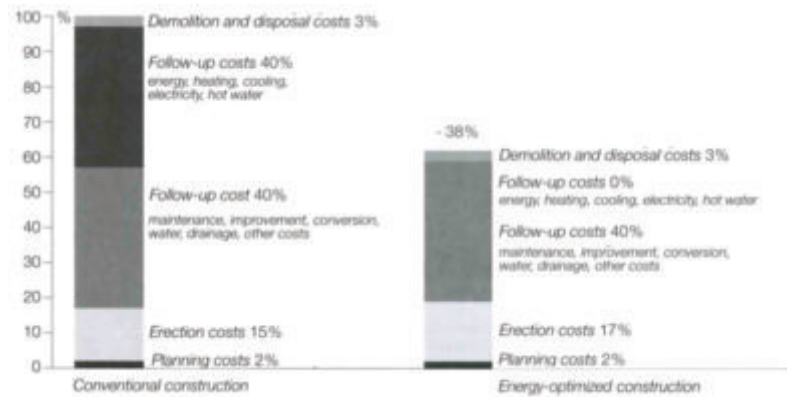
with intelligent outer skins and with mechanical services that ensure a positive energy balance.

“Zero-energy” houses with a positive energy balance already exist.

If one considers the life-cycle of a building, 17 per cent of the overall costs are spent on the planning and construction. Maintenance and renewal account for 40 per cent. The remaining three per cent must be calculated for the demolition. In modern “zero-energy” projects, the erection cost 10 per cent more, but that amounts to only a.5 per cent of the life-cycle costs. At the same time 40 per cent of the life cycle of the life-cycle costs can be saved in the from of energy that is not anymore required- without taking account of the inevitable rise in energy prices over the years.⁷

To sum up, the cost which are spent more for the planning of those kind of houses will be pay in by less maintenance cost, this makes this buildings more than competitive and demonstrates the economic advantages of *eco-efficiency* in construction.

Cost of conventional and energy optimized in comparison



The construction process will assume greater importance. Application concepts like “passive houses” strategies getting more and more importance: a compact built form and good insulation reduces losses through transmission, and a controlled airtight skin decreases. In the field of mechanical services, airborne and waterborne energy cycles will be closed by the process of energy recovery. That is why a solar thermal system should always be based on an interaction between four relevant actions

- 1-Transparent thermal insulation, also in form of thermopane glazing: sunlight enters the building, but the thermal energy cannot anymore escape.
- 2-Absorbers, they can be selective. Sunlight may be absorb by a dark surface and converted into thermal energy, while heat emission is restrained.
- 3-storage elements. Thermal energy is absorbed in the *insertia* (construction mass-component of the building) and emitted into the internal space after an interval of time – as radiant heat
- 4- Protection against overheating. In the case of an exess of solar energy, overheating within the system can be prevented.

All of this aspect can be applied in different forms; important is that they interact with each other.⁷

Forms of sustainable constructions:

Green Buildings:

The expression green building refers to the quality and characteristics of the actual structure, developed and erected by using the principles and methodologies of sustainable constructions: “healthy facilities designed and built in a resource-efficient manner, using ecologically based principles. Also the terms ecological design, ecologically sustainable design and green design describe the application of sustainable principles to the buildings’ design.

Project example: vernacular architecture

High-Performance Building

High-Performance Building “uses whole building design to achieve energy, economic, and environmental performance that is substantially better than standard practise”¹. It requires therefore a *system-thinking* and collaboration of all participants (architect, owner, engineer, experts of energy)focusing the complete integration of energy, materials, indoor air quality, acoustics, natural resources, as well as the interrelation among those.

Project example: Solaire in New York inter alia with solar façade, Burj Al-Taqa/ Energy Tower for the Middle East

Simplicity

Prefabrication is also a step towards sustainability, because it speeds up the construction, therefore less energy is used. Moreover the adjustment of the materials is very high and so less material is used, and additionally it keeps the quality into control.

3 Sustainable timber construction

The Sustainability concept has developed it self in almost every aspect of human activities. This shows the growing awareness and conscious about nature and environment and can be considered as a positive thinking direction. Construction performs some kind of “hardware” enclosing us and plays therefore a crucial role in respect of the three mainstays of sustainability: ecology, economy and social viability. An efficient handling of resources can make an important contribution to sustainable development. Timber is one of the most important renewable resources. Sustainability presupposes its application in accordance with the instinct nature of the material and on the same time with an intelligent choice of load-bearing system

Sustainable forestry:

The use of wood has to be seen in relation to its production. That means in some periods it shouldn't be extracted more than it is re-grown. The utilizable area of forests is limited by the factor which is need for regeneration of Biomass. Beneath the building brand also the paper industry is a major wood-consumer. The demand for wood is rising, which efforts a logistic control and organized handling for the forestry.

The use of tropical timber in Europe must be seen critically. The advantages of using it should outweigh the fact that it is transported halfway round the earth connected with energy consumption by the transport.

If it is used the planner should ask for a “sustainable and fair” forestry origin. On the other hand using tropical wood increases the value of it, and gives the involved country the chance to use their tropical forests in a more sustainable way than burning them down.

Instead the planner should try to consider the many regionally kinds of timber as construction material. Like that he supports local economic and encourages the producers to practise biodiversity instead of monocultures. On the same time the transportation energy-consumption will be reduced and other function of the forests would achieve greater importance.

Efficient and sustainable treatment and processing of timber as material:

During the treatment of wood accrue beneath sawn-wood a lot of other secondary products, which can be used as material or for energy-production.

The development of prefabricated building material, which can be partly produced by low-quality material, contributes to a maximum resource –efficiency and adds value. Materialist more-use cycles should be already planned during the timber machining and detail planning.

Chemical wood preservation avoidance, careful choice of additives

If additives like glues and coatings are used, or when wood is combined with other substances, like cement or plastic, one have to be careful that the material and its thermal potential are not impaired and that no substances are employed that pose a potential danger or cause disposal problems. Even during the project design-stage the planner should be aware of the fact, that one day the built-in material will be used as stock for making further products (design for recycling), and ultimately it can be used to generate energy (design for energy).

Reduction of the Greenhouse-Effect:

Timber components among constructions should have a long life and subsequently used further. Ultimately it can be used as already mentioned to extract energy. Just with this handling it can be help to reduce the greenhouse-effect. The greenhouse-effect is getting also more and more an economic factor, because of the many catastrophes resulting from climatic changes. Timber offers regarding that many advantages. When wood is growing it exchanges during the photosynthesis the CO₂ of the atmosphere– which is the responsible gas for the greenhouse effect- into oxygen. So it stores carbon during its growing and building material is a result of “life”. Moreover, by using timber instead of producing materials accompanied by a great CO₂-emission, the greenhouse-effect can be reduced.

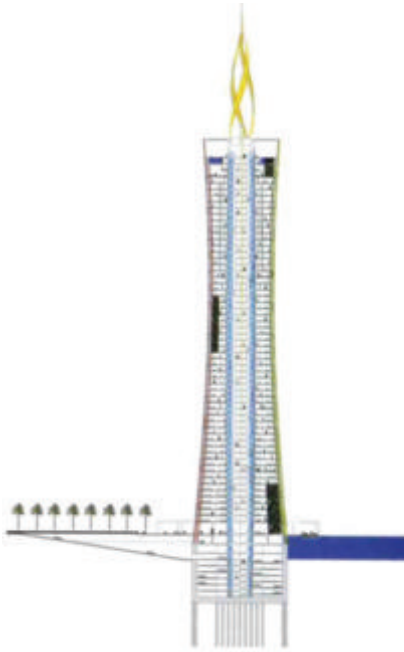
Wood ash

Also the wood ash as result of firing process is a potential raw material. It can be used as fertilizer (nutrient recycling) or for producing new material like for example bricks. But for this the ash has to be free of heavy metals and other deleterious substances. With intelligent planning it will be possible to implement the “zero emission” principle almost to the full.

All in all, using timber could perform a major step towards achieving a sustainable economic balance. With intelligent planning and application of materials, architects and engineer can make an important contribution in this respect.

4 Case Studies

Burj Al-Taqa/Energy Tower for the Middle East Gerber Architects in collaboration with environmental engineers DS-Plan



section through the building

During the building boom in the Middle East in the recent years, often the aspects of sustainability got ignored.

The Burj Al-Taqa/Energy Tower a 322m high “zero”-energy structure reduces energy consumption by 60 per cent. Remaining needs are covered entirely by renewable sources, exploiting sun, wind, earth and water. In the end the building does not cause any CO₂ emissions. In the 60-storey structure natural air conditioning-system, with a technology based on the Arab wind towers is used. The air stream above the building gets caught and conducted down towards the interior. It doesn't depend on wind direction. The down-streaming air gets cooled through the evaporation of water. The Burj Al-Taqa project is based on the same concept: ventilation through wind-energy, replacing a mechanical air-extract system.

The air-pressure rises on the windward-side of the tower, which results a decrease on the leeward side. With its circular floor plan the Energy Tower is able to exploit this pressure difference, independently from wind direction. The enclosing double skin of the building serves to remove vitiated air in a system driven solely by wind and thermal convection. The space between the inner skin and the outer skin is divided each five storeys by a ring of ventilation flaps. The ventilation of those internal units is controlled by sensors.

Vacuum glazing is used for the façade providing a maximum exploitation of daylight and allowing an unimpeded view out.

For the tower a new solar-shield was developed, it is protecting the interior against direct insulation. The shield covers a 60° segment of the circumference and it rotates about the tower with the sun. Additionally on the solar shield are photovoltaic panels, which are used to produce from sunlight electrical energy. Through the centred atrium-working on the same time as structural core- fresh cool air flows inside the building, as well as through five further peripheral atria. By the pressure difference between the extract façade and the atria the

air-circulation is activated. Perimeter atria extending over the full height of the building ensure a vertical circulation. They are designed as hanging gardens and therefore also oxygen “producers”, supporting natural each floor with oxygen. Via earth ducts and water-heat exchange units on the bed of the sea the entire intaken air is cooled down from 45-50° to 27°. Through adsorption cooling machines the air temperature is further cooled to 18°. For that affording energy water is heated on solar islands, the heat is transformed in a cooling medium. This cold water is also used to for active the floor slabs of the building. All required energy for the tower is used from renewable energy producing: a rotor generates power from the wind; the photovoltaic panel on the solar shield provides further energy. All in all, no pollution is caused, just electricity, water and heat.

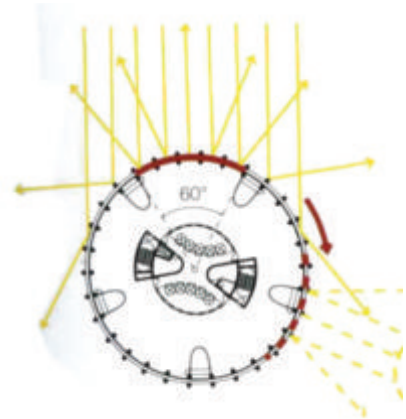
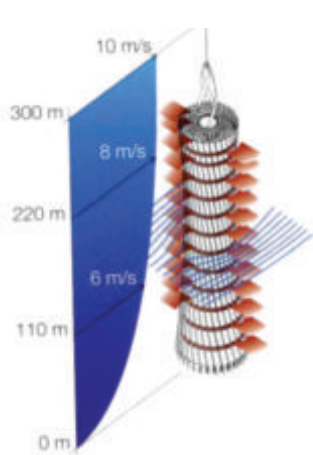


site plan

Ventilation flaps close in the wind compression zone and open in the suction area

vitated air moves freely beetween the double skin-facade

solarshields rotating suround the building, following the sun-position





Alpine Lodge in Styria Pos architekten, vienna

This Alpine lodge is situated at a height about 2000 m and has been built according passive-energy standards. The use of active and passive solar energy at such altitude and strong exposing to solar radiation and without much infrastructure can be considered as logical.

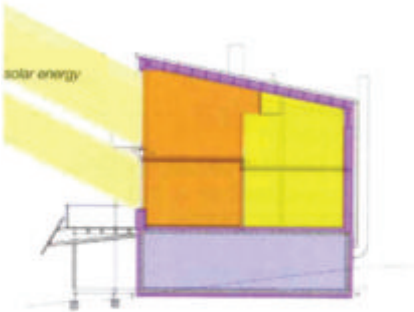
The internal layout reflects thermal needs. Spaces used by guests are oriented towards the south, where the windows absorb solar energy and provides an impede view of the mountain panorama. Access areas and ancillary spaces are located on the north side. The shelter operates in a thermally self-sufficient form. The needed thermal and electrical energy for the building is generated by solar collectors and photovoltaic panels (together with a co-generating unit fuelled by vegetable oil).

A water-storage-tank extracts thermal energy from the collectors, waste heat from the co-generating unit and from a solid-fuel stove in the kitchen. This produced energy is used for hot-water supply and to heat up the intake air. The photovoltaic panels provide approximately 65 per cent of the power supply.

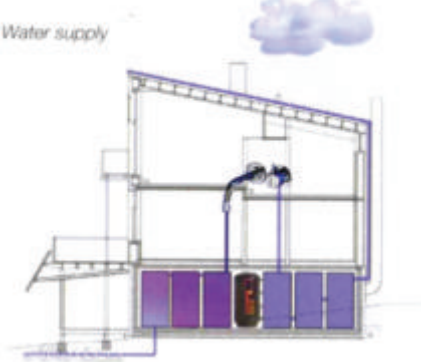
For wind-proofing purposes, a compact design was chosen, and the windows were sealed internally and externally at the reveals with adhesive strips. The two upper storeys are made of prefabricated timber elements and so fast assembled. The weight and dimensions of the construction materials were also limited, since everything was delivered by helicopter.



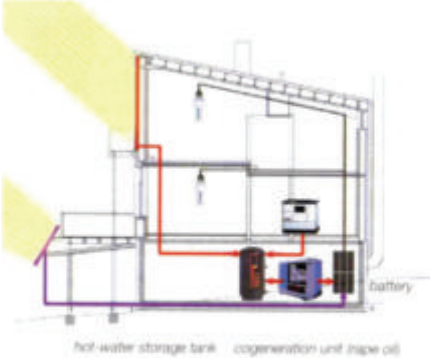
Zones heated up by solar energy



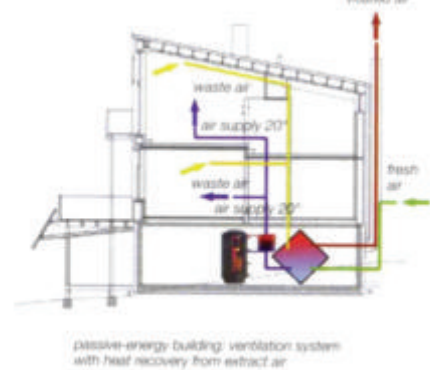
Diagramms of energy generation/supply



Hot water, electricity

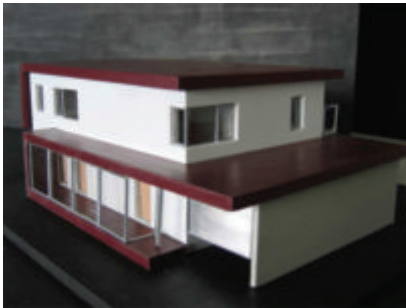


Ventilation / Heat recovery



Passive House in Dresden-Hellerau

Study-project by Sabine Böttger



With its construction and technical equipment this “more – generation” – building is able to exist autarkic, without conventional energy.

The building consists of three volumes connected by a “line”. This line has several functions: it starts as floor of the vestibule, becomes wall, continues as roof of the vestibule; becomes rain protection of the connection garage-entrance; forms the roof of the garage; “winds” itself round the south façade as sun protection; and finally serves as roof of the living building.

Wood is used in the construction to divide it from the remaining massive part from the building.

With an average U_w of $0.14 \text{ W/m}^2\text{K}$, the building needs no heating system.

The air-conditioning is managed by supply air conditioned by the earth and extracted air.

The provision of warm water operates also with earth conditioning. Solar energy provides the remained amount of energy.

compactness: in order to have a very compact volume and therefore avoiding heat-loss, the building has a uniform main body, just the “cool” rooms (Garage, porch) are added externally.



location: the width-to-height ratio is 2:3, the longer side is in the south, to use optimal the sun as heat-source.

floorplan/zones: rooms, which need less natural light are in the north, se-journ rooms are in the south. These zones are divided through a ward-robe-bar, which are also used as installation-bar. The room height is reduced to avoid heat losses.



summer hot protection: the construction is protruding the window facade, therefore the windows are shaded during the summer, without impeding the flat-angled sunrays in the winter to enter.



construction: the whole construction has an U -value of $0.14 \text{ W/m}^2\text{K}$. The windows have 3-layered e-glazing, with a high g -Value, therefore thermal “bridged” are avoided. Since standard drain and sewer systems are always thermal bridges, the “line” is covered by a watertight film, which lets the water flow down and avoids an interior drainage.

building-services:

hot water: The water is heat up through a heat pump and stored in 300-liter, insulated storage. In the guest-WC there is provide just cold water, to avoid heat-losses caused by long conduction distance. With a heath exchanger the heat-energy of the wate water is recuperated.

Ventilation: The fresh air is led subterrenean beneath the base-plate and a earth-heat-exchanger. The stable temperature of the earth is used as heat-source and -depression to heat up or cool the supply air. Through a cross-flow heat exchanger.

Footnotes

- 1 sustainability according to: **Edward Allen**, *Stone Shelters*, Cambridge: The Massachusetts Institute of Technology, 1969
- 2 according to Giorgio **Simoncini**, *Architettura contadina di Puglia. Le forme a trullo*, Roma: Vitali e Ghianda, 1960
- 3 based on the analysis of the “research focus” “Avoiding grave climatic Developments” by the Swiss bank giant UBS, 2007
- 4 according to data issued by the European Commission
- 5 World business council on Sustainable Development (WBCSD), 1992
- 6 according to Charles J. **Kibert**, *Sustainable Construction, Green Building design and delivery*, New Jersey: John Wiley & Sons, Hoboken, 2005
- 7 Dietrich Schwarz, *Sustainable building*, Detail, Zeitschrift für Architektur, Institut für internationale Architektur Dokumentation, 6/2007
- 8 according to: U.S. Office of Energy Efficiency and Renewable Energy (EERE)
- 9 according to Daniel D. **Chiras**: *Environmental Science*, Jones & Bartlett Publishers, 2005
- 10 Dietrich Schwarz, *Sustainable building*, Detail, Zeitschrift für Architektur, Institut für internationale Architektur Dokumentation, 6/2007



- 1- Introduction: aim of research
- 2 - Timber construction development
from tradition to modernity
- 3 - Timber Construction today
- 4 - Construction Trends
- 5 - Construction Basics
- 6- Case studies

Wooden lightweight structure architecture VI

1 Aims of Research

Wood has always been an emotional material, it is natural and somehow still living. Often it gets substitute through steel or concrete structure. But timber as construction material should not be under-estimated. In single housing it can substitute concrete and steel-frames absolutely.

Since it is natural, has a low embodied energy and is a renewable material it is considered as very sustainable.

Wood was chooses, because of all this positive characteristics. Also it supports the design idea to create a project which adapts to the natural environment. Through its grey colour, his position inside the *ncurtaturu* and the visual symbiosis with the surrounding tree trunks and branches it is include inside the territory without longing to catch attention.

Since the project is limited by the dry walls of the *ncurtaturu*, the planed house inside it has to have a very thin construction matter to increase the living space. Also less construction material means more sustainability, since the material consumption is reduced.

For the project constructions pre-fabricated materials are foreseen. Pre-fabrication provides better results, since it is neater, take exact dimensions, because the manufacturing is directly connected to the planning process. It reduces also the time span as well the occupation of the area and resulting spoiling through the buildings' construction.

The research is therefore focused on existing projects, where the walls have minimized sizes, achieved through both, the material choose and mode of structure.

The first part consists of a short historical overview, followed by a trend research to understand the markets' offers.



House Mairea by Alvar Aalto

2- Timber construction development from tradition to modernity

The human being has shaped timber into various forms to serve his needs for thousands of years, using it to manufacture functional objects and as building material.

Until well into the 20th century, people's life were much more connected to nature. Timber differences and the ability to judge the quality of the timber in an unfilled tree was a wide spread skill in forest areas, and the materials has been used in spheres as demanding yet different as shipbuilding and instrument making.

The industrial revolution as well as the rapid expansion of transport infrastructure in the late 19th century overwhelmed traditional societies and transformed their buildings culture. Demographic growth, rural exodus and globalisation took mankind away from its natural environment. The increasing urbanization process was connected to the need of houses, which could be cheap and fast erected. Therefore the emergence of new materials grew. The Modern Movement in the beginning of the 20th century focused on an international and "dematerialized" architecture, causing the timber to become white, smooth and pure. The Finn Alvar Aalto sensed the dangers of industrialized building and of mass construction; since started to favour the protection of nature and "simple people"-life style. His Mairea Villa combined harmoniously modernity and tradition rather than opposing them; it was one of the first examples of a modern and ecological home that united timber with stone and concrete.

For almost one century timber was quite insignificant. During the 1970s it was rediscovered. Introduced by the petrol crisis and reinforced through the emotional reaction of people against the cult of image architecture, the ecological approach became more and more important. A brand of contemporary timber architecture began to spread across Europe initiated through "pioneers" in timber construction such as Sverre Fehn in Norway, Roland Schweizer in France or Thomas Herzog in Germany.

The timber houses during that time were often built in the post-and beam technique; they were generally more expensive than "solid" houses. The clients

came from the more privileged social classes and choose timber primarily for aesthetic reasons, they demanded that material used structurally and for cladding should be visible. Pierre Lajus designed in 1973 a house with atelier for his family in Mérignac, which was one of the first in France house built entirely of timber; to protect the house's outer shell and its post-and beam framework, its roof terrace overlaps greatly. The construction of Charles Moore's Sea Ranch on the Californian coast, a project harmonizing very well with the nature and landscape, was a major event in the development of timber homes. In all buildings of this vast operation red cedar was used for the structure, the walls and the roof in order to conserve the natural harmony of this wild spot and to respect the *genius loci*.

In the 1980s the first bio-climatic houses came up. The timber-structure facades of these houses offered considerable thermal isolation; they were combined with interior layers of concrete or masonry whose inertia favoured the comfort of living in summer.

With Earth Summit in Rio da Janeiro in 1992 the direction versus ecologic awareness, which started with the petrol crisis was amplified. The search for healthy materials attracted new clients towards timber; several technological advancements increased its possibilities: computerised design; the progress in techniques and assembly components, the overall use numerically controlled machines facilitating prefabrication and reducing production costs. The rapid boom in timber houses led to an international diversification of products including the processing of trees and the appearance on the market of industrial by-products and of new species that widen the field of possibilities. Today, this movement is on an international level thriving.

3 Timber Construction today

Wood still possesses a rich imaginary, even if timber construction today is determined largely by technical and functional needs. The prejudice that it has a short life or is suitable only for provisional purposes is disproved by the many historical timber structures that survive; Japanese temples, Norwegian stave churches are two examples.

External timber cladding has enjoyed something like renaissance –quite independently of the material used for the structure since the mid 1980'ies. In addition to traditional boarding, louvers as well as wood strips and sheets for a cladding are quite common. It is still too early to determine the long term behaviour of some panel finishing especially in untreated form. Researches over long time and practise are missing since it is used just short time ago. For that reason, many planners prefer to allow timber to weather to a natural grey colour. Today in addition to sawn timber a wide range of wood based products is available. Also innovative work is focused on the development of timber composite material with new properties and increased technical efficiency.

Traditional skeleton, stud, frame and panel forms of construction continue to exist side by side with buildings in which technical innovation is the dominant aspect. Even log got forms of modern construction experiments, examples are in Scandinavia and the Alps found. The development of new materials and components away from the traditional linear or stave forms of construction allows a greater freedom in timber design, such as the unrestricted location of openings in panel or laminated timber strip elements. Nowadays timber has been liberated its traditional and perhaps outdated image. Modern developments in the fields of fire protection and thermal acoustic insulation, as well as numerous model projects for multi-storey housing in timber have proofed their validity over a period of many years now and have helped to shape a new future for timber construction.

4 Construction Trends

A simultaneous development of several building trends took place since the revival of timber homes second half of the 20th century:

Material Pureness

The first construction trend, resulting from the movements of social and ecological groups of the 1970 s, praises the use of solid timber: barked trunks; begged or bound beams, wall panels, floor and roof made of boards, nailed horizontally and an outer shell in local species. The architecture favours artisan skills and increases the value of small pieces of second-rate timber planks by turning them into fine timberwork and so provide a better use of the raw material taken from this region forests. Representatives in Europe are the architect Joachim Ebble and Peter Hübner in Germany, the engineer Julius Natterer in Switzerland and L'Atelier de l'Entre in France.

