



NEWSLETTER

IN THIS ISSUE

GEOTHERMAL ENERGY PILES

CASE STUDIES

CENTRAL HEATING NEW ZEALAND

OCTOBER GEOTHERMAL HEAT PUMP SEMINAR - JAPAN

GROUND THERMAL STORAGE

INSTALLATION DATA

TRAINING

WORLD GEOTHERMAL CONGRESS 2015

HAPPY CHRISTMAS

WELCOME

Welcome to the December 2014 Issue 7 newsletter from the Geothermal Heat Pump Association of New Zealand.

Interest and activity in the sector continues to grow with a number of members of the Association indicating that they are very active. Activity is occurring in Christchurch and at a number of other locations. For instance in Lower Hutt the City Council has installed heat exchange pile cages as part of their office rehabilitation. It is great to see the technology taken up and seen in action which will all promote further growth.

Enjoy the read – Brian Carey

GEOTHERMAL ENERGY PILES

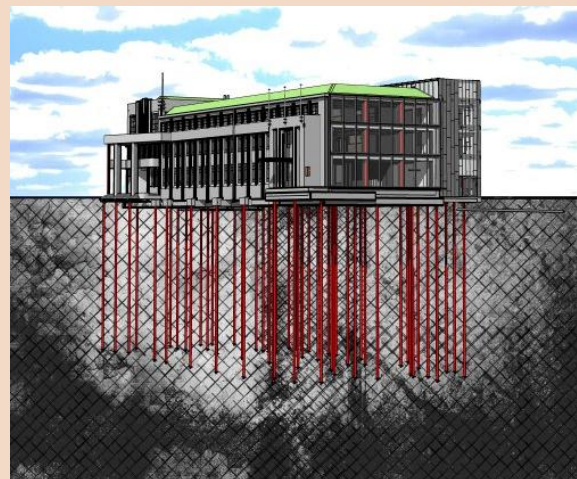
The Lower Hutt City Council has put in energy piles as part of its structural strengthening of the Council's historic administration building. With the existing façades retained, the interior demolished, a new extension added and new deep structural piles, the challenge was to achieve thermal comfort and good energy

efficiency whilst maintaining the integrity of the existing building. The idea was to align the reconstruction work with the Hutt City Council's Vision CBD 2030 plan, for an environmentally friendly and energy efficient Hutt City.

Stephenson and Turner's energy design for the project features the use of energy piles as the backbone of the geothermal heat pump system within the buildings structural piles. This technology is well established in the UK and Europe but has not been used in New Zealand until now.

The energy design uses closed loop piping within the 60 piles required for the structural design. Each energy pile goes down 20 metres below the ground surface.

If you would like more information a contact at Stephenson and Turner is tsanderson@stephensonturner.com.



This type of construction is also being used in Australia where a recent example is the Beaurepaire Sports Centre at Melbourne University which has a ground energy capture field that incorporates two 600mm diameter 30m deep energy piles. In the Beaurepaire Centre the piles are not used for structural purposes as their installation is for characterising thermal performance as part of the studies being undertaken at the University of Melbourne.

The Photographs below are a typical arrangement of an energy pile



CASE STUDIES

GNS Science would like to update the geothermal heat pump cases study brochures that showcase a selection of the NZ installations. If you haven't visited the webpage to access and view the case studies that are currently available then please browse here :

<http://www.gns.cri.nz/Home/Learning/Science-Topics/Earth-Energy/Case-Studies>

If you have case studies that you think might be worth featuring, additional to those already written up, please email material and contacts to Anya Seward (a.seward@gns.cri.nz).

CENTRAL HEATING NEW ZEALAND

We are looking to periodically publish short profiles of companies associated with GHANZ in the newsletters.

Central Heating New Zealand have been involved with GHANZ since its inception and the information in this profile was supplied by John Walker and edited by Brian Carey. Thank you John for the information provided.

Central Heating New Zealand have designed and been involved with around 100 geothermal heat pump systems over the last 6 years including large residential and small-to-medium sized commercial projects. They are the largest dedicated warm water (hydronic) heating supplier in NZ with a staff of 36, including four qualified design engineers and engineers working in sales

and technical support. Three members of the team are IGSHPA qualified designers and installers. Included in the company's capability is in ground thermal conductivity testing to assist with installation design.

The systems they have been involved with include horizontal loop, vertical borehole loop and ground water systems. The ground source heat pump systems designed provide heating, cooling and hot water. They lead by example and their own Christchurch office and warehouse uses groundwater to provide heating, cooling and hot water, with the plant room shown in the attached photograph.



As a recent example Central Heating New Zealand designed and supplied equipment for the ground source heat pump system at the Copper House which uses vertical borehole loops. This web address will provide some more information :

<http://www.touchofspice.co.nz/bespoke-luxury-travel/luxury-accommodation/new-zealand/queenstown/the-copper-house,-queenstown.aspx>

OCTOBER GEOTHERMAL HEAT PUMP SEMINAR - JAPAN

An Asian Pacific geothermal heat Pump Seminar was run by the International Energy Agency (IEA) in Koriyama Japan on the 19th October 2014. I (Brian Carey) was in Japan at the time as part of broader IEA meetings and was able to attend and to present the New Zealand situation. Additionally Professor Ian Johnston was invited to present on the Melbourne work that he and his team are undertaking to provide an Australian

perspective. He was unable to attend in person and I was privileged to be able to present his material. The presentations will go up on the IEA-Geothermal web site in time <http://iea-gia.org/work-program/annex-viii/> (They are not there yet but can be expected in the new year).

The heat pump market in Asia is growing rapidly and a number of connections were made at the seminar including with the speakers.

Presentation made were as follows:

Masakatsu Sasada, *Current trend in ground source heat pumps in Japan*, Chairman Geo-HP Association Japan

Rudolf Minder, *Innovative GSHP Applications in Switzerland*, Swiss Federal Office of Energy

Brian Carey, *Geothermal Heat Pumps in New Zealand*, GNS Science Wairakei, NZ

Ian Johnston, *Direct Geothermal Field Projects at The University of Melbourne*, Victoria, Australia

Hikari Fujii, *New technologies on TRT and borehole heat exchange system*, Akita University, Japan

Yoonho Song, *Estimating energy production with GSHP – its importance in geothermal direct-use statistics*, KIGAM, Korea

Isao Takashima, *Feasibility study on GHP systems in tropical Asia from the experimental data of Thailand and Indonesia*, Akita University, Japan

Shrestha Gaurav and Dr. Youhei Uchida, *GSHP studies under CCOP groundwater project*, AIST, Japan

GROUND THERMAL STORAGE

The International Energy Agency (IEA) has a group that is looking at energy conservation and energy storage (ECES) including ground energy storage. The material is extensive and should be of interest to many of you. Browse and have a read <http://www.iea-ec.es.org/annexes/completed-annexes.html>. Here is an interesting compilation

www.iea.org/media/freepublications/technologyroadmaps/AnnexA_TechnologyAnnexforweb.pdf

There is interesting material on thermal response testing of the ground for the derivation of thermal properties from the IEA ECES Annex 21 <http://thermalresponsetest.org/>.

INSTALLATION DATA

The New Zealand installation data base continues to be updated. The goal is to capture as many installations as possible for furthering our knowledge of the New Zealand industry and to measure and report on growth.

You can browse what GNS have assembled to date for New Zealand at <http://data.gns.cri.nz/geothermal/>. This database consists of data supplied by members and data GNS collect from elsewhere. The heat pump data is included and you can select and query.

Unfortunately this material is difficult to collect and GNS are always lagging behind or missing installations. Any assistance from GHANZ members would be greatly appreciated – if you know of, or are yourselves installing a system, please let GNS know. This will help our industry.

The Swiss have a very regulated approach which requiring reporting and their data set is very comprehensive by comparison. The Canadians also have a very comprehensive dataset.

To update the GNS Dataset please email Anya Seward a.seward@gns.cri.nz, This is a resource for the sector.

TRAINING

On our last teleconference we discussed organising another IGSPHA training course in New Zealand. To be viable, we understand that each course should have 12 to 15 or so attendees.

If you are interested and would like to attend such a course can you please email Simon Bendall simon.bendall@emslimited.co.nz who will coordinate with our Australian counter parts

in the Australasian IGSPHA Chapter to indicate the level of interest.

If sufficient interest is present we might be able to get a course run in NZ and will keep you posted on what training might go on in Australia.

WORLD GEOTHERMAL CONGRESS 2015

The World Geothermal Congress is to be held in Melbourne from 19th to 24th April 2015.

This is a high profile event to which the New Zealand Minister of Energy, Simon Bridges, will attend. Several of our members have had papers accepted that will be published as part of the Congress.

Huw Williams and Martin Preene (Engeo Ltd)
Addressing Sustainability in Ground Source Heat Pump Projects

Anya Seward and Angela Prieto (GNS Science Ltd) New Zealand Rock Properties: Determining Thermal Properties of Shallow Soils

The geothermal heat pump section which will be run in separate sessions at congress comprises approximately 4% of the total papers published, 56 papers from a total of 1328.

The early bird registration closes on the 1st February 2015. Get in now to get the cheaper rate <http://wgc2015.com.au/registration.php>.

HAPPY CHRISTMAS

2014 is drawing rapidly to a close. I would like to take this opportunity to wish you all a safe happy Christmas and a restful break if you are fortunate enough to be able to be taking one.

Brian Carey

Chair

GHANZ

12 December 2014.

