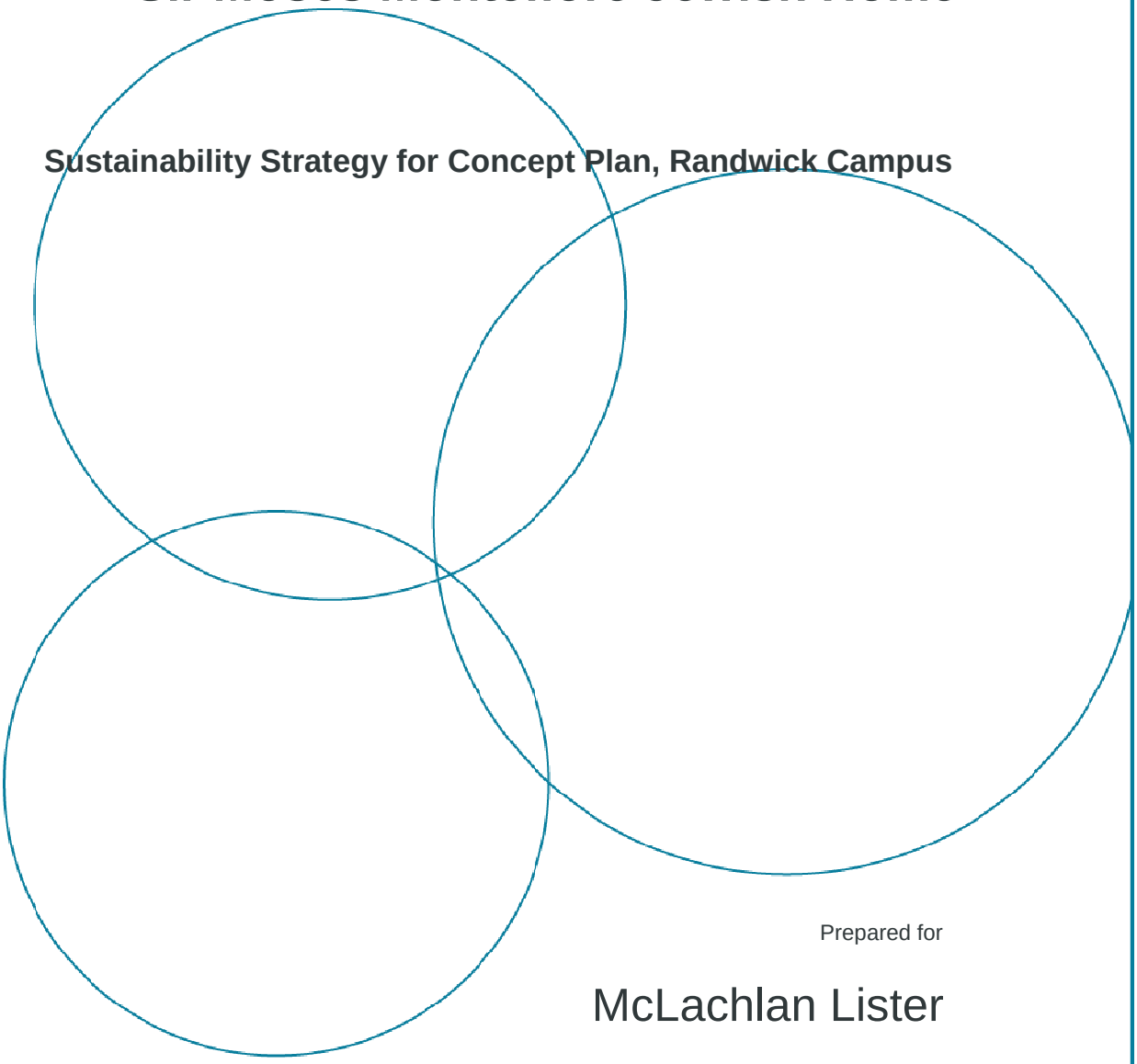
Monday, 6 September 2010

Sir Moses Montefiore Jewish Home

Sustainability Strategy for Concept Plan, Randwick Campus



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1. Executive Summary

Montefiore's philosophy is based on enhancing the quality of life of the aged community. This is balanced with an understanding of its responsibility to future generations to use resources wisely. Montefiore is committed to supporting a sustainable future and recognises the business and environmental benefits associated with reducing or minimising the use of essential resources, such as water and energy.

