

# SUSTAINABLE MANAGEMENT PLAN



PROPOSED MIXED USE  
DEVELOPMENT

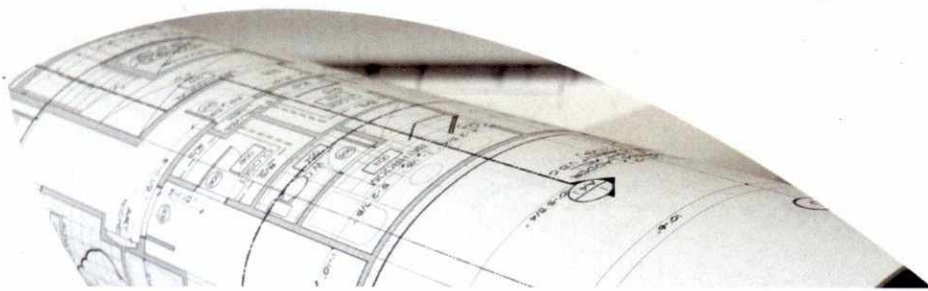
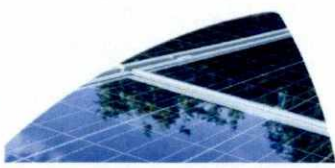
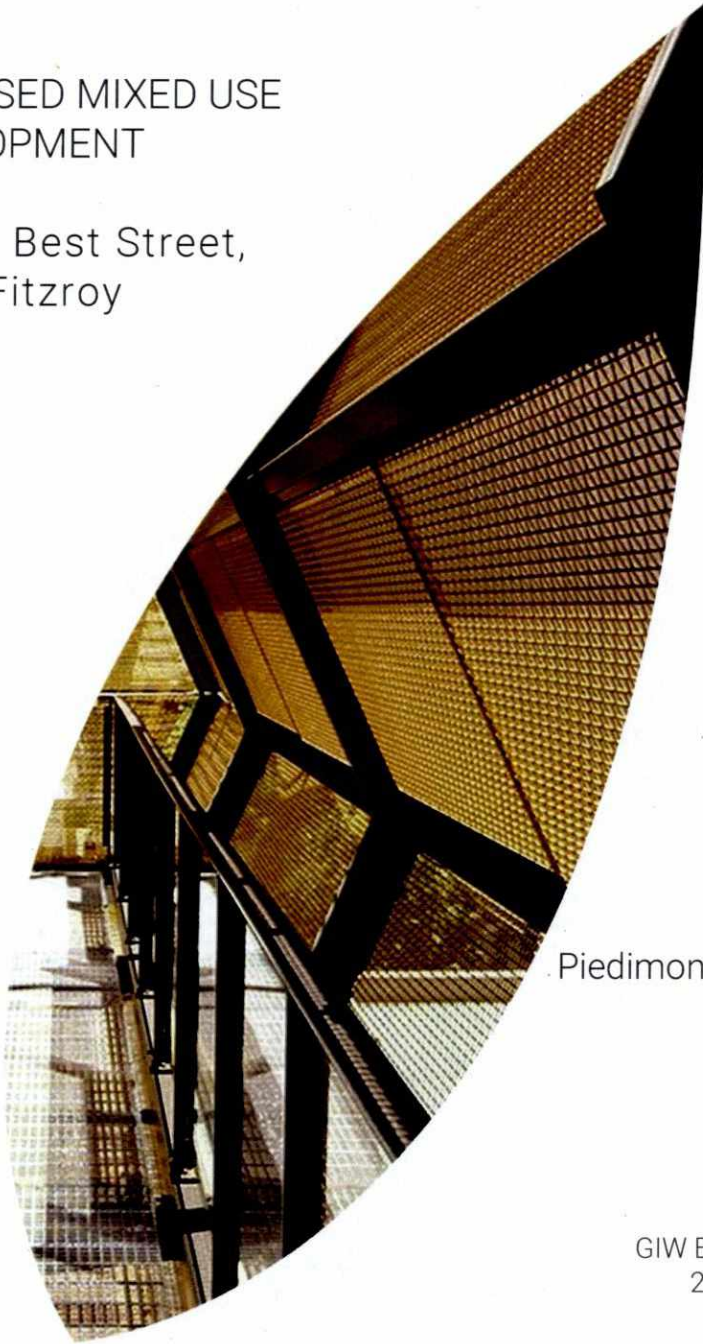
27-49A Best Street,  
North Fitzroy

GIW17191  
Revision C

Prepared for:  
Piedimonte Developments Pty Ltd

19 December 2018

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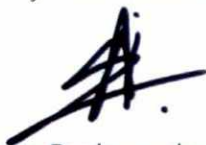
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### Revision History

Revision Number	Date Issued	Author	Approved	Comments
A	13/11/2018	IB	GW	Draft
B	04/12/2018	IB	GW	Draft
C	19/12/2018	IB	GW	Final

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# 1. Introduction

## Project Information

GIW Environmental Solutions Pty Ltd ("GIW") has been engaged by Piedimonte Developments Pty Ltd to provide Environmentally Sustainable Design (ESD) consulting services for the proposed mixed-use development at 27-49A Best Street, North Fitzroy.

The proposed development will include 8 townhouses, 58 apartments, a supermarket, liquor store, office, cafe and basement carpark. The development will consist of the following:

- 8 x townhouses
- 6 x 1 bedroom apartments
- 36 x 2 bedroom apartments
- 16 x 3 bedroom apartments
- 4,741m<sup>2</sup> retail
- 324m<sup>2</sup> office area

This Sustainable Management Plan (SMP) has been prepared to inform City of Yarra of the proposed development's sustainability credentials and performance targets. The project team is committed to achieving a building solution which responds to City of Yarra Planning Scheme - Clause 22.17 Environmentally Sustainable Development.

In consideration of the amended application, the SMP and BESS assessment are to be considered relative to the design by Peddle Thorp.

## Site Context

In consideration of VC149 and Planning Practice note 88, a shadow study has been undertaken by JCB Architects. This study assesses the impact of the proposed development on the installed solar PV systems at 20, 30 and 36 Egremont Street. Based on this study we can conclude that only the solar PV system installed on 36 Egremont Street will be overshadowed during the winter months.

Further to the shadow study, a desktop assessment identifies that the proposed development complies with the side and rear setback and north-facing windows standards for residential development under clauses 54 and 55. Further to this the protection of the existing rooftop would unreasonably constrain or compromise the proposed new development. Hence, we acknowledge the impact, but deem the proposed design to be reasonable and in line with Planning Practice note 88.

### Location

The site located at 27-49A Best Street, North Fitzroy has an approximate surface area of 3,865m<sup>2</sup> and is currently the location of a several commercial and residential buildings. Distance from the site to Melbourne CBD is approximately 3.7km.