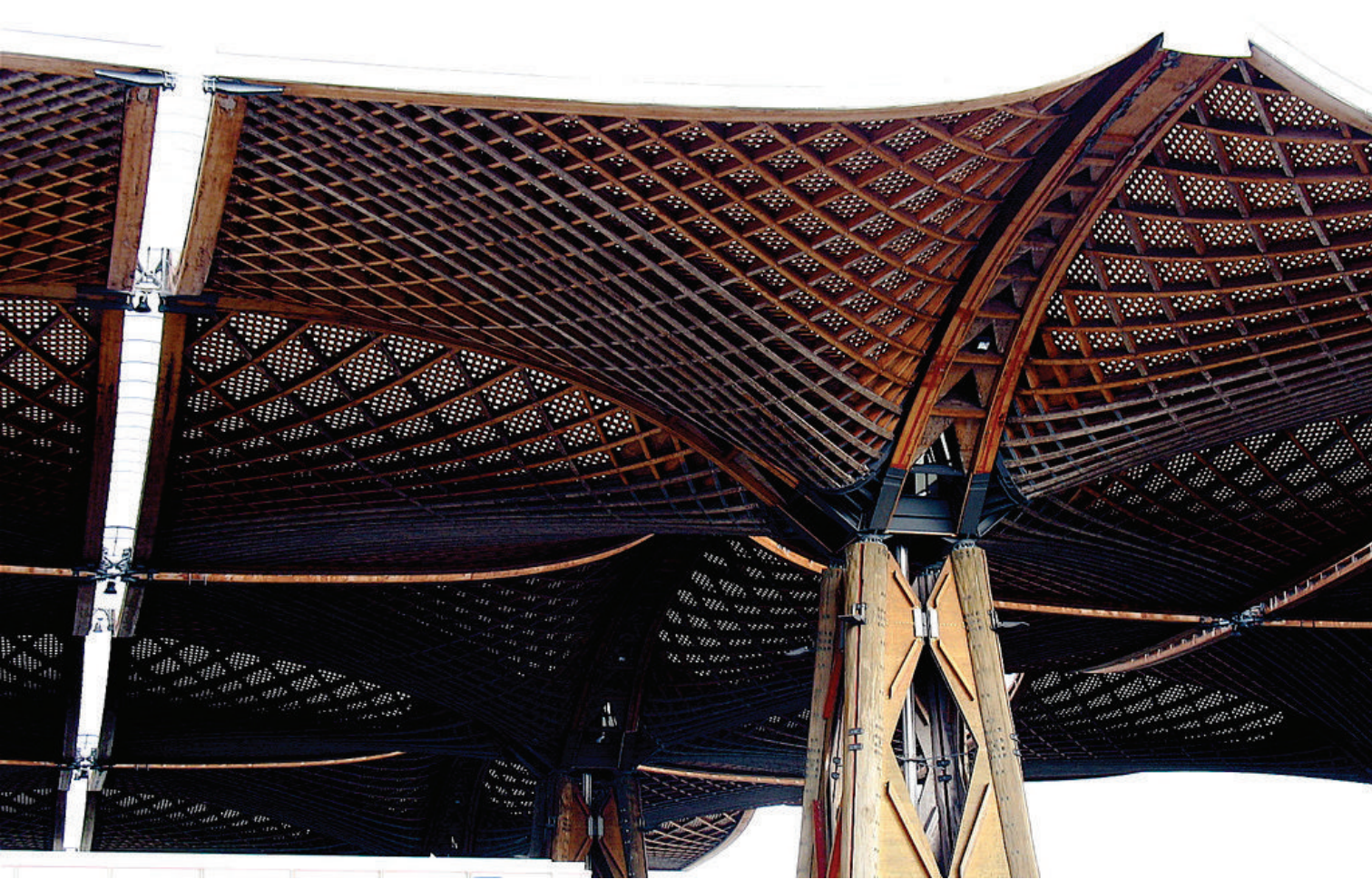
Their architectural achievements showed that there exist alternatives to the normally-used imported timber such as Scandinavian conifers for sawing or American red cedar for the outer shell. They reminded people of the availability of high-quality timber in Central Europe.

Industrial By-products

This ecological approach is nevertheless not limited to the use of local solid timber. The originality of contemporary houses lies more in the diversification of products starting from the transformation of trees, in the reducing of the quantity of material used as an absolute minimum and in the plurality of the materials.

One of the first designers who used timber as an industrial material without the emotional weight normally attached to the living material was Jean Pouvé. Referring to the small houses he designed for the priest Father Pierre in 1952 he said: "I don't use wood in the traditional way. I seek to use it with elements that can be industrialised and that shape the way – as the way carpenters did in the past but by machine. I used 'Rousseau' panels because it was a modern way of using wood."

Decades later the arrival on the market of structural timber based panels has



Wooden roof of the Expo 2000 by Julius Natterer

widened the designers' field of exploration. These by-products start from peeling and grinding processes, which conserves the unique character and the warm colour that constitute the wood's charm; others adding qualities by lacking it in order to become an industrial material capable of competing technically and economically with concrete and steel. The manufacture of these products including long strips (Triply OSB), veneers (Kerto plywood) or small boards (three and five-ply panels, type Multiplan) makes homogeneous material from a material that is heterogeneous by its very nature. Therefore these panels are mechanically very resistant, physically more stable and less sensitive to humidity than solid timber. The large dimension of these relatively inexpensive products enables the rapid process of pre-fabricated wide-span box elements, making timber houses economically competitive.

Combining Materials

The combining timber and its by-products with concrete and steel are responding to structural objectives as well as to ecological and economical concerns. Because it optimises the capacities of each material by reducing the used material amounts down to an absolute minimum. For example, concrete is used not only for foundation and basement flooring but also as acoustic screen or a firebreak element; it provides the thermal inertia that timber-frame construction lack. Plates, pins and cast pieces allow for elegant and high-performance compilations; cables and metal pulleys refine the timber section of rooms in wide-span structures. This consistent application of building logic, associated with research on appropriateness of form regarding function, is one of the principal motors of contemporary timber homes.

Prefabrication

In the 90ies timber frame structures marked the advent of non-modular but prefabricated form of timer constructions. They still depended on traditional craft methods to create planar frame elements. Openings represent an exceptional situation, requiring the insertion of timing members; and each layer is more or less mono-functional.

Rapidly, in the years afterwards, new systems and semi-finished products have been developed that are changed the traditional tectonics of timber construction. Modern timber materials are manufactures in a finely co-ordinated processing sequence. After the tree stems have been cut into square timbers and boards, the offcuts are used to produce battens, lathes and strips of smaller cross section, from which block board and laminated timber are made. The remaining material is further reduced in size to manufacture laminated boards, strand boards and chipboards. At every stag, it is the constitutive technology, Materials produced in this way have an astonish workability. Not only can they be cut to complex shapes; they can be modelled in three-dimensional form, in this respect timber prod, timber products can possess an amalgam-like, mouldable quality that can be exploited with the use of computer-controlled robot tools.

It is only logical, therefore, to extend the everyday practise of CAD in architecture to the production stage and the tectonics of buildings. For example, a design can be divided into manageable segments, sent into production via the data line and reassembled on site. Construction elements may thus be manufactured for specific situations: in other words, in a non-modular manner.

Technological developments allow the production of increasingly strong and even more slender materials. The basin element of modern timber construction systems is no longer the linear member, but the panel. Panel elements may consist of three or more layers – often of low quality wood – arranged of right angles to each other and glued together. This cross-layered composition gives the board greater strength and rigidity, which allows them to serve as structural diaphragms. They are also extendable in all directions. Additional layers and increased thickness, for example, mean greater structural strength. Furthermore, the boards are directionally neutral or “indifferent” and openings can be simply cut out where required.

Only systems that provide a compact solution in terms of load bearing strength,

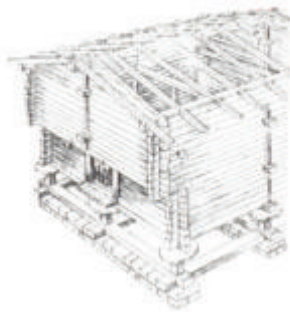
constructional physics and weather protection and only those with a minimum number of layers are likely to prove viable in the long run; e.g. synthetic systems with poly-functional components. This implies a process of intelligent synthesis, which would parallel developments taking place in solid forms of construction, where new single-layer materials now perform both a structural and insulating role.

Prefabrication is also a step towards sustainability, because it speeds up the construction, therefore less energy is used. Moreover the adjustment of the materials is very high and so the resource impact is lowered, and additionally it keeps the quality into control.

5. Construction modes – Basics

1 supporting wall structure

-1. Block - construction



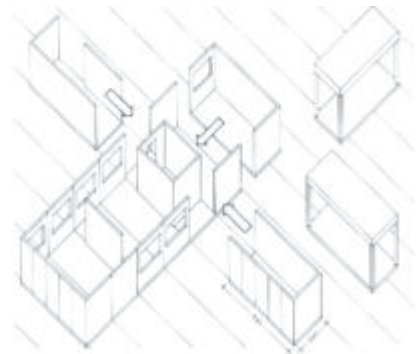
- Stiffening through plate-effect of the solid wood walls

2.- Framework



-Stiffening through pressure of diagonals

3.- Board construction



-Stiffening through planking of the pillar - waler construction

Board construction
prefabricated



-prefabricated boards are fixed together on building site, stiffening through plate-effect of boards.

4.- Skeletons

Continuous girder



- primary girder upon pillar
- secondary girder upon primary girder
- one-floor possible

Continuous pillar, primary and secondary girder; Primary and Secondary girder divided



- primary girder laterally fixed on pillar
- secondary girder hang up
- two or more floors possible

Continuous pillar, Primary and



Continuous girder, Primary and Secondary girders in same level

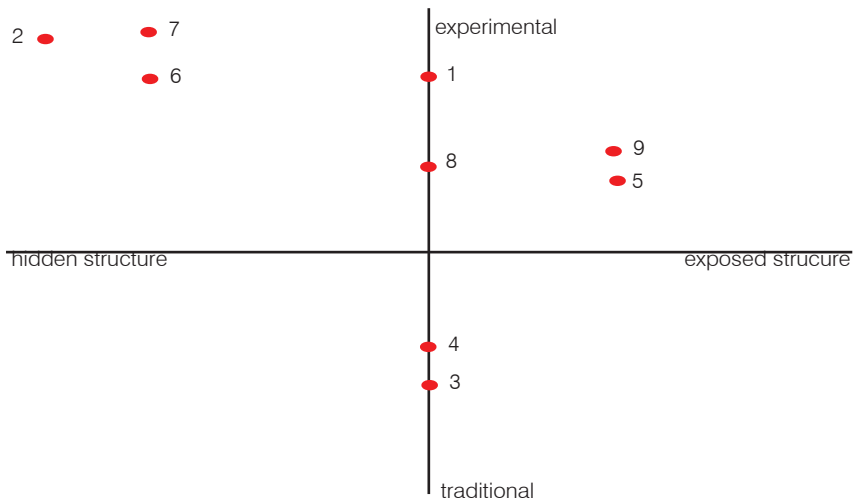


Secondary girder; pillar divided

- primary girder laterally fixed on pillar
 - secondary girder hang up
 - pillar divided
 - two or more floors possible
- primary girder frontal fixed on pillar
 - secondary girder frontal fixed on primary girder
 - two or more floors possible ⁷

6. Case Studies

The cases are ordered among supporting structures, whether Frame-structure, where the load is carry through beams and columns or wall-structure, where the load is carry through the board-effect of wall.



6.1. Frame – structure

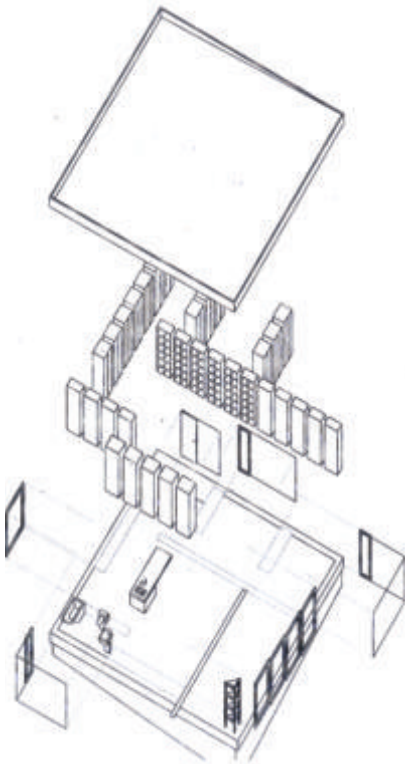
- 1 House near Tokyo, Japan
- 2 Micro Home, Munich
- 3 Weekend –House Lake Yamanaka
- 4 Holiday House in Trosa, Sweden
- 5 Living House in Stuttgart

6.2. Supporting wall structure:

- 6 Prefabricated dwelling unit in Innsbruck, Austria
- 7 Rotatable housing cube in Dipperz, Germany
- 8 Mobile Artists' studio Utrecht, Netherlands
- 9 Living House in London

1 supporting wall structure

2 frame structure



architect

Shigeru Ban, Tokyo

location

Japan, near Tokyo

-latitude

35°N

-sea level

90 ft

use

single housing

size ground x height

100sqmx3m

-wall thickness

104mm

structure

furnitures as pillaster

-base

concrete columns

-roof

flat; beams horizontally braced with plywood panels

prefabrication

yes, can be assembled by a single person, elements fixed and then screwed to floor

materials

- wall exterior

plywood sheet

- wall interior

plywood sheet

- insulation/thickness

90 mm

climate regulation

natural

environmental-consciousness

not direct, but search for saving materials, short-time assembly

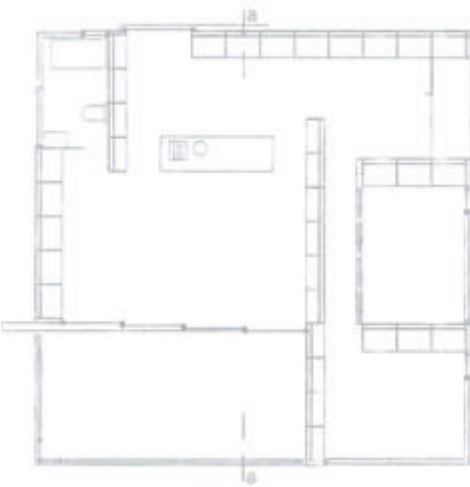
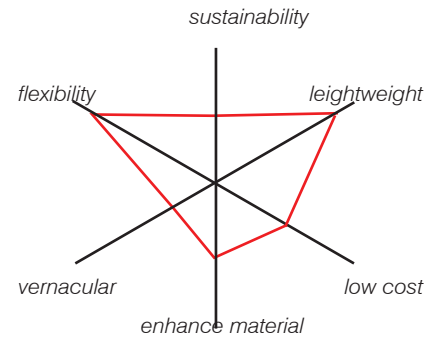
reason of wood use

flexible, simple construction, fast assembly



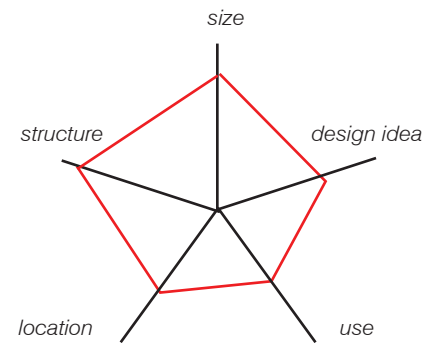
Evaluation

use of wood



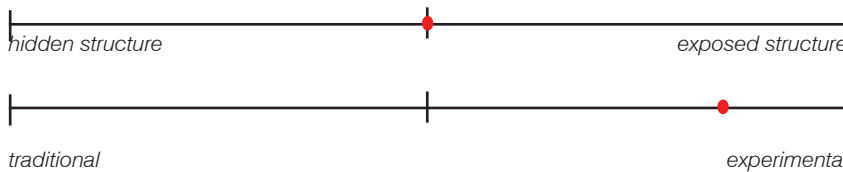
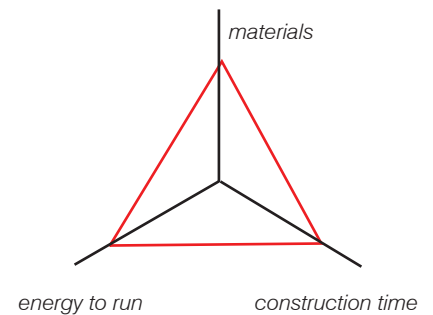
plan scale 1:200

similarity to project



sustainability

- in terms of:





1 Roof construction: coloured sheet steel covering on bit.roofing felt 12 mm water-proof-bonded plywood laid to falls

12 mm plywood sheet bracing timber web beams 356 mm deep with 100 mm thermal insulation between beams plasterboard on supporting structure

2 25 mm plywood sheet

3 *Cupboard door with 5.5 mm chipboard lining*

4 *Rear wall of cupboard: 12 mm timber boarding with coloured glaze*

9 mm plywood sheet

90 mm thermal insulation

5.5 mm plywood sheet

5 *2 x 50/100 timber plate with bolt fixing (M 12) to foundation*

6 floor construction:

plastic floor covering

2 x 12 mm plywood sheets

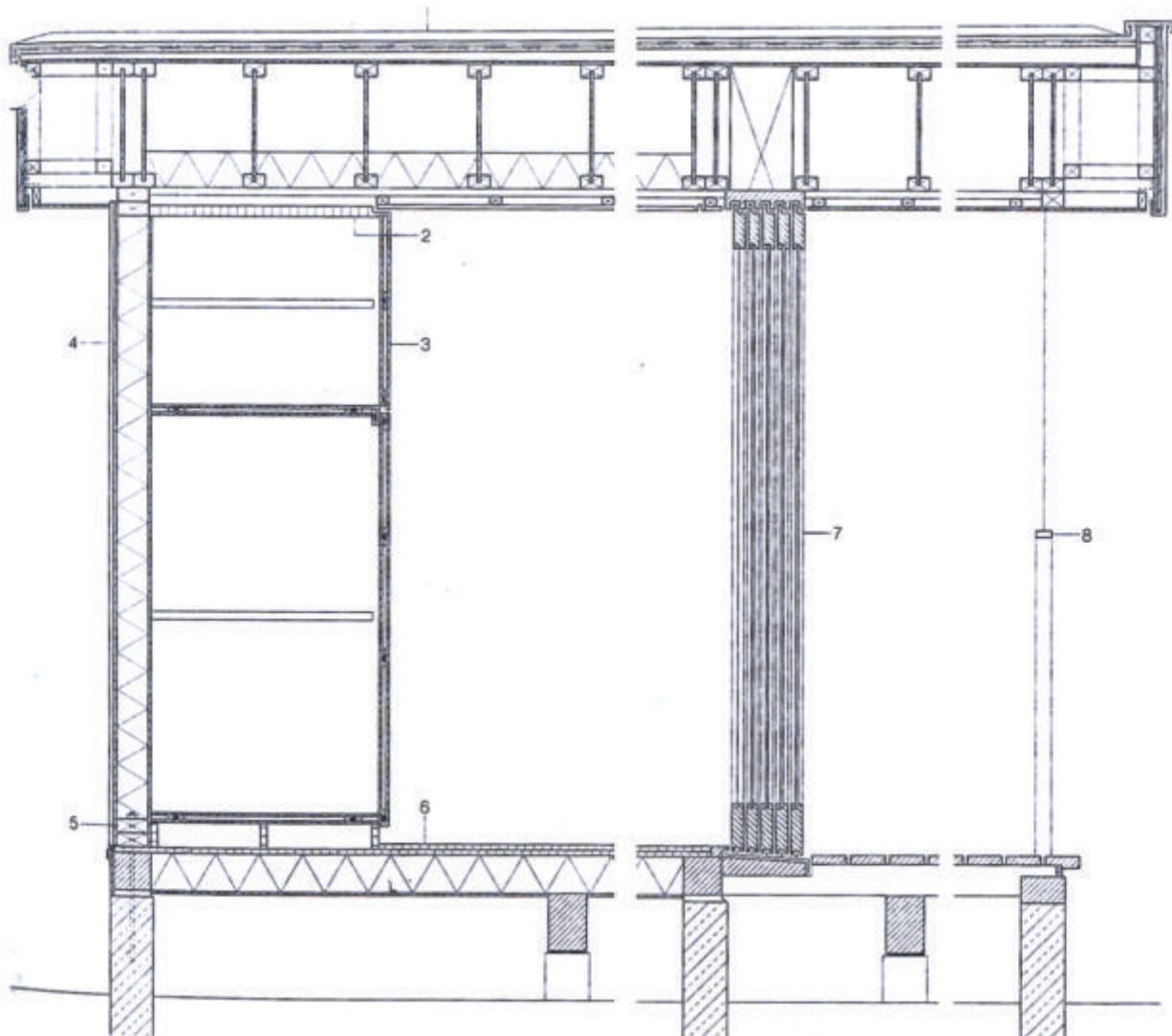
100 mm thermal insulation between 45 / 105 mm timber studs

Waterproof-bonded plywood sheet

7 4 sliding elements with glass filling

1 element with wire mesh filling

8 19/44 mm steel RHS balustrade



section a-a 1:20

1 supporting wall structure

2 frame structure



architect

location

-latitude

-sea level

use

size ground x height

-wall thickness

structure

-base

-roof

prefabrication

materials

- wall exterior

- wall interior

- insulation/thickness

climate regulation

environmental-consciousness

reason of wood use

Horden, Cherry Lee architects, Lee; Lydia
Haak+John Hoepfner architekten, Muenchen
Munich, Germany

48°N

1700ft

temporary

4,4sqm (2,2x2,2)x2,2m

125 mm

timber skeleton

timber

flat

manufactured production

perspex on velcro strips

coated aluminium

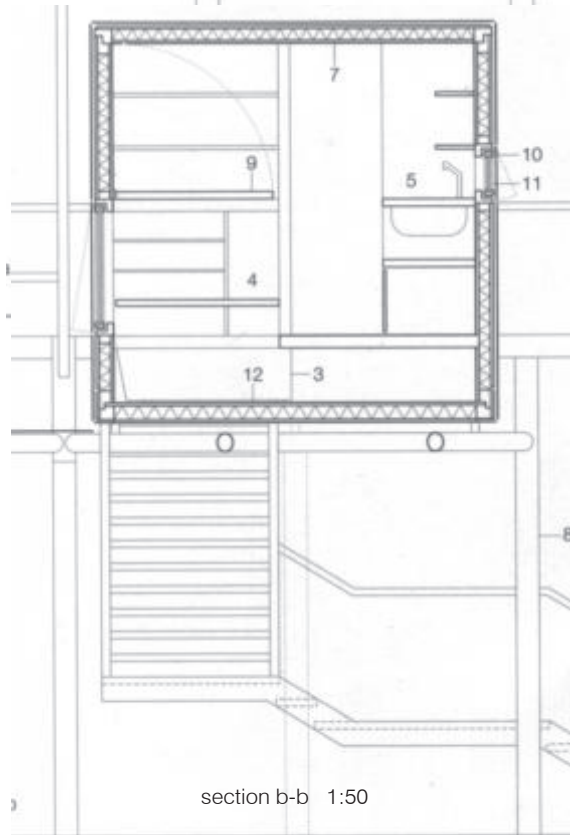
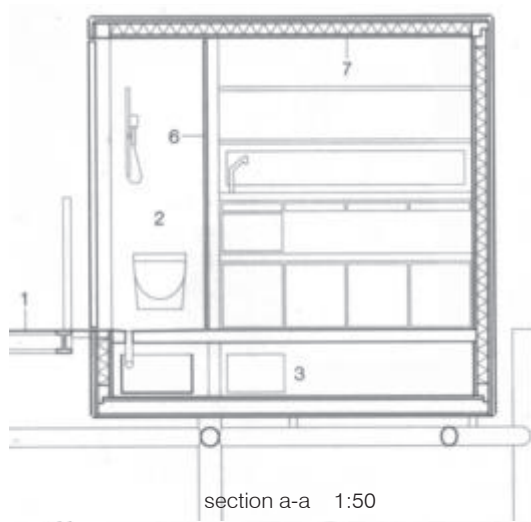
100 mm

natural

no

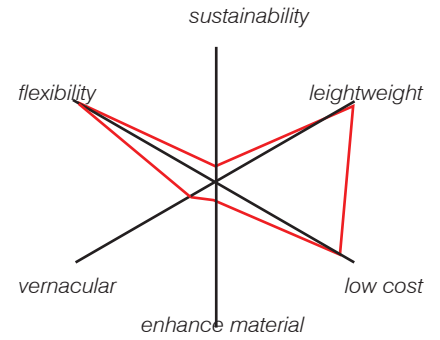
flexible, simple and cheap construction material

- 1 terrace
- 2 entrance / shower
- 3 storage space
- 4 dinning area
- 5 kitchen
- 6 sliding door

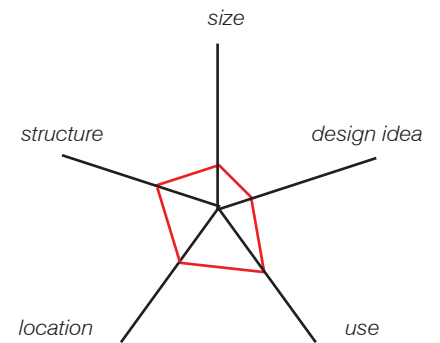


Evaluation

use of wood

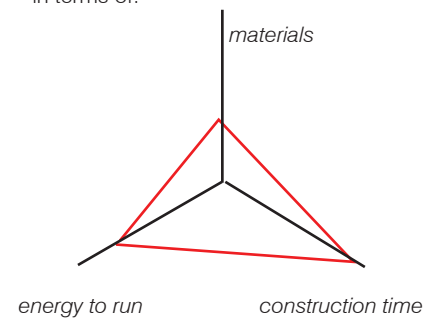


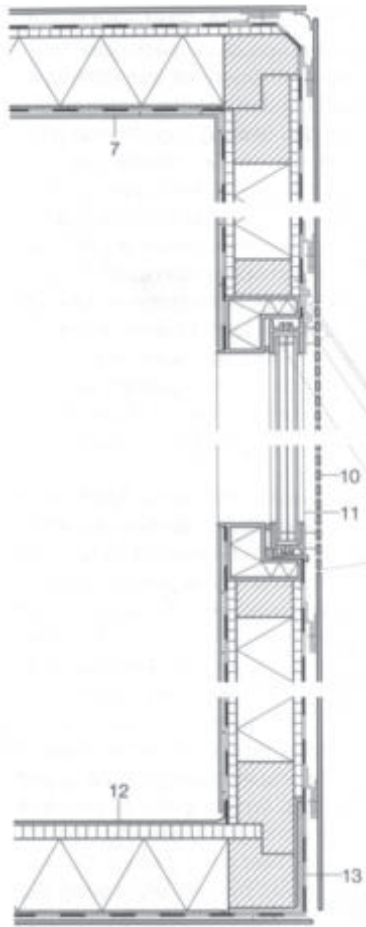
similarity to project



sustainability

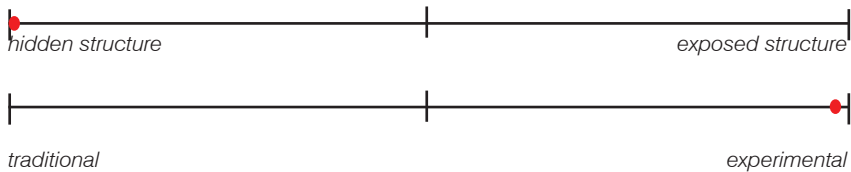
- in terms of:





