Architectural Engineering Technology

Raquel et al., J Archit Eng Tech 2014, 3:4
http://dx.doi.org/10.4172/2168-9717.1000132

Research Article Open Access

Design of Active and Passive Solar Elements for Sustainable Contemporary Architecture

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Within this paper we describe the design and development of technological innovative modules to be applied in architecture cladding. They combine passive solar features like solar protection, solar thermal energy storage, ventilated and Trombe wall effects with active solar thermal collectors and photovoltaic systems. The proposed solar protection features can also include a biological element, proving support for vertical gardens and shelter for small birds. This novel modular system comprises several multifunctional technical parts. A prototype of the thermodynamic module was constructed with selected cork, ceramic, glass and copper materials.

Keywords: [illegible]

Introduction

[illegible] [1].

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September 08, 2014; September 29, 2014; October 06, 2014

Raquel SO, Coelho R, Marques AT, Torres C, Simoes JA (2014) Design of Active and Passive Solar Elements for Sustainable Contemporary Architecture. J Archit Eng Tech 3: 132. doi:10.4172/2168-9717.1000132

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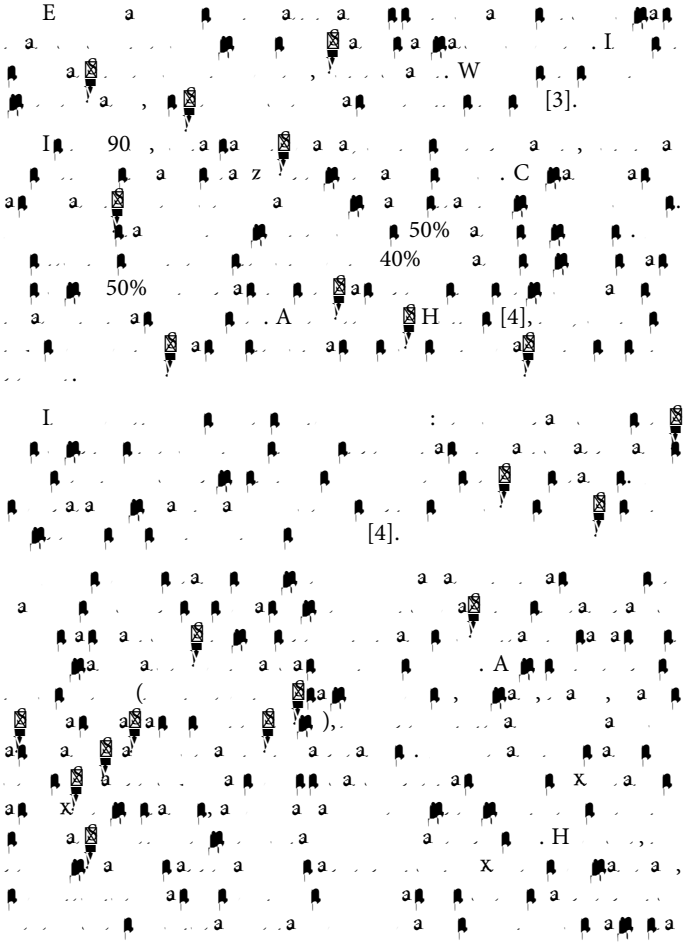
Research Contextualization



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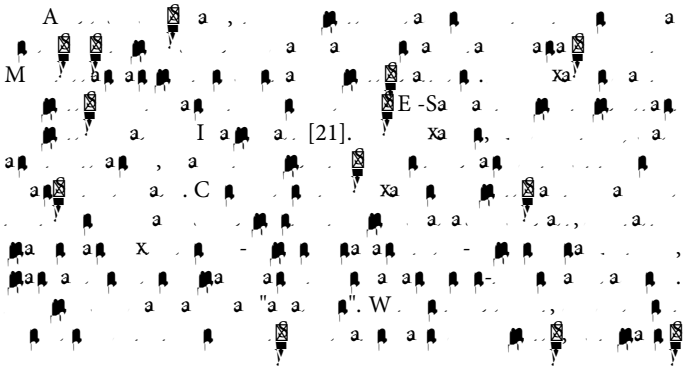

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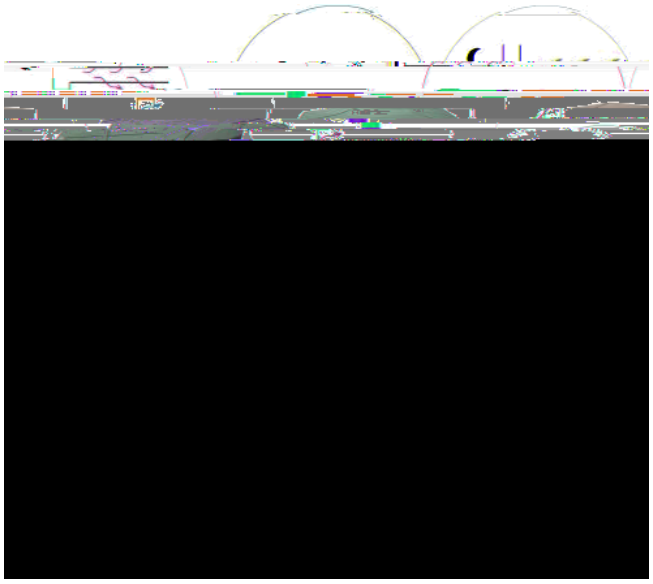

: Thermal passive glass module to perform Trombe and chimney functions.

Ceramic

Cork

Air

Glass

Copper

Chimney e ect Trombe e ect Thermodynamic

Organization of the materials for different energy functions.

Simulation of a thermo-active surface built of copper and ceramic plus glass modules.

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– E -2.98. J/(^{2} K)

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Simulation of a thermo-active surface built of black ceramic with.

External view of a facade composed with ceramic and solar thermal modular and illumination parts.

: Internal view of a facade composed with modular parts for inside illumination.

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