

## Factsheet 4: Environmental Measures

### **Green building**

In designing and building the district, a choice was made for the principles of Green Building (at that time). The core concepts are: an integrated chain (raw materials are kept as far as possible within a circuit, wastage is combatted, recycling encouraged); energy extension (focusing on saving energy and improving efficiency) and encouraging quality (using as much durable material as possible). These so-called DCBA score list from the BOOM environmental advisory bureau, which was closely involved developing the plans, was used as guidance. The intention was to realise the highest possible score (A). In practice, the average score was slightly lower (around B), largely as a result of the higher costs of many environmental measures. Yet the district scored 8 out of 10 in a recent IVAM durability survey, indicating that the district is still easily complying with criteria for green building.

### **Environmental Criteria.**

Five environmental themes were the focus of developments in the district: building materials, energy, water, vegetation and waste. In addition, the theme of traffic played an important role in the design of the district.

### ***Material.***

In its choice of building materials, Ecoplan made use of the environmental preference list of the City of Amsterdam (1993 version). This list includes all building materials (staircases, sanitary fittings, paintwork, frames) weighted per section from the most environmentally friendly to the least. If the budget allowed, then the most environmental friendly solution was chosen.

Examples of applications of this are:

The choice to use brick as facing instead of plastic insulation. Brick is more expensive but also more durable than other materials.

The use of 20% granulated concrete rubble in the dwellings (with rubble from the demolition of the former clean-water cellars).

The use of pine wood instead of tropical hardwood, aluminium or plastic for frames, doors, stairs and as finish. Frames (bottom- and side-hinged windows) are made of non-impregnated Norwegian pine, treated with water-based paints. Doors with glass are made of larch wood. For frontage, hemlock (a kind of pine) and Oregon pine are used.

Use of water-based paint (doors, frames).

Sewage pipes are not glued.

PVC tubing used in the dwellings is suitable for recycling.

Kitchen units (Bruynzeel, model Atlas) are design to be dismantled and 70% can be reused.

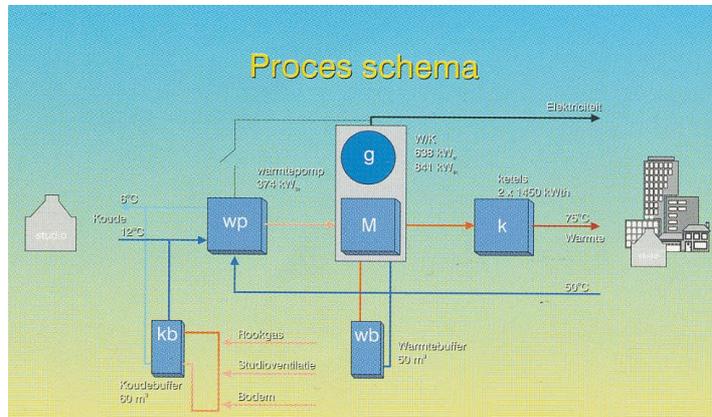
Roofing, using the more environmentally friendly EPDM instead of bitumen.

### ***Energy.***

The dwellings are built according to the energy performance norm (EPN) of 750 m<sup>3</sup> (natural gas equivalent) per year. This compares favourably with the standard at the time of 1400 m<sup>3</sup> (for an average single floor apartment) and offers a significant energy saving. This norm was realised by:

Insulation (installation of cavity walls, floors and roof).

Use of passive solar energy (north/south situation of the apartment blocks in the middle section, this does not apply for the high building on the west side).



Cogeneration (combined heat and power, CHP). The water company site has its own CHP station, located just to the west of the Machinepompgebouw, that supplies hot water to the houses. Application of CHP was an innovation at the time, there was very little experience with it in residential accommodation.

CHP uses residual heat from generating electricity. CHP saves almost 50% on carbon-dioxide discharge; the yield is

about 10% higher than from a normal power station. The heated water – at a temperature between 55 and 60°C – is led to the dwelling is through underground pipes. Each apartment has a heat unit (heat exchanger), which provides hot water and heating in the dwelling. The owner of the CHP and the heat units in the dwelling is (and hence the supplier of heating) is the local energy company NUON. The station operates automatically and is monitored remotely.

Hot fill (washing machines, dishwashers) have been used on trial in some of the dwellings.

There is no energy production from sun or wind. Natural gas is used for cooking in the dwellings (which does not provide any energy advantage). There is mechanical ventilation, which uses between 20 and 100 watts of power per dwelling.

### **Water.**

Saving on water use is an important theme that has led to several unusual technological solutions. The reason this aspect was emphasised relates to the fact that the district has been built on the former water-company site.

