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69 Carrington Road, Box Hill

SUSTAINABILITY MANAGEMENT PLAN

DOCUMENT PROPERTIES

DOCUMENT BY: WRAP Engineering Pty Ltd
132 Chestnut Street,
Cremorne, Victoria 3121

DESCRIPTION: Sustainability Management Plan

PROJECT NAME: 69 Carrington Road, Hill

PROJECT NUMBER: 23384

DOCUMENT AMENDMENTS

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CONTENTS

1	INTRODUCTION	4
1.1	SITE DESCRIPTION	4
1.2	DEVELOPMENT SUMMARY	4
1.3	COUNCIL PLANNING REQUIREMENTS	4
1.4	REFERENCE DOCUMENTATION.....	5
2	ESD ASSESSMENT	6
2.1	INDOOR ENVIRONMENT QUALITY	6
2.2	ENERGY EFFICIENCY.....	7
2.3	WATER EFFICIENCY	8
2.4	STORMWATER MANAGEMENT	9
2.5	BUILDING MATERIALS.....	9
2.6	TRANSPORT	10
	WASTE MANAGEMENT	12
2.7	URBAN ECOLOGY	12
2.8	CONSTRUCTION AND BUILDING MANAGEMENT	13
3	BESS ASSESSMENT.....	14
	APPENDIX A – VOC & FORMALDEHYDE LIMITS	15
	APPENDIX B – DAYLIGHT ASSESSMENT	17
	APPENDIX C – STORMWATER ASSESSMENT.....	24
	APPENDIX D – NCC SECTION J PRELIMINARY ASSESSMENT	36
	APPENDIX E – BESS ASSESSMENT	56

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1 INTRODUCTION

This Sustainability Management Plan (SMP) has been prepared to assist the design, construction and operation of the proposed industrial development at 69 Carrington Road, Box Hill to achieve a range of best-practice sustainable development objectives.

WRAP Engineering have assessed the proposed plans and provided input to the design team. This SMP captures initiatives necessary to ensure that the development meets the sustainability requirements of the Whitehorse City Council, in particular the ESD requirements of the following proposed Planning Clause:

- 15.01-2L “Environmentally Sustainable Development”.
- 53.18 “Stormwater Management (Water Sensitive Urban Design)”

1.1 SITE DESCRIPTION

The site at 69 Carrington Road, Box Hill has an area of approximately 1,119m² and is located approximately 20km east of the Melbourne CBD.

1.2 DEVELOPMENT SUMMARY

The proposed development will comprise:

- Basement 2: Car lift to car park, secure bicycle storage with dedicated lift, end-of-trip (EOT). facilities.
- Basement 1: Car lift to car park, bin room and services room.
- Ground- level 1: Retail tenancies and services zone
- Levels 2 – 14: commercial office space.
- Roof – plant

1.3 COUNCIL PLANNING REQUIREMENTS

Whitehorse City Council expects new developments to be designed, built and maintained at a level that reflects best practice sustainable development outcomes. The ESD response will need to ensure that the design meets sustainability targets in the areas of energy reduction, water use reduction and water sensitive urban design, indoor environment quality, materials selection, transportation, waste management and urban ecology.

Whitehorse City Council encourages the implementation of SDAPP to enhance the sustainability of the built environment. For this project, the SDAPP framework on the 10 Key Sustainable Building Categories will be addressed. These categories are as follows:

- Energy Efficiency;
- Water Efficiency;
- Stormwater Management;
- Indoor Environment Quality;
- Building Materials;
- Construction and Waste Management;
- Transport;
- Urban Ecology;
- Building Management; and
- Innovation.

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The council's Planning Scheme also encourages the use of relevant ESD tools to assess the proposed development. For this project, the following tools will be used:

- Built Environment Sustainability Scorecard (BESS) – a holistic sustainability assessment tool; and
- InSite – a stormwater assessment tool

This SMP incorporates initiatives to ensure that the council's ESD requirements are satisfied by addressing the Key Sustainable Building Categories, demonstrating that council's Best Practice Standards will be achieved, and using relevant and appropriate ESD assessment tools.

