

Strategies of Power Efficiency for the rural social house of the coastal desert of the Region of Antofagasta: Project factory IX Architecture and Energy

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ABSTRACT: From the power contingency that lives the country, one considers to develop proposals that incorporate concepts of efficient power design. Making the problems visible of the existing rural establishments in the coastal strip of the desert of Atacama, in its majority lived permanently by artisan fishermen and temporarily by veraneantes. All these towns work with conventional power systems at a high economic and environmental cost. The present project occupied the second place in the Aid of Ideas for the development of architectonic designs made by the MINVU and the PPEE to develop a suitable habitability of solar protection and luminance for summer, design and innovation with controlled soleamiento and Efficiency and effective yield for the summer, high-priority subject in the location region.

Key words: Passive systems, habitability barren zones, power efficiency, social house, solar control, luminance comfort.

1. INTRODUCTION

The reality of creeks of fishermen of the coast of the region of Antofagasta is delimited by the degree of permanence of the establishments and its condition of habitability due to the lack potable water networks and energy. At the moment and systems of motors or group work with water tankers electro-generators.

The coastal slumses are of great precariedad and improvisation, conformed for architectures autoconstruidas under a

concept of the provisory thing and for an intensive seasonal use.

From the environmental point of view the coastal desert is a territory with great potential for the operation of renewable resources such as Aeolian the solar energy and, of application direct in solar system of pick up, photovoltaic, desalination and pick up of water of camanchacas. It would allow imagining another destiny for this region of great ecological singularity and enormous landscaping value.

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2. ARCHITECTONIC MEMORY

The project of rural house locates in the present creek of fishermen and historical establishment of Cobija, to the north of the locality of Mejillones, in a zone outside the urban networks.

The unfamiliar type house has the quality to domesticate the outdoor, opening itself or closing themselves according to the use requirements. This conquest is obtained with an intermediation space, one surrounding double that controls passively the high indices of radiation and incident illumination, direct or diffuse.

The climatic comfort provides the double skin, conforming a tenuous shade, protecting the house of the direct solar radiation.

From a social perspective the project reflects on the paper of the resident population, contemplating the ways of life of the fishermen and the population seasonal with the intention to guarantee the security, maintenance and care of the spaces public for the collective benefit.

On the other hand the product guarantees its economic sustainability, and the promotion of potential sustainable productive activities related to the artisan fishing, commerce and service

3 CRITERIA OF DESIGN

The prototype responds to diverse criteria of power design of proven effectiveness for the traditional architecture associated with the solar and luminance control on the base of technologies and appropriate constructive systems and low impact direction

A planned that allows to obtain a more sustainable yield (power saving, solar incidence, natural ventilation, etc.)

Surroundings

The integration of the house with its immediate surroundings, is privileged to open

the house to the oceanic landscape, combined with the protection

Indoor:

The treatment of the limits is conceived to allow the flexibility and functional adaptability, permitting the growth of the house with movable closings. The volume and the emptinesses are unified under one double cover that favors the ventilation and luminance control. The North facade and the west are protected with a wood sieve whose function is to refract the intense luminosity smoothing its enter the inner atmosphere

Outdoor:

The benign climate of the desert coastal coast allows to gain the exterioridad, it implies to open and to extend the limits of the house

Natural illumination:

The control of the intense natural illumination in the North zone is fundamental to obtain the smooth penumbra and thresholds of luminance graduation between the inner-outer. An optimization of the luminance incidence within the building helps to comfort luminance and ambient atmospheres, warm accents, favoring the perception of amplitude of small enclosures

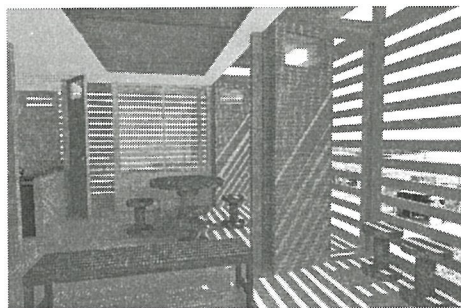


Figure 1: Luminance control, transparency of you limits them.