Sustainability Principles:

- To promote conservation amongst employees and stakeholders through education and awareness programs
- To investigate opportunities to reduce usage and to implement those strategies that are both achievable and financially viable
- To utilise data collection as a means to monitor usage patterns, identify abnormalities for appropriate investigation and to quantify the success of conservation strategies
- To ensure that sustainability is included as a factor for consideration within the purchasing/procurement decision-making process.

Examples of how this translates into their current facility and operations at Randwick include:

- Commissioning of an energy audit last year to review energy use and identify areas for improvement at the facility
- Rainwater tanks for irrigation of landscape, which is primarily planted with native, drought-tolerant species

In keeping with this commitment, Montefiore is targeting a high level of sustainability performance in this proposed expansion.

The Director-General's Requirements nominate that the following be demonstrated with regard to sustainability:

1. The EAR shall detail how the development will incorporate ESD principles in the design, construction and ongoing operation phases of the development.
2. The EAR must demonstrate that the development has been assessed against a suitably accredited rating scheme to meet industry best practice.
3. The DGR's nominate BASIX as a relevant SEPP.

Each of these requirements is addressed under a separate heading in the remainder of this document.

As a summary, the Concept Plan for the Montefiore Randwick Campus has developed best-practice sustainability strategies that provide a considerable benefit to the new building as well as providing benefits in operational performance to the existing building. We propose the following commitments for the new project:

- Carbon: to achieve a reduction of 40% compared against the existing building.
- Water: to achieve a reduction of 25% compared against the existing building.
- IEQ: to provide increased levels of indoor environmental quality through additional fresh air levels and daylight. An improvement of 50% increases in fresh air over code compliance has been recommended.
- Materials: commit to assessing alternative, environmentally-friendly materials. A matrix of business-as-usual materials will be assessed against a suite of

environmentally-friendly materials and tested in terms of fitness for purpose, durability and performance.

- Long term improved performance: A commitment to establish a review panel that assesses annual resource usage and aims towards achieving the City of Sydney sustainability targets of a 70% reduction in carbon by 2050.

Some of the key sustainability initiatives that have been integrated to achieve these targets into the project include:

1. Cogeneration: A micro gas-fired cogeneration unit that provides a low carbon solution to base building energy generation, recycling all the heat for supplying the domestic hot water and pool heating in the new and existing buildings. This technology is a considerable investment for Montefiore with a long-term vision to reduce carbon emissions. The new building will reduce operational carbon emissions by 40% compared to the existing building's performance.

2. Improved fresh air: Planning principles were established at the beginning of the project to promote natural ventilation and daylighting throughout. The ventilation for the building will work under a number of different modes depending on external conditionals. Openable windows are provided throughout and on the hot and cold days the building will be heated and cooled by an efficient VRV system that pumps 50% more fresh air through the building.

3. Laundry water savings: The laundry within the existing building supplies a number of offsite operations and was a focus for water conservation. This laundry processes 34,000kg of laundry per month which equates to approximately 10.5 Mega litres of water per year. The proposal is to supply the laundry with recycled rainwater from the roofs of proposed Buildings D and E which would mean an overall 25% reduction in water usage for the new building in comparison to the existing.

4. Long term carbon reduction strategy: Montefiore has fully embraced a long term strategy to continually improve the operational performance of the facility and reduce its carbon footprint. Montefiore is committed to:

    - Reviewing the energy, water and waste bills annually.
    - Reviewing renewable energy trends/technologies and potential funding opportunities annually.
    - Targeting continual incremental improvements in carbon reduction to achieve a 60% to 70% reduction in carbon by 2030 which is in excess of the City of Sydney's new sustainable targets and in line with current global carbon reduction targets.

