ENVIRONMENTAL & SAVINGS REPORT

Some of the other ESD commitments are listed below. These are also listed later in the report, in relation to the BASIX assessment:

- Water-efficient fixtures (5-star taps, 4-star toilets, 4-star showers, etc).
- Energy-efficient whitegoods (fridges, dryers, etc)
- Rainwater for irrigation of landscaping and car washing.
- Recycling or reuse (closed loops) of water from fire pump testing.
- Efficient irrigation such as drip irrigation, timers and moisture -sensors for planters and gardens.
- At least 50% use by area of locally indigenous or "one-drop" water-efficient plants.
- Generous deep-soil allocation and planter bed gardens.
- Recycling of construction and demolition waste (over 80% of total waste by mass).
- The use of re-usable formwork for internal floors and core walls on site.
- Paints and floor-coverings with low VOCs and wood products with low formaldehyde (and VOCs), wherever possible.
- Water-based and low-emission paints where possible, for internal 'low-sheen' areas.
- Low-emission and (where practical) water-based paints for internal gloss or semi-gloss finishes.
- Fitout materials and finishes will include products with recycled content and/or certified as sustainable by GreenTag or GECA.
- Specification of sustainably sourced timber, where possible, using FSC or PEFC (for structure, skirtings, architraves, etc).
- PV solar power to provide power for common lighting or other uses
- Motion-sensors and time-based controllers (time clocks) for lights, ventilation, etc.
- Air quality (CO/CO2) monitors for the carpark ventilation system control and efficient, variable-speed fans.
- Light-colour roofs, generous vegetation and passive cooling to reduce ''urban heat-island effects''.
- Sensible access to and bus transport as well as an extensive network of bike paths.
- Generous Bicycle Parking.
- Investigation of suitable "Carshare" schemes and other private-vehicle-alternative schemes for the benefit of residents.
- Reduced Living and Operating Costs (water, gas and electricity bills will be reduced due to the good BASIX and NatHERS scores).

Thermal Comfort Summary

- Average NatHERS rating > 6.1 stars
- Average cooling load = 17 MJ/m2.year (permitted average is 26 MJ/m2.year) – approx. 40% better than minimum
- Average heating load = 33 MJ/m2.year (permitted average is 40 MJ/m2.year) – approx. 20% better than minimum

BASIX Summary

In summary, the BASIX scores were >25/25 for energy and >40/40 for water.

ESD Strategy (Environmentally Sustainable Development)

This project will be designed and built, in accordance with many best practice principles of "Ecologically Sustainable Development" (ESD). This following ESD discussion describes some of the initiatives relating to governance, indoor environmental quality, energy, water, transport, emissions, ecology, materials and community.

TRILOGY

Energy Efficiency

Greenhouse-gas reduction and energy-efficiency initiatives include:

- Development has achieved the BASIX Energy Score of 25 (5+ stories).
- Project scoring an average >6.1-star NatHERS rating across the development. This target is well above the minimum required to pass BASIX and this contributed towards the energy performance.
- Average cooling load < 17 MJ/m2.year (permitted average is 26 MJ/m2.year) – approx. 40% better
- Average heating load < 33 MJ/m2.year (permitted average is 40 MJ/m2.year) – approx. 20% better
- PV solar power to provide power for common lighting or other uses
- Lighting throughout the development will use LED technology (or high efficiency CFL's where appropriate).
- A building manager will be commissioned to undertake a formal building commissioning phase upon completion.
- Unit design included effective cross-ventilation, generous insulation, operable glazing and suitable shading devices. In particular, the corner dwellings, the dual aspect dwellings, the thermal mass and the large openings (such as bifolds) all helped the passive cooling and heating.
- Materials selected (especially concrete) provide thermal mass to control internal apartment temperature in winter and summer.
- Glazing was appropriately designed to reduce heat losses in winter, and to give opportunities for natural cooling in summer. Furthermore, performance glazing is proposed for all the development, including low-E throughout, tinting throughout and some double-glazing.
- External walls will contain high efficiency insulation to help reduce reliance on mechanical heating and cooling.

Energy

The design will seek to reduce energy consumption and greenhouse gas (GHG) emissions, by combining a well-designed building envelope and high-efficiency systems and services. Furthermore, smart controls, meters and automation will ensure that the major building services only operate when needed. Passive design principles have also been integrated (as discussed above) to reduce the demand on active systems such as HVAC and artificial lighting.

