

**ADVERTISED  
PLAN**

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134 Moray Street, South Melbourne

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Issue	Date	Prepared	Checked	Status
A	23.10.2024	HM / LT	LD	TP Draft
B	20.12.2024	HM / LT / DO	LD	TP
C	29.01.2026	HM / LT / DO	LD	S72 Endorsement Draft
D	23.02.2026	HM / LT / DO	LD	S72 Endorsement
E	22.04.2026	HM / LT / DO	LD	S72 Endorsement

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## 1.0 Introduction

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Ark Resources has been engaged by SMA Projects to provide advice in relation to environmentally sustainable development outcomes from the proposed development at 134 Moray Street, South Melbourne.

The proposed mixed-use development at 134 Moray Street, South Melbourne has been designed to meet Planning Permit PA2503652 and Clauses 15.01-2S, 15.01-2L-02 (Environmentally Sustainable Development Policy) plus 19.03-3S and 19.03-3L (WSUD Policy) of the Port Phillip Planning Scheme.

This report contains a summary of:

- Environmental objectives adopted for the development
- Sustainable design initiatives integrated into the design of the project.

Performance outcomes in this report are based on:

- Discussions and correspondence with Ben McCann, SMA Projects

Architectural drawings prepared by Hayball set out below.

SITE PLAN	TP01.01	5	12.12.2025
BASEMENT LEVEL	TP02.00	13	12.12.2025
GROUND LEVEL	TP02.01	10	12.12.2025
LEVEL 1	TP02.02	7	12.12.2025
LEVEL 2	TP02.03	7	12.12.2025
LEVEL 3	TP02.04	7	12.12.2025
LEVEL 4	TP02.05	7	12.12.2025
LEVEL 5	TP02.06	8	12.12.2025
LEVEL 6	TP02.07	8	12.12.2025
LEVEL 7	TP02.08	9	12.12.2025
LEVEL 8	TP02.09	8	12.12.2025
LEVEL 9	TP02.10	8	12.12.2025
ROOF LEVEL	TP02.11	7	12.12.2025
EAST ELEVATION	TP03.00	9	12.12.2025
NORTH ELEVATION	TP03.01	9	12.12.2025
WEST ELEVATION	TP03.02	9	12.12.2025
SOUTH ELEVATION	TP03.03	9	12.12.2025
SECTION A-A	TP04.00	10	12.12.2025
SECTION B-B & C-C	TP04.01	10	12.12.2025
MATERIALS AND FINISHES	TP08.01	3	12.12.2025
SUN STUDY	TP10.01	6	12.12.2025










### 3.0 Key ESD Initiatives

A detailed analysis has been undertaken in order to nominate the ESD initiatives required and confirm the performance outcomes achieved. The results of this analysis are set out in the remainder of this report.

The following key sustainable design initiatives have been incorporated into this project:

An assessment of sustainable design outcomes of the proposed development has been undertaken with NCC 2022, BESS and MUSIC benchmarking tools. The information presented in this report demonstrates that:

<p><b>Energy</b></p> <p>23.7kWp rooftop solar photovoltaic system</p> 	<p><b>Energy</b></p> <p>All-electric development</p> 	<p><b>NCC 2022 Part J</b></p> <p>Building Fabric Improvement</p> <p><b>11.1%</b></p>	<p><b>BESS Assessment</b></p> <p>The combination of design features and services initiatives meets all the standards of the BESS sustainability assessment tool</p> <p><b>55%</b></p>
<p><b>Water</b></p> <p>Rainwater harvesting system for toilet flushing</p> 	<p><b>Performance</b></p> <p>High-performance glazing and energy efficient building services, appliances and fixtures</p> 		<p><b>Stormwater</b></p> <p>The development meets the Best Practice standard for stormwater quality.</p> 

## 4.0 Built Environment Sustainability Scorecard (BESS)

The project meets the standard required for water, energy, stormwater and Indoor Environment Quality. The project also meets the 50% BESS Score required to demonstrate Best Practice.

Please refer Appendix A for the BESS Report.

Element	Required Score	Project Score	Pass
Management	0%	62%	Yes
Water	50%	60%	Yes
Energy	50%	74%	Yes
Stormwater	100%	100%	Yes
Indoor Environment Quality	50%	51%	Yes
Transport	0%	22%	Yes
Waste	0%	33%	Yes
Urban Ecology	0%	12%	Yes
Innovation	0%	0%	Yes
<b>Project BESS Score</b>	<b>50%</b>	<b>55%</b>	<b>Yes</b>

The BESS assessment tool for new projects was developed by the Council Alliance for a Sustainable Built Environment (CASBE).

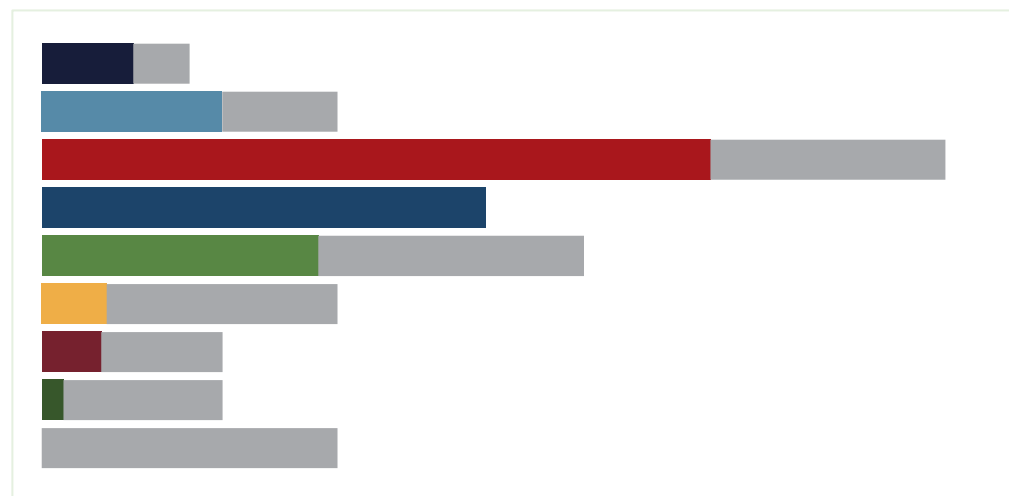
The BESS tool provides an objective performance based analysis of nine key sustainable building design categories at the planning permit stage of the building lifecycle.

BESS is widely regarded as an appropriate sustainability assessment tool for both residential and non-residential development projects. Since its launch, 29 Victorian councils including Port Phillip have adopted BESS.

The BESS tool builds on the NCC energy efficiency measures and provides a framework for assessing building performance outcomes in relation to:

- Management
- Water
- Energy
- Stormwater
- Indoor Environment Quality
- Transport
- Waste
- Urban Ecology
- Innovation

BESS scores for the development are summarised in the following table.



## 5.0 MUSIC Modelling

To assess the quality of stormwater runoff from the site, an analysis has been undertaken using MUSIC Modelling software.

The proposed development exceeds the pollutant load reduction targets set out in the Best Practice Environmental Management Guidelines (BPEMG)

Reduction in Total Suspended Solids (TSS) load:	Reduction in Total Phosphorus (TP) load:
<b>80.5%</b>	<b>52.4%</b>
Reduction in Total Nitrogen (TN) load:	Reduction in Gross Pollutants (GP) load:
<b>64.1%</b>	<b>99.8%</b>

The results indicate that the project meets the requirements of Planning Scheme Clause 58.13 as the post development stormwater peak discharge does not exceed the pre-development peak.

Refer to Appendix B for the MUSIC rating results, Appendix B.6 for rainwater harvesting and reliability results and Appendix C for the WSUD Maintenance Manual.

A rainwater harvesting system will be installed comprising:

- Rainwater harvesting from all roof areas and the L9 roof canopy (approx. 889m<sup>2</sup>):
- Total storage volume of 20kL rainwater tanks
- Re-use of captured water for flushing of retail toilets on ground level, and hotel toilets on level 1 and level 2.

In addition to the harvesting and re-use of rainwater, the following features will be incorporated into the proposed design to facilitate treatment of stormwater runoff:

- Landscape areas that promote infiltration and reduce runoff during storm events.
- A CDS Nipper gross pollutant trap (or equivalent primary treatment device) to capture pollutants generated onsite.

## 6.0 Daylight Modelling

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This report contains a summary of analysis of internal daylight levels in all regularly occupied spaces within the proposed mixed-use development at 134 Moray Street, South Melbourne.

The model accounts for shading and obstructions provided by existing adjacent structures, an 8-storey building under construction at 132 Moray St and 24-30 York St and a 6-storey building expected to be developed on the vacant land at 133 and 137 Moray St.

Results of daylight assessment are based on the BESS standard for daylight modelling as follows:

Residential developments:

- At least 80% of dwellings achieve a daylight factor greater than 0.5% to 90% of the floor area in all bedrooms.

Non-residential areas:

- At least 30% of nominated commercial area achieves a daylight factor greater of at least 2.0%.

The modelling results and software input assumptions are provided in Appendix G.

The daylight modelling confirms that:

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Class 3 Hotel Kitchen/living areas meet the Best Practice standard.

97%

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Class 3 Hotel Studios/bedrooms meet the Best Practice standard.

92%

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Total Class 5 Office floor area meeting the BESS daylight standard.

100%

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Total Class 6 Retail floor area meeting the BESS daylight standard.

86%

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Total Class 9b Conference floor area meeting the BESS daylight standard.

75%

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## 7.0 Preliminary J1V3 Simulation

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The results of the J1V3 analysis demonstrates that the proposed design achieves compliance with Performance Requirements J1P1 of NCC 2022, based on the design and modelling assumptions set out in this report.

Refer to Appendix F for J1V3 details and assumptions

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**Building Fabric Improvement over NCC**

**11.1%**

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**Reference Total Loads (KgCO2-e/yr)**

**80,696**


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**Proposed Total Loads (KgCO2-e/yr)**


**71,711**


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## 8.0 Sustainable Design Initiatives & Systems


Issue	Performance	Comments
Building Management		
Metering	<p>In addition to individual meters for utilities, the following meters will be installed to provide information to the building manager in relation to centralised building systems and common area energy consumption:</p> <ul style="list-style-type: none"> <li>– Harvested rainwater supply line</li> <li>– Flow meter for hot water plant</li> <li>– Common area lift and lighting meter</li> <li>– Car park lighting &amp; power meter</li> <li>– Photovoltaic system generation meter</li> </ul>	<p>The information collected from these meters will be used by the building manager to assess the function and efficacy of central systems during commissioning and ongoing operation.</p>
Building Users Guide	<p>A Building Users Guide will be prepared and will provide details regarding the everyday operation of the building to enable building users to minimise energy and water consumption and optimise internal comfort and amenity.</p>	<p>The Building Users Guide will be prepared in accordance with the requirements of Credit 4.0 of the Green Star Design &amp; As Built tool, Version 1.3.</p>
NCC J1V3 & J4D6 Façade Calculator	<p>Preliminary J1V3 and J4D6 façade calculations have been carried out to determine thermal performance and window/wall ratios and are achievable with the proposed design. Results demonstrate that the project meets the requirements of NCC 2022 Section J.</p>	<p>Refer to Appendix F for the J1V3 simulation and facade calculator.</p>


Issue	Performance	Comments
<div style="display: flex; align-items: center;"> <span style="margin-right: 20px;">Water</span>  </div>		
Water Efficiency	<p>The following water efficient fittings and appliances will be specified:</p> <ul style="list-style-type: none"> <li>– WELS 4 star showers (&gt;6 but &lt;=7.5 litres/minute)</li> <li>– WELS 4 star toilets</li> <li>– WELS 6 star kitchen taps</li> <li>– WELS 5 star basin taps</li> <li>– WELS 5 star dishwashers (commercial areas)</li> </ul>	Water using fixtures and appliances will be specified during design development in accordance with this water efficiency performance standard.
Rainwater Harvesting	<p>A rainwater harvesting system will be installed comprising:</p> <ul style="list-style-type: none"> <li>– Rainwater harvesting from all roof areas and the level 9 roof canopy (catchment area of approx. 889m<sup>2</sup>);</li> <li>– A total storage volume of 20,000 litres;</li> <li>– Re-use of water for toilet flushing in retail toilets on ground level, and hotel toilets on level 1 and level 2.</li> </ul>	<p>Rainwater modelling indicates that this system will provide an estimated annual mains water saving of 431 kL and a supply reliability of 76% from toilet flushing.</p> <p>MUSIC results are provided in Appendix B, refer to Appendix B.6 for details of predicted harvested rainwater volumes and Appendix C for an indicative maintenance program.</p>
Water Efficient Landscaping	<p>Where appropriate, water sensitive landscape design will be incorporated into the development by specifying the following:</p> <ul style="list-style-type: none"> <li>– Drought tolerant and/or indigenous plant species that are best suited to local climate.</li> </ul>	These initiatives will ensure efficient use of water and also reduce the total potable water used for landscape works.
Fire System Water Testing	Strategies to reduce potable water used for testing water in fire systems to be implemented.	Refer to VBA PN-ESM-08 for water saving options.


Issue	Performance	Comments
Energy 		
Renewable Energy System	A solar photovoltaic system will be installed to offset greenhouse emissions and will provide a total peak generation capacity of 23.7 kW.	Note that the system is predicted to result in equivalent avoided greenhouse emissions of approximately 24.1 tonnes CO2-e each year. Refer to Appendix D for details of proposed system capacity and panel numbers.
Gas Free Development	The project will not have gas services connected. Gas free developments not only avoid ongoing service charges for building users, but it takes advantage of the improvement in emissions from grid connected electricity in addition to the energy generated on-site.	
Thermal performance efficiency	Roof and floor insulation specification will meet Section J 2022 requirements. Walls and window performance will meet NCC 2022 J4D6 façade requirements.	Refer to Appendix F for the J1V3 simulation and facade calculator.
Heating & Cooling	Space heating and cooling will be provided by reverse cycle heat pumps with minimum seasonal CoP & EER of 4.0 calculated in accordance with AS 3823.4 2014.	Efficient reverse cycle units in conjunction with a thermally efficient building envelope are considered to be an environmentally acceptable method of space conditioning.
Domestic Hot Water	Domestic hot water will be provided by an efficient central heat pump electric hot water system with a highly insulated circulating loop to reduce parasitic heat losses.	
Lighting	Lighting will be designed to meet the lighting power density requirements in Table J7D3a of the NCC 2022 Vol 1.	Note that external lighting for the development will be designed with the objective of preventing light spill to the night sky.
Carpark Ventilation	To reduce energy use and greenhouse emissions from the basement car park mechanical ventilation system, energy use will be minimised by the use of a variable speed fan motor and appropriate controls including CO monitoring.	


