Example name: *FedEx, Colorado, USA*

Template completed by:
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Photographs

For installations

BISTS Location: *Denver, Colorado, USA, 39°44'21"N 104°59'5"W*
Climate Type: *BSk*
Building Use: *Industrial*

Level of BISTS integration
3. Adding to the architectural image

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

Type of BISTS:

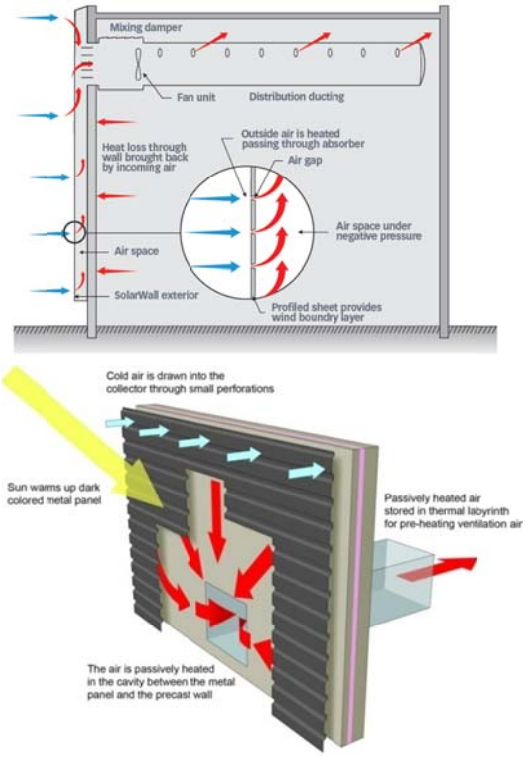
~~Active~~/Passive/~~Hybrid~~
delete as appropriate

Function(s):
√ Air heating
O 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

Building element:

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

Drawings/Sketches/Cross-sections



BISTS characteristics:

Because of the many trucks that pass through the facility, the building was placed in the same category as car parks, with the requirement for air ventilation to 0.14 cfm / m². The heating for this volume of air using conventional methods would be prohibitively expensive. So the Colonial Red SolarWall system was chosen, sized 465 m², to preheat the ventilation air.

Stage of Development: Responsible: *Company.*

O	Idea/Patent	……..
O	Prototype	……..
O	Demonstration	……..
O	Integral building element	……..
√	Commercially available	SolarWall

tick all that apply

BISTS description and context

It is basically a second shell which is mounted on the outer walls of the building, and heats the air and then leads it inside the building.
The red color of the wall was used to make an architectural statement, which is connected to the rest of the building as a horizontal red line which is wrapped around it. The installation of the system was integrated to the building and looks as a part of the texture of the building.

System viability

This solar investment provides 2,300 million BTUs of thermal energy in the building for each year. The system also includes three solar fans offering 45000 cfm of hot air ventilation throughout the building.
The solar system has brought immediate savings of about $ 12,000 per year (in gas prices of 1996), and now these numbers are much bigger. The increase in lease payments for the SolarWall installation was $ 400 / month, while FedEx saw a decrease of $ 1,000 / month in energy costs. This meant that the company made direct savings of around $ 600 / month! Finally, the system also prevents 127 tons of CO_2 from being released into the atmosphere each year.

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 *CANMET's monitoring report.* 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://solarwall.com/media/download_gallery/SolarWall_SellSheet.pdf* *http://solarwall.com/media/download_gallery/cases/FedEx_Y96_SolarWallCaseStudy.pdf*	

INSTRUCTIONS

Please fill in as much information as possible.

Tick where appropriate.

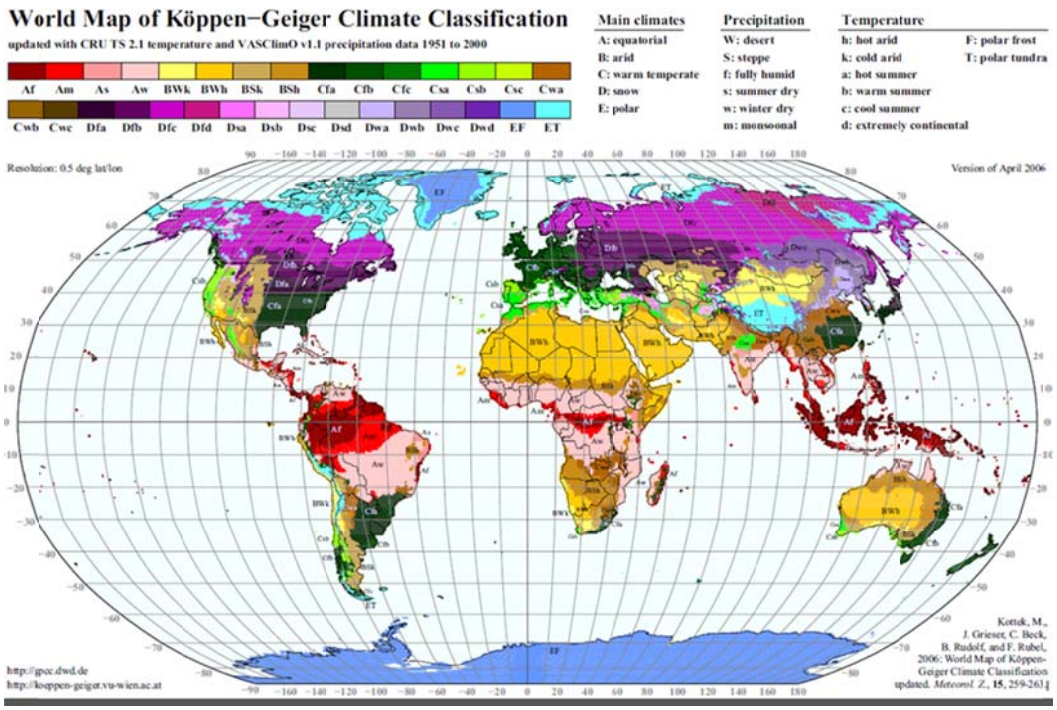
Text in red is suggested guidance. Insertinformation in provided space, removing red text as appropriate

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'