ESD Principles for Design, Construction and Operation

Design

The building solution has considered the following:

- Management:
    - All of the consultant team have direct project experience in sustainable solutions, and some of the individuals have formal qualifications in the field.
    - Comprehensive pre-commissioning, commissioning and quality monitoring will be included as part of the contractual requirements for the BCMS, mechanical, electrical and hydraulic systems. Building Tuning will also be required.

- The Montefiore facilities management team has been consulted throughout the design process for lessons learned and briefing on preferred solutions.
- The current BCMS will be expanded to include the new facilities.

- Energy:
  - Lighting- a 40% reduction in the annual energy consumed by the lighting system- this will be a combination of lighting controls and efficient LED lighting.
  - Small power- a 20% reduction in small power by reviewing the equipment that residence are using such as TV's, plug in heaters etc.
  - Cooling- a 40% reduction in cooling through the use of reed switches, improved natural ventilation, controls and room ceiling fans.
  - Domestic hot water- a 20% reduction in energy via more efficient appliances and tap ware.
  - Base building systems- a 20% reduction in energy consumed with the base building systems - strategies for this are currently being investigated.
  - Adoption of a 130KWe cogeneration system for domestic hot water and pool heating with base building power supply supplying the new and existing building.
- IEQ:
  - Daylight: low e glass has been selected to improve the energy performance of the building whilst improving the daylight levels. A design approach of planning corridors so there is daylight at either end of the corridor has also been adopted.
  - Natural ventilation: Dedicated natural ventilation openings are provided for all bedrooms. Reed switches will be provided so that air conditioning and natural ventilation cannot be used at the same time.
  - An improvement of 50% increases in fresh air over code compliance with the use of heat recovery units so there is a minimum energy impact.
  - Use of low- or no-VOC paints, adhesives and sealants throughout.
- Water:
  - Recycled rainwater for irrigation and existing laundry.
  - More efficient appliances/ tap ware.
  - Overall the new building will reduce potable water consumption by approximately 25% compared to the existing building.
- Materials:
  - A matrix of business-as-usual materials will be assessed against a suite of environmentally-friendly materials and tested in terms of fitness for purpose, durability and performance.
- Land Use and Ecology:
  - The landscape design incorporates native, non-invasive plant species which will require less irrigation, fertiliser and pesticides; and will provide habitat for native birds.
- Transport:
  - A staff transport survey has been undertaken to understand current patterns and preferences for commuting. Some 20% of staff uses the bus, and the remainder travel by car. On-site parking has been provided at just over DCP requirement levels to strike an appropriate balance between addressing community concerns and not discouraging the use of public transport.
  - Montefiore requested the addition of a stop nearer its property to further increase the use of public transport in late 2008, but this request was not supported by the majority of the community in the area, and was not implemented.
- Emissions:

- The stormwater design maintains TPP, TN and TSS levels at current levels based on a 1 in 100 year storm event. This is achieved via the expanded rainwater collection and a large detention tank at the northwest corner of the site, which is covered by reed beds.
- Light Pollution will be addressed such that no external luminaries has an upward light output ratio that exceeds 5%, and the lighting design will comply with AS4282 'Control of the Obtrusive Effects of Outdoor Lighting' and demonstrate that no light spill is impacting neighbours or the night sky.

Construction

The Construction Management Plan has considered and addressed the following:

- Resource efficiency:
  - Operation of site sheds will be encouraged to be resource-efficient in terms of energy, water and recycling.
- Materials:
  - An 80% recycling rate target will be nominated for the builder for materials leaving the site.
- Transport:
  - Contractor and subcontractor staff will be encouraged to use public transport or carpools to get to and from site.
  - Some on-site parking will be provided for contractor and project management staff.
- Emissions:
  - An EMP will be provided by the contractor to minimise the environmental impact of stormwater quality and light and noise pollution
- Contractor:
  - The development of a project-specific EMP will be a contractual requirement for the builder
  - A general contractor with ISO 14001 accreditation will be sought.

