WESTFIELD HURSTVILLE – ROOFTOP DINING, ENTERTAINMENT & LEISURE PRECINCT EXTENSION

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Ecologically Sustainable Report

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EXECUTIVE SUMMARY

This Ecologically Sustainable Development (ESD) report documents the sustainability commitments for the proposed development at Westfield Hurstville Shopping Centre.

The report summarises the key initiatives that Scentre Group will target to be implementing to deliver the benefits of best practice sustainable design as practically as possible.

The following ratings will be targeted for the development:

1. Retail – 5-star Green Star Design As Built equivalency.

This report defines the environmental commitments and performance outcomes to be achieved under the following environmental categories:

- Outdoor Environmental Quality

  Detailed climate assessments were carried out to determine prevailing site conditions including typical ambient air temperature distributions and wind directions. The project will endeavour to incorporate passive design features to respond to the local climate, local sun path and wind profile, with the aim of reducing the building's demand for active building services systems to provide thermal comfort and lighting and reducing peak energy demand and annual energy consumption. Passive design features have been considered for the development and these include the following:

  1. Canopies are to be designed to reduce direct solar gain into restaurant tenancies for energy efficiency.
  2. Selection and optimisation of building envelope and glazing of shopfronts to balance heat gain/heat loss thereby reducing heating/cooling energy.
  3. The site's microclimate provides suitable conditions during the shoulder seasons to support economy cycle and natural ventilation. A mixed mode system may be considered for the restaurants, i.e. reed switches to turn off active air conditioning when weather conditions area favourable and shop fronts are opened.
- Indoor Environmental Quality

  Initiatives in regards to improvement of indoor air quality, acoustics comfort, lighting comfort, visual comfort, indoor pollutants and thermal comfort were proposed to create a pleasant internal environment for the building's occupants. The following initiatives will be considered as the project progresses:

  1. Reduction of outdoor pollutants entrance into the tenancy space through positioning fresh air intakes at least 6m away from any discharge point.
  2. Provision of carbon dioxide sensors to ensure concentration levels of carbon dioxide is kept below 800 ppm.
  3. High efficiency filtration for further improvement on air quality by removing large percentage of contaminants from the air.
- Material & Resource Sustainability

  Standard best practice measures will be implemented and the use of recycled content in building materials will be considered further in a construction/environmental management plan as it is developed.

- Water Conversation Strategies
  The development will endeavour to reduce the consumption of potable water through water conservation measures such as incorporating water efficient systems, water consumption monitoring through building control management systems and water re-use where practical.
- Waste Management
  A range of demolition and construction waste management strategies will be considered as a construction management plan is developed during the construction phase to divert the amount of construction waste going to landfill. An operational waste management plan will also be considered during the operation phase of the building.
- Energy
  A list of energy efficient initiatives was proposed in this report and energy assessments will be carried out during the design stage of the project to target an energy improvement of 30% as compared to that of a NCC compliant building. The project will consider implementing:
  1. A highly efficient central plant to serve the development with an optimised operation through a Building Management Control System BMCS.
  2. A comprehensive metering and energy monitoring system.
  3. An adaptive comfort strategy involving a flexible space temperature set point that could be modified seasonally to suit extremes in weather conditions. This measure will reduce the energy consumption as well as ensure that customers and tenants are comfortable
- Transport
  The site is well accessible by public transport with the local train station located approximately less than 1km from the centre. Sustainable transport initiatives and provisions for low emission vehicle infrastructure are also considered in this report to help reduce greenhouse gas emissions arising from occupants travelling to and from the centre.
- Emissions
  The project will strive to mitigate the negative impacts to the environment through minimising pollution.
- Urban Ecology
  A landscape architect will be appointed to provide advice on the urban ecology and a revised landscape plan will be considered to outline the types of water-wise plants being used in the development.