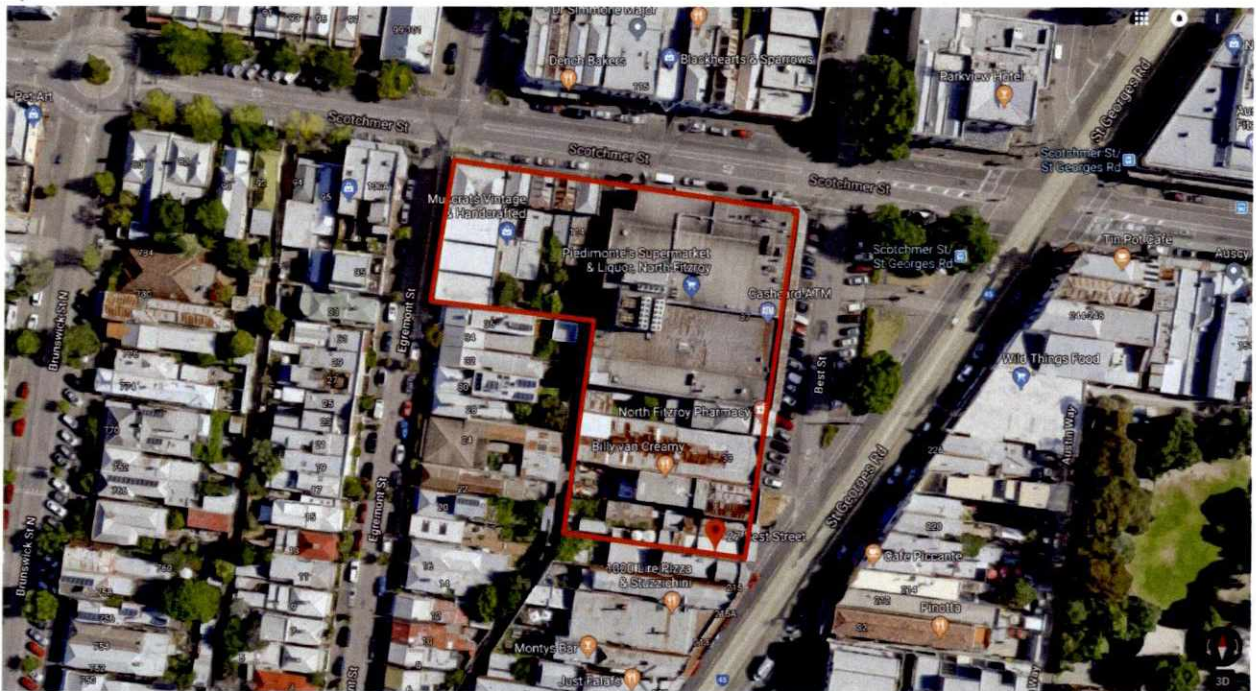


Figure 1 - Pre-existing sites at 27-49A Best Street, North Fitzroy

## Built Environment Sustainability Scorecard (BESS)

The proposed mixed use development will be assessed against the Built Environment Sustainability Scorecard (BESS) guidelines. The BESS tool addresses nine key environmental categories as follows:



Figure 2. BESS Environmental Categories ([www.bess.net.au/](http://www.bess.net.au/))

All ESD measures described under the nine key environmental categories are to be suitable incorporated into relevant project documentation at the appropriate project phase.

## Responsibilities & Implementation

Piedimonte Developments Pty Ltd will be responsible for the suitable implementation of the requirements of this report throughout the design and development phases. Should the development be sold the responsibility will pass to the new owner. At such time as a builder is novated or a building contract is put in place the builder will be responsible for implementation during the construction phase. At occupancy, the Owners Corporation and individual lot owners and or tenants will be responsible for the correct use of installed equipment and building systems in line with the provided Building User's Guide.

## Sources of Information

The following 'Sources of Information' have been used to guide the design solutions:

- JCB Architects – Project No. 18-038 – Drawing No. A-TP0-001-A-TP-002 Rev 00; A-TP0-101-A-TP0-103 Rev 00; A-TP0-111-A-TP0-113 Rev 00; A-TP0-201-A-TP0-204 Rev 00; A-TP0-211-A-TP0-214 Rev 00; A-TP1-100-A-TP1-110 Rev 00; A-TP2-100-A-TP2-105 Rev 00; A-TP3-100-A-TP3-103 Rev 00; A-TP9-101-A-TP9-126 Rev 00; A-TP31 Rev 00.
- Municipal Association of Victoria - SDAPP Explained; Building Design for a Sustainable Future
- Built Environment Sustainability Scorecard (BESS)
- Green Star Design & As Built v1.1 Submission Guidelines
- CSIRO 1999, Urban Stormwater – Best Practise Environmental Management Guidelines

## 2. ESD Summary

The proposed mixed-use development at 27-49A Best Street, North Fitzroy will implement the following ESD initiatives:

1. The project achieves a total BESS score of 70% with no mandatory category (IEQ, Energy, Water, Stormwater) below 50%.
2. 47% (31 out of 66) of the development's apartments and townhouses are naturally cross-ventilated.
3. Daylight modelling has been conducted for a representative sample of apartments. The summary result is as follows:
  - a. 81% of living floor area above achieves a DF 1.0
  - b. 88% of bedroom floor area achieves a DF0.5
4. The non-residential areas are targeting a 2% DF to 60% of the nominated area.
5. 53% (31 out of 66) of apartments and townhouses achieve at least 3 hours of sunlight.
6. The development is provided with a comprehensive shading strategy.
7. The development is to achieve a 7.0 Star average NatHERS Energy Rating result.
8. The buildings thermal fabric of the non-residential areas aims to reduce heating and cooling energy consumption 10% below the reference case (BCA Section J).
9. The development is to utilise a centralised gas hot water system.
10. A 30kW Solar PV system is to be located on the roof of the proposed development.
11. Individual cold and hot water, electricity meters will be provided to the apartments and communal areas.
12. Water efficient fixtures are applied throughout.
13. A  $\geq 35,000$  litre rainwater tank will harvest rainwater from the roofs, rooftop terrace and balconies. This tank will be connected to all commercial and residential WC's.
14. A Melbourne STORM rating of 100% is achieved.
15. In total 147 bicycle spaces are to be provided for residents and employees.
16. 30 existing bicycle spaces for visitors of the commercial tenancies are provided at grade.
17. The development is provided with an end of trip facility including a minimum of 4 showers, 27 lockers and changing facilities.
18. 216m<sup>2</sup> of communal open space will be provided at roof.
19. 34m<sup>2</sup> of communal food production area will be provided at roof.

### 3. BESS Performance

The project achieves a total BESS score of 70% with no mandatory category (IEQ, Energy, Water, Stormwater) below 50%. This figure represents a percentage improvement over a benchmark project. A score of 50% and higher equates to 'best practice' and is an effective pass of the BESS tool. A score of 70% and higher equates to BESS 'excellence' and exists as a higher benchmark in the tool.






## 4. ESD Assessment

### Indoor Environment Quality

Council ESD objectives:

- to achieve a healthy indoor environment quality for the wellbeing of building occupants.
- to provide a naturally comfortable indoor environment will lower the need for building services, such as artificial lighting, mechanical ventilation and cooling and heating devices.

