
Port of Brisbane goes green

The Port of Brisbane's new head office building has become the first in Australia to receive a 5 Star Green Star Office Design v3 Certified Rating from the Green Building Council of Australia (GBCA), and utilises state-of-the-art Grundfos pumps and booster systems to contribute to efficient stormwater harvesting and greywater recycling.

Green Star is a national, voluntary environmental rating system that evaluates the environmental design and construction of buildings, with a range of criteria over nine different categories. The 5 Star Green Star Rating signifies 'Australian Excellence' in environmentally sustainable design, including reduced energy use, optimal building orientation, rainwater harvesting, greywater recycling, waste water treatment and passive design features, such as natural lighting, water sensitive urban design elements and the inclusion of a range of eco-friendly building products.

The Situation

The Port of Brisbane is one of Australia's fastest-growing and diverse ports, with more than 2400 ships visiting the port each year. The Port of Brisbane Pty Ltd (PBPL) manages over 1,800ha of land for industrial, commercial, environmental and community purposes and has invested more than \$1.3 billion in infrastructure and assets in the past 20 years.

PBPL's investment in green buildings reflects their vision – to be Australia's leading port. PBPL was the first Australian port to produce sustainable development guidelines for development on port land back in 2003, which today is incorporated within the Port of Brisbane's Development Code. PBPL is committed to ensuring sustainable development at the port, and it is now mandatory for all office buildings located in the Port Central Precinct Port to achieve a minimum 5 Star Green Star design rating.

TOPIC:

Port of Brisbane goes green

LOCATION:

Australia

COMPANY:

Brisbane

Brisbane based company, Prime Pumps, partnered with Grundfos to deliver an efficient pump system solution to harvest the stormwater that is then utilised around the five-storey building to supply toilets with non-potable water. They also provided a solution for greywater recycling, where water from showers and sinks in the building is stored in an underground tank and used for irrigation purposes.

Prime Pumps was created in Sydney 1982 and now has offices in Brisbane and Melbourne. Prime Pumps mission is to “Provide the Very Best Water Pumping Systems and Water Hydraulic Maintenance Services into the Fire Protection and Commercial Building Services Sector”. Prime Pumps’ commercial philosophy of strict compliance with all relevant standards whilst providing best possible quality to meet the commercial situation of its clients has seen the Company develop into one of Australia’s leading “Water Pumping System and Water Hydraulic Maintenance Service” providers.

The Grundfos Solution

Prime Pumps supplied and installed Grundfos pumps in two important aspects of the new Port Office – the collection, treatment and boosting of stormwater for use in toilet water supply and the collection, treatment and boosting of greywater for irrigation.

In order to increase water savings and reduce environmental impact, stormwater from around the new port office is harvested and stored in an underground tank at the building. Before this water can be used, the bonds in the DNA of micro organisms have to be broken down by Ultraviolet (UV) water disinfection, to prevent them from reproducing.

In order for UV rays to penetrate this water, the water must first be filtered. A Grundfos UV Compact disinfection unit filters the water before it enters the UV disinfection stage. Once the water has been filtered and passed through the UV disinfection, the water can then be pumped around the building for use in toilets and urinals.

The filtered water is pumped to all toilets and urinals by a Grundfos Hydro MPC Booster system at a flow rate of 5 litres per second. The Hydro MPC is a variable volume system that maintains the required pressure in an installation, regardless of the flow requirements.

The Grundfos Hydro MPC booster system is fitted with Grundfos CRE frequency converter controlled pumps, which ensures complete and instant control of the booster output. The Grundfos CRE pump offers more than a 10% increase in pump efficiency compared to any other multistage centrifugal pump on the market, which translates into a power reduction of 15-20% for every CR pump. The pumps are in operation many hours a day in commercial buildings like the Port of Brisbane headquarters, and this translates to substantial savings in energy use and in energy costs. This energy saving adds to the overall Green Star Rating at the Port Office.

For Andrew Myers, Queensland State Manager at Prime Pumps, this is the first system of its kind using the combination of a filtration and UV disinfection system on a dual alternating variable speed pump station in Australia.

Mr Myers went on to add that the variable speed operation ensured that the electrical components of the pumps were very efficient. “It works off a pressure transducer which speeds up or slows down the pump depending on the amount of water being used,” he explains. “So when the pump is only pumping a minimum amount of water, it wouldn’t operate at its full speed or its full capacity. In turn, the pump only uses a very small amount of energy, which saves energy and money.”

Murray Hill is the Grundfos Commercial Building Services Account Manager involved in the project. He said, “Having this booster system for greywater re-use creates huge incentives for the PBC. In the long run it will save them a lot of money and it works really well.”

Mr Hill goes on to explain, “The MPC control unit, which is capable of controlling up to six pumps connected in parallel, automatically turns all pumps off and switches to towns mains water supply in case of insufficient stormwater supply.”

Cleverly, it is the same booster system that is used for the irrigation system, which utilises greywater drained from sinks, showers and kitchens across the building. This greywater is also collected in an underground tank . It goes through the same UV disinfection process as the harvested stormwater and is then diluted with some of the collected rainwater and used for irrigation. The Grundfos Hydro MPC booster system helps the PBC to conserve water and optimise the irrigation system by responding to pre-set minimum and maximum levels.

“The MPC booster system is ingenious, I like the simplicity and the technology,” Mr Myers says. “Grundfos invests an enormous amount in R&D, more than any other manufacturer I have seen in all my years in this industry. It is a credit to them.”

The water supply for the building’s air-conditioning system is also provided by a Grundfos pump – a close-coupled end suction pump called the NB.

One of the key benefits of the NB/NBG pumps is their small size .

My Hill explains, “By using smaller pumps, the architects have been able to allocate more space for car parking.”

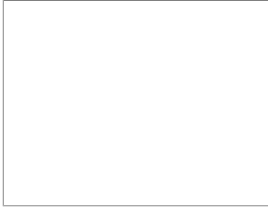
In the case of fire, the building’s hydrant and sprinkler system jumps in, using NK/ NKG end-suction pumps, a long-coupled single-stage centrifugal range of pumps with a modular design comprising a motor, a coupling and a pump part, mounted on a base frame.

The Outcome

Prime Pumps was able to supply a sustainable Grundfos pumping solution to the PBC that was Certified with its 5 Star Green Star Rating, for stormwater harvesting, greywater re-use for irrigation, air conditioning as well as fire hydrants and sprinkler systems.

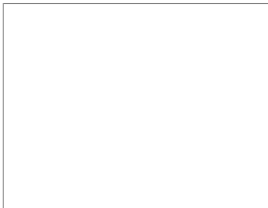
“The whole technology supplied is incredibly adding to the Green Star rating of the building because the pumps are only using the energy required for the water being used,” Mr Myers says and adds that he was very proud to work on that particular project. “The relationship between Prime Pumps and Grundfos is very strong. They are our number one supplier.”

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