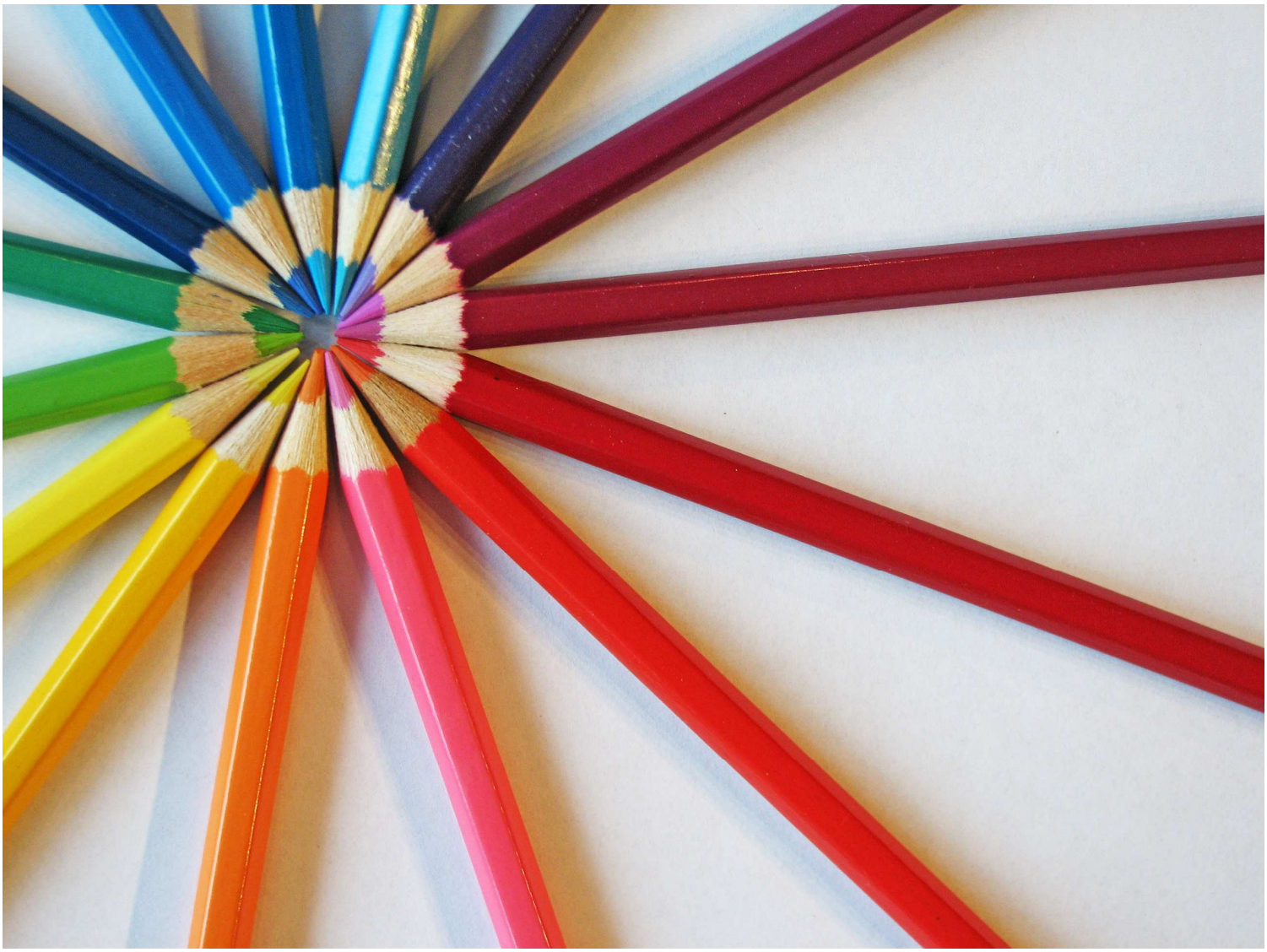

Royal Far West

ESD Report

May 2011

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Source: a Wordle of this report http://www.wordle.net/

green building council australia
MEMBER 2010-2011

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Royal Far West is a not-for-profit organisation based in Manly that has been providing services to enhance the health and well being of country children for more than 85 years. The original facilities on the subject site at Manly have been incrementally expanded over the years and are now outdated, poorly coordinated and in need of upgrading. In reviewing the various options moving forward, Royal Far West are proposing to introduce new, purpose built facilities which will extensively improve the clinical, schooling and accommodation services currently offered to children and their families.

Considering the history and role of the institution Royal Far West (RFW) see opportunity in setting a clear approach to Ecologically Sustainable Design (ESD) for the site. RFW believe an effective approach to ESD will set a positive direction for the development. It will lead to an efficient and responsible development that is appropriate for such a prominent site on the Manly foreshore and for its end users. Sustainability has been an important consideration in the preparation of the Concept Plan.

This report documents the sustainability initiatives being considered for the site as part of the Part 3A Concept Plan and provides an overview of initiatives being considered for the next phase of the development. It demonstrates progress and commitment towards achieving more sustainable outcomes for the development. The Director General set the following requirements for the Part 3A application:

> *5. Ecologically Sustainable Development*
>
> - *Detail how the development will incorporate ESD principles in the design, construction and ongoing operation phases of the development;*
> - *Include a description of the measures that would be implemented to minimise the consumption of resources, water and energy, including an integrated water management plan which details any proposed alternative water supplies, proposed end uses of potable and non-potable water, and*
> - *Water sensitive urban design; and*
> - *Demonstrate that the development can achieve a minimum 4 green star rating, or any other suitable accredited rating scheme.*

This report demonstrates the incorporation of the principles of ESD, provides a description of the measures undertaken as part of the Concept Plan in relation to water, energy and transport and provides a demonstration of the elements of the Concept Plan relevant to appropriate environmental ratings.

This report uses the principles of the Green Building Councils Green Star Communities Framework to reflect the development's response to the principles of ESD. This considers principles of enhanced liveability, opportunities for economic prosperity, environmental responsibility, design excellence and strong governance.

In detailing the measures to be implemented around resource efficiency, the development is proposing a number of elements at concept plan phase. These measures will be further advanced during project approvals and construction documentation. Some of the key sustainability measures detailed at the concept plan phase include:

- Using building orientation and passive solar design features and maximising opportunities for natural ventilation.
- Maximising land use efficiency through increasing the use and function of the site.
- Shared resources including the car parking, loading, rainwater storage and communal spaces.
- Effective location near significant public transport, cycling and pedestrian infrastructure as well as a large range of community and retail service offers that enables reduced transport by car.
- An integrated rainwater harvesting scheme for non potable use throughout the development.

At an individual building scale, this report commits to a minimum 4 Star Green Star Certified Rating under the Multi Unit Residential v1 tool and the Education v1 tool for the respective buildings. For all other uses on the site there is a commitment to the preparation or an appropriate response to energy, water and transport at project approval phase.

1 Introduction

This report details some of the Ecologically Sustainable Development (ESD) strategies and initiatives proposed at the concept plan stage for the Royal Far West site (the site) in Manly. It is recognised that these are the first steps in setting the ESD approach for the site and that these will evolve as the plans for the site are developed through further approvals and construction documentation. The issues and initiatives covered in this report are relevant to the concept planning stage of development in particular.

Considering the history and role of the institution, Royal Far West (RFW) see opportunity in setting a clear approach to ESD for the site. RFW believe an effective approach to ESD will set a positive direction for the development. It will lead to an efficient and responsible development that is appropriate for such a prominent site on the Manly foreshore and for its end users.

The myriad of uses for the site prevent a clearly defined response to an environmental rating tool such as Green Star for the concept phase. The applicability of such tools for the range of proposed uses and the stage of development detail means that many of the elements of the rating tools cannot be assessed. Whilst some of the fundamental principles and key design features can be identified at concept plan phase, the nature of the development process prevents some of the more detailed responses from being included. These will be detailed through project approvals, construction documentation, contract details and the operation of the facility.

This report looks at how the proposed development employs the principles of ESD, demonstrates the proposed developments alignment to the Green Star rating tools and provides some detail around specific water and energy initiatives.

1.1 THE SITE

The site is known as 12 - 22 Wentworth Street, 16 South Steyne and 19-21 South Steyne, Manly. It comprises the eastern end of the street block bounded by Wentworth Street, Victoria Parade and South Steyne, Manly. The western end of the street block accommodates Manly Public School and between the school and the site are several older style walk up apartment buildings. To the east across South Steyne is Manly Beach. The site is regularly proportioned, has an area of 6,950m2 and is quite flat. The site is located within the Manly Town Centre, one block south of the Corso, and is approximately 300 metres east of the Manly Ferry Wharf.

The site currently accommodates a clinical services building, a short stay residential facility for patients and their families, an affordable housing accommodation facility, an integrated school facility, a playground, a garden and a car park and is located mainly within the 5(a) Special Uses (Children's Home) zone, pursuant to Manly Local Environmental Plan 1988 (MLEP 1988). The Drummond Far West Home, which forms part of the site, is listed as a Heritage Item under MLEP 1988, as are several surrounding buildings.

Manly Town Centre is a major tourism and visitor destination in Sydney. Manly provides a mix of retail, tourism and residential uses which are well connected to a range of strategic public transport options at the Manly Wharf & Bus Interchange. The draft North East Subregional Strategy supports "significant investment in regional facilities, within and between subregions" and specifically defines Manly as an existing industry concentration/cluster for medical services.

The site is excellently located to accommodate a higher density mix use development, with ready access to transport infrastructure and employment opportunities.

1.2 THE CONCEPT PLAN

The proposed development includes a mix of uses with the following key elements:

- A new building for Royal Far West including clinical facilities, student and parent accommodation and school facilities.
- The renovation and incorporation of the existing heritage facility for use by Royal Far West.