1.4 REFERENCE DOCUMENTATION

This SMP should be read in conjunction with the other relevant documentation included within the development's town planning submission to council. These documents may include the following:

- Architectural documentation
- Stormwater Management Plan
- Waste Management Plan
- Traffic engineer's report, transport plan, green travel plan or similar.

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2 ESD ASSESSMENT

The following sections outline the ESD assessment which has been completed for the project. The assessment is presented within the Key Sustainable Building Categories, and for each item following information is provided:

1. A short description of the ESD initiative and/or the project's design response;
2. The nominated party responsible for implementation of the initiative; and
3. The stage of the project at which implementation could be demonstrated.

Within this assessment, the level of detail that has been provided is generally in proportion to what is appropriate or practicable at this early stage of design. This is described or explained within each item, with future commitments included as appropriate.

2.1 INDOOR ENVIRONMENT QUALITY

2.1.1 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.*

2.1.2 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
Volatile Organic Compounds All carpets, paints, adhesives and sealants and carpets will not exceed the limits outlined in Appendix A.	Architect Services Engineer	Contract Documentation
Formaldehyde All engineered wood products will have 'low' formaldehyde emissions, certified as E0 or better, or will not exceed the limits outlined in Appendix A.	Architect	Contract Documentation
Daylight Glazing with VLT \geq 40% will be specified for the development. A preliminary daylight assessment using the Green Star hand calculation methodology has been completed for the project: The results from this assessment indicate that at least 50% of the office floor area and 30% of the retail floor area will achieve a Daylight Factor of 2%. Please refer to Appendix B for details.	Architect	Contract Documentation
External Views All office areas have high-quality external views.	Architect	Design Development
Effective Ventilation Outside air levels will exceed AS1668:2012 by 50%.	Architect	Contract Documentation
Thermal Comfort The development will include double glazing and a highly insulated façade to facilitate occupant comfort.	Architect ESD Consultant	Contract Documentation
Artificial Lighting The lighting design throughout the office areas will ensure that the minimum illuminance levels and uniformity are in accordance with the requirements of AS1680.	Services Engineer	Contract Documentation

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
Air Monitoring CO ₂ sensors will be installed to initiate ventilations system when CO ₂ levels reach 800ppm.	Services Engineer	Contract Documentation

2.2 ENERGY EFFICIENCY

2.2.1 OBJECTIVES:

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

2.2.2 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
Heating and Cooling Systems The project will implement heating and cooling systems at least 3 Stars or within one Star of the most efficient equivalent capacity unit available (or equivalent EER/COP).	Services consultant	Design Development
Commercial Energy Efficiency The project is targeting the following minimum energy saving strategy: -All exposed floors and ceilings (forming part of the envelope) demonstrate a minimum 10% improvement in required NCC2019 insulation levels -All wall and glazing meet or exceed the NCC2019 facade calculator.	Architect ESD Consultant	Design Development
Domestic Hot Water The project will implement a centralised air sourced heat pump hot water system for common uses.	Services Engineer	Contract Documentation
Artificial Lighting The lighting design throughout the development will meet the NCC 2019 requirements and include time and motion detector controls.	Services Engineer	Contract Documentation
Solar PV A solar array of at least 4.5 kW will be provided, with final sizing to be coordinated during the design development phase.	Services Engineer	Contract Documentation

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2.3 WATER EFFICIENCY

2.3.1 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 minimise associated water costs.