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1 INTRODUCTION

1.1 The Project

The site is located in NSW, within South-West Sydney, 20 kilometres from the Sydney CBD. It is occupied by Westfield Hurstville and is a major regional shopping centre with over 250 specialty shops, 7 Major tenants (Big W, Kmart, Dan Murphy's, Woolworths, Coles, Aldi and Event Cinemas) with an existing Gross Lettable Area of approximately 61,231 sqm over 3 retail levels.

The Centre also includes Loading Docks, Basement parking with retail, Ground Level parking with retail, mezzanine and rooftop car parking levels. There is a total of 7 stories.

Westfield Hurstville is bounded by four street frontages being Cross street to the north, The Avenue to the east, Humphreys lane to the south and the west. Park Road also runs through the centre of the site. The total site area is approximately 98,000 sqm.

Proposed Development

Scentre Group and Dexus the Co-owners intend to redevelop a portion of the site to include an extension to the current Entertainment and lifestyle precinct.

It will compromise a new extended entertainment and leisure precinct (ELP). Alterations are proposed to existing Vertical transportation, and existing services plant rooms. Landscaping works include a new landscaped public domain area for community activities and events. Parking layouts on level 3 will be affected as well as new earthquake k braces in the existing centre. There will be a new larger amenities block, parents' room, kids play and stage. Additional tenancies will be introduced and will include Restaurants, cafes and retail tenancies; Tavern/pub (Recreation Facility with ancillary amusement), with associated storage and amenities.

1.2 Limitations

It should be noted that the environmental initiatives targeted by the development reflect the points which should be met by the Development at this early stage, however, this may vary during the Design development stage of the project to achieve the objectives of the project.

2 OUTDOOR ENVIRONMENTAL QUALITY

2.1 Environmental Professional

Scentre group will involve in-house accredited professional(s) who are enrolled in the Green Building Council of Australia's CPD Program from schematic design through to practical completion.

The professional(s) will be the project contact providing advice and support to ensure that the project team has access to information covering sustainability principles, structure, timing and process including:

- Environmental Categories
- Point allocation and scores
- Documentation and Compliance Requirements

The professional(s) will also deliver at least one workshop to the project team covering the topics above at project inception.

Furthermore, the professional(s) will also provide guidance and support at all stages of the project, as follows:

- Participate in meetings and workshops;
- Review documentation.

2.2 Climate Analysis

Local climate assessments were carried out to understand the prevailing weather conditions in Hurstville including the typical ambient air temperature, annual wind speed distribution and direction. For the purposes of this analysis, climate data were extracted from the Bureau of Meteorology (BOM) at the nearest weather station (Canterbury Racecourse AWS) to Westfield Hurstville which is approximately 9 km away. Weather files are constructed to represent the average conditions for the previous years and are commonly used for building energy simulation and allow building designers to test the effect that modifying design features will have upon typical annual conditions. In most instances this requires extensive, line by line manipulation of the data to ensure it is both complete and accurate.

2.2.1 Dry Bulb Temperature (DBT)

The following Figure 2-1 illustrates the annual distribution mean maximum and minimum dry bulb temperature of the climate revolved around Westfield Hurstville. It can be observed that air temperatures in Summer typically lies within the range of 18 – 29 degrees Celsius whereas in Winter, the air temperatures are expected to be in the range of 6 – 18 degrees Celsius. Climate data also reveal that the site is likely to experience extreme temperatures where the highest air temperature observed at the site was 45.9 degree Celsius and the lowest air temperature was -1.6 degree Celsius.

