toyotagreen BUSINESS PARK
PORT MELBOURNE

A CASE STUDY OF ENVIRONMENTAL INITIATIVES

NOVEMBER 2006

CITY OF PORT PHILLIP

MAB

Folkestone

TABLE OF CONTENTS

1.0 PROJECT OUTLINE **3**

1.1 PROJECT DETAILS 3

1.2 SITE DESCRIPTION 4

1.3 PROJECT BACKGROUND 4

2.0 SUSTAINABLE DESIGN APPROACH **6**

2.1 COPP SUSTAINABLE DESIGN SCORECARD NON-RESIDENTIAL 6

2.2 PROJECT RESPONSE TO SCORECARD 7

3.0 KEY OUTCOMES **13**

3.1 REDUCED ENVIRONMENTAL IMPACTS 13

3.2 IMPROVED INDOOR ENVIRONMENT QUALITY 13

3.3 PROJECT MARKETABILITY 14

3.4 ECONOMIC OUTCOMES 14

3.5 INDUSTRY EDUCATION 15

3.6 DRIVING CHANGE 15

1.0 PROJECT OUTLINE

1.1 PROJECT DETAILS

Building Name	Building A Fuji Xerox Australia – 60 Bertie Street Building B Units 1-4 - 32-38 Fennel St
Building address	Corner Bertie & Fennell Streets, Port Melbourne
Site reference	Precinct D
Client	MAB Corporation / Folkestone Limited
Architect	Watson Young Architects
Planning Consultant	SJB Planning
Design and Construct Contractor	Access Constructions Pty Ltd
ESD Engineer	Connell Mott McDonald
Building Type	Industrial warehouse with office component

Area Schedule

Total Site Area		10,138 m^2
Building A –	Warehouse	3616 m^2
	Office	552 m^2
Building B - (Total)	Warehouse	672 m^2
	Office	876 m^2
	Showroom	876 m^2
Landscaping / Car parking		4974 m^2

Owner occupier / tenanted	Building A tenanted Building B tenanted
Construction time	10 Months
Delivery method	Design and Construct
Construction Cost	$6 Million
Construction	Precast concrete panel walls, monolithic concrete slab at ground level, lightweight mezzanine floor structure, flat zincalume roof, powdercoated aluminium framed glazing, alucobound cladding features.

1.2 SITE DESCRIPTION

The site is located within Port Melbourne and is just three kilometres away from the docklands precinct and the Melbourne CBD. The site comprises of 10,138 m^2 and has two street frontages, making it ideal for vehicle access and street exposure.

The surrounding areas consist of mainly industrial zoned land, which is currently occupied by light industry, manufacturing and warehousing.

Figure 1. Site location

1.3 PROJECT BACKGROUND

A consortium consisting of MAB Corporation Pty Ltd, Macquarie Goodman Group and Folkestone Limited had been successful in acquiring around 12 hectares of industrial land from Toyota Motor Corporation Australia surrounding its new Corporate Headquarters in Port Melbourne.

The 12 hectares is broken up into 5 precincts of land, scattered along Bertie, Fennell and Bridge Streets, Port Melbourne. The consortium intends to develop a high quality industrial estate to be known as **toyotagreen Business Park**.

MAB / Folkestone recently completed **toyotagreen Precinct D** which comprised of a purpose built office and warehouse facility for Fuji-Xerox Australia and four office / showroom and warehouse buildings ranging from 521 m^2 to 859 m^2.

Throughout the planning and design process, MAB and Folkestone worked closely with the City of Port Phillip providing valuable input into the draft **Sustainable Design Scorecard Non-residential**. This collaboration was critical in achieving the Ecological Sustainable Development (ESD) initiatives in the project. To assist in the ESD design process MAB / Folkestone engaged the services of Connell Mott McDonald to design a storm water retention and reticulation system, which included a swale drain to the site's perimeter.