2.3.2 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE												
<p>Water Fixtures and Fittings</p> <p>The following Water Efficiency Labelling Scheme (WELS) star ratings will be specified:</p> <ul style="list-style-type: none"> - Toilets: 4 Star; - Taps (bathroom and kitchen): 4 Star; and - Showerheads: 4 Star (>4.5 but ≤6.0 L/min). 	Architect	Contract Documentation												
<p>Rainwater Collection and Reuse</p> <p>Rainwater harvesting for non-potable uses will be implemented as a water saving initiative. The details of this system for this development are as follows:</p> <table border="1"> <thead> <tr> <th>RWT</th> <th>Size</th> <th>Catchment</th> <th>Re-use</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>10kL</td> <td>Roofs</td> <td>Toilet flushing</td> </tr> <tr> <td>2</td> <td>10kL</td> <td>Terrace</td> <td>Irrigation</td> </tr> </tbody> </table> <p>Rainwater will be reused for toilet flushing from ground floor to level 6 and irrigation from ground floor to level 13. Refer to Appendix C for details.</p>	RWT	Size	Catchment	Re-use	1	10kL	Roofs	Toilet flushing	2	10kL	Terrace	Irrigation	Architect Services Engineer	Design Development
RWT	Size	Catchment	Re-use											
1	10kL	Roofs	Toilet flushing											
2	10kL	Terrace	Irrigation											
<p>Landscape Irrigation</p> <p>Landscaping will use water-efficient irrigation systems as appropriate to each application.</p>	Services Engineer Landscape	Contract Documentation												
<p>Waterless HVAC</p> <p>All HVAC systems will use air-cooled heat rejection systems.</p>	Services Engineer	Contract Documentation												
<p>Fire System Test Water</p> <p>The fire water test system will not expel water for testing, or the fire systems will include temporary storage for 80% of the routine fire protection system test water and maintenance drain-downs for reuse on site.</p>	Services Engineer	Contract Documentation												

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2.4 STORMWATER MANAGEMENT

2.4.1 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.*

2.4.2 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
<p>Stormwater Pollution Reduction</p> <p>The project will achieve a Best Practice stormwater pollution reduction outcome by achieving a STORM score of at least 100%.</p> <p>Refer to Appendix C for details.</p>	<p>Architect Civil Engineer</p>	<p>Contract Documentation</p>

2.5 BUILDING MATERIALS

2.5.1 OBJECTIVES:

- *To minimise the environmental impacts materials used by encouraging the use of materials with a favourable lifecycle assessment based on the following factors:*
 - *Fate of material*
 - *Recycling/Reuse*
 - *Embodied energy*
 - *Biodiversity*
 - *Human health*
 - *Environmental toxicity*
 - *Environmental responsibility.*

2.5.2 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
<p>Insulation</p> <p>All insulants will have zero ozone depletion potential (ODP) and use recycled materials (e.g. polyester, recycled glasswool)</p>	<p>Architect</p>	<p>Contract Documentation</p>
<p>Refrigerants</p> <p>All HVAC refrigerants used in the development will be selected to have an Ozone Depletion Potential (ODP) of zero.</p>	<p>Services Engineer</p>	<p>Contract Documentation</p>

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2.6 TRANSPORT

2.6.1 OBJECTIVES:

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

2.6.2 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
Active Transport Facilities The development will include the following facilities to support active transport: <ul style="list-style-type: none"> - 40 secure bicycle parking spaces for the use by building staff - 10 publicly accessible external bicycle parking spaces for the use of visitors - Six showers - 60 lockers 	Architect	Design Documentation
Access to Public Transport The development is located in Box Hill, with excellent access to trains, trams and buses. It scores an “Excellent Transit” Score of 78 out of 100.	n/a	
Walking Access to Amenities The development is a “Walker’s Paradise”, achieving a Walk Score of 93 out of 100.	n/a	

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Transit Score

78

Excellent Transit

Add to your site

69 Carrington Road has excellent transit which means transit is convenient for most trips.

Rail lines:

Lilydale City (Flinders Street)...	0.2 km	Belgrave City (Flinders Stree...	0.2 km
109 Port Melbourne - Box Hill	0.3 km		

Figure 1 Public transport local area map showing site location

69 Carrington Road

Box Hill, Melbourne, 3128

Commute to **Downtown Melbourne**

🚗 26 min
🚌 34 min
🚲 59 min
🚶 60+ min
View Routes

❤ Favorite
📄 Map
🔍 Nearby Apartments

Walk Score

93

Walker's Paradise

Daily errands do not require a car.