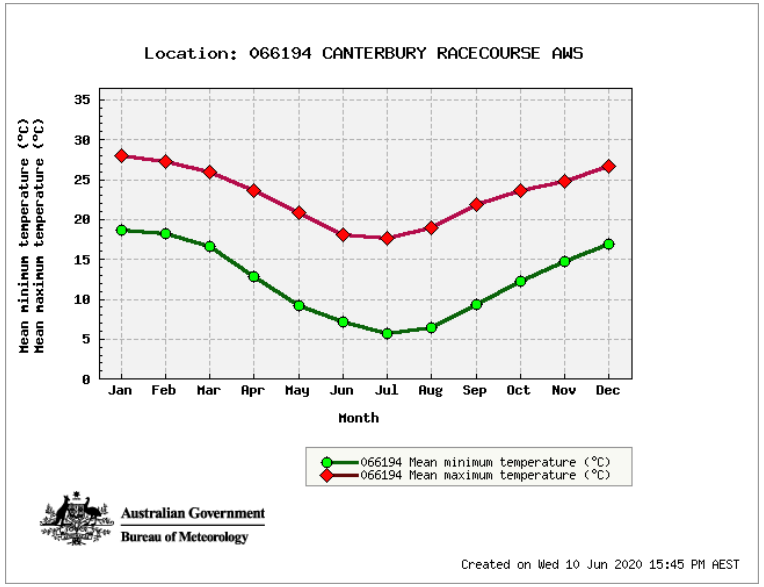

Figure 2-1: Annual Distribution of Outdoor Dry-bulb Air Temperature

2.2.2 Wind Study

Refer to Wind report by Windtech.

3 INDOOR ENVIRONMENTAL QUALITY

Scentre Group's purpose is to create extraordinary places connecting and enriching communities. This is supported by its commitment to design shopping centres mindful of customer's health and well-being. The following key initiatives are being targeted in creating an energy efficient space that is also focused on occupant well-being.

3.1 Indoor Air Quality

The entry of outdoor air pollutants to the space will be minimised. The building services will be designed to comply with AS 1668.2-2012 regarding minimum separation distances between pollution sources and outdoor air intakes. In addition, exceeding mandatory outdoor air rates by 50% to further dilute unpreventable internal pollution will be considered. Alternatively, it is proposed that a carbon dioxide (CO_2) monitoring system is to be installed to monitor CO_2 levels in the space and outside air supply to be modulated accordingly to maintain CO_2 concentration level in the occupied space below 800ppm.

3.2 Acoustic comfort

The project will have low noise plant so that the internal noise levels from all building services is in accordance with Table 1 of AS/NZS 2107:2000. Reverberation times are also proposed to meet the requirements of Table 1 of AS/NZS 2107:2016. This is expected to provide comfortable acoustic conditions for the occupants.

3.3 Lighting Comfort

Lighting comfort is a key initiative identified by Scentre Group. Scentre Group in-house lighting designers will ensure that all lighting systems are designed to maximise visual comfort, by adopting the following measures:

- Accurate colour perception of the space using high colour rendering index (CRI) fittings, flicker free lighting by use of high frequency
- Limiting glare by baffles, louvres, translucent diffusers, ceiling design or other means
- General lighting levels and quality comply with best practice guidelines
- In nominated areas, a combination of lighting and surfaces improve uniformity of lighting

3.4 Visual comfort

The project will deliver well-lit spaces that provide high levels of visual comfort to building occupants. The development of the ELP and retail will consider using architectural design (where practical) to harness available natural lighting into the space through shop front glazing but also with consideration to prevent direct sunlight penetration which can be achieved through solar access modelling.

3.5 Indoor Pollutants

All paints, adhesives, sealants, carpets, and engineered wood products used in the building will meet the maximum Total Volatile Organic Compounds (TVOC) limits to provide a safe and healthy environment for

the occupants. Emissions for each application will be acquired through recognised testing methods and reported through a recognised datasheet.

3.6 Thermal Comfort

Thermal comfort of the building will be assessed using the Predicted Mean Vote (PMV) method in accordance with the international standard for moderate thermal environments – determination of the PMV index and specification of the conditions for thermal comfort (ISO 7730). The PMV is an index that predicts the mean value of the votes of a large group of persons on the following seven-point scale as shown in figure 3-1 below.