- Construction of a Hotel consisting of 168 rooms.
- A street level retail component of 1,207m^2.
- A new 58 unit residential development.
- The provision of 2 basement levels of car parking comprising of 117 spaces on each level.

1.3 THE DIRECTOR GENERAL'S REQUIREMENTS (DGRS)

Considering the above, the Director General has set a number of specific requirements for documenting the ESD directions for this project at concept plan stage. Though there are elements of ESD included in other DGRs such as transport and flooding this report responds wholly to the specific DGR relating to ESD. This DGR is repeated below:

5. ECOLOGICALLY SUSTAINABLE DEVELOPMENT

- *DETAIL HOW THE DEVELOPMENT WILL INCORPORATE ESD PRINCIPLES IN THE DESIGN, CONSTRUCTION AND ONGOING OPERATION PHASES OF THE DEVELOPMENT;*
- *INCLUDE A DESCRIPTION OF THE MEASURES THAT WOULD BE IMPLEMENTED TO MINIMISE THE CONSUMPTION OF RESOURCES, WATER AND ENERGY, INCLUDING AN INTEGRATED WATER MANAGEMENT PLAN WHICH DETAILS ANY PROPOSED ALTERNATIVE WATER SUPPLIES, PROPOSED END USES OF POTABLE AND NON-POTABLE WATER, AND*
- *WATER SENSITIVE URBAN DESIGN; AND*
- *DEMONSTRATE THAT THE DEVELOPMENT CAN ACHIEVE A MINIMUM 4 GREEN STAR RATING, OR ANY OTHER SUITABLE ACCREDITED RATING SCHEME.*

1.4 THIS REPORT

This report provides an overview of the sustainability features of the Concept Plan and provides a clear and concise response to the DGRs for ESD. There are four components included in this report which both inform the design and detail for the Concept Plan and demonstrate the requirements stated in the DGR. The structure of the report is as follows:

- An overview of the context of sustainability for planning and for the site.
- Detailing the incorporation of ESD Principles for the proposed development.
- Demonstrating Concept Plan actions to deliver improved water, energy and transport outcomes.
- Describing the appropriate ESD measures associated with the buildings on the site at concept plan phase.

The approach detailed in this report identifies relevant rating tools and provides a demonstration of how elements of the development could achieve a potential rating under Green Star.

2 ESD Context

This section provides some context for ESD and sustainability as it relates to development, concept plans and Part 3A. It also provides an overview of what sustainability means for RFW and the Director Generals Requirements.

2.1 SUSTAINABILITY IN DEVELOPMENT

Sustainability is a concept that aims to optimise outcomes for the human and natural environments both now and into the future. It is about the interaction between the economic, social and environmental factors in relation to human society and the natural environment. The ultimate goal of sustainability policies and practices is to provide a framework to guide human activity so that society, its members and economies are able to reach their greatest potential in the present, without compromising the ability of future generations to reach their full potential. This concept affects every level of humanity from the local neighbourhood to the global community.

There are several other factors that must be considered when looking to achieve more sustainable outcomes within an urban development context. These factors include consideration of the timing of the project, the size of the project and the scale at which the development decisions operate. It is also important to recognise that sustainability is a fluid concept and there is not a definitive answer to whether something is sustainable or not. Actions and outcomes can be considered more sustainable or less sustainable than others. Put simply, it is not a yes or no answer. The decision-making process is therefore vital to the long-term implementation of sustainability strategies, policies and practices. All decisions must consider the level at which they operate, the time frame involved and the long term impacts of each decision.

2.2 SUSTAINABILITY FOR PART 3A

Statutory planning is a critical decision stage in the development process and sets some of the physical and land use function for the future of a development site. It is important that consideration is given at this stage to the principles of sustainability and the role of the planning process in assisting in driving more sustainable outcomes. It is also important to recognise the phases that a development goes through and the role of each of these phases in supporting and influencing more sustainable outcomes.

Major development projects and developments that pass through the concept plan stage in NSW go through a number of distinct approvals and documentation phases often over many years. A Part 3A approval is the NSW government mechanism for progressing approvals for state or regionally significant projects as defined under the Environmental Planning and Assessment Act 1979 (EP&A Act) and the Major Projects SEPP. Through planning and certification these projects go through varying levels of concept approvals, project approvals, building approvals, subdivision approvals, civil works approvals and building certification. Each of these phases deal with different levels of design detail and play different roles in the decision making process for the developments.

At each phase a range of decisions and actions can be taken that may facilitate a shift towards achieving more sustainable outcomes. It is critical to understand at what phase in the decision making process a development is, in order to maximise actions that deliver more sustainable outcomes through targeting the correct phase of development. RFW is currently proposing a Concept Plan for the site outlined above for approval under Part 3A.

From a sustainability perspective, a Part 3A concept approval at the master planning phase of a development is only one tool in documenting and confirming sustainability measures. One of the risks with sustainability planning at the concept approval phase is trying to provide detailed engineering commitments (that require a level of design, quantification, governance, ownership and costing) that will not be prepared until the project approvals, subdivision planning, civil works plans, detailed design, construction documentation, building certification or occupational phases of the development. The responsibility and timing of each of these phases will differ significantly through the life of the project.

It is critical that the ESD or sustainability reports prepared for the Part 3A application provide certainty to the planning authority, government agencies, council and community that more sustainable outcomes will be provided in response to the key opportunities and issues identified. This can be provided through clearly defining the actions and responses that are being taken at this stage and creating structures that will enable the next phases of the development to build on the initiatives taken within the concept approval phase.

2.3 SUSTAINABILITY IN MANLY

The suburb of Manly is home to a community deeply connected to and proud of its seaside culture and natural environment. Consisting of just 15.2 square kilometres, the suburb provides for a great contrast of local communities and seaside resort visitors from all over the globe. It is a suburb where the economy and social systems are intimately entwined with the natural environment and environmental amenity.

The natural aspects of Manly are what make the area such a desirable destination for tourists and residents alike. The local beaches, waterways, fresh air, local climate and pockets of natural bushland are the life source of the local economy with local businesses relying on the careful management of these natural assets to ensure their futures. For this reason the concept of sustainability and minimising impacts is particularly important in this region and the issues quite targeted.

2.3.1 *Manly Sustainability Strategy 2006*

The Local Agenda 21 Action Plan for Sustainability adopted at the 1992 Rio Earth Summit served as a gateway to the conservation and sustainability visions of Manly Council. Between the years of 1995 and 1998, Manly Council worked with the local community to develop a Conservation Strategy of its own. The strategy addressed the management of land, aquatic systems, biodiversity, air, waste, noise, Aboriginal Heritage and social environment. It put Manly at the forefront of conservation planning with the strategy winning awards at both the state and national levels.

Review of the plan and its implementation meant that the 2002 version of the report more closely reflected the elements and intention of the Agenda 21 from the Rio Earth Summit. As a result, the new plan dealt with protection of the environment and development in respect of the role of people in a sustainable society. The 2006 version of the document saw the adoption of the United Nation's 'Melbourne' Principles for Sustainable Cities as the basis or the future direction of the document. The 2006 strategy is a comprehensive Strategy that considers a broad perspective of sustainability including social, environmental and economic factors. The following principles underpin the 2006 Strategy:

Manly's Strategy for Sustainability[1]

A. A Long Term Vision for Manly

A1. A shared long-term vision for Manly based on: sustainability, intergenerational, social, economic and political equity; and our individuality.

B. A Safe and Cohesive Manly

B1. Achieve long-term social and economic security.

C. A Natural, Sustainable Manly

C1. Recognise the intrinsic value of Manly's geodiversity, biodiversity and natural ecosystems, and protect and restore them.

C2. Enable Manly's community to minimise our ecological footprint.

C3. Promote sustainable production and consumption, through appropriate use of environmentally sound technologies and effective demand management.

D. A Living Manly

D1. Build on the characteristics of ecosystems in the development and nurturing of a healthy and sustainable Manly.

D2. Recognise and build on the distinctive characteristics of Manly, including its human and cultural values, history and natural systems.

E. An Involved Manly

E1. Empower people and foster participation.

E2. Expand and enable cooperative networks to work towards a common, sustainable future.

F. A Well Governed Manly

F1. Enable continual improvement, based on accountability, transparency and good governance.

1 http://www.manly.nsw.gov.au/IgnitionSuite/uploads/docs/manly_sustainable_strategy_final2.pdf

2.3.2 *Manly Coastline Management Plan*

The Manly Ocean Beach Coastline Management Plan was develop to enable the sustainable future management of the Ocean Beach area. The Plan is intended to be used to steer community action and assist government and Council in the management of the area. Included in the Plan is the review of planning and management frameworks for the area in regards to likely future uses of beach front land and directions for the local economy. Various elements of sustainability are addressed including:

- Implication of coastal planning policy and planning instruments.
- Nature of coastline hazards e.g. potential risk to coastal developments.
- Aesthetic, recreational and ecological values of this particular section of coastline.
- Social factors.
- Climate change.
- Economic analysis of proposed or existing development with cost and benefit studies.

2.4 SUSTAINABILITY FOR RFW

The Royal Far West facility was originally set up in 1924 as a coastal retreat for children from regional NSW to recreate, rest and recuperate in a pristine environment by the sea. The benefits of fresh air, water, local climate and access to health services were fundamental to this process. This vision was held by the Reverend Stanley Drummond who through personal experience saw value in this and inspired his vision for Royal Far West. The facility has since focussed on providing services for country children through meeting their clinical, accommodation and education needs on site in Manly.

In more recent times, the scientific community has recognised the close connection between the natural environment and human health benefits and over that time the facility has gone from strength to strength. In her recent book 'Healing Spaces', Ester Sternberg explored and further defined the influence and benefits of sustainable design in provision of health facilities to the ultimate health outcomes of patients[2].