Toyotagreen is the first major project to satisfy the CoPP **Sustainable Design Scorecard Non-residential** requirements and the development was approved accordingly. MAB / Folkestone are proud of the development and realise the positive

impact, ESD principles have in marketing, building occupation and during construction.

Strong demand has resulted in the four units being sold, prior to the building completion; two units had been leased by end October 2006.

toyotagreen Precinct B is currently under construction. Stage 1, comprising of five office / showroom and warehouse buildings ranging from 1292 m^2 to 1737 m^2 was completed in September 2006. Stage 2 is currently under construction *(at Dec 2006)*.

Similar ESD principles were applied to the design of Precinct B and this development also exceeded the environmental targets within the **Sustainable Design Scorecard Non-residential**.

*Figure 2. Masterplan of **toyotagreen** BUSINESS PARK*

2.0 SUSTAINABLE DESIGN APPROACH

2.1 COPP SUSTAINABLE DESIGN SCORECARD NON-RESIDENTIAL

The City of Port Phillip has a strong commitment to encouraging sustainable design initiatives within the municipality. Council has a Sustainable Design Policy, which is supported by the Sustainable Design Strategy. The strategy applies to all new and refurbished buildings, including both residential and non-residential developments. The cornerstone of the Sustainable Design Strategy is the sustainable design assessment process that takes place when a planning permit application is submitted.

To facilitate a consistent approach, Port Phillip uses two tools, **STEPS** and the **Sustainable Design Scorecard Non-Residential**, to assess the sustainability of residential and non-residential developments. This approach is consistent with Moreland City Council, who developed **STEPS** and jointly contributed to the development of the **Sustainable Design Scorecard Non-Residential (SDS)**.

The **Sustainable Design Scorecard Non-residential** (SDS) is a checklist in an Excel format that assesses the environmental impact of non-residential buildings, including commercial, retail and industrial buildings. The SDS was developed as a collaborative effort between Moreland City Council and the City of Port Phillip to provide clear consistent advice to planning applicants on our minimum expectations in terms of sustainable design outcomes for non-residential buildings.

The scorecard is aimed at lifting the average development to a minimum level of environmental performance, while allowing room for innovation and exceptional outcomes. If a designer or developer wishes to target industry best practice they can use alternative assessment methodologies, such as GreenStar for office buildings for example. These would be accepted by Council in lieu of the Scorecard as part of the standard planning permit assessment process.

The SDS awards points in 7 different environmental categories including energy efficiency, transport, water, waste, materials, indoor environment and innovation. A building must achieve a minimum score in each environmental category; therefore, a high score in one environmental area cannot be used as an offset for a low score in another environmental area. However, there are a number of sustainable design strategies that can be selected from to achieve the minimum scores.

MAB / Folkestone were instrumental in assisting with the refining of the SDS in its early days of use. This project was the first major non-residential development to have the scorecard applied to it. Through workshops and liaison between MAB / Folkestone and council officers, feedback was obtained to refine the scorecard into its present format.

2.2 PROJECT RESPONSE TO SCORECARD

Building A - Fuji Xerox
60 Bertie Street Port Melbourne

The response to the scorecard for this parcel of land was as follows:

COPP Scorecard V 3.2	
ENERGY	**Target: 30 points**
Energy saving building lighting 6-12 watts/m	6 points
Natural ventilation to the warehouse	6 points
Commercial HVAC cooling system	6 points
Commercial HVAC heating system	6 points
Maximize insulation and minimize air leakage (the building will use an R 1.5 thermal blanket to the roof areas which will be sealed at the perimeter. Sisalation will also be used to light weight wall areas.)	6 points
	30 points achieved

TRANSPORT	**Target: 10 points**
Bicycle parking provided	5 points
Trip change facilities provided (shower and change rooms)	5 points
	10 points achieved