Operation

The operations plans and targets have considered and addressed the following:

- Management:
  - Transfer of design team knowledge to operations team - and vice versa - will be undertaken throughout the design process. Detailed documentation will be provided to the operations team at handover, along with training of building management staff, particularly in the use of the BCMS.
  - Energy and water use will be monitored on a monthly basis to assess performance against the reduction target.
- Materials:
  - Building maintenance staff will be advised of any special cleaning regimes for alternative materials.
- Transport:
  - Staff will be encouraged to carpool or use public transport.

Assessment against a Suitably Accredited Rating Scheme

We appreciate the Department's requirement that this facility perform environmentally, and that such performance is evaluated in a rigorous fashion. The Department has stated that this should be demonstrated using a 'suitably accredited rating scheme'.

Possible sources for 'suitably accredited rating schemes' for the project include:

- The Green Building Council of Australia
- NABERS.

We have discussed the Green Star tools in relation to this project with the Green Building Council of Australia and as this project is an extension, it does not strictly meet the eligibility requirements of the Green Star tools. Furthermore, as an Aged Care project, it falls somewhere between the Healthcare and Multi-Unit Residential tools, making it difficult to rate effectively under either scheme. We understand that the GBCA is developing a PILOT tool for Aged Care facilities, but this tool will not be ready within the timeline of this project.

We have also reviewed the tools available under the NABERS scheme, and while they have a hotel tool and a multi-unit residential tool, they do not have an aged care tool.

For both of these schemes, using a tool that is not appropriate to the building type creates fundamental issues in the benchmarking of performance.

Fortunately, for this project, we have the benefit of a nearly ideal benchmark in the form of the existing facility. As an alternate approach, we propose the following commitments for the new project:

- Carbon: to achieve a reduction of 40% compared against the existing building.
- Water: to achieve a reduction of 25% compared against the existing building.
- IEQ: to provide increased levels of indoor environmental quality through additional fresh air levels and daylight. An improvement of 50% increases in fresh air over code compliance has been recommended.

- Materials: commit to assessing alternative, environmentally-friendly materials. A matrix of business-as-usual materials will be assessed against a suite of environmentally-friendly materials and tested in terms of fitness for purpose, durability and performance.
- Long term improved performance: A commitment to establish a review panel that assesses annual resource usage and aims towards achieving the City of Sydney sustainability targets of a 70% reduction in carbon by 2050.

The sustainability strategy proposed will achieve far in excess of the industry best practice for sustainability.

BASIX

As the majority of this development is classed 9c under the Building Code of Australia, it is not subject to BASIX. As with the issues described above regarding Green Star and NABERS, BASIX, as a residential benchmark, is difficult to apply to an aged care facility.

