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Bahman Al Nadaf, Hot Water Heat Pumps Ltd

Meticulously Designed Indoor Pool in the Heart of Remuera

In May 2016 plans were afoot for a major upgrade to turn the outdoor pool at Remuera Gardens into a meticulously designed indoor pool. Remuera Gardens is a retirement village situated amid established gardens that provide a park-like environment.

Bahman, from HWHP (Hot Water Heat Pumps Ltd) received a phone call from Herb Farrant of Procis Construction Information Systems Ltd, who were project managing the upgrade. Back in 2011, HWHP had successfully finished the design, build and installation of the Summerset Retirement Village indoor pool heating and ventilation in Manukau City. That project with Herb was based on HWHPs Duoheat and Vent-Air integrated system. The result was a success in comparison to what Herb was calling a “traditional plant for air conditioning the pool environment” and a separate heat source for pool heating.

Underground Air Distribution Duct - A Retirement Village First.

The upgrade was going through a tender process. A mechanical consultant had already designed the ventilation based on a traditional air-to-air heat exchange system and a single overhead duct down the centre of the pool for Remuera Gardens. Poor ductwork design can lead to stagnant areas of air resulting in trapped moisture, which could lead to poor health and future building damage.

Because of high initial investment and high running cost, Herb Farrant was contracted to look for a more economic solution to lower both the capital and operating costs.

Keeping the humidity in the indoor pool hall under control is a major concern for any pool facility owner. Our solution was based on our integrated system utilising a Duoheat Heat Pump as the heat source for pool water heating. The same Duoheat unit is used to heat a buffer tank efficiently and push the heated water through epoxy coated coils of a Vent-Air Supply Air Handler, which in turn supplies warm fresh air to the indoor pool hall.

HWHP years of experience in this field, commissioning more than 90 indoor pools in different shapes, sizes and applications helped us to put a budget price together quickly for this project.

Herb also wanted an estimated annual operating cost and we presented the following:

Estimated Annual Operating Cost for Integrated Pool and Air Heating

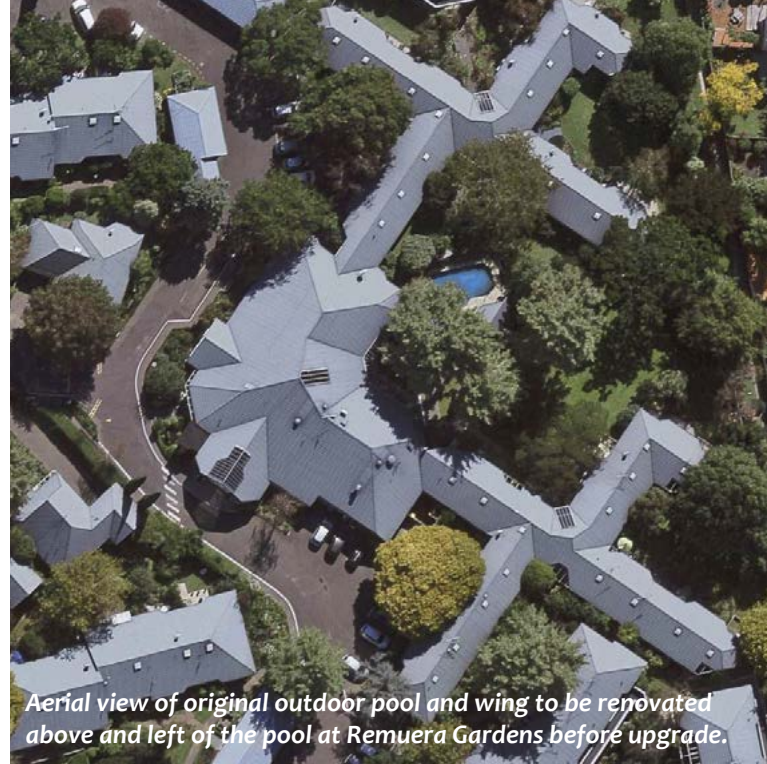
Estimated Running Cost:

- If the facility is paying \$0.25/kWh of electricity, the running cost of the heat pump would be \$1.75 per hour and the air handling units is going to be \$0.28 per hour.
- In summertime, the heat pump would run for an estimated 4-5 hours in a 24 hour cycle.
- During spring and autumn, the heat pump would run for an estimated 8-10 hours in a 24 hour cycle.
- In wintertime, the heat pump would run for an estimated 10-15 hours in a 24 hour cycle.
- The Air Handling Units should run the entire time if a proper pool cover is not used; otherwise the air handlers could be switched off when the pool cover is fitted.

