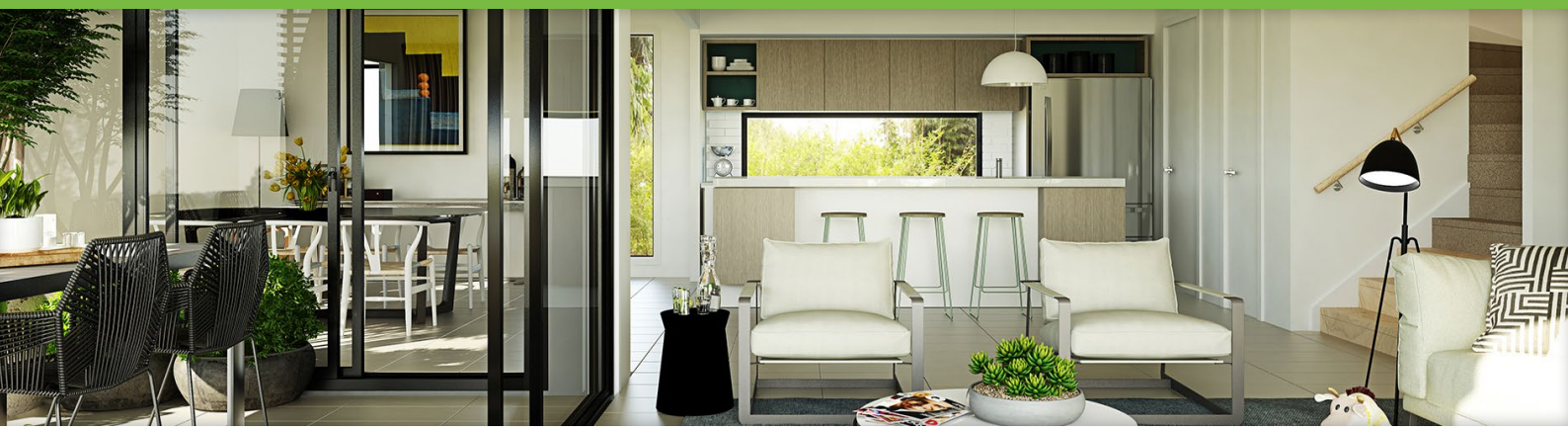
FAIRWATER RESIDENTIAL ESTATE



CASE STUDY

Largest Residential Geothermal Installation in the Southern Hemisphere

GEO AIR
HEATING COOLING

Fairwater

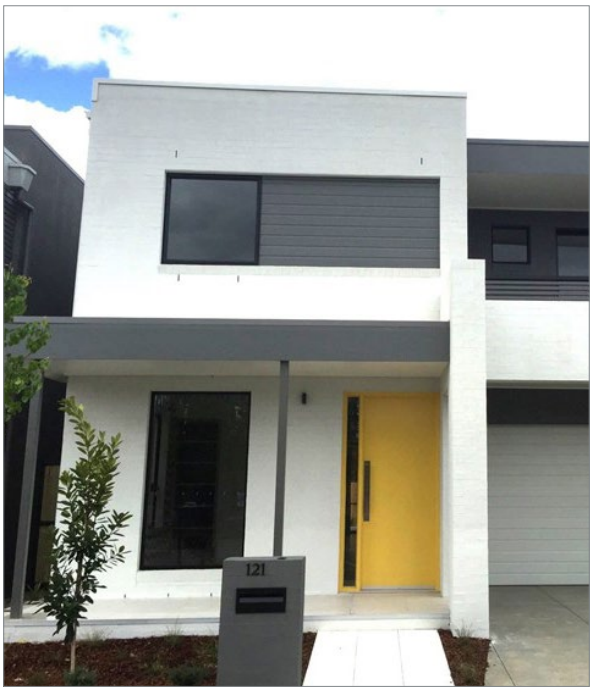
Residential Estate

Customer

Frasers Property Australia

Location

Blacktown NSW



Project Highlights

- **6 Star Green Star Communities rating from Green Building Council of Australia – first in New South Wales**
- **Over 900 new homes built in infill site in Blacktown in western suburbs of Sydney.**
- **Largest geothermal installation in Southern Hemisphere.**
- **Project commenced in September 2014 with a 5 year program**

Fairwater Residential Project Overview

Frasers Property Australia's Fairwater community in Sydney's west has delivered another sustainability first, achieving a 6 Star Green Star – Communities rating from the Green Building Council of Australia (GBCA) to position it as one of the country's most progressive environmentally friendly developments.