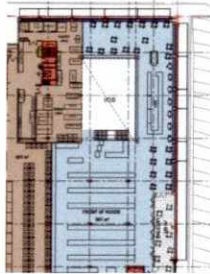
#### Council Best Practice Standard

Criteria	Development Provision				
Natural Ventilation	<p>47% (31 out of 66) of the development's apartments and townhouses are naturally cross-ventilated. Units are provided with windows on opposite or adjacent facades or are effective single sided ventilated.</p>				
<p>At least 60% of a development's apartments should be naturally ventilated.</p>					
Daylight	<p>80% of dwellings achieve a daylight factor greater than 1% to 90% of the floor area of each living area, including kitchens.</p> <p>80% of dwellings achieve a daylight factor greater than 0.5% to 90% of the</p> <p>Daylight modelling has been conducted for a representative sample of apartments. The summary result is as follows:</p> <table border="1" data-bbox="644 1697 1401 1832"> <thead> <tr> <th data-bbox="644 1697 984 1765">% of living floor area above DF 1.0</th> <th data-bbox="1031 1697 1339 1765">% of bedroom floor area above DF 0.5</th> </tr> </thead> <tbody> <tr> <td data-bbox="805 1800 859 1830">81%</td> <td data-bbox="1188 1800 1241 1830">88%</td> </tr> </tbody> </table> <p>Refer Appendix A - Daylight Modelling.</p>	% of living floor area above DF 1.0	% of bedroom floor area above DF 0.5	81%	88%
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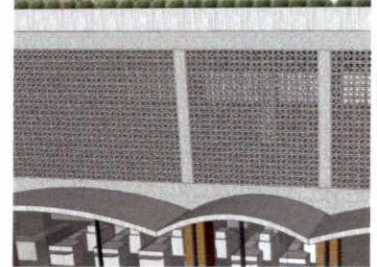
Council Best Practice Standard

Criteria	Development Provision
<p>floor area in all bedrooms.</p> <p>&gt;30% of the nominated non-residential area achieves a daylight factor of at least 2%</p>	<p>The retail and office areas are targeting a 2% DF to 60% of the nominated area.</p>
<p>90% of bedrooms have an external window.</p>	<p>NIL internal bedrooms.</p>
<p>Courtyards and light courts in multi-storey buildings are surrounded by a maximum of four storeys.</p>	<p>There are no courtyards in this development.</p>
<p>70% of dwellings receive at least 3 hours of direct sunlight in all living areas between 9am and 3pm in mid-winter.</p> <p>Winter Sunlight</p>	<p>53% (31 out of 66) of apartments and townhouses achieve at least 3 hours of sunlight.</p>

The development is provided with a comprehensive shading strategy:



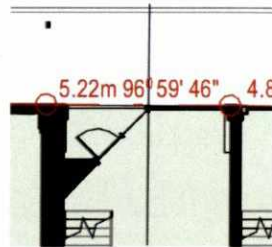
The north and east oriented retail façade is shaded by a 2,250mm deep canopy.



The north and east café façade is shaded by breeze blocks.

Thermal Comfort

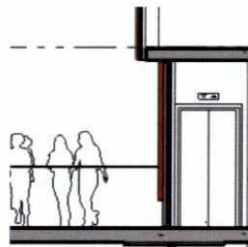
Appropriate external shading is provided to east, west and north facing living area and bedroom windows,



North oriented townhouse windows at ground floor will be partially recessed.



West oriented windows at ground floor and north and west oriented windows at level 1 are limited in size to reduce summer heat gains and winter heat loss.



North oriented townhouse windows at level 3 will be provided with an 500mm deep overhang.



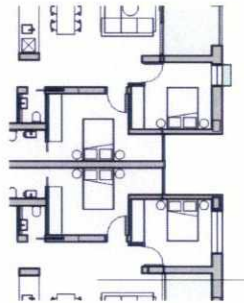
North oriented perimeter windows at level 3-4 of the west block are provided with horizontal slats.



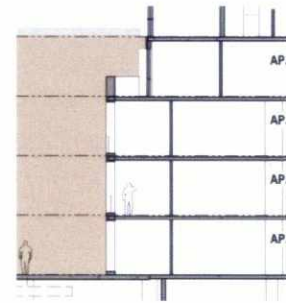
North oriented recessed windows at level 2-5 are shaded by the overhanging balconies of the floor above.



North oriented perimeter windows at level 2-5 are to be recessed by 250mm.



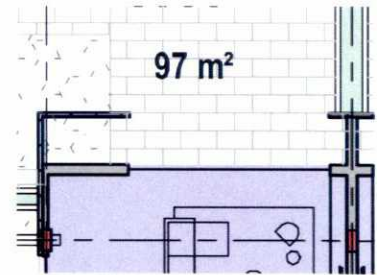
East and west oriented perimeter windows at level 2-4 are recessed by 200mm.



East and west oriented recessed windows at level 2-4 are shaded by the overhanging balcony above.



East and west oriented windows at level 5 and 6 are shaded by overhanging balconies, breeze blocks and / or 450mm deep window boxes.



North oriented windows at level 6 are shaded by a 1,400mm deep overhang.

## Energy

Council ESD objectives:

- To ensure the efficient use of energy
- To reduce total operating greenhouse emissions
- To reduce energy peak demand
- To reduce associated energy costs

### Council Best Practice Standard

Criteria	Development Provision																																				
	<p>The National Construction Code (NCC) Class 2 – Sole Occupancy Unit(s) residential building component is to be designed in accordance with NCC Section J (2016) NatHERS requirements. The residential units must achieve an average 7 Star rating, with no unit achieving below 5 Stars and no dwelling is to exceed the maximum allowed cooling load of 30 MJ/m<sup>2</sup> (Climate Zone 21 Melbourne RO).</p> <p>The apartments are currently achieving a 7.2 Star average. This represents &gt; 10% improvement on minimum NCC compliance benchmarks. The below sample ratings demonstrate the developments ability to achieve this average and none of the sample apartments exceed the maximum allowed cooling loads.</p>																																				
Thermal Performance Rating	<p>Demonstrate energy efficiencies beyond minimum BCA compliance benchmarks (e.g. 10% or + 1 star).</p> <table border="1"> <thead> <tr> <th>Apartment No.</th> <th>ACE Total MJ/M2</th> <th>ACE Heating</th> <th>ACE Cooling</th> <th>ACE NCFA</th> <th>Star Rating</th> </tr> </thead> <tbody> <tr> <td>TH2</td> <td>76.1</td> <td>57.7</td> <td>18.5</td> <td>169.5</td> <td>7.2</td> </tr> <tr> <td>2.08</td> <td>74.7</td> <td>60.8</td> <td>13.9</td> <td>62.6</td> <td>7.3</td> </tr> <tr> <td>4.11</td> <td>86.1</td> <td>70.6</td> <td>15.5</td> <td>51.9</td> <td>6.9</td> </tr> <tr> <td>6.01</td> <td>73.3</td> <td>44.2</td> <td>29.1</td> <td>211.8</td> <td>7.3</td> </tr> <tr> <td><b>Average</b></td> <td><b>77.6</b></td> <td><b>58.3</b></td> <td><b>19.3</b></td> <td><b>124.0</b></td> <td><b>7.2</b></td> </tr> </tbody> </table>	Apartment No.	ACE Total MJ/M2	ACE Heating	ACE Cooling	ACE NCFA	Star Rating	TH2	76.1	57.7	18.5	169.5	7.2	2.08	74.7	60.8	13.9	62.6	7.3	4.11	86.1	70.6	15.5	51.9	6.9	6.01	73.3	44.2	29.1	211.8	7.3	<b>Average</b>	<b>77.6</b>	<b>58.3</b>	<b>19.3</b>	<b>124.0</b>	<b>7.2</b>
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	<p>*Apartments are assessed using FirstRate5 v5.2.9</p> <p>Construction assumptions for preliminary FirstRate ratings are listed below. Note, these assumptions are based on the sample of apartments assessed and may vary throughout the development. These assumptions are not to be relied upon for any other purpose beyond Town Planning assessment.</p>																																				