In addition to this, the NSW school design standards recognise the influence of design principles in the educational experience, behaviours and outcomes for students right down to the colour of paints. The NSW School Design Standards include extensive ESD design guidance. There is a growing body of research that has found a statistically significant relationship between the condition of a school or classroom and student behaviour and achievement. Spatial configurations such as noise, heat, cold, light, and air quality affect students' and teachers' ability to perform[3]. There may be further benefits in demonstrating to country students the principles of resource efficiency and adaptation to climate change which is a critical issue facing Australia's rural communities.

In 2011 demand is increasing for the services provided by RFW and the organisation is committed to enhancing services and reaching more country kids, especially in the important areas of mental health, oral health, early intervention and country children with special needs. It is this demand that has sparked the vision and intent for this project, which is to provide the framework for the 50 year vision of RFW (PEA). The design intent for the project is to include a state-of-the-art health facility and a centre for excellence for children's mental health and behaviour. State-of-the-art health facilities are increasingly recognising the role of sustainable design principles in delivering positive health outcomes. This project provides the RFW significant opportunity to think about the long term priorities for the site and the benefits of the facility for future generations.

In this development evolution, RFW seeks to remain true to its original vision of creating an environment that is positive for country children and provides them hope for their future. For RFW, a vision for sustainability is about a hopeful vision for the future. This vision can play an important role for children and youth and particularly those who are struggling with health concerns or an uncertain future. The approach taken by RFW in ESD for this project will seek to emphasise the principles of intergenerational

[2] Esther M. Sternberg Healing Spaces, Harvard University Press, 2009

[3] Schneider, M 2002, *Do School Facilities Affect Academic Outcomes?*, National Clearinghouse for Educational Facilities, Washington DC.

equity and environmental health and to emphasise the organisations commitment to the future of the children and families it serves.

RFW also see sustainability making good business sense. Increasing costs of utilities and competition for space means that efficient design practices and effective design responses to water and energy challenges have the potential to reduce the operating costs for the RFW facilities and potential development partners. In this RFW see opportunities to consider the life cycle costs associated with the development and balance capital expenditure with operational expenditure across the site.

From the perspective of RFW, the overall approach to sustainability on this site focuses on the principles of intergenerational equity, maximising environmental health as well as achieving cost effective resource efficiency for its own facility and its potential development partners. This has driven the approach outlined in this report.

2.5 APPLICABLE SUSTAINABILITY FRAMEWORKS AND STANDARDS

There are a large number of sustainability frameworks and rating tools for the development industry either in use or under development around the world. Some of these are being developed by governments (eg, Estidama, Merton Steps, BASIX NABERS or PRECINX) and others by non government organisations (eg, GBCA Green Star, LEED, BREAM or Green Globe). More still are being developed by commercial entities (ARUP SPeAR or AAECOM SSIM) or developers. All have a range of different objectives and interpretations of sustainability or ESD and most either advise or guide at different phases of the development cycle or rate development at design or operational phases. Some are compliance based and others are voluntary tools.

The focus within this report is to utilise the Green Building Council of Australia's(GBCA) suite or Green Star frameworks and rating tools to inform the ESD approach for the RFW site at concept plan phase. These are voluntary rating tools set up by the GBCA as an incentive to encourage positive environmental practices within the Australian development industry.

This section of the report provides an overview of the applicable sustainability frameworks including GBCA Green Star, NABERS, BASIX and their applicability to the RFW site.

2.5.1 The Green Building Council suite of frameworks and rating tools

In 2003, the Green Building Council of Australia released Green Star, a voluntary environmental rating system for buildings in Australia. The system rates a large range of environmental and sustainability features of the design of the building and provides an assessment of the environmental "value" of these design features depending on the ability of these design features to minimise environmental impacts. Green Star was developed for the property industry in order to:

- Establish a common language
- Set a standard of measurement for green buildings
- Promote integrated, whole-building design
- Recognise environmental leadership
- Identify building life-cycle impacts
- Raise awareness of green building benefits.

Green Star tools generally include nine categories for assessment with a number of possible credit points designated to each. These categories include management, indoor environment quality, energy, transport, water, materials, land use and ecology, emissions and innovation. If the building meets the mandatory criteria and the minimum standards, the building's overall score is then translated into "Green Stars". The following shows the available ratings:

- 45-59: 4 Star Green Star, 'Best Practice' in environmentally sustainable design and/or construction
- 60-74: 5 Star Green Star, 'Australian Excellence'

- 75-100: 6 Star Green Star, 'World Leadership'

The first rating tool was developed to rate the design of commercial office space. Five years on, achieving a Green Star rating has emerged to become a quasi standard for new commercial office space in Australia with a number of reports showing higher returns for office space with green star ratings. In addition to this, many government departments and large companies now have policies that require them to locate their operations in Green Star rated space.

Since its commercial beginnings the Green Star ratings tools have grown to include a suite of over 12 tools which rate a range of development types at design and operational phases. Some of these tools are still in pilot phase and a number include both design and “as built” ratings. The following tools are currently available:

- Education v1
- Healthcare v1
- Industrial v1
- Multi Unit Residential v1
- Office v3
- Office Interiors v1.1
- Retail Centre v1
- Office Design v2
- Office As Built v2
- Custom PILOT
- Convention Centre Design PILOT
- Public Building PILOT

In 2010 the Green Building Council also started on a process of developing a broader sustainability framework to facilitate more sustainable urban form at a scale that includes multiple buildings and broader functions. The intent of this was to enable a broader reach for sustainability and recognise the importance of planning at this scale to delivering more sustainable outcomes.

The Green Star Communities Framework was released in mid 2010 and provides a different approach to enabling more sustainable outcomes. It is focussed on providing a framework for sustainable urban design practices at a master planning scale. In considering the features of larger scale planning it embraces a broader definition of sustainability that includes the following principles:

- Enhance liveability
- Create opportunities for economic prosperity
- Foster environmental responsibility
- Embrace design excellence
- Demonstrate visionary leadership and strong governance

The framework was developed with the intent of guiding development at all stages to consider some of the key principles of sustainable urban forms. The Green Building Council is currently in the process of developing a rating tool around the framework and are seeking to release it in the latter part of 2011.

2.5.2 NABERS and Building Disclosure

NABERS is a performance-based rating system for existing buildings. NABERS is the assessment of the environmental sustainability of buildings as they serve their intended function. Where Green Star relates

to the design and construction of a building, NABERS considers the actual operation of that building. The system rates a building on the basis of its measured operational impacts on the environment, and provides a comparison of the management of environmental impacts with neighbours and peers. The rating system covers Offices, Homes, Hotels, Retail, Transport, Hospitals, and Schools.

NABERS is dominant in the commercial office space sector with the introduction of the Federal Governments Commercial Building Disclosure program in 2011. As of November 2011, it became mandatory for sellers or leasers of office space of 2,000 square metres or more will be required to disclose a full Building Energy Efficiency Certificate (BEEC). BEECs are valid for 12 months, must be publicly accessible on the online Building Energy Efficiency Register and include:

- A NABERS Energy star rating for the building
- An assessment of tenancy lighting in the area of the building that is being sold or leased and
- General energy efficiency guidance

It is the intent of the Federal Government to roll out mandatory disclosure or energy use across most other forms of development over the next 3-4 years. As NABERS already covers Residential, Hotels, Retail, Hospitals and Schools this could be a requirement imposed on most of the uses proposed within the RFW Concept Plan.

It is important to note that NABERS is not a design tool or a rating tool that considers design. It is a tool that considers operating efficiency and records the previous years consumption. For the purposes of this report we have made reference to NABERS to emphasises the priorities around energy and water use for those developments not currently eligible for ratings by the GBCA under Green Star.

2.5.3 NSW BASIX

The Building Sustainability Index (BASIX) was released in 2004 by the NSW Department of Planning to set standards for reductions in greenhouse gas and potable water use associated with new residential development in NSW. This now includes reduction standards for all new free standing residential developments, multi unit residential housing and residential renovations over $50,000. BASIX analyses data on size, building materials, location etc of the intended dwelling/s and determines a score benchmarked against energy and water targets. If the dwelling passes specific targets then a certificate is issued for submission with the development application.

Though BASIX certificates are not required at the concept plan phase, these will need to be provided at the project approvals stage for the residential component of the development. Although the legislation does not apply at the concept stage, many of the concepts and principles of multi unit BASIX have been considered in the plans and this ESD report and the proposed GBCA Green Star target should exceed the requirements of BASIX.

2.5.4 Applicability to Royal Far West

The following points identify the appropriate sustainability ratings for the mixed use development proposed at concept plan phase.

For the Concept Plan, this report applies the principles of the Green Star Communities Framework. The Green Star Communities Framework was released mid 2010 and provides an approach to enabling more sustainable outcomes at the mixed-use master planning scale. It is focussed on providing a framework for sustainable urban design practices at a master planning scale. This framework has been used in this report to provide an assessment of the project at concept plan scale that includes the broader context for the site and an overall assessment of the mix of uses proposed within the Concept Plan.

For the educational components of the development, this report applies the principles and appropriate credits of Green Star Education v1. There are currently 42 registered projects across Australia under the Design Tool. Of those registered, only 11 have been awarded. Four are awarded 4-star, five 5-star and two 6-star. The rest are still in the process of being awarded. There are also currently seven registered under the as built tool but none yet awarded. The Green Star Education v1 tool has been used to guide the sustainability elements for the concept plan phase.

For the residential components of the development, this report applies the principles and appropriate credits of Green Star Multi Unit Residential v1. This tool has only recently become an active tool. Under the pilot phase only four projects across Australia were registered and awarded. The current tool has a design rating and an as built rating. There are five projects currently registered under design tool and one registered as built but no projects have yet been awarded. The Multi Unit Residential component of the development will also be subject to the statutory requirements under the NSW BASIX scheme. The Green Star Multi Unit Residential v1 tool has been used to guide the sustainability elements identified in the concept plan phase.