WATER	**Target: 20 points**
STORMWATER Refer to detail listed under 32-38 Fennel St Port Melbourne	11 points
WATER AAA shower heads used AA basin tapsets used 6/3 dual flush toilets used Water efficient garden 150m^2 garden area ** note the AAA rating scheme has now been replaced by the Water Efficiency Labelling and Standards (WELS) Star Rating scheme*	12 points
	23 points achieved

WASTE	Target: 12 points
Operational recycling (Recycle bins will be provided at tea points etc.)	5 points
Waste management plan (60 % site waste reduction during Construction. Waste minimization plan will be developed for the Construction process)	5 points
Recycling targets - During the building process we will recycle as much as possible. This includes reusing existing materials where possible such as concrete, bitumen and steel	2 points
Adaptable design - The design incorporates modular precast panels, concrete floors and steel which can be recycled and reused. The open plan nature (column free) of the building gives adaptable design for the current and future tenants	2 points
Premanufacturing - The main structure of the building is Precast panels and steel all of which are prefabricated and prefabricated off site. The metal cladding panels are also prefabricated along with glazing. This equates to the main fabric of the building meeting this Criteria.	2 points
	16 points achieved

Detail of internal recycling facilities

MATERIALS	Target: 12 points
The building will not use unsustainable timber	4 points
All timber used will be plantation/sustainable timber	4 points
The building will incorporate recycled steel reinforcing	4 points
Durable materials will be used externally such as aluminum cladding, colorbond steel, non toxic paints, glass and concrete	4 points
	16 points achieved

Detail of façade materials

INDOOR ENVIRONMENT QUALITY	Target: 8 points
Effective air changes - The mechanical system will be designed to provide effective air changes to Australian Standards	3 points
Low emission particle board - The joinery and toilet cubicle partitions will use EO boards	5 points
Low VOC paints - The project will use low VOC paints both internally and externally	3 points
	11 points achieved

INNOVATION	Target: 8 points
Electrical sub metering - Fuji will be on a separate sub meter from the multiunit building.	2 points
Naturally ventilated carpark - The undercroft car park has been designed as an open naturally ventilated car park	4 points
Day light maximized - The building has extensive glass south facing to maximize daylight. Glass windows will also be provided into the warehouse to gain' additional daylight. The warehouse has 10% roof lights throughout.	No points as modeling not undertaken
Water sub metering - Separate check metering for water will be provided to minimize un-noticed leaks	2 points
Minimize waste from fitout - The building areas both warehouse and office are virtually column free. This gives flexibility and minimizes waste from fitouts.	3 points
	11 points achieved

Internal office space

Building B – 4 No. Warehouse / Office and Showrooms
32-38 Fennel St Port Melbourne

The response to the scorecard for this parcel of land was as follows:

COPP Scorecard V 3.2	
ENERGY	**Target: 30 points**
Energy saving building lighting 6-12 watts/m	6 points
Natural ventilation to the warehouse	6 points
Commercial HVAC cooling system	6 points
Commercial HVAC heating system	6 points
Maximize insulation and minimize air leakage (the building will use an R 1.5 thermal blanket to the roof areas which will be sealed at the perimeter. Sisalation will also be used to light weight wall areas.)	6 points
	30 points achieved

TRANSPORT	**Target: 10 points**
Bicycle parking provided	5 points
Trip change facilities provided (shower and change rooms.) In disabled toilets	5 points
	10 points achieved

Bicycle rack in warehouses

WATER	**Target: 20 points**
STORMWATER The site approach to stormwater treatment was to incorporate swales and bio-retention trenches along Bertie and Fennell Streets to a combined length of 100 m. The swale and bioretention trench on Bertie Street will capture stormwater runoff from the carpark and a section of the roof area 3600 m2 for treatment. The swale and bioretention trench on Fennell Street will capture stormwater runoff from the northwestern and adjoining paved area, treating it to 75% of best practice as outlined in the Urban Stormwater: Best Practice Environmental Management Guidelines 1999.	11 points
WATER - AAA shower heads used - AA basin tap sets used -6/3 dual flush toilets used -Water efficient garden ** note the AAA rating scheme has now been replaced by the Water Efficiency Labelling and Standards (WELS) Star Rating scheme*	12 points
	23 points achieved