Council Best Practice Standard

Criteria	Development Provision		
	Element	Material	Insulation Value
	Floor	SOG	NIL
	Floor (where exposed below)	Concrete	R1.4
	External Walls	Concrete	R1.8
	External Walls	Brick Veneer	R2.5
	External Walls	Lightweight	R2.5
	Internal Walls	Concrete	R1.8
	Internal Walls	Plasterboard	R2.5
	Where exposed above (APT)	Concrete	R1.4
	Roof & Where exposed above (TH)	Concrete	R3.0
	Fixed Windows	Aluminium framed, Double glazed, argon filled, low-E, clear	Total System: • U-Value: 2.71 • SHGC: 0.58
	Sliding Doors	Aluminium framed, Double glazed, argon filled, low-E, clear	Total System: • U-Value: 3.19 • SHGC: 0.48
	Awning Windows	Aluminium framed, Double glazed, argon filled, low-E, clear	Total System: • U-Value: 4.42 • SHGC: 0.41

The buildings thermal fabric of the non-residential areas aims to reduce heating and cooling energy consumption 10% below the reference case (BCA Section J).

**Council Best Practice Standard**

Criteria		Development Provision
Hot Water System	Install energy efficient (high star rating) HWS	<p>The development is to utilise a centralised gas hot water system, with either:</p> <ul style="list-style-type: none"> <li>• 7 Star energy rating for instantaneous units; or</li> <li>• Minimum 90% energy efficiency for a single water heater</li> </ul>
Peak Energy Demand	Demonstrate Instantaneous (peak-hour) demand has been reduced by >25%	High performance thermal envelope in conjunction with high efficiency HVAC systems and lighting systems reduce energy demand at peak times.
	Specify energy efficient (high star rating) heating and cooling systems.	When outdoor conditions are not conducive to natural ventilation, air conditioning will be used. Inverter split system units are to be installed and sized to maintain conditions of the main living space of each apartment. The efficiency of the air conditioning system is to be within 1 star rating of best available under MEPS Post-October 2012 measurement standard.
Efficient HVAC Systems	Carpark ventilation is either fully naturally ventilated or uses CO monitoring to control the operation of the ventilation fans	<p>Carpark ventilation fans are driven by a VSD motor connected to CO sensors within the carpark. The inclusion of CO sensor control will allow the ventilation fans to ramp down when the car park is unoccupied. The system is to be designed in accordance with AS1668.2.</p> <p>The mechanical services engineer is responsible for the design and specification of the system. The contractor is to procure and install the specified system.</p> <p>Maintenance requirements of the CO sensor system are to be included in the O&amp;M manual.</p>
Efficient Lighting	Maximum illumination power density (W/m <sup>2</sup> ) in at least 90% of the relevant Building Class is at least 20% lower than required by current BCA requirements	<p>Lighting for the residential and non-residential development is to be LED types. High efficiency fluorescent T5 type lighting will be provided to the carpark and services areas only.</p> <p>Lighting power density shall be as follows:</p> <ul style="list-style-type: none"> <li>• Dwellings: No greater than average 4W/m<sup>2</sup></li> <li>• Veranda/balcony/terrace: No greater than average 4W/m<sup>2</sup></li> <li>• Back of house and indoor car parks: No greater than average 5W/m<sup>2</sup></li> <li>• Retail: No greater than average 17W/m<sup>2</sup></li> <li>• Office: No greater than average 7W/m<sup>2</sup></li> </ul>

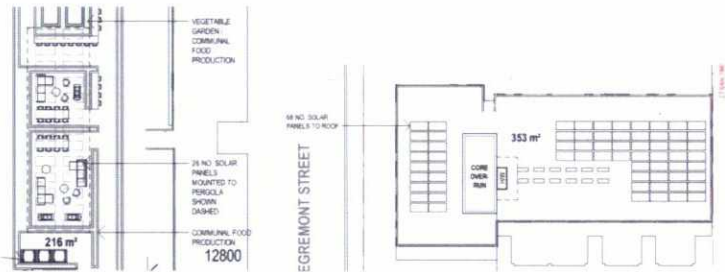
Council Best Practice Standard

Criteria	Development Provision
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All common area, external and carpark lighting is to be controlled with daylight, motion sensors or timers (whichever is deemed appropriate).

A 30kW Solar PV system is to be located on the roof of the proposed development. The system is expected to generate approximately 28,832kWh.

Renewable Electricity Generation  
Solar power system provides 5% of the building's energy consumption.



Location Solar PV System

Refer Appendix B – Renewable Energy

Clothes Drying  
Clothes drying energy consumption is >10% below the benchmark

Clothes drying racks or retractable lines are to be provided to all apartment and townhouse POS.


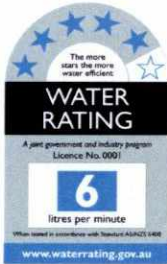




Water

Council ESD objectives:

- To ensure the efficient use of water
- To reduce total operating potable water use
- To encourage the collection and reuse of stormwater
- To encourage the appropriate use of alternative water sources (e.g. grey water)
- To minimize associated water costs

**Council Best Practice Standard**

Criteria		Development Provision			
		WELS 4 Star – Toilets	WELS 5 Star - Taps	WELS 4 Star - Showerhead	WELS 5 Star - Dishwasher
Potable Water Reduction	>25% potable water reduction.				
Rainwater Collection & Reuse	25-75% reduction of potable water demand due to rainwater collection and reuse systems.	<p>A ≥35,000 litre rainwater tank will harvest rainwater from the roofs, rooftop terrace and balconies. This tank will be connected to all commercial and residential WC's. It is estimated that this will save more than 791kL of potable water every year and meet 72% of the demand in these areas.</p> <p>Stormwater drainage mechanism is to be determined by the hydraulics services engineer at the design development phase.</p> <p>Refer Appendix C – WSUD Response</p>			
Water Metering	The installation of separate water meters in individual dwellings.	The apartments and commercial tenancies are to have individual cold and hot water meters. This measure is aimed at encouraging user awareness and accountability and it is likely to lead to more responsible water use.			
Landscape Irrigation	Are water efficiency principles used for landscaped areas.	The majority of landscaping is to be native vegetation with low watering demand.			

