



Flower Power Terrey Hills Energy Efficiency & Sustainability Report For Statewide PM

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Introduction

This Energy Efficiency & Sustainability report has been prepared for Flower Power Terrey Hills development at 277 Mona Vale Road, Terrey Hills NSW 2084. This report supports a Development Application (DA) submitted to the Northern Beaches Council. The Energy Performance report is required under Manly LEP 2013 for commercial buildings with ground floor area of greater than 500m² to demonstrate compliance with the planning provisions for energy efficiency/ conservation contained in paragraph 3.5 of the Manly DCP 2013.

Building Description

The proposed development comprises of a garden centre and an open nursery building and ancillary uses including café, fruit and pet store, associated amenities, and a ground and a basement carpark located at 277 Mona Vale Road, Terrey Hills NSW 2084. The development is located within the Northern Beaches Local Government Area under BCA Climate Zone 5, warm temperate.



Figure 1: Flower Power Terrey Hills Site & Roof Plan (Ref: Dwg no. SK01, Rev C by Leffler Simes Architects)

Reference Documents

Drawings

This report is based on the following architectural drawings received –

Architect: Leffler Simes Architects,
7 Young Street,
Neutral Bay NSW 2153

The relevant documents and drawings used in compiling this report are as follows:

Project Number	Drawing No.	Revision	Drawing/ Document Title
4932	DA 15	10	Proposed Site Plan
4932	DA 100	10	Basement Plan
4932	DA 111 DA 112 DA 113 DA 114	6	Ground Floor Plan 1 of 4 Ground Floor Plan 2 of 4 Ground Floor Plan 3 of 4 Ground Floor Plan 4 of 4
4932	DA 115	6	Ground Floor Plan – Parking
4932	DA 120	8	Roof Plan
4932	DA 150	8	Elevation
4932	DA 151	8	Elevation
4932	DA160	8	Sections
4932	DA161	7	Sections
4932	DA162	7	Sections
-	-	-	Manly LEP 2013

Table 1: Reference documents

Energy Efficiency/ Conservation Opportunities

The project seeks to integrate energy efficiency and conservation measures where practically possible for the development.

Greenhouse gas emissions

The NCC 2019 Section J contains mandatory requirements for the design of building envelope and features to minimise energy use. The proposed development in this project will be designed to comply with the requirements as specified under NCC 2019 Section J, addressing the following.

- Building fabric
- Building sealing
- Air-conditioning and ventilation systems
- Artificial lighting and power
- Heated water supply
- Facilities for energy monitoring

Under NCC Section J Energy Efficiency, greenhouse gas emissions compare between a base case ("reference DTS building") and proposed development ("proposed building"), making sure that the proposed building performance better than the code compliance requirement. A copy of the Section J compliance assessment report will be submitted during Construction Certificate (CC) application stage.

Other potential energy efficiency measures are as outlined below and shared be considered, where feasible and practical throughout design development:

- The roof and ceiling design target to allow for 10% increase on the minimum required by J1.3 and J1.6.
- Roof upper surface solar absorptance shall allow for at least 0.05 less than maximum allowable value in Part J1.3.
- Skylights or roof lights U-value not exceeding 3.3W/m²K and SHGC of no more than 85% of the maximum allowable value in J1.5.
- Display glazing: U-value no more than 5W/m²K and SHGC no more than 85% of maximum allowable value in J1.5.
- Wall-glazing construction overall U-value at least 10% less than the allowable in J1.5.
- For wall exceed 80%, achieve 10% increase beyond J1.5 requirement.
- LED lighting design to achieve 10% reduction in lighting power density from the maximum allowable in Table J6.2a and be linked to automatic lighting control with daylight adjustment.
- Installed fan motor power and pump power is ≤ 15% and ≤ 10% respective lower than the maximum fan motor power and pump power in Specification J5.2a and Part J5, Table J5.2;
- Minimum energy efficient ratio (EER) for cooling ≥ 5% than the required minimum specified in Specification J5.2e.
- Energy efficient lift of Class A or B in accordance with ISO25745-2 and idle and standby energy performance level in accordance with ISO25745-2.
- Energy efficient escalator with performance class A+ to A+++ in accordance with ISO 25745-3.
- Domestic hot water system to be powered by either renewable energy source, electric heat pump with minimum COP 3.5 under design conditions or waste heat recovered from other processes.
- Maximise natural light and ventilation to reduce cooling and heating demand (e.g. mansards roof with roof lights for natural light and ventilation). The building has been oriented North to North-Easterly direction where it can benefit from prevailing cooling summer breezes which generally comes from North-Easterly direction in Manly.