Transit Score

78

Excellent Transit

Transit is convenient for most trips.

[About your score](#)

Figure 2 Walk Score and Transit Score for the site location

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WASTE MANAGEMENT

2.6.3 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.

2.6.4 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
Construction Waste Management The contractor will prepare a construction waste management plan for the project and will divert at least 80% of all demolition and construction waste from landfill. This includes paving and floor slabs.	Contractor	Construction
Operational Waste A dedicated storage area will be provided for the separation and collection of recyclable waste, located in a convenient location. Recycling facilities will be separated from general waste but will be co-located to provide convenient access to recycling.	Architect & Waste Consultant	Contract Documentation

2.7 URBAN ECOLOGY

2.7.1 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.

2.7.2 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
Vegetation Water efficient landscaping with a variety of species will be provided on terraces.	Landscape	Contract Documentation

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2.8 CONSTRUCTION AND BUILDING MANAGEMENT

2.8.1 OBJECTIVES:

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

2.8.2 DEVELOPMENT RESPONSE

ESD INITIATIVE	RESPONSIBILITY & IMPLEMENTATION	PROJECT STAGE
Construction Environmental Management The contractor will prepare and implement a project-specific EMP at the start of construction. The EMP will be developed in accordance with the NSW Environmental Management Systems Guidelines or equivalent.	Contractor	Construction
Building User Guide Prior to occupancy, a Building User Guide (BUG) will be developed for use by the tenants. The BUG will use non-technical language help facilitate more sustainable behaviour by building occupants and more efficient use of the building systems.	Developer	Construction
Building Information Prior to occupancy, a package of building information will be developed and handed over to the building manager. This will include as-built drawings, operations and maintenance manuals, and supplier and warranty details.	Contractor	Construction

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3 BESS ASSESSMENT

A summary of the BESS results is presented below. For full details of the project’s BESS assessment, please refer to the online portal.

BESS, 69 Carrington Rd, Box Hill VIC 3128, Australia 69 Carrington Rd, Box Hill ...

BESS Report

Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 69 Carrington Rd Box Hill Victoria 3128. 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 Whitehorse 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

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

54%

Project details

Name 69 Carrington Rd, Box Hill VIC 3128, Australia
Address 69 Carrington Rd Box Hill Victoria 3128
Project ID 565805CD-R7
BESS Version BESS-7

Site type Non-residential development
Account admin@wrapengineering.com.au
Application no.
Site area 1,119 m²
Building floor area 8,033 m²
Date 16 December 2024
Software version 2.0.1-B.574

Performance by category ● This project ● Maximum available

Category	Weight	Score	Pass
Management	5%	50%	✘
Water	9%	57%	✔
Energy	28%	54%	✔
Stormwater	14%	100%	✔
IEQ	17%	56%	✔
Transport	9%	50%	✘
Waste	6%	66%	✘
Urban Ecology	6%	25%	✘
Innovation	9%	0%	✘

Project composition

● Office ● Shop

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

Figure 3: BESS Summary Results

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APPENDIX A – VOC & FORMALDEHYDE LIMITS

VOC LIMITS – PAINTS, ADHESIVES & SEALANTS

PRODUCT CATEGORY	MAX. TVOC (g/L OF READY TO USE PRODUCT)
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

VOC LIMITS – CARPETS

COMPLIANCE OPTIONS	COMPLIANCE CRITERIA
A – PRODUCT CERTIFICATION	<p>The product is certified under a recognised Product Certification Scheme (listed on the GBCA website http://new.gbca.org.au/product-certification-schemes/) or other recognised standards.</p> <p>The certificate must be current at the time of project registration or submission and list the relevant product name and model.</p>
B – LABORATORY TESTING	<p><u>ASTM D5116:</u></p> <ul style="list-style-type: none"> - Total VOC limit: 0.5mg/m² per hour, & - 4-PC limit: 0.05mg/m² per hour <p><u>ISO 16000 / EN 13419:</u></p> <ul style="list-style-type: none"> - TVOC at three days: 0.5mg/m² per hour <p><u>ISO 10580 / ISO/TC 219 (Document N238):</u></p> <ul style="list-style-type: none"> - TVOC at 24 hours: 0.5mg/m² per hour