Council Best Practice Standard

Criteria	Development Provision	
Building Systems Water Reduction	Reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems	<p>The dwellings will be provided with split systems.</p> <p>The commercial areas are to be provided with an air-cooled HVAC system.</p> <p>The sprinkler system test water is to either expel no water when testing or test water is to be redirected into the system.</p>

## Stormwater

Council ESD objectives:

- To reduce the impact of stormwater run-off
- To improve the water quality of stormwater run-off
- To achieve best practice stormwater quality outcomes
- To incorporate water sensitive urban design principles

### Council Best Practice Standard

Criteria	Development Provision
<p>STORM Rating</p> <p>Exceed Victoria's best practice standards by achieving a MUSIC / STORM rating of at least 100% or equivalent modelling results.</p>	<p>The Melbourne Water - Stormwater Treatment Objective Relative Measure (STORM) tool has been applied to determine performance relative to Best Practice Environmental Management Guidelines (Victoria Stormwater Committee, 1999). As per City of Yarra Planning Scheme - Clause 22.16 Stormwater Management (Water Sensitive Urban Design), the development is required to achieve a STORM rating of 100% or greater.</p> <p>A Melbourne STORM rating of 100% is achieved via the following:</p> <ul style="list-style-type: none"> <li>• Rainwater is to be collected from the roofs, rooftop terrace and balconies and directed into the 35,000 litre rainwater tank. All WC's are to be connected to the rainwater tank.</li> </ul> <p>Suitable filtration is to be introduced to ensure stormwater collected off trafficable areas meets the water quality requirements.</p> <p>Refer Appendix C – WSUD Response.</p>

## Transport

Council ESD objectives:

- To minimise car dependency.
- To ensure that the built environment is designed to promote the use of public transport, walking and cycling.

### Council Best Practice Standard

Criteria	Development Provision
Bicycle Facilities	<p>For residential developments, provide at least one secure bicycle parking space per dwelling for residents and one bicycle space per 4 dwellings for visitors</p>
End Of Trip Facilities	<p>Provide accessible showers (1 per 10 bicycles spaces), changing facilities and one secure locker per bicycle space in the changing facilities.</p>



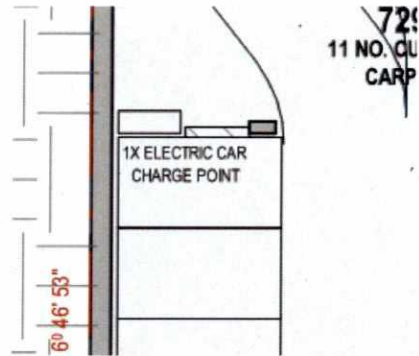


In total 147 bicycle spaces are to be provided for residents, visitors and employees.

30 existing bicycle spaces for visitors of the commercial tenancies are provided at grade.

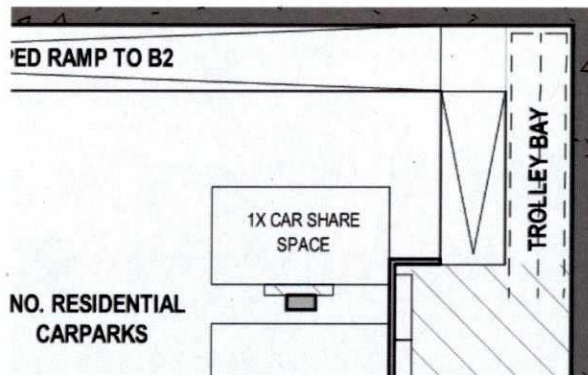
Charging point for electrical vehicles is integrated in the proposed development.

Electric Vehicle Charging Provide facilities for charging of electric vehicles.



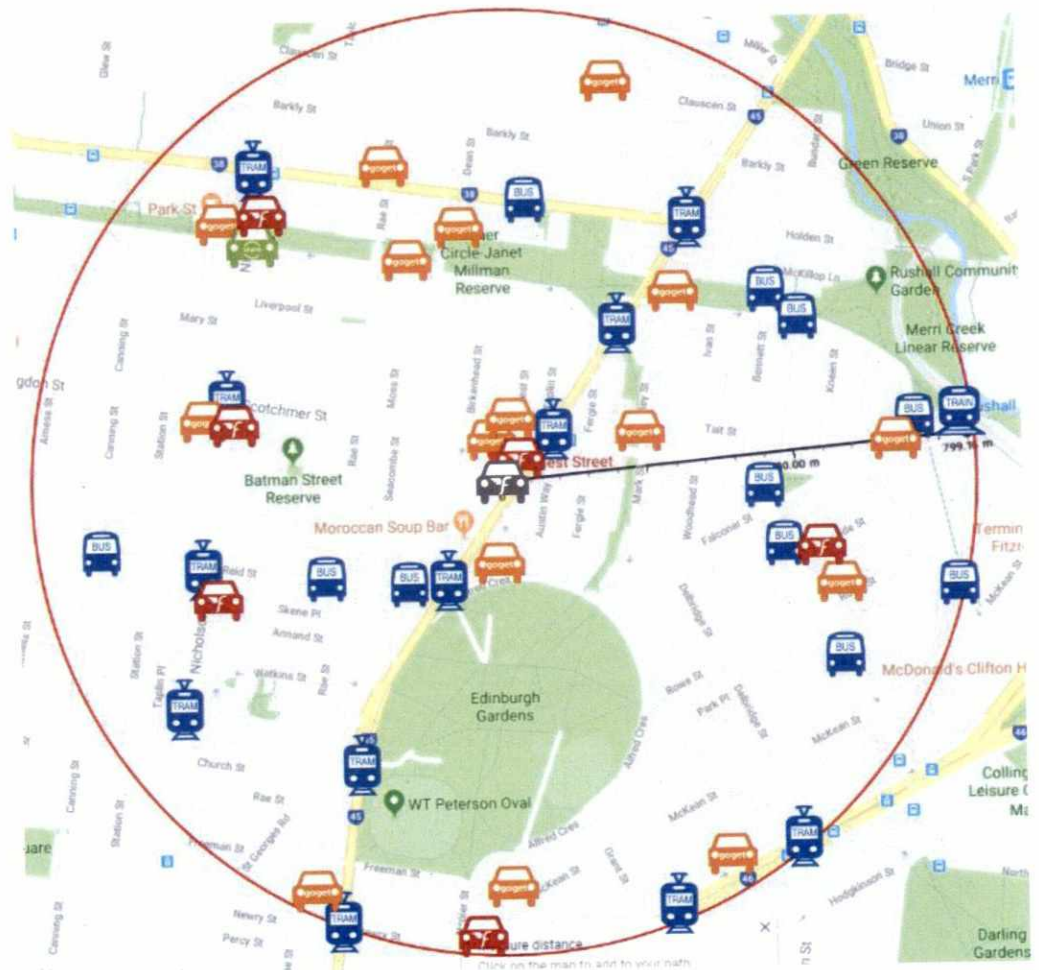
Location of electric charging point

Car Share Scheme Integrate formal car sharing scheme into the development



The development is to be provided with a parking space designated to a formal car sharing scheme at basement 01.