Issue	Performance	Comments
<div style="display: flex; align-items: center; background-color: #1a3d54; color: white; padding: 10px;"> <span style="margin-right: 20px;">Stormwater</span>  </div>		
Stormwater Quality	<p>The MUSIC results and stormwater management strategy described in Section 5.0 above demonstrate that the development attains the Best Practice Standard for Urban Stormwater.</p>	<p>The proposed development exceeds the pollutant load reduction targets set out in the Best Practice Environmental Management Guidelines (BPEMG) for Total Suspended Solids (TSS), Total Phosphorus (TP), Total Nitrogen (TN) and Gross Pollutants (GP). Refer to Section 5.0 and Appendix B for the MUSIC rating results and Appendix C for the WSUD Maintenance Manual.</p> <p>Note that the preliminary MUSIC modelling undertaken to confirm achievable stormwater quality results is based on best information currently available relating to the technical and commercial feasibility of the WSUD strategy proposed. Further investigation will be undertaken during design development which may result in minor variations to the strategy described above to meet the <i>best practice</i> stormwater quality targets.</p>
Construction Stormwater Pollution Reduction Plan	<p>A construction phase stormwater pollution reduction plan will be prepared and implemented during construction to ensure that litter, sediments and other pollution are prevented from entering the stormwater system.</p>	<p>Please refer to Appendix E for the preliminary Site Management Plan.</p>

Issue	Performance	Comments
Indoor Environment Quality 		
Natural Ventilation	The building has been designed to ensure that 40% of hotel suites have access to natural ventilation via operable windows along the façade.	These features will improve comfort and amenity for occupants and reduce peak energy demand and greenhouse emissions arising from mechanical cooling.
Mechanical Ventilation	The mechanical ventilation system will be designed to achieve an increase in outdoor air (in L/s) of at least 50% above the AS 1668.2:2012.	
Daylight Access	<p>Computer modelling has been undertaken to quantify internal daylight levels within hotel rooms and commercial areas of the proposed development.</p> <p>The results of the daylight modelling confirm that the commercial areas and hotel rooms meet the Council's 'best practice' standard for daylight</p>	Refer to Appendix G for details of the daylight modelling.
Thermal Comfort	Thermal comfort for occupants will be enhanced by the specification of high performance glazing.	
Shading	To control solar heat gain, a combination of canopies and external horizontal and vertical sun louvres will be installed to glazing on the north, west and east facades.	Refer to the elevations for the location of shading devices. Permit Condition 1(d).
Volatile Organic Compounds	<p>All interior paints, adhesives and sealants will be Low VOC type to improve indoor environmental quality for residents.</p> <p>Low VOC carpets will be selected for the development.</p> <p>Low formaldehyde engineered wood products (minimum E1 grade) will be specified.</p>	Low VOC paints, adhesives and sealants, carpets and engineered wood products will be specified to meet the requirements Indoor Pollutants (Credit 13) of the Green Star Design & As Built Tool Version 1.3, or alternative green product certification such as GECA or Green Tag.

Issue	Performance	Comments
Transport		
Bicycle Facilities & End of Trip	<p>Readily accessible bicycle storage facilities have been provided to encourage bicycle use by including:</p> <ul style="list-style-type: none"> <li>- 23 vertical &amp; 8 horizontal spaces for staff and guests located in the basement carpark.</li> <li>- 12 horizontal spaces for visitors located outside the building entrances.</li> </ul> <p>End of trip (EOT) facilities have been provided for staff on Ground and Levels 7 &amp; 8. Each EOT facility will include a shower, change bench and lockers. This credit has not been claimed in BESS.</p>	Refer to the Traffic Report prepared by Ratio.
Electric Vehicle Charging	Electrical infrastructure to ensure car parking areas are 'electric vehicle ready', including 1no. charger.	EV facilities to meet the requirements of NCC2022 Section J9D4.
Walkability & Public Transport Access	<p>The site attains a Walk Score® of 98 out of 100 which is defined as 'Walker's Paradise', and a Transit Score of 100 out of 100 which is defined as 'Rider's Paradise'.</p> <p>The site is located within a close walking distance to Clarendon Street (200m), with numerous amenities within a short walking distance. Building users won't require a car to run daily errands.</p> <p>The site is also within close proximity of convenient public transportation options including:</p> <p><b>Trams</b></p> <p>(&lt;200m): 12 Victoria Gardens - St Kilda (Fitzroy St); 58 West Coburg - Toorak;</p> <p>(&lt;300m): 1 East Coburg - South Melbourne Beach;</p> <p><b>Bus Routes</b></p> <p>(&lt;400m): 236 City (Queen Victoria Market) - Garden City;</p> <p>(&lt;500m): 234 City (Queen Victoria Market) - Garden City;</p> <p>(&lt;900m): 605 City - Gardenvale.</p>	The location of the development will facilitate walking and public transport in lieu of private vehicle use.

Issue	Performance	Comments
Waste 		
Operational Waste Management	<p>Bins for both recycling and general waste will be provided in each hotel suite.</p> <p>The following waste management facilities will be provided in the development:</p> <p>An enclosed bin store in the basement level containing:</p> <ul style="list-style-type: none"> <li>– 2 x 1100 litre bins for general waste</li> <li>– 2 x 1100 litre bins for commingled recyclables</li> <li>– 2 x 240 litre bins for food and garden organics</li> <li>– 1 x 660 litre bin for glass</li> <li>– 1 x 240 litre bin for e-waste</li> <li>– 2sqm for hard waste</li> </ul>	For details of waste generation rates and collection logistics, refer to the Waste Management Plan prepared by Ratio.
Construction Waste Minimisation	<p>A target recycling rate of 80% of construction and demolition waste has been adopted for the construction phase of the development to minimise the volume of waste to landfill.</p> <p>This will be achieved by the development of a comprehensive waste minimisation strategy including:</p> <ul style="list-style-type: none"> <li>– Separation of all commercially viable recyclable waste streams;</li> <li>– Training in waste minimisation for all site staff and contractors to form part of site induction training;</li> <li>– Record keeping of landfill waste and recyclable stream volumes to track performance against the 80% recyclable target; and</li> <li>– Quarterly reporting of volumes and percentages for each waste stream.</li> </ul>	A dedicated recycling contractor will be engaged to facilitate separation of commercially viable recyclable waste streams in accordance with the target adopted.

Issue	Performance	Comments
Urban Ecology		
Maintaining/Enhancing Ecological Value	Landscaping and planter boxes have been integrated into the proposed design on ground and levels 5 & 6.	These features will provide amenity for building occupants and contribute to the ecological value of the proposed development.
Roofing	To reduce the Urban Heat Island impact, light coloured roofing will be installed with a minimum Solar Reflectance Index (SRI) of 0.7.	Permit Condition 1.o)

Issue	Performance	Comments
Materials		
Environmentally Preferable Materials	<p>The following environmentally preferable materials will be specified with the objective of reducing off-site environmental impacts and improving indoor environmental quality for residents:</p> <ul style="list-style-type: none"> <li>- All feature timber will be recycled or from accredited sustainably harvested plantation sources (FSC or PEFC).</li> </ul>	Timber products will be specified in accordance with the requirements of Credit 20.2 of the Green Star Design & As Built Tool Version 1.3.

## 9.0 Implementation Plan

The ESD initiatives set out in this report will be coordinated by the Project Manager in conjunction with the following project design team members:

- - Architect
- - Thermal Performance Assessor
- - Building Services Consultant
- - Waste Management Consultant

An implementation schedule is set out in the following table.

ESD Initiative Implementation Schedule

#	Initiative	Requirement	Responsibility	Stage
	Coordination of Initiatives	Full implementation	Project Manager	All
1	Metering	Specify meters in accordance with nominated schedule	Building Services Engineer	Design Development
2	Water Efficiency	Specify fixtures in accordance with nominated WELS star ratings	Architect	Design Development
3	Rainwater Harvesting	Design and specify rainwater harvesting system including toilet flushing	Building Services Engineer	Design Development
4	Landscaping	Specify water efficient landscaping	Landscape architect	Design Development
5	Thermal Performance	Update Section J Report	Thermal Performance Assessor	Design Development
6	Heating & Cooling	Specify units in accordance with nominated MEPS star ratings	Building Services Engineer	Design Development
7	Hot Water	Specify nominated hot water system	Building Services Engineer	Design Development
8	Lighting	Specify nominated energy efficient lighting types and automated controls	Building Services Engineer	Design Development
9	Carpark Ventilation	CO sensors installed	Building Services Engineer	Design Development
10	EV Charging	Specify equipment in accordance with nominated schedule	Building Services Engineer	Design Development
11	Solar PV Array	Specify system in accordance with nominated schedule	Building Services Engineer	Design Development
12	Environmentally Preferable Materials	Specify materials in accordance with nominated schedule	Architect	Design Development
13	Bicycle Facilities & End of Trip	Specify bike racks & hoops, showers and change facilities	Architect	Design Development
14	Construction Waste Minimisation	Prepare construction waste minimisation plan	ESD consultant	Design Development
15	Building Users Guide	Prepare building users guide	Contractor	Practical Completion

## 10.0 Conclusion

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This report sets out a range of sustainable design features, which are integrated into the design and specification of the proposed development, to improve environmental outcomes during occupation.

In terms of performance outcomes, the analysis presented in this report demonstrates that the proposed development:

- Attains an overall BESS score of 55% and passes the mandatory water, energy, stormwater and indoor environment quality elements;
- Achieves an overall energy efficiency performance permitted by NCC 2022; and
- Attains the Best Practice standard for urban stormwater quality.

Accordingly, the sustainable design outcomes from the proposed development are adequate for a mixed-use development of this scale and are consistent with the objectives set out in Clauses 15.01-2S, 15.01-2L-02 (Environmentally Sustainable Development Policy) plus 19.03-3S and 19.03-3L (WSUD Policy) of the Port Phillip Planning Scheme.

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### **BESS Assessment**

The combination of design features and services initiatives meets all the standards of the BESS sustainability assessment tool

55%

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### **NCC 2022 Part J**

Building Fabric Improvement

11.1%

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### **Best Practice**

The development meets the Best Practice standard for Stormwater Quality



# Appendix A. BESS Results

BESS, 134-138 Moray St, South Melbourne VIC 3205, Australia 134-138 Moray S...

## BESS Report

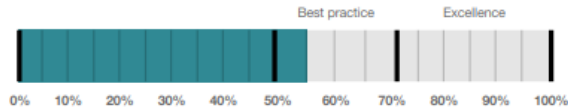
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 134-138 Moray St South Melbourne Victoria 3205. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Port Phillip City Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

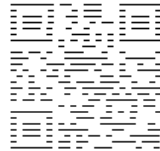
### Your BESS Score



# 55%

### Project details

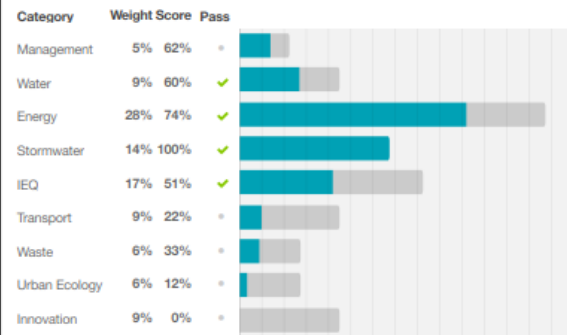
**Name** 134-138 Moray St, South Melbourne VIC 3205, Australia  
**Address** 134-138 Moray St South Melbourne Victoria 3205  
**Project ID** 4F6111AF-R2  
**BESS Version** BESS-8  
**Date** 22 April 2026  
**Software version** 2.3.0-B.650



**Site type** Mixed use development  
**Account** info@arkresources.com.au  
**Application no.**  
**Site area** 1,040 m<sup>2</sup>  
**Building floor area** 5,989 m<sup>2</sup>

### Performance by category

● This project ● Maximum available



### Project composition



The Built Environment Sustainability Scorecard is an initiative of the Council Alliance for a Sustainable Built Environment (CASBE). For more details see [www.bess.net.au](http://www.bess.net.au)

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## Buildings

Name	Height	Footprint	% of total footprint
Mixed-Use	10	982 m <sup>2</sup>	100%

## Dwellings & Non Res Spaces

### Non-Res Spaces

Name	Quantity	Area	Building	% of total area
<b>Office</b>				
Commercial	1	589 m <sup>2</sup>	Mixed-Use	9%
<b>Total</b>	<b>1</b>	<b>589 m<sup>2</sup></b>	<b>9%</b>	
<b>Shop</b>				
Retail	1	273 m <sup>2</sup>	Mixed-Use	4%
<b>Total</b>	<b>1</b>	<b>273 m<sup>2</sup></b>	<b>4%</b>	
<b>Public building</b>				
Hotel Conference	1	372 m <sup>2</sup>	Mixed-Use	6%
<b>Total</b>	<b>1</b>	<b>372 m<sup>2</sup></b>	<b>6%</b>	
<b>Other building</b>				
Hotel Rooms (L3 - L7 not connected to RWT)	1	3,122 m <sup>2</sup>	Mixed-Use	52%
Hotel Rooms (L1-L2 connected to RWT)	1	1,633 m <sup>2</sup>	Mixed-Use	27%
<b>Total</b>	<b>2</b>	<b>4,755 m<sup>2</sup></b>	<b>79%</b>	

## Supporting Evidence

### Shown on Floor Plans

Credit	Requirement	Response	Status
Management 3.2	Annotation: Individual utility meters to be provided to all individual commercial tenancies		-
Management 3.3	Annotation: Sub-meters to be provided to all major common area services (list each)		-
Water 3.1	Annotation: Water efficient garden details		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Location and size of solar photovoltaic system		-
Stormwater 1.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste 2.2	Location of recycling facilities		-
Urban Ecology 2.1	Location and size of vegetated areas		-

### Supporting Documentation

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment		-

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Credit	Requirement	Response	Status
Management 2.3b	Preliminary modelling report		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.1	Details of either the fully natural carpark ventilation or CO monitoring system proposed		-
Energy 3.7	Average lighting power density and lighting type(s) to be used		-
Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.4	A short report detailing assumptions used and results achieved.		-

### Credit summary

#### Management Overall contribution 4.5%

Requirement	Response	Percentage
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 60%;"></div> <div>Minimum required 50%</div> <div>62% <span style="color: green;">✔ Pass</span></div> </div>		
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		100%
3.2 Metering - Non-Residential		100%
3.3 Metering - Common Areas		100%
4.1 Building Users Guide		100%

#### Water Overall contribution 9.0%

Requirement	Response	Percentage
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 60%;"></div> <div>Minimum required 50%</div> <div>60% <span style="color: green;">✔ Pass</span></div> </div>		
1.1 Potable Water Use Reduction		44%
3.1 Water Efficient Landscaping		100%
4.1 Building Systems Water Use Reduction		100%

#### Energy Overall contribution 27.5%

Requirement	Response	Percentage	Status
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 60%;"></div> <div>Minimum required 50%</div> <div>74% <span style="color: green;">✔ Pass</span></div> </div>			
1.1 Thermal Performance Rating - Non-Residential		37%	
2.1 Greenhouse Gas Emissions		100%	
2.2 Peak Demand		100%	
2.6 Electrification		100%	
2.7 Energy consumption		100%	
3.1 Carpark Ventilation		100%	
3.2 Hot Water		100%	
3.7 Internal Lighting - Non-Residential		100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	<span style="color: orange;">⚠ Scoped Out</span>
No cogeneration or trigeneration system in use.			
4.2 Renewable Energy Systems - Solar		6%	
4.4 Renewable Energy Systems - Other		N/A	<span style="color: orange;">⚠ Scoped Out</span>
No other (non-solar PV) renewable energy is in use.			