For the other uses on the site, the strategy has been to focus on the water and energy use of these facilities in order to maximise future operational efficiencies or capacity to achieve environmental ratings under tools such as NABERS. It is proposed that these developments would use a similar approach to the requirements under the GBCA Green Star water and energy credits. This includes the hotel, RFW accommodation and clinical facilities and the retail uses.

3 ESD for the Concept Plan

This section is focussed on the ESD principles of the development as a whole. It provides an assessment of the development as a complex mixed use site against some generally accepted industry principles of ESD and provides an overview of some of the initiatives for resources, energy and water at the concept plan scale.

3.1 PRINCIPLES OF ESD

DGR: *Detail how the development will incorporate ESD principles in the design construction and ongoing operation phases of the development.*

The proposed Part 3A Concept Plan sets the land use priorities, proposed function, building envelopes and some of the design intentions for the site. There are some significant challenges in applying the broader principles of ESD at all phases of the development within the context of what stage the development planning is at. The Environmental Planning and Assessment Act 1979 adopts the following definition of Ecologically Sustainable Development from the POEOA 1991[4]:

Ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

(a) the precautionary principle-namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

b) inter-generational equity-namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) conservation of biological diversity and ecological integrity-namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

There have been many attempts to convert these into principles that can be applied within the context of development planning at a range of scales. At the urban planning scale the Green Building Council of Australia has converted many of these principles into a framework to guide the development of new mixed-use developments and communities through the development of the Green Star Communities Framework. For the purposes of this project, the Green Star Communities Framework has been adopted as a basis for demonstrating the projects alignment to the principles of ESD. This review provides an overview of the project in context with this framework considering the ESD context for the development through design, construction and ongoing operation.

3.1.1 Green Star Communities Framework

The Green Building Council of Australia has recently prepared a framework that sets principles and aspirations to help guide and support the development of sustainable communities. The intention of the framework is to provide inspiration and to contribute to a national position about to how to plan, design, build, maintain and renew sustainable communities.

The principles and criteria specified in this framework are relevant when considering the planning of a mixed use Concept Plan such as RFW. For the RFW site, it was considered that the approach to sustainability planning set by the Green Star Communities Framework provided a good basis for addressing the principles of sustainability within the Concept Plan as it addresses features relevant at the scale of development proposed. The following figure shows the principles and themes used to frame the approach to sustainability for RFW Concept plan.

[4] *PROTECTION OF THE ENVIRONMENT ADMINISTRATION ACT 1991 - SECT 6.* The full definition is in the Appendix

Table 1 – Sustainability principles and themes for Green Star Communities Framework

Principle	Theme	Royal Far West
Enhance liveability	Providing diverse and affordable living	The project will add a new and diverse residential offer to Manly. This will include high end residential and tourist accommodation on the foreshore as well as tourist accommodation and accommodation associated with the RFW facilities for parents and students.
	Creating healthy, safe and secure communities	The residential development will encourage improved natural surveillance of the Manly area and promenade. The developments on the site will be designed to include significant natural ventilation and will encourage active transport and lifestyles.
	Fostering inclusiveness and cohesiveness	The development will include a range of uses that will serve a broad range of the community. The retail proposed will further activate and articulate the Manly foreshore and continue the retail further along the strip.
	Building community adaptability	The residential facilities will adopt the principles of universal design to enable easy adaptation to suit generational needs. The mixed use nature of the development will facilitate a broad range of uses on the site. As these needs change the facility will be designed to enable future changes. Manly Council operates a development contributions plan that requires developers to dedicate money towards local community infrastructure provision.
Create Opportunities for Economic Prosperity	Promoting education and learning	Education and learning are key principles of RFW and will continue to be a critical element of the site. The ESD elements delivered on the site will be communicated to students and users through interpretative signage.
	Enhancing employment opportunities	Significant employment opportunities will be provided in association with the sites proposed retail, education, service, tourism, restaurants, health administration, construction and maintenance.
	Attracting investment	The development of the RFW site will involve significant investment in the site and in the local community in both the construction and operational phases of the development. Expanding the tourism opportunities around Manly through the provision of new tourist accommodation, restaurants and retail facilities. The Royal Far West facility has historically been provided State Government grants to support its clinical operations. This is likely to continue with the new facility and provides an investment into the region.
	Encouraging innovation	The set up of “development partnership agreements” will provide opportunities to RFW in models to innovate on the social, economic and environmental outcomes for the site.
	Promoting efficiency and effectiveness	The development proposes to maximise the land use efficiencies in a highly valuable and accessible location. This encourages more sustainable urban densities while minimising impacts on more sensitive natural environments.

Principle	Theme	Royal Far West
Foster Environmental Responsibility	Enhancing natural environment	BIODIVERSITY – The site does not negatively impact on any threatened flora or fauna communities. There may be opportunities through the landscape planning to improve the sites contribution to the local biodiversity through provenance planting of native low water use species. WATER QUALITY – Permeable surfaces are being considered where appropriate across the site. A gross pollutant trap would be installed to ensure improved water quality from site run off. An integrated on site rain water storage facility is being considered which may reduce peak flows. A construction water quality plan will be prepared at project/s approval phases in line with the Landcom NSW guidelines.
	Reducing ecological footprint	ENERGY – The orientation of the proposed buildings on the site have considered the principles of passive solar design and maximising the ability to use natural ventilation. Façade treatments are being considered to maximise heating in winter and cooling in summer. Opportunities are currently being considered around alternative energy supplies for the different uses across the site including solar thermal, electric, small scale wind or a cogeneration facility. WATER – The Concept Plan considers the principles of Water Sensitive Urban Design and considering the opportunities around rainwater harvesting and grey water systems. TRANSPORT - The site is well located near a centre encouraging significant trip reductions or pedestrian and public transport journeys. This will limit the relative carbon intensity of the occupants. WASTE – The reuse of the heritage item will limit the demotion waste generated from the site. Recycling of demolition and excavation materials will be considered as a priority in the project approvals phase.
Embrace Design Excellence	Adopting effective planning practices	The concept planning process allows a clear progression of the vision for the RFW site and this ESD report provides the first step in setting the sustainability direction for the future of the site.
	Encouraging integrated design	The development considers a broad range of mixes across the site within a single integrated concept plan. RFW are currently considering some of the energy and water options that may be applied across the site. The proposed WSUD initiatives are integrated across the site. The proposed parking provision will be shared across the uses on the site and will encourage integrated planning and energy use for the car parking.
	Maintaining flexible and adaptable approaches	The Concept Plan details a range of uses and building forms for the site. The details of the flexible and adaptable use will be detailed at the project approvals phase.
	Creating desirable places	The project proposes residential, clinical, educational, hotel and retail facilities in a highly desirable location. One of the core principles of RFW is to facilitate children's health in a desirable location.
	Promoting accessibility	The project is in a highly assessable location and is well served by effective pedestrian, cycle and regional public transport and vehicle infrastructure.

Principle	Theme	Royal Far West
Demonstrate Visionary Leadership and Strong Governance	Establish coordinated and transparent approaches	RFW are using the NSW Part 3A process which provides a transparent and staged approval process that provides a number of opportunities for input from key stakeholders and the community.
	Build a commitment to implementation	RFW has a vision for the site that will be implemented to meet the objectives of the organisation and meet the needs of the surrounding communities.
	Engaging with stakeholders	The Part 3A process requires consultation and engagement with stakeholders at a number of stages before project commencement. A number of stakeholder information sessions and presentations have been organised during the concept development and environmental assessment phases of the project.
	Fostering sustainable cultures and behaviours	There are numerous opportunities though this development to foster sustainable behaviours, particularly around transport choice and the educational role of RFW.
	Encouraging and rewarding innovation	RFW is investigating opportunities across the development including rewarding through the development partnership agreements.

The response to the principles of ESD for the purposes of responding to the DGR's has focussed on the principles and themes developed by the GBCA in its Green Star Communities framework. This framework was considered to be a broad approach to sustainability planning for major projects or mixed use sites that will influence the project through design, construction and operational phases.

3.2 CONCEPT PLAN MEASURES AND OPPORTUNITIES

DGR: *Include a description of the measures that would be implemented to minimise consumption of resources, water and energy, including an Integrated Water Management Plan which details any proposed alternative water supplies, proposed end uses of potable and non-potable water, and Water sensitive urban design*

The approach outlined in 3.1 above illustrates some of the site-based approaches to the principles of sustainability. This section provides some further detail on some of the proposed approaches to energy, water and transport in the current Concept Plan and identifies a number of further initiatives for potential consideration in future approvals.

3.2.1 Energy

The orientation of the proposed buildings on the site have considered the principles of passive solar design and maximising the ability to use natural ventilation. Façade treatments are being considered to maximise heating in winter and cooling in summer. Opportunities are currently being considered around alternative energy supplies for the different uses across the site including solar thermal, electric, small scale wind or a cogeneration facility.

The current proposal includes the following features that will reduce the overall energy consumption of the proposed facilities:

- Good connections to existing energy infrastructure.
- Orientation to maximise through breezes and natural ventilation.
- Narrow floor plates to maximise natural lighting.

Opportunities for further investigation in detailed design and development partnership phases include:

- Installation of smart grid technologies to the precinct and the units.
- Consideration of an energy services company (ESCO) to serve the electricity, heating and cooling needs of the site.
- Investigation of renewable energy opportunities including use of urban wind, solar hot water or solar electric technologies.
- This may balance the mix of uses and energy demand profiles to enable significant efficiencies of any renewable energy or cogeneration facilities proposed.

Orientation

It is recognised that significant energy savings can be achieved in a building through effective orientation and through the design of the façade. The proposed buildings on the RFW site are oriented to maximise passive solar principles (East North East) and natural ventilation (through flowing residential) and indoor light quality (depth of floor plate). It also minimises glazing on the western façade. The project will incorporate external façade treatments to control solar access and shading. An example of the façade treatments being considered is shown in **Error! Reference source not found.** below.