Car Share & Public Transport



Car Share Scheme



Flexicar



GoGet Car Share



Green Share Car

Public Transport



Bus Stop



Tram Stop



Train Station

## Materials

ESD objectives:

- Recycling/Reuse
- Embodied energy
- Human health
- Environmental toxicity & responsibility

### Council Best Practice Standard

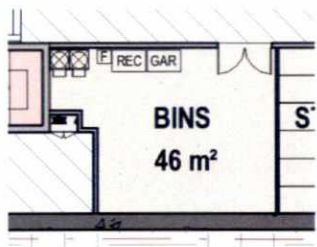
Criteria		Development Provision
Embodies Energy	Limited use of high embodied energy metals and materials, especially in a design with intended high churn (e.g. retail)	The design will seek to limit the use of high embodied energy metal finishes.
Sustainable Timber	Commitment to source timber from sustainably managed source, with proof of audit trail.	Where timber is to be used, such timbers are to accord with the GBCA's 'Essential' criteria for forest certification. This may include FSC and / or PEFC Certification which are both internationally recognised schemes ensuring that timber is sourced from sustainable sources. Alternatively, recycled timber will be used.
Indoor Pollutants	Commitment to limit indoor pollutants.	All internally applied paints adhesives, sealants and carpets are to have a low or ultra-low VOC content. All internally applied engineered wood products are to have low formaldehyde levels.

## Waste Management

Council ESD objectives:

- To ensure waste avoidance, reuse and recycling during the design, construction and operation stages of development.
- To ensure long term reusability of building materials.
- To meet Councils' requirement that all multi-unit developments must provide a Waste Management Plan in accordance with the *Guide to Best Practice for Waste Management in Multi-unit Developments 2010*, published by Sustainability Victoria.

### Council Best Practice Standard

Criteria	Development Provision
Construction Waste Management	<p>Adopt a recycling target of at least 70% for all demolition and construction waste (by mass.)</p> <p>The contractor will implement a waste management plan to ensure that at least 80% of demolition and construction waste (by mass) is recycled. The waste management plan will be developed in accordance with the MBAV Guidelines.</p> <p>If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used.</p> <p>&lt;30% of the existing structure is re-used.</p>
Operational Waste Management	<p>Are the recycling facilities at least as convenient for occupants as facilities for general waste.</p> <p>Separate general and recycling waste storage will be provided at basement.</p> 
	<p>Are facilities provided for on-site management of food and garden waste.</p> <p>Green waste / worm farm will be provided at the communal roof terrace.</p> <p>The retail will introduce an on-site food digester. This will result in less bin collection and conversion of food waste into usable compost.</p>



## Urban Ecology

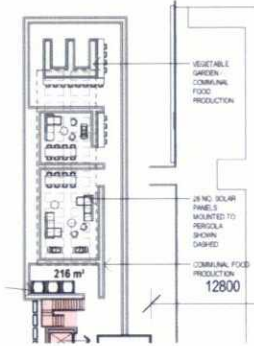
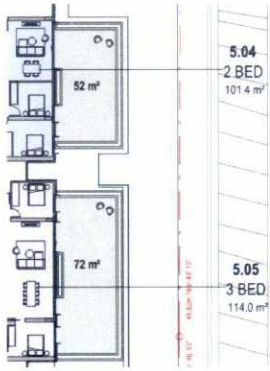
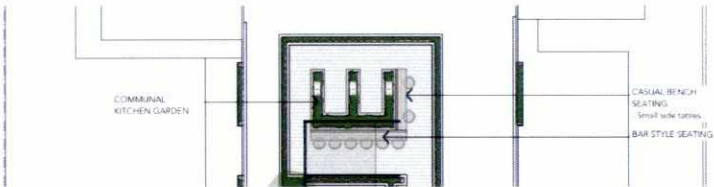
Council ESD objectives:

- To protect and enhance biodiversity.
- To provide sustainable landscaping.
- To protect and manage all remnant indigenous plant communities.
- To encourage the planting of indigenous vegetation.

### Council Best Practice Standard

Criteria	Development Provision
Ecological Value	<p>Enhance the ecological value of your site through the protection of existing vegetation.</p> <p>The proposed site is currently the location of several commercial and residential buildings. Redeveloping the site will not only reduce the burden on previously undeveloped sites and greenfield urban sprawl, but also provides regeneration to the location and help to create a more socially cohesive and environmentally friendly residential community.</p>
Vegetation	<p>Provide additional vegetation that serves the amenity and environmental performance of the development.</p> <p>Planter boxes are to be located at ground floor, level 2-5 and 6 terraces and at the communal roof terrace.</p> <p>Landscaped area is to be provided adjacent to the new laneway.</p>
	<p>Is there a tap and floor waste on every balcony / in every courtyard</p> <p>All balconies or terraces and the communal roof terrace are to be provided with a taps allowing residents to cultivate and maintain the (communal) planters.</p>
Communal Spaces	<p>Common space : 216m<sup>2</sup> of communal open space will be provided at roof. Communal space will include the following amenities: seating opportunities, barbeques, productive gardens and green waste.</p> <p>-1m<sup>2</sup> for each of the first 50 occupants</p> <p>- Additional 0.5m<sup>2</sup> for each occupant between 51 and 250</p> <p>- Additional 0.25m<sup>2</sup> for each</p>

Council Best Practice Standard

Criteria	Development Provision
occupant above 251	
Communal space will be provided at roof	
Green Walls / Roof	Green wall or façade and / or green roof are included in the development.
	
The level 5 east façade is provided with green walls.	
Food Production	0.25m <sup>2</sup> of space per resident dedicated to food production.
	
34m <sup>2</sup> of communal food production area will be provided at roof.	

## Innovation

Council ESD objectives:

- To encourage innovative technology, design and processes in all development, which positively influence the sustainability of buildings.