Solar Photovoltaic System for Peak Electricity Demand Reduction

The proposed development has included the provision for rooftop solar photovoltaic system. This is located at a section of the Garden Centre that is tilted at 12 degrees towards the North direction. Solar panels shall be mounted on roof towards North to maximise the amount of sunlight received for conversion to solar energy.

This will assist to reduce reliance of grid electricity, and hence contribute to peak electricity demand reduction. Details and layout of the solar photovoltaic system can be referenced from architectural drawing roof plan. Electrical drawings and documentations shall capture the requirements as the project progress into detailed design stage.

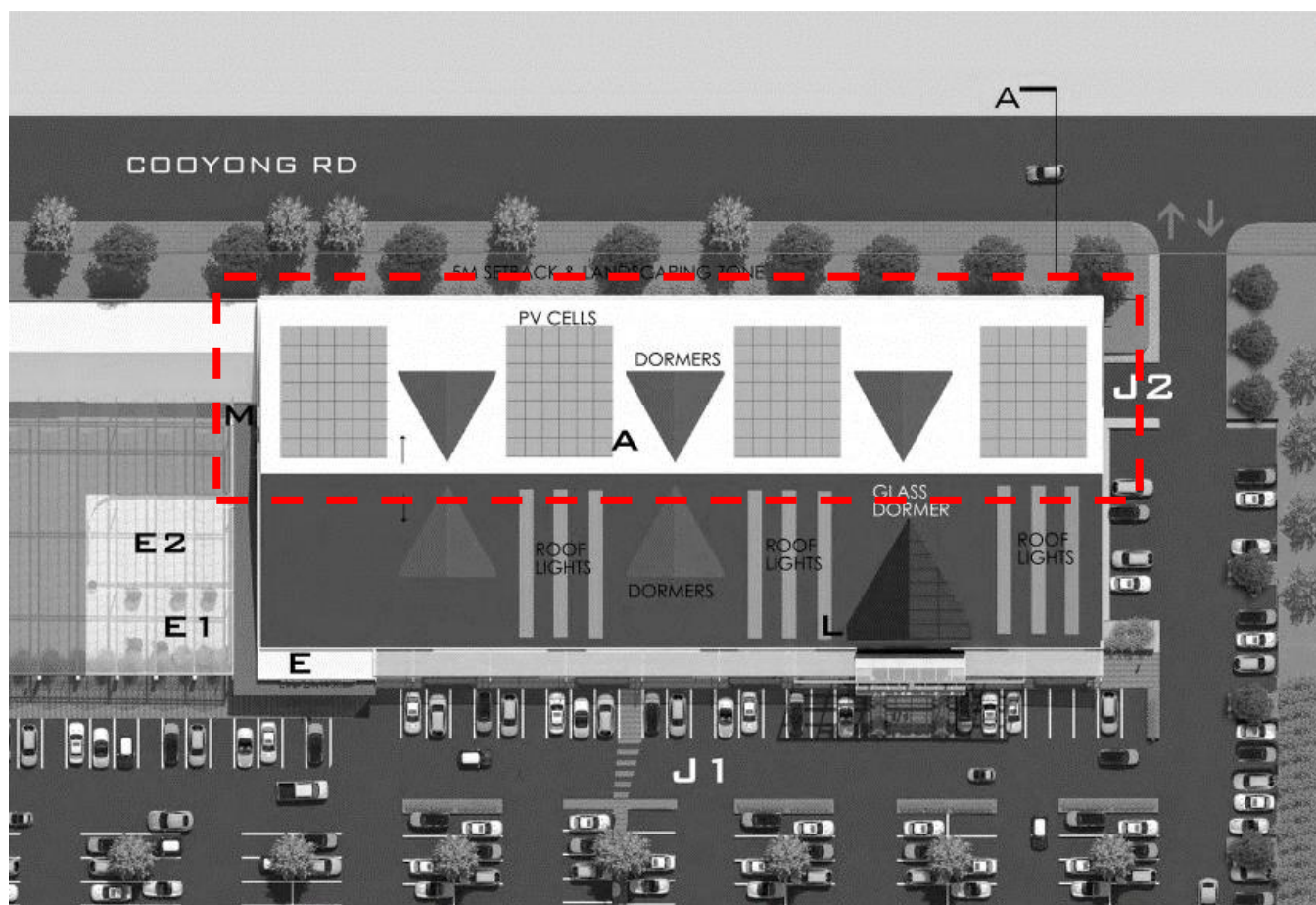


Figure 2: Flower Power Terrey Hills PV cells provision on Garden Centre North facing roof (Ref: Dwg no. SK01, Rev C by Lefler Simes Architects)

Energy Monitoring

The proposed development will be designed to comply with the minimum requirements as specified under NCC 2019 Section Part J8 Facilities for Energy Monitoring. The emphasis of Part J8 is on being able to maintain the required performance level such that excessive energy use can be detected and rectified, if arise.

