

# Lapping up the fresh air

**Inadequate ventilation in indoor pools will lead to a build-up of irritants in the air that can affect the human respiratory system and even cause serious illnesses. Tweed Council has discovered new ways to increase the intake of fresh air, as *CCN* reports.**

Given the obvious health benefits of breathing fresh air, air quality is a major consideration for any building or facility. Yet perhaps an even greater proficiency of air quality is needed for indoor pool areas.

A growing number of indoor pool owners are improving their facilities by incorporating continuous fresh airflow and ventilation, which is essential for efficient removal of chloramines and other harmful air impurities.

Additionally, renewing the internal air with large volumes of fresh outside air not only dilutes the corrosive atmosphere but also reduces harmful condensation, which attacks a building's structure. Although such technology would appear to require greater energy consumption, new HVAC systems can offer both economical running costs and effective air ventilation/ heat recovery while meeting the energy efficiency guidelines.

## ON TRAC

A recent project is the Tweed Regional Aquatic Centre (TRAC) in Murwillumbah, NSW. This project features a year-round indoor pool with a heated 25-metre lap pool that includes a diving pool, a learn-to-swim pool and a hydrotherapy pool.

TRAC was described by Patrick Knight, Tweed Shire Council's director of engineering and operations as "a physically constrained site which required a number of recreation features within a tight budget."

Despite the demanding parameters, The TRAC facility won the Sporting and Community Service Facilities (\$4 million to \$15 million) category in the Master Builders Gold Coast Region Housing and Construction Awards.

TRAC is part of a collective council-building project for the community and visiting tourists.

Martin Hood, construction manager for building contractors Multi Span Australia and project manager for TRAC, had to meet quite strict council requirements, including specialised galvanised processes to handle the aggressive chemical environment, insulated roof and wall panel systems to assist with the thermal and



The Tweed Regional Aquatic Centre uses air-to-air sensible heat exchangers.

chemical aggressive properties, dehumidification and clean air replacement with inbuilt economy and vent-only options within the pool hall to control the aggressive environment, and a building management system to monitor and control mechanical services and pool conditions.

## POOL MECHANICS

Designing the mechanical system for the Tweed Aquatic Centre presented a complexity of challenges for George Floth Consulting Engineers, Brisbane. These include controlling the many variables such as humidity, temperature, wide variance in ambient conditions and removal of toxic by-products and condensation.

Glenn Ralph, managing partner of George Floth, was given the brief to design the mechanical systems.

Ralph says he investigated pool hall conditioning challenges extensively through

»| "The project as a whole was quite interesting – not your usual, everyday job." |«

international associations such as American Society of Heating, Refrigeration and Air Conditioning before determining the Air Change Poolpac equipment uniquely met the requirements of the project specification.

The four Poolpac units designed for the project handle 5,000l/s outside air each and come with inbuilt air-to-air sensible heat exchangers. These exchangers pre-condition incoming outside air by transferring energy reclaimed from the warm air exhaust.

Variable speed drives control the fan speeds, with fans and motors directly coupled.

The cabinets housing each unit are corrosion-resistance sandwich panels and the fans, coils

and any part in contact with the corrosive air are also specially treated. The air to air heat exchanger is completely non-corrosive using mylar heat exchanger plates with a chromated powder coated casing.

Apart from conditioning and ventilating the pooldeck, the Poolpac units can also provide hot water via desuperheaters which use waste heat from the compressor to provide free hot water for the pool heating and showers. The sensible heat exchanger condenses the exhaust air moisture which can be used to replenish the evaporation lost at the pool deck. Cam McIntosh, Queensland manager for Air Change, noted that the four Poolpac units can save TRAC approximately 150,000Kwh or about \$23 per hour when in winter heating mode.

"The heat exchanger would provide approximately 450Kw of free heating by preheating outside air from 10°C in winter to approximately 28°C before the reverse cycle refrigeration system heats it a further 7°K."

Contractor Rob MacKay, managing director of LEN Enterprises, enjoyed the challenge the site presented. "The project as a whole was quite interesting – not your usual everyday job."

"Starting with the main underground ducting, the product chosen for this was high density PVC stormwater pipe. This was

installed by Multi Span Australia at ground works stage, early in the project construction."

"The Poolpac units supply conditioned air from the roof level in stainless steel duct, then into Colorbond sandwich panel ducts to complement the interior design. The conditioned air then flows underground into concrete distribution pits and then into the PVC ducting. Finally, the air emerges at pool deck level and is dispersed via 19 Klima air displacement units, supplied by Holyoake.

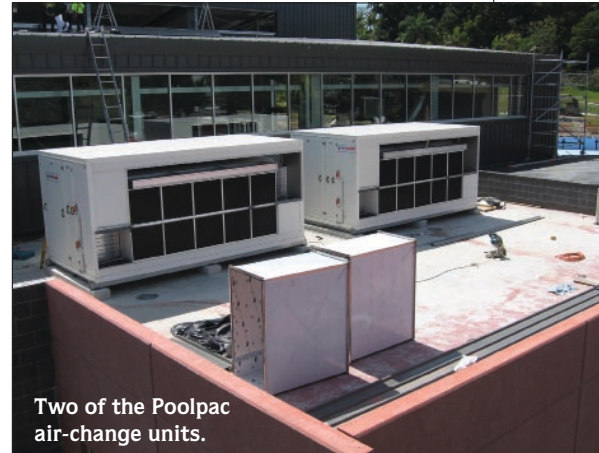
#### BUILDING CONTROL

Similarly, the control system has been selected to handle TRACs diverse building environments.

MacKay installed and commissioned the mechanical and building management systems, selecting the Siemens Synco 700 HVAC management and control system which resides on the Tweed Council Ethernet network. This permits the contractor and the shire facilities management to remotely monitor the facility.

The Aquatic Centre utilises a linked control panel, allowing the temperature, pH and chlorine level of each pool to be accessed via one main controller in the lifeguard area.

"There are four zones to the system, which are all controlled via the Siemens Synco 700 product".



Two of the Poolpac air-change units.

"Commissioning was straightforward," MacKay stated. "We had no issues or equipment failures and we also found the Poolpac units to perform extremely well and are very quiet in operation, which was important, given the surrounding environment."

Pools are an extremely costly facility for councils using enormous amounts of water and appropriating high energy and maintenance costs. The TRAC is an award winning example of the successful combination of building management and heat-recovery HVAC systems.



**International large-scale projects clearly prove the exceptional reliability of FAFCO ice storage technology.**

- ◆ New Exhibition Munich/Germany 150'000 kWh
- ◆ Renault Research Centre Paris/France 70'000 kWh
- ◆ District Cooling Paris/France 100'000 kWh

- ◆ Top economical feasibility
- ◆ Absolutely reliable
- ◆ Custom fit ice storage tanks in steel or concrete casing design
- ◆ Supply in component form for site assembly if necessary
- ◆ Full advice and estimating service

**FAFCO S.A.**  
 Johann Renfer-Str. 4-6  
 2104 Blie/Etienne  
 SWITZERLAND  
 Tel.: +41 32 342 33 52  
 Fax: +41 32 342 39 47  
 info@fafco.ch  
 www.fafco.ch

**We are looking for agents in Australia!**



**FAFCO Ice storage technique. Just Ingenious.**



**The new Stuttgart/Germany exhibition uses FAFCO ice storage with a storage capacity of 57'000 kWh.**