#### Stormwater Overall contribution 13.5%

Requirement	Response	Percentage	Status
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 60%;"></div> <div>Minimum required 100%</div> <div>100% <span style="color: green;">✔ Pass</span></div> </div>			
1.1 Stormwater Treatment		100%	

#### IEQ Overall contribution 16.5%

Requirement	Response	Percentage	Status
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 60%;"></div> <div>Minimum required 50%</div> <div>51% <span style="color: green;">✔ Pass</span></div> </div>			
1.4 Daylight Access - Non-Residential		95%	<span style="color: green;">✔ Achieved</span>
2.3 Ventilation - Non-Residential		33%	<span style="color: green;">✔ Achieved</span>
3.4 Thermal comfort - Shading - Non-Residential		0%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

**Transport Overall contribution 9.0%**

		<b>22%</b>
1.4 Bicycle Parking - Non-Residential		0%
1.5 Bicycle Parking - Non-Residential Visitor		0%
1.6 End of Trip Facilities - Non-Residential		0%
Credit 1.4 must be complete first.		
2.1 Electric Vehicle Infrastructure		100%
2.2 Car Share Scheme		0%
2.3 Motorbikes / Mopeds		0%

**Waste Overall contribution 5.5%**

		<b>33%</b>
1.1 - Construction Waste - Building Re-Use		0%
2.1 - Operational Waste - Food & Garden Waste		0%
2.2 - Operational Waste - Convenience of Recycling		100%

**Urban Ecology Overall contribution 5.5%**

		<b>12%</b>
1.1 Communal Spaces		0%
2.1 Vegetation		25%
2.2 Green Roofs		0%
2.3 Green Walls and Facades		0%
3.2 Food Production - Non-Residential		0%

**Innovation Overall contribution 9.0%**

		<b>0%</b>
1.1 Innovation		0%

**Credit breakdown**

**Management Overall contribution 4.5%**




		<b>62%</b>
<b>1.1 Pre-Application Meeting</b>		<b>0%</b>
Score Contribution	This credit contributes 37.5% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	-	
<b>2.3 Thermal Performance Modelling - Non-Residential</b>		<b>100%</b>
Score Contribution	This credit contributes 25% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2022 Section J4D6?	
Question	Criteria Achieved ?	
Office	Yes	
Shop	Yes	
Public building	Yes	
Other building	Yes	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2022 Section J (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Office	Yes	
Shop	Yes	
Public building	Yes	
Other building	Yes	
<b>3.2 Metering - Non-Residential</b>		<b>100%</b>
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have utility meters been provided for all individual commercial tenants?	
Question	Criteria Achieved ?	
Office	Yes	
Shop	Yes	
Public building	Yes	
Other building	Yes	
<b>3.3 Metering - Common Areas</b>		<b>100%</b>

Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Have all major common area services been separately submetered?
Question	Criteria Achieved ?
Office	Yes
Shop	Yes
Public building	Yes
Other building	Yes
<b>4.1 Building Users Guide</b>	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	Yes

**Water Overall contribution 9.0%**

	Minimum required 50%	60% <span style="color: green;">✔</span> Pass
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<b>Water Approach</b>	
What approach do you want to use for Water?:	Use the built in calculation tools
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
<b>Fixtures, fittings &amp; connections profile</b>	
Showerhead: All	4 Star WELS (>= 6.0 but <= 7.5)
Bath: All	Scope out
Kitchen Taps: All	>= 6 Star WELS rating
Bathroom Taps: All	>= 5 Star WELS rating
<b>Dishwashers:</b>	
Retail	>= 5 Star WELS rating
Commercial	
Hotel Conference	Scope out
Hotel Rooms (L1-L2 connected to RWT)	
Hotel Rooms (L3 - L7 not connected to RWT)	
WC: All	>= 4 Star WELS rating
Urinals: All	Scope out
Washing Machine Water Efficiency: All	Scope out
<b>Which non-potable water source is the dwelling/space connected to?:</b>	
Retail	RWT
Commercial	
Hotel Conference	
Hotel Rooms (L1-L2 connected to RWT)	
Hotel Rooms (L3 - L7 not connected to RWT)	-
<b>Non-potable water source connected to Toilets:</b>	
Retail	Yes
Hotel Rooms (L1-L2 connected to RWT)	
Commercial	No
Hotel Conference	
Hotel Rooms (L3 - L7 not connected to RWT)	
Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No
<b>Rainwater tank profile</b>	
What is the total roof area connected to the rainwater tank?:	
RWT	889 m²
	-

<b>Tank Size:</b>	
RWT	20,000 Litres
	-
<b>Irrigation area connected to tank:</b>	
RWT	0.0 m <sup>2</sup>
	-
<b>Is connected irrigation area a water efficient garden?:</b>	
RWT	No
	-
<b>Other external water demand connected to tank?:</b>	
RWT	0.0 Litres/Day
	-
<b>1.1 Potable Water Use Reduction</b>	 44%
Score Contribution	This credit contributes 71.4% towards the category score.
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.
Output	Reference
Project	11540 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	8771 kL
Output	Proposed (including rainwater and recycled water use)
Project	8236 kL
Output	% Reduction in Potable Water Consumption
Project	28 %
Output	% of connected demand met by rainwater
Project	93 %
Output	How often does the tank overflow?
Project	Never / Rarely
Output	Opportunity for additional rainwater connection
Project	3456 kL
<b>3.1 Water Efficient Landscaping</b>	 100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	Yes
<b>4.1 Building Systems Water Use Reduction</b>	 100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Where applicable, have measures been taken to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems?
Question	Criteria Achieved ?
Project	Yes

**Energy Overall contribution 27.5%**

		<b>Minimum required 50%</b>	<b>74%</b>	<b>✓ Pass</b>
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Use the BESS Deem to Satisfy (DtS) method for Non-residential spaces?:		Yes
Do all exposed floors and ceilings (forming part of the envelope) demonstrate meeting the required NCC2022 insulation levels (total R-value upwards and downwards)?:		Yes
Does all wall and glazing demonstrate meeting the required NCC2022 facade calculator (or better than the total allowance)?:	Yes	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes	Yes
<b>Solar Photovoltaic system profile</b>		
System Size (lesser of inverter and panel capacity):		
PVE	11.8 kW peak	
PWW	11.8 kW peak	
Orientation (which way is the system facing)?:		
PVE	North-East	
PWW	South-West	
Inclination (angle from horizontal):		
PVE	13.0 Angle (degrees)	
PWW	13.0 Angle (degrees)	
Which Building Class does this apply to?:		
PVE	Public building	
PWW	Public building	
<b>1.1 Thermal Performance Rating - Non-Residential</b>		37%
Score Contribution	This credit contributes 34.8% towards the category score.	
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC2022 Section J)?	
<b>2.1 Greenhouse Gas Emissions</b>		100%
Score Contribution	This credit contributes 8.7% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	
<b>2.2 Peak Demand</b>		100%
Score Contribution	This credit contributes 4.3% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	

<b>2.6 Electrification</b>		100%
Score Contribution	This credit contributes 13% towards the category score.	
Criteria	Is the development all-electric?	
Question	Criteria Achieved?	
Project	Yes	
<b>2.7 Energy consumption</b>		100%
Score Contribution	This credit contributes 17.4% towards the category score.	
Criteria	What is the % reduction in annual energy consumption against the benchmark?	
<b>3.1 Carpark Ventilation</b>		100%
Score Contribution	This credit contributes 4.3% towards the category score.	
Criteria	If you have an enclosed carpark, is it: (a) fully naturally ventilated (no mechanical ventilation system) or (b) 40 car spaces or less with Carbon Monoxide monitoring to control the operation and speed of the ventilation fans?	
Question	Criteria Achieved ?	
Project	Yes	
<b>3.2 Hot Water</b>		100%
Score Contribution	This credit contributes 4.3% towards the category score.	
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?	
<b>3.7 Internal Lighting - Non-Residential</b>		100%
Score Contribution	This credit contributes 8.7% towards the category score.	
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J7D3a of the NCC 2022 Vol 1?	
Question	Criteria Achieved ?	
Office	Yes	
Shop	Yes	
Public building	Yes	
Other building	Yes	
<b>4.1 Combined Heat and Power (cogeneration / trigeneration)</b>		N/A ✦ Scoped Out
No cogeneration or trigeneration system in use.		
This credit was scoped out	No cogeneration or trigeneration system in use.	
<b>4.2 Renewable Energy Systems - Solar</b>		6%
Score Contribution	This credit contributes 4.3% towards the category score.	
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?	
Output	Solar Power - Energy Generation per year	
Public building	26,420 kWh	
Output	% of Building's Energy	
Public building	191 %	

<b>4.4 Renewable Energy Systems - Other</b>	N/A	Scoped Out
No other (non-solar PV) renewable energy is in use.		
This credit was scoped out	No other (non-solar PV) renewable energy is in use.	

**Stormwater Overall contribution 13.5%**

<b>Minimum required 100%</b>	<b>100%</b>	<b>Pass</b>
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Which stormwater modelling software are you using?:	MUSIC or other modelling software
<b>1.1 Stormwater Treatment</b>	100%
Score Contribution	This credit contributes 100% towards the category score.
Criteria	Has best practice stormwater management been demonstrated?
Question	Flow (ML/year)
Project	62.6 % Reduction
Question	Total Suspended Solids (kg/year)
Project	80.5 % Reduction
Question	Total Phosphorus (kg/year)
Project	52.4 % Reduction
Question	Total Nitrogen (kg/year)
Project	64.1 % Reduction

**IEQ Overall contribution 16.5%**

<b>Minimum required 50%</b>	<b>51%</b>	<b>Pass</b>
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<b>1.4 Daylight Access - Non-Residential</b>	95%	Achieved
Score Contribution	This credit contributes 35.3% towards the category score.	
Criteria	What % of the nominated floor area has at least 2% daylight factor?	
Question	Percentage Achieved?	
Office	100 %	
Shop	86 %	
Public building	75 %	
Other building	97 %	
<b>2.3 Ventilation - Non-Residential</b>	33%	Achieved
Score Contribution	This credit contributes 35.3% towards the category score.	
Criteria	What % of the regular use areas are effectively naturally ventilated?	
Question	Percentage Achieved?	
Office	-	
Shop	-	
Public building	0 %	
Other building	-	
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?	
Question	Percentage Achieved?	
Office	0 %	
Shop	0 %	
Public building	0 %	
Other building	-	
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?	
Question	Value	
Office	800 ppm	
Shop	800 ppm	
Public building	800 ppm	
Other building	800 ppm	
<b>3.4 Thermal comfort - Shading - Non-Residential</b>	0%	
Score Contribution	This credit contributes 17.6% towards the category score.	

Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?
Question	Percentage Achieved?
Office	0 %
Shop	0 %
Public building	0 %
Other building	-
<b>3.5 Thermal Comfort - Ceiling Fans - Non-Residential</b> 0%	
Score Contribution	This credit contributes 5.9% towards the category score.
Criteria	What percentage of regular use areas in tenancies have ceiling fans?
Question	Percentage Achieved?
Office	-
Shop	-
Public building	-
Other building	-
<b>4.1 Air Quality - Non-Residential</b> 100%	
Score Contribution	This credit contributes 5.9% towards the category score.
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Office	Yes
Shop	Yes
Public building	Yes
Other building	Yes
Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Office	Yes
Shop	Yes
Public building	Yes
Other building	Yes
Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Office	Yes
Shop	Yes
Public building	Yes
Other building	Yes

**Transport Overall contribution 9.0%**

		<b>22%</b>
<b>1.4 Bicycle Parking - Non-Residential</b>		0%
Score Contribution	This credit contributes 22.2% towards the category score.	
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?	
Question	Criteria Achieved ?	
Office	No	
Shop	No	
Public building	No	
Other building	No	
Question	Bicycle Spaces Provided ?	
Office	0	
Shop	1	
Public building	0	
Other building	17	
<b>1.5 Bicycle Parking - Non-Residential Visitor</b>		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?	
Question	Criteria Achieved ?	
Office	No	
Shop	No	
Public building	No	
Other building	No	
Question	Bicycle Spaces Provided ?	
Office	0	
Shop	1	
Public building	0	
Other building	11	
<b>1.6 End of Trip Facilities - Non-Residential</b>		0% <input checked="" type="checkbox"/> Disabled
		Credit 1.4 must be complete first.
This credit is disabled		Credit 1.4 must be complete first.
<b>2.1 Electric Vehicle Infrastructure</b>		100%
Score Contribution	This credit contributes 22.2% towards the category score.	
Criteria	Are facilities provided for the charging of electric vehicles?	
Question	Criteria Achieved ?	
Project	Yes	
<b>2.2 Car Share Scheme</b>		0%

Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	Has a formal car sharing scheme been integrated into the development?
Question	Criteria Achieved ?
Project	-
<b>2.3 Motorbikes / Mopeds</b>	<b>0%</b>
Score Contribution	This credit contributes 22.2% towards the category score.
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?
Question	Criteria Achieved ?
Project	-

**Waste Overall contribution 5.5%**

	<b>33%</b>
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<b>1.1 - Construction Waste - Building Re-Use</b>	<b>0%</b>
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?
Question	Criteria Achieved ?
Project	-
<b>2.1 - Operational Waste - Food &amp; Garden Waste</b>	<b>0%</b>
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	No
<b>2.2 - Operational Waste - Convenience of Recycling</b>	<b>100%</b>
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?
Question	Criteria Achieved ?
Project	Yes

**Urban Ecology Overall contribution 5.5%**

	<b>12%</b>
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<b>1.1 Communal Spaces</b>	<b>0%</b>
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?
Question	Common space provided
Office	0.0 m²
Shop	-
Public building	0.0 m²
Other building	-
Output	Minimum Common Space Required
Office	47 m²
Shop	27 m²
Public building	37 m²
Other building	143 m²
<b>2.1 Vegetation</b>	<b>25%</b>
Score Contribution	This credit contributes 50% towards the category score.
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?
Question	Percentage Achieved ?
Project	5 %
<b>2.2 Green Roofs</b>	<b>0%</b>
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Does the development incorporate a green roof?
Question	Criteria Achieved ?
Project	-
<b>2.3 Green Walls and Facades</b>	<b>0%</b>
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Does the development incorporate a green wall or green façade?
Question	Criteria Achieved ?
Project	-
<b>3.2 Food Production - Non-Residential</b>	<b>0%</b>

Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	What area of space per occupant is dedicated to food production?
Question	Food Production Area
Office	-
Shop	-
Public building	-
Other building	-
Output	Min Food Production Area
Office	12 m <sup>2</sup>
Shop	7 m <sup>2</sup>
Public building	10 m <sup>2</sup>
Other building	60 m <sup>2</sup>

**Innovation Overall contribution 9.0%**

	0%
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<b>1.1 Innovation</b>	0%
Score Contribution	This credit contributes 100% towards the category score.
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?