Isolation:

The heat insulation as a factor of optimization of the energy efficiency of the house is contemplated. The structure of floor is separated and put in a home of the natural land. With it has been possible to improve the thermal requirement of the house in winter, which implies a saving high degrees of power autonomy. [Figure N°2 and N°3]

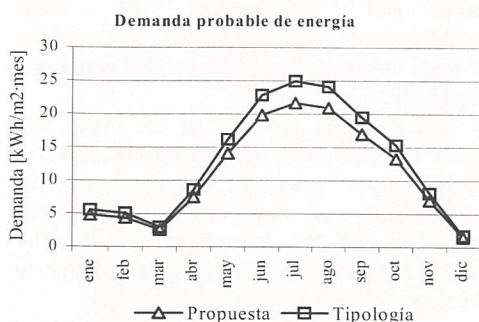


Figure 2: Graphical probable demand of energy between propose house and typologies of reference.

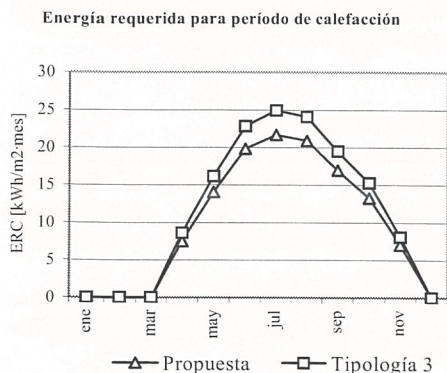


Figure 3: Graphical Energy required for period of heating, between propose house and typologies of reference.

Energy efficiency:

It is contemplated integration of apparatuses of low power consumption, photovoltaic equipment for lighting system and a correct application of criteria of passive solar design, which to improve the power behavior of the house, with a smaller demand.

Natural ventilation:

Concepts like the ventilation crossed for a passive inner air conditioning to traverse of one surrounding double, windows lattice windows and ventilated cover consider.

Remainders:

The project contemplated the treatment, recycling and reduction of the remainders generated by the house in the process of construction and maintenance. The water reusability is very important by means of the reconducción and gray water purification for different uses and the incorporation from the dry toilets

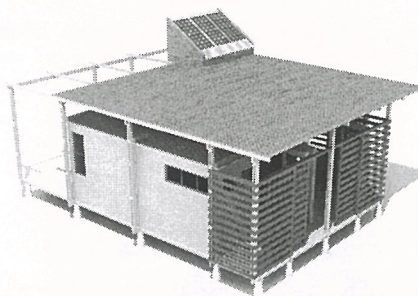


Figure 4: image of the surrounding house

4. CONSTRUCTION/MATERIAL

The constructive conception and material is related to the service life of the materials. Present factors like the durability and under maintenance, together with criteria of assembly and disassembling, transport, seriating, recycling, and reusability, aspects in

the engineering specifications of the work considered.

We are deciding to work with the prefabricated wood framework, because this material has good behavior to the conditioners of the barren and humid climate of the nortino coast. Associated to it manipulation reasons there are, transports, modulation, constructive rapidity and premanufacture, everything which allowed to maximize the use of the resources, diminishing the energy of production and execution of the work in the site.

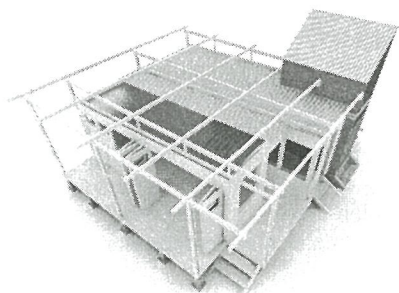


Figure 5: image constructive system house prototype.

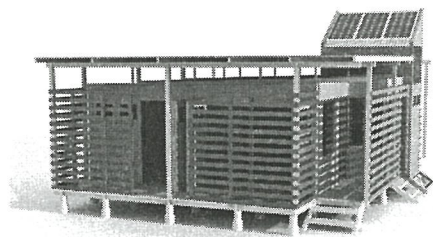


Figure 6: image of the proposal and system of surrounding of the house.

5. CONCLUSION

The coastal zone of the north of Chile presents/ an incomparable scenic beauty that

deserves to take care of. Nowadays those establishments have been developed from the architectonic point of view on the basis of the improvisation. Without a projects one for constructing, rooted projects of house and appropriate that allow a good space and urban integration of the surroundings these values will be destroyed, of there the value of the proposal presented.

On the other hand, the productive and habitacional development of these establishments is related to the improvement of basic infrastructures, like potable water and electricity.

This endemic problem of the cities and small establishments of the desert coast of Chile raises presently a challenge of sustainability of first order. The superb conditions for the advantage of the solar energy are an opportunity to give solution to the necessities of a better quality of life.

The use of the new technologies is not a reality, with enormous potentials, only implies to support certain renewable energies associated with an answer of power design architectonic contemporary, integral, efficient and respectful with environment

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