

# A Grand Change to Green

By MARILYN URCH

The Hotel Grand Chancellor was specially built only 24 years ago yet has a timeless ambience, appearing to have always occupied this central position at the historic heart of Hobart's Waterfront Docks.

**T**he hotel has a well established principal of continuous improvements in energy efficiency and operating systems. A recent decision to upgrade to natural gas to reduce carbon emissions provided an excellent opportunity to replace less efficient equipment.

John Holborow, Engineering Manager, of the Hotel Grand Chancellor, had the challenge of ensuring the project to change to natural gas for the indoor pool, domestic water heating, building heating, kitchen and laundry areas, could be carried out without disruption for guests and the hotel's active function areas.

The hotel's outstanding indoor pool and fitness club was an important facility for guests, commanding spectacular views over Hobart.

In particular, the indoor pool required very careful consideration, due to the large use of water, energy, and maintenance requirements. Pool water heating and pumping consume high levels of power, and substantial energy is also required to heat, dehumidify, and circulate the air.

The internal air in an indoor pool needs to be renewed with around 8 to 10 air



changes per hour of outside air to dilute the chlorinated atmosphere and to provide indoor air quality for swimmers and staff. Further to this, excess humidity causes to reduce harmful condensation which can attack the building's structure causing major maintenance costs. To

minimize this humidity, air temperature inside a pool must be kept 1 to 2 degrees above that of the water to limit moisture and heat loss from the pool to the air (also reducing pool water evaporation). Further to this, dry air should be supplied and moist air removed.

← Some inefficient pools achieve this by simply heating cold outside air, and removing the warm moist air via a separate fan. This is very wasteful, as a substantial amount of energy is used to heat the incoming air whilst the heat in the exhaust air is simply lost. A smarter way of achieving the same result is to utilize "heat recovery" which will use the already warm exhaust air to pre-heat the incoming outside air.

John Holborow called in ASC Engineering to assist in the design of the mechanical requirements for the energy systems upgrade for the hotel and for the indoor pool. Principal Andrew Sutherland is an industry acknowledged expert in indoor air quality, and the firm has wide expertise in consulting engineering in building services, energy related, recommendations, asset maintenance and carbon emission reduction initiative.

Andrew Sutherland commented "The old ventilation and air heating system was a heat wheel system which was difficult to maintain and inefficient by contemporary standards. The plant room space with the old heat wheel system was restricted with chaotic duct work connection due to the system configuration".

The ASC recommendation was to use new energy efficient heat exchange units, incorporating Sensible air to air heat exchangers with a hot water coil, treated for corrosion resistance.

Andrew confirmed the new Air Change Heat Exchange AHU enabled a much improved plant room layout and integrated the new hot water heating coil to replace the original electric element duct. Maintenance access was also much improved. "The new heat exchanger system is much simpler compared to the old heat wheel system and significantly more efficient. Energy reduction to date has met our design expectation in addition to the carbon emission reduction. The new system has been a great improvement for the Hotel".

Rhys Bennett of Major Air is the Tasmanian distributor for Air Change heat exchange equipment and advised a 1,500 l/s Heat Recovery Air Handling unit would ensure the air in the pool area is fresh whilst maintaining optimal pool conditions at the same time.

Rhys commented "The energy calculations showed that the Air Change unit would reduce a conventional heating load of 69kW

to just 26kW, which is a saving of 62%. The Fresh air supply was 1,500 litres per second of outdoor air. Major energy reductions are made through the reclaiming of energy from the exhausting corrosive warm air to pre-heat the outdoor air. The units are corrosion resistant with robust insulated cabinets of 50mm Colorbond Sandwich panel".

Tasmanian building services Contractors, White & McAllister were chosen to carry out the project of converting from LPG to natural gas and replacing equipment for hot water heating, pool water heating, Pool heat recovery air handling unit, laundry and cooking equipment. A total of sixteen SIME boilers were installed for the conversion, two of which were installed to service the indoor pool area.

Dave McAllister commented "We had to ensure the function floors all operated as normal. With the prominence of the site, SIME boilers had to be discreetly placed externally to the building but invisible from the street. The swimming pool ductwork was completely demolished and redesigned with new ductwork. We had limited space, but as usual we made it fit".

Management of the Hotel Grand Chancellor report high satisfaction with the natural gas conversion and welcome the future ongoing energy savings contributed by the new Indoor Pool heating and ventilation equipment and the contribution to the Hotels initiative to reduce energy consumption and associated green house gas emissions. ■

## Contacts

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