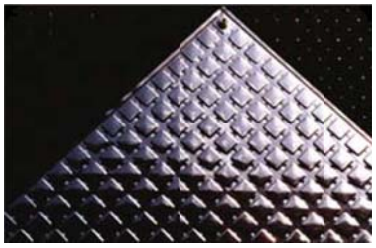
Example name: *Le Cern de Bursins*

Template completed by:
Constantinos Vassiliades,
c.vassiliades@hotmail.com

Photographs



For installations

BISTS Location: *Bursins, Switzerland, +46°26'41.28", +6°17'46.28"*
Climate Type: *ET*
Building Use: *Offices, Service Center*
Level of BISTS integration
3. Adding to the architectural image

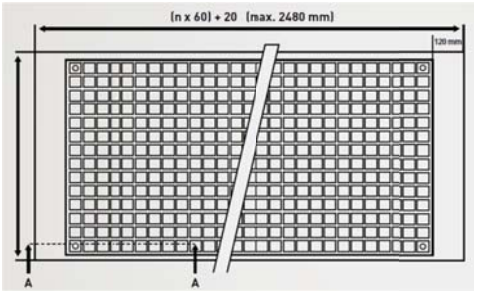
√ New Build
O Refurbishment
O Other: ……
tick all that apply

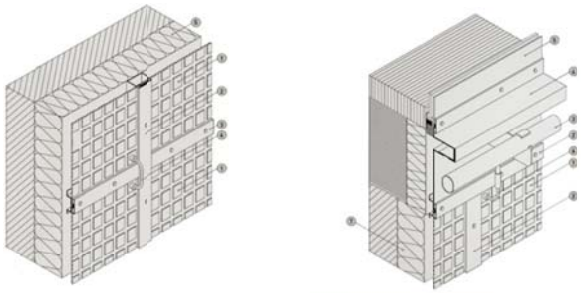
Type of BISTS:

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

Function(s):
O Air heating
√ Water heating
O Combi-system
O Cooling/ventilation/shading
O PV/T
O 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 facade consists of stainless steel solar collectors. The panels contain heat exchangers through which circulates the heat transfer fluid. The collector consists of two sheets of stainless steel. Regularly-spaced square patterns are stamped on the sheets. The two sheets are assembled «back to back» with their peaks and edges shifted in such a way relative to one another so the fluid can flow through the resulting voids. This method provides a uniform flow of water. Heat transfer is particularly effective , since the fluid is in contact with almost the entire surface of the collector sheet. In the absence of the glass, and contrary to the conventional collectors, solar radiation reaches the surface without partial absorption or reflection of the glass. Collection area is 576 m^2, and the collectors are 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	*Energie Solaire SA • Switzerland*

tick all that apply

BISTS description and context

The Centre d'entretien des Routes Nationales (CeRN) is a building that was aiming at the maintenance of the highway. The south side of the building is covered with solar thermal collectors which act as a "multifunctional" material of the facade.The north side is covered with stainless steel elements of the same geometry but not thermally active.

System viability

For example….Economic viability (capital and running costs), maintenance, embodied energy, environmental impact and sustainability, wider social contexts

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

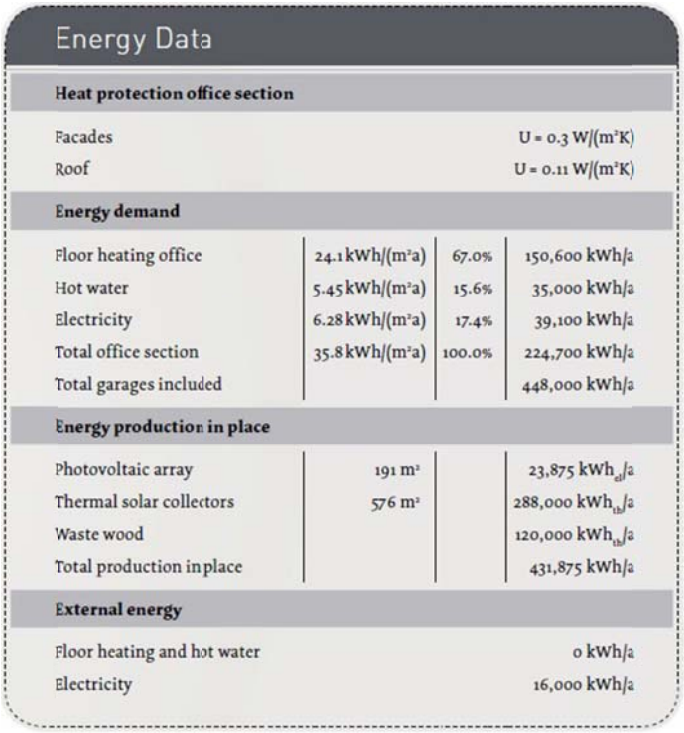
For integrated systems:
key performance indicators -

