



INTEGRATED ENGINEERING SYSTEMS

Daylight Glare Control

Pixel has been designed to provide 100% daylight penetration into the office space, whilst allowing screen based technologies to be used 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 this.

Gas Fired Absorption Chiller

Grocon has imported and licenced the gas fired absorption chiller technology that has been implemented at Pixel. The technology originates from Europe where it is widely used, but is unknown in Australia. The gas fired absorption chiller uses ammonia as the refrigerant source and gas as the energy source. As a consequence, 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 there is no ozone depleting potential in the gas, nor is there any possibility of legionella.

Free Night Cooling

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

100% Fresh Air

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

Three Uses of All Water; Irrigation, Building Use, Reed Bed Irrigation

Water falling on Pixel 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 to potable water standard. This treated water will then be distributed to all fixtures and fittings within the building. The grey waste water is then filtered and directed to the living edge reed beds. This process means there will be no grey water waste leaving Pixel except for the wettest month of the year in Melbourne – thus dramatically reducing the waste flow to sewer.

Vacuum Toilet Technology

Pixel is 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.

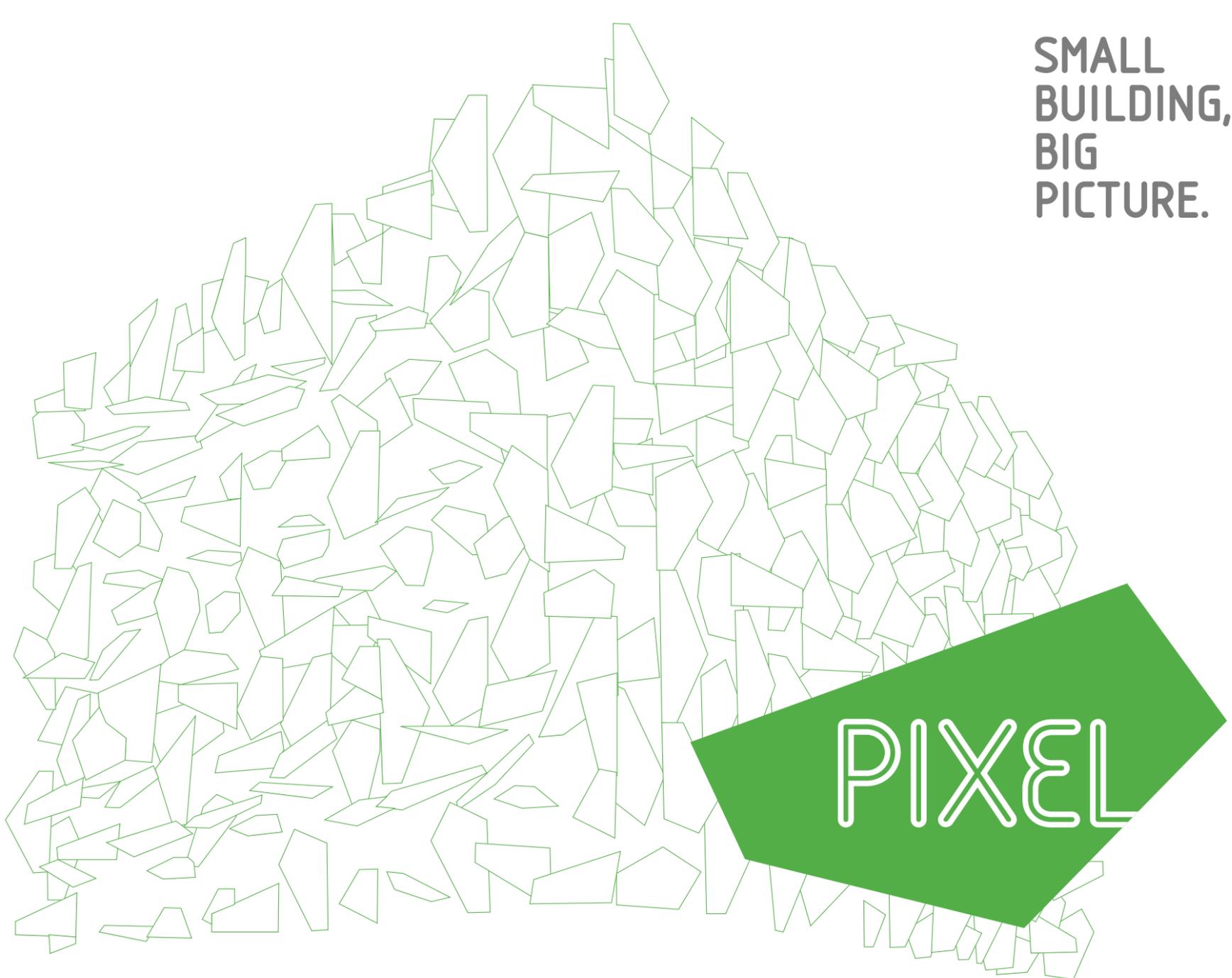
Architects
Studio 505
Sustainability & Services
Umow Lai
Structure Consultant
VDM Consulting

RECYCLE OR REUSE.