Gustavsberg toilet. This is a special toilet to save water that has been used in all the dwellings. When flushing, only 3.5 to 4 litres of water are used (instead of the standard 6 litres). To enable this, special flow enhancers were fitted to the interior sewers. These flow enhancers, that are located in the store rooms, collect at most 18 litres of waste water after which it is emptied in one go.

The use of grey (rain) water to flush the toilets (apart from in the high buildings, blocks 1 and 2). Rainwater is taken from the roof via rain pipes and filters to reservoirs beside the dwellings. From these reservoirs, the water is pumped into the toilets. This is augmented with drinking water when necessary.

In retrospect, this is one of the less successful environmental experiments. The system turns out to be vulnerable (the filters become blocked), needs a lot of maintenance and uses relatively large amounts of energy (to pump up the rainwater). In several blocks, the system is no longer in use.

Showerheads to save water and water limiters. Limiters on the supply provided an average saving of 30%.

### **Vegetation.**

In laying out the site, the choice was made for a lot of vegetation, with public, private and shared gardens.

The various areas of the site are divided from each other by hedges. Hawthorns can be found along the borders between the parks and squares and the Green areas. They also surround the six areas on the site with shared gardens. Privet hedges separate the private gardens. It's been decided that the height of the hedges should be at most 1.4 m. The inhabitants are not allowed to use other boundaries (fences). Along the eastern edge of the site (Van Hallstraat) is a holly hedge. Hedges further nesting space to birds and routes for small animals. They do not use any material likely to damage the environment.

There are more than 60 fruit trees on the site (historic breeds of apple and pear trees). Other trees on the site include: elm trees (west side of Waterpoortweg and north side of the Pump Engine Building); acacias (in the area), chestnuts (in the squares).

There are 85 communal gardens on the site maintained by inhabitants.

### Vegetation roofs.

The high buildings, blocks one and two, have a roof of vegetation that is unfortunately not visible to the surrounding area. The vegetation roofs were only possible here, because they cannot be combined with grey-water capture (see above). In the high buildings, grey-water capture was not feasible because of the large number of dwellings. The roofs are covered with moss, succulents, herbs and grasses. Precipitation is stored on the roof, evaporates or is used in growth. Chemical materials from the rain water are also stored and partly converted to materials that can be used by vegetation. This results in reducing the burden on the surface water. Other advantages: heat insulation, reducing heat loss, damping sound, cooling in hot weather, improving air quality.



Rainwater capture on the site. About two thirds of the inner area is unpaved; rainwater is directly absorbed here into the ground and does not need to be removed. On the paved parts of the site, the rainwater is not lead to the sewer, but is stored in Waterleliegracht. The canal has an overspill to the Haarlemmer trekvaart (canal) on the other side of Haarlemmerweg. This limits the load on the sewer and surface water.

Swift nesting boxes have been built into part of the façades on the north and east side.

**Refuse.**

As one of the first districts in Amsterdam, the water-company site was fitted with a system for underground refuse collection. In the meantime, underground refuse collection is common in many towns and districts. The underground containers are along the edge of the site. Glass and paper are collected separately. Large refuses collected twice a week. Organic waste collection has now been stopped in the area.

**Traffic.**

The water-company site is unusual because of its entirely car-free inner area; only emergency services are allowed on to the site. The car-free ground level protects the area from exhaust gases, traffic noise and rows of parked cars. Children can play safely outside. The streets have been constructed for pedestrians and cyclists. They are not designed for heavy traffic. This makes owning and using a car a less natural step for inhabitants.

There is only limited parking space in the district. Only on the western side of the site (Waterpoortweg and Waterkeringweg) are some parking places. For 600 dwellings there are 129 parking places. Of these, five have been reserved for car sharing (via the car rental companies Diks and Green Wheels). Two spaces have been reserved for invalids (general). The parking norm of 0.3 is very low – especially for a new district.

The area was subject to paid parking when the district was built. It's very busy for parking, especially along Waterkeringweg. This is also because of the many visitors to e.g. café-restaurant Amsterdam and the nearby Westergasfabriek culture park.

The number of parking permits for inhabitants of the district is limited. The inhabitants who want to be considered for a parking permit are put on a waiting list. In the industrial area to the west of the district there is a multi-storey car park where inhabitants without parking permit can hire a parking place (more expensively). There is also a certain trade in parking permits, with which inhabitants with a 'borrowed' permit can park their car in one of the surrounding areas.

The cycle is the main means of transport for most inhabitants of the water-company site. This can also be seen in the large number of bicycles parked on and around the site.

For public transport, there are no extra facilities. Beside the district on Van Hallstraat are a tram halt (the terminus of tram 10) and bus stops (bus route 21, Van Hallstraat and Haarlemmerweg). There is a direct connection with Central Station (route 21) and with Sloterdijk Station (route 60).