



Creative rainwater management using spiral ponds in Luxembourg



The drilling rig at the BRE environment building, used to drive a 70m deep borehole into a chalk aquifer

### 3.4.2 WATER

#### Collect, store and recycle rainwater

Retaining surface water reduces the need for drainage infrastructure and energy for pumping, with their extensive capital and maintenance costs. Streams, rivers, canals, ponds and lakes can be incorporated into surface water retention systems, whilst simultaneously providing attractive visual landscape features and valuable ecological habitats. They can also be linked to the recycling of grey water (run-off from roofs and other hard surfaces) for the irrigation of plants (refer to 3.4.5 for waste water recycling). Maintenance and management requirements must be carefully considered at the outset, and particular care needs to be taken where contamination is present.

### 3.4.3 EARTH

#### Use the potential of the ground

Consider the potential of underground energy sources for environmentally friendly heating and cooling systems. This has two aspects:

##### 1 Temperature difference

The temperature at a depth of 10m is about 14 °C. It is possible to use heat pumps that take advantage of the temperature difference between the ground and the air for both heating and cooling but the heat transfer fluid needs to be checked as suitable for the environment.

##### 2 Aquifers

Buildings that produce a great deal of heat internally can be cooled using borehole water from aquifers, found in much of the country. The most common way of doing this is by sinking two boreholes into the aquifer, one for a supply of cool water and the other as a discharge point.



Sheets, blocks and buildings are orientated for solar gain (Photographer: Jan van Ijken)

<b>Nieuwland, Amersfoort, Netherlands: Solar design on a grand scale</b>	
Location	An urban extension to Amersfoort, The Netherlands
Project team	N.V. Regionale Energiemaatschappij Utrecht (REMU) Ecofys, ENEL SpA
Details	REMU, the Regional Energy Distribution Company of Utrecht, has initiated the construction of approximately 500 houses, a crèche, a sports hall and nine school dwellings fitted with solar cells, or 'photovoltaic modules'. This is taking place in Nieuwland, the City of Amersfoort's new housing area (30km east of Amsterdam) and has the capacity of generate 1 megawatt of electricity.
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