Swale details along Bertie and Fennel Streets

WASTE	Target: 12 points
Operational recycling – recycle bins provided at tea points	5 points
Waste management plan – 60 % site waste reduction during construction. Waste minimization plan developed for the construction process.	5 points
Adaptable design – The design incorporates modular precast panels, concrete floors and steel which can be recycled and reused. The open plan nature (column free) of the building gives adaptable design for the current and future tenants.	2 points
Premanufacturing – The main structure of the building is precast panels and steel all of which are prefabricated and prefabricated off site. The metal cladding panels are also prefabricated along with glazing. This equates to the main fabric of the building meeting this criteria.	2 points
	14 points achieved

MATERIALS	Target: 12 points
The building will not use unsustainable timber	4 points
All timber used will be plantation/sustainable timber	4 points
Durable materials will be used externally such as aluminum cladding, colorbond steel, non toxic paints, glass and concrete	4 points
	12 points achieved

INDOOR ENVIRONMENT QUALITY	Target: 8 points
Effective air changes: The mechanical system will be designed to provide effective air changes to Australian Standards	3 points
Low emission particle board. The joinery and toilet cubicle partitions will use EO boards.	5 points
Low VOC paints. The project will use low VOC paints both internally and externally	3 points
	11 points achieved

INNOVATION	Target: 8 points
Electrical sub metering is provided to each tenancy	2 points
Carpark ventilation not applicable	2 points
Day light maximized. The building has extensive glass to maximize daylight. Glass windows will also be provided into the warehouse to gain' additional daylight. The warehouse has 10% roof lights throughout. Windows are provided into the warehouse from the office areas	no points as modeling not undertaken
Water sub metering. Separate check metering for water will be provided to minimize un-noticed leaks	2 points
Minimize waste from fitout. The building areas both warehouse and office are virtually column free. This gives flexibility and minimizes waste from fitouts	3 points
	9 points achieved

3.0 KEY OUTCOMES

3.1 REDUCED ENVIRONMENTAL IMPACTS

The key drivers behind the introduction of sustainability assessment of buildings at the planning stage are to reduce the environmental impact of the built environment. The global environmental priorities we collectively face include climate change, the quantity and quality of water resources, deforestation (habitat depletion) and loss of biodiversity.

To address these issues through the built environment, building designers and developers need to consider energy efficiency, water use reduction, improvement of stormwater quality, and the impact of materials. Coupled with these environmental issues are broader human health issues, which translate to building design issues such as the provision of healthy indoor environments.

Through the application of the sustainability assessment tools, such as the **Sustainable Design Scorecard Non-residential**, the City of Port Phillip aims to reduce the impact of the built environment on both the immediate and global environment, and to encourage the provision of healthy buildings.

The MAB / Folkestone Limited project and **toyotagreen Business Park** is an example of where design initiatives will result in reduced environmental impact over the life cycle of the building. Through the sustainable design strategies employed, the following environmental outcomes are expected:

- Reduced greenhouse gas emission from improved energy efficiency of envelope and HVAC (heating, ventilation, and air-conditioning) systems. (Note a predictive analysis of the office component of the development suggested that this component of the development would received a 4 star rating under the ABGR scheme)
- Improved quality of stormwater leaving site through the provision of an onsite bioremediation system
- Reduced potable water use through the use of water efficient fixtures and drought resistant plant species
- Reduced waste to landfill through the waste management plan incorporated during construction (estimated waste recycled approx. 367m^3), and through the provision of recycling facilities within the building.
- Long building life through the selection of durable and low maintenance materials.