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SMALL BUILDING, BIG PICTURE.



“Energy efficiency, along with cleaner and renewable forms of energy generation, is one of the pillars upon which a de-carbonized world will stand or fall. The savings that can be made right now are potentially huge and the costs to implement them, relatively low, if sufficient numbers of governments, industries, businesses and consumers act. By some conservative estimates, the building sector world-wide could deliver emission reductions of 1.8 billion tonnes of CO2. A more aggressive energy efficiency policy might deliver over two billion tonnes or close to three times the amount scheduled to be reduced under the Kyoto Protocol.”

Achim Steiner, UN Under-Secretary General and UNEP Executive Director

PIXEL INNOVATIONS

- Carbon Neutral
- Water Balanced
- 100% Fresh Air System
- Ammonia Refrigeration
- Chilled Structure
- Green Roof
- Photovoltaic & Wind Power Generation
- Reed Bed Water Treatment
- Reliance on Natural Daylight
- Green Concrete
- Gas Fired Absorption Chillers
- Extensive Recycling
- Free Night Cooling
- Bio-Gas Energy
- High Performance Facade

Grocon has developed the Pixel building in a manner that is so environmentally advanced, there’s nothing presently like it in the world. Pixel is Grocon’s “Future Office” – a prototype of the buildings that will emerge when a carbon constrained environment demands a greater focus on energy efficiency. Achim Steiner’s quote accurately identifies that the building and construction sector is ideally placed to play a major role in this new world.

Existing environmental rating tools do not yet place a significant importance on the issue of carbon pollution. Grocon’s Pixel building is an insight into the way buildings of the future will be designed, built and managed in order to tackle the carbon cost issue head on.

Pixel is aiming to achieve the highest environmental rating ever for buildings using the US LEED, UK BREEAM and Australian Greenstar environmental rating schemes. To put that into context, there are approximately 740,000 buildings registered worldwide under those three rating schemes, and Pixel would be at the forefront of all of them.

In anticipation of the worldwide move to carbon neutral buildings, Pixel has been designed to generate more energy on site

than it uses, thus off-setting carbon generated to run the building. But Pixel goes further by generating more energy in order to offset the carbon used to build it and so the building becomes carbon positive, giving the energy it generates back to the grid. We believe no other building in the world can claim that outcome on its own site.

In addition to tackling the carbon issue head on, Grocon has designed Pixel to be water balanced. That means that if Melbourne maintains the 10 year average rainfall levels from 1999-2009, then Pixel will be self sustainable for water supply. The building could theoretically be disconnected from the grid and continue to safely operate.

Through Grocon’s work at Pixel, new technologies have been developed, new systems have been brought to Australia and there has been significant “green” up-skilling of both our workforce and our sub-contractors.

And as part of our community focus, Grocon has directed support and donations to our charity partner, “Kids Under Cover”, to assist with the provision of scholarships to disadvantaged youth in Melbourne.

ENVIRONMENTAL RATING ACHIEVEMENTS

Target To Achieve a Perfect Greenstar Score

Pixel has been designed to achieve all the available rating credits under all categories of the Greenstar Version 3 rating system, and is targeting to achieve all five of the available innovation credits. This is an unprecedented outcome and puts Pixel at the forefront of the Greenstar rating system in Australia.

