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HEAT PUMPS



Wairakei Golf and Sanctuary uses a geothermal heat pump to heat its building.

Heating from a Water Hazard

A golf course pond is usually only responsible for lost balls, but Taupō's Wairakei Golf and Sanctuary uses one of its water hazards for heating a new clubhouse.

Wairakei Golf and Sanctuary is recognised internationally for its distinctive blending of recreation with restoration and conservation.

The course is surrounded by a recently completed 2 m tall fence, five kilometres in length, specially designed to keep out predators like rats, mice, stoats, weasels, hedgehogs, feral cats and possums.

Plant and animal pest eradication programmes and the re-planting of around 25,000 native trees and five thousand exotics create an environment where native species are beginning flourish.

Nigel Lloyd, Wairakei Golf and Sanctuary Manager, says: "In 2012 we partnered with the Department of Conservation in the Kiwi for Kiwis breeding programme. Our sanctuary is a crèche for newly hatched kiwis. They come to us at 2 weeks old and after 9-12 months, when they can defend themselves from predators, they are released back into their original nest areas.

There are Kiwi within the Sanctuary at all times that freely walk about, giving people the opportunity to see a real live Kiwi."

KEY BENEFITS:

- Heat gained from existing manmade lake on golf course
- No visual or audible impact
- Maintains high heating efficiency year round

KEY FEATURES:

- System installed in 2010 and operational in 2011
- Closed loop, submerged coil, geothermal heat pump
- 20 kW system providing underfloor heating for golf clubhouse
- Heated area: 350 m² (approximately)



The heat pump unit is mounted discretely in an outdoor locker.



A hazard for golf balls, a haven for bird life, and a source of heat for the clubhouse.



The ground loop pipe where it enters the lake.

“IT’S CLEAN, QUIET, AND COST EFFECTIVE TO RUN, AND TIES IN WELL WITH OUR CONSERVATION ETHIC.”

“When it was time to build a new clubhouse it was a natural extension to the conservation theme to find an energy efficient, environmentally friendly heating solution.”

Nigel says that an existing man-made lake, built to provide a water hazard for the golf course, provided the solution.

The temperature of the water in the lake remains relatively constant year round and this low grade heat is collected by a geothermal heat pump in a closed loop, submerged coil configuration.

A pipe was laid in a trench leading from the clubhouse to the lake, approximately 200 metres away, where it is anchored to the bottom with weights and arranged in a circuit to access as much of the lake as possible.

The circuit completes by the return pipe running in an adjacent trench back to the clubhouse.

“Generally the lake depth is between 1 and 2 metres and the pipes in the lake are black and difficult to see. Once the trench was backfilled and grassed over, the entire system is almost completely invisible.”

The heat pump unit is mounted in a locker on a clubhouse external wall and circulates a fluid through the pipe network. This fluid gains heat from the lake and takes it to the clubhouse where it supports a hydronic underfloor heating system within the clubhouse.

The clubhouse houses a shop, bar and café, and changing rooms and is used extensively by members and visitors.

Right House provided the system design and installation.

Nigel considers ground source heating a logical and practical choice for the golf course.

“The heating solution we ended up with makes use of what we already have on site. It’s clean, quiet, and cost effective to run, and ties in well with our conservation ethic.”

WAIRAKEI
golf+sanctuary.



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New Zealand requires reliable, renewable energy sources into the future. The Government is supporting GNS Science in fostering increased use of renewable resources. By 2025, the Government’s Energy Strategy aims for direct use of geothermal energy to account for more than 12 PJ/year.

For more information visit our website:

www.gns.cri.nz/earthenergy

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