- 7 3 mm perspex on velcro strip
- 2 mm moisture-diffusing GRP membrane
- 100 mm thermal insulation to falls
- 12 mm OSB to falls
- moisture-diffusing membrane
- 22 mm vent. cavity
- 5 mm coated aluminium
- 8 Ø 150 mm steel tube
- 9 fold-up bank
- 10 3 mm perforated sheet aluminium
- 11 top-hung aluminium window with double glazing: 4 mm glass + 11 mm cavity + 4 mm glass (W/m2K)
- 12 19 mm OSB with epoxy-resin coating;
100 mm thermal insulation; 2 mm GRP; membran; 10 mm cavity; 3 mm aluminium lining
- 13 100 / 150 / 10 mm galv. steel section

sectional detail 1:10





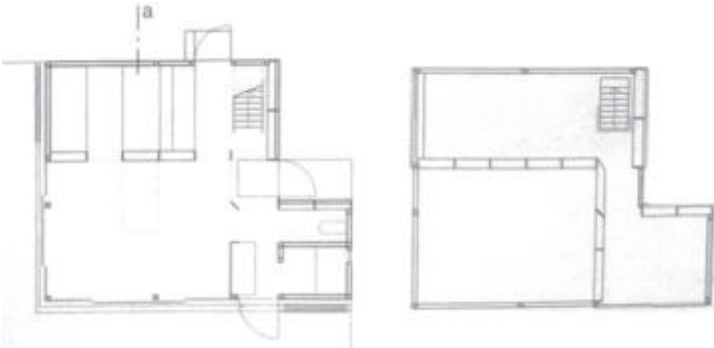
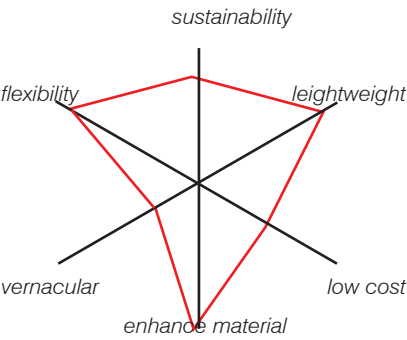
1 supporting wall structure

2 frame structure

architect	Shigeru Ban, Tokyo
location	Japan, near Tokyo
-latitude	35°N
-sea level	
use	single housing
size ground x height	100sqmx3m
-wall thickness	104mm
structure	furnitures as pillaster
-base	concrete columns
-roof	flat; beams horizontally braced with plywood panels
prefabrication	yes, can be assembled by a single person, elements fixed and then screwed to floor
materials	
- wall exterior	plywood sheet
- wall interior	plywood sheet
- insulation/thickness	90 mm
climate regulation	natural
environmental-consciousness	not direct, but search for saving materials, short-time assembly
reason of wood use	flexible, simple construction, fast assembly

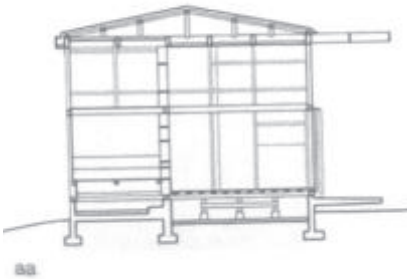
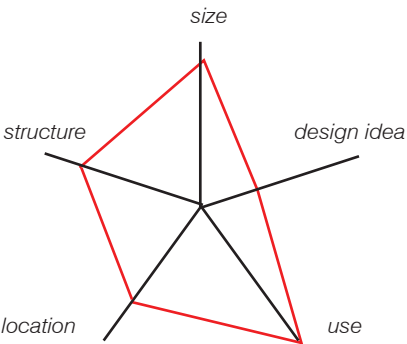
Evaluation

use of wood



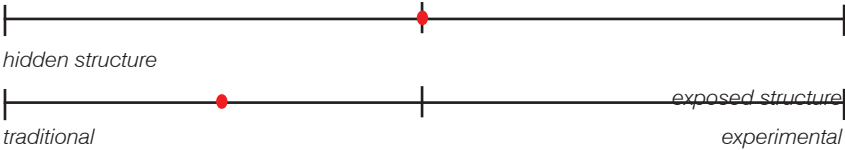
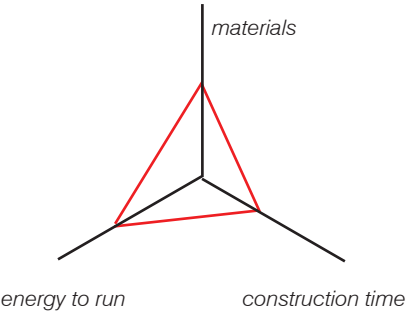
floor plans 1:200

similarity to project



Section 1:200

sustainability
- in terms of:





1 roof construction:

1.5 mm plastic roof sealing layer, 12 mm plywood on 45/45 mm battens with 50 mm, polystyrene insulation between batens, 90/90 Japanese pine raftres

2 ventilation of roof space

3 soffit construction beneath roof space:

75 mm mineral-wool around 30/30 mm battens

9 mm Japanese-lime-veneered plywood

4 mm float glass

5 10 mm polycarbonate hollow cellular slabs

6 floor construction

15 mm birch-veneered plywood, waxed

5.5 mm lauan-veneered plywood

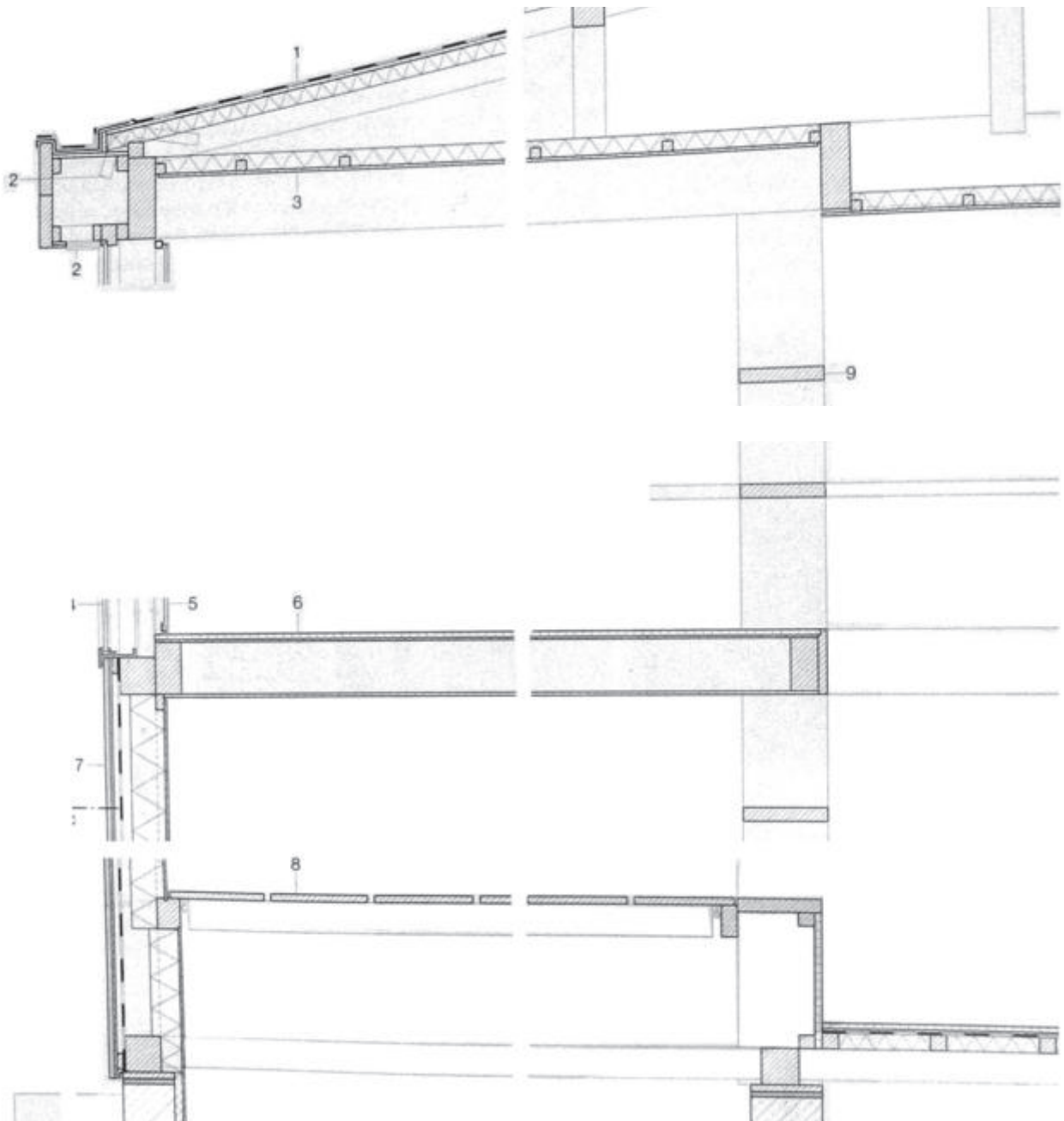
75/150 mm joists

9 mm Japanese-lime-veneered plywood

7 external wall construction:

15 mm, cedar cladding 5.5 mm lauan-veneered plywood, 24/25 mm battens, vapour diffusing windproof layer, 100 mm mineral-wool thermal insulation between 105/105 mm, timber studding, 24/45 mm battens, 5.5 mm Japanese-lime-veneered plywood, waxed

8 opening flap to storage space between raised sleeping



Section 1:20



1 supporting wall structure

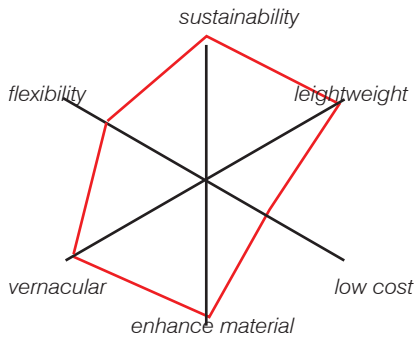
2 frame structure

architect	Natasha Racki, Hakan Widjedal
location	Trosa, Sweden
-latitude	58°5N
-sea level	1m
use	vacational
size ground x heigth	100 sqm x 3 m
-wall thickness	200mm
structure	skeleton
-base	timber
-roof	shed
prefabrication	no
materials	
- wall exterior	spruce tongued-and-grooved boarding
- wall interior	wood fibreboard
- insulation/thickness	cellulose/45 +145mm (depending on zones)
climate regulation	natural, seperated in diffrent zones: summertime-use/ wintertime-use
environmental-con- sciousness	harmonizing with nature, low energy to run because of diffrent used zones according to season
reason of wood use	tradition, harmonizing with landscape

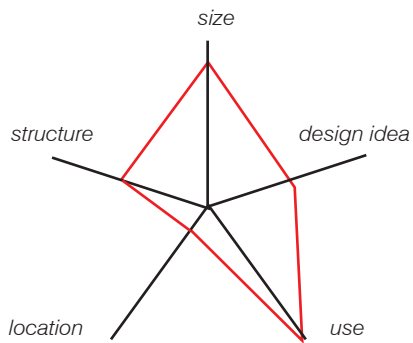


Evaluation

use of wood

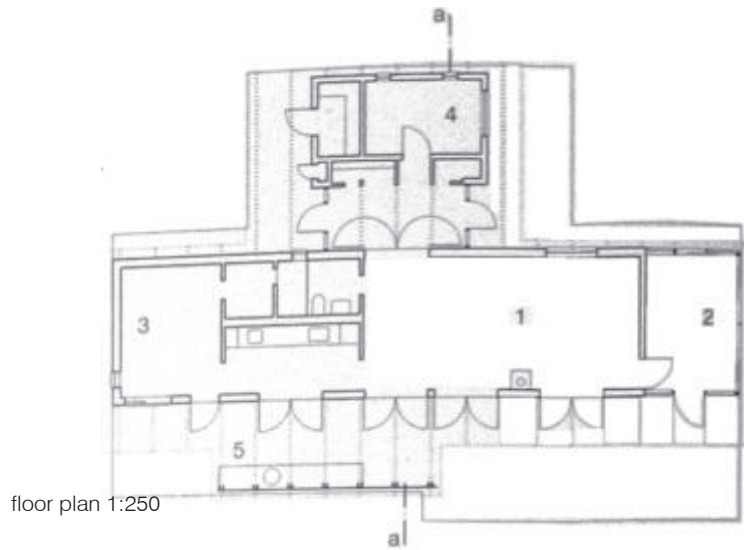
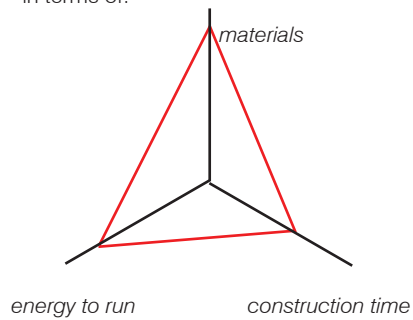


similarity to project



sustainability

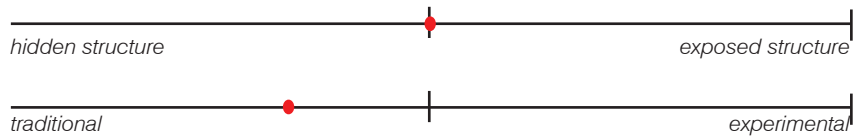
- in terms of:

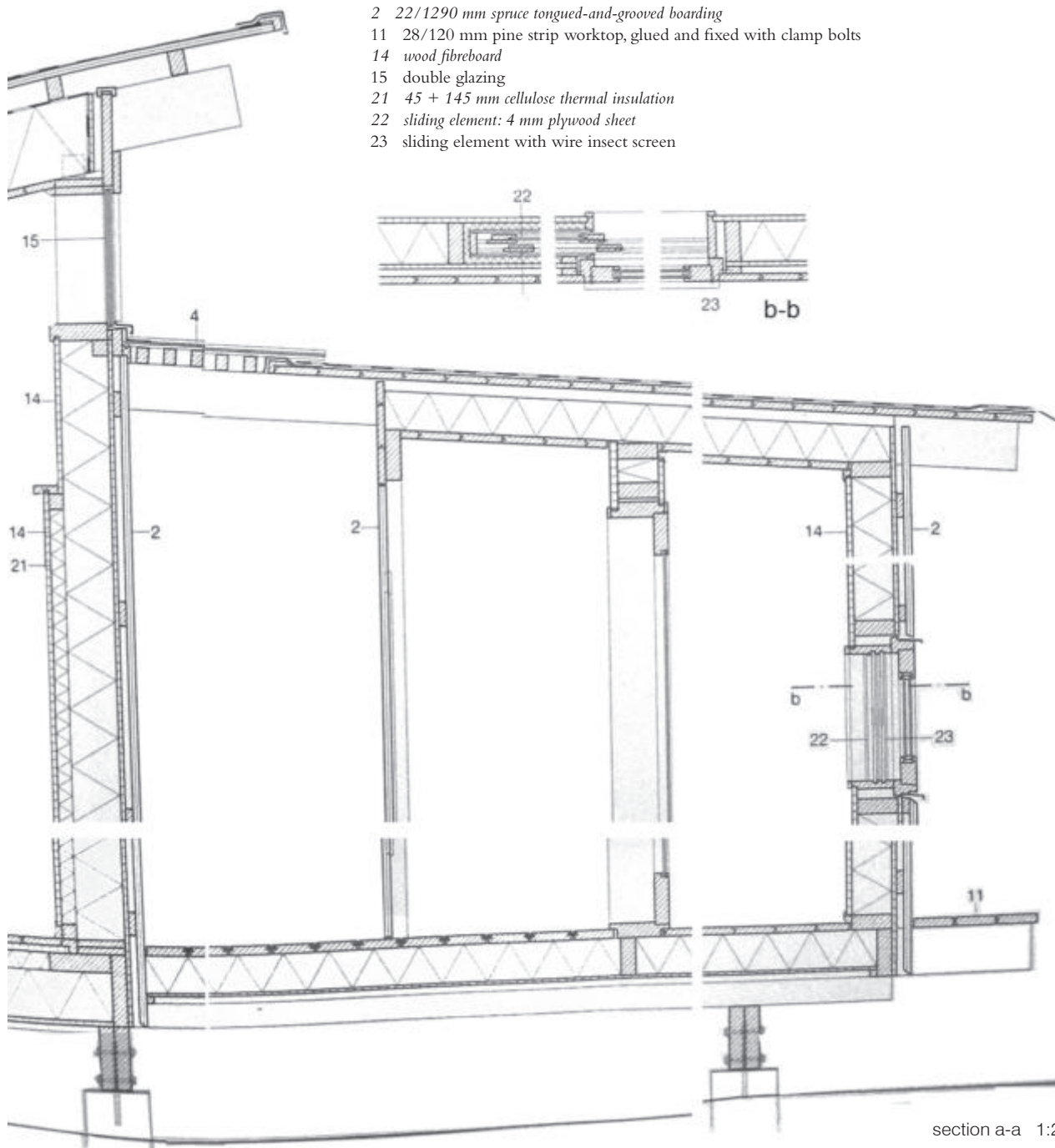


floor plan 1:250



section 1:250





1 supporting wall structure

2 frame structure

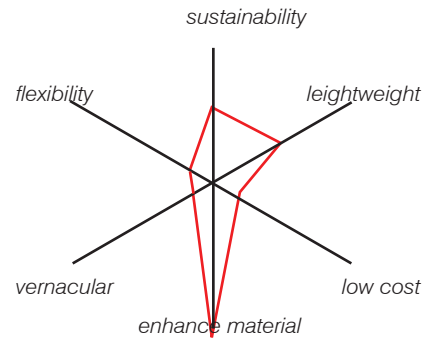


architect	Hartwig N. Schneider Architekten, Stuttgart
location	Stuttgart, Germany
-latitude	45°N 5
-sea level	330m
use	housing
size ground x height	
-wall thickness	380 mm
structure	
-base	concrete
-roof	flat
prefabrication	prefabricated, build within 3 days
materials	
- wall exterior	larch
- wall interior	spruce-softwood
- insulation/thickness	softwoodboard/2x60 mm
climate regulation	floor heating system
environmental-consciousness	short building time
reason of wood use	aesthetical

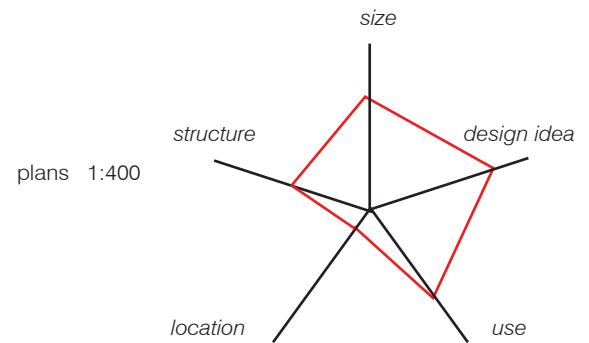


Evaluation

use of wood



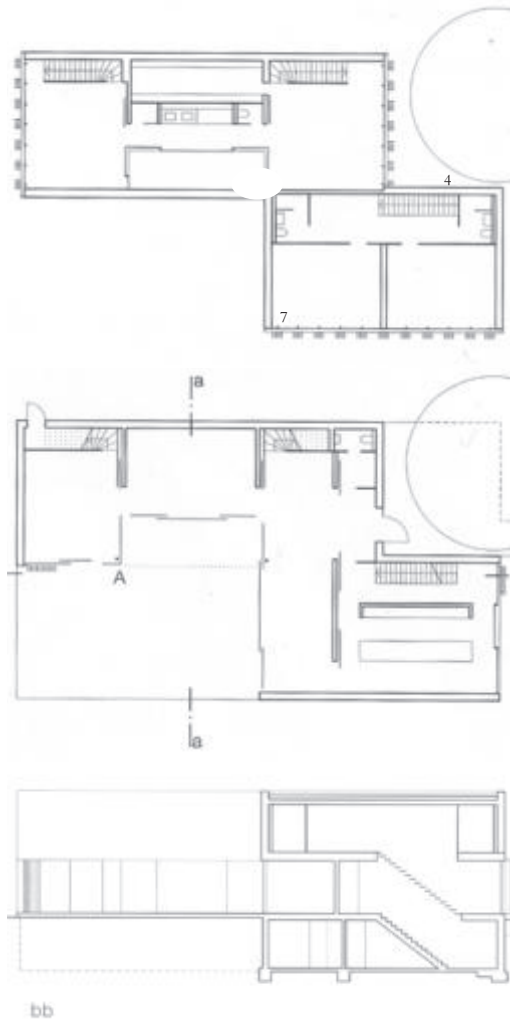
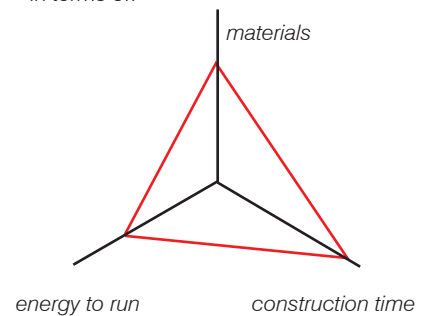
similarity to project



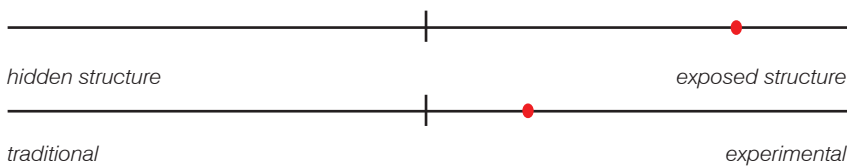
plans 1:400

sustainability

- in terms of:



section 1:400



traditional

experimental

1 roof construction: extensive planting layer, root resistant bituminous sealing layer, elastomer bitumen separating layer, 189mm cross-laminated softwood roof, 12.5 plasterboard soffit

2 pre-weathered titanium-zinc covering

3 - wall construction:

28mm tongued and grooved larch boarding, 20+2x60mm softboard insulation, 115mm cross-laminated softwood wall, joints sealed with adhesive airtight tape, 12.5 plasterboard lining

4 floor construction:

14mm oak parquet, oiled, 60mm anhydrite screed with under-floor heating; separating layer, 40mm polystyrene; separating layer, 216mm cross-laminated softwood floor, 12.5 mm gypsum fibreboard soffit

5 wood element facade with lifting-sliding casements

6 200/200/16 mm steel angle

7 larch folding-sliding shutters:

40/70 mm frame; 40/25 mm louvres; 216mm 22/1290 mm spruce tongued-and-grooved boarding

11 28/120 mm pine strip worktop, glued and fixed with clamp bolts

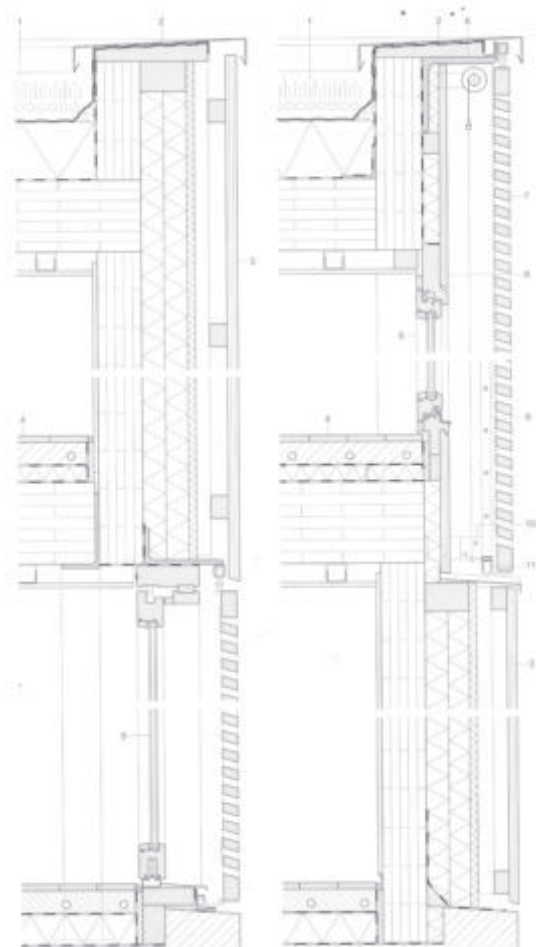
14 wood fibreboard

15 double glazing

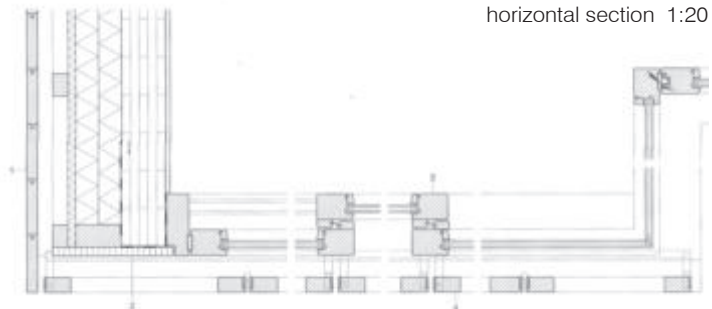
21 45 + 145 mm cellulose thermal insulation