In line with J8, a building with a floor area of more than 2,500 m² must have energy meters configured to enable individual time-of use energy consumption data recording, and must be interlinked by a communication system that collates the time-of-use energy consumption data to a single interface monitoring system where it can be stored, analysed and reviewed, of the energy consumption of:

- (i) air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and
- (ii) artificial lighting; and
- (iii) appliance power; and

- (iv) central hot water supply; and
- (v) internal transport devices including lifts, escalators and moving walkways where there is more than one serving the building; and
- (vi) other ancillary plant.

Details of energy monitoring system shall be captured in Electrical drawings and documentations as the project progress into detailed design stage.

Water Conservation

The development shall consider measures where practically possible for the development to reduce water use and reliance on potable water source.

Water Efficient Fittings

To reduce water demand from potable water source, water efficient sanitary fixtures with the following WELS rating may be considered where feasible.

Fixture/ Equipment Type	Min. WELS Rating
Taps	6 Star
Urinals	6 Star
Toilet	4 Star
Showers	3 Star (> 4.5 but ≤ 6.0)
Clothing Washing Machines	5 Star
Dishwashers	6 Star

Table 2: Water Efficient Fixture Best Practice WELS rating

Based on the above initiatives, and subject to occupancy details and water usage pattern, water savings of up to 30% reduction in potable water use may be achievable when compared to standard practice building water usage.

Rainwater for Non-Potable Water Use

The development shall include provision of rainwater capture and reuse for outdoor nursery. This will reduce a significant amount of water use from potable source. Rainwater tank shall be sized to maximise capture from non-trafficable roof area. Details of design shall be included in Civil and Hydraulics drawings and documentations as the project progress into detailed design stage.

Waste Reduction

The development shall consider measures where practically feasible for the development to reduce waste generation and increase diversion of waste to landfill.

Operational, Construction & Demolition Waste Minimisation

- (i) Owner to review the inclusion as part of its policy or guideline to reduce demolition waste and extend the life of interior fitout and finishes to at least 10 years.

- (ii) Easily accessible bin center provision sized according to Northern Beaches Council or equivalent best practice guide to provide adequate space for separation and storage of at least 3 separate waste streams with clearly marked bins/ containers distributed throughout the building.
- (iii) Contractor to ensure that at least 90% of construction and demolition waste to be diverted from going to landfill.

Sustainable Materials Selection

To reduce sustainability impact from resource consumption within the building, sustainable products and low emissions materials are to be considered where feasible and appropriate.

Paints, Adhesives, Sealants, Carpets & Engineered Wood

Where feasible, at least 95% of all internally applied paints, adhesives, sealants (by volume) meet the TVOC limits as detailed in Table 1.

Product Category	Max. TVOC content (g/L) of ready to use product
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16; and ≥ 50% of all paints by volume must have TVOC limit of ≤ 5g/L (i.e. Ultra low VOC)
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

Table 2: Max TVOX content limit for paints, adhesives and sealants

Carpets

Where feasible, at least 95% of all carpet (by area) products meet the product certification requirement or the Total VOC (TVOC) limits.

The following credit requirements is applicable to all carpets used for internal application of the building.

