Air Conditioning

Case Study

Salmon Lake Centre, Isle of Man

Making a World of Difference

Renewable tourist attraction wins award for sustainability

One of the Isle of Man's leading tourist attractions has recently secured an award for its sustainability following the installation of system that capitalises on the nearby river and lake.

The owners of the Salmon Lake Centre and Ballacregga Tea Rooms wanted to improve the efficiency of the site, which includes an old stone building that needs a lot of heating. The resulting upgrade secured the 'Private Sector: Best Innovation' at the Isle of Man's Energy Awards 2015.

The site now benefits from a self-sufficient hydro-electric, central heating, air conditioning and hot water system which can all be controlled either centrally from a PC or remotely, by smart phone or tablet.

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LIVING ENVIRONMENTAL SYSTEMS

Air Conditioning | Heating
Ventilation | Controls

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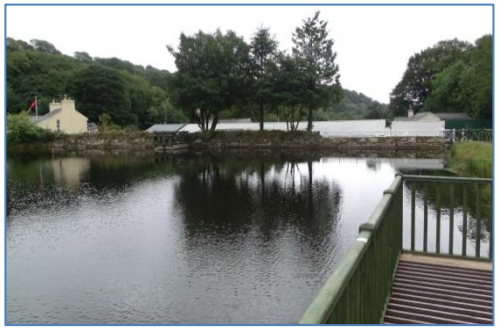
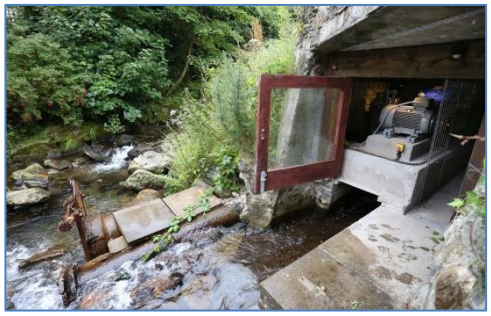


ABOVE: The Salmon Lake is used to help dissipate heat, whatever the season using an open-water, slinky-based system.

BELOW: The site makes full use of the Laxey River as well as the nearby Salmon Lake.



BELOW: The Centre's function rooms are now fully air conditioned.

Specialist building contractor, SCS Ltd, rose to the challenge using ingenious technologies and methodology to create the award winning project.

"Initially, we decided we could install a turbine in the nearby Laxey river, to provide free electric to heat the premises but then it occurred to us that we really should also be able to heat or cool", explains SCS Ltd Managing Director, Stewart Clague.

The site has an open area which is popular for functions such as weddings and meetings so needs ventilation and air conditioning.

SCS called upon the expertise of HVAC specialist supplier Kooltech Ltd, and a subsequent site visit determined that if the client was to use the natural resource of the adjacent Salmon Lake, far more benefits could be gained.

"One of the biggest concerns on a project such as this is the dissipation of heat which can be generated from a system so the logical solution was to use the Salmon Lake", explains Application Engineer Alan Clarke of Kooltech Ltd.

"The benefit of using the lake was that the system wouldn't be at the mercy of the elements or have to worry about heat dissipating into the atmosphere".

A Mitsubishi Electric City Multi WR2 heat pump system was installed to provide heating and cooling by using a closed loop slinky sitting at the bottom of the lake.

The WR2 can harvest low grade heat from the lake and upgrade it to provide heating, or can take excess heat from cooling requirements and reject it safely into the lake.

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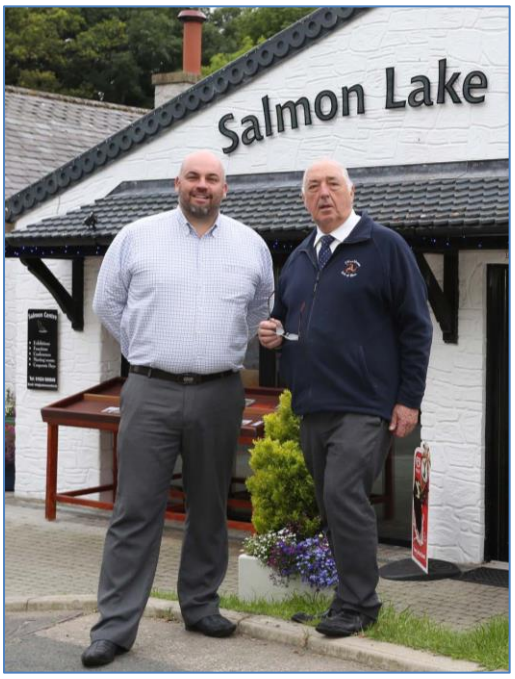
ABOVE: The whole centre now benefits from a self-sufficient hydro-electric, central heating, air conditioning and hot water system

BELOW: Alan and Stewart Clague of Specialist building contractor, SCS Ltd, outside the Salmon Lake Centre



Kooltech Ltd National Technical Manager, John Hammond who was heavily involved in the project, expands, “The temperature of the lake was around 17°C in summer and 5°C in winter, so we knew that absorption and rejection of heat was good”.

Using an open-water, slinky-based system was a sensible choice as borehole technology for a ground-source system would have been cost prohibitive.

The WR2 system also uses inverter-driven control to modulate performance and energy consumption to suit the time of year and local conditions.

When coupled with wall mounted air conditioning units to heat or cool the open plan areas and the café, the first phase of the project was complete.

Phase two involved the installation of a Mitsubishi Electric PWFY heat pump boiler as a primary heat source to meet the sanitary hot water, under floor and central heating requirements.

The PWFY works seamlessly with the WR2 taking excess heat from the air conditioning to also provide a constant supply of hot water for the kitchen.

The whole system benefits from isolation valves which is ideal for maintenance schedules because individual areas can be closed off without the need to shut down everything.

Discreet remote temperature sensors were commissioned in each room and an advanced TG-2000 control software system was installed on a central computer connected to a bespoke ‘K-Con’ control panel developed by Kooltech.

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Installation Summary:

Installation date: April 2015

Location: Isle of Man

Equipment:

- **A City Multi WR2 water-source heat pump system using a closed loop slinky sitting at the bottom of the lake**
- **The system is coupled with wall mounted air conditioning units to heat or cool the open plan areas and the café**
- **A Mitsubishi Electric PWFY heat pump boiler takes excess heat from the WR2 to meet the sanitary hot water, under floor and central heating requirements**
- **Discreet remote temperature sensors were commissioned in each room and an advanced TG-2000 control software system was installed on a central computer**
- **This is connected to a bespoke 'K-Con' control panel developed by Kooltech, to give the client ultimate control over energy consumption in each zone**

This gives the client ultimate control over energy consumption in each zone and means they can keep an eye on running costs, whilst also providing alerts for any faults that may occur.

Energy costs can rise up to 5% for every degree that the system deviates from the required temperature, so the client now has a sophisticated building management tool that can even be controlled remotely.

If that wasn't efficient enough, SCS installed the best third party turbine on the market which provides 24-hour electric to run the WR2.

"Although the site is connected to the grid, the turbine generates 10KW of electricity, so this means that, other than the original capital, there are no other costs involved in the whole project", proclaims Alan Clague of SCS.

SCS

For further information on the range of services provided by SCS, visit http://www.scs.co.im/

kooltech
Air Conditioning and Refrigeration Solutions

For more details on the K-Con range and the bespoke services offered by Kooltech, visit http://kooltech.co.uk

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Green Gateway
Mitsubishi Electric UK's commitment to the environment