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FORMALDEHYDE LIMITS

TEST PROTOCOL	EMISSION LIMIT/ UNIT OF MEASUREMENT
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	$\leq 1\text{mg/ L}$
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	$\leq 1.5\text{ mg/L}$
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	$\leq 1\text{mg/ L}$
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	$\leq 1\text{mg/ L}$
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	$\leq 1\text{mg/ L}$
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	$\leq 1\text{mg/ L}$
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	$\leq 1\text{mg/ L}$
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	$\leq 0.1\text{ mg/m}^2\text{hr}$
ASTM D5116 (applicable to high pressure laminates and compact laminates)	$\leq 0.1\text{ mg/m}^2\text{hr}$
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	$\leq 0.1\text{ mg/m}^2\text{hr (at 3 days)}$
ASTM D6007	$\leq 0.12\text{mg/m}^3$
ASTM E1333	$\leq 0.12\text{mg/m}^3$
EN 717-1 (also known as DIN EN 717-1)	$\leq 0.12\text{mg/m}^3$
EN 717-2 (also known as DIN EN 717-2)	$\leq 3.5\text{mg/m}^2\text{hr}$

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APPENDIX B – DAYLIGHT ASSESSMENT

NON-RESIDENTIAL DAYLIGHT

A daylight assessment of the building office's primary spaces has been completed in accordance with the GBCA *Green Star Daylight Hand and Views Calculation Guide*, to estimate the areas which will receive a daylight factor of at least 2%.

Under this assessment methodology, there is a requirement that the project must specify glazing with Visible Light Transmission (VLT) at least 40%.

Results Summary:

SPACE TYPE /LEVEL	TYPE	NOMINATED FLOOR AREA (m ²)	DAYLIGHT COMPLIANT AREA (m ²)
Ground	Retail	471	119
Level 1	Retail	924	296
Level 2	Office	859	248
Level 3	Office	859	248
Level 4	Office	511	317
Level 5	Office	510	307
Level 6	Office	510	307
Level 7	Office	510	307
Level 8	Office	512	303
Level 9	Office	471	293
Level 10	Office	437	282
Level 11	Office	396	270
Level 12	Office	380	251
Level 13	Office	371	239
Level 14	Office	311	215
Retail Overall Compliance		30%	
Office Overall Compliance		50%	