22 sliding element: 4 mm plywood sheet

23 sliding element with wire insect screen



horizontal section 1:20



vertical section 1:20



1 supporting wall structure

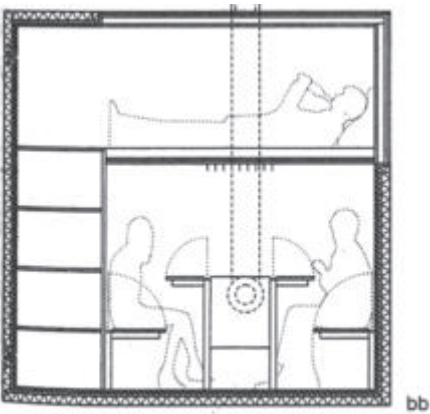
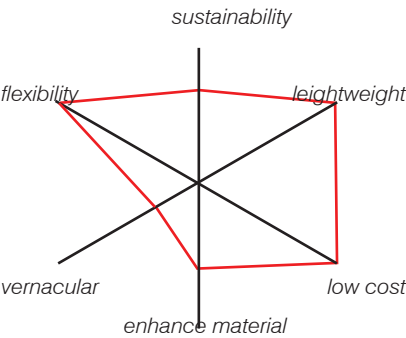
2 frame structure

architect	Holz Box Tirol, Austria
location	Innsbruck, Austria
-latitude	47°N
-sea level	1900 ft
use	temporary (disaster areas ...)
size ground x height	5,76sqm (2,40x2,40) x 2,40m
-wall thickness	90 mm
structure	slabs / board construction
-base	concrete
-roof	flat
prefabrication	yes
materials	
- wall exterior	formwork sheeting
- wall interior	three-ply laminated larch sheeting
- insulation/thickness	rigid foam/40 mm
climate regulation	natural
environmental-consciousness	not directly
reason of wood use	sheep, simple and flexible construction, pre-fabrication



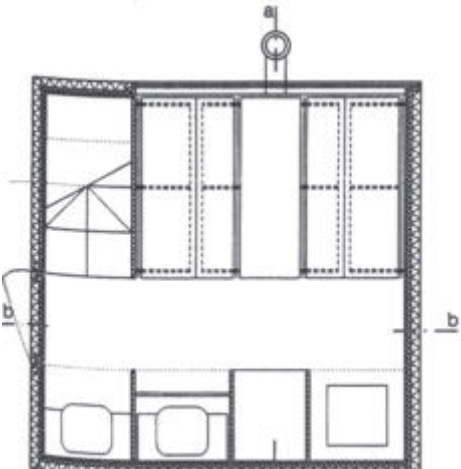
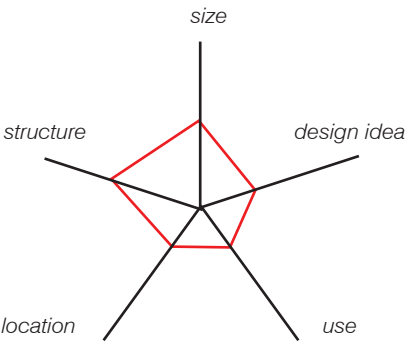
Evaluation

use of wood



sections 1:50

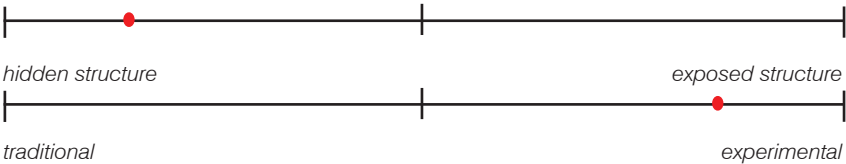
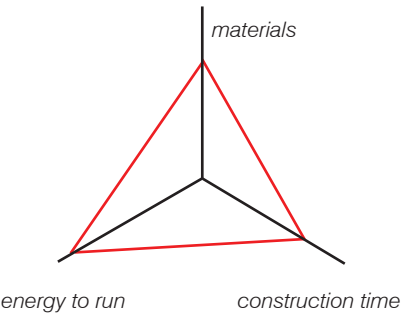
similarity to project

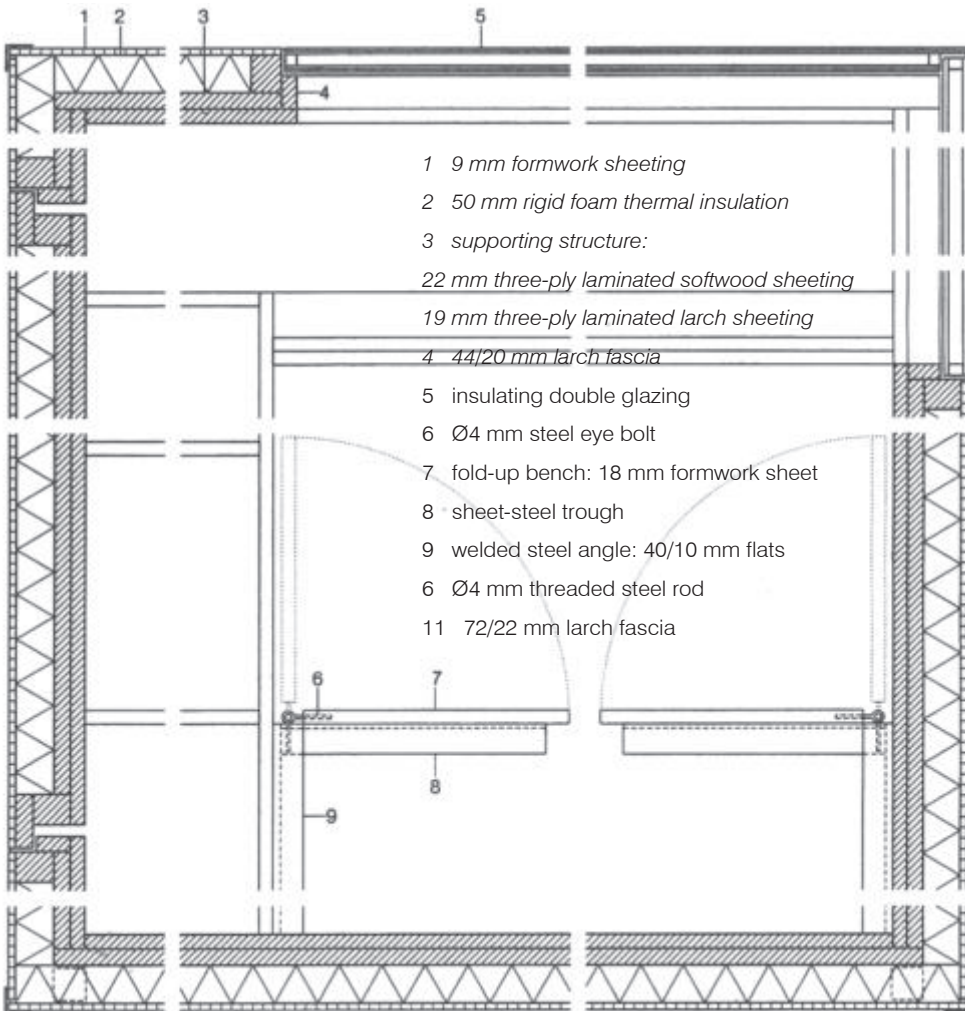
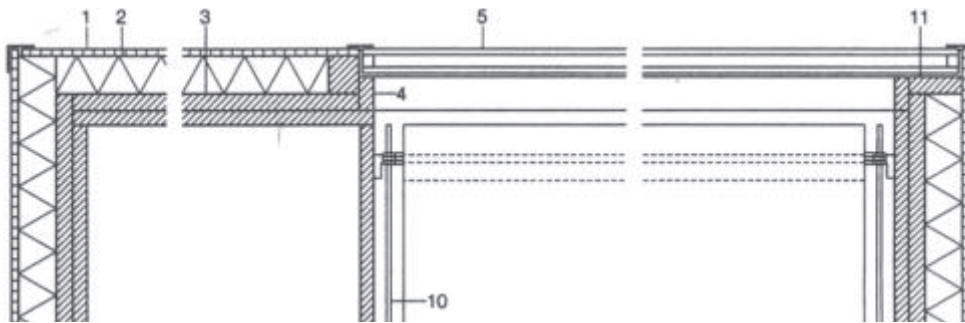


floor plan 1:50

sustainability

- in terms of:





- 1 9 mm formwork sheeting
- 2 50 mm rigid foam thermal insulation
- 3 supporting structure:
22 mm three-ply laminated softwood sheeting
19 mm three-ply laminated larch sheeting
- 4 44/20 mm larch fascia
- 5 insulating double glazing
- 6 Ø4 mm steel eye bolt
- 7 fold-up bench: 18 mm formwork sheet
- 8 sheet-steel trough
- 9 welded steel angle: 40/10 mm flats
- 6 Ø4 mm threaded steel rod
- 11 72/22 mm larch fascia

1 supporting wall structure

2 frame structure



architect

Sturm and Wartzeck, Dipperz

location

Dipperz, Germany

-latitude

50°N

-sea level

1200ft

use

temporary

size ground x height

7,29sqm(2,70mx2,7m)x2,7

-wall thickness

222 mm

structure

skeleton

-base

steel

-roof

flat, covered with solar cells

prefabrication

yes

materials

- wall exterior

laminated timber sheeting

- wall interior

laminated timber sheeting

- insulation/thickness

cotton/200mm

climate regulation

heat development controlled by self-rotation

environmental-consciousness

self sufficient in energy (photovoltaic)

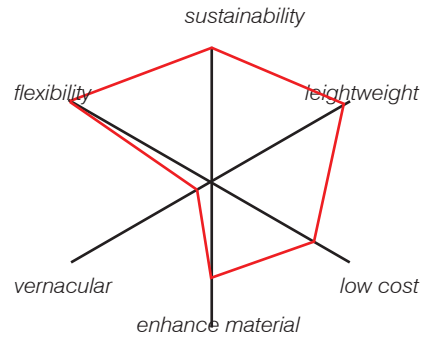
reason of wood use

simple flexible construction

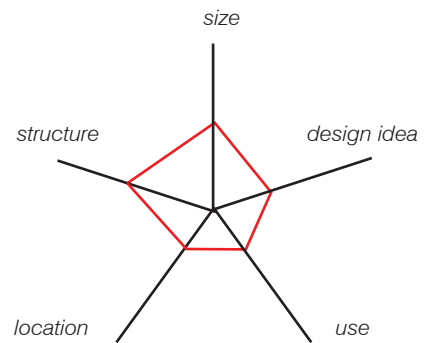


Evaluation

use of wood

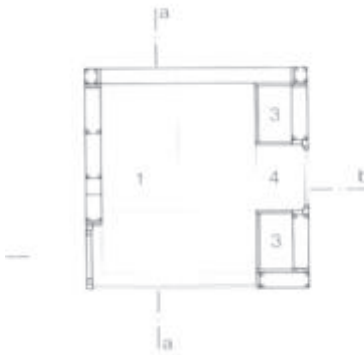
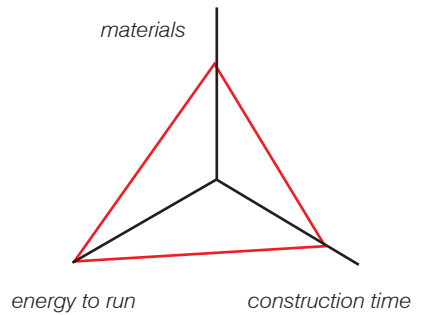


similarity to project

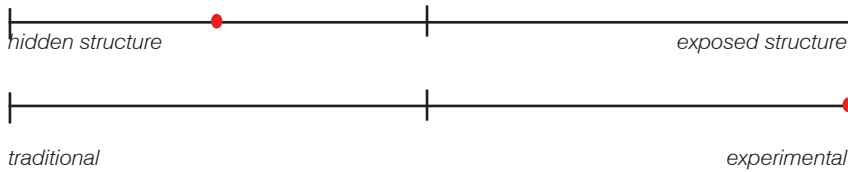
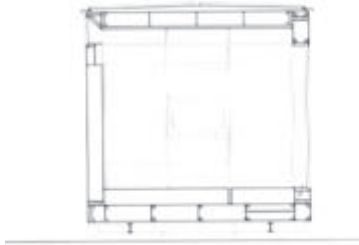


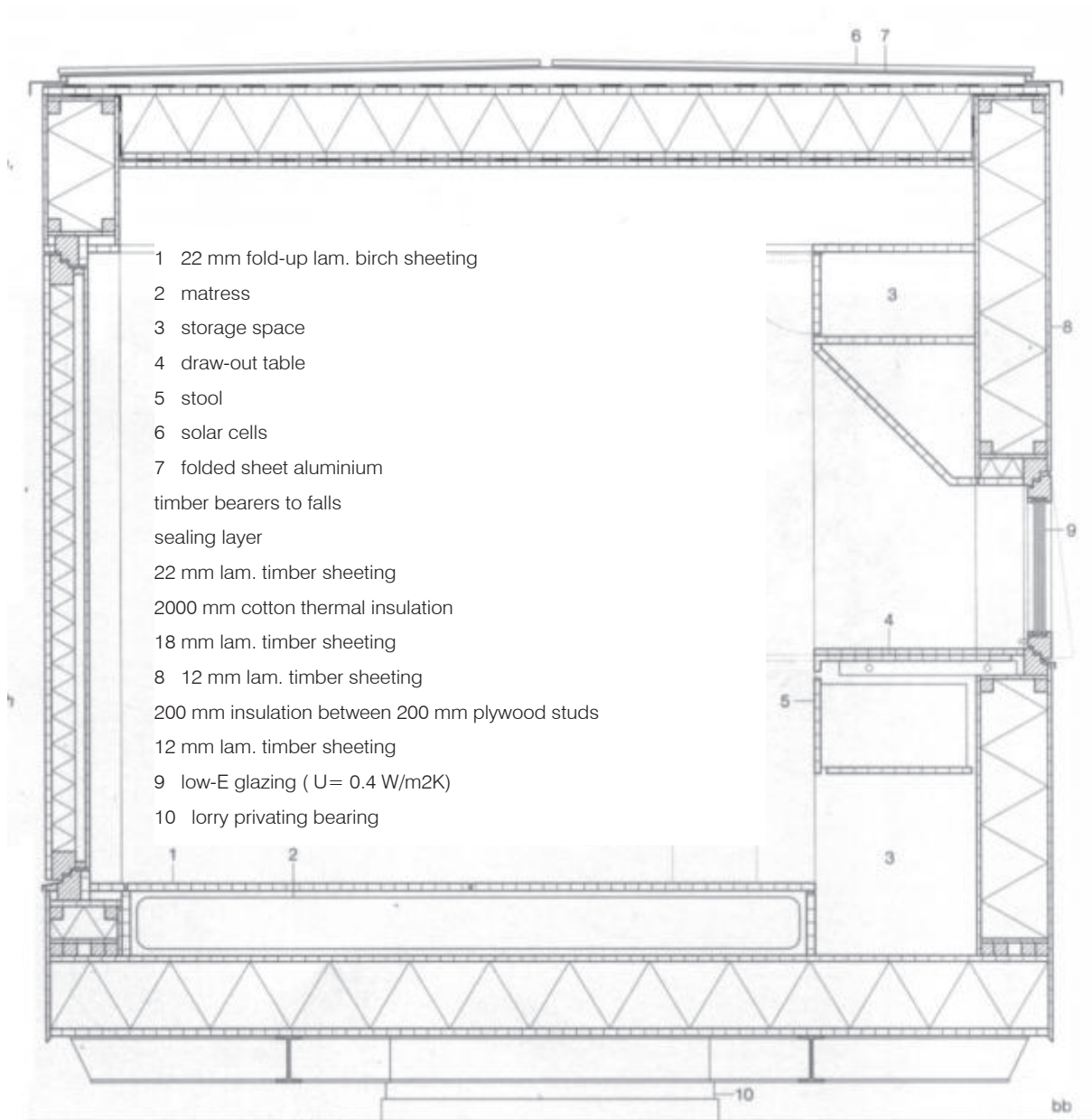
sustainability

- in terms of:

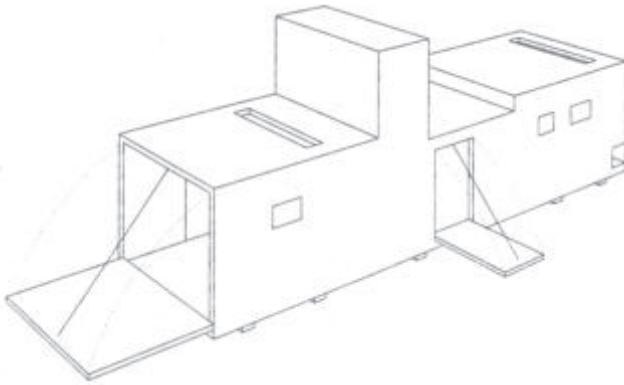


floor plan / section 1:100





floor plan / section 1:20



1 supporting wall structure

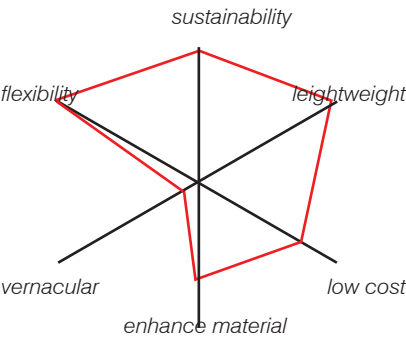
2 frame structure

architect	Christian Kahl, Korteknie Stuhlmacher architecten
location	Utrecht, Netherlands
-latitude	52°N
-sea level	37ft
use	temporary
size ground x height	46,2 sqm (16,50x2,80) x 3m
-wall thickness	180 mm
structure	board construction
-base	timber
-roof	flat, different levels
prefabrication	
materials	
- wall exterior	three-ply laminated sheeting
- wall interior	laminated timber sheeting
- insulation/thickness	rigid foam insulation/69 mm
climate regulation	natural
environmental-consciousness	not direct
reason of wood use	flexible, simple construction, fast assembly

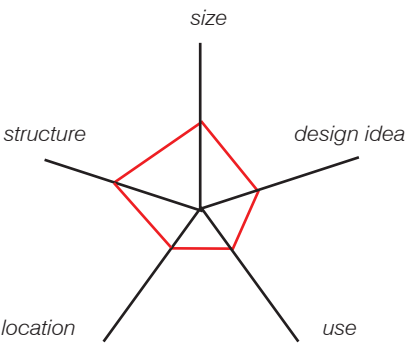


Evaluation

use of wood

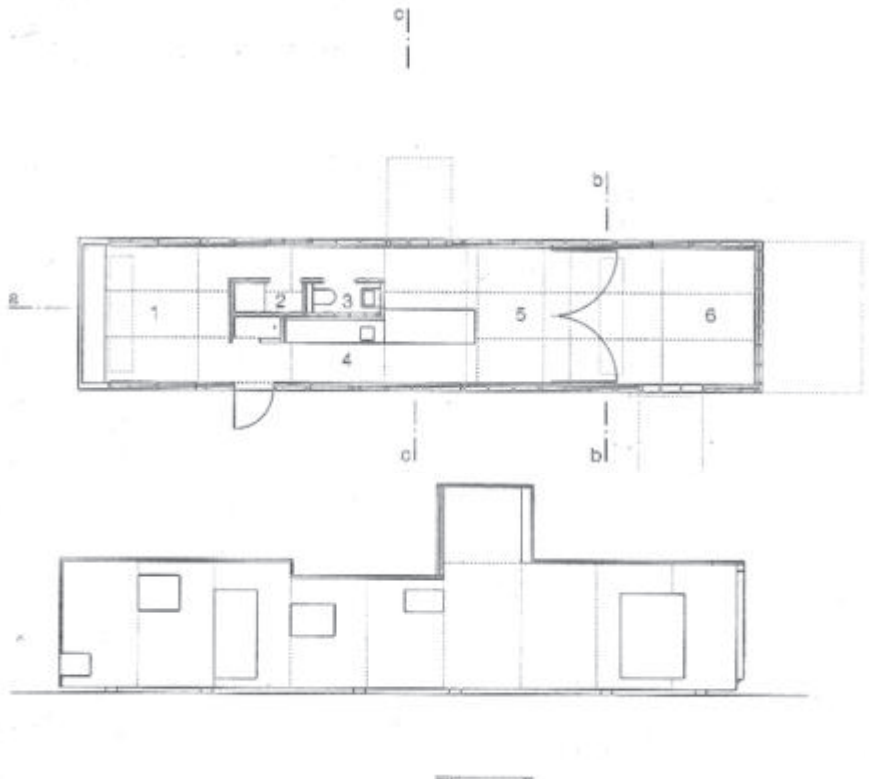
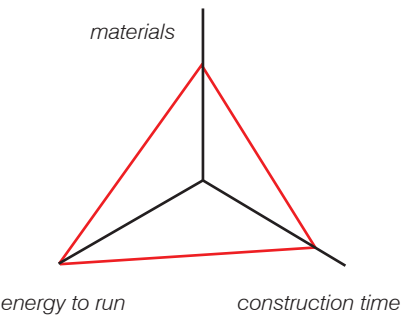


similarity to project

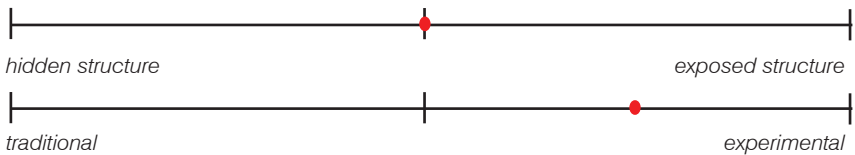


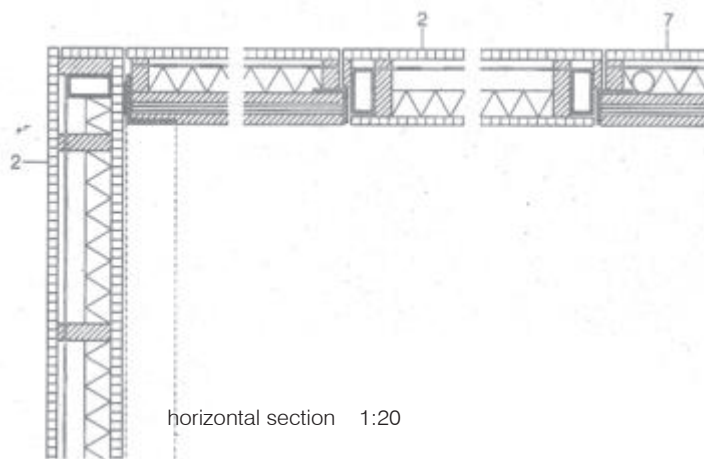
sustainability

- in terms of:

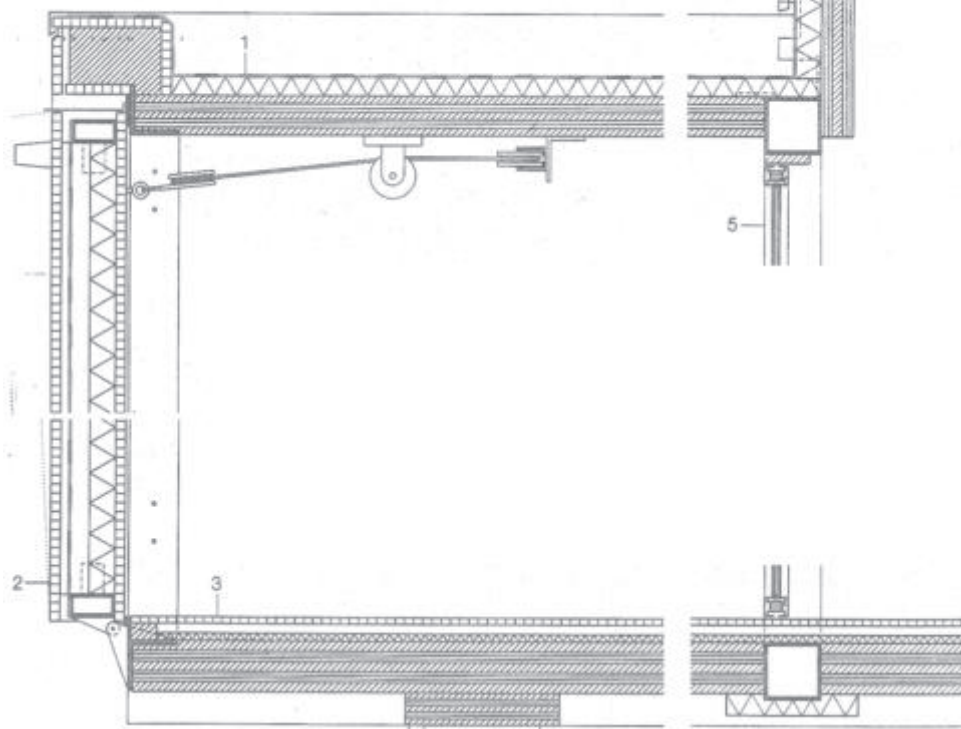


sections and plans 1:200

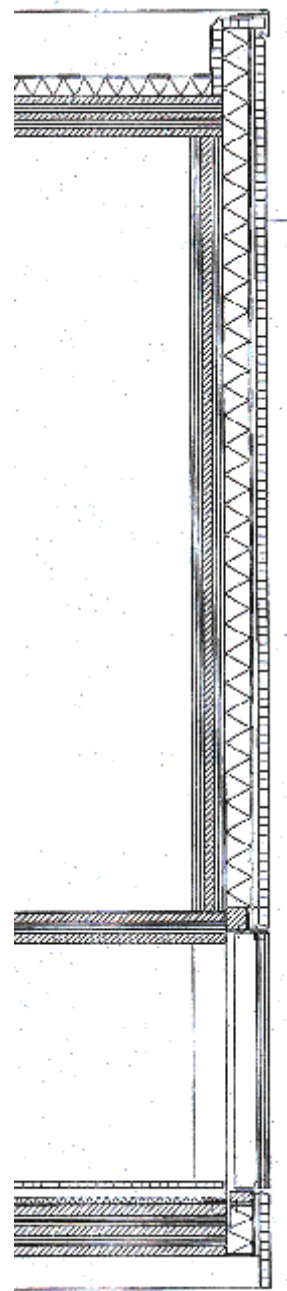




horizontal section 1:20



vertical section 1:20





- 1 roof sealing layer
- 50 mm thermal insulation on 105 mm laminated timber sheeting
- 2 bottom-hung facade flap:
 - 26 mm laminated sheeting
 - 27/44 mm timber battens; windproof layer
 - 60/120/5 mm steel RHS frame
 - 44/125 mm timber battens
 - 70 mm rigid foam thermal insulation
 - 26 mm three-ply laminated sheeting
- 3 18 mm epoxy-resin-coated orientated strand board
 - 27/44 mm wood battens
 - 20 mm rigid foam insulation
 - 135 mm laminated timber sheeting
- 4 400/85 mm laminated timber bracing strip
- 5 150/150/6 mm steel SHS frame
- 7 wall construction: 26 mm three-ply laminated sheeting
 - 44/89 mm wood battens; windproof layer
 - 69 mm rigid-foam insulation
 - 85 mm laminated timber sheeting