Figure 3-1: Predicted Mean Vote (PMV) chart

The PMV index can be determined when the activity (metabolic rate) and the clothing (thermal resistance) are estimated, and the following environmental parameters are measured;

- Air temperature
- Mean radiant temperature
- Relative air velocity; and
- Humidity

A PMV of -1 to +1 corresponds to a Percentage of People Dissatisfied (PPD) of no more than 25% (i.e. 25% of the people are dissatisfied or uncomfortable). A PMV of -0.5 to +0.5 corresponds to a PPD of 10%. It is important to note that a PMV of 0 would still have 5% of the occupants dissatisfied or uncomfortable.

The development will be designed to achieve high levels of thermal comfort. This will include implementing the following design measures to target a PMV between ± 1, as a minimum:

- Maintaining Dry bulb temperature between 20°C and 24°C in the space.
- Maintaining a relative humidity level between 40% and 60%
- Maintaining air velocity to be no more than 0.2 m/s with no supply air directed at occupants
- Systems will be able to modulate with turn down capability
- Air conditioning zones will be provided separating perimeter from internal zones with separate air handling for these spaces
- Solar heat gain into the space will be restricted to less than 250 W/m² at the peak
- Total glazing u-value will be assessed using the NCC glazing calculator and will be as low as feasible.

3.7 Environment Quality – Summary

The project is aiming to create a pleasant environment for the occupant to inhabit by implementing initiatives to increase comfort and well-being and reducing their exposure to environmental contaminants.

4 MATERIAL & RESOURCE SUSTAINABILITY

The development strives to implement standard best practice measures to address the consumption of resources during the building construction phase and to reduce the environment impacts of building materials. The project will target to include building materials that are responsibly sourced or have a sustainable supply chain which uses energy-reducing processes in its manufacture. For steel framed structures, steelwork sourced from a responsible steel maker/steel contractor will be incorporated as much as practically possible. Details of these initiatives will be explored further in a construction/environmental plan as it is developed.

5 WATER CONVERSATION STRATEGIES

The project will implement initiatives with the aim to reduce the consumption of potable water through measures such as the incorporation of water efficient fixtures and building control management systems and water re-use where practical. Reductions in operational water consumption may be achieved through maximisation of water efficiency within a project through following initiatives:

- The selection of equipment that is more water efficient than comparable standard practice equivalents.

Fixture / Equipment Type	WELS Rating
Taps	6 star
Urinals	6 star
Toilet	4 star

Table 5-1: Summary of fittings and fixtures that will be proposed during design

- The use of water-efficient supplementary equipment.
- The selection of water-efficient toilets taps and showers.
- Precedent given to the specification of flora and fauna for any landscaping to be that of native origin with minimal water consumption.
- Integration of water metering and facilities management plans for prevention of excessive water consumption through leakages of amenities and hardware.

6 WASTE MANAGEMENT

A construction management plan will be considered during the construction phase to minimise construction waste as well as diverting the amount of construction waste going to landfill. During the design, consideration will be given to the appropriate collection, separation and management including the possibility of recycling/reuse of construction waste on site.

Recycling waste storage facilities including a 2 m^3 cage will be considered during the design development stage for the separation of waste streams to encourage operational waste recycling. Waste avoidance measures including incorporation of design solutions that make use of modular and prefabricated installations will also be considered during the construction phase. To explore further the mentioned initiatives, a detailed waste

management plan (WMP) will be developed by centre management as the development progress to the construction phase. The plan will mainly aim to address the requirements of separation of waste streams, dedicated waste storage area and access to waste storage area.