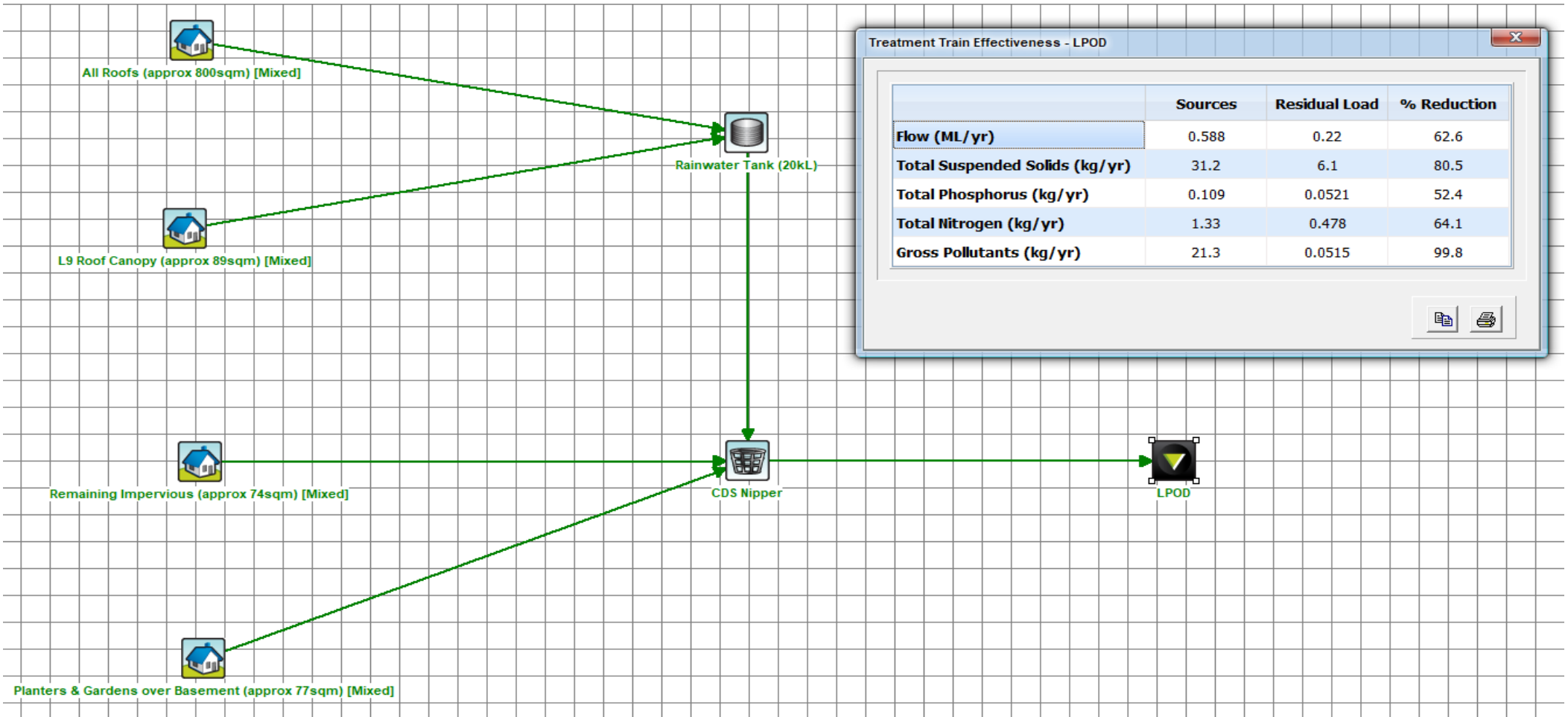
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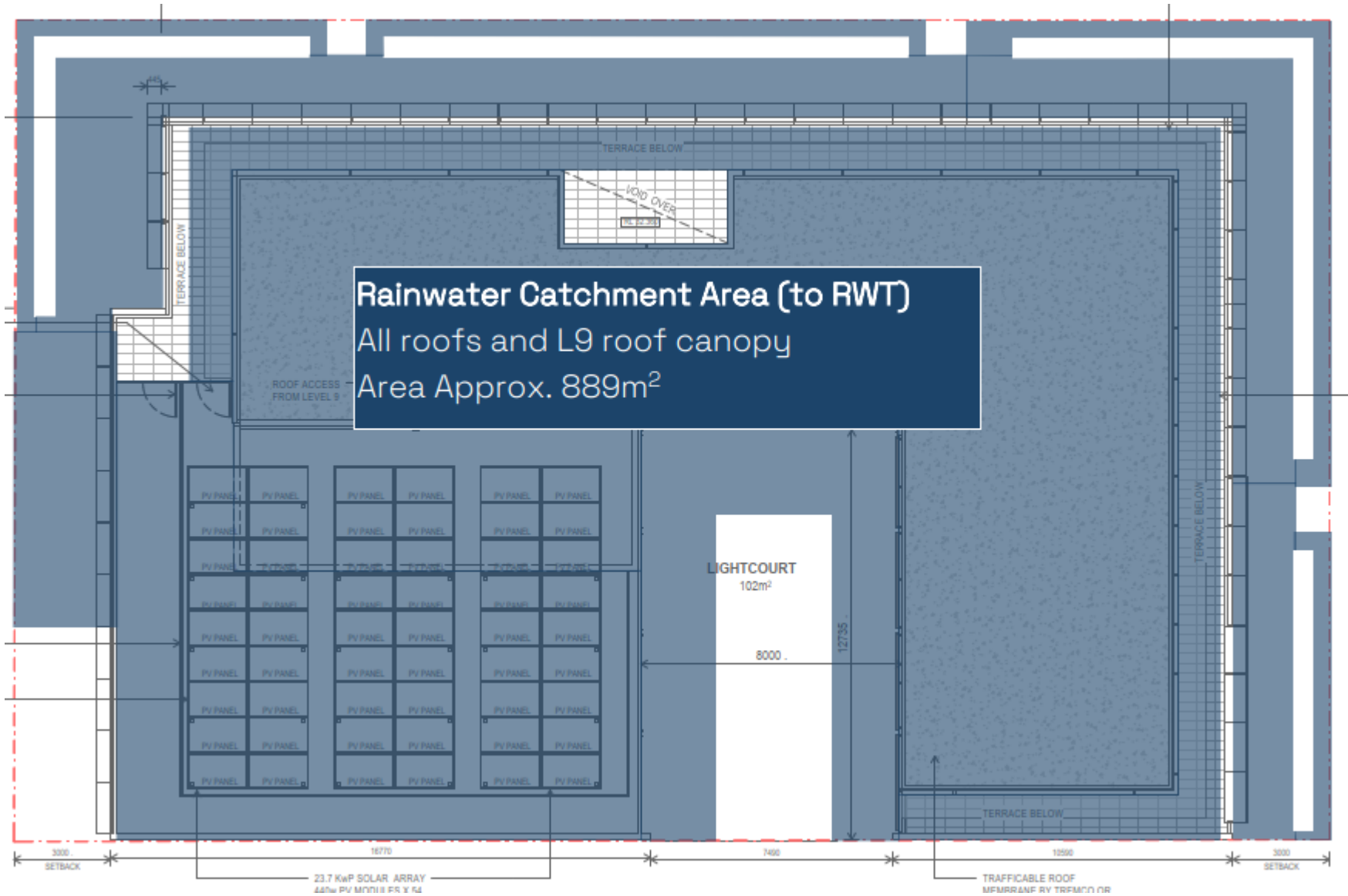
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# Appendix B. MUSIC Modelling

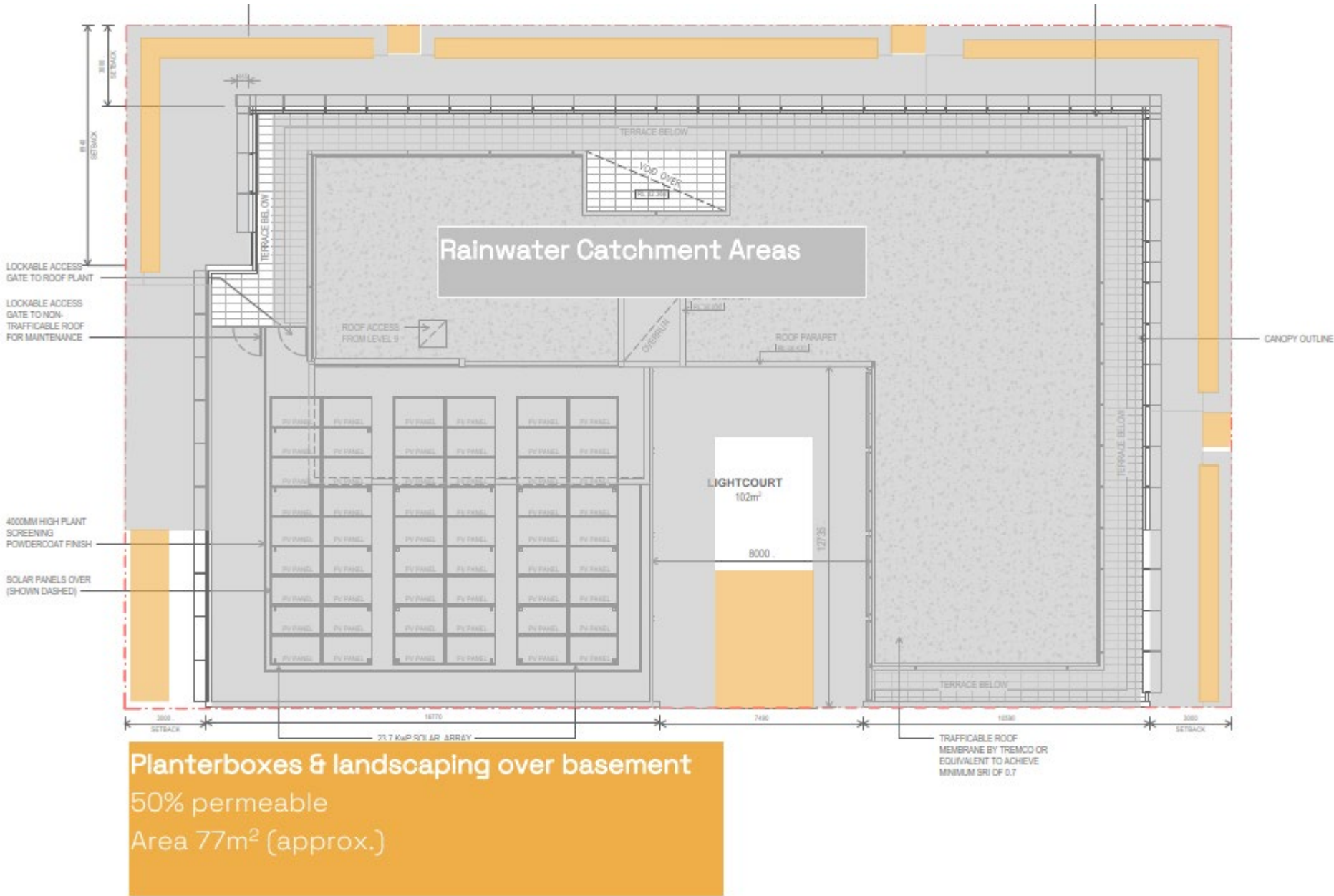
## B.1 MUSIC Schematic



## B.2 Rainwater Catchment Areas



### B.3 Permeable Areas



## B.4 MUSIC Modelling Assumptions and Inputs

Area Name	Area [m <sup>2</sup> ]
Roof Areas to Rainwater Tank	889
All Roofs	800
L9 Roof Canopy	89
Semi-Permeable Areas (Planters on structure)	77
Remaining Area	74
<b>Total Site Area</b>	<b>1,040</b>

Treatment Devices Features	
Rainwater Tank	20 kL
Est. daily water demand for Toilet flushing	1.498 kL/day
Retail toilets and Hotel toilets on Levels 1 and 2	
**Primary Treatment System (Gross Pollutant Trap)	Rocla CDS Nipper (or equivalent)

NOTES:	
**Nutrient reduction (Phosphorous and Nitrogen) not attributed to GPT as per Melbourne Water MUSIC guidelines.	

### Acronyms

- RWT: Rain Water Tank
- RG: Rain Garden
- TF: Toilet Flushing
- GPT: Gross Pollutant Trap

## B.5 MUSIC Results

Pollutant	MUSIC Model Results	Melbourne Water Targets
Reduction in Total Suspended Solids (TSS)	80.5%	80.0%
Reduction in Total Phosphorus (TP)	52.4%	45.0%
Reduction in Total Nitrogen (TN)	64.1%	45.0%
Reduction in Total Gross Pollutants	99.8%	70.0%
<b><i>Compliance with Melbourne Water targets</i></b>		<b>YES</b>

### MUSIC v6.3.0 Input Parameters

Rainfall data	
Rainfall Range & Station Name	C - Melbourne City (650-750mm)
10 Year Period	C - 1952-1961
Mean annual rainfall	C - 708mm
Evapotranspiration	C - 995
Time step	6 minutes
Estimation method	Stochastically generated

Soil properties - Melbourne	
Soil store capacity	120mm
Field capacity	50mm

GPT Pollutant Removal Rates (Rocla CDS)	
Total Suspended Solids	70%
Total Nitrogen	0%
Total Phosphorous	0%
Gross Pollutants	98%
Validation report	<a href="#">CRC for Catchment Hydrology</a>

# B.6 Rainwater Harvesting and Tank Reliability

Property **134 Moray Street, South Melbourne**  
Version

**Inputs:**

Floor Area - NLA (m2)	276
PPL [ M / F ]	28 / 28
Flush/Person/Day [ M - Urinal ]	0
Flush/Person/Day [ M / F - WC ]	2.3 / 2.3
Litres/Flush [ Urinal / WC ]	1 / 3.3
Total Daily usage (litres)	417
PPL	54
Flush/Person/Day	5
Litres/Flush	4
Total Daily usage (litres)	1080
Total Daily usage (litres)	1497

**Irrigation Schedule**

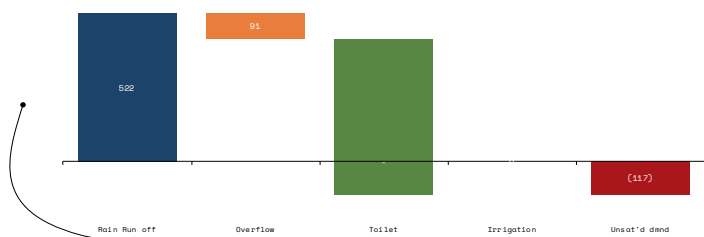
l / m2	S	M	T	W	Th	Fr	S
Jan	10						
Feb	10	y				y	
Mar	10	y				y	
Apr	5	y				y	
May	5		y				
Jun	5		y				
Jul	5			y			
Aug	5			y			
Sep	5				y		
Oct	5				y		
Nov	10					y	
Dec	10		y			y	