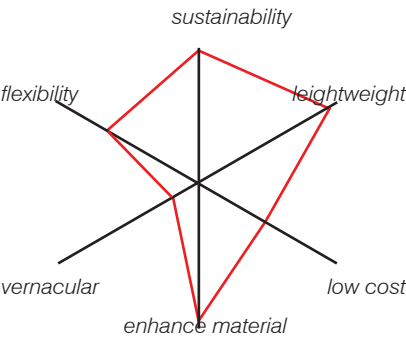
1 supporting wall structure

2 frame structure

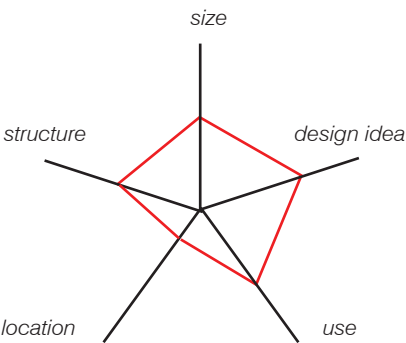
architect	David Adjaye, London
location	London, U.K.
-latitude	51°N
-sea level	14m
use	single housing
size ground x heigth	
-wall thickness	
structure	
-base	
-roof	flat
prefabrication	prefabricated by Eurban, erected within 5 days
materials	
- wall exterior	
- wall interior	
- insulation/thickness	
climate regulation	
environmental-consciousness	Prefabrication and use of low impact material
reason of wood use	aesthetical

Evaluation

use of wood

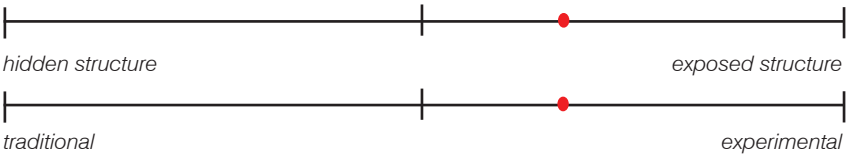
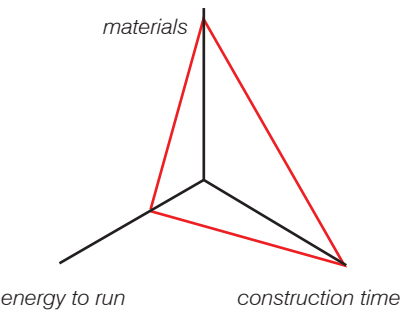


similarity to project



sustainability

- in terms of:



Footnotes

- 1 Early history of timber construction according to: Thomas **Herzog**, Julius Natterer, Roland **Schweitzer**: *Holzbau Atlas*, München: Institut für internationale Architektur-Dokumentation, 1996
- 2 History of timber construction according to: Will Pryce, *Buildings in Wood*, London: Thames and Hudson Ltd., 2005
- 3 Timber construction today according to: Dominique **Gauzin-Müller**, *Wood Houses: Spaces for Contemporary Living and Working*, 2004
- 4 Trend of material pureness according to: Naomi **Stungo**, *Wood: New Directions in Design and Architecture*, San Francisco: Chronicle books LLC., 2001
- 5 Trends in timber construction: Joaquim **Ballarín i Bargalló**, *Wood Houses*, London: teNeues, 2005
- 6 Trend of Prefabrication: Detail, Zeitschrift für Architektur, München: Institut für deutsche Architekturdokumentation: 7/2006
- 7 Thomas **Herzog**, Julius **Natterer**, Roland **Schweitzer**: *Holzbau Atlas*, München: Institut für internationale Architektur-Dokumentation, 1996



- 1- Introduction: aim of research
- 2- Trends and market development
- 3- Materials

innovative building insulation VII

1 Aims of Research

Insulation, a certain inertia (“building mass”) and air circulation are decisive for a buildings’ natural climate. Although Southern Italy’s warm temperatures, thermal insulation is important over there. On the one hand because of the winter, which is pretty mild, but humidity lets feel the temperatures much lower; on the other hand especially during the summer season it can substitute a part of the inertia by absorbing the heat. By that the thermal insulation keeps the temperatures stable and could avoid the use of a heating or cooling system. In spite of those advantages, insulation is mostly not used in Apulia. The inhabitants were adopting their lifestyle by wearing layers of clothes during the winter season. Their houses were mostly made of stone, firstly because of the local abundance of stone as raw material and the missing forests to get timber. Secondly, thick stone walls are a perfect heat storage, which makes it during the summertime pleasantly warm inside the houses; in contrast to the winter season, when it gets unpleasantly cold. Walls are reaching thicknesses until 2m. Nowadays this is considered as a waste of building material. In former times the building material were often just rest (loose stone from the fields, rests from land expenditure ...), today the stones have to be mined in open cast. Since the population increased it is also in our today’s responsibility to reduce the used ground. Since thermal insulation reduces the inertia it could keep also the wall thickness slim.

The project tries to combine reduced wall thickness through insulation in order to keep the material impact low and to adapt to the little available building space; with the use of stone as inertia to achieve an agreeable climate inside the house without the help of a heating or cooling systems.

That is why the wall construction should be made of timber, including a layer of insulation; the floor should be made by stone.

To keep the walls as slim as possible the research is looking for innovative insulation material with a very high insulation effect. In addition, the sustainability of the material is important. As well as preferable a natural material should be used.

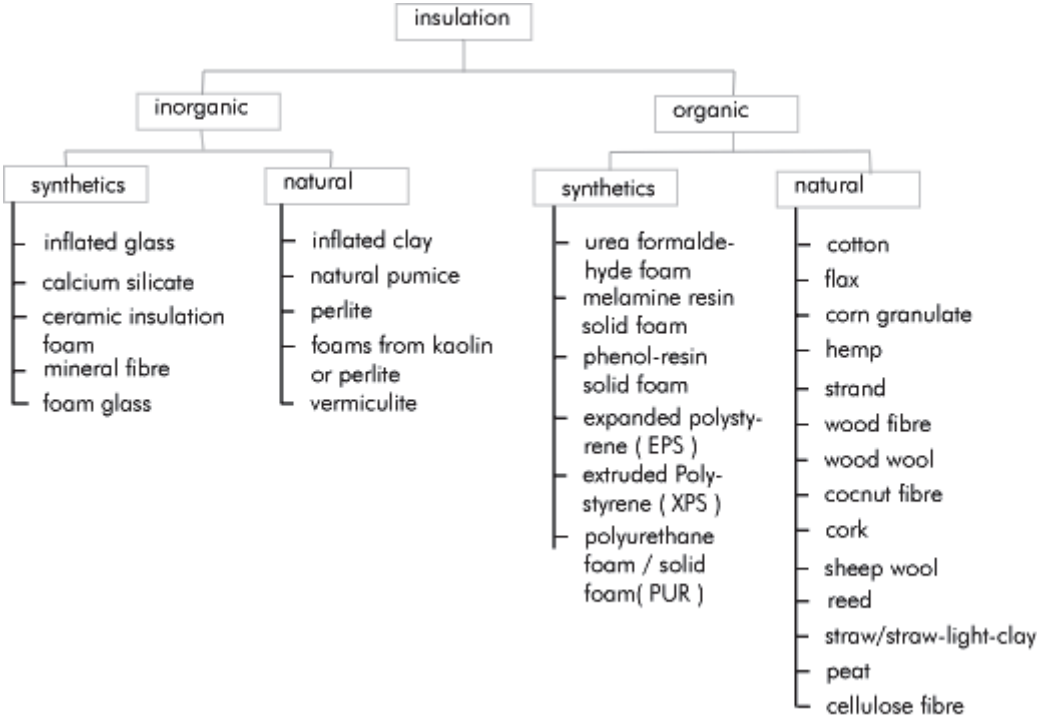
2 Insulation - basics

All materials that are applied for enhancing heat and acoustic protection of a construction are defined as insulations. According to their thermal conductivity, their fire prevention performance, their ability to work under pressure and their commercial size and packaging (mats, panels, loose ...) they are used for different implementations.

The thermal conductivity λ , predicating the heat insulation of a building material, is a construction material specific coefficient which evaluates the capacity of a material to conduct heat. The evaluation is abstract, that means independent from the installation situation. The less the thermal conductivity the better is the insulation effect.

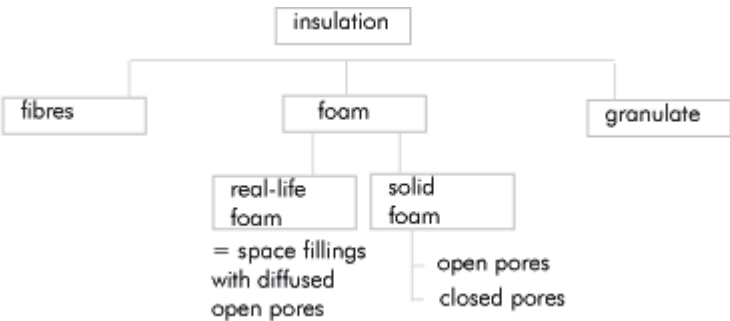
Consisting of different raw materials, the insulation materials derivation is classified in two groups: organic and inorganic. While organic insulation consists of carbon compounds, extract from natural renewable raw material (cork, wood, cellulose) as well as extract from mineral oils (polymers like e.g. polystyrene, polyurethane); the inorganic consists of mineral compounds (e.g. rock wool, foam glass, perlite).

The following image illustrates the classification according to the materials raw material (KOMPENDIUM):

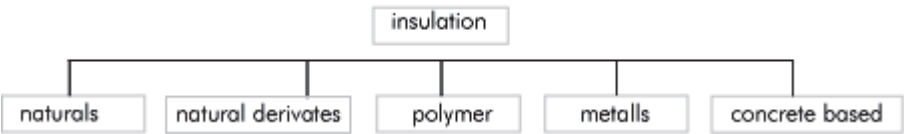


Each one among them has a different structure grouped in fibre insulation, foamed insulation and granulates.

Classification according to the materials structure (KOMPENDIUM):



One can also classify the insulation according their materialist consistence: (MaterialconneXion):



I referred to this classification, since I focus on the usage and less on regarding their chemical derivation and raw material.

3 Innovative Insulation

The thermal conductivity of conventional insulation material like glass-, Mineral wool- and Polystyrene foams is around 0,035 and 0,050 W/(mK).

Hence, one is searching for innovative insulation on the one hand for materials whose thermal conductivity is below the mentioned. Until long time this has been just one: Polyurethane (PUR) with a thermal conductivity of 0,02 W/(mK).

The innovation of the last years has been an improved use of renewable raw materials. However, insulations like hemp, corn, wool and similar do have higher thermal conductivity than Glass and Mineral fibre. A great advantage of them is beneath the help to conserve finite resources also that they feature good heat and humidity storage capability compared to conventional ones. A disadvantage is in terms of the constructions' point of view their biodegradability, especially when used in clammy-warm areas they are considered as a risk of mould-generation.

A great contribution to innovation is made by the development of vacuum-insulation. Showing a very low thermal conductivity the insulation-layer can be reduced by 10 times.

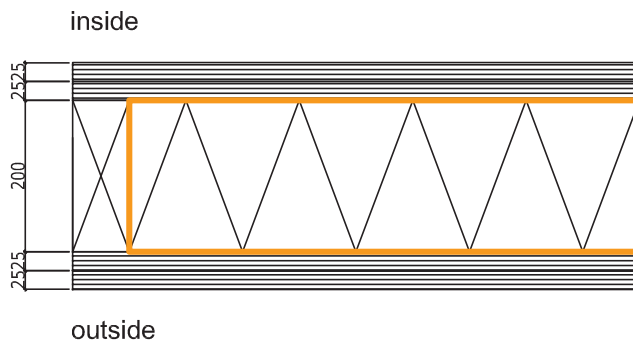
4 - Innovative building material research

This material research collects and compares different insulations, which are considered as innovative.

In a brief description they are characterized and evaluated on different aspects.

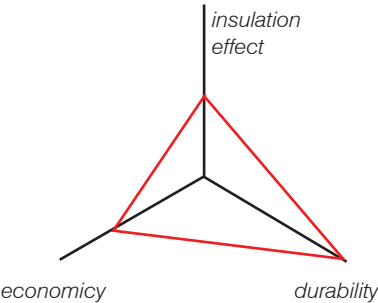
Additional there is a technical drawing how a possible wall section would look using the material.

wall assembly with polystyrene, as example for a conventional material:

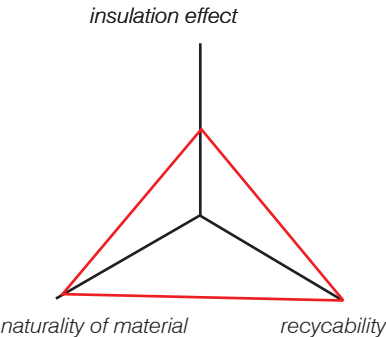


Evaluation

characteristics:



sustainability - in terms of:

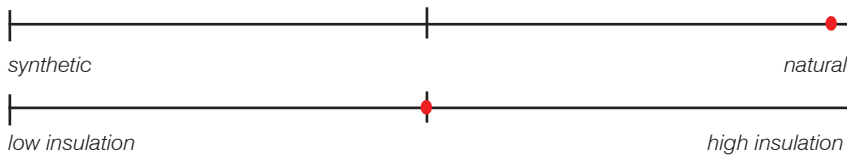
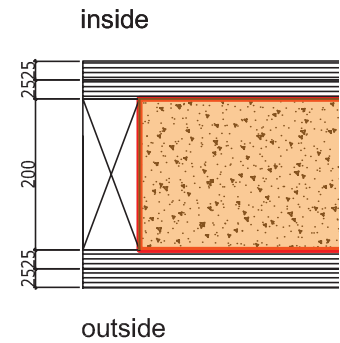


name	Zostera mat
material	seaweed (Zostera Marina)
constistence	mats
characteristics	nonflammable, easy available, environmental friendly
Manufacturing process/ Assembly	picking up; seperation from detritus; processing into mats
Application	construction industry
Dimensions (HxWx L) in mm	30 mm mats cut to measure
Thermal Conductivity KW/Km ²	0.040
Durability	unlimited
Price	17€/m ²
Manufactors	Syd Tek

source: www.syd-tek.dk

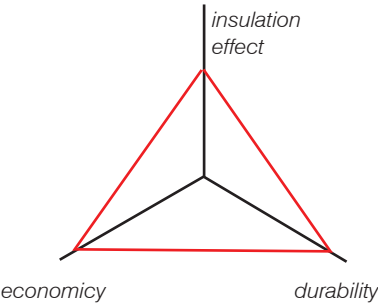


wall construction scheme:

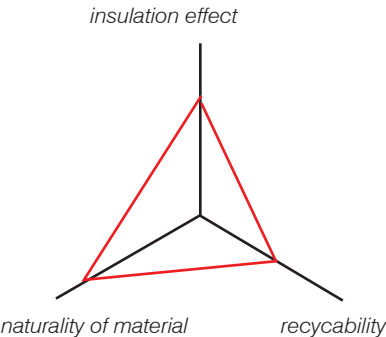


Evaluation

characteristics:



sustainability - in terms of:

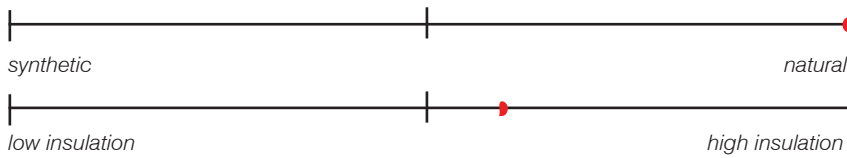
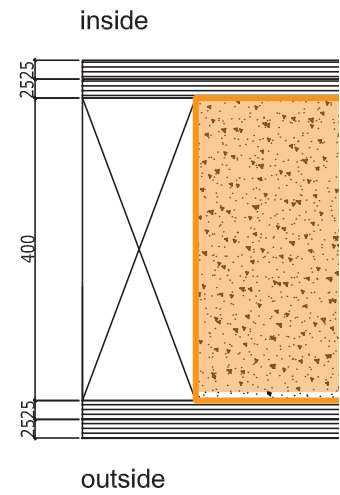


name	BatiPlum
material	feathers
constistence	mats
characteristics	Hygromatic insulation, nonflammable, easy available, environmental friendly
Manufacturing process/ Assembly	feathers 70%, 10%wool, 20% natural fibre
Application	construction: insulation of roof, wall, floor
Dimensions (HxWx L) in mm	40/60/80/110x110x3500xunlimited
Thermal Conductivity KW/Km ²	0.033-0.042
Durability	no experience untill now --> no timelimit
Price	like conventional insulation
Manufactors	Nap'tural

source: www.batiplum.com

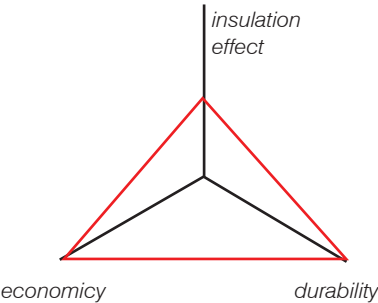


wall construction scheme:

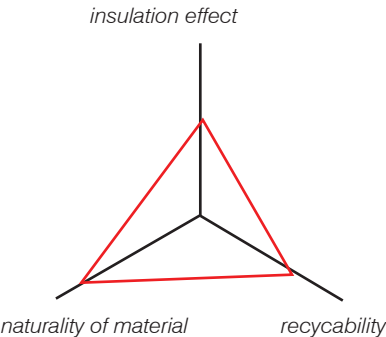


Evaluation

characteristics:



sustainability - in terms of:

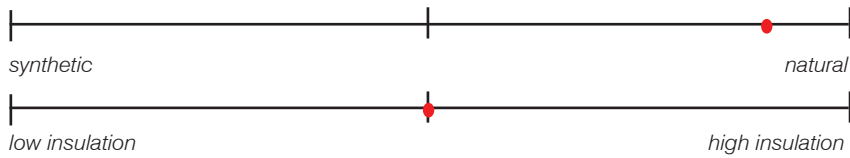
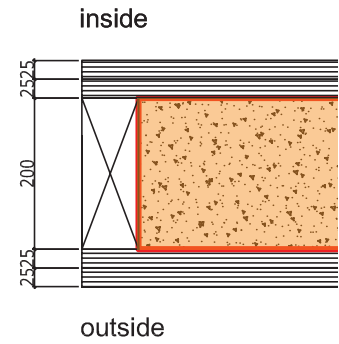


name	Lan Kot
material	75% sheep wool, 25% polystyrene fibre
constistence	mats
characteristics	Optimal relation of sheep wool and polystyrene in terms of durability and thermo-acoustic insulation
Manufacturing process/ Assembly	sheep wool thermal bound with polystyrene fibre, formed as panels
Application	perimeter- and deviding wall -, roof - and floor -insulation
Dimensions (HxWx L) in mm	unlimited x 12 000 x 6000
Thermal Conductivity KW/Km²	0.040
Durability	unlimited
Price	for 50 mm thickness 11,62 €
Manufactors	coverd

source: www.coverd.it

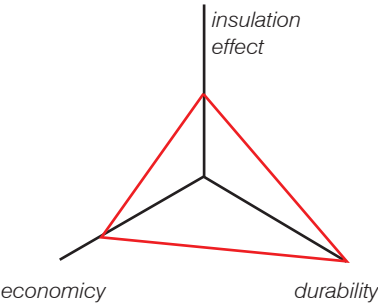


wall construction scheme:

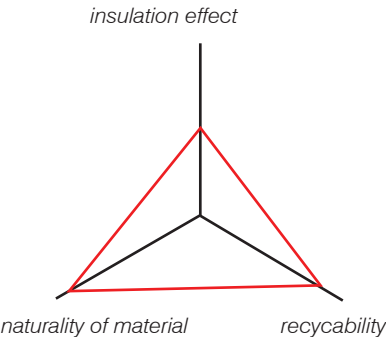


Evaluation

characteristics:



sustainability - in terms of:

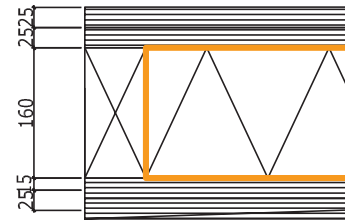


name	CorkPan
material	expanded cork
constistence	panels
characteristics	through the expansion of the cork a better insulation effect than normal cork is achieved; fireclass E
Manufacturing process/ Assembly	to make raw material cork durable roasted directly after “harvesting” and expanded and put in form
Application	roof, wall, floor insulation
Dimensions (HxWx L) in mm	20/40x1000x500
Thermal Conductivity KW/Km²	0.036-0.040
Durability	unlimited
Price	for 20mm 13 €/m²
Manufactors	TecnoSugheri

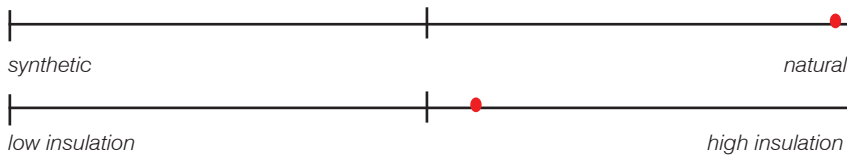
source: www.tecnosugheri.it

wall construction scheme:

inside

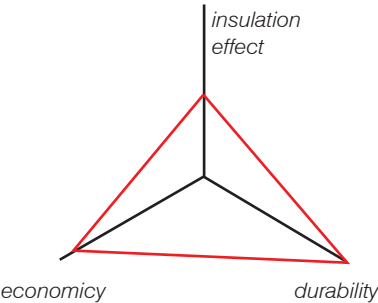


outside

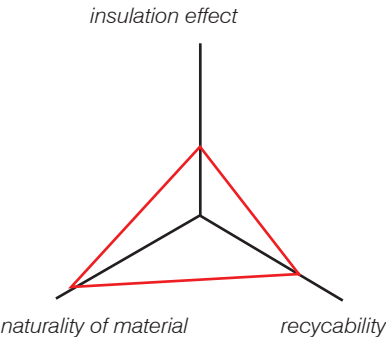


Evaluation

characteristics:



sustainability - in terms of:

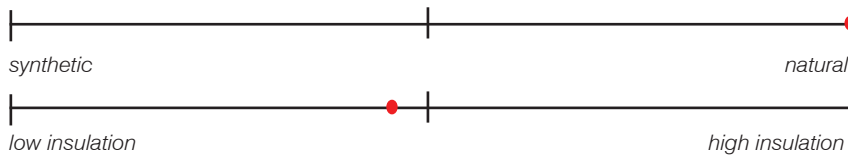
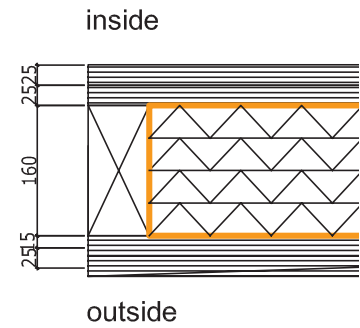


name	Lastra in Cocco
material	cocnut fibres
constistence	panels
characteristics	without any chemical bounders
Manufacturing process/ Assembly	outer fibre of cocnut is formed and pressed to a panel
Application	wall insulation, cieling
Dimensions (HxWx L) in mm	10 to 40x120x60
Thermal Conductivity KW/Km ²	0.043
Durability	unlimited
Price	for 20mm 15.25 €/m ²
Manufactors	TecnoSugheri

source: www.tecnosugheri.it

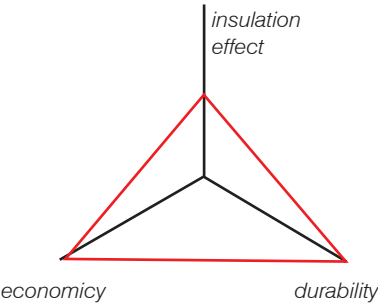


wall construction scheme:

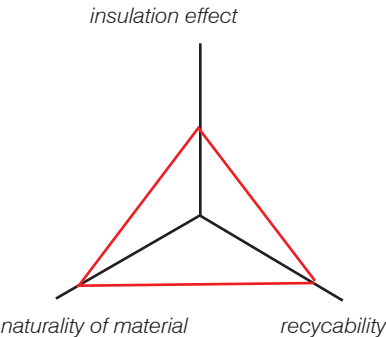


Evaluation

characteristics:



sustainability - in terms of:

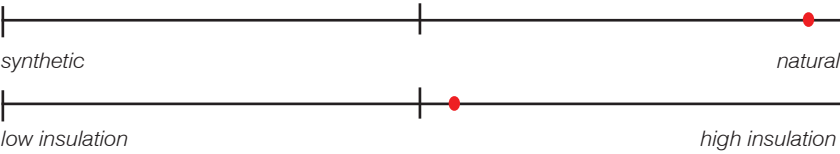
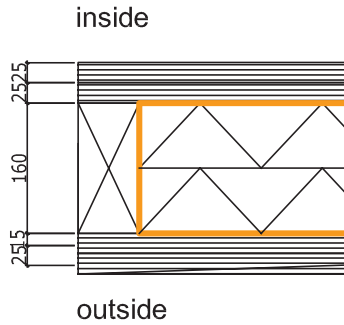


name	Isokenaf
material	hemp fibre
constistence	mats, panels
characteristics	easily be reused and as a result, fully recyclable even after removal, fireclass B2
Manufacturing process/ Assembly	90% hemp fibre, 10% polystyrene fibre
Application	roof, wall and floor insulation
Dimensions (HxWx L) in mm	10/20/30/40/50/60/80/100/120x600- 2400x100-2850
Thermal Conductivity KW/Km ²	0.039
Durability	unlimited
Price	for 40mm 16€/m ²
Manufactors	kenaf

source: www.iso-kenaf.it

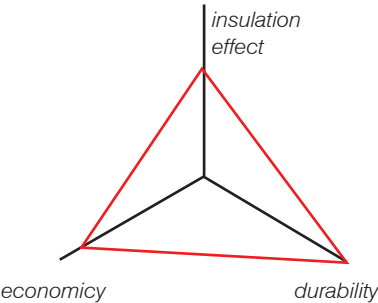


wall construction scheme:

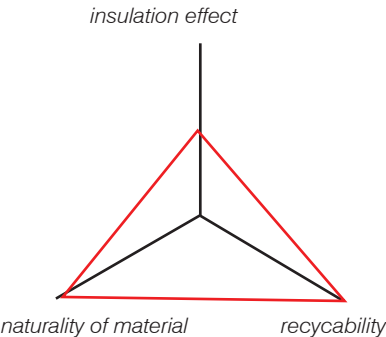


Evaluation

characteristics:



sustainability - in terms of:

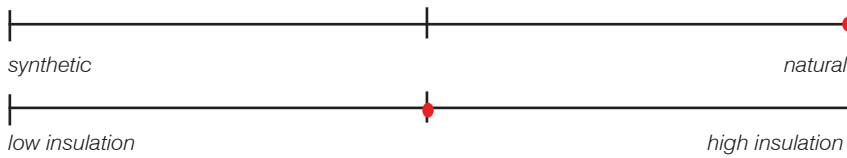
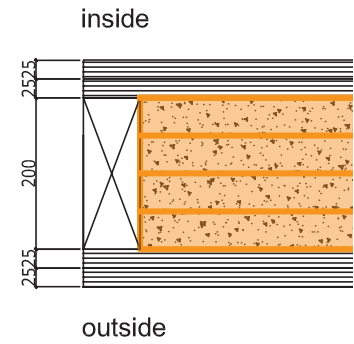


name	PanLin
material	textile, linen (flax-fibre)
constistence	mats
characteristics	100%natural, environmentally friendly, fully recyclable, flame resistant
Manufacturing process/ Assembly	leftover particles of linen formerly discared by textile manufactureers
Application	insulation of doors, furniture, indurstial packa-ging
Dimensions (HxWx L) in mm	25 to 50mmx5110x2050mm; also cut by measu-re
Thermal Conductivity KW/Km ²	0.040
Durability	unlimited
Price	for 25mm 13€/m ²
Manufactors	Uni Lin

source: www.unilin.com

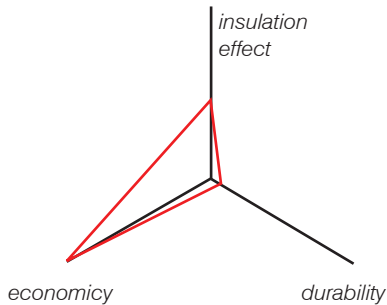


wall construction scheme:

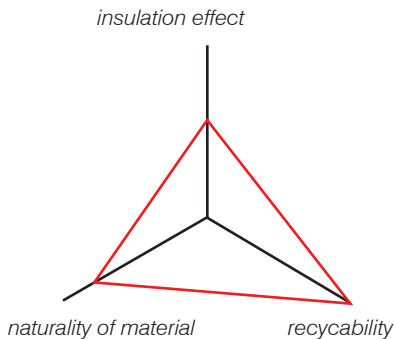


Evaluation

characteristics:



sustainability - in terms of:



name

Thermofloc

material

cellulose

constistence

loose, panels

characteristics

recycled newspaper and borate

Manufacturing process/
Assembly

old newspapers cut in flakes and concentrate with borate, for floor insulation material is put under pressure to achieve higher density

Application

in architecture as perimeter- and dividing wall insulation as loose materials or panels

Dimensions (HxWx L)
in mm

if in form of panels (at least 600m2): 40/60/ 80 x individuell x individuell

Thermal Conductivity
KW/Km²

0.039

Durability

10 years warantee, untill 20 years no problems

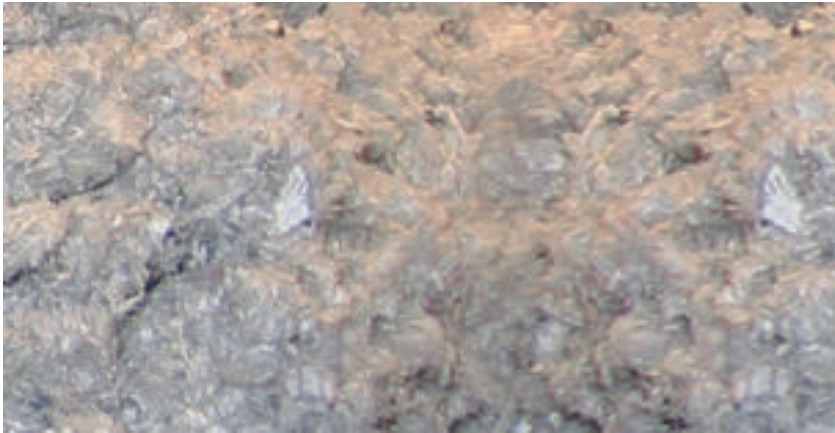
Price

10cm: 14,5 €/m²

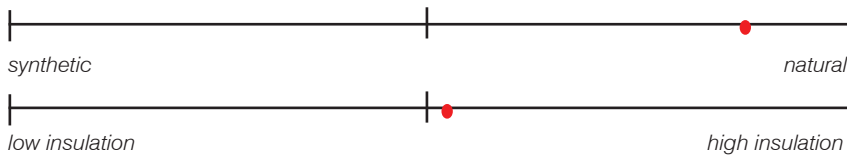
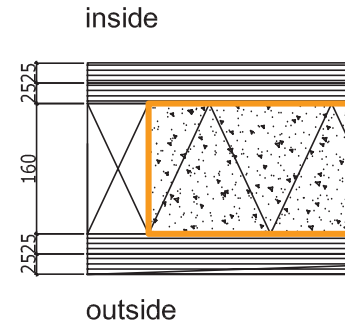
Manufactors

Thermofloc

source: www.thermofloc.it



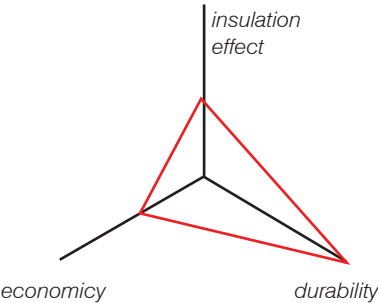
wall construction scheme:



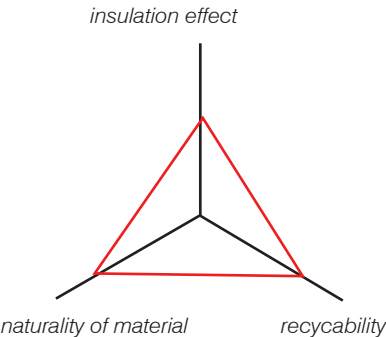
organic – natural

Evaluation

characteristics:

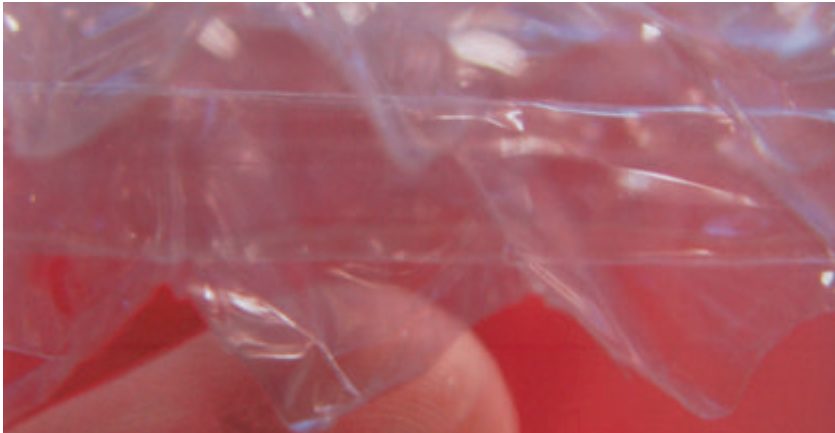


sustainability - in terms of:

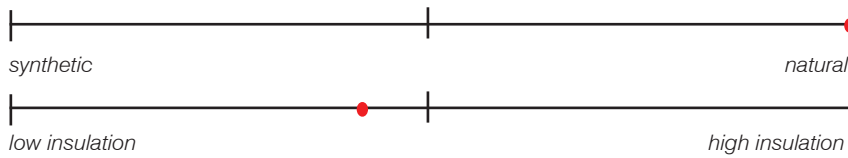
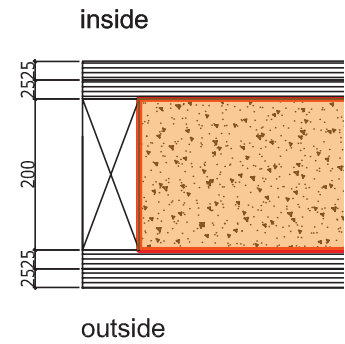


name	Moniflex
material	cellulose
constistence	transparent sheets
characteristics	lightweight, highly resistant to UV light and humidity, recyclable, nontoxic, durable, fibre-free
Manufacturing process/ Assembly	transparent corrugated cellulose sheets glued together
Application	insulation for railway coaches, glazing industrial roof, shipbuilding, vehicles, recently introduced in architecture
Dimensions (HxWx L) in mm	variable (depending on amount of layers) x935x3000
Thermal Conductivity KW/Km²	0.0056
Durability	unlimited
Price	thickness of 20mm: 10€/m²
Manufactors	Isoflex

source: www.isoflex.sk



wall construction scheme:



Phase Changing Materials (PCM)

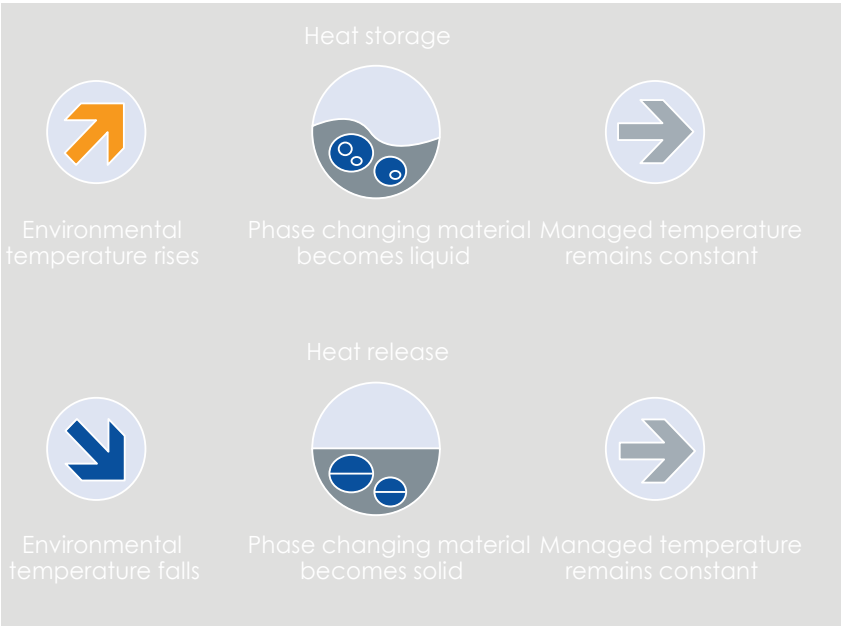
A Phase Change Material (PCM) is a substance with a high heat of fusion which, melting and solidifying at certain temperatures, is capable of storing or releasing large amounts of energy.

The phase change used for PCMs is the solid-liquid change. When a solid PCM is heated up and reaches its melting point, it goes through a phase change, from solid to liquid. During this process the material absorbs a certain amount of heat, known as melting enthalpy. Despite the heat input, the temperature of the material stays at a relatively constant temperature, even though phase change is taking place. We thus speak of latent (concealed) heat having been taken up by the material. Equally, when the phase change process is reversed, that is from liquid to solid, the stored latent heat is released, again at a nearly constant temperature.

The most commonly used PCMs are salt hydrides, fatty acids and esters, and various paraffins (such as octadecane).

Microencapsulated PCMs provide a portable heat storage system. By coating a microscopic sized PCM with a protective coating, the particles can be suspended within a continuous phase such as water. This system can be considered a phase change slurry (PCS).

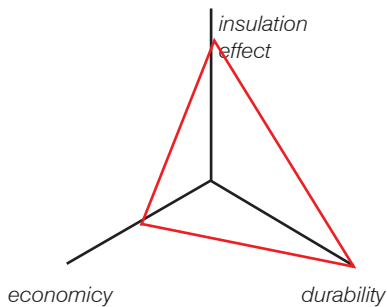
How phase changing materials work



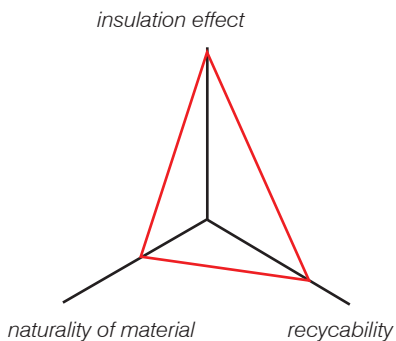
inorganic - natural

Evaluation

characteristics:



sustainability - in terms of:



name

PCM - Micronal

material

latent heat storage medium

constistence

plasterboards with wax particles

characteristics

insert wax melt at temperature up to 26°C and absorbs the excess heat; when temperature falls, wax becomes solid and the capsules release their heat again

Manufacturing process/
Assembly

capsules containing a pure wax storage medium at their core are for example inserted into a gypsum wall boards during production

Application

passive protection of building interiors from summer heat, substitutes building inertia

Dimensions (HxWx L)
in mm

normal gypsum plates eg 25x500x3000

Thermal Conductivity
KW/Km²

-

Durability

unlimited

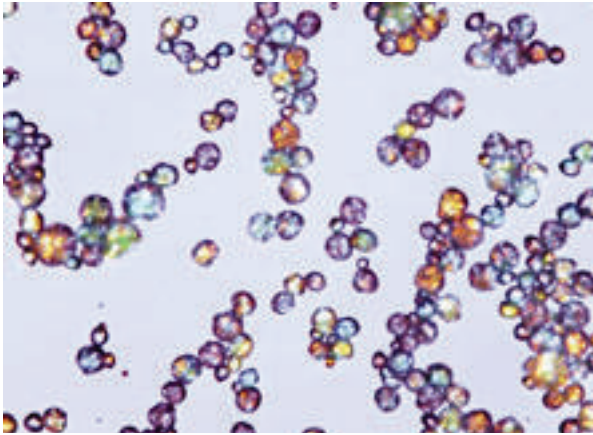
Price

40-43 €/m²

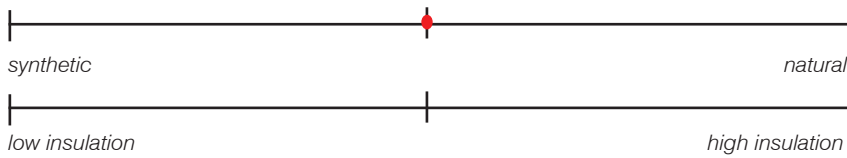
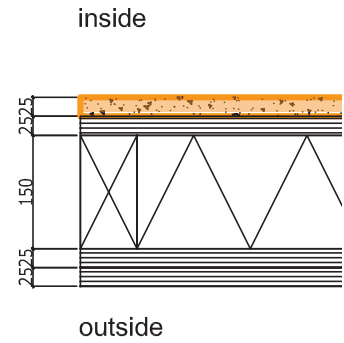
Manufacturers

BASF

source: www.basf.de

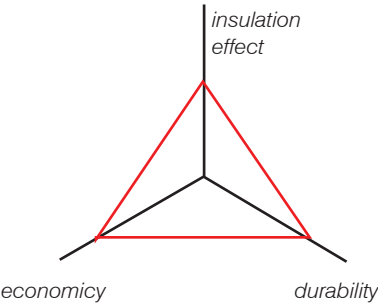


wall construction scheme:

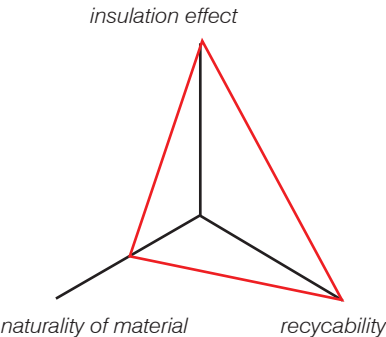


Evaluation

characteristics:



sustainability - in terms of:

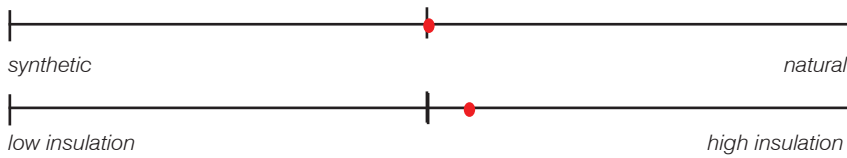
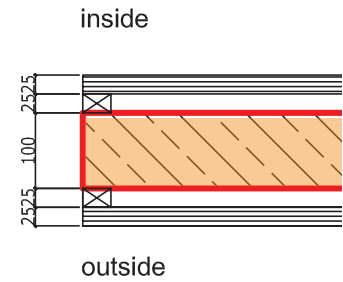


name	PLS
material	mineralized wood
constistence	blocks or prefabricTED WALLS
characteristics	low-density concrete
Manufacturing process/ Assembly	woodchips (different kind of types) dried by high temperatures, mixed with mineral powder and other ecologic products
Application	architecture as thermal and acoustic insulation, exterior walls, roofs
Dimensions (HxWx L) in mm	80/100/140x250x100 or walls with 18-30cm thickness
Thermal Conductivity KW/Km²	0.09
Durability	ca. 100 years (untill 30years warantee)
Price	according to thickness: 17€/m²;18€/m²; 23€/m²; prefabr. Walls with thickness of 25cm 80€/m²
Manufactors	Bonelli

source: www.bonellispa.com



wall construction scheme:



organic – natural/barrier: inorganic
– synthetic

Vacuum-insulated panel (VIP)

The Vacuum Insulated Panel (VIP) uses the isolative effects of a vacuum to produce much higher isolative values than conventional insulation.

VIPs consist of: membrane walls, used to prevent air from getting into the vacuum area; a core material, used to hold the vacuum inside the membrane while preventing the membrane walls from collapsing; and chemicals to collect gases leaked through the membrane or off gassed from the membrane materials. The near-vacuum in the vacuum area greatly reduces conduction and convection of heat.

The core material is porous and it occupies an evacuated space so that almost no air remains in the pores. The core material is often open cell polyurethane or polystyrene foam. Silica aerogel pressed into a board structure is a relatively recent and high performance alternative to foam. The vapor barrier maintains the vacuum in the space occupied by the core. Thin polymer films are common choices for barrier materials. An aluminized layer is commonly used on the barrier to minimize vacuum degradation due to diffusion (Polymer materials diffuse water vapor too readily). To delay vacuum degradation due to any leaks that remain, a getter (for absorbing gas molecules) or a desiccant (for absorbing water vapor) is often used. Typically a heat seal is used to hermetically join the barrier material around the perimeter of the panel. For high temperature applications, foil replaces the aluminized polymer barrier and a weld replaces the heat seal.

While offering insulation values for a given thickness, VIPs have always had major issues with cost and lifespan.

VIPS are used to enhance the performance of appliances such as refrigerators or vending machines; to form insulation containers or boxes for transportation; and for all types of building insulation.

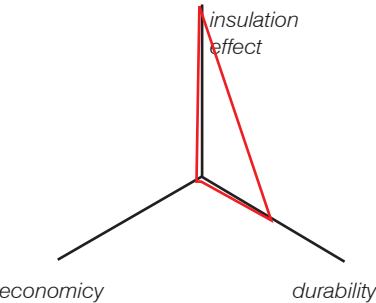
Until now lifespan has been a major issue, due to the fact that the panels cannot be made completely airtight.



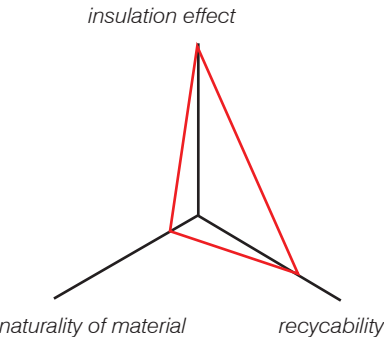
organic – natural/barrier; inorganic
– synthetic

Evaluation

characteristics:



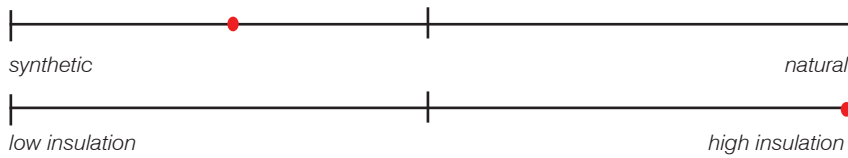
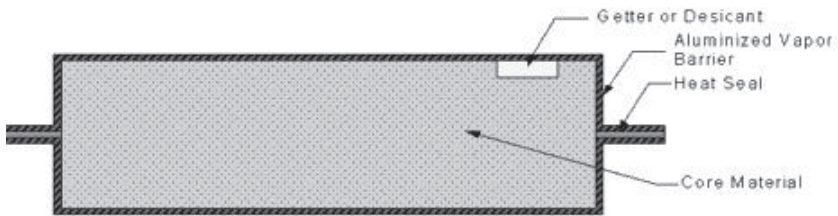
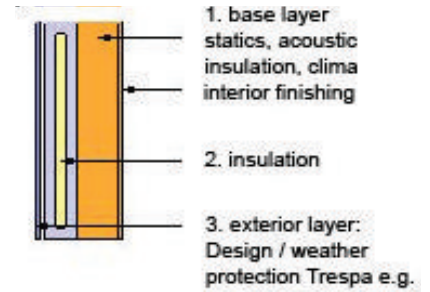
sustainability - in terms of:



name	Variotec VIP
material	vacuum
constistence	panels
characteristics	highest insulation effect known
Manufacturing process/ Assembly	aluminized layer used on the barrier; to delay vacuum degradation due to any leaks that remain, use of getter (absorbing gas molecules) or desiccant (absorbing water vapour); heat seal to join hermetically barrier material
Application	Sandwich panels with VIP core in architecture especially for outer walls and cooling chambers; originally used for refrigerators
Dimensions (HxWx L) in mm	Sandwich element: 20 to 200 (depending on the VIP core)x4000x2000 or 20 to 200x6000x1250
Thermal Conductivity KW/Km²	0.0004/ 0.0005
Durability	~50 years (limited by air-permeability)
Price	for 20mm: 90 €/m²
Manufactors	Variotec
	source: www.variotec.com



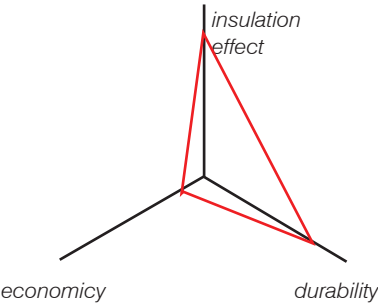
wall construction scheme:



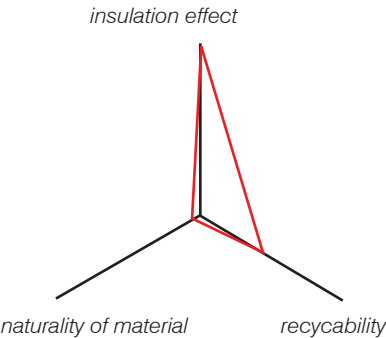
inorganic – synthetic

Evaluation

characteristics:



sustainability - in terms of:

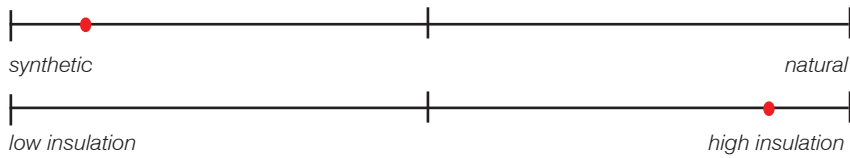
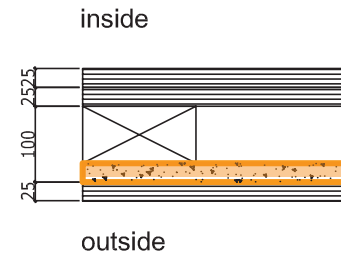


name	Nanogel
material	Silicon aerogel (blue smoke)
constistence	granulate or as panel
characteristics	the lightest material known to man, extremely fire resistant, translucent 54%
Manufacturing process/ Assembly	3% amorphous silicon, 97% air; expensive manufacturin
Application	insulation, glazing, collecting space dust
Dimensions (HxWx L) in mm	10/16/25xunlimited
Thermal Conductivity KW/Km²	0.0018
Durability	material itself has an unlimited lifespan, but lifespan of sandwich depends on the panel material (eg polycarbonate 10years)
Price	thickness of 10mm 20€/m² + filling cost
Manufactors	Capot

source: www.cabot-corp.com/Nanogel



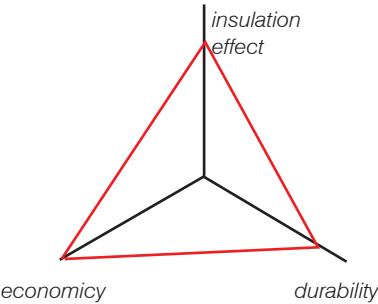
wall construction scheme:



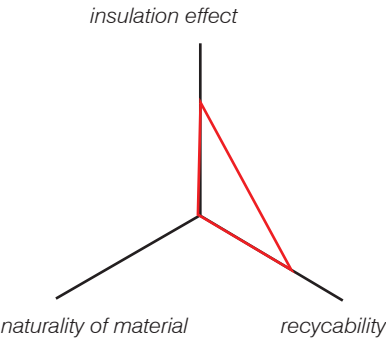
inorganic – synthetic

Evaluation

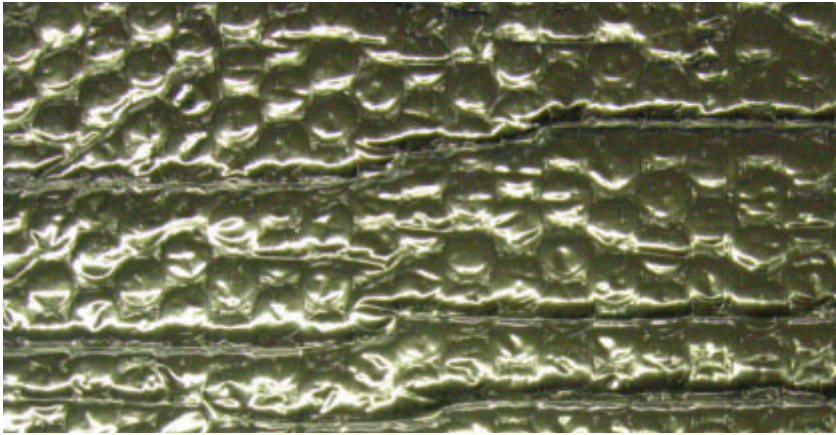
characteristics:



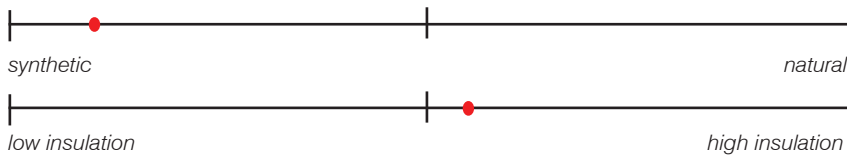
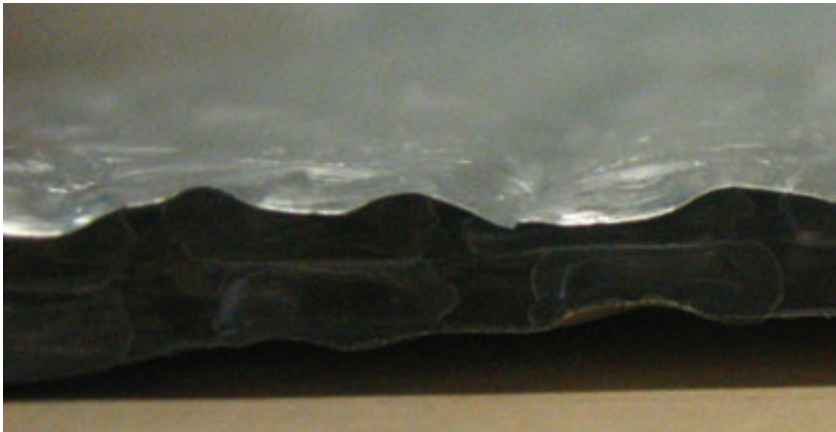
sustainability - in terms of:



name	Acufoil
material	saluminium, polyethylene protection
constistence	mats or rolls
characteristics	lightweight, water resistant
Manufacturing process/ Assembly	Duple layer of air inserting bubble structure made of polyethylene, sheeted with pure alumi- nium and a polyethylene protection film on the exterior
Application	thermo - acoustic insulation, perfect vapour barrier. Wall and roof insulation for residence houses, commercial and industrial buildings
Dimensions (HxWx L) in mm	6.5 x 1200 x 25 000
Thermal Conductivity KW/Km²	R = 1,49 m²K / W
Durability	unlimited (warantee for 10 years)
Price	5 €/m²
Manufactors	Over All s.r.l. source: www.overall.it



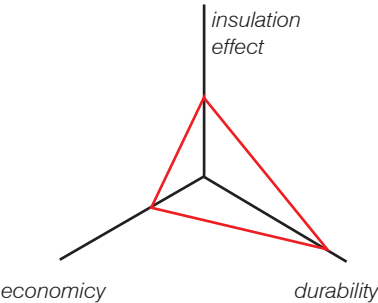
wall construction scheme:



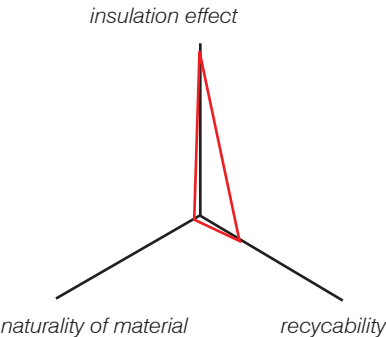
inorganic – synthetic

Evaluation

characteristics:

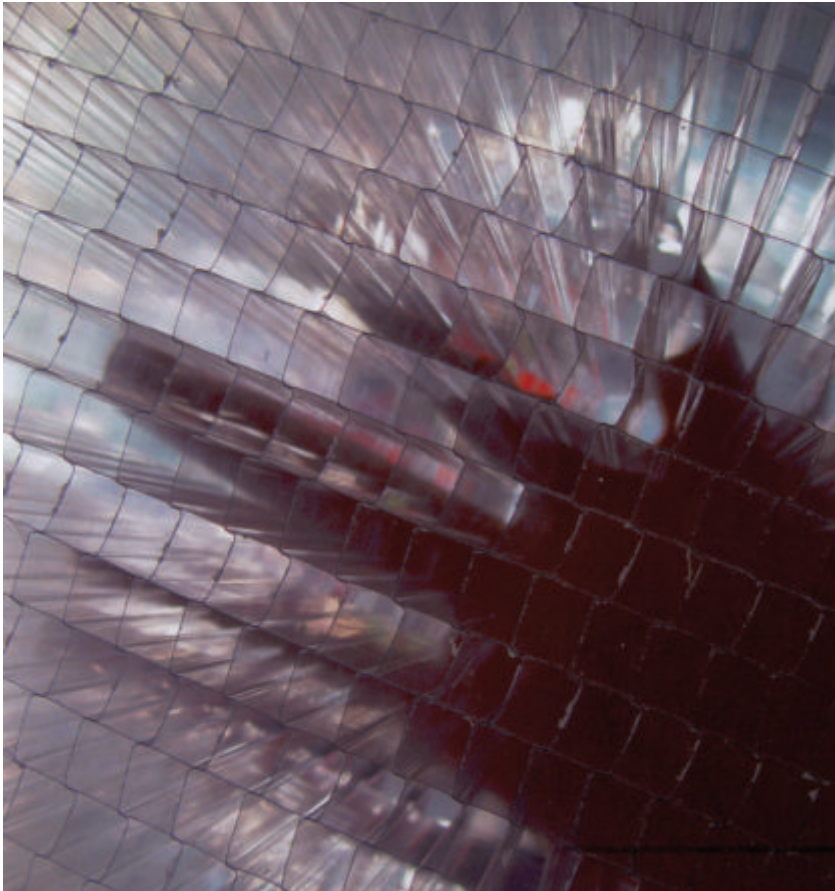


sustainability - in terms of:

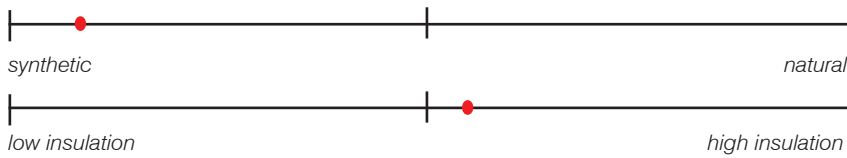
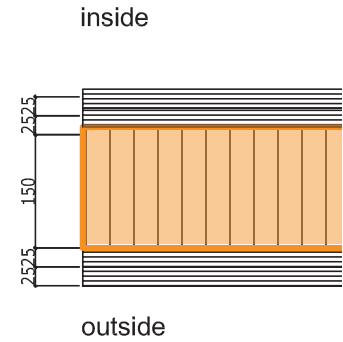


name	WaveCore
material	translucent honeycomb structure
constistence	sheets
characteristics	optical effect of light passing through it
Manufacturing process/ Assembly	based on continueos thermal welding of multi- ple sheets of polymer, cells grouped to blocks
Application	core in low-density composite panels, shock ab- sorbers, shipbuilding, railways and road-haulage vehicles, interior design
Dimensions (HxWx L) in mm	160x1300xunlimited
Thermal Conductivity KW/Km²	0.0040
Durability	no experience until now/unlimited
Price	thickness of 70mm: 40 €/m²
Manufactors	Wacotec

source: www.wacotec.com



wall construction scheme:



Evaluation

organic-natural

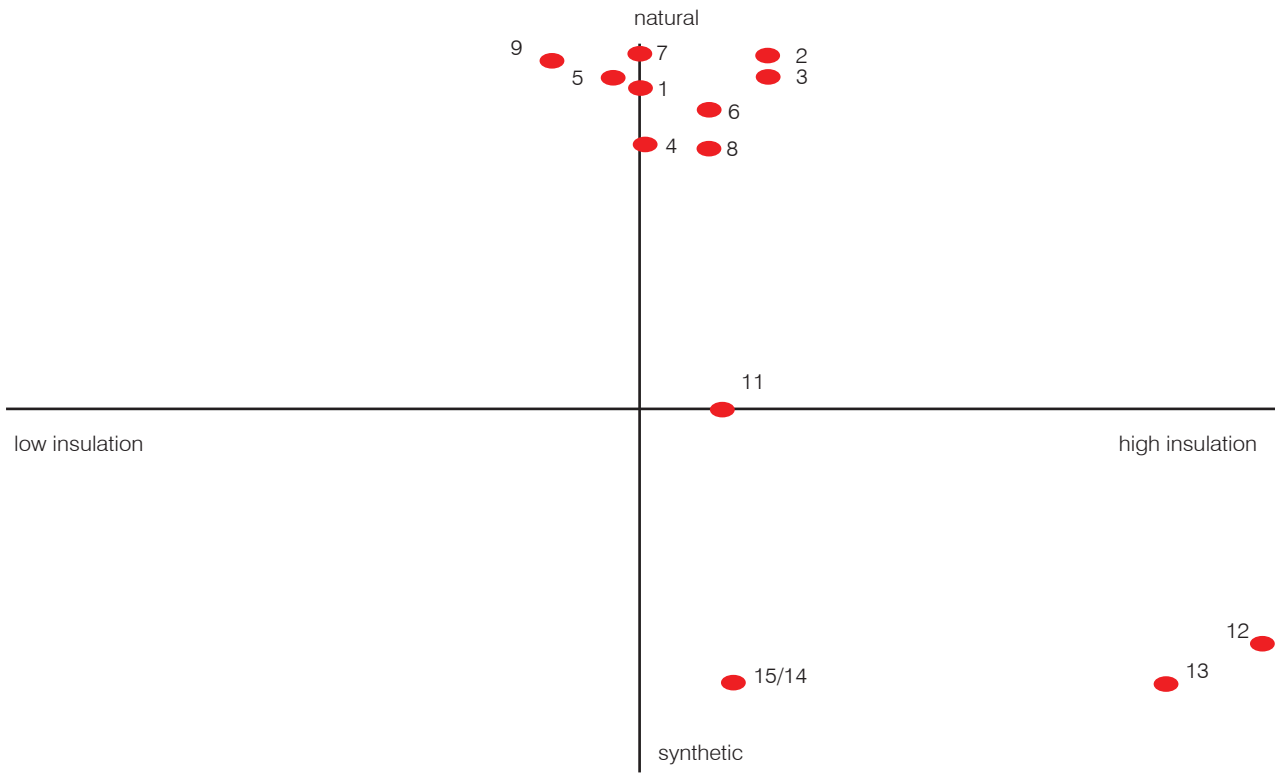
- 1 ZosteraMat
- 2. BatiPlum
- 3. LanKot
- 4. CorkPan
- 5. Lastra in Coco
- 6. IsoKenaf
- 7. PanLin
- 8. ThermoFloc
- 9. MoniFlex

innorganic-natural

- 10. PCM (is not taking part in evaluation, since it an latent heath storage and has therefor no comparable insulation effect)
- 11. PLS

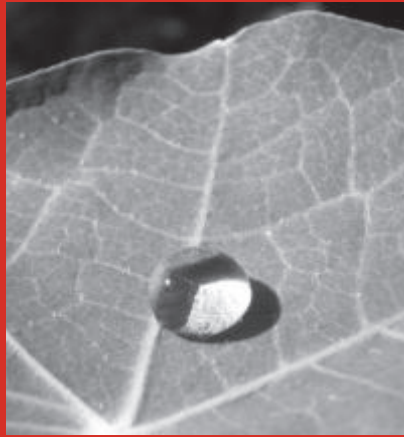
innorganic-synthetic

- 12.VIP
- 13. Nanogel
- 14. AcuFoil
- 15. WaveCore



Footnotes

- 1 introduction and scheme according to A.-K. **Kleinhempel**, *Innovative Dämmstoffe im Bauwesen—Forschungsstand und Marktübersicht*, Bremen: Bremer Energie Institut, 2005
- 2 scheme according to George M. **Beylerian**, Andrew **Dent**, and Anita **Moryadas**, *Material ConneXion: The Global Resource of New and Innovative Materials for Architects, Artists and Designers*, **Paris**, New York, London: J. Wiley, 2005
- 3 according to **matèriO**, *Material World 2*, Basel –Berlin–Boston: Frame Publishers Birkhäuser–Publisher for Architecture, 2006



1- Lifecycle Design

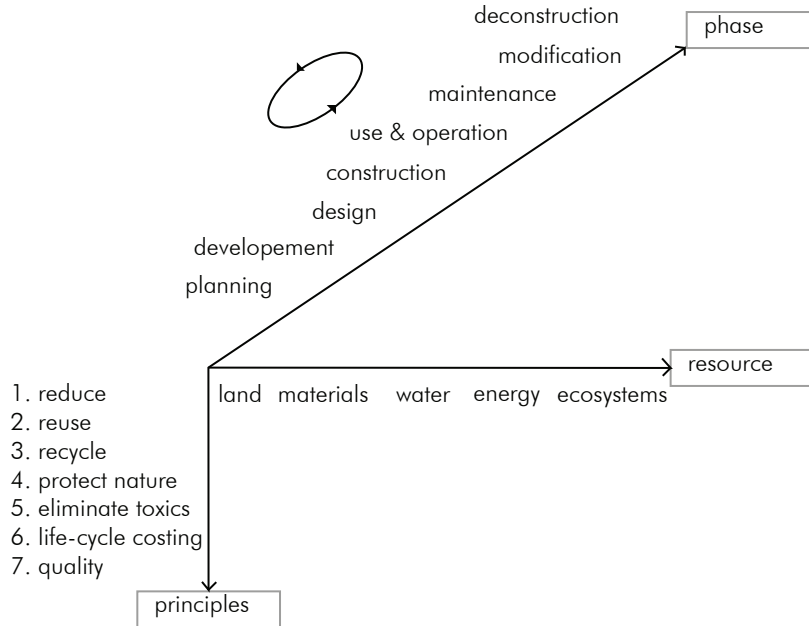
2- Application within the phases

conclusion/technical application

VI

1 Lifecycle Design

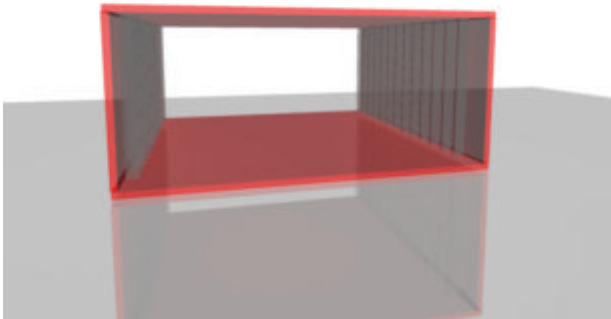
The Principles of sustainable constructions



2 Phases - Application of Lifecycle Design

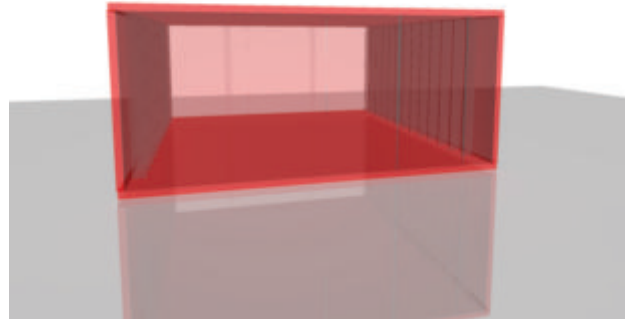
Planning

- prefabrication: less construction time, less pollution through building site
- sustainable construction and maintenance: decision to keep it a simple shape and a non-complicated construction technique.



prefabrication: walls as board construction

- > shorter construction time, energy + land resource impact reduction



cubic shape - simplicity

Design

- since the project is inside ncurtaturu, it will be protected from too much sun and thus cooling is not necessary
- less “visual” disturbance through new construction
- cubic form: simple maintenance

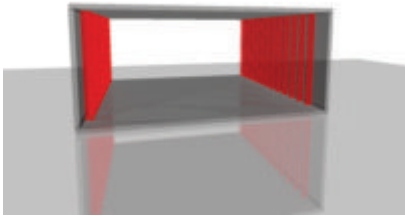
almost invisible: no “visual disturbance”

-> reduction of land resource impact

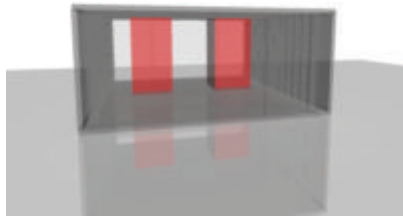


Construction:

- wood structure-> low embodied energy
- reduction of building material through very thin walls
- insulation material: natural (also in reference to the place) feathers or sheep wool
- use of PLS -> substitution of inertia (construction mass), when temperature less than 26°C wax particles stable, when more than 26°C melting and absorbing coldness



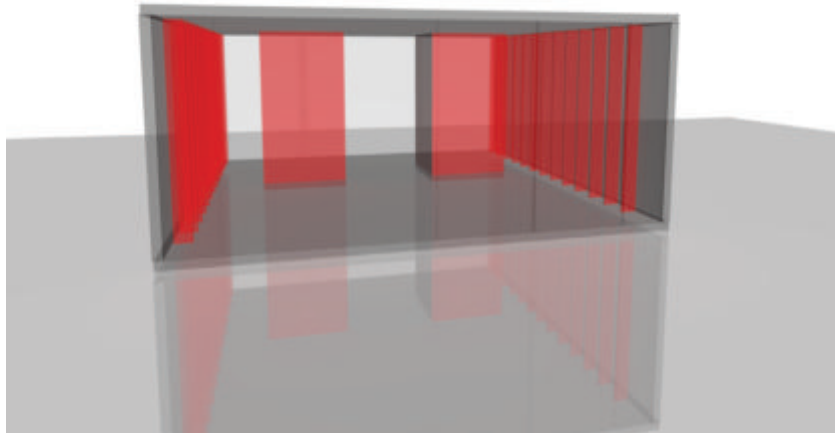
cupboards alongside the wall as supporting structure



inside bathrooms as supporting structure



structural support allow reduced wall dimensions



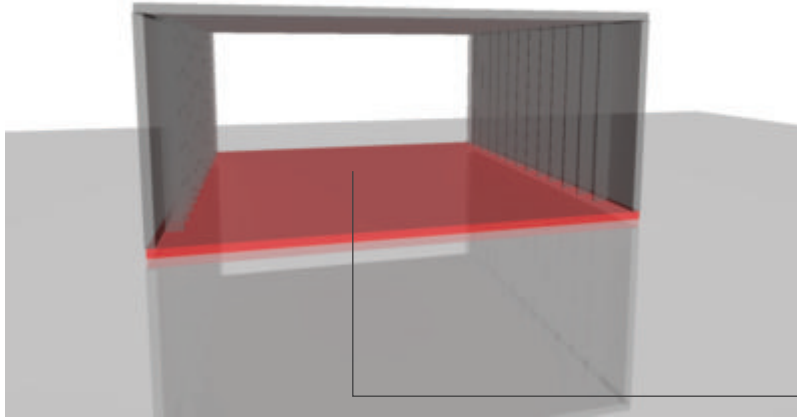
reduction of wall dimensions through the use of furniture as support structure

-> reduce of material impact

-> reduce of land resource impact



- stone floor, a concrete base and furniture made out of stone to serve additionally as construction mass, to avoid cooling system facilities during the summer



lecce-stone floor

again to create inertia (thermal construction mass) and avoid mechanical cooling

Use and operation:

-The interiors are provide with fresh air which is going to be conducted through the earth to use its stable temperature. The input of the fresh air is in a distance of 3m away from the house, insert in the ncurtaturu wall. Conducting the fresh air through the interiors, it mixes and gets wasted. The waste air is drained. The heat of the waste air is abstract through a cross-heat exchanger, which is on the same time warming up the fresh air (cross-exchange). The output of the drained air is placed opposite to the input on the base of the house, in order to hide it visually. and -use of stable temperature of earth: -> supply air is led through under base plate.

Anatural air circulation through concentration difference is created.

-Moreover rainwater gets collected for the fountain

Maintenance:

-Through its simple construction (one complex box) the house can be also easily maintained.

-all technical components like the heat-exchanger are put in positions where they are easily accessible

Modification:

-The size can be seasonally changed: in the summer both window facades can be open to create a huger space including the terrace and garden of the ncur-taturu.

_The interior of the house can be easily changed, since it is an open room concept.

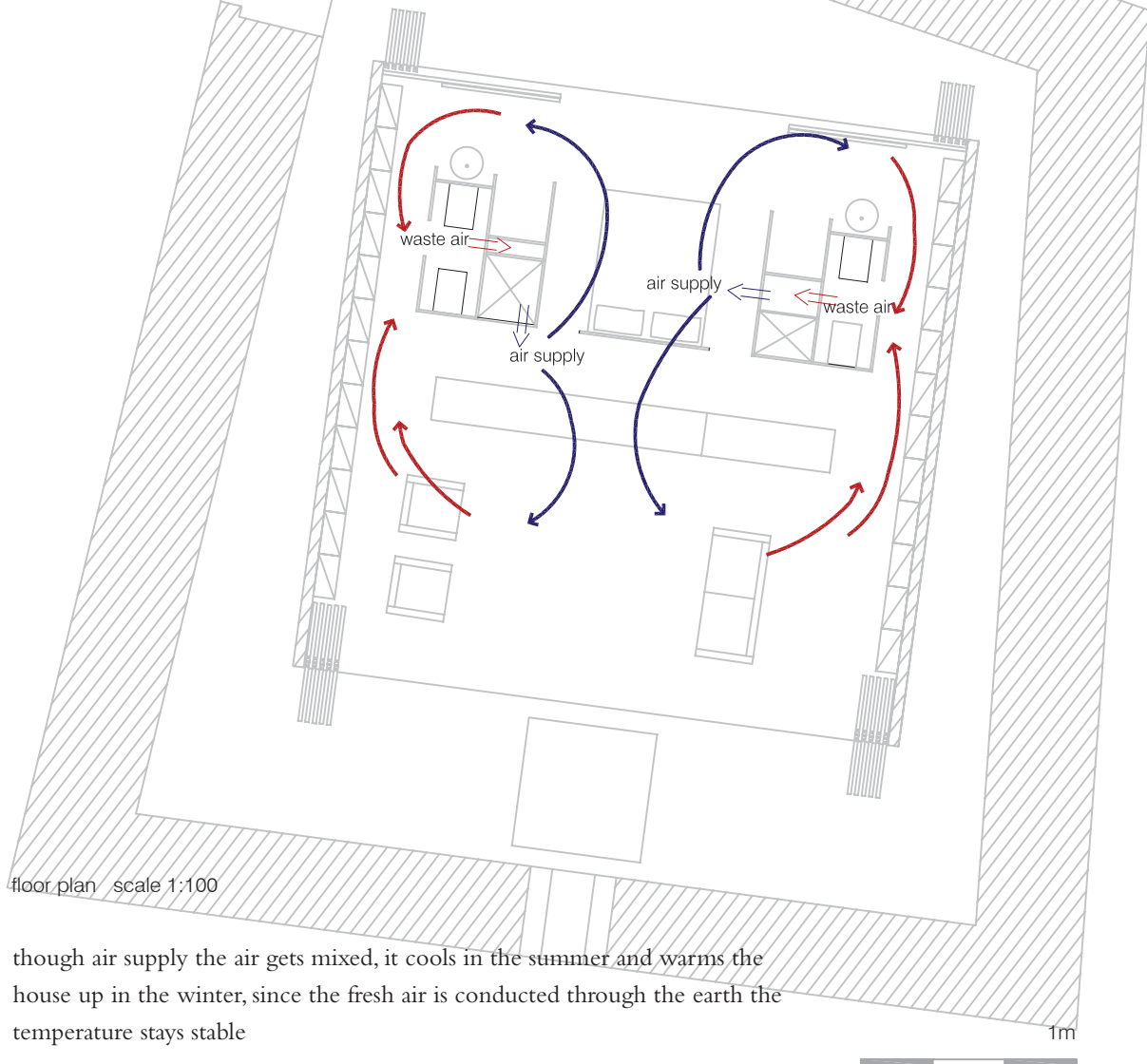
-The size of the house itself cannot be changed since it is based on a concept. But a guest house in the garden is provided, in case of need for more space.