This system would provide an energy efficient pool, and also air heating solutions for the indoor pool enclosures.

Later that month, Herb organized a meeting at Brown Day Architects office where we could supply further details to prove the benefits of our approach to the owners over the “original stand-alone equipment solution for air conditioning the pool area.”

Our preliminary offer was accepted and followed by another meeting with Kyla Wilson, an associate architect at Brown Day Group Architects; Adrian Spalletta of Cape Ltd; Carl



Aerial view of original outdoor pool and wing to be renovated above and left of the pool at Remuera Gardens before upgrade.



Original outdoor pool at Remuera Gardens before upgrade.

Woolright, the pool builder; and others to decide on the air distribution duct work and other key concerns.

The following three options were discussed for air delivery:

- 1- Overhead C Shape (powder coated galvanized steel)
- 2- Overhead C Shape (fabric duct)
- 3- Underground ducting including an air grille system

The underground duct work was the most expensive option of the three. All agreed this would produce the best outcome both aesthetically and practically for an indoor pool with high windows and skylight ceiling design. This design is effective to keep condensation under control because heat naturally rises.



*Skylight over new indoor pool,
underground duct at bottom right of picture.*



*High windows and ceiling
over the new indoor pool.*

In December 2016, we received approval from the project Directors to proceed and they also decided to add a new inground spa pool to the facility.

In March 2017, we began production of the underground duct work for the first part of the installation followed by an onsite meeting with Adrian of Cape Ltd. Cape was also engaged in upgrading/renovating the two adjacent residential wings. A part of the upgrade was changing the hot water cylinders, which were originally installed in the roof space of each unit. The cylinders had caused issues with leakage, stain and mould.

HWHP offered them an energy efficient solution based on a Performance Plus Duoheat heat pump, to heat the spa pool and also to provide the domestic hot water heating for the upgrade wing. We also sized two Thermoheat (heat pump ready) Duplex Stainless Steel Cylinders to reserve hot water for use. The mechanical room was spacious enough to accommodate the new changes with only minor alterations on the louver sizes.

A Total Success Story

The Remuera Gardens indoor pool Duoheat heating system, Vent Air equipment and underground air delivery system was successfully installed and commissioned on time by our own experienced team in May 2018. It has been in operation for the past few months, ticking all the boxes in the design brief and delivering on the promises made at the initial design stage.

- Providing an energy efficient solution to create a thermally comfortable environment for the users.
- Keeping the initial investment to an acceptable level.
- Utilising the Vent Air heat recovery system to an optimum capacity and therefore having a lower running cost than other traditional heat and ventilation solutions.
- Keeping all windows and walls above the dew point to reduce the chance of condensation forming.
- Providing an underground draft free air delivery system to evenly distribute the heated fresh air.
- Utilising New Zealand engineered and built equipment.
- Keeping the humidity in the indoor pool hall under control.
- Providing after sales service and maintenance.
- Onsite staff training for use of the equipment supplied.
- Lowering service and maintenance costs
- Prolonging the life expectancy of the building.

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SHOWCASE AT A GLANCE

Village Owner	Real Living Group
Project Manager	Procis Construction Information Systems Ltd.
Architect	BDG Architects
Builder	Cape Ltd
Pool Builder	Woolright Construction
Pool Heating, Spa Heating, Domestic Hot Water, Air Heating and Condensation Control System	Hot Water Heat Pumps Ltd
Equipment	
Duoheat Heat Pump	7GP35A27-3 7GP17D10-3
Vent-Air system	comprising of a supply and return air handlers with heat recovery option
Air Distribution system	Underground ducting including air grille system
Thermoheat Hot Water Cylinder	2 x HWCYL300

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