3.2 IMPROVED INDOOR ENVIRONMENT QUALITY

Expected outcomes from some of the sustainable design initiatives incorporated into the building include improved health of building users due to:

- Significant levels of daylighting in office areas;
- The use of low VOC (Volatile Organic Compounds) particleboard and paints;
- The ability for building users to open windows in office areas.

3.3 PROJECT MARKETABILITY

Prospective tenants and purchasers receive a marketing flyer which includes information about the project and they have access to the web site: www.toyotagreen.com.au. The website outlines the vision for the development:

"Blending smart ecological advances with practical design, toyotagreen is an environment that staff and customers will enjoy. Features include:

- Clever use of natural light and shade to create a comfortable environment;
- Zoned temperature control minimises heating and cooling costs;
- Water efficient appliances and thoughtful landscaping conserve water; and
- An environmentally sustainable standard being trialed with the local council, the City of Port Phillip.

The objective is a sustainable development, balanced with the potential to lower your day-to-day running costs - thus effectively lowering your overall annual outlay".

MAB / Folkestone acknowledge that further improvements could be achieved through effective operation of the buildings. MAB / Folkestone have committed to providing this case study to the building users in an effort to raise awareness of the ESD measures implemented into the project and the expected environmental performance.

Future actions with MAB to progress the application of ESD initiatives within their buildings include a copy of the Sustainable Design Scorecard Non-residential included with the building documentation and quantifiable energy assessments (eg predictive ABGR rating for office components) allowing formal identification of energy rating of the building for marketing purposes.

3.4 ECONOMIC OUTCOMES

The upfront capital cost of implementing the strategies outlined in the Sustainable Design Scorecard Non-residential was an increase of 1.5 % to the project construction cost. The significant items that occurred significant cost were the high performance windows (now required under current Building Code requirements) and the stormwater treatment system.

While the above is a snapshot of the impact of the ESD strategies on upfront capital costs, a comprehensive economic analysis would require an assessment of the impact of the ESD initiatives on long term operational costs. This has not been calculated for the project.

To date there has been no additional impact on ongoing building maintenance costs. MAB anticipate the maintenance of the swale drain to be the largest cost, but do not foresee this cost to be major.

The impact of incorporating the ESD initiatives on the construction process was minimal. There was an initial delay on the supply of the E0 particleboard; however this did not result in any real delay on the project time.

3.5 INDUSTRY EDUCATION

Part of the process of incorporating ESD initiatives into the **toyotagreen Business Park** project was increasing the knowledge base within the Project Team on sustainable design strategies. This was achieved through engaging an ESD consultant for the project and through liaison with council officer, Natasha Palich, City of Port Phillip Sustainable Design Architect, who provided a presentation to all staff within the Melbourne MAB office on the background to council's approach to sustainable design, and the environmental outcomes possible from implementing ESD initiatives into buildings.

MAB Corporation is committed to providing a workplace that is safe and has minimal impact on the environment.

MAB is committed to minimising pollution and waste generation associated with our broad range of activities.

3.6 DRIVING CHANGE

The City of Port Phillip is committed to driving change towards sustainable built environments. Our Sustainable Design Policy states:

"The City of Port Phillip aims to foster a built environment that:

- Moves towards the elimination of the use of non-renewable resources (such as fossil fuel based energy, mains water and materials).
- Moves towards the elimination of solid waste production.
- Moves towards the elimination of air, soil and water pollution.
- Creates healthy indoor environments.
- Protects and enhances natural eco-systems and cycles."

The City of Port Phillip approach to achieving these aims is three pronged:

- Positively influencing redevelopment within the municipality
- Advocating within the community, industry and government for an increasingly low impact built environment
- Improving the performance of councils own buildings

The MAB / Folkestone **toyotagreen Business Park** is a successful example of where a collaborative approach to development has resulted in a highly marketable project and improved environmental outcomes for our municipality.

Acknowledgements
Thanks to Luke Appleton, MAB, for assistance in preparing this case study. All diagrams are reproduced with permission from MAB / Folkestone.