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Legend

- Daylight Compliant Area
- Nominated Floor Area

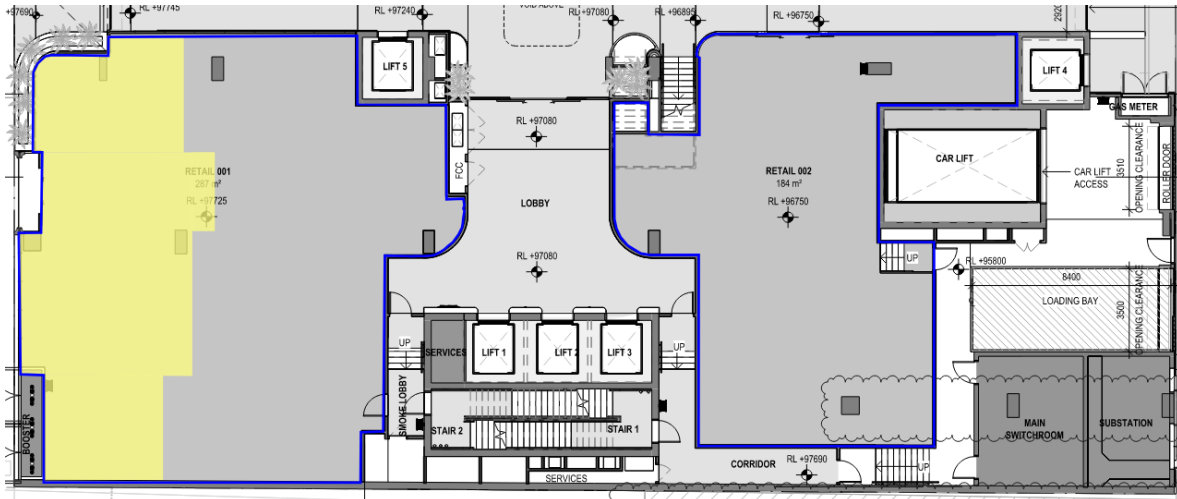


Figure 4 Retail daylight hand calculations for ground floor

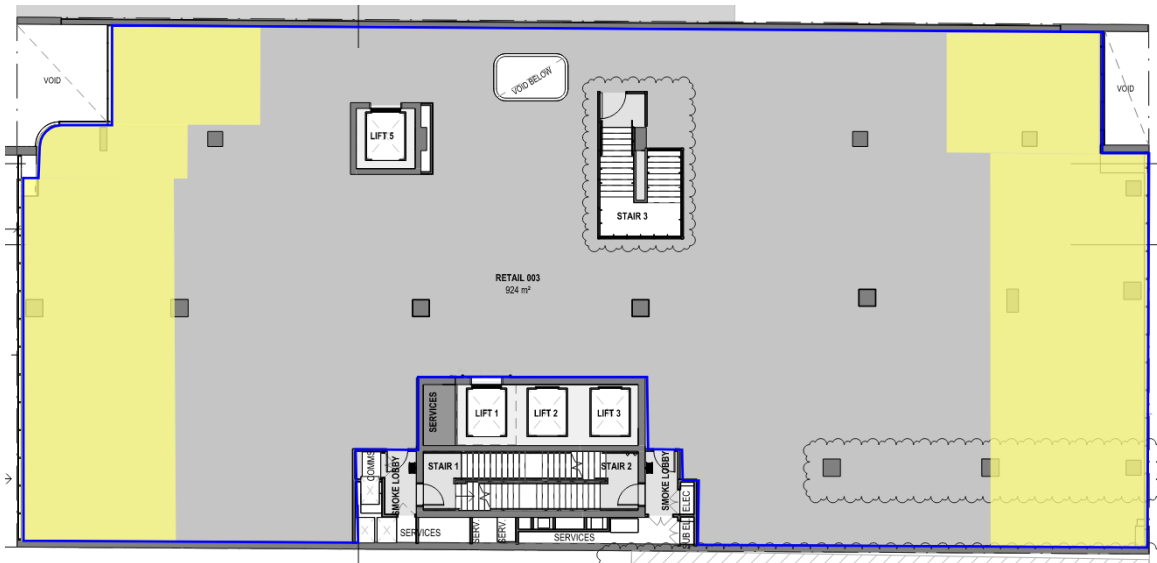


Figure 5 Retail daylight hand calculations for level 1

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Legend