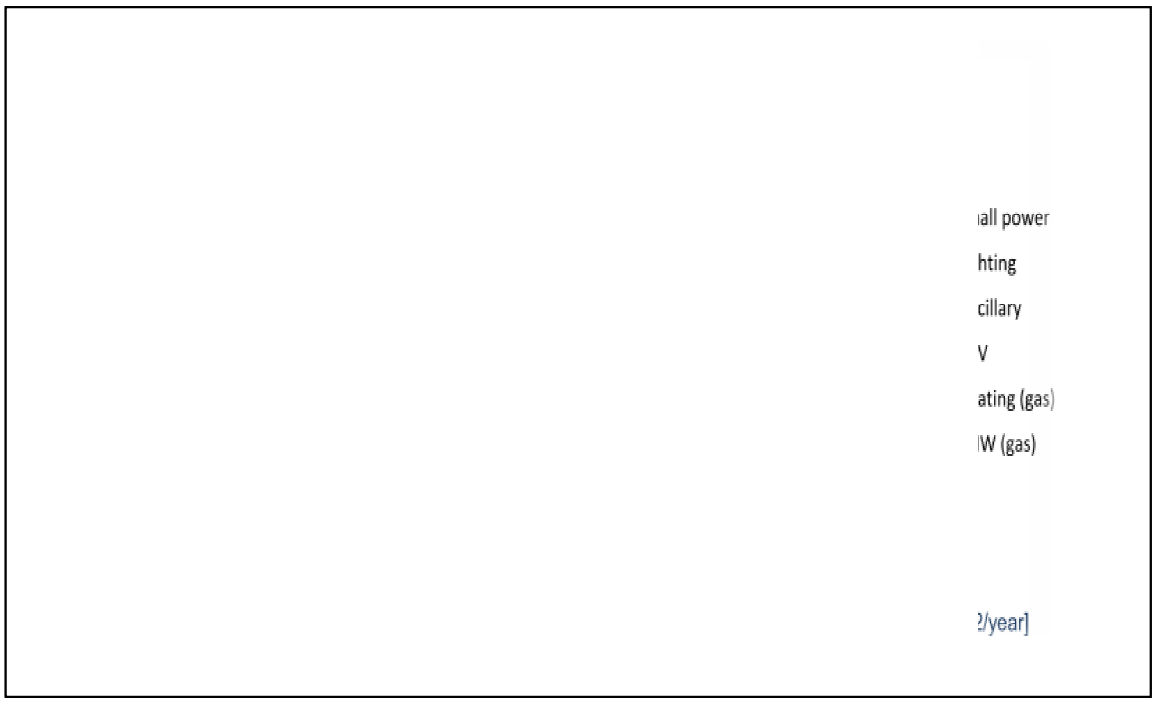
BASIX sets its benchmarks as an improvement against the aggregate performance of all building stock in NSW.

Our targets are set against a recently-completed facility that is already performing very efficiently in terms of both energy and water, and based on the benchmarking work provided in the next section, our assessment is that the targets nominated above for energy and water will meet or exceed the performance benchmarks of BASIX.

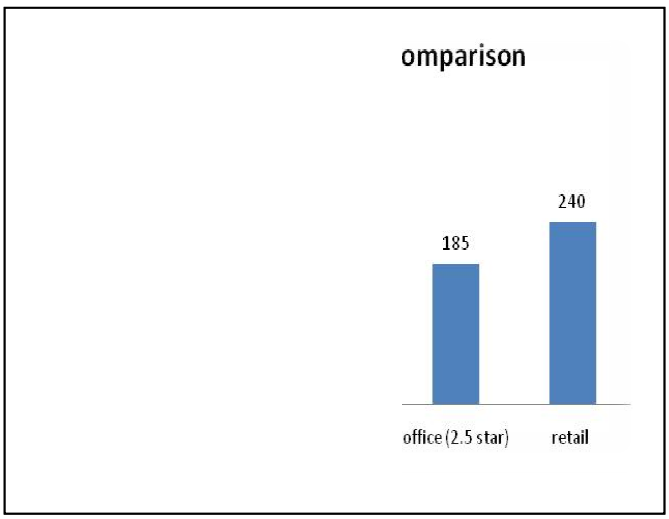
A BASIX Certificate will be provided for the self-care units in Building F.

2. Carbon reduction strategy

To determine the appropriate targets for the carbon reduction strategies, an audit of the existing building's performance was conducted. The pie chart below summarises the energy breakdown of the existing building- the lighting and small power contributed to 50% of the energy usage. A target for achieving a 40% reduction was established.



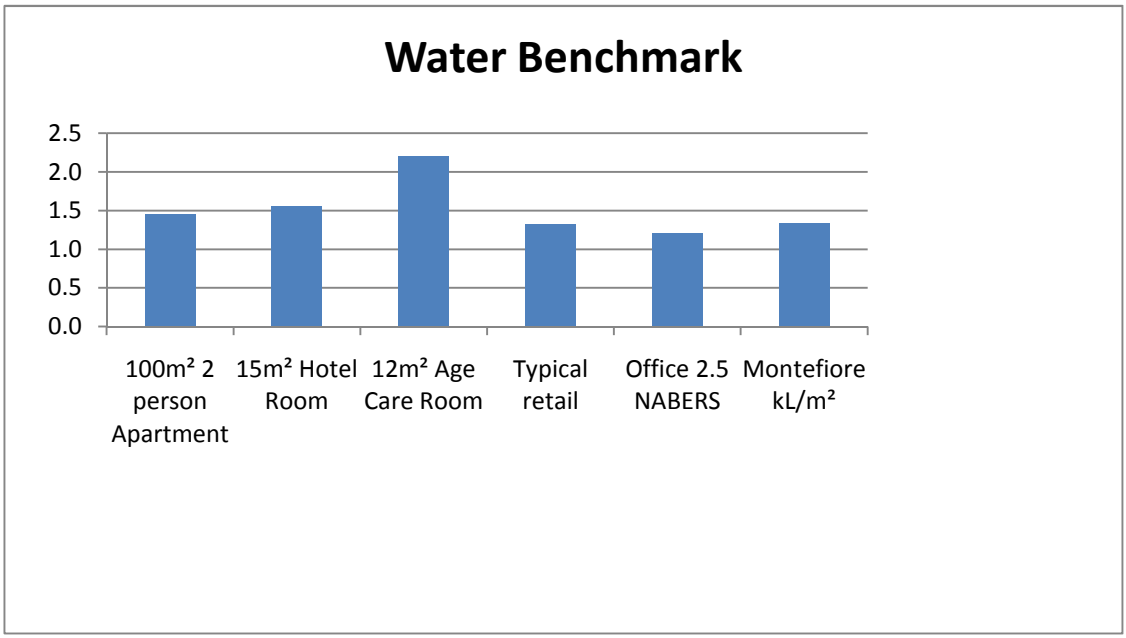
The table below illustrates the energy usage based on a per m^2 rate (on the left) and as a per person rate (right). Although for energy use the existing Montefiore building was in between a typical residential and hotel, which you might expect, but based on energy usage per person the building used considerably more energy.



This energy benchmarking exercise highlighted the operational differences that the Montefiore building has in comparison to other age care buildings.

3. Water reduction strategy

The following section details the water conservation strategy for Montefiore. The existing water bills were assessed and compared to a number of other simular building types:



The strategy has been to optimise the efficiency of the appliances and then consider water recycling options. The table below lists the efficiency of the water fixtures in the existing building and compares them to fixtures proposed in the new building. With more efficient appliances, alone, the there is a 14% saving in water consumption for the new building.

Fixture	Existing Building		Stage 2	
	Flow Rate	Rating	Flow Rate	Rating
WC	6L. full & 3 L. half flush	AAA	4.5L. full & 3 L. half flush	WELLS 4 Star
Basin	7.5 – 9 L/min.	AAA	4.5 – 6 L/min.	WELLS 5 Star
Shower	7.5 – 9 L/min.	AAA	7.5 – 9 L/min.	WELLS 3 Star
Sink	7.5 – 9 L/min.	AAA	6 – 7.5 L/min.	WELLS 4 Star

4. Long term carbon reduction strategy

The carbon reduction strategy for Sir Moses Montefiore has been to focus on a long term strategy to reducing carbon emissions. The design will achieve a 40% reduction in carbon in comparison to the existing building on an area basis. The intention is that a management structure is developed by Sir Moses Montefiore to review the annual energy performance of the building and assess the available current renewable energy options. The intention is to periodically invest in carbon reduction technologies as they become more available and competitive in terms of cost and payback.

As an example the cogeneration could be supplied by an available bio fuel in the future or replaced for a fuel cell.