Deconstruction:

- design for disassembly: board construction easy to deconstruct
- all natural material decomposable
- design for recycling: wood can be used as fire wood or woodchip recycling

air flow:

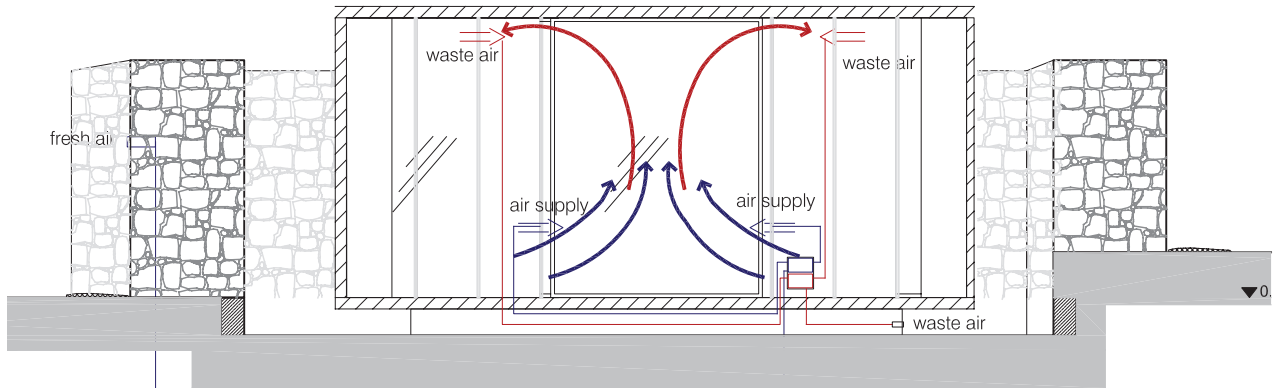
a cross-heat exchanger and fresh air supply conducted through the earth provide an air-exchange without permanent energy supply. The air supply and drain are closed to bathroom and kitchen. Moreover they are put on opposite



though air supply the air gets mixed, it cools in the summer and warms the house up in the winter, since the fresh air is conducted through the earth the temperature stays stable

air flow:

fresh air is supplied in a low height thus it is ascending. The waste air is withdrawn in the upper part of the house. So a natural air flow is created.



winter : use of heat of waste air to warm up intaken air through a cross flow heat exchanger

use of stable temperature of earth
-> supply air is led through Earth Heat Exchanger under base plate

air exchange scheme

section scale 1:100



- 1 - Project scope
- 2 - Structure
- 3 - Interior
- 4-Conclusion

backcheck of the house IX

– verifying the brands personality in
the architecture of the house

1 Project Scope

The project is hidden on the landscape through its integration in nature and cultural heritage of the territory. The project itself is inside the old ncurtaturu. It is almost invisible, just the top parts of the house are seen from outside. The project therefore doesn't destroy or touches the environment but it is bonding with it. The material of the house "absorbs" the material of the environment: the predominating vertical structures on the property are the trunks of the trees and the stones of the dry walls as human-"built" structural landscape; the house – also as vertical structure is "adapting" to the natural landscape and "takes" the materials wood symbolically from the trees.

Keyword NATURAL is transferred in the design concept, and with that communicated a life in harmony with nature and the release from materialistic towards more essential values.

The fact that it doesn't absorb the material stone from the already-built environment can be seen as statement to accentuate from the traditional structures as being built among a "different" time period.

The choice of using wood for the newly designed house is to harmonize with the ancient stone of the vernacular architecture of the ncurtaturu and the dry walls of the landscape.



2 Structure

The shape of the house has a square plan with the dimensions 8,50m x 8,50m and a height of 3,50m. The north and the south sides are fully glazed and can be opened. East and west side have no windows. Wooden shutters are placed in front of the glazed facades. When closed, the house looks like a wooden box. Those open facades serve also as entrance. The form of the house is very reduced, but on the same time designed with meanings.

All in all, this cubistic shape communicates the features SIMPLICITY and ESSENTIAL.

Also it can be seen as harmonizing through setting margins through geometric forms within the organic forms of the environment a feature used also in traditional Japanese Architecture.

A square plan is –in the architecture mind, the best shape to be embedded in the non-regular floor plan of the ncourtaturu. The square shows the sense of symbolism. Square stands for perfection, harmony and for the earthly, whereas a rectangular shape has less meaningful background.

Inside the surrounding ncourtaturu are trapeze-shaped openings. That is why –when the window facades are open– enough light enters inside and lets the house open up optically towards the garden.

The house itself is detached from the earth. Inside the house there is no door it is an open plan concept. All those facts show the affinity for freedom of both personalities, they do not like to be enclosed in borders; they long for a wide horizon.

The big open window front show also preference of natural light rather than artificial light.

Those windows can be closed when the sun –as often in this area– is too strong, or rather semi-closed by the wooden shutters, this creates a play of light and shadow. Light and shadow can be perceived consciously.



section A-A - house

3 Interior

The interior is divided into two main zones: the “public” zone with kitchen and living area; and the “private” zone with sleeping area and bathrooms. The whole interiors are nearly symmetric. Symmetry shows again harmony.

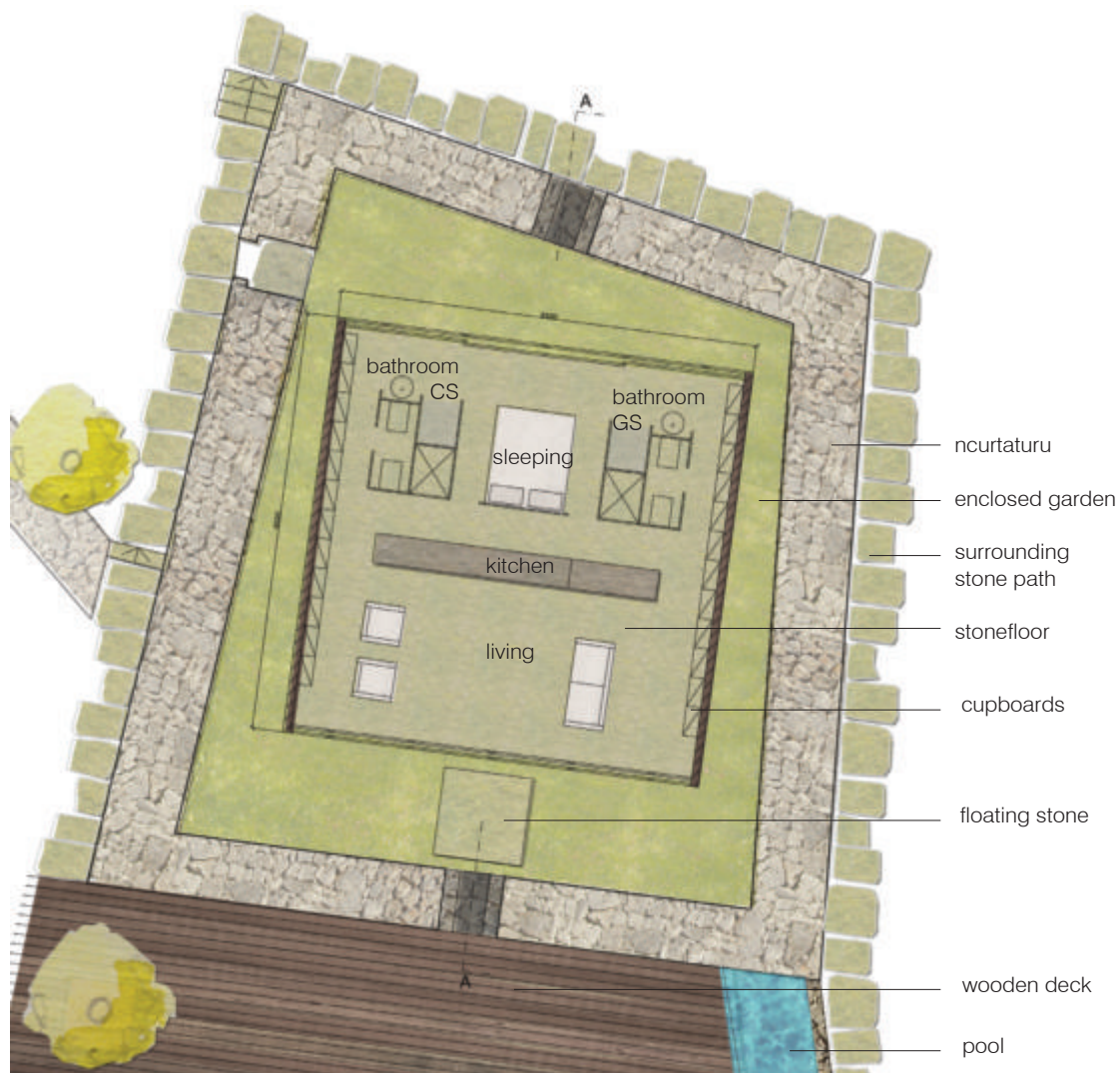
On the sides where there are no windows there are cupboards. Those cupboards will be mostly closed and its content won't be visible. This means an avoidance of visual distraction by “materialistic” things and shows again the sense for concentrate oneself more on the essential things of life.

The materials used in the interiors are natural ones: a stone floor and a wooden skin. Both materials are local: Lecce stone and the local Lecce oak wood. Those materials are refined and from high quality and indicate also the sense of elegance.

4 Conclusion

Many shapes and arrangements have a meaning and were been chosen for its deeper meaning, which shows again the characteristic philosophical, since the forms and the material chose, is profound thought out.

To sum up the house reflects the features of both personalities: natural, elegant, philosophical, essential and simplicity. As well many features indicate harmony, which can be understood as a well balanced relationship of both.



plan - house

Bibliographie:

Chapter 01:

- + David A. Aaker, Building Strong Brands, London: Free Press Business, 1996
- + Franco Bertoni, Claudio Silvestrin, Basel: Birkhäuser Verlag
- + Castaldo S., Retailing e innovazione. L'evoluzione del marketing nella distribuzione, Egea, Milano, 2001
- + S. Colli, R. Perrone, Space-identity-company, Barcelona: Gustavo Gilli, 2003
- + Dean C., Inspired Retail Space: Attract Customers, Rockport, Gloucester (MA, USA) 2005
- + Douglas B. Holt, How brands become icons. The principles of cultural branding, Boston: Harvard Business School Press, 2004
- + Gareth Williams, branded – products and their personalities, London: V&A Publications
- + Noami Klein, No logo, Rotterdam : Lemniscaat, 2002
- + Norman D., Emotional Design, Apogeo, 2004
- + John M. Murphy, Branding a marketing tool, London, Macmillan Academic and Professional LTD, 1992
- + Tom Peters, The brand you 50, New York, Alfred A. Knopf, 2000
- + Al Ries, Laura Ries, Die 22 unumstößlichen Gebote des Brandings, München: Econ, 1999
- + O. Riewoldt, Brandscaping: Worlds of Experience in Retail Design, Basel-Berlin-Boston: Birkhauser Verlag AG, 2002
- + Riewoldt O., Retail Design, Laurence King Publishing, London (GB), 2000

Magazines:

- + Douglas B. Holt, What becomes an icon most?, Harvard Business Review, 2003, pp. 1-8
- + Douglas B. Holt, Brands and Branding, Harvard Business School, 2003, pp. 1-12

- + Douglas B. Holt, Why Do Brands Cause Trouble? A Dialectical Theory of Consumer Culture of Branding, *Journal of Consumer Research*, vol. 29, 2002, pp. 70-90,
- + Erich Joachimsthaler, David A. Aaker, Building Brands without Mass Media, *Harvard Business Review*, 1997, pp. 1-10.
- + B. Joseph Pine, James H. Gilmore, Welcome to the Experience Economy, *Harvard Business Review*, 1998, pp. 97-105.
- + Bernd Schmitt, Experiential Marketing: A New Framework for Design and Communications, *Design Management Journal*, spring 1999, pp. 10-16.

Chapter 02:

- + Peter Amann, *Apulien, Gargano, Salento*, Bielefeld: Verlag Peter Rump GmbH, 2006
- + Edward Allen, *Stone Shelters*, Cambridge: The Massachusetts Institute of Technology, 1969
- + *Attraverso l'Italia: Puglia*, Milano: Touring Club Italiano, 1967
- + Antonella Calderazzi, *Le masserie fortificate: aspetto storico e tipologico*, Università – Bari: Edizione S.P.P.U.T., 1983
- + Antonio Costantini, *Guida ai monumenti dell'architettura contadina del Salento*, Congedo Editore, 1996
- + Gabriella Esposito, *Architettura e Storia dei Trulli*, Roma: casa del libro
- + Pietro Maria Favia, *Architettura minore di Puglia*, Bari-Roma: Favia, 1947
- + Luigi Mongiello, *Trulli e Costruzioni a Piegnon*, Bari: Mario Ada Editore, 1992
- + Michael Oppenheimer, *The Monuments of Italy. A Regional Survey of Art, Architecture and Archaeology from Classical to Modern Times. Volume: 5/Southern Italy : the regions of Abruzzo-Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, and Sardegna*, London, New York: Tauris, 2002
- + Giorgio Simoncini, *Architettura contadina di Puglia. Le forme a trullo*, Roma: Vitali e Ghianda, 1960

- + M. Letizia Troccoli Verardi, I misteriosi simboli dei trulli, Bari: Mario Alda editore, 1984
- + David Trump: Central and Southern Italy before Rome, London: Thames and Hudson, 1966
- + Carl A. Willemsen, Apulien, Kathedralen und Pastelle; Ein Kunstführer durch das normannisch-staufische Apulien, Köln: M. DuMont Schauberg, 1973
- + Joachim Dornbusch, Dr. Hans-Joachim Kämmer: Diercke WeltATLAS, Braunschweig: westermann, 2000

Magazines:

- + Enzo Minchelli, Martina Franca, Casabella, N. 209, Gennaio-Febbraio 1956, pp. 47-49
- + Bernardo Rudofsky, Architettura senza architetto: In Puglia, Domus, N. 431, 1965, pp. 52-54

Chapter 04:

- + Roberto Casati, Die Entdeckung des Schattens, Berlin: Verlag Berlin, 2001
- + Heinz Götze, Geometric Mystery of the Middle Ages, London: Prestel, 1998
- + Mark Major, Made of Light. The art of light and architecture: The Art of Light and Architecture, Basel: Birkhäuser, 2005
- + Karlheinz Schaldach, Römische Sonnenuhren., Frankfurt Main: Harri Deutsch, 2001
- + Mireia Verges, Light in Architecture, Genth: Tectum, 2007

Magazines:

- + Matteo Vercelloni: Sacre Design, Interni N. 567 december 2006

Chapter 05:

- + Dominique Gauzin-Müller, Sustainability in Architecture and Urbanism, Basel, Boston, Berlin: Birkhäuser, 1996

- + Charles J. Kibert, Sustainable Construction, Green Building design and delivery, New Jersey: John Wiley & Sons, Hoboken, 2005
- + Manzini, E., Vezzoli C., 'Product-Service Systems and Sustainability: Opportunities for Sustainable Solutions', UNEP-United Nations Environment Programme, Paris, 2002
- + Ezio Manzini & Francois Jegou, Sustainable Everyday – Scenarios of Urban Life, Edizioni Ambiente, Milan, 2003
- + Daniel D. Chiras: Environmental Science, Jones & Bartlett Publishers, 2005

Magazines:

- + Detail, Zeitschrift für Architektur, München: Institut für deutsche Architekturdokumentation: 6/2007

Scientific reports:

- + “research focus” “Avoiding grave climatic Developments” by the Swiss bank giant UBS, 2007
- + U.S. Office of Energy Efficiency and Renewable Energy (EERE)
- + World business council on Sustainable Development (WBCSD), 1992
- + data issued by the European Commission

Chapter 06:

- + Joaquim Ballarín i Bargalló, Wood Houses, London: teNeues, 2005
- + Romeyn Beck Hough: The Wood Book, Köln: Taschen GmbH, 2002
- + Nicola Brughieri, Casa in legno, Milano: Federico Motta Editore S.p.A., 2004
- + Charles von Büren: Prix Lignum – Constructions et facades en bois, Zürich: Lignum / Baufachverlag, 2000
- + Dominique Gauzin-Müller, Wood Houses: Spaces for Contemporary Living and Working, 2004
- + Thomas Herzog, Julius Natterer, Roland Schweitzer: Holzbau Atlas, München: Institut für internationale Architektur-Dokumentation, 1996

- + Will Pryce, Buildings in Wood, London: Thames and Hudson Ltd., 2005
- + Ruth Slavid, Materiali in architettura legno, Modena: logos, 2005
- + Naomi Stungo, Wood: New Directions in Design and Architecture, San Francisco: Chronicle books LLC., 2001
- + Naomi Stungo, The New Wood Architecture, London: Laurence King, 1998
- + Michele di Sivo, Giorgio Pardi: Natural Timber, Guide for the choice of timber, Firenze: Alinea editrice, 2000

Magazines:

- + Detail, Zeitschrift für Architektur, München: Institut für deutsche Architekturdokumentation: 8/2001; 12/ 2003; 12/2004; 7/2006; 10/2006
- + db –deutsche bauzeitung, Leienfelden-Echterdingen: Konradin Medien GmbH; 2/2004
- + dbz –deutsche bauzeitschrift, 2/2002 ; 8/2004

Websites:

- + www.adjaye.com

Chapter 07:

- + Axel Ritter, Smart Materials in architecture, interior architecture and design, Basel-Berlin-Boston: Birkhäuser – Publisher for Architecture, 2007
- + matèriO, Material World 2, Basel –Berlin-Boston: Frame Publishers Birkhäuser–Publisher for Architecture, 2006
- + George M. Beylerian, Andrew Dent, and Anita Moryadas, Material ConneXion: The Global Resource of New and Innovative Materials for Architects, Artists and Designers, Paris, New York, London: J. Wiley, 2005

- + Cristina Michieli, Gianna Nencioli, Maria Pia Tinaglia, Mimmo Trinciale, Guida alla Bioedilizia e all'arredamento ecologico, Firenze: AAM Terra Nuova, 2003
- + A.-K. Kleinhempel, Innovative Dämmstoffe im Bauwesen—Forschungsstand und Marktübersicht, Bremen: Bremer Energie Institut, 2005

Websites:

- + www.basf.com
- + www.batiplum.com
- + www.bonellispa.com
- + www.coverd.com
- + www.isoflex.com
- + www.cabot-corp.com/nanogel
- + www.syd-tek.dk
- + www.tecnosugheri.it
- + www.thermofloc.it
- + www.wacotec.com

Picture Credits

Page	Source
------	--------

Chapter 1

13	Jim Richardson, National Geographic
16	O. Riewoldt, Brandscaping: Worlds of Experience in Retail Design, Birkhauser Verlag
17t	Heinz Fuchs, 150 Jahre deutsches Design, Inst. f. Auslandsbeziehungen
17b	own posses
19	from posess of Claudio Silvestrin Architects office
20t	own photography
20b	own photography
21	own posess
25	Politecnico di Milano
31	private photograph of Giuliana Salmaso
32 1-4	private photograph of Giuliana Salmaso
33 5-7	private photograph of Giuliana Salmaso
38 t, b	own private photograph
39	own private photograph
48t	own private photograph
48b	own private photograph

Chapter 2

58	Museo Archeologico di Taranto
59	Museo Archeologico di Taranto
57-68	own private photographys
69	own developed scheme
70t	Edward Allen, Stone Shelters, Cambridge: The Massachusetts Institute of Technology, 1969; p. 32
71-73	own private photographs of Technology, 1969; p. 93
74 t, b	M. Letizia Troccoli Verardi, I misteriosi simboli dei trulli, Bari: Maria Alda editore, 1984, p. 20

- 75 t, b Luigi Mongiello, Trulli e Costruzioni a Piegnon, Bari: Mario Ada Editore, 1992; p. 44
- 77 t, b Luigi Mongiello, Trulli e Costruzioni a Piegnon, Bari: Mario Ada Editore, 1992; p. 89
- 79 Edward Allen, Stone Shelters, Cambridge: The Massachusetts Institute of Technology, 1969; p. 46
- 81 Edward Allen, Stone Shelters, Cambridge: The Massachusetts Institute of Technology, 1969; p. 48
- 83 own private photography
- 85 Edward Allen, Stone Shelters, Cambridge: The Massachusetts Institute of Technology, 1969; p. 53
- 90 own private photography
- 92,93 Antonio Costantini, Guida ai monumenti dell'architettura contadina del Salento, Congedo Editore, 1996; p. 38
- 96,97 own private photography
- 90b M. Letizia Troccoli Verardi, I misteriosi simboli dei trulli, Bari: Mario Alda editore, 1984, p. 32
- 91 Edward Allen, Stone Shelters, Cambridge: The Massachusetts Institute of Technology, 1969; p. 102
- 92, 93 own private photographs, pictures
- 94, 95 Giorgio Simoncini, Architettura contadina di Puglia. Le forme a trullo, Roma: Vitali e Ghianda, 1960
- 94-97 own private photographs
- 98 Peter Amann, Apulien, Gargano, Salento, Bielefeld: Verlag Peter Rump GmbH, 2006; p. 19
- 99 Peter Amann, Apulien, Gargano, Salento, Bielefeld: Verlag Peter Rump GmbH, 2006; p. 20
- 103-101 own private photographs
- 105 own private photograph
- 106,107 private photographs from possess of Giuliana Salmaso
- 108,109 Joachim Dornbusch, Dr. Hans-Joachim Kämmer: Diercke WeltATLAS, Braunschweig: westermann

Chapter 5

- 158 own private photograph
- 159 own developed scheme
- 162 own photograph
- 163 Charles J. Kibert, Sustainable Construction, Green Building design and delivery, New Jersey: John Wiley & Sons, Hoboken, 2005
- 165 CIB. 1994
- 167 Charles J. Kibert, Sustainable Construction, Green Building design and delivery, New Jersey: John Wiley & Sons, Hoboken, 2005
- 172-175 Detail, Zeitschrift für Architektur, München: Institut für deutsche Architekturdokumentation, 7/2006
- 176t private picture of Manuela Schubert
- 176b own developed groundfloor
- 177 own developed scheme

Chapter 6

- 184 Romeyn Beck Hough: The Wood Book, Köln: Taschen GmbH, 2002
- 190 Thomas Herzog, Julius Natterer, Roland Schweitzer: Holzbau Atlas, München: Institut für internationale Architektur-Dokumentation, 1996
- 198-199 Joaquim Ballarín i Bargalló, Wood Houses, London: teNeues, 2005
- 200-202 Detail, Zeitschrift für Architektur, München: Institut für deutsche Architekturdokumentation: 12/2003
- 203-206 Detail, Zeitschrift für Architektur, München: Institut für deutsche Architekturdokumentation: 1/2004
- 207-209 db –deutsche bauzeitung, Leienfelden-Echterdingen: Konradin Medien GmbH; 2/2004
- 210-212 Detail, Zeitschrift für Architektur, München: Institut für deutsche Architekturdokumentation: 10/2006
- 213-214 Detail, Zeitschrift für Architektur, München: Institut für deutsche Architekturdokumentation: 8/2001 p. 1502 – 1503

216–218 Detail, Zeitschrift für Architektur, München: Institut für deutsche
Architekturdokumentation: 12/2004 p. 1472 – 1473
220–222 Detail, Zeitschrift für Architektur, München: Institut für deutsche
Architekturdokumentation: 12/2004 p. 1466 – 1469
224–225 www.adjaye

Chapter 7

234,235 www.syd-tek.dk
236, 237 www.batiplum.com
238,239 www.coverd.it
240,241 www.tecnosugheri.it
242,243 www.tecnosugheri.it
244,245 www.iso-kenaf.it
246,247 www.unilin.com
248,249 www.thermofloc.it
250,251 www.isoflex.se
252–253 www.basf.com
254,255 www.bonellispa.com
256,257 www.variotec.de
258,259 www.cabot-corp.com/nanogel
260,261 www.overall.it
262,263 www.wacotec.com

Legend:

t...top

b...bottom