**Roof area (m2)** 895  
**Collection Evaporation** 5%  
**Tank Capacity (litres)** 30000

**Irrigation Area (m2)** 10  
T'off if Total Rain (mm) 10  
in the last 5 days

**Recalc, update pivots, table and graphs**

System components (kls per year)



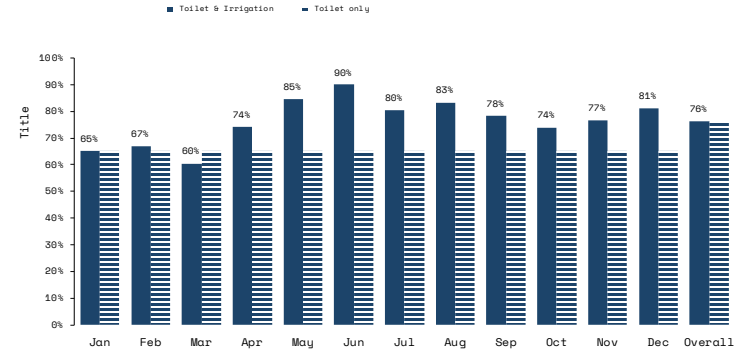
System components (kls per year) based on 12 years of actual historical daily rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rain Run off	35	36	32	64	44	45	40	45	44	41	56	48	522
Overflow	(5)	(7)	(6)	(11)	(5)	(7)	(2)	(3)	(3)	(7)	(15)	(11)	61
Rain Water saved	39	29	26	43	39	39	38	42	39	33	42	31	431
Toilet	(46)	(42)	(46)	(45)	(46)	(45)	(46)	(46)	(45)	(46)	(45)	(46)	(547)
(Shortfall)/Surplus before Irrigation	(16)	(13)	(21)	(2)	(7)	(6)	(8)	(4)	(6)	(13)	(3)	(15)	(116)
Irrigation													0
Unsatisfied Demand	(16)	(13)	(21)	(2)	(7)	(6)	(8)	(4)	(6)	(13)	(3)	(15)	(116)

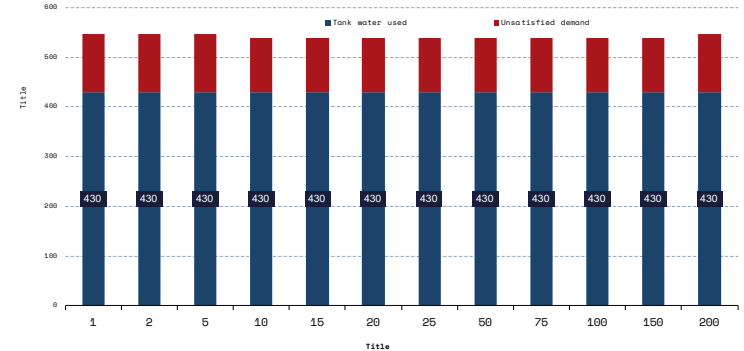
  

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Rain Run off	426	663	658	535	576	403	414	573	531	476	355	648	6,280
Overflow	(86)	(160)	(188)	(75)	(107)	(25)	(3)	(84)	(96)	(92)	(1)	(170)	(1,090)
Rain Water saved	360	483	470	460	469	377	412	496	433	383	354	478	5,170
Toilet	(547)	(547)	(547)	(548)	(547)	(547)	(547)	(548)	(547)	(547)	(547)	(545)	(6,560)
(Shortfall)/Surplus before Irrigation	(186)	(64)	(76)	(88)	(77)	(170)	(135)	(58)	(113)	(163)	(192)	(67)	(1,391)
Irrigation													0
Unsatisfied Demand	(186)	(64)	(76)	(88)	(77)	(170)	(135)	(58)	(113)	(163)	(192)	(67)	(1,391)

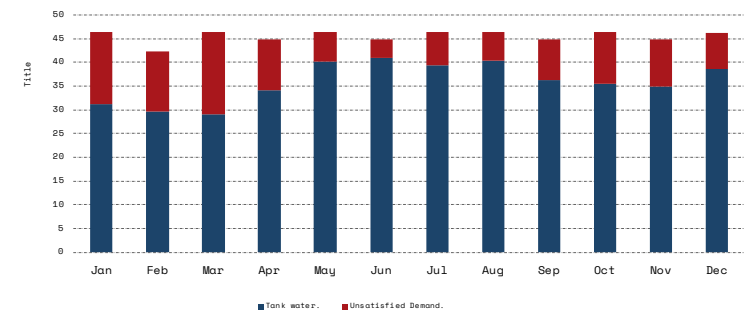
Graph 2 - Reliability of supply from tank (average across 12 years)



Graph 3 - Tank water used (per year) v Tank size



Graph 4 - Tank water used v unsatisfied demand by month (kls per month)



## Appendix C. WSUD Maintenance Manual

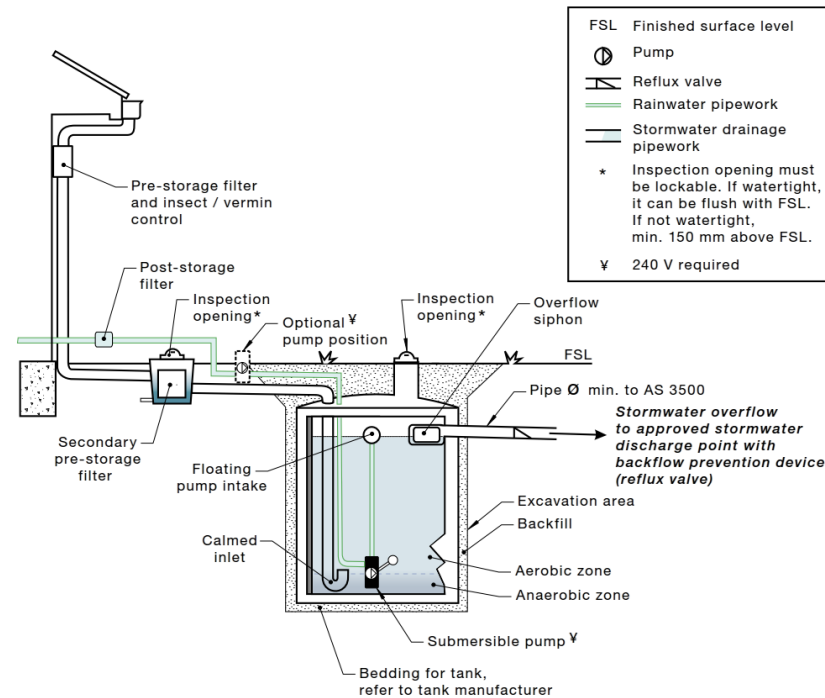
Once installed, a systematic maintenance program will be implemented by the owner's corporation maintenance contractor to ensure the rainwater harvesting system operates as designed and water quality is maintained.

The scope of the maintenance program will include inspection and rectification of issues associated with:

- Roof gutters and downpipes
- First flush screens and filtration devices
- Pumps
- Distribution pipework and reticulation systems
- Overflow systems

Inspections of the system and any maintenance works required will be undertaken on a quarterly basis or as per manufacturers guidelines.

The rainwater harvesting system will be installed in accordance with the guidelines set out in the Rainwater Design & Installation Handbook published by the National Water Commission<sup>1</sup>. A schematic diagram of the rainwater tank installation is provided below.



<sup>1</sup> Rainwater Design & Installation Handbook, National Water Commission, 2008

Rainwater Tank Element	Inspection Item	Y/N	Likely Maintenance Task
Roof gutters and downpipes	Is there leaf litter or debris in the gutters?		Remove by hand and dispose responsibly
First flush diverter	Is there anything blocking the first flush diverter (Leaves etc.)?		Remove by hand and dispose responsibly
Potable mains back up device	Is the potable mains back up switch operating correctly?		Repair or replace device. Consider a manual switching device.
Mesh cover	Has the mesh cover deteriorated or have any holes in it?		Replace mesh cover.
Tank volume	Is there large amounts of sediment or debris sitting in the bottom of the tank, reducing the volume available in the tank to store water?		Remove sediment and dispose responsibly.
Pump	Is the pump working effectively? Have you heard it on a regular basis?		Check the potable mains back up is not permanently on. Repair or replace pump.
Pipes and taps	Are pipes and taps leaking?		Repair as needed.
Overflow	Is the overflow clear and connected to the storm water network?		Remove blockages and/or restore connections to stormwater network.

### Maintenance Frequency

	J	F	M	A	M	J	J	A	S	O	N	D
All tasks	X			X			X			X		

## Appendix D. Solar Photovoltaics

During the construction phase, high-efficiency solar PV modules with a total capacity of 23.7 kWp will be installed at roof level as per the preliminary layout indicated below. The PV modules will be mounted on a raised platform above plant area at a height to avoid overshadowing from the lift core.

PV modules should be oriented in pairs to the northeast and southwest at 10-15° tilt and have at least 440Wp capacity. High-efficiency modules deliver more compact arrays with inherently lower embodied ecological impact per unit of generation than standard efficiency modules.



The undulating east-west configuration prevents self-shadowing of the array and provides a low-profile installation with maximised packing factor. It also helps maximise self-consumption due to its flatter and broader power output yield profile.

Total yield of this array will be approximately 28 MWh per annum equating to an estimated annual carbon emissions offset of 24.1 tonnes CO<sub>2</sub>-e per annum.

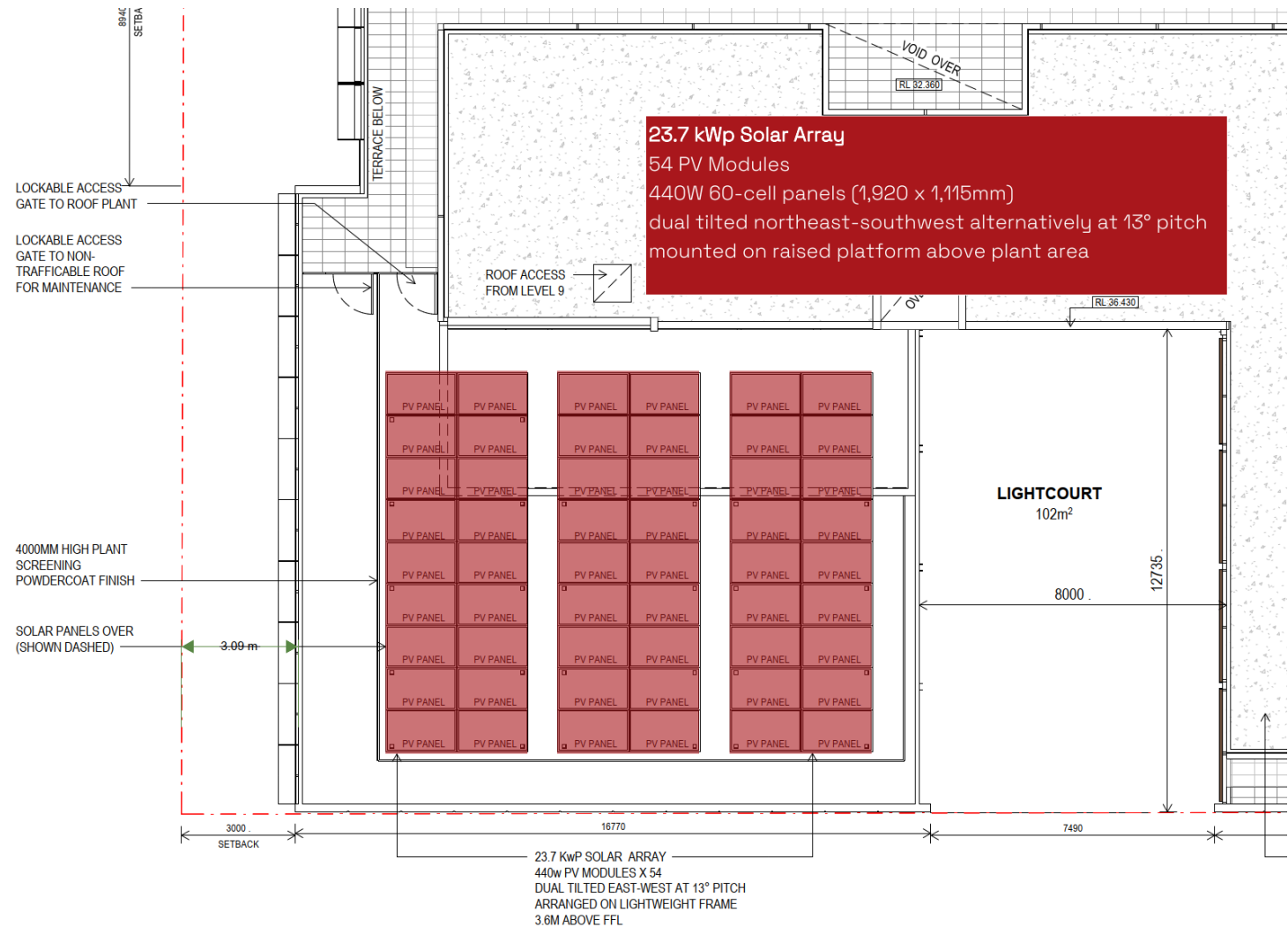


Figure 1 Indicative Solar Photovoltaic array layout

## North East facing array output

### RESULTS

 Print Results

15,068 kWh/Year\*

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	6.99	1,919
February	6.45	1,617
March	5.31	1,514
April	3.78	1,045
May	2.47	717
June	2.11	601
July	2.21	652
August	3.09	911
September	4.26	1,199
October	5.34	1,526
November	5.69	1,550
December	6.63	1,816
<b>Annual</b>	<b>4.53</b>	<b>15,067</b>

#### Location and Station Identification

Requested Location	134 Moray Street, South Melbourne VIC
Weather Data Source	Lat, Lng: -37.83, 144.98 1.0 mi
Latitude	37.83° S
Longitude	144.98° E

#### PV System Specifications

DC System Size	11.85 kW
Module Type	Premium
Array Type	Fixed (open rack)
System Losses	14.08%
Array Tilt	13°
Array Azimuth	45°

## South West facing array output

### RESULTS

 Print Results

12,947 kWh/Year\*

Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )
January	6.84	1,889
February	6.01	1,514
March	4.44	1,258
April	2.86	774
May	1.71	470
June	1.39	366
July	1.49	413
August	2.21	629
September	3.45	964
October	4.77	1,362
November	5.55	1,519
December	6.49	1,789
<b>Annual</b>	<b>3.93</b>	<b>12,947</b>

#### Location and Station Identification

Requested Location	134 Moray Street, South Melbourne VIC
Weather Data Source	Lat, Lng: -37.83, 144.98 1.0 mi
Latitude	37.83° S
Longitude	144.98° E

#### PV System Specifications

DC System Size	11.85 kW
Module Type	Premium
Array Type	Fixed (open rack)
System Losses	14.08%
Array Tilt	13°
Array Azimuth	225°

## Appendix E. Site Management Plan

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During the construction phase, the key pollutants at risk of entering the stormwater system include:

- Sediments (soil, sand, gravel and concrete washings); and
- Litter, debris etc.