Carbon Neutral

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

Water Balanced

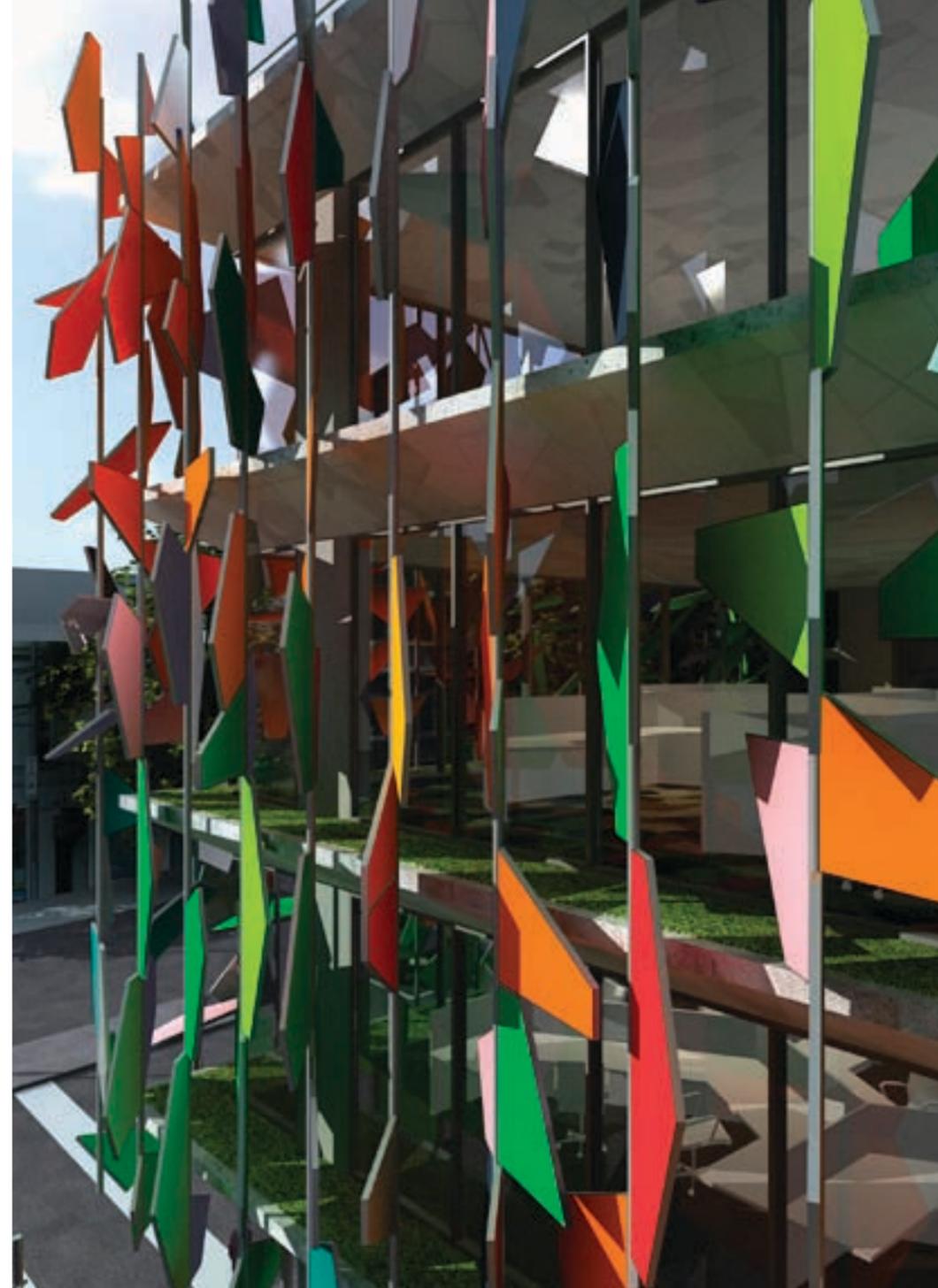
Pixel has been designed to be water balanced. This means on the basis that Melbourne maintains the 10 year rainfall average between 1999-2009, Pixel could be disconnected from the mains supply and would be self sufficient.

Commitment to Achieve the Highest LEED Environmental Rating – “Platinum”

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.

Target to Achieve the Highest BREEAM Score – “Outstanding”

Pixel is to be rated under the UK-based BREEAM “Bespoke International” environmental rating tool. Grocon is funding the development of that tool specifically for the Australian market on behalf of UK authorities. Pixel is targeted to achieve the highest score yet of any of the registered BREEAM projects worldwide.



**“All new commercial office developments in the carbon constrained environment can learn from Pixel”
Daniel Grollo, CEO – Grocon**

PIXELCRETE®

Grocon has developed a new structural concrete design, with the ability to halve the embodied carbon within the concrete mix.

Pixelcrete achieves the same strength as traditional concrete and can be used in the same way. Our new concrete 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 emissions every year, this product has a very significant potential international impact.

RENEWABLE ENERGY SYSTEMS

Wind Turbines

Grocon has worked with a local inventor of new wind turbines which have been installed for the first time at Pixel. This technology is protected by worldwide patents and will be commercialised following its successful implementation. We believe these turbines will outperform all other 1kW turbines now in production worldwide.

Tracking & Fixed Photovoltaic Panels

Pixel has implemented an extensive photovoltaic (PV) array on the roof of the building. The majority of that array will be mounted on a tracking device which will turn the panels towards the sun at all times, thus maximising their performance. The project will also feature some fixed PV panels.

Anaerobic Digester

A tank system on the ground level of Pixel 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 hot water heaters on the roof of Pixel. Those heaters provide 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.