Figure 1 – Potential façade treatments being considered (RFW on Wentworth Street)

Source: Concept plan drawing CP-10 issue C

Figure 2 – Potential façade treatments being considered (Cnr South Steyne and Wentworth St)

Source: Concept plan drawing CP-10 issue C

Potential energy generating solar facades

A selection of external building façade treatments such as membrane solar shading systems, shadovoltaics and the like, are also being considered to control solar access, provide shading and potentially, generate on-site electricity and offset external lighting electricity consumption. These will be detailed in the project approvals phase. An example of the active solar materials that are being considered are shown in Figure 3 below.

Figure 3 – Potential façade energy generation measures being considered

3.2.2 Water

There are a number of water initiatives being proposed for the development that are integrated across the Concept Plan. At the planning approvals phase of the development, the following actions are proposed as part of the integrated water management options:

- Incorporation of Gross Pollutant Traps (GPT) to reduce the volume and percentage of suspended pollutants from the stormwater flows which discharge from the site.
- Provision of onsite absorption systems to cater for minor storm events which provides a first flush capability, to remove pollutants such as salt and other chemicals which are collected from roof and surface areas in the first minutes of a storm event.
- Harvesting of rainwater for the purpose of reuse in sanitary flushing, irrigation systems and other non-potable water uses.
- Electronic Monitoring of water demand for defined areas to enable the detection of spikes which may indicate leakage from the system.
- Sub metering within the facility to allow effective management and usage charges to be applied.
- Reuse of fire water from testing procedures to reduce the consumption of potable water and minimise the discharge from the site to the authorities' drainage infrastructure.

3.2.3 Transport

There are a number of transport actions that have been considered in the planning approvals phase. The development is very well serviced by pedestrian and cycle facilities and local public transport. The development will benefit from Mass Transport criteria under the Green Star tools where they are used. Some of the existing sustainable transport context for the site includes:

- The existing bus and ferry services that operate in the locality provide excellent access to the local area and wider region.
- Dedicated cycle lanes within the region including a dedicated path along the south of the site along Wentworth Street and Darley Street.
- Wide pedestrian footpaths, 40km/hr speed limits, dedicated cycle ways and a vibrant streetscape all encourage walking, cycling and public transport use.
- Journey to work statistics show that for the Manly area approximately 45% of work trips are undertaken using Manly's public transport facilities. This includes 11% undertaken by bus, 25% of total trips are undertaken by ferry and 9% are achieved by a combination of two forms of pubic transport.

Key features of the Concept Plan include:

- The provision of 234 car parking spaces, meeting the minimum car parking requirements for the site under Manly Council Controls. This has the potential of providing two credits for transport depending on how these are allocated to different uses.
- Bicycle facilities will be provided in accordance with Council's requirements at Project Application stage. Bicycle facilities including lockers or racks will be provided in convenient locations.
- Car sharing has been addressed in the Transport Report and is identified as an integral part of the Travel Plan for occupants of the development to be considered further at project application stage.

In addition to this, the following transport actions are being considered for project approval phase:

- Promotion of public transport, cycling and walking and reduced reliance on private vehicles through preparation and implementation of a Workplace Travel Plan or Travel Access Guides.
- Bicycle parking and shower/change room facilities to promote sustainable modes of transport, including cycling and walking. The provision of cycle spaces, showers and lockers and a changing area will provide for capacity for credits under the Green Star Tool.
- Currently the parking modules are designed within the Australian Standard for Class 1 parking. There may be opportunities to consider parking areas for smaller cars, car share or electric or hybrid vehicles to encourage more sustainable travel choices.

4 ESD in buildings

DGR: *Demonstrate that the development can achieve a minimum 4 Green Star rating, or any other suitable accredited rating scheme.*

The documentation for the purposes of seeking concept plan approval for the RFW site is not yet at the level of detail where the majority of the sustainability elements have been identified. Steps have been taken to ensure the buildings meet the eligibility criteria for a Green Star rating where applicable and that the Concept Plan details appropriate elements to enable the potential achievement of a rating.

4.1 BUILDING RATING SYSTEMS

There is no one rating tool currently available that can demonstrate a sustainability rating for the entire development of the site at RFW. The GBCA is currently preparing a rating tool for Communities and another for Custom developments that may in the future be applicable across the range of proposed uses on the site. The GBCA currently has applicable Green Star tools for the education and residential components of the development. There are other GBCA tools for retail and health facilities however they are not applicable to the scale and form of development being considered.

This section of the report focuses on the ESD actions being considered for individual buildings within the Concept Plan and identifying the specific actions being undertaken at this stage to support the achievement of a potential rating under appropriate tools.

- Education – The educational component of the RFW development will be eligible for a rating under the GBCA Education v1 rating tool. An assessment was completed against this tool and those elements relevant to the concept plan phase have been determined and detailed where appropriate.
- Residential – The residential development will be subject to the criteria of BASIX and will be eligible for a rating under the GBCA Multi Unit Residential v1 rating tool. The relevant Concept Plan elements have been considered in this section.
- The hotel, retail, clinical facilities and accommodation associated with the RFW facility do not have applicable rating tools however it is proposed that these buildings would detail actions on water, energy and transport relevant to the appropriate approval stage and design detail. Some of the Concept Plan actions have been identified in this report and concepts for further consideration have been considered in this section.

For the appropriate Green Star elements for consideration a review of the building elements was undertaken against their relevant frameworks. This then determined the elements relevant at Concept Approval phase and those which are relevant to later Project Approval or construction documentation phases. The Green Star rating process requires the provision of detailed reporting and evidence at appropriate design development to achieve the rating. This includes evidence from construction documentation, short reports, tender drawings, specifications, as built drawings, commissioning reports and energy models on construction documentation. A fair portion of this detail is not yet developed at the concept plan stage for the RFW site. An assessment was undertaken against each of the tools to identify factors of design detail relevant to the concept plan phase to determine the points of focus for the design and documentation for the Concept Plan. These reviews can be found in Appendix B.

The following section provides an overview of the criteria for assessment under the appropriate Green Star rating tool relevant at the planning application phase. There are elements which are identified at the planning approval phase that show the early actions being proposed to progress towards a Green Star rating. The following section identifies some of those actions taken during the planning approvals phase to facilitate the achievement of the ESD objectives and the Green Star rating. Actions to progress these ratings will be further developed during project approvals or construction documentation.

4.2 EDUCATION

The aim of RFW in the construction of the new facility is to create a new centre for excellence for children's mental health and behaviour. The proposed education facilities include the construction of a new purpose built education facility and the renovation and upgrade of Drummond House. These buildings and associated works fall within in the eligibility criteria for the GBCA Education v1 rating tool. There are two options available to RFW in how a rating could be structured for the educational facilities. Under the Green Star criteria the options include:

- Single building certification, where selected campus buildings individually undergo assessment and receive individual ratings.
- Single certification for multiple buildings, where all the buildings are certified at the same time and awarded one rating.

The preferred option for rating will be determined in discussion with the GBCA in the preparation of the documentation for the project approval. The following table highlights some of the proposed actions for the educational facilities being considered at the concept plan phase.

TABLE 2 – GREEN STAR CATEGORY ACTIONS FOR THE EDUCATION FACILITIES.

STAR CATEGORY	FEATURES CONSIDERED
Indoor Environment Quality	Natural ventilation is a significant opportunity for the site at RFW. The site location is blessed with good air flow and air quality which will minimise the need for extensive mechanical ventilation systems. The building floor plates are relatively narrow and oriented to achieve maximum through breezes.
Transport	Council does not have a standard provision rate specified for the RFW facility. A conservative estimate has been made for the staff parking in the transport plan for both staff and visitors. Parking for small cars, car pool vehicles, and bikes are currently being considered in line with the Green Star tool credit criteria. As the site is well located for public transport, access credits would be achieved under the Community Mass Transport criteria.
Energy	The proposed development has an orientation that will maximise passive solar design principles. This will include natural heating and cooling, natural ventilation and good access to natural lighting. These are all factors considered under the Green Star energy criteria. The RFW facility has a relatively narrow floor plate that improves the buildings land use efficiency and passive energy design. Stairs will be provided for the facility, though it is recognised that lifts will be required. During detailed design at project approval phase, stairway design will be carefully considered to maximise use.
Water	Rain water harvesting is proposed as part of the Concept Plan. This water will be used for occupant amenity water, landscape irrigation and use in laboratories. This will form part of the sites integrated water management plan and will be detailed at project approvals stage.
Materials	The educational component of the development includes the reuse and renovation of the existing Drummond House building, maximising the cultural and embodied resources (energy, water and materials) in the existing facility. RFW would seek to recycle demolition waste and site cut where possible. The details of this will be prepared for the project approvals and during construction documentation.
Land Use and Ecology	The RFW facility would seek to gain credits for the reuse of land through increasing the efficiency of the site. Credits are also available through development on a site that has limited ecological value.
Emissions	Stormwater quality improvement will be managed through use of Gross Pollutant Traps, site permeability and stormwater harvesting.

It is proposed that the RFW education facility aims to achieve a minimum 4 Star Green Star rating under the GBCA's Education Rating Tool v1.

4.3 RESIDENTIAL

The proposed residential component of the Concept Plan would fall within the eligibility criteria for the Multi-Unit GBCA Green Star v1 but also within the requirements for certification under the NSW Multi Unit BASIX. The final details of the residential component of the development will be subject to future detailed design and project approvals however the concept design shows a number of elements that support the achievement of a Green Star rating under the Multi-Unit GBCA Green Star v1. It is also important to note that there will also be a need to achieve the multi unit BASIX criteria at project approval phase. The following features are key elements for consideration at the concept phase for the Residential GBCA Green Star tool. This identifies the category and the considerations as part of the Concept Plan:

TABLE 3 – GREEN STAR CATEGORY ACTIONS FOR THE RESIDENTIAL FACILITIES.