- a) Select and install carpets that are certified with the following certification levels. The certificate must be current and valid at time of purchase:
 - (i) GECA 50-2011 v2 - 'Carpets' - Level A;
The certified products can be searched from the following link, (<http://geca.eco/product-finder/>)
 - (ii) GreenTag GreenRate v4.0 Level A or Level B;

The certified products can be searched from the following link,
https://www.globalgreentag.com/?archive_template=search.php&s=carpet&post_type=products)

- (iii) ECS v1.2 Level 4 (two options) - Level A;
- (iv) ECS v1.2 Level 3 - Level B;
- (v) ECS v1.2 Level 2 - Level C;

The certified products for (iii) to (v) can be searched from the following link,
<https://www.carpetinstitute.com.au/xls/environment/ECSCarpetNameRating20200430.xls>)

OR

- b) Select and install carpets that are certified with the following maximum TVOC content validation via laboratory testing:

Laboratory Testing Max TVOC content in grams per litre (g/L) of ready to use product.		
Compliance Option	Test Protocol	Limit
ASTM D5116	ASTM D5116 - Total VOC limit	0.5mg/m ² per hour
	ASTM D5116 - 4-PC (4-Phenylcyclohexene)	0.05mg/m ² per hour
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5mg/m ² per hour
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m ² per hour

Table 3: Max TVOX content limit for carpets

Engineered Wood Products

Where feasible, at least 95% of all new engineered wood products meet the product certification requirement or the formaldehyde emission limits. Engineered wood products are such as particleboard, plywood, medium density fibreboard (MDF), Laminated Veneer Lumber (LVL), High-Pressure Laminate (HPL), Compact Laminate and decorative overlaid wood panels used for internal application of the building. Timber veneers and all engineered wood products used in carparks, as formwork and other non-engineered wood products (e.g. milled timber) can be excluded.

- a) Select and use compliant engineered wood products with the following certification levels. The certificate must be current and valid at time of purchase:
 - (i) GECA 25-2011 v2 - 'Floor Coverings' - Level A;
 - (ii) GECA 04-2011 v2 - 'Panel Boards' - Level A;
 - (i) GECA 40-2008 v1.1 - 'Hard Surfacing' - Level A;

The certified products can be searched from the following link,
<http://geca.eco/product-finder/>)

- (ii) GreenTag GreenRate Standards (all Levels);
 The certified products can be searched from the following link,
https://www.globalgreentag.com/blog/product_category/engineered-wood/)

OR

- b) Select and use compliant engineered wood products with the following maximum TVOC content validation via laboratory testing:

Laboratory Testing Test Protocol	Emission Limit/Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/L
JIS A 1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1mg/m ² hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1mg/m ² hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1mg/m ² hr (at 3 days)
ASTM D6007	≤0.12mg/m ² hr**
ASTM E1333	≤0.12mg/m ² hr***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m ² hr
EN 717-2 (also known as DIN EN 717-2)	≤0.35mg/m ² hr

*mg/m²hr may also be represented as mg/m²/hr.

**The test report must confirm that the conditions of Table 3 comply for the particular wood product type, the final results must be presented in EN 717-1 equivalent (as presented in the table) using the correlation ratio of 0.98.

***The final results must be presented in EN 717-1 equivalent (as presented in the table), using the correlation ratio of 0.98.

Table 3: Max TVOX content limit for Engineered Wood Products

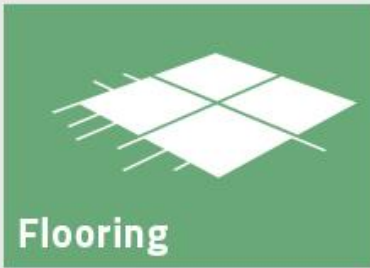
Best Practice PVC

Where feasible, at least 90% (by cost) of all flooring, blinds, permanent formwork, pipes and cables used meet either of these requirements:

- a. Do not contain PVC (as reflected in product Safety Data Sheet or product Environmental Product Declaration (EPD));
 - i. OR
- b. Certified under BEP PVC registry (<https://www.vinyl.org.au/in-greenstar/best-practice-pvc-product-register>)

Best Practice PVC Register

Click on an application below for a list of accredited Best Practice PVC products:



Available at: <https://www.vinyl.org.au/in-greenstar/best-practice-pvc-product-register>

Conclusion

The Flower Power Terrey Hills design and site conditions documentation have been reviewed to identify potential sustainability initiatives suitable for the development. These include efficient energy performance initiatives and other sustainability elements such as water use reduction, waste reduction and material conservation. The initiatives outlined in this report shall be reviewed progressively by the project design team throughout each key project stages.

Sydney

Level 1,
15 Atchison Street
St Leonards NSW 2065
+612 9437 1022

Melbourne

Level 3,
116 Hardware Street
Melbourne VIC 3000
+613 9111 2290

Manila

Suite 2403, Union Bank Plaza
Meralco Avenue Ortigas Centre
Pasig City Philippines 1605

general@erbas.com.au | erbasSUSTAIN.com.au



green building council australia
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