

Grundfos warms prisoners

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The Situation

New Zealand's Department of Corrections required a functional, cost effective and efficient way of heating its new prisons, so when the Otago Correctional Facilities was building its new regional correctional facility, the consulting engineers recommended Grundfos Magna and UPS circulator pumps for under floor heating and air conditioning respectively.

Otago is at the southern end of the New Zealand's South Island, where the winters can be harsh with temperature often falling to minus 10 degrees centigrade or lower, so an effective heating system was essential.

The prison construction project was substantial.

The \$218 million facility houses 335 low to medium-high level security prisoners in a modern 48 hectare complex built on a 187 hectare site. During peak construction it employed some 600 workers. It was completed in mid 2007.

Among its features are five self care units where prisoners nearing release are taught independent living skills by taking responsibility for their living arrangements with a small group of peers in a flat-type situation.

The overall complex has some 20 buildings, is deliberately different to traditional prisons and is basically a large and secure enclosure with the living units set within a 1.8 kilometre 5 metre high perimeter fence. The living units are clustered around service facilities that include kitchens, industry areas and program rooms.

The Grundfos Solution

TOPIC:

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LOCATION:

New Zealand

COMPANY:

Otago Correctional Facilities

Opus International Consultants Ltd provided the base design from their Auckland office for the Otago Corrections Facility at Milton. Opus construction supervision was based on site working closely with the Mechanical Contractor David Browne Contracting Ltd.

Grundfos Pumps were recommended and selected through competitive tender to provide the under-floor heating, air conditioning and domestic water generation.

“We were given excellent support from Grundfos Denmark and New Zealand, while Siemens USA and Setpoint Solutions NZ wrote the interfacing software,” says David Browne Contractors’ project manager at the time, Gordon Vanderlinden. “Without this assistance we would have had difficulty in overcoming a number of challenges. And considering the vast majority of communication was done via email and the telephone the end result has been outstanding.

“The Grundfos Magna in-line circulating pumps were chosen because of their energy efficiency and ability to work with the prison’s Building Management System. They are also low noise, and the pumps’ internal water temperature, pump pressure and speed sensors are controlled through Lon modules that interfaces with the Building Management System via the specially written software,” says Gordon.

“The whisper-quiet Grundfos UPS pumps were installed to provide continuously circulating hot water for the prison’s domestic water hot supplies.

“Site water is provided via a Grundfos Hydro 2000 four pump manifold system which has an on-board controller.

In all, 53 Magna, 23 UPS circulator pumps and the single Hydro 2000 were installed.

“The Magna’s maintain a temperature range of 55-65°C for the air conditioning, and 25-30°C for the under floor heating.

“The UPS pumps maintain the hot water at between 75-85°C.

“The Magna’s with Lon Module, however, were a ‘first’ for New Zealand, so it was essential we got them right,” says Gordon.

“The bulk of the buildings have ducted air conditioning, while twelve have under floor heating – and the heating is distributed via the site-wide networked Building Management System to twenty individual Building Management Systems that control intelligent ventilation and floor heating pumps.”

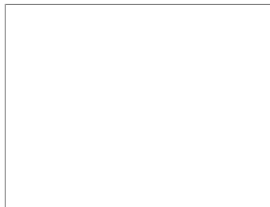
The Outcome

Gordon says that when the system was commissioned all Building Management Systems met their design parameters.

“It sounds complex,” he says, “but really, the overall system works extremely well and has caused no problems.

“The client is pleased with the result.”

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