Example name: *House on Durand DR*

Template completed by:
Constantinos Vassiliades,
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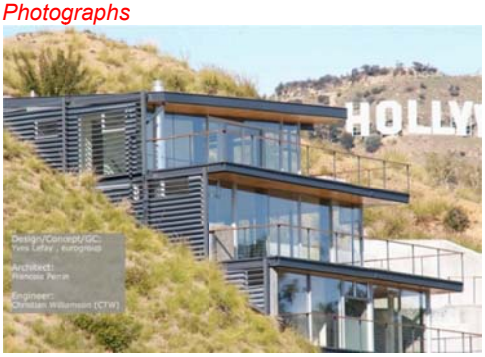
For installations

BISTS Location: *Hollywood, CA, USA, +34°5'34.11", -118°19'43.18"*
Climate Type: *BSk*
Building Use: *Residential*

Level of BISTS integration
2. Added to the design

√ New Build
O Refurbishment
O Other: ……
tick all that apply

Photographs



Type of BISTS:

Active/Passive/~~Hybrid~~
delete as appropriate

Function(s):
O Air heating
√ Water heating
O Combi-system
√ Cooling/ventilation/shading
O PV/T
√ linked to another system (e.g., heat pump)
O Other: ……
tick all that apply

Drawings/Sketches/Cross-sections

Building element:

√ Facade
O Roof
O Other: ……..
tick all that apply

BISTS characteristics:

The system is 5 specially designed "boxes" with horizontal tubes placed on the south side of the building. Special software was used to finalize the their design, taking into account various factors such as the size and the distance between the tubes in order to shade the building without obstructing the view, but according to proper thermal performance.The collection area is 18.5 m². The main system is pre-fabricated off-site, and assembled on-site.

Stage of Development:Responsible: *Company*

O	Idea/Patent	……..
O	Prototype	……..
O	Demonstration	……..
O	Integral building element	……..
√	Commercially available	*Bio-tecture*

tick all that apply

BISTS description and context

With the integration of passive and active solar technologies, the house offers thermal comfort all year round without the need for air conditioning. In the southern side of the building, the building integrated solar thermal system, functions both as blinds for shading of the building, as well as solar thermal system that provides hot water used for household needs in the water and on floor heating. The thermal solar collector is invisible, fully integrated and does not distract from the clean architectural lines of the building.

System viability

This small 18.5 m² Hybrid Facade Shield pre-heats water to reduce energy costs (by 20 to 30%), while being a fully integrated part of the natural cooling concept of this project reducing heat gain by an average of 4.8% and 18.9% peak demand reduction.

Modelling and simulation tools developed/used

For example….new modules/types created for established simulation programs, stand-alone modelling, use of generalised codes, model outcomes, validation and accuracy. Design tools developed

BISTS Performance data Based on: O Estimation O Detailed simulation *Specify software(s) used* O Measurement/testing O Long-term monitoring *tick all that apply* **Performance parameters** For integrated systems: key performance indicators - *Solar savings fraction: %* *Light transmittance: %* *Solar transmittance:%* *Total solar energy transmittance: %:* *Solar heat gain factor: %* *Building fabric U-values: W/m^{2}K* *Noise, fire, etc ratings* *Other:* For separate collectors: performance rating coefficients - (EN12975, a0,a1,a2), ASHRAE, etc Other:	*Graphs for collector efficiency, seasonal energy gains, diurnal/seasonal solar fraction, etc.*
Additional information:	
Sources and references: *http://www.bio-tecture.net/downloads/residential_casestudy.pdf*	

INSTRUCTIONS

Please fill in as much information as possible.

Tick where appropriate.

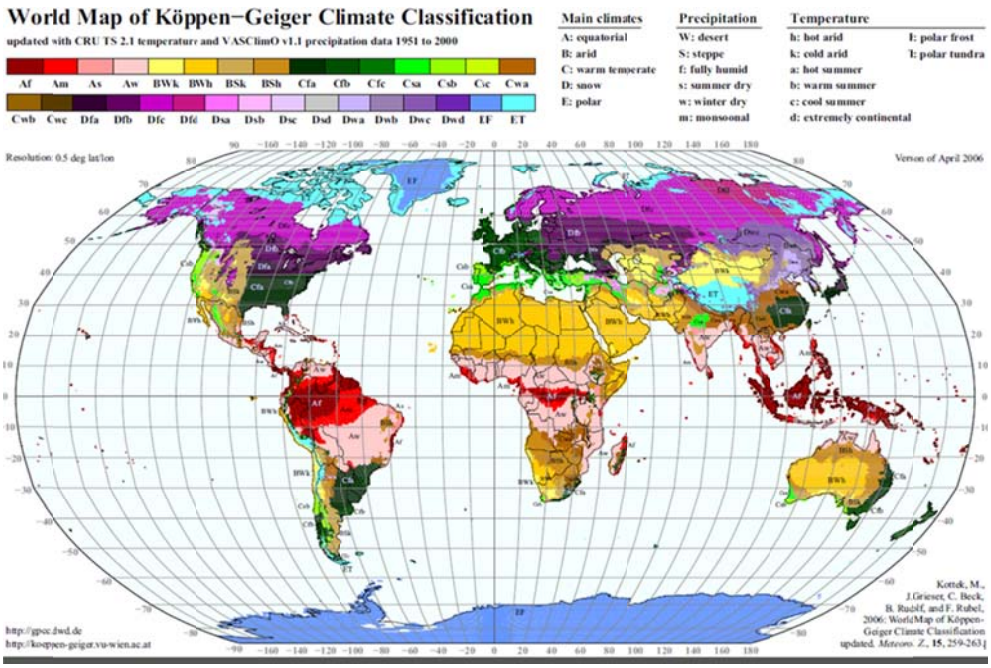
Text in red is suggested guidance. Insertinformation in provided space, removing red text as appropriate

If possible, use metric values.

If necessary, supply additional information on separate sheets

Reference listing

Köppen climate classification



(Kottek, M.,J. Grieser, C. Beck,B. Rudolf, and F. Rubel,2006: World Map of Köppen-Geiger Climate Classificationupdated. Meteorol. Z., 15, 259-263.)

Reijenga classification

The integration of PV systems in architecture can be divided into five categories:

1. Applied invisibly
2. Added to the design
3. Adding to the architectural image
4. Determining architectural image
5. Leading to new architectural concepts.

(Reijenga, TH and Kaan, HF. (2011) PV in Architecture, in Handbook of Photovoltaic Science and Engineering, Second Edition (eds A. Luque and S. Hegedus), John Wiley & Sons Ltd, Chichester, UK)

Rush classification
The architectural/visual expression of building services systems are identified as:

Level 1. Not visible, no change
Level 2. Visible, no change
Level 3. Visible, surface change
Level 4. Visible, with size or shape change
Level 5. Visible, with location or orientation change

(Rush, RD. (1986) The Building systems integration handbook Wiley, New York, USA)

Collector test standards

BS EN 12975-2 2006 'Thermal solar systems and components solar collectors - Part 2 test methods'
ASHRAE Standard 93-2010 'Methods of Testing to Determine the Thermal Performance of Solar Collectors'
ASHRAE Standard 95-1987 'Methods of Testing to Determine the Thermal Performance of Solar Domestic Water Heating Systems'