7 ENERGY CONSUMPTION

Scentre Group is conscious of their large energy consumption and on a national level, NABERS energy ratings are being carried out to determine the current performance of the centres. The redevelopment will aspire to exceed the performance requirements of the NCC Section J. Some of the design initiatives that may be implemented are as follows: -

- High efficiency HVAC aimed at lower operating emissions
- High performing glazing for restaurant shopfronts
- High efficiency LED lighting
- Incorporation of commissioning, maintenance and building tuning into the project programme
- Incorporation of ongoing monitoring trends from energy metering.
- Consideration to passive design to minimise the need for mechanical heating and cooling of spaces.
- Integration of shading devices and ventilation of facades to reduce solar heat gains into occupied spaces at high luminance periods of the day.
- Implement economy cycle and natural ventilation during favourable outdoor conditions.
- Consideration to adaptive comfort. The design team recognises that the building occupants adapt to prevailing external conditions, therefore, the perceived optimum thermal comfort conditions is likely to drift in the direction of the external climate to which they have been exposed. Adaptive comfort theory suggests that on an extremely hot day (40°C) a person is less likely to perceive the difference between an internal air conditioning set point temperature of 24 °C and 22 °C; therefore, there is an opportunity to save air conditioning energy by maintaining the internal environment at the higher set point temperature.

8 SUSTAINABLE TRANSPORT

Westfield Hurstville has good access to public transport with Hurstville train station located less than 1km away from the centre. It is expected that a large percentage of people within the Greater Capital City Statistical Area will be able to travel to the centre by public transport within 45 minutes during peak hour due to the proximity of these services.

Furthermore, the project will investigate the feasibility of implementing the following design and operational measures that reduce the carbon emissions arising from occupant travel to and from the shopping centre, when compared to a benchmark building:

- To dedicate car parks for fuel efficient vehicles (small cars, hybrids, motorbikes).

- Provide information regarding location of local cycle routes and public transport locations and timetables.

8.1 Walkable Neighbourhood

The development will provide improved connectivity including amenities that are easily accessible by the public and these include:

- Restaurants
- Food and Beverage outlets
- Supermarket

9 EMISSIONS

The project will endeavour to reduce emissions of the project with the aim of mitigating negative impacts to the environment through the following strategies (where practical):

- Demonstrate that the post-development peak event stormwater discharge from the site does not exceed the pre-development peak event stormwater discharge.
- Refrigerants and insulants will be considered for their ozone depleting potential;
- Minimising impacts of external light pollution to the local community.
- Best practice application of microbial controls within air conditioning systems.
- Refrigerant leak detection system will be considered to prevent local refrigerant emissions.
- It is a standard practice for Scentre Group to provide water treatment to any new cooling towers in accordance with the requirements of the Building Code of Australia Part F2. Regular Microbial (Legionella) Testing and Dosing of the system/s will take place directly when the system/s are placed in service. All water treatment works will be in accordance with the Public Health Act and /or AS/NZS 3666 series.
- All emissions, particularly kitchen exhaust arising from the new restaurants, will be discharged to the atmosphere in such a manner as to not impact negatively on neighbouring buildings, and/or members of the public. New systems will be designed in accordance to the AS1668.2-2012 requirements where all exhausts that are deemed objectionable by Australian Standards will be discharged upwards in a vertical direction above the roof. There will be minimum separation distances between any air discharges to air intakes and the building boundary.

10 URBAN ECOLOGY

Ecological value of the site will be preserved and initiatives such as

- Plantation of indigenous xeriscape species of plants to replace hardscape.
- Reducing the impact of heat island effects from hard surfaces

will be considered by the landscape architect to enhance the natural diversity of the site.

11 CONCLUSION

This report has reviewed and considered the applicable ESD requirements, rating tools and initiatives as required by Georges River Council for the proposed Hurstville ELP.

The series of specific initiatives proposed in this document are based on the following targeted ratings:

1. Retail – 5-star Green Star Design As Built equivalency.

This report demonstrates general compliance with the objectives of these requirements and is considered to sufficiently address DA requirements for ESD. The project is still to progress through detailed design, which will allow for changes and improvements to ESD commitments.