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.



Energy Data

Heat protection office section			
Facades			U = 0.3 W/(m²K)
Roof			U = 0.11 W/(m²K)
Energy demand			
Floor heating office	24.1 kWh/(m²a)	67.0%	150,600 kWh/a
Hot water	5.45 kWh/(m²a)	15.6%	35,000 kWh/a
Electricity	6.28 kWh/(m²a)	17.4%	39,100 kWh/a
Total office section	35.8 kWh/(m²a)	100.0%	224,700 kWh/a
Total garages included			448,000 kWh/a
Energy production in place			
Photovoltaic array	191 m²		23,875 kWh_{el}/a
Thermal solar collectors	576 m²		288,000 kWh_{th}/a
Waste wood			120,000 kWh_{th}/a
Total production in place			431,875 kWh/a
External energy			
Floor heating and hot water			0 kWh/a
Electricity			16,000 kWh/a

Additional information:

Sources and references:

http://www.nivo.ch/cern.html

http://www.worldstainless.org/Files/issf/non-image-files/PDF/ISSF_Stainless_Steel_in_Solar_Energy_Use_Case_Study.pdf

http://www.energie-solaire.com/jt_files/jt_files_filename_0336_1326402945.jpg

INSTRUCTIONS

Please fill in as much information as possible.

Tick where appropriate.

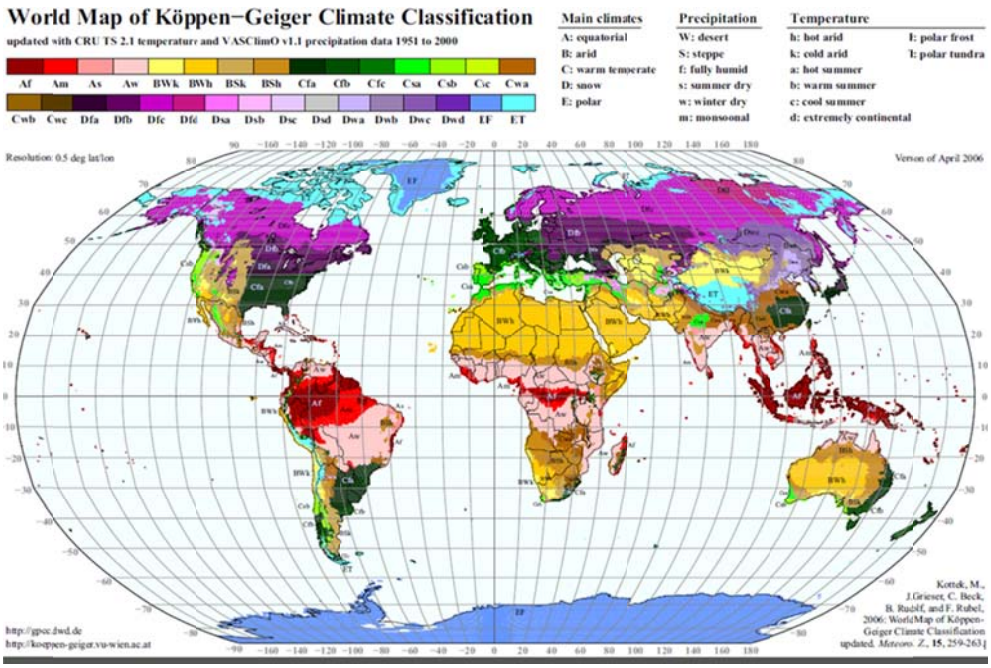
Text in red is suggested guidance. Insertinformation in provided space, removing red text as appropriate

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'