The achievement means Fairwater is the first project in New South Wales to be awarded a 6 Star Green Star – Communities rating – the highest possible recognition. Only a handful of projects have received this rating nationally.

Fairwater Geothermal

Frasers Property Australia has committed to installing geothermal air conditioning systems to each of the 950 new homes being built in its 38 hectare Fairwater residential development In Blacktown (NSW). Geothermal is a sustainable, reliable, clean power source which reduces the communities' dependence on fossil fuels. All houses will be connected to a GeoAir heat pump which will reduce household heating and cooling related energy costs by in excess of 60%. Most geothermal energy applications in Australia have been for single dwellings, small commercial applications and pool heating. Frasers Property's application of geothermal air conditioning to a large residential development is the first of its kind in the Southern Hemisphere.

Modelling undertaken by leading engineering and sustainability consultancy Cundall has found the system will achieve a 42% of the communities' peak energy demand and reduce greenhouse gas emissions by 13.5% compared to conventional air conditioning units. The GSHPs act to cool the home in summer and heat the home in winter, and is adaptable to deliver benefits in any climatic conditions. The system in Fairwater will deliver 10,000 kW of thermal energy which makes Fairwater the largest usr of geothermal energy in Australia. The Coefficient of Performance (COP) of the GSHPs installed at Fairwater, are approximately double that of conventional air conditioners.

Installation of the GeoAir the geothermal heating and cooling technology is a key point of difference at Fairwater. It's the largest geothermal community in the southern hemisphere and the technology will be accessible to every one of the approximately 900 homes on site.

"The system is well hidden and barely noticeable, but makes a huge difference to the environment, our energy costs as well as our comfort," Fairwater Home Owner.

An environmental first for new communities in Australia when it was unveiled at Fairwater in 2014, the geothermal technology saves significant energy compared to traditional air conditioning systems, with the potential to save residents over 60% in heating and cooling energy costs compared to a standard air-conditioned home, based on equivalent house size and power usage.

System Installation

Installing geothermal systems at scale require significant co-ordination and planning prior to commencement. With no access available post construction, it was important that geothermal loops were installed prior to any building works

Installation process has been developed in partnership with Frasers to integrate within existing processes

- Design team locate heat pump position on DA drawings
- Surveyor on site marks location of heat pump immediately following bulk earthworks
- QPS Geothermal receive approval for works from NSW Water
- QPS Geothermal install loop to nominated location prior to any other works on site
- Installed loops capped and protected with building works following to program

All internal installation follows conventional system installation and program and is undertaken by existing air conditioning contractors. All internal equipment and materials are the same as conventional ducted air conditioning.

1. Geothermal Loops

Each home has a geothermal loop installed to designated location. Installed to depth dictated by the system size, the loops are grouted in place and capped off for protection.

2. Internal Installation

All units are centrally ducted with in ceiling fan coil units and typically day / night zoning. System is controlled by wall mounted thermostat.

All internal installation is completed by Frasers Property nominated air conditioning contractors. Installation processes reflect that of conventional ducted system including equipment and materials.

3. Geothermal Heat Pumps

With geothermal loops installed at 200mm off slab, heat pumps are placed adjacent for connection. At 600 x 600 x 890 in dimensions and with no external fan or condenser coil, the geothermal heat pumps are very small, compact and quiet. This feature has enabled the units to be designed within each home to maximise liveable space and neighbourhood amenity.

Installation Benefits

1. **Large scale installation enabled efficiencies to be achieved during installation process.**
2. **Each home owner will save in excess of $600 per year in air conditioning costs**
3. **Small external heat pumps enabled installation where conventional system would not be suited**
4. **Removes acoustic issues associated with air conditioning with heat pumps operating at 51db**
5. **No external fans remove potential safety risks**

QPS GEOTHERMAL

69 Fredrick St Northgate QLD 4013

Phone: [07] 3256 7092
Fax: [07] 3256 8251
Email: info@qpsgeothermal.com.au
Web: qpsgeothermal.com.au