STAR CATEGORY	FEATURES CONSIDERED
Indoor Environment Quality	Natural ventilation is a significant feature of the residential design. This has been detailed in the concept plan in the preliminary SEPP 65 analysis (Figure 4). External views is also a criteria under the GBCA criteria which will also be a focus of the orientation and design.
Transport	The site has excellent proximity to pedestrian, cycling and mass transport infrastructure. The car parking being provided is at the minimum council rate for the residential facility. Cyclist facilities are proposed to be included in the development. RFW are investigating car sharing as a component of the development.
Energy	The site is well oriented in an Eastern / North Easterly orientation which facilitates solar access and the principles of passive solar design Figure 5. Light shelves are being considered for improved natural lighting. Limited glazing is proposed on the western façade and shading / privacy screens are also proposed.
Water	Stormwater collection is proposed for toilet and landscaping uses. Integrated water tanks are being considered as part of the proposal. Large trees with native grasses are proposed in the landscape plan. These will maximise WSUD and water efficiency of the landscapes.
Land Use and Ecology	The development is proposed on previously developed land. This limits the development's physical ecological footprint and increases the efficiencies of land already developed.
Emissions	Stormwater emissions from the site will be treated through WSUD and pollutant traps.

The following figures highlight some of the indoor air quality and energy principles applied in the Concept Plan for the residential units.

FIGURE 4 – CROSS VENTILATION OF RESIDENTIAL UNITS

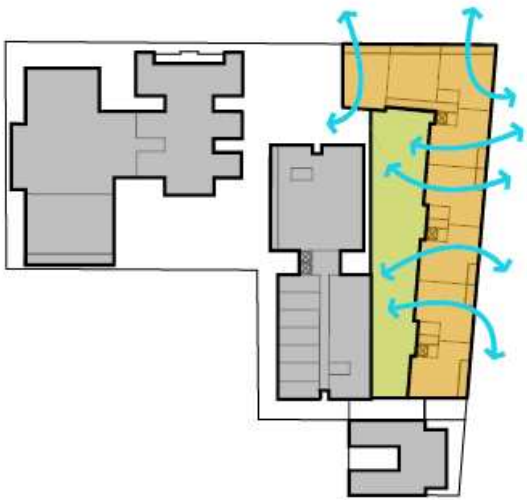
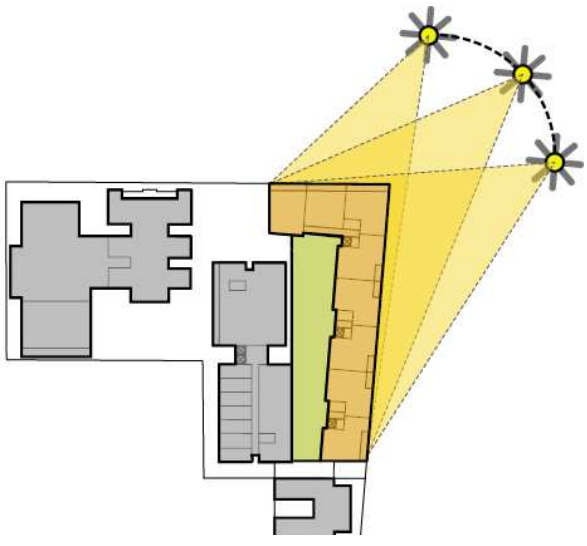
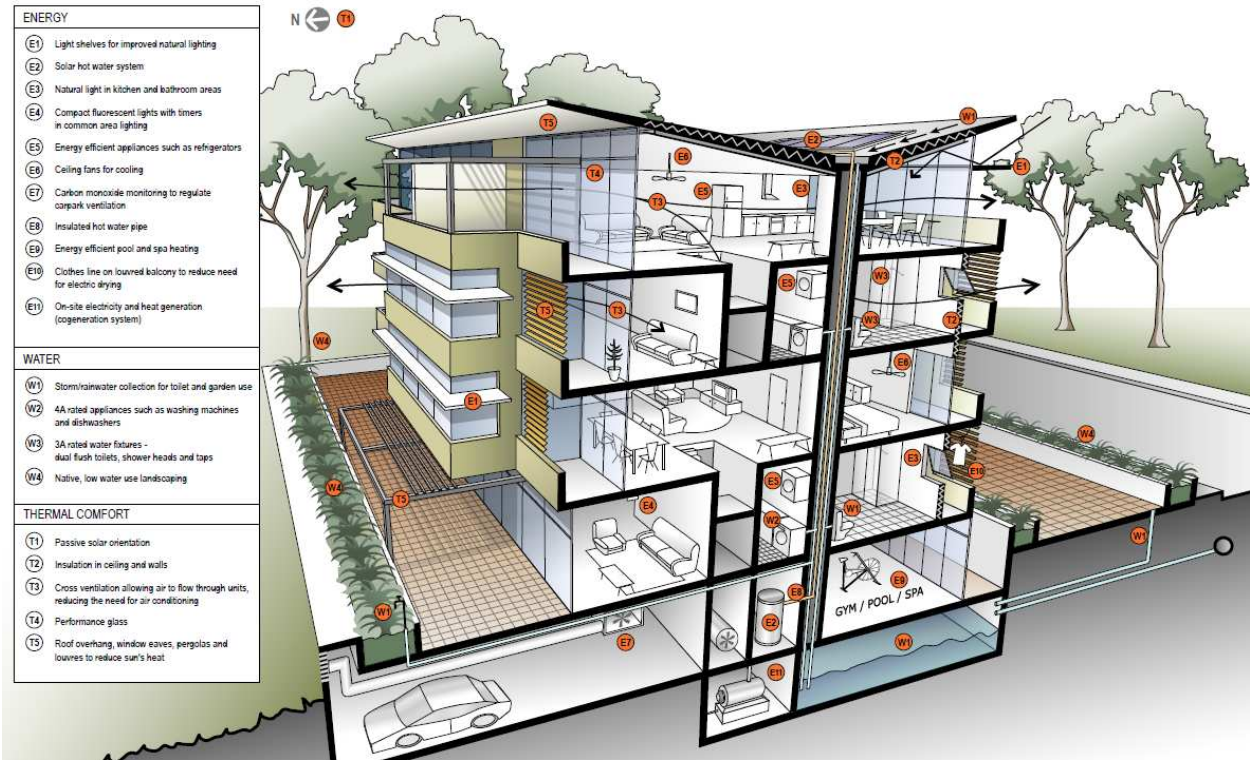


FIGURE 5 – SOLAR ACCESS



The proposed residential component of the development will also need to comply with the Multi-Unit BASIX. The following diagram is an example of typical features encouraged by the Multi-Unit BASIX. These will be considered for the proposed residential at RFW.

FIGURE 6 – SUSTAINABLE MULTI-UNIT FEATURES ENCOURAGED BY BASIX



Source: http://www.basix.nsw.gov.au/information/common/pdf/sustainable_feat_multi.pdf

A number of additional sustainability features are currently being considered and would be detailed in the project approvals phase. Examples include:

- Ceiling fans for cooling.
- Low energy lighting such as LED' with timers / sensors for common areas.
- Carbon monoxide monitoring in the car parks to regulate car park ventilation.
- High performance glass and shutters on the eastern façade to limit temperature / noise transfers.

There is also the opportunity on this site to consider small scale urban wind which is an emerging technology that could achieve good efficiencies within this coastal zone. Some examples of this technology are provided in the figures below. These opportunities would be further investigated in the next approvals phase.

FIGURE 7 – EXAMPLE VERTICAL AXIS WIND TURBINE

FIGURE 8 – EXAMPLE VERTICAL AXIS WIND TURBINE

Source: http://windenergydesign.com.au/wind_turbine.htm

It is proposed that the residential component of the development aims to achieve a minimum 4 Star Green Star rating under the GBCA's Multi-Unit Residential tool v1.

4.4 HOTEL

There are currently no recognised national environmental standards for hotels in Australia although there are a number of emerging sustainable design and operating principles under schemes such as Earth Check, Green Globe and case studies under the federal governments Energy Efficiency Best Practice Programs[5].

Environmental practices within hotels have historically been conflicted as there is a fine balance between the perception of luxury and some of the environmental practices and efficiencies seen in the industry. An American study found that 60% of travellers leave their environmentally-conscious behaviour at home when they check into a hotel (e-Newswire, 8/08/07). This creates some additional challenges when planning to address sustainability criteria in hotels.

The hotel facility proposed in the Concept Plan will seek to achieve both the perception of luxury and significant environmental efficiencies through careful design and maximising the assets of the site and the sites location. The following provides an overview of some of the sustainability considerations at concept plan phase and identifies some of the details for further consideration at project approval phase. Options considered for the Concept Plan include:

- Orientation considers the principles of passive solar design.
- Minimal glazing and shading proposed on western façade.
- Operable windows and natural ventilation proposed.

Examples of potential initiatives able to be considered for future approvals:

- Timers in hallways to turn off lights.

5 http://www.ret.gov.au/energy/efficiency/best_prac/Pages/default.aspx

- Fluorescent lights in guest rooms.
- Compact fluorescent lights in hotel common areas.
- If a pool is considered at later stages consider gas boosted solar or Gas heating.
- Water efficient shower fittings.
- Smart key switching to be installed within the rooms areas of the hotel.

Potential future management system initiatives include:

- Daily monitoring of electricity, gas and water and monthly resource reporting.
- Potential participation in EEBP's[6] hotels energy use benchmarking project, and also the Australian Greenhouse Office's Greenhouse Challenge Program.

It is proposed that at the project approval phase for the hotel will require the preparation and detailing of an appropriate response to energy, water and transport associated with the hotel.

4.5 INITIATIVES FOR OTHER USES

The other uses proposed on the site include retail, clinical facilities, parent and student accommodation, car parking and professional offices. None of these uses are either the subject of rating tools or at a scale where rating tools can be applied. Despite this, the Concept Plan has considered relevant ESD measures at this phase of these uses.

