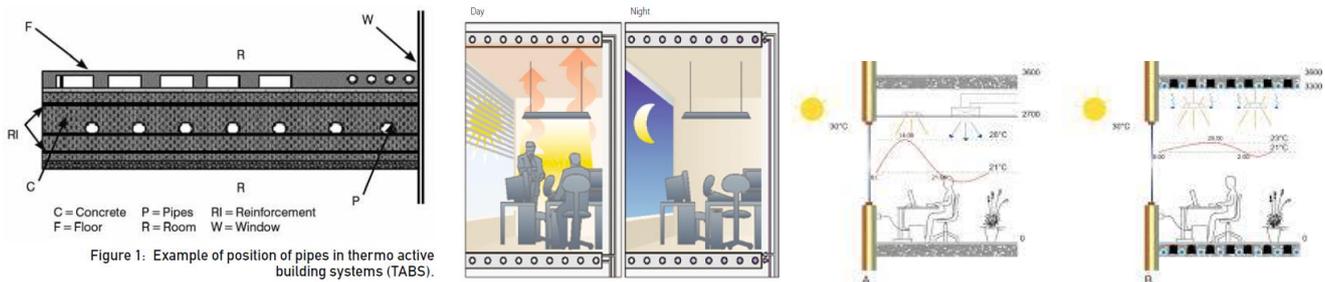




## Comfort cooling and heating with aquatherm Thermo Active Building Systems (TABS)

“Thermo-Active Building Systems” (TABS) are water carrying pipe systems, embedded in concrete slabs, integrated into ceilings and floors for temperature control of buildings. “TABS” technology, also known as “Concrete Core Temperature Control” (CCTC) or “Concrete Core Activation”, has been used in Europe since 1990 and is spreading to other parts of the world like North America and Asia.



The water carrying pipes, embedded in the concrete slabs, function as a big heat exchanger, cooling- or heating the mass of the concrete slabs. By using the thermal mass of the concrete slab, peak (cooling- or heating) loads will be reduced and some of the cooling- or heating loads will be transferred beyond the time of occupancy, like during night time (using the lower night-time energy rates).



**aquatherm green pipe**

**aquatherm blue pipes**

**aquatherm orange pipes**

By embedding the water carrying pipes in concrete slabs (i.e. avoiding suspended ceilings), the building height can be reduced or an extra floor can be created in the original building height, creating more office or living space.

Due to the large heat and cold transfer surfaces of the concrete slabs, it is possible to heat or cool with very slight temperature differences between the slab and room temperature. The cooling water temperatures are often 18°C to 22°C and the heating water temperatures are no more than 27°C to 29°C.

Due to the fact that a lot of concrete thermal mass has to be heated or cooled,

TABS is a **slow response** heating and cooling system.

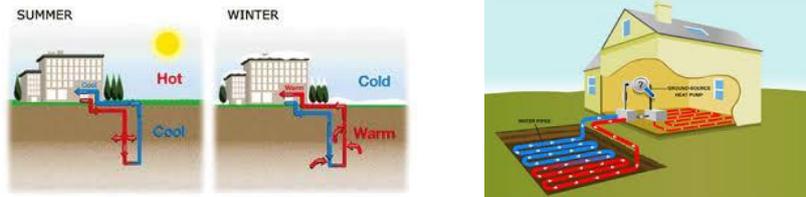
### More information on TABS:

- Themeninfo I/2007 BINE Informationdienst
- Thermo Active Building Systems article (AIRAH Ecolibrium magazine August 2014)



## Geothermal application

The almost constant water temperatures from deep underground, up to 100m, (**Geothermal cooling/heating**) or sometimes even ground water can be used for cooling or heating of the building. Borehole heat exchangers, made of double plastic pipes lowered to deep boreholes, are generally used to absorb from or release heat into the ground or rocks.



In winter cold water is transported down 50-100m into the earth in a closed system. On the way down the water absorbs the ambient heat of the ground or rocks. The heated water is then returned to the surface without any heat loss.



The heat is there extracted from the water, via a heat exchanger, and conveyed back into the depth in a cooled condition. In summer the system works the other way around, releasing heat onto the ground.



[aquatherm green pipes](#)

[aquatherm blue pipes](#)

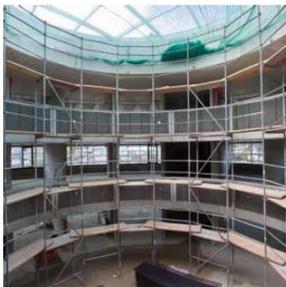
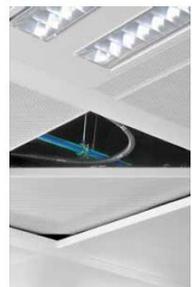
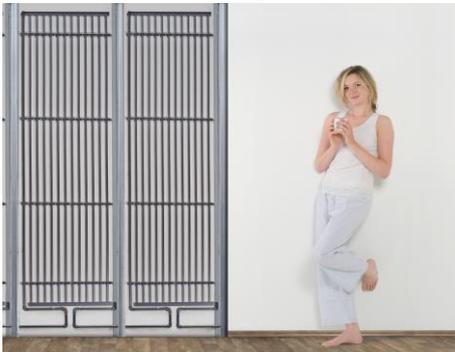
Only electricity for the circulating pumps, as final energy source, is used for heating and cooling the building. By using photovoltaic solar panels, even the electricity could be (almost) for free.







## aquatherm black system for comfort heating and cooling





## aquatherm red pipe for wet sprinkler embedded in the same concrete slabs

When using a Thermal Active Building System (TABS) why not embed **aquatherm red pipes** for wet sprinkler application in the same concrete slabs, as has been done elsewhere in the world?

Will our current AS2118.9 1995 (section 3.3) allow us to do that?

By embedding the **aquatherm red pipes** in concrete slabs (i.e. avoiding suspended ceilings), the building height can be reduced or an extra floor can be created in the original building height, creating more office or living space.



21<sup>st</sup> Century Pipe Innovation with **aquatherm PP-R**



**aquatherm**  
state of the pipe