These pollutants arise from factors such as dirt from construction vehicles, stockpiles located close to surface runoff flow paths, and surface runoff from disturbed areas during earthmoving and construction works. It is therefore important to have measures that either prevent or minimise the pollutant loads entering stormwater system during construction.

In order to mitigate the impacts of the above pollutants on the stormwater system, the following stormwater management strategies will be implemented during the construction phase as appropriate:

- Installation of onsite erosion and sediment control measures. All installed control measures shall be regularly inspected & maintained to ensure their effectiveness. Such measures may include (but not limited to):
  - Silt fences
  - sediment traps
  - hay bales
  - geotextile fabrics
- Where possible, litter bins with a lid will be used to prevent litter from getting blown away and potentially entering stormwater drains.

Additionally, the following work practices shall be adopted to reduce stormwater pollution:

- Site induction by the head contractor/ builder to make personnel aware of stormwater management measures in place
- Employ suitable measures to reduce mud being carried off-site into the roadways such as installing a rumble grid/ gravel/ crushed-rock driveway (or equivalent measure) to provide clean access for delivery vehicles, removing mud from vehicle tyres with a shovel etc.
- Safe handling and storage of chemicals, paints, oils and other elements that could wash off site to prevent them from entering stormwater drains.
- Where practicable, stockpiles will be covered, located within the site's fence and away from the lowest point of the site where surface runoff will drain to. This initiative will minimise erosion.

Accordingly, the measures presented above are considered appropriate for the proposed development at this stage of the project. The measures will reduce the pollutants entering stormwater system from the site during construction works thereby protecting waterways.

Furthermore, the initiatives are consistent with the Application Requirements set out in 19.03-3L of the City of Port Phillip Planning Scheme.

## Appendix F. Preliminary JV3 Simulation

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## Appendix G. Daylight Modelling

This Appendix provides a summary of internal daylight levels in all regularly occupied spaces within the proposed mixed-use development.

The BESS tool sets the following minimum performance standards for internal daylight within habitable rooms:

### Residential developments:

- At least 80% of dwellings achieve a daylight factor greater than 1% to 90% of the floor area of each living area, including kitchens;
- At least 80% of dwellings achieve a daylight factor greater than 0.5% to 90% of the floor area in all bedrooms/studios.

### Commercial developments:

- For commercial regular use areas, a minimum score of 33% of the total floor area must achieve the target daylight factor of 2%.
- Additional points are awarded where a higher proportion of regular use areas (by floor area) achieves the target daylight factor.
- Maximum points are awarded where 100% of regular use areas (by floor area) achieves the target daylight factor.

Additional points are allocated in the BESS tool if 100% of each room type achieve the daylight factor thresholds above however a 'best practice' outcome in BESS is achieved when 80% of rooms meet these thresholds.

## G.1 Results

### **Class 3 Hotel Living/Kitchen Areas**

Level	Total of Rooms	Rooms meeting 'best practice'	% of rooms meeting 'best practice'
L01	4	4	100
L02	4	4	100
L03	2	2	100
L04	4	4	100
L05	5	4	80
L06	5	5	100
L07	5	5	100
<b>Total</b>	<b>29</b>	<b>28</b>	<b>97</b>

### **Class 3 Hotel Bedrooms/Studios**

Level	Total of Rooms	Rooms meeting 'best practice'	% of rooms meeting 'best practice'
L01	27	18	67
L02	27	23	85
L03	28	27	96
L04	27	27	100
L05	22	22	100
L06	20	20	100
L07	20	20	100
<b>Total</b>	<b>171</b>	<b>157</b>	<b>92</b>

### Class 5 Office

Room	Level	Floor Area	DF % > 2
Commercial Tenancy	Level 8	589	100

### Class 6 Retail

Room	Level	Floor Area	DF % > 2
Restricted Retail	Ground	273	86

### Class 9b Conference

Room	Level	Floor Area	DF % > 2
Conference 1&2	Ground	96.7	2
Conference space	Level 9	275.7	100
		Area Weighted Average	75

The results confirm that, on a whole of development basis, 97% of living/kitchen areas, 92% of bedrooms/studios, 100% of total Class 5 Office floor area, 86% of total Class 6 Retail floor area and 75% of total Class 9b Conference floor area in the development meet the daylight standard and thus **the development does meet the minimum daylight requirements of BESS.**

The daylight modelling confirms that:

Class 3 Hotel Kitchen/living areas meeting the Best Practice standard

97%

Class 3 Hotel Studios/Bedrooms meeting the Best Practice standard

92%

Total Class 5 Office floor area meeting the BESS daylight standard.

100%

Total Class 6 Retail floor area meeting the BESS daylight standard.

86%

Total Class 9b Conference floor area meeting the BESS daylight standard.