4.5.1 Retail

The proposed retail is too small to be rated under the GBCA Retail rating tool, however the location and design will enable good access to natural ventilation and lighting. The energy, water and transport impacts associated with these facilities will be assessed at detailed design phase.

4.5.2 Clinical facilities

There is increasing evidence that sustainable design practices can have a positive impact on health outcomes in clinical facilities. Though not directly applicable to the clinical facilities proposed as part of the RFW facility the Green Star rating tool Healthcare v1 provides some valuable benchmarks and initiatives for the clinical facilities. Further investigation into the environmental health benefits in the detailed design of the clinical facility may be valuable to the long term vision of RFW. If the proposed clinical facilities are greater than 1000m^2 GFA then the Healthcare rating may be applicable. This would be discussed with the GBCA at project approvals phase.

4.5.3 Car park

The car park will operate underneath a number of potentially Green Star rated facilities as well as non Green Star facilities. There are potentially significant efficiencies available though the use of a shared car parking facility in managing peak demands and car park efficiencies. Some other features to be considered in the detailed design phase include:

- Provision of ramps and stairs where possible to service the upper levels located along desire lines and clearly signed.
- Incorporate energy efficient lighting technologies (e.g. T5 Fluorescent, L.E.D., Metal Halide etc).
- For common car park area target lighting power densities to not exceed 1.5 W/m2 per 100 lux.

6 http://www.ret.gov.au/energy/efficiency/best_prac/Pages/default.aspx

- Car park ventilation on underground facilities can be a significant user of energy. Carbon monoxide monitoring and control should be employed in the mechanically ventilated sections of the car park to reduce fan energy consumption.

The project approval phase of all non Green Star portions of the development will prepare and detail an appropriate response to energy, water and transport.

4.6 OTHER ACTIONS TO BE CONSIDERED DURING DETAILED DESIGN

Other initiatives to be considered during detailed design include:

- Energy efficient lighting designed in accordance with relevant Australian Standards, with zoning, light level and motion detectors installed where possible.
- Sub-metering of water and energy to facilitate energy monitoring by tenants.
- Installation of water meters for major water uses, with monitoring of water consumption.
- Installation of water efficient fixtures and fittings.
- Preparation of a waste management plan that accommodates on-site provision for sorting and recycling of waste.
- Consideration of operable windows within the facades.
- Considering the role of ESD in the terms of the development partnership arrangement being sought. This may be in the form of joint venture responsibilities or development agreements.
- There may be opportunities to integrate the rainwater collection and meter its use across the range of uses across the development.
- Opportunities for site based energy generation facilities with costs and energy shared. Possibly include options around cogeneration / small scale wind / solar electric or solar thermal systems.

5 Conclusion

This report has given close consideration to the ESD requirements specified in the Director General Requirements for RFW. It demonstrates the incorporation of the principles of ESD into the Concept Plan, provides a description of the measures undertaken as part of the Concept Plan in relation to water, energy and transport, and provides a demonstration of the elements of the Concept Plan relevant to appropriate environmental rating systems.

Appendix A Recommended statement of commitments

A.1 Draft Statements of Commitments

The following draft statement of commitments is proposed:

- The educational component of the development commits to a minimum 4 Star Green Star Certified Rating under the Education v1 tool. These actions are to be further progressed in the project approvals phase.
- The residential component of the development commits to a minimum 4 Star Green Star Certified Rating under the Multi Unit Residential v1 tool. The appropriate actions to progress this target rating are to be further progressed in the project approvals phase.
- The residential units will be subject to the Multi Unit BASIX criteria.
- The project approval phase of the non Green Star portions of the development will prepare and detail an appropriate response to energy, water and transport.

Appendix B Green Star Demonstration Checklists

B.1 Green Star Residential v1

Category and title		Points available	Design phase: Planning documentation	Design phase: Construction documentation
Management				
	Green Star Accredited Professional	2	X	X
	Commissioning Clauses	2		X
	Building Tuning	1		X
	Independent Commissioning Agent	1		X
	Building Users' Guide	1		X
	Environmental Management	3		X
	Waste Management	2		X
	Metering	6		X
		18		
Indoor Environment Quality				
	Daylight	2	X	X
	Thermal Comfort	2		X
	Hazardous Materials	1		X
	Internal Noise Levels	2		X
	Volatile Organic Compounds	4		X
	Formaldehyde Minimisation	1		X
	Electric Lighting Levels	1		X
	Private External Space	1	X	X
	Dwelling Ventilation	3		X
	Natural Ventilation	3	X	X
		20		
Energy				
	Conditional Requirement			X
	Greenhouse Gas Emissions	20		X
	Unoccupied Areas	2		X
	Energy Efficient Appliances	2		X
	Peak Electricity Demand Reduction	2		X
		26		
Transport				
	Provision of Car Parking	2	X	X
	Fuel-Efficient Transport	2		X
	Cyclist Facilities	3	X	X
	Commuting Mass Transport	5	X	X
	Trip Reduction - Mixed Use	2	X	X
		14		
Water				
	Occupant Amenity Water	5	X	X
	Landscape Irrigation	1	X	X
	Heat Rejection Water	2		X
	Fire System Water	1		X
	Water Efficient Appliances	1		X
	Swimming Pool/Spa Water Efficiency	2		X
		12		
Materials				
	Recycling Waste Storage	2		X
	Building Re-use	6		X
	Recycled-Content & Re-used Products	1		X
	Concrete	3		X
	Steel	2		X
	Steel	2		X
	PVC Minimisation	2		X
	PVC	2		X
	Sustainable Timber	2		X
	Timber	1		X
	Design for Disassembly	1		X
	Dematerialisation	2		X
	Flooring	1		X
	Joinery	1		X
	Internal Walls	2		X
	Universal Design	1		X
		31		
Land Use & Ecology				
	Conditional Requirement	No		X
	Topsoil	1		X
	Re-use of Land	1	X	X
	Reclaimed Contaminated Land	2		X
	Change of Ecological Value	4		X
	Outdoor Communal Facilities	3		X
		11		
Emissions				
	Refrigerant ODP	1		X
	Refrigerant GWP	2		X
	Refrigerant Leaks	1		X
	Insulant ODP	1		X
	Stormwater	3	X	X
	Watercourse Pollution	3	X	X
	Discharge to Sewer	5		X
	Light Pollution	1		X
	Legionella	1		X
		18		
Innovation				
	Innovative Strategies & Technologies	2		X
	Exceeding Green Star Benchmarks	2		X
	Environmental Design Initiatives	1		X
		5		

Source: Green Star - Residential v1

B.2 Green Star Education v1

Category and title		Points available	Design phase: Planning documentation	Design phase: Construction documentation
Management				
	Green Star Accredited Professional	2	X	X
	Commissioning - Clauses	2		X
	Building Tuning	1		X
	Independent Commissioning Agent	1		X
	Building Guides	2		X
	Environmental Management	2		X
	Waste Management	2		X
	Learning Resources	1		X
	Maintainability	1		X
		14		
Indoor Environment Quality				
	Ventilation Rates	3	X	X
	Air Change Effectiveness	2		X
	Carbon Dioxide Monitoring and Control an	1		X
	Daylight	4	X	X
	Thermal Comfort	3		X
	Hazardous Materials	1		X
	Internal Noise Levels	2	X	X
	Volatile Organic Compounds	4		X
	Formaldehyde Minimisation	1		X
	Mould Prevention	1		X
	Daylight Glare Control	1		X
	High Frequency Ballasts	1		X
	Electric Lighting Levels	1		X
	External Views	1	X	X
		26		
Energy				
	Conditional Requirement			X
	Greenhouse Gas Emissions	20		X
	Energy Sub-metering	1		X
	Peak Energy Demand Reduction	2		X
	Lighting Zoning	1		X
	Lighting Zoning	1		X
	Unoccupied Areas	2		X
	Stairs	1	X	X
	Efficient External Lighting	1		X
	Shared Energy Systems	1		X
		30		
Transport				
	Provision of Car Parking	2	X	X
	Fuel Efficient Transport	1		X
	Cyclist Facilities	4	X	X
	Commuting Mass Transport	5	X	X
	Transport Design and Planning	1	X	X
		13		
Water				
	Occupant Amenity Water	5	X	X
	Water Meters	1		X
	Landscape Irrigation	3	X	X
	Heat Rejection Water	4		X
	Fire System Water	1		X
	Potable Water Use in Laboratories	2	X	X
		16		
Materials				
	Recycling Waste Storage	2	X	X
	Building Reuse	6	X	X
	Recycled Content & Re-used Products and	1		X
	Concrete	3		X
	Steel	2		X
	Steel	2		X
	PVC Minimisation	2		X
	PVC	2		X
	Sustainable Timber	2		X
	Timber	1		X
	Design for Disassembly	1		X
	Dematerialisation	1		X
	Flooring	3		X
	Joinery	1		X
	Loose Furniture	3		X
		32		
Land Use & Ecology				
	Conditional Requirement			X
	Topsoil	1		X
	Reuse of Land	1	X	X
	Reclaimed Contaminated Land	2	X	X
	Ecological Value of Site	4	X	X
		8		
Emissions				
	Refrigerant ODP	1		X
	Refrigerant GWP	2		X
	Refrigerant Leaks	2		X
	Insulant ODP	1		X
	Stormwater	5	X	X
	Discharge to Sewer	3		X
	Light Pollution	1		X
	Legionella	1		X
		17		
Innovation				
	Innovative Strategies & Technologies	2	X	X
	Exceeding Green Star Benchmarks	2		X
	Exceeding Green Star Scope	1		X
		5		

Source: Green Star - Education v1

Appendix C Registered Green Star Projects

C.1 Residential tool as at 1 March 2011

There are currently no residential developments awarded under the GBCA Residential tool. There were 4 awarded under the Pilot (phase before the tool went live)