### Council Best Practice Standard

Criteria	Development Provision
Enhancements	<p>Significant enhancements to a building's environmental performance.</p> <p>This has been addressed throughout this Sustainable Management Plan. Refer specific sections for relevant details.</p>
Innovative Social Improvements	<p>Introduction of measures that stimulate social cohesion and interaction.</p> <p>The proposed development is to be provided with a communal roof terrace. This space will allow residents to engage with nature, stimulate social cohesion, neighbourhood interaction and increased sense of community.</p>
New Technology	<p>Introduction of new building technologies.</p> <p>As building technologies continue to evolve, the development will commit to implementing the most current ESD relevant technologies at the time of construction. This will include HVAC systems, ventilation and lighting control systems, building materials, renewable energy technologies, lift systems etc.</p> <p>The supermarket and liquor store will be provided with state-of-the-art CO2 refrigeration. This will result in approximately 20% energy reduction compared to a conventional refrigeration system and reduce the use of chemical refrigerants.</p> <p>Further to this the waste heat produced by the refrigeration systems will be reused on-site for pre-heating of office and retail space heating and / or domestic hot water system.</p>
Design Approach	<p>A new design approach that reflects the Australia Dream of the 21<sup>st</sup> century.</p> <p>The proposed development is consistent in providing the Australian Dream of the 21st century as follows:</p> <ul style="list-style-type: none"> <li>• It responds to social equity in a much greater way than that of freestanding housing within the area;</li> <li>• It is consistent with the principles of urban consolidation.</li> </ul>

Council Best Practice Standard

Criteria	Development Provision
Commitment and Implementation	ESD Checkpoint during Construction Phase
	An ESD professional will be engaged throughout the design and construction process. The ESD professional will perform a minimum of 2 site inspections during the construction phase to ensure suitable implementation of the ESD initiatives. Any deficiencies compared to the endorsed SMP will be escalated to the project manager and resolved.

## Management

Council ESD objectives:

- To encourage a holistic and integrated design and construction process and ongoing high performance.

### Construction And Building Management Actions

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Metering	<p>Electricity and cold / hot water metering is to be provided to each individual apartment and commercial tenancy. This measure is aimed at encouraging user awareness and accountability and it is likely to lead to more responsible energy use.</p> <p>Shutdown switches connected to all lighting will be provided to all dwellings.</p> <p>Lighting and general power to common areas is to be separately metered to quantify energy used for common areas spaces.</p>
Building Tuning	<p>Provision of comprehensive pre-commissioning, quality monitoring and building tuning for all building services in accordance with CIBSE and ASHRAE (for mechanical systems) guidelines will be the responsibility of the development team. This is in line with the Green Star Design &amp; As-Built tool credit criteria 'Building Commissioning' and 'Building System Tuning'.</p>
Building User's Guide	<p>A Building User's Guide will be provided to all occupants explaining the correct use of installed equipment and building systems. This shall cover at a minimum:</p> <ul style="list-style-type: none"> <li>• Energy and Environmental Strategy</li> <li>• Monitoring and Targeting</li> <li>• Building Services</li> <li>• Transport Facilities</li> <li>• Materials and Waste Policy</li> <li>• Expansion/Re-fit Considerations</li> <li>• References and Further Information</li> </ul>
ISO14001 Accreditation Builder	<p>ISO14001 Accreditation will be positively weighted as part of the selection criteria.</p>

## Appendices

### Appendix A: Daylight Modelling

The following Daylight Modelling Assessment has been prepared for the proposed mixed-use development at 27-49A Best Street, North Fitzroy. This assessment responds to BESS – IEQ credit 1.1 Daylight Access – Living Areas, 1.2 Daylight Access –Bedrooms.

We have undertaken daylight modelling for 10 apartment types assessing both living and bedroom areas. The 10 apartments have been selected with consideration of internal layout, inherent and adjacent building shading features. These apartment types reflect an average daylight performance of the development.

The adjacent buildings have included in the modelling as follows:

- 20-36 Egremont Street: maximum allowed height under the planning scheme for zone NRZ2.
- 94-100 Schotchmer Street: maximum allowed height under the planning scheme for zone NRZ2.

### Methodology

The daylight levels in apartments are benchmarked against the best practice requirements as set out under the Built Environment Sustainability Scorecard (BESS) tool: Indoor Environment Quality (IEQ) – Daylight Access Living Areas and Bedrooms. These levels are as follows:

*"Dwellings should achieve the following daylight factors (DF)*

- *80% of the total number of living rooms achieve a daylight factor greater than 1% to 90% of the floor area of each living area, including kitchens.*
- *80% of the total number of bedrooms achieve a daylight factor greater than 0.5% to 90% of the floor area in each room."*

The daylight modelling has been completed using the Radiance software suite, an accurate computing program used to predict light levels in a space prior to construction. Scene geometric data and material properties are interfaced into the Radiance software using DesignBuilder.

Daylight Factor has been calculated using a CIE uniform cloudy sky.