75%

## G.2 Model Images

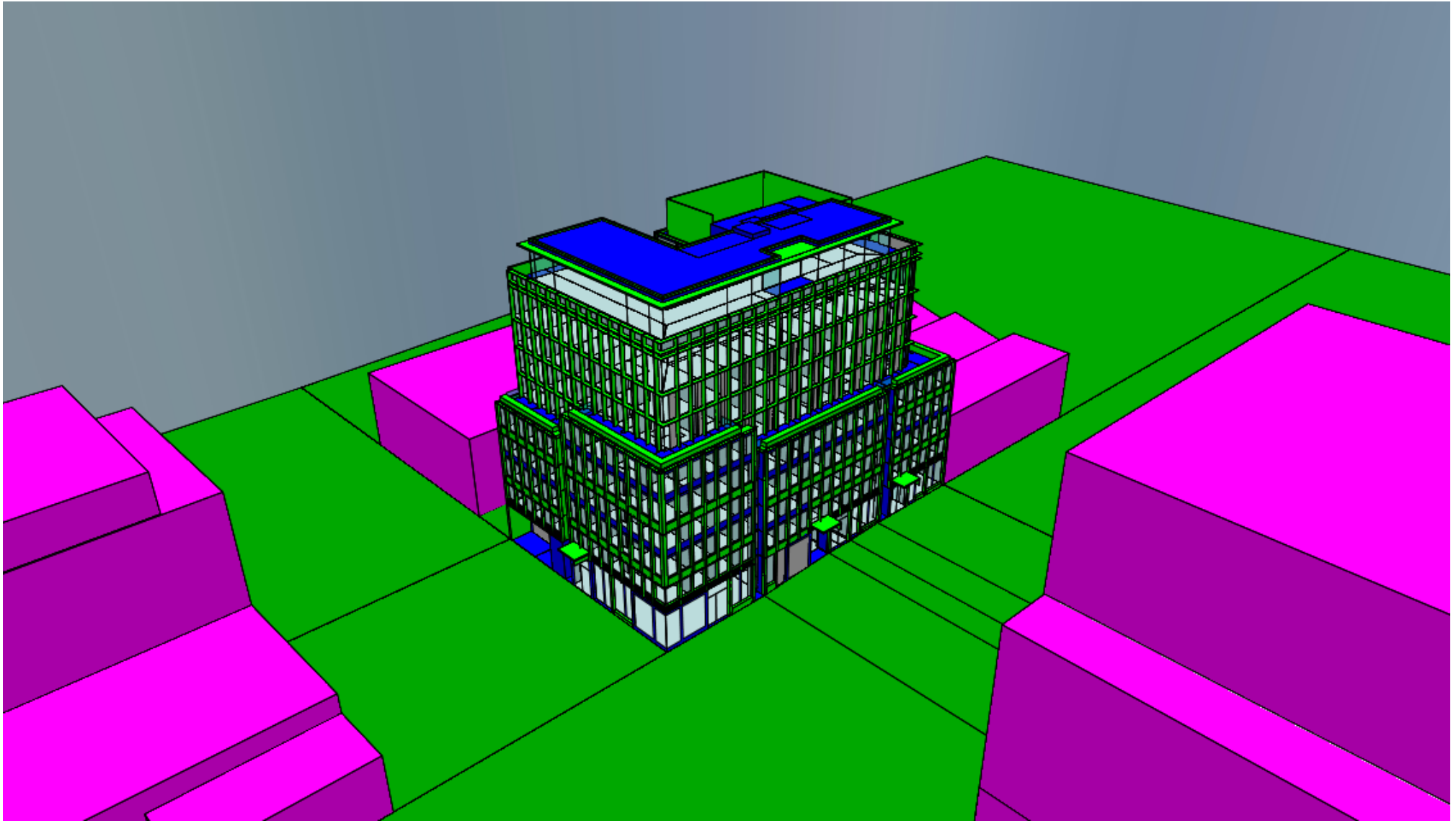


Figure 1 Model view from North-East

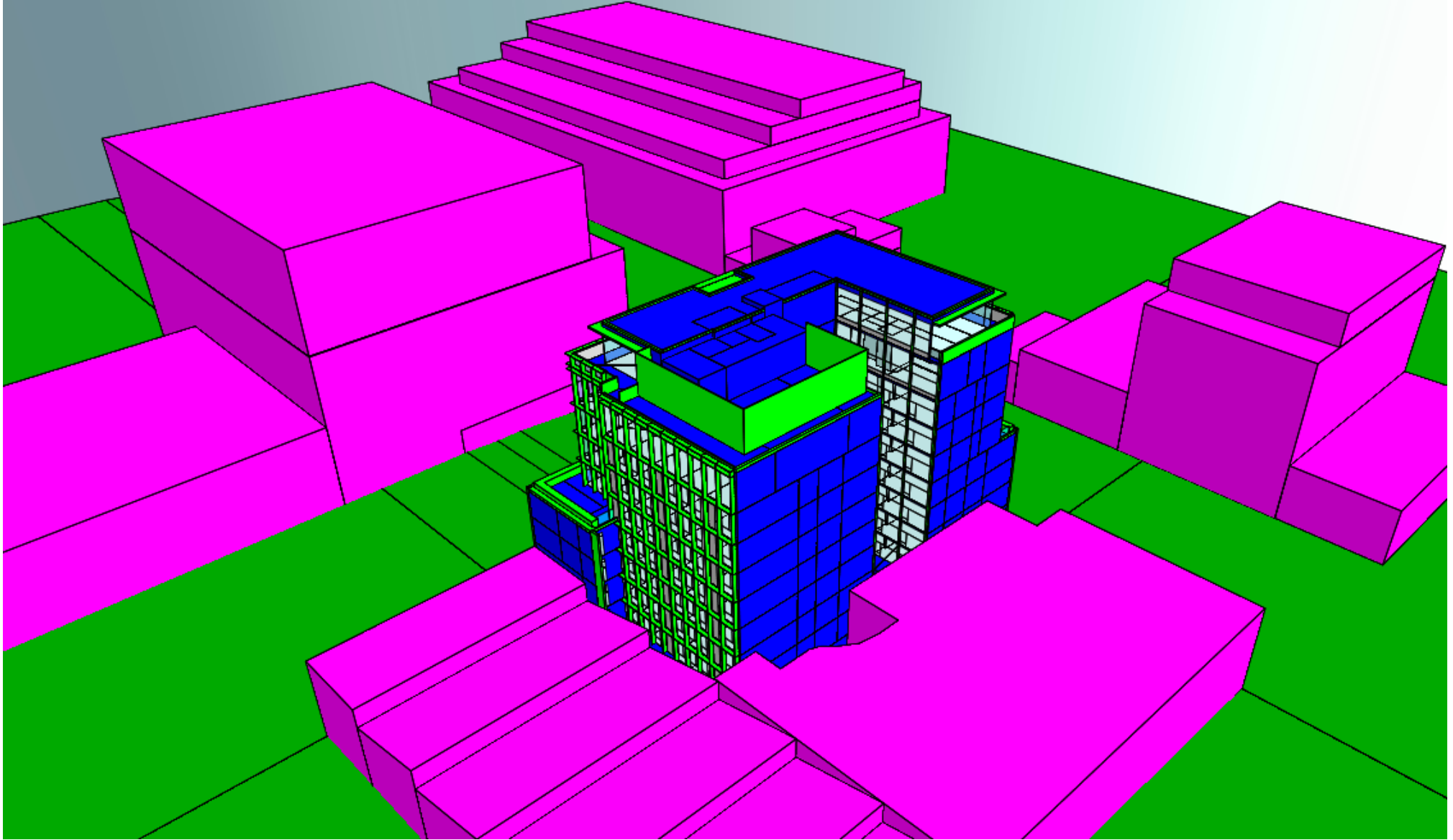


Figure 2 Model view from South-West





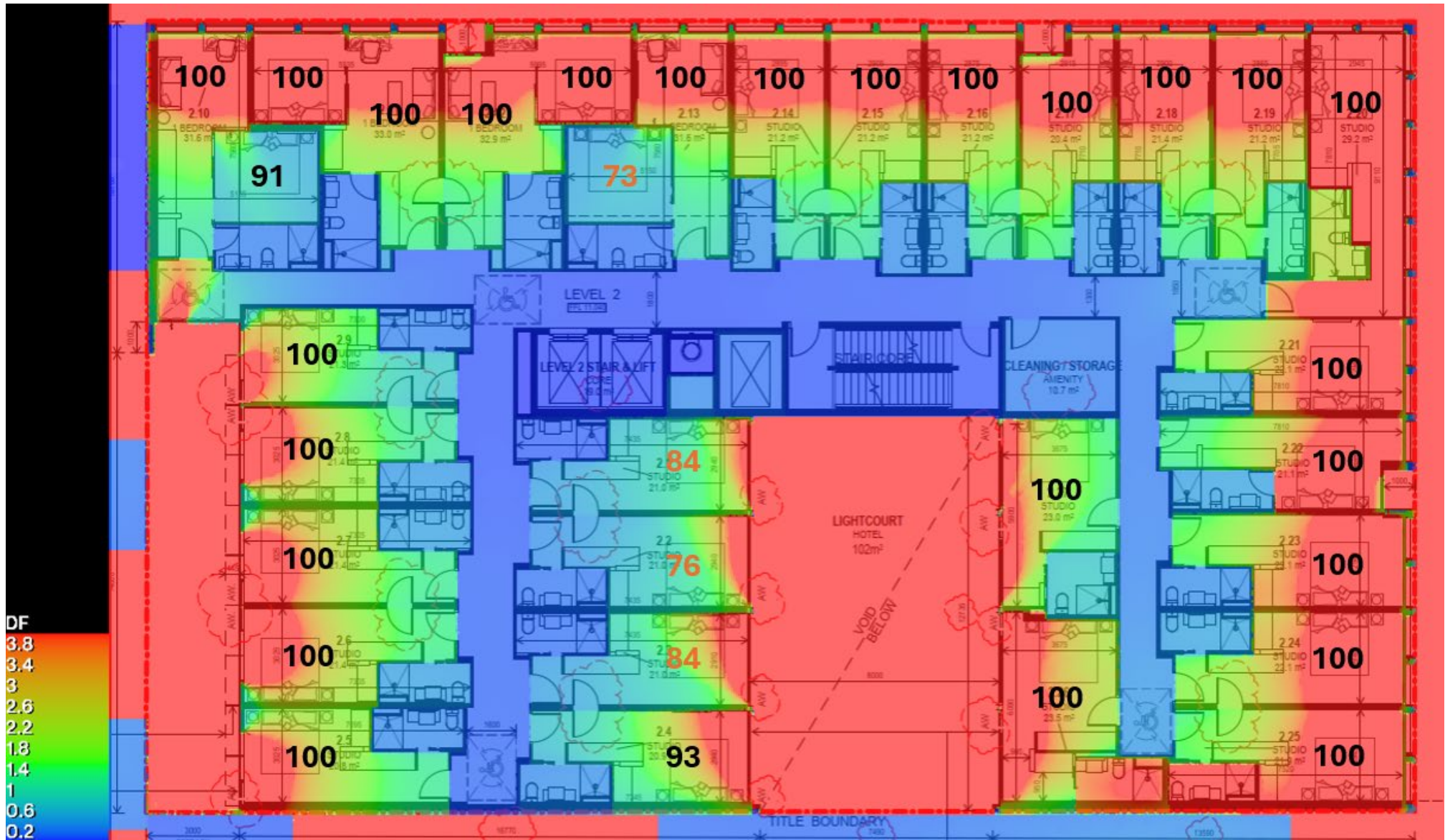


Figure 5 Level 2 Daylight Factor Contour Plot

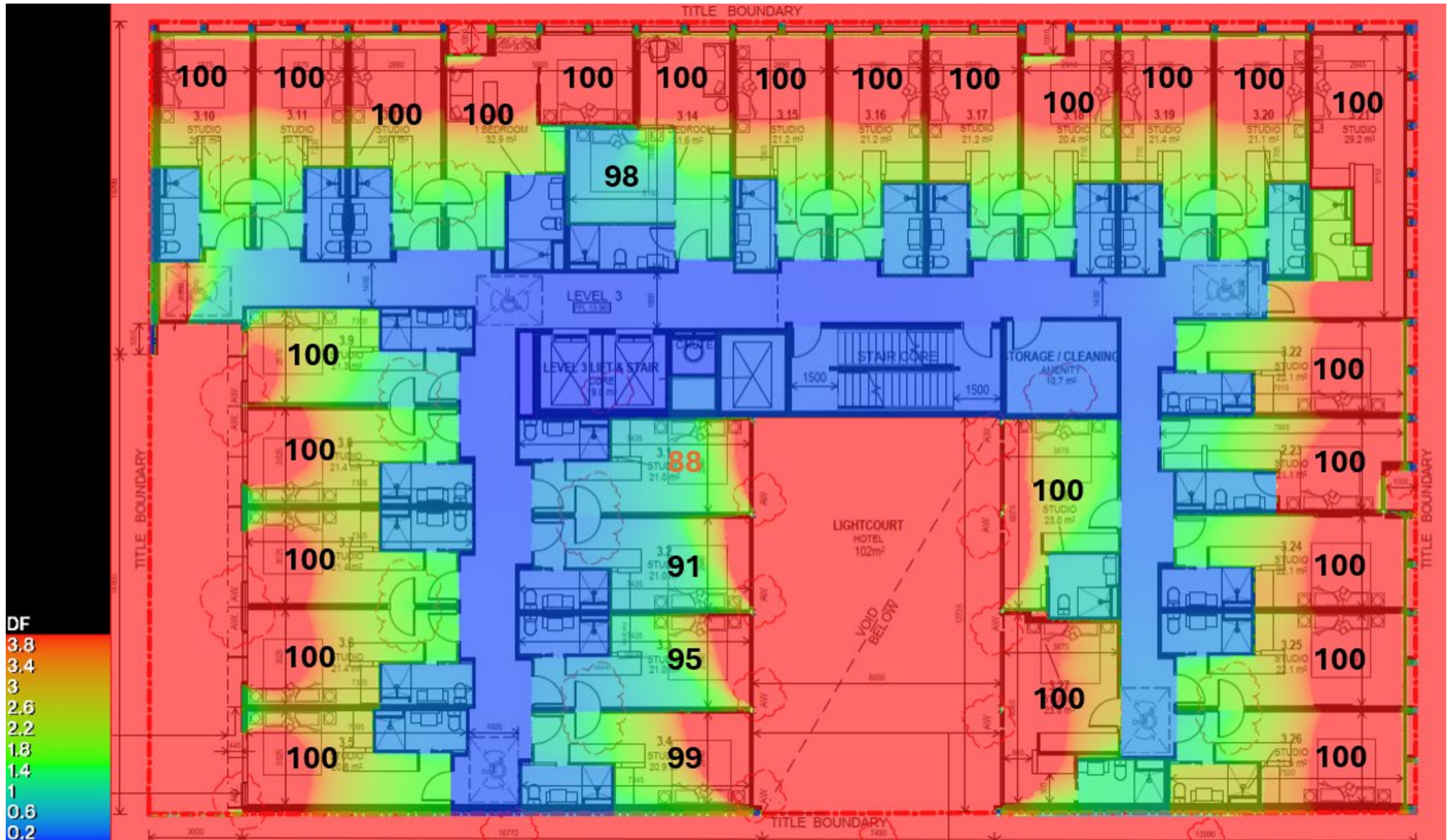


Figure 6 Level 3 Daylight Factor Contour Plot

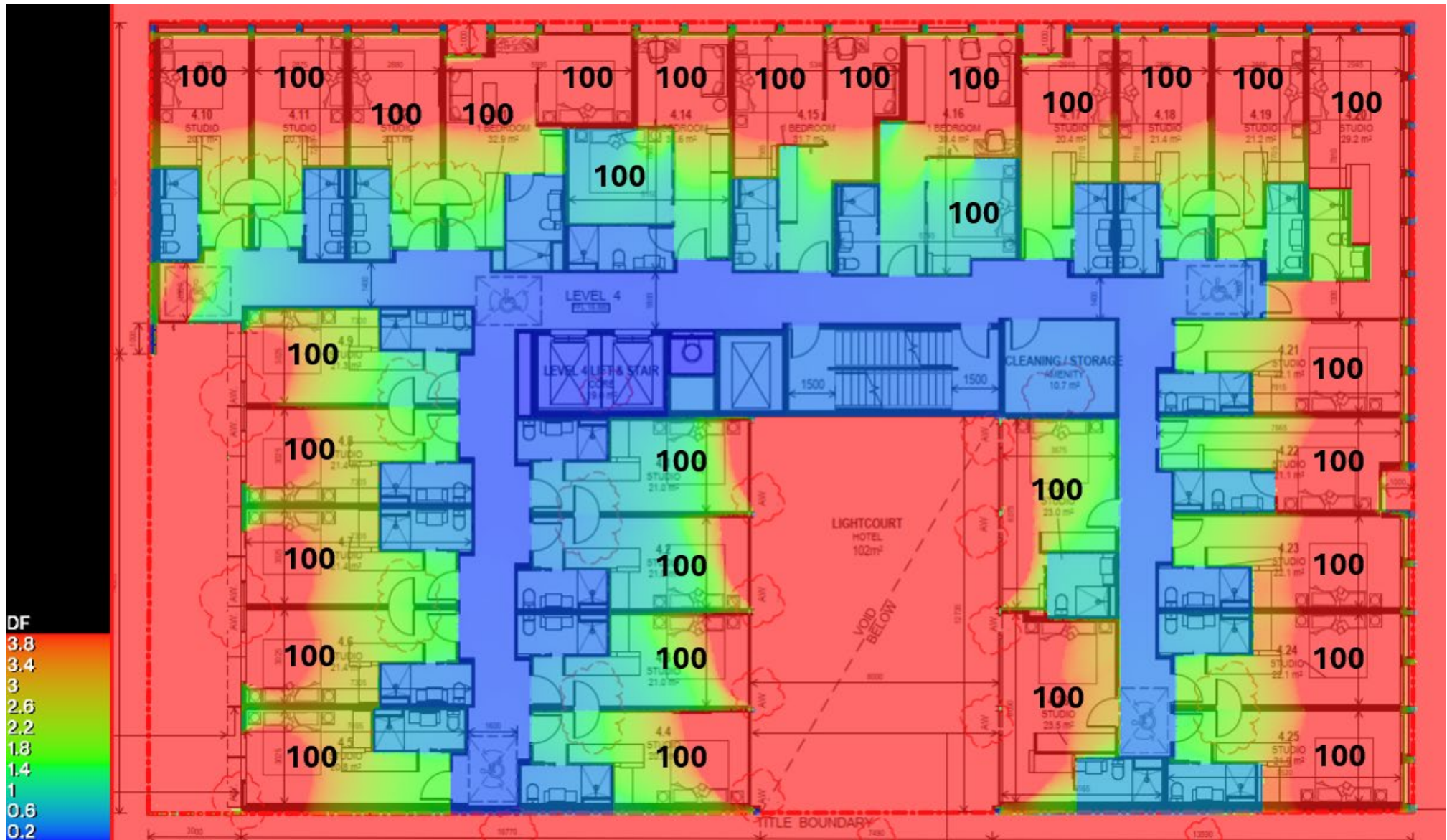


Figure 7 Level 4 Daylight Factor Contour Plot

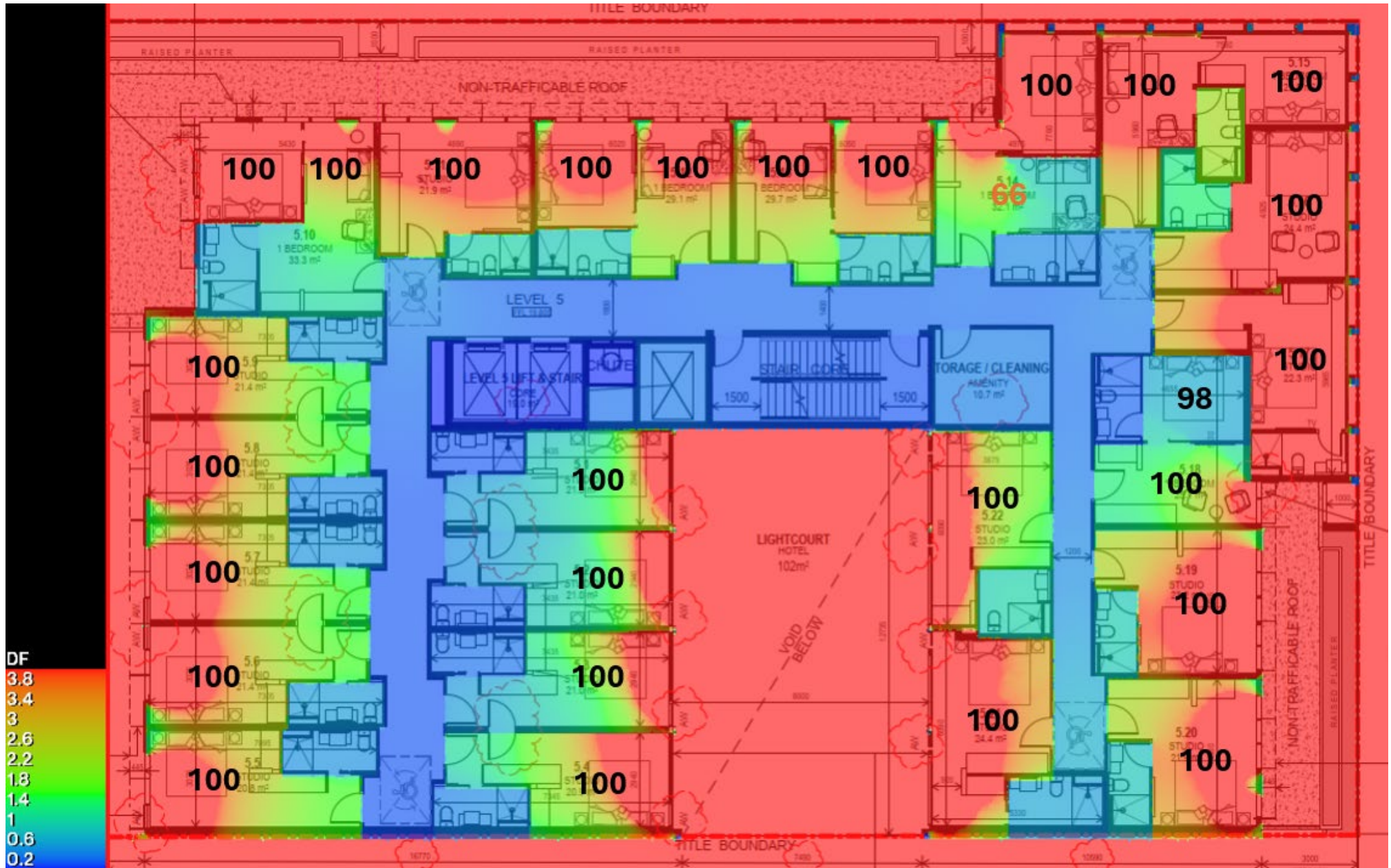


Figure 8 Level 5 Daylight Factor Contour Plot

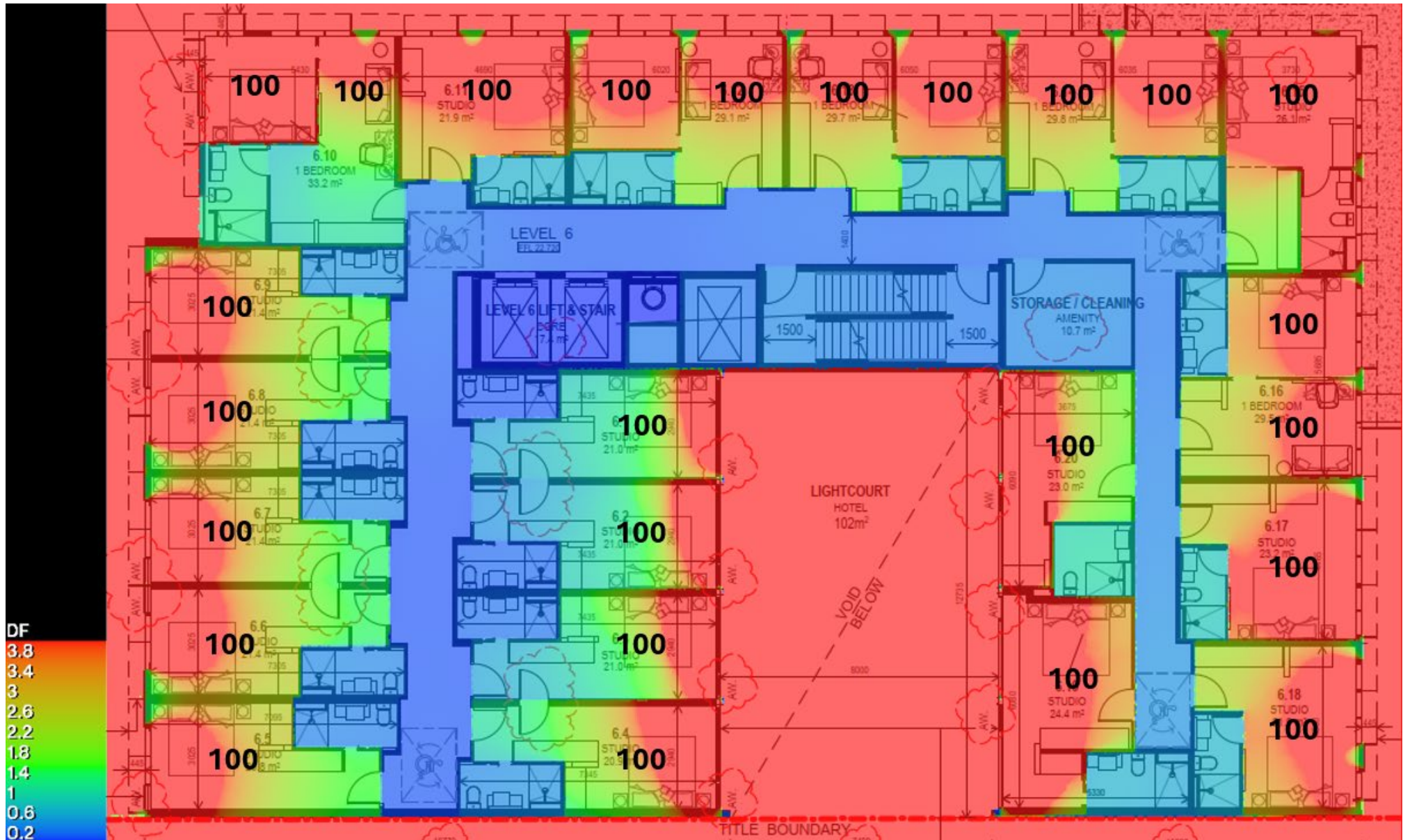


Figure 9 Level 6 Daylight Factor Contour Plot

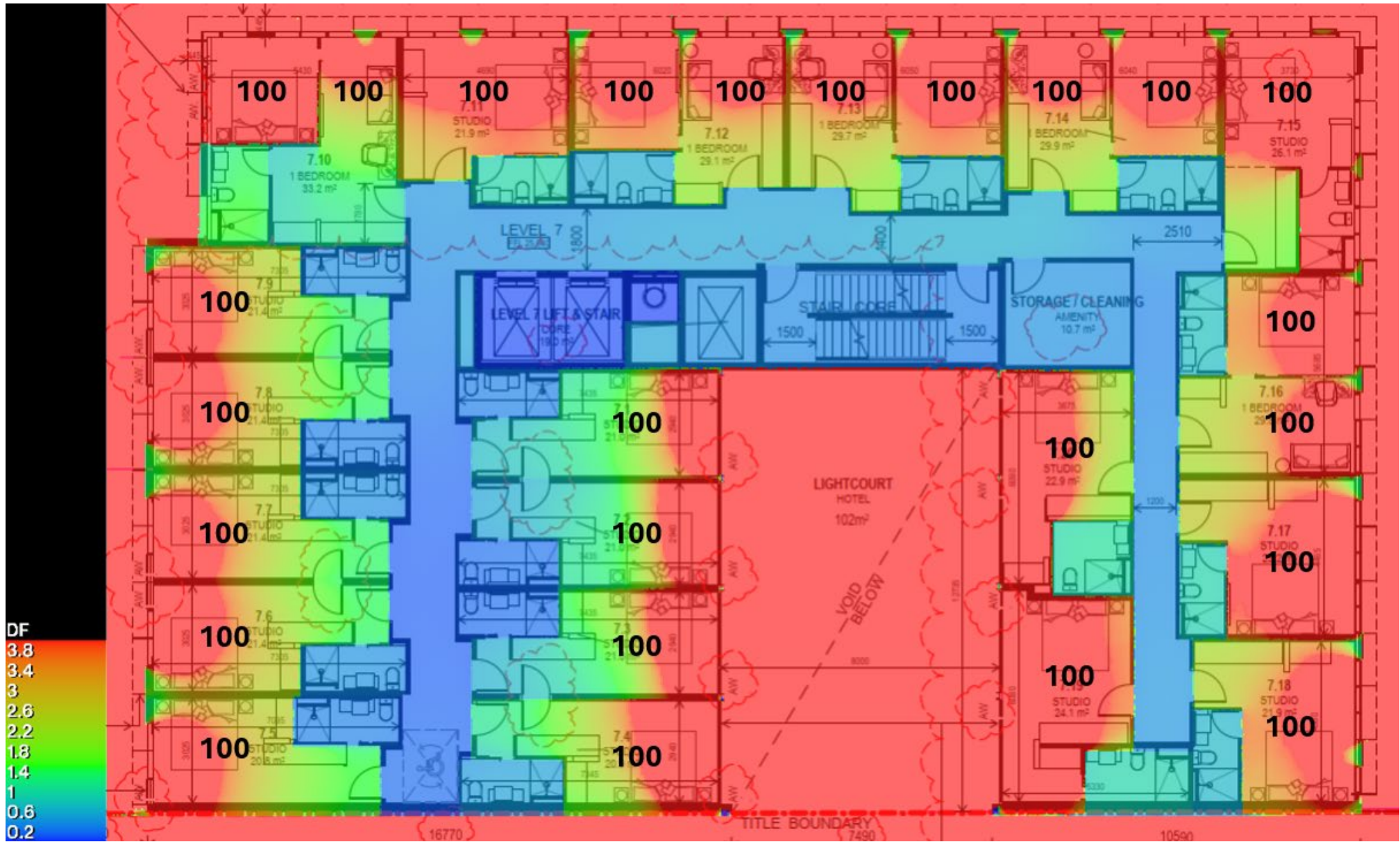


Figure 10 Level 7 Daylight Factor Contour Plot

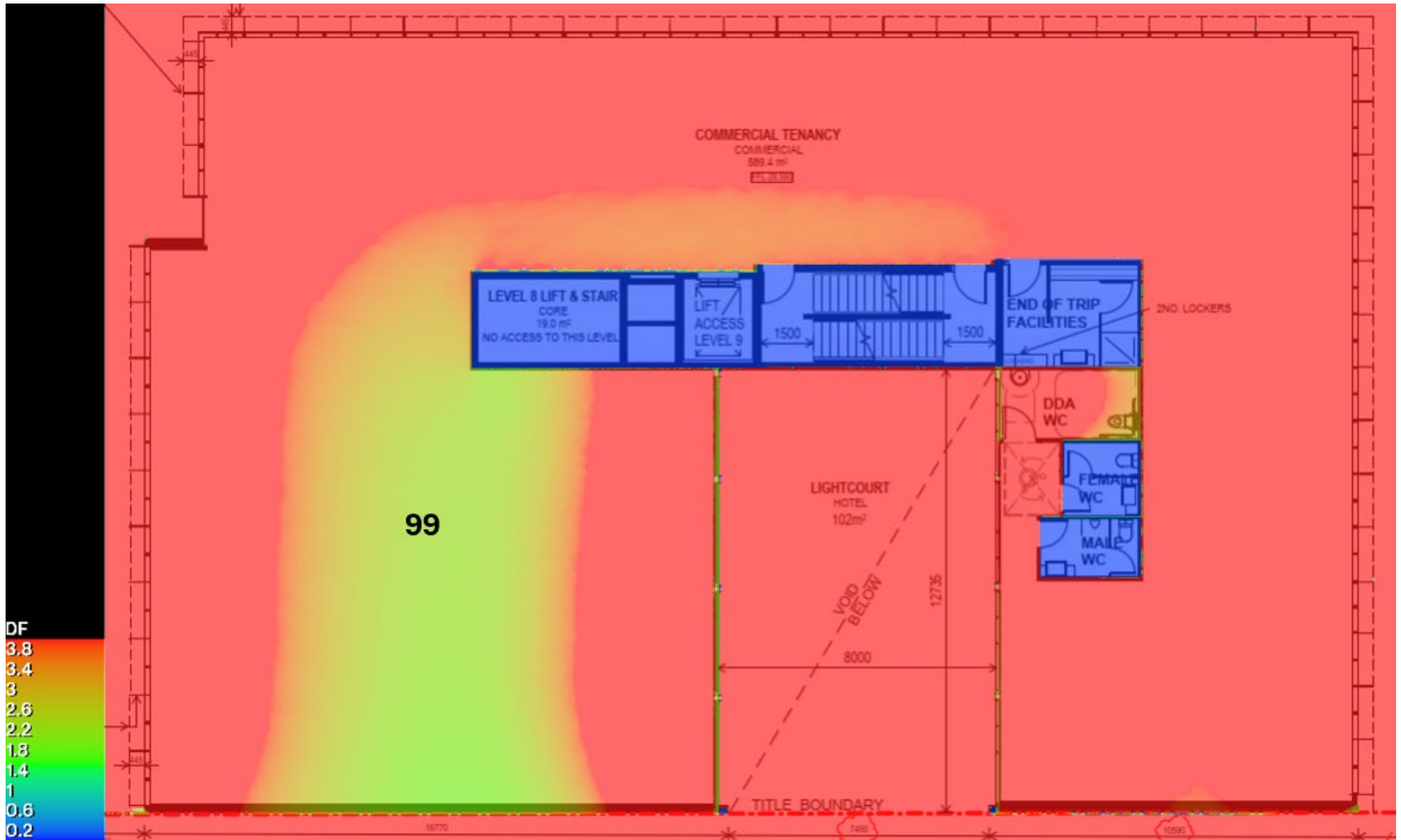


Figure 11 Level 8 Daylight Factor Contour Plot

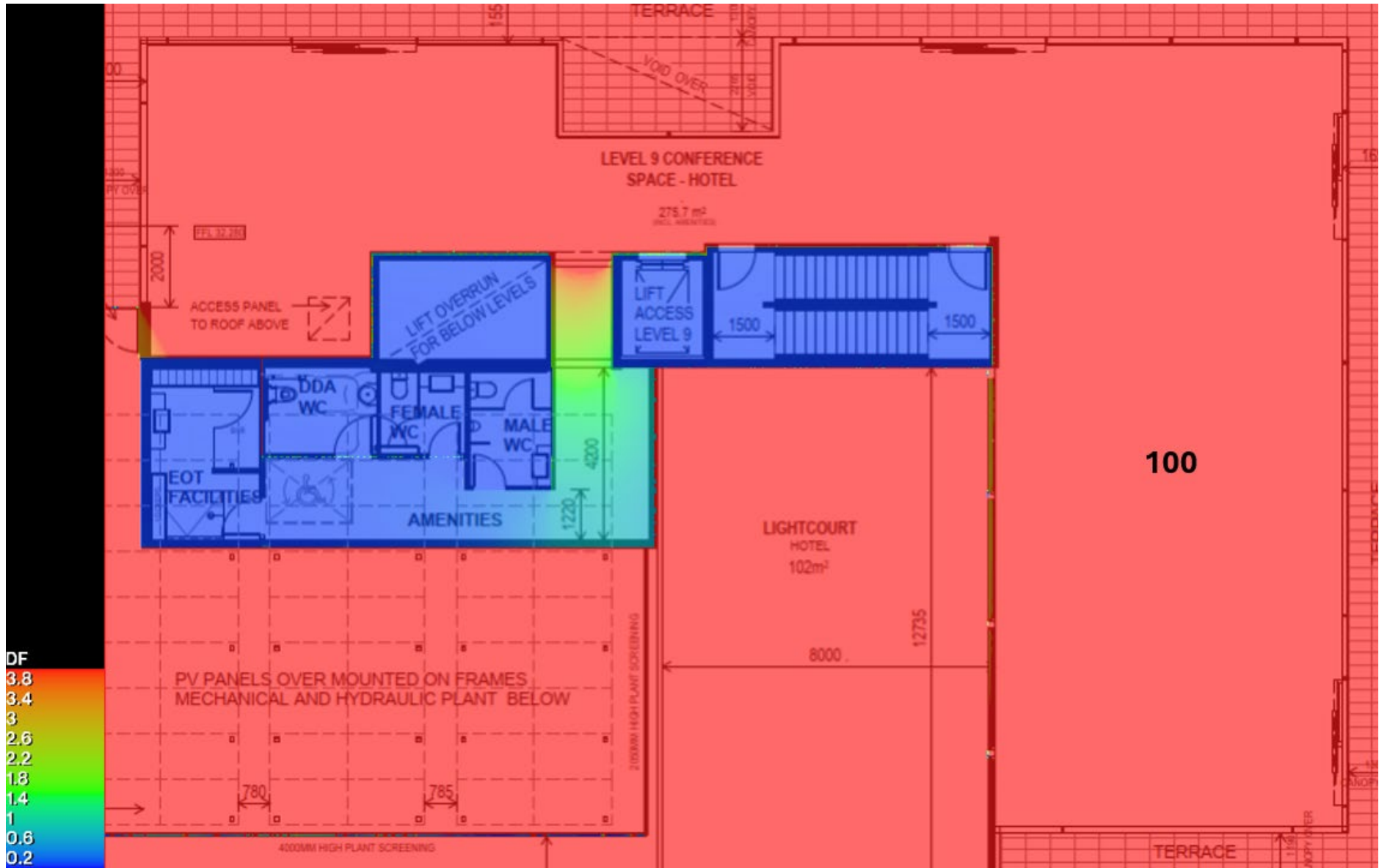


Figure 12 Level 9 Daylight Factor Contour Plot

## G.4 Assumptions

The following assumptions have been made for the Visible Light Transmittance (VLT) values for all glazing applicable to this analysis:


### Assumed Glazing Visual Light Transmittance

Glazing Type	Visible Light Transmittance (VLT)
	%
External Glazing (GL01): Clear, Double Glazing	60
External Glazing (GL02): Clear, Fluted, Double Glazing	50
External Glazing (GL03): Bronze, Double Glazing	40
External Glazing (GL04A): Bronze, Fluted, Double Glazing	35
Internal Glazing: Clear, Single Glazing	85

### Assumed Surface Reflectances

Construction Element	Reflectance (%)	Description
Internal Floors	30	Assumes a light-coloured timber/carpet
Internal Walls	94	Dulux Vivid white paint
Internal Ceilings	94	Dulux Vivid white paint
External Walls 1	30	Red Brick (BR01)
External Walls 2	70	White Brick (BR02)
External Walls 3	60	Off-White Concrete (CON01)
Shrouds	25	Bronze finish (ST01)
Terrace/Balcony Floor	40	Assumes medium-coloured paver
External Ground	10	Asphalt
Equitable Buildings	40	Medium colour finish
Adjacent Buildings	40	Medium colour finish

Sky conditions: 10K Lux CIE overcast sky



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