- Convesso 8 Waterside Place 1 Waterside Place Victoria Harbour VIC Lend Lease 4 Star Green Star - Multi Unit Residential PILOT
- Lilyfield Housing Redevelopment 271-281 Balmain Road and 4-14 Edward Street Lilyfield NSW Housing NSW 5 Star Green Star - Multi Unit Residential PILOT
- Redfern Housing Redevelopment Project - East Site 57-75 Walker St. Redfern NSW Housing NSW 5 Star Green Star - Multi Unit Residential PILOT
- The Summer 40 south beach prom South Fremantle WA Match 2 Pty Ltd ATFT South Beach Development Trust c-o Match 4 Star Green Star - Multi Unit Residential PILOT

There are four developments currently registered under Design v1

- 75-77 Hopkins Street 75-77 Hopkins Street Moonah TAS *Registered for* Green Star - Multi Unit Residential Design v1
- Common Ground Supportive Housing 660 Elizabath Street Melbourne VIC YARRA COMMUNITY HOUSING LTD *Registered for* Green Star - Multi Unit Residential Design v1
- No.1 Central Park No.1 Central Park Avenue Chippendale NSW *Registered for* Green Star - Multi Unit Residential Design v1
- Upper West Side - Stage 1 613-649 Lonsdale St and 204-240 Spencer St Melbourne VIC Far East Consortium (Australia) Pty Ltd *Registered for* Green Star - Multi Unit Residential Design v1 Verve Village Stanfield Drive Old beach TAS *Registered for* Green Star - Multi Unit Residential Design v1

Registered for as Built

- Clayton NRAS Housing Clayton Campus, Wellington Rd Clayton VIC Monash University *Registered for* Green Star - Multi Unit Residential As Built v1

C.2 Education tool as at 1 March 2011-04-19

There are 48 registered projects under the Green Star Education Design v1 though only 13 are currently certified.

- Bellbird Park P-7 Primary School Lot 905 on SP202613 Brittains Road Bellbird Park QLD Department of Education and Training (QLD) 4 Star Green Star - Education Design v1
- Australian Institute for Management Stage 3 76 Birkdale St Floreat WA Australian Institute of Management Human Resources Development Centre Inc 6 Star Green Star - Education Design v1
- Thornlands South P-7 Primary School Corner Ziegenfusz Road and Vintage Drive Thornlands QLD Department of Education and Training (QLD) 4 Star Green Star - Education Design v1
- East Coomera P-7 Primary School 81-87 Finnegan Way Coomera QLD Department of Education and Training (QLD) 5 Star Green Star - Education Design v1
- Energy Australia Learning Centre 48-50 Holker Street Silverwater NSW Energy Australia 6 Star Green Star - Education Design v1
- Innova 21 University of Adelaide, North Terrace Adelaide SA University of Adelaide 6 Star Green Star - Education Design v1
- International Microsimulation Centre University Drive South, UC Campus Bruce ACT University of Canberra 5 Star Green Star - Education Design v1
- Central Gippsland Institute of TAFE Nerrena Road Leongatha VIC Central GippsTAFE Institute of TAFE (GippsTAFE) 5 Star Green Star - Education Design v1
- Parkville Neuroscience Development University of Melbourne,, Parkville Campus between Gate 12, Genetics Lane and the Microbiology building Parkvillle VIC University of Melbourne 5 Star Green Star - Education Design v1
- Peregian Springs P-7 Primary Corner Ridges Boulevard and The Avenue Peregian Springs QLD Department of Education and Training (QLD) 4 Star Green Star - Education Design v1
- RMIT Advanced Manufacturing Precinct (AMP) (Building 55) 58 Cardigan Street Carlton VIC Royal Melbourne Institute of Technology 5 Star Green Star - Education Design v1
- Swinburne ATC 427 Burwood Road Hawthorn VIC Swinburne Limited 5 Star Green Star - Education Design v1
- Collingwood Park P-7 Primary School Lot 999 on S170613, Collingwood Drive Collingwood Park QLD Department of Education and Training (QLD) 4 Star Green Star - Education Design v

http://www.gbca.org.au/greenstar-projects/

Appendix D Education facilities – possible design and sustainability initiatives

D.1 School design and ESD

There is a growing body of research that has found a statistically significant relationship between the condition of a school or classroom and student behaviour and achievement. Spatial configurations, noise, heat, cold, light, and air quality affect students' and teachers' ability to perform[7]. Some research concludes that needed are clean air, good light, and a quiet, comfortable and safe learning environment. It is understood that these environments can be achieved through adequate funding, innovative design, construction and maintenance.

Internationally, sustainable design strategies including daylighting, the specification of sustainable and non – toxic building materials, and the use of renewable energy resources are gaining attention in school design[8]. Such initiatives may have a positive impact on student health and safety, academic results, teacher retention and reduction in school energy and operational costs. Innovative elements of best practice educational facility design are discussed by the American Institute of Architects and include initiatives such as quieter spaces for individual study, view windows scaled to students ages and sizes, display and presentation surfaces, outdoor amphitheatres and energy and water saving solutions such as rainwater harvesting and solar panels[9].

Ohio School Facility Commission (OSFC) offers an example of best practice planning and provision of school facilities. The Commission works to assist Ohio school districts fund, plan, design, and build or renovate schools, promoting the design and construction of green sustainable school buildings. The commission work with school districts, design professionals and members of the education community to align Ohio's school construction program with the needs of 21st century learners[10]. The *Ohio School Design Manual*[11] is a comprehensive set of standard guidelines for the design of school facilities and has been developed by OSFC staff, in cooperation with architects and nationally recognised educational planners. The Manual provides a wide selection of high quality materials and systems to serve the schools over the entire life cycle of the buildings. It is updated annually and is a cornerstone of the Commission's efforts to promote the 21st century learning environment, providing guidelines that serve the diverse needs of local school communities and their students.

Closer to home, their have been drivers to incorporate sustainable design practices in to the design of school facilities. The Victoria Governments' Department of Education and Early Childhood Development have produced an *Environmental Sustainability Strategy* The *Australian Sustainable Schools Initiative*, a partnership of the Australian Government and the states and territories, brings to the forefront the important role schools play in the sustainable management of resources and facilities. The initiative seeks to support schools and their communities to become sustainable, with schools in Victoria and NSW taking part in a successful pilot from 2002-2004 which engaged schools to take part in best practice sustainability education.

In addition, the Green Building Council of Australia's introduction of the new voluntary sustainability rating tool for school buildings, the *Green Star – Education v1* tool, which assesses the environmental attributes of new and refurbished education facilities in Australia represents another sustainability driver for school design in Australia.

The *Australian Sustainable School Initiative* and *Sustainable Schools NSW* [13]are raising the awareness of environmental sustainability and encouraging the implementation of sustainability education initiatives, innovative design practices and sustainable building innovations are areas of potential growth for schools in NSW.

7 Schneider, M 2002, *Do School Facilities Affect Academic Outcomes?*, National Clearinghouse for Educational Facilities, Washington DC.

8 Whole Building Design Guide, 2010, *Educational Facilities*, National Institute of Building Sciences, Washington DC.

9 Fielding, R 2007, *Six Elements of Educational Facility Design*, American Institute of Architects.

10 Ohio School Facilities Commission 2011, Ohio Government, accessed 13 January 2011, < http://osfc.ohio.gov/Home.aspx >

11 Ohio School Facilities Commission 2010, *Ohio School Design Manual*, Ohio Government, accessed 13 January 2011, < http://osfc.ohio.gov/Library/OhioSchoolDesignManual/2010OhioSchoolDesignManual.aspx >

12 Victorian Department of Education and Early Childhood Development 2009*, Looking Ahead DEECD's Environmental Sustainability Strategy,* State of Victoria, accessed 12 January 2011, <http://www.eduweb.vic.gov.au/edulibrary/public/schadmin/environment/lookahead.pdf>

13 http://www.sustainableschools.nsw.edu.au/

Appendix E Hotel design considerations

E.1 Green Globe and EarthCheck

EarthCheck (the most recent version of Green Globe) is a program currently used by tourism and travel organisations around the world, to validate their carbon claims and guide their sustainability initiatives. It is the largest environmental benchmarking, certification and management solution in use by the tourism industry. EarthCheck compares business efficiencies against relative benchmarks to assess the sustainability of business practices and identify where opportunities exist for increased efficiencies. EarthCheck assesses performances of 10 key areas:

- Greenhouse Gas Emissions
- Energy efficiency, conservation and management
- Management of freshwater resources
- Ecosystem conservation and management
- Management of social and cultural issues
- Land use planning and management
- Air Quality protection and noise control
- Waste water management
- Solid waste management
- Storage of environmentally harmful substances

The EarthCheck Program was developed by the Sustainable Tourism Cooperative Research Centre and EC3. It was originally used to underpin larger brands such as Green Glove, through its wholly owned subsidiary Green Globe Asia Pacific. EarthCheck undergoes annual upgrades to ensure it remains aligned with advances in climate change science and sustainable technologies. http://www.earthcheck.org/en-us/wp/EarthCheck-Brochure.aspx. EarthCheck is now a highly respected independent product, independent of Green Globe.

An abbreviated version also exists in the form of EarthCheck Assessed that acts as a preliminary online tool deigned for businesses to commence addressing sustainability and climate change without fully engaging in a full EarthCheck in the immediate future. EarthCheck Assessed acts as an online Health Check Framework.

Appendix F Definition of Ecologically Sustainable Development ESD

The Environmental Planning and Assessment Act 1979 adopts the following definition of Ecologically Sustainable Development from the POEOA 1991.

Ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

(a) the precautionary principle-namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

> *(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
>
> *(ii) an assessment of the risk-weighted consequences of various options,*

(b) inter-generational equity-namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

(c) conservation of biological diversity and ecological integrity-namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

(d) improved valuation, pricing and incentive mechanisms-namely, that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays-that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

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