- Daylight Compliant Area
- Nominated Floor Area

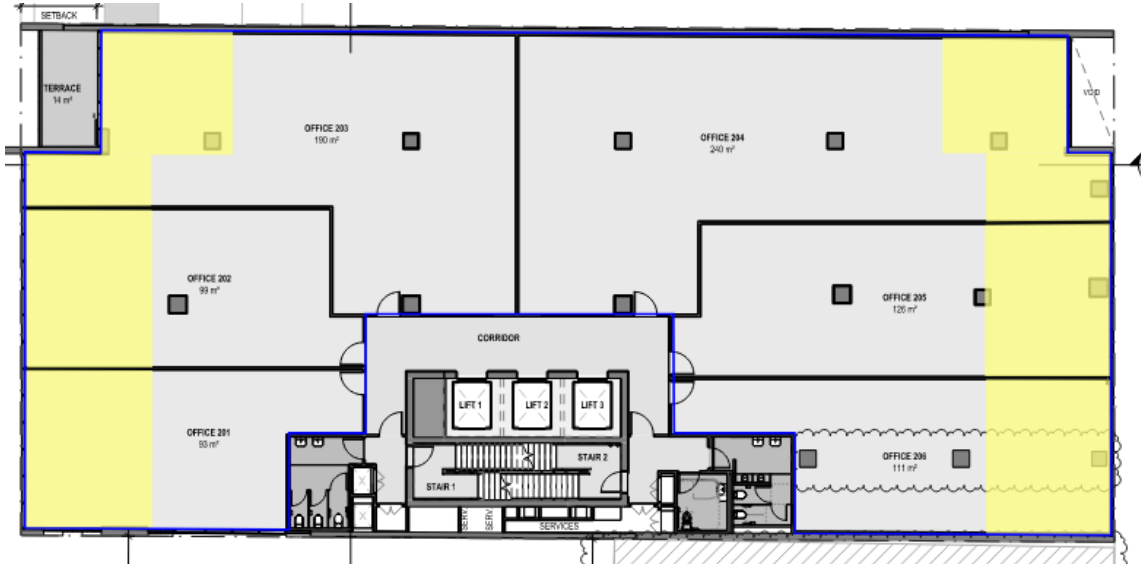


Figure 6 Office daylight hand calculations for level 2 – level 3

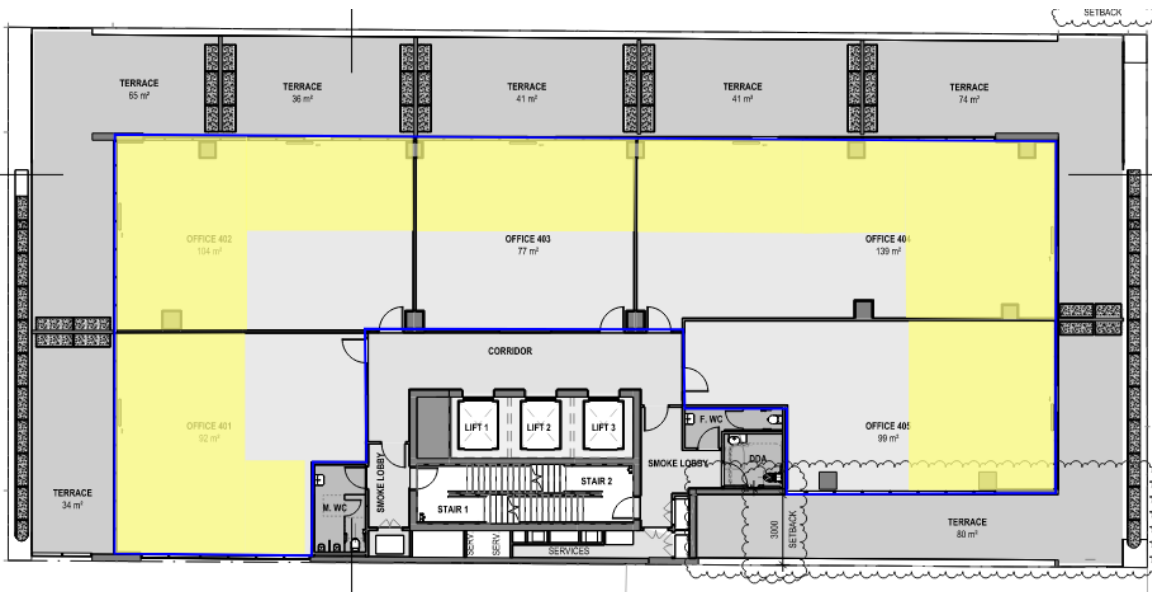


Figure 7 Office daylight hand calculations for level 4

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Legend

- Daylight Compliant Area
- Nominated Floor Area