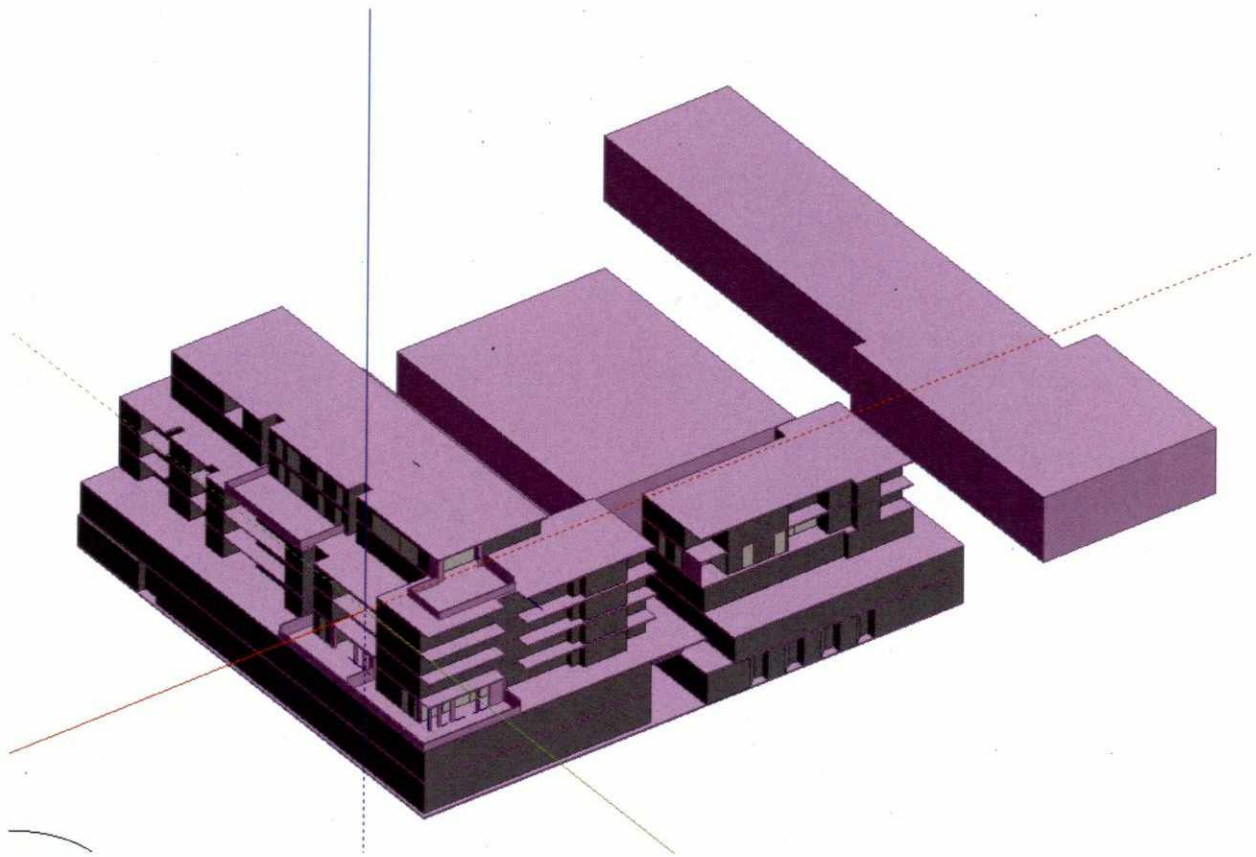


Figure 3 – DesignBuilder model of proposed and adjacent equitable development right buildings

## Modelling Assumptions

The following assumptions have been made with respect to the modelling:

- Modelled window dimensions and shading structures are as depicted on the Architectural drawings.
- The glazing performance used for external windows is as follows:
  - Clear windows with a total system VLT of 0.55.
  - Clear windows + screening with a total system VLT of 0.275
  - Clear windows + Breeze.Blocks with a total system VLT of 0.275
- The reflectance of all materials is in accordance with the Green Star Multi Unit Residential credit IEQ-4 Daylight.
- Transient and unoccupied spaces such as corridors, wardrobes and transient spaces have been excluded from the modelled area.
- The reflectance of external buildings and structures is assumed to be 0.6.

## Daylight Results Living Areas – Numerical

The daylight results for living areas of 27-49A Best Street, North Fitzroy can be summarised as follows:

Apartment	% of floor area above DF 1
APT 2.03	97.6
APT 2.04	99.7
APT 2.12	64.0
APT 2.13	26.9
APT 3.15	84.9
APT 3.16	92.6
APT 4.10	99.6
APT 4.11	56.4
APT 5.05	99.6
APT 6.02	100



### Daylight Results Bedrooms – Numerical

The daylight results for bedrooms of 27-49A Best Street, North Fitzroy can be summarised as follows:

Apartment	Area	% of floor area above DF 0.5
APT 2.03	Bed 1	100
	Bed 2	100
APT 2.04	Bed 1	100
	Bed 2	100
	Bed 3	64.0
APT 2.12	Bed 1	100
	Bed 2	100
APT 2.13	Bed 1	100
APT 3.15	Bed 1	100
	Bed 2	100
APT 3.16	Bed 1	100
	Bed 2	100
	Bed 3	100
APT 4.10	Bed 1	100
	Bed 2	100
APT 4.11	Bed 1	99.9
	Bed 1	98.3
APT 5.05	Bed 2	97.4
	Bed 3	100
	Bed 1	100
APT 6.02	Bed 2	100
	Bed 3	100
	Bed 1	100

Daylight Results – Visual

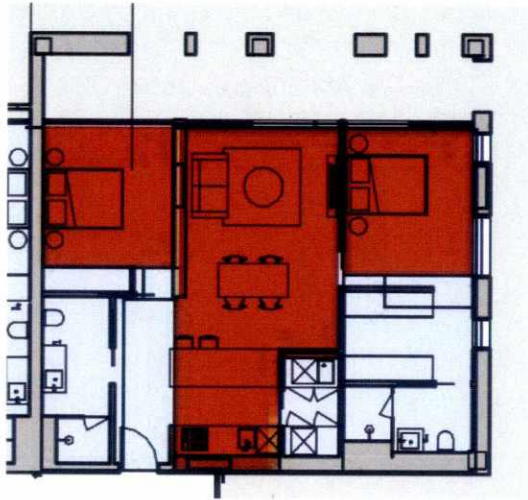


Figure 4 - Daylight Map – APT 2.03

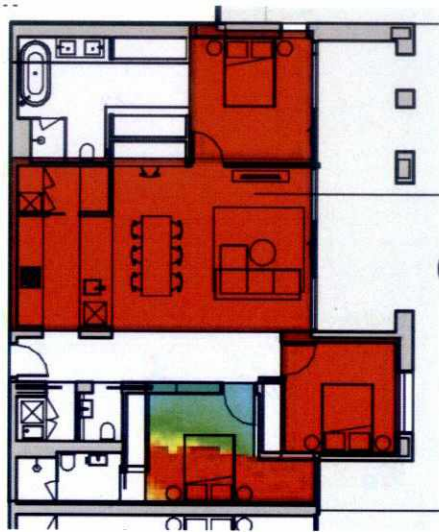


Figure 5 - Daylight Map – APT 2.04



Figure 6 - Daylight Map – APT 2.12



Figure 7 - Daylight Map – APT 2.13



Figure 8 - Daylight Map – APT 3.15

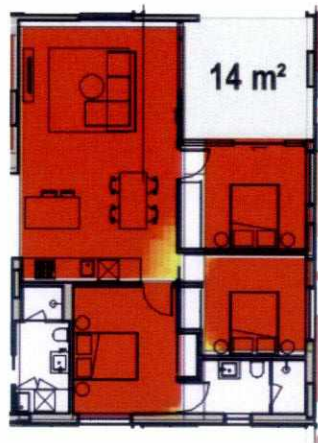


Figure 9 - Daylight Map - APT 3.16

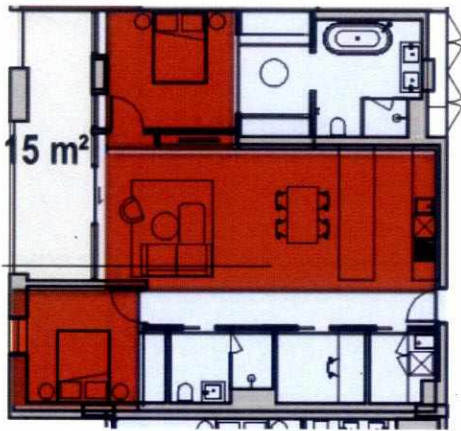


Figure 10 - Daylight Map - APT 4.10

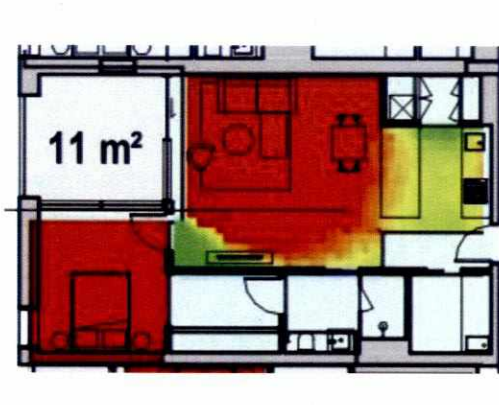


Figure 11 - Daylight Map - APT 4.11