

Farmleigh Grove, Walton-on-Thames from Octagon Developments

Since 1980, Octagon have been developing prestigious new homes in premier, private residential areas in and around London and the South-East.

Specifically designed with individual interior and exterior features, Octagon also incorporate an intricate array of in-house technology.

A natural extension of this innovative mindset was to explore the advantages to be gained by utilising the latest renewable technologies – particularly as they provided benefits when seeking planning consent.

Farmleigh Grove on the the Burwood Park Estate; the latest 4 of more than a dozen prestigious Octagon properties to be specified with GreenTec Systems – integrated heating, ventilation and cooling systems powered by Ground Source Heat Pumps that give a greatly reduced carbon footprint, with the bonus of a supremely comfortable environment.

The GreenTec Systems produce no local fossil fuel emissions and have remarkably low running costs. Just as importantly, the constant delivery of fresh, filtered air confers great health benefits – particularly for asthma and allergy sufferers.

“Octagon have established a proud reputation for constructing homes of unsurpassed quality and excellence”

And with the steady rise in Summer temperatures expected to continue, it's great to know that the system keeps the internal temperatures under control for a miniscule cost – the coolant used is a waste by-product from the Heat Pump.



The GreenTec Systems at Farmleigh Grove

- **Heating:** Each Farmleigh Grove house is powered by a 17kW Ground Source Heat Pump manufactured by NIBE of Sweden – a country where more than 90% of homes are fitted with Heat Pumps. The Heat Pumps draw their energy from beneath each property through 3 x 100mtr deep boreholes, supplying all the hot water required for domestic and heating purposes. In periods of extreme cold, the Heat Pump can be assisted by its own built-in immersion heaters. When required, heat contained in extracted air is recovered (at no cost) to be used to heat incoming air – a system we call Air Heat Recovery.

- **Ventilation:** The system extracts stale air from wet areas – the kitchen and bathrooms – replacing it with fresh, filtered air fed into the living areas. The temperature of the incoming air is raised or lowered as necessary according to outside temperatures.

- **Cooling:** As the outside temperature rises, the GreenTec System initially turns off the Underfloor Heating and Air Heat Recovery systems. If the temperature in the house continues to rise, the system starts to cool incoming air using the cold fluid that is a by-product from the Heat Pump; Comfort Cooling.

- **Environment:** Each home uses 60-80% less energy than a conventionally-powered property, and there are no local CO₂ emissions.

Complementing their superb design, the four GreenTec-equipped homes at Farmleigh Grove will have a supremely comfortable, healthy living environment within a minimal carbon footprint. And their new owners will certainly appreciate their very low running costs.

The GreenTec System: a year at Farmleigh Grove

The 17kW NIBE Ground Source Heat Pumps fitted in Farmleigh Grove homes provide all of the hot water needed for domestic use and for the Under Floor Heating system.

Octagon have built the four properties at Farmleigh Grove to very high standards of insulation. Part of this insulation comes from the houses being built to be as air-tight as possible and, while this greatly reduces heat loss, it makes ventilation essential - so fresh, filtered, temperature-controlled air (great for asthma and allergy sufferers) is piped into living areas, while stale air is extracted from wet areas. The temperature of the incoming air is automatically adjusted to be warmer or colder depending on outside temperatures.

Here's how the GreenTec System automatically controls the house temperature under a variety of typical conditions:

28°C; Hot, Sunny Summer Day

Hot water is required for sinks, showers and baths. The house is too warm for comfort, even at night; it needs to be cooled.

- During the day, the Heat Pump occasionally kicks in to keep the Domestic Hot Water tank up to temperature.
- The ventilation system is sized to change all of the air in the house every 2 hours. While the internal temperature is higher than the temperature set on the thermostat, the Comfort Cooling system will operate; cold fluid from the Heat Pump (at 8-10°C) cools incoming air. The specialised pump required to circulate the cold fluid costs approximately 1p per hour to run.



18°C; Warm Autumn Day

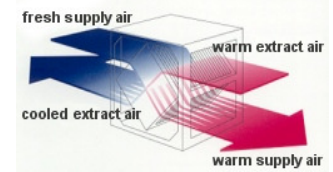
Hot water is required for sinks, showers and baths. As the overnight temperature dips, the Underfloor Heating may switch on in the coolest rooms, supplying gentle heat till the morning sun starts to warm the building.

- During the day, The Heat Pump will occasionally kick in to keep the Hot Water tank up to temperature; it probably won't be triggered into action by the Under Floor Heating's requirements.
- The ventilation system is pushing fresh, filtered air around the house; the warm outside temperature means that the system won't need to adjust the incoming air temperature.

5°C; Cold Winter Day

Hot water is required for sinks, showers and baths, and for the Underfloor Heating, which runs continuously, keeping the house up to the owner-selected temperature.

- The Heat Pump will be supplying the Domestic Hot Water tank and the Under Floor Heating as required.
- The incoming air temperature is raised using heat recovered from the air being extracted - Air Heat Recovery. The heat recovery process costs nothing to run, but reduces the building's heat requirement by around 20% per year, which can in turn reduce the capacity of the Heat Pump required.



Minimal impact on the environment

- By utilising the heat held in the ground, the GreenTec System's clever integrated controls maintain a comfortable, healthy environment in each Farmleigh home with no local CO₂ emissions, and no unsightly boiler flues or air-conditioning units. Best of all, tapping in to the latest technologies reduces the energy requirement – and running costs – of each house by somewhere between 60 and 80% compared to a conventional gas-boiler + air-conditioning setup.