

DK_ Hirtshals_Spirehuset

Image 01:

Northwest façade

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Image 02:

Internal view – common room

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Image 03:

View of the roof with roof windows

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Building Specifications

Address	Søndergade 20 A, 9850 Hirtshals, Denmark
Building Category	Kindergarden
Year of Construction	1998
Special Qualities	Special acoustics
Location	58° northern latitude, 10° eastern longitude, located on flat land. Located in suburban area in a small town. There are no buildings close to Spirehuset and the neighbourhood mainly consists of one-storey buildings and open land
Climate	Cfb (warm temperate climate, moist with adequate precipitation in all months and no dry season, warm summer with the warmest month below 22°C)

Vent. Cooling Site Design Elements (Solar Site Design and Wind Exposure Design, Evaporative Effects from Plants or Water)

n/a

Vent. Cooling Architectural Design Elements (Form, Morphology, Envelope, Construction & Material)

Form: It is a multi-surface symmetric single-storey building in extensive shape. The shape of the building provides solar protection for the big windows section. In cases where this isn't efficient enough, internal roller blinds can be manually activated.

Morphology: The building layout is designed based on a cell principle. The building is divided into 5 zones. A common room in the central part of the building is surrounded with other zones (playing rooms, staff room, kitchen, etc.). Total floor area is 500 m2.

Envelope: Each façade features large openings with hinged windows in the top and bottom parts. Exhaust openings are located in the ceiling in the common room (roof windows), which also improves the supply of daylight. To improve the stack effect this room is higher than the adjacent rooms.

Construction: The core of the construction is wood, and all the outlying parts are in brick.

IEA EBC Annex 62 Ventilative Cooling

Vent. Cooling Technical Components (Airflow Guiding Components, Airflow Enhancing Components, Passive Cooling Components)
<p>Airflow Guiding Components: The design of Spirehuset makes use of both cross and stack natural ventilation principles. Additional exhaust systems are installed in toilets and the kitchen. Stack ventilation is enhanced by lower air inlets located in the windows and the upper exhaust openings located in the roof.</p> <p>Airflow Enhancing Components: The roof of the common room is designed to be higher compared to the others. Additional pulse ventilation (every 180 seconds) is applied to the time schedule. Manually operable windows ensure user control.</p>
Actuators, Sensors and Control Strategies
<p>Façade windows and roof openings are operated by chain actuators.</p> <p>The ventilation system is demand controlled either by CO₂ level (above 1000 ppm) or room temperature sensors, with the possibility of manual override. Sensors measuring the wind speed/direction are used to define the opening area of the roof windows.</p> <p>Night cooling is controlled according to room temperature range (18 – 23°C)</p>
Building Energy Systems (Heating, Ventilation, Cooling, Electricity)
<p>Mechanical ventilation in kitchen and toilets</p> <p>Information regarding heating system is not available</p>
Building Ownership and Building Facility Management Structures
<p>The owner of the building is Hjørring municipality</p>
Acknowledgements
<p>n/a</p>
<p>Datasheet Source: The information and the design details were collected during the Advent Building Project. Long term measurements taken from the control system through a year. Question survey was carried out too. © 2/2 All images and copyrights belong to the original owners and are reproduced for the purpose of training and education only</p>