



PIXEL

The Pixel Building
205 Queensberry Street, Carlton, Victoria



PIXEL

ECOLOGICALLY SUSTAINABLE DESIGN INITIATIVES

PROJECT FEATURES

1. TARGET TO ACHIEVE A PERFECT GREENSTAR SCORE

Pixel has been designed to achieve all of the available rating credits under all of the categories of the Greenstar V3 rating system and is targeting to achieve all five of the available innovation credits. This is an unprecedented outcome and puts Pixel at the very forefront of the Greenstar rating system in Australia.

2. CARBON NEUTRAL

Pixel will be carbon neutral. This means that the renewable energy sources on the site are generating all of the energy that Pixel requires plus surplus energy to be fed back into the grid to offset all of the energy that was used, and the carbon that was generated, in the manufacture of the materials and equipment that enabled Pixel to be built. Pixel will be Australia's first carbon neutral commercial office building.

3. WATER BALANCE

Pixel has been designed to be water balanced. This means that on the basis that Melbourne returns to the 10 year rainfall average 1999-2009, Pixel could be disconnected from the mains supply and would be self sufficient for water supply.

4. COMMITMENT TO ACHIEVE THE HIGHEST LEED ENVIRONMENTAL RATING

LEED is the environmental rating tool of the United States Green Building Council. Pixel will achieve a Platinum score under the rating system and is targeted to achieve the highest score yet achieved anywhere in the world under the LEED rating regime.

5. TARGET TO ACHIEVE A BREEAM "OUTSTANDING" SCORE

Pixel is to be rated under the BREEAM "Bespoke International" environmental rating tool. Grocon is funding the development of that tool specific for the Australian context for and on behalf of the UK authorities. Pixel is targeted to achieve the highest score yet achieved of any of the 714,000 registered BREEAM projects worldwide.

6. 100% FRESH AIR

All of the air being distributed and used in the Pixel building will be fresh air. Pixel implements sophisticated energy capture systems so that exhaust air has its heat or coolth removed before it is exhausted into the environment, thus reducing overall energy use.

7. FREE NIGHT COOLING

The Pixel facade includes smart window technology that automatically opens the windows of the facade on cool nights to enable the night air to flow into the building and cool the structure – this process is termed “night purging” and at Pixel the exercise is free as it uses the natural processes of the environment. The operation of the windows is controlled by the sophisticated Building Management System being installed in the project.

8. GAS FIRED ABSORPTION CHILLER

Grocon is importing and seeking to licence the gas fired absorption chiller technology that is to be implemented at Pixel. The technology originates from Europe where it is widely used but it is unprecedented in Australia. The gas fired absorption chiller uses ammonia as the refrigerant source and gas as the energy source. As a consequence of this technology the carbon emissions from the energy are dramatically lowered when compared with electrically powered chiller systems. The use of ammonia as the refrigerant gas means that there is no ozone depleting potential in the gas, nor is there any possibility of legionella.

9. TRACKING AND FIXED PHOTOVOLTAIC PANELS

Pixel is implementing an extensive photovoltaic array on the roof of the building. The majority of that array will be mounted on a tracking device which will orient the panels towards the sun at all times of the year, thus maximising the performance from the panels. The project will also feature some fixed PV panels.

10. WIND TURBINES

Grocon is working with a local inventor to finalise the design and specification of new wind turbines which will be installed for the first time at Pixel. This technology is protected by worldwide patents and will be commercialised following its successful implementation at Pixel. These turbines will outperform all other 1kW turbines now in production worldwide.

11. PIXELCRETE ENVIRONMENTAL CONCRETE

Grocon has developed a new structural concrete design which has the ability to halve the embodied carbon within the concrete mix. That mix design achieves the same strength as traditional concrete and can be used in the same way as traditional concrete. Pixelcrete also includes a high proportion of both reclaimed and recycled aggregates and dramatically reduces the content of Portland cement. With worldwide production of Portland cement accounting for nearly 6% of all the world's greenhouse gas emission every year this product has a very significant potential worldwide impact.

12. DAYLIGHT GLARE CONTROL

Pixel is designed to provide 100% daylight penetration into the office space whilst allowing screen based technologies to be deployed without the need for blinds on windows. Extensive 3D CAD modelling has been undertaken to maximise the performance of the external sun-shade system to enable these high levels of daylight penetration.

13. THREE USES OF ALL WATER; IRRIGATION, BUILDING USE, REED BED IRRIGATION

Water falling on the Pixel building as rainwater will be collected after it has been used to irrigate the living roof. The rainwater will be stored in tanks before being treated by reverse osmosis to potable water standard. This treated water will then be distributed to all fixtures and fitting within the building. The grey waste water is then filtered and directed to the living edge reed beds where it is used to irrigate the reeds and plants. This process means that there will be no grey water waste leaving the Pixel site except for the wettest month of the year in Melbourne – thus dramatically reducing the waste flow to sewer.

14. VACCUUM TOILET TECHNOLOGY

Pixel will be the first project in Australia to implement small scale vacuum toilet technology. This technology has been sourced from northern Europe where it has been developed for high quality office and accommodation buildings. Vacuum toilet systems reduce the water consumption to an absolute minimum. Grocon has reached agreement with the manufacturer of that technology to be a distributor of the system in Australia.

15. ANAEROBIC DIGESTER

A tank system on the ground level of the Pixel building will hold all of the black waste from toilets and kitchen facilities. The methane will be extracted from that waste and used as the energy source for the hot water heaters on the roof of the Pixel building. Those hot water heaters provide the hot

water to the showers that subsequently produce the grey water that irrigates the reed beds. The black waste is then sent to the sewer in a liquefied form and with reduced methane levels.