The following strategies will be investigated to improve energy efficiency:

- Use of renewable energy sources including PV solar power.
- Low-carbon hot water systems (gas, rather than electric)
- Efficient heating, ventilation and cooling (HVAC) systems including:
  - High efficiency chillers
  - Variable speed pumps & fans
  - Sensors or BMS to monitor and control building systems
  - Ventilation to include efficiency controls such as zoning and occupancy sensors
  - Common area ventilation to include efficiency controls such as zoning, motion sensors or time clock controls
  - Carbon Monoxide sensors and variable VSD fans in basement levels
- Passive systems such as passive heating, passive cooling and natural ventilation (through the intelligent use and positioning of thermal mass, window openings, glazing, shading devices, etc).
- Efficient lighting, sensors and efficiency controls (with mainly LED lights). This includes internal, external and public domain lighting.
- Some areas with shut-off switches for lights and non-essential power to be turned off when unoccupied.
- Appliances and whitegoods (where installed) will have good energy efficiency ratings.
- Efficient taps, showers and water-consuming whitegoods, which will hence reduce the hot water use, per capita.
- Minimised infiltration through weather stripping for doors and windows, dampers for exhaust fans and compliance with Section J.

Most of the above-mentioned strategies will also contribute to reducing peak electrical demand from the development. This factor is very important when it comes to reducing the stress on the surrounding energy networks and infrastructure.

Transport

The following alternative transport initiatives are being proposed to improve amenity, to promote occupant health and to reduce transport related GHG emissions.

Active Transport Facilities

Secured bicycle parking and associated facilities will be provided to for patrons and visitors.

Walkable Neighbourhood & Public Transport

The site is located near some amenities, however a 'walk score' of just 6 was achieved (see below). That said, a transit score of 78 was also achieved and this is regarded as being in the 'excellent' category. This transit score will be highlighted to the building users and encouragement of public transport will be implemented.

The project has been designed to optimise connectivity and pedestrian links within the site itself for "enhanced walkability". This will allow access to the numerous features within the site itself and also easy access to nearby amenities and public transport.

Electric car recharging stations

In order to encourage the use of sustainable motor-vehicle transportation, electric car recharging stations may be considered later, for inclusion within the development.

Water strategies

The following strategies will be used to reduce potable water consumptions. These initiatives may change slightly as detailed design is developed.

- Water efficient fittings, fixtures and appliances
- Rainwater harvesting and re-use on the site (10kL of storage for irrigation)
- Recycling or reuse (closed loops) of any water required for fire testing.
- Efficient irrigation such as drip irrigation to planters and gardens
- At least 40% use by area of locally indigenous or "one-drop" water-efficient plants
- Generous deep-soil allocation
- Use of permeable pavements and other alternative pavements
- Generous garden areas and green-roof gardens
- Efficient swimming pool and indoor location to reduce water losses

Material Selection

Materials used in the building industry are responsible for significant waste generation, resource depletion, GHG emissions and water consumption. To minimise these environmental impacts, the following principles will be considered for material selection on the site:

- Selection of certified timbers, especially those with FSC-certification
- Selection of Best Practice Certified PVC products (or avoidance of PVC)
- Design major building components for longevity, adaptation, disassembly, re-use and recycling
- Local procurement to support the local economy and reduce transport emissions
- Design for robustness - review the design and the materials to ensure durability for high-traffic surfaces and high-use fittings.
- Specification of sustainable products where appropriate, such as those with recycled content or potential for recycling
- Specification of products with third-party certifications (e.g. GECA or GreenTag) or those with EPDs (Environmental Product Declarations)
- Consider responsible steel products sourced from accredited steel makers and fabricators
- Consider portland cement reduction in concrete mixes by using industrial waste product such as fly ash

Community

The project will be designed to maximise community benefit. In particular, it will encourage active lifestyles, maintain good pedestrian and cyclist linkages and facilitate ample, safe social interaction. The project will also be designed to minimise other undesirable impacts on the community such as glare and light pollution.

The following strategies will be considered:

- Marketing and education strategies to convey the numerous sustainability practices to wider audiences
- Ensuring that the design and the building materials do not lead to hazardous, undesirable or uncomfortable glare to pedestrians, motorists or occupants of surrounding buildings
- Minimise light spill to the sky.
- Promotion of healthy and active living through various design and education strategies (for example, with cycling storage and facilities)
- Incorporation of crime prevention through environmental design (CPTED)

MERITON