Alpine visitor centre heated by an in screed hydronic underfloor heating using the Mitsubishi Electric Air to Water system using a CITY MULTI PUHY VRF heat pump and PWFY HEX units.

Project Info

Application
Cradle Mountain Visitor Centre

Location
Cradle Mountain, Tas

The Challenge

The Cradle Mountain Visitor Centre is located in the heart of Tasmania's alpine country just outside the Cradle Mountain - Lake St Clair National Park. The park is a popular destination for day visitors to Lake St Clair and for hikers taking on the legendary Overland Track.

The new visitor centre is part of the Cradle Mountain Gateway precinct project and will be the heart of the visitor experience and the first arrival destination for visitors to the park.

The development called for a sustainable solution and was requested to fit with the ecology and environment parameters of the project. Budget requirements included reduced ongoing operating costs compared to other heating systems, and the initial system outlay had to fit within budget.

As the Cradle Mountain area is subject to low temperatures in winter, including snowfall, air conditioning units for the site would still need to operate to provide year-round heating and seasonal cooling.

To fit within the architecturally designed space, the design requirements called for no air conditioning indoor units or ductwork to be seen.

The Solution

To heat the large, open space, an in screed hydronic underfloor heating was used. The 70-80 mm in screed concrete layer poured of top of the structural concrete and an insulation layer, would be more responsive to temperature control than in floor heating within structural concrete.

Mitsubishi Electric Air to Water (ATW) system was selected to provide heating to the underfloor heating. The system includes CITY MULTI PUHY VRF heat pump connected to six PWFY HEX (Heat Exchanger) units.

The PWFY HEX units provide heating hot water at 40°C to floor slab heating system covering an area of approximately 600m2 entire floor area which includes the visitors centre store, café and administration rooms.

To suit the alpine environment, the outdoor units were fitted with snow hoods, and the snow sensor control function built into the City Multi VRF is used.

Having modular refrigerant to water heat exchangers within the building prevent any water from being exposed between plant outside in low temperature where the use of antifreeze may have been required.

Smaller office areas are served by ducted units connected to a CITY MULTI PURY heat recovery system. These units provide supplementary heating and seasonal cooling year round. Both systems are able to take advantage of the continuous heating operation during defrost feature to reduce the effect of cold air being blown on to occupants during defrost.

The two systems simply connect to a proprietary central control system which allows building users to operate and monitor the systems. Control of the floor heating is further supported with the Air to Water system being integrated to the BMS system. This allows for optimum flow temperature, depend on the building load and the outdoor conditions.

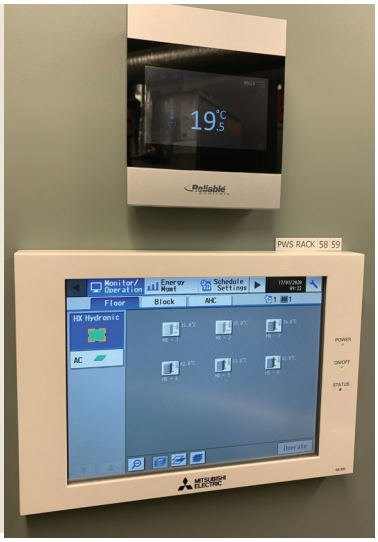
The Team

Client
Tasmania Parks & Wildlife Service

HVAC Consultant
COVA Thinking

HVAC Contractor
Superheat Pty.. Ltd.

CITY MULTI PWFY HEX (Heat Exchanger) units.

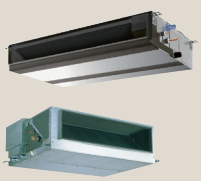


AE-200E Central Controller with Bac-Net

CITY MULTI outdoor units fitted with snow hoods

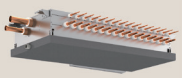
UNIT INFORMATION

Outdoor Units
PUHY-P600YSNW-A x 1
PURY-P400YNW-A x 1
PUHY-P300YNW-A x 2



Indoor Units
PEFY-P125VMA-E x 1
PEFY-P40VMA-A x 2
PEFY-P80VMHS-E x 1
PEFY-P71VMHS-E x 1
PEFY-P63VMHS-E x 1

PEFY-P50VMHS-E x 1
PEFY-P40VMHS-E x 1
PWFY-EP100VM-E1-AU x 6



BC Controller
CMB-P108V-JA x 1

Controllers
AE-200E x 1
PAR-CT01MAA-S x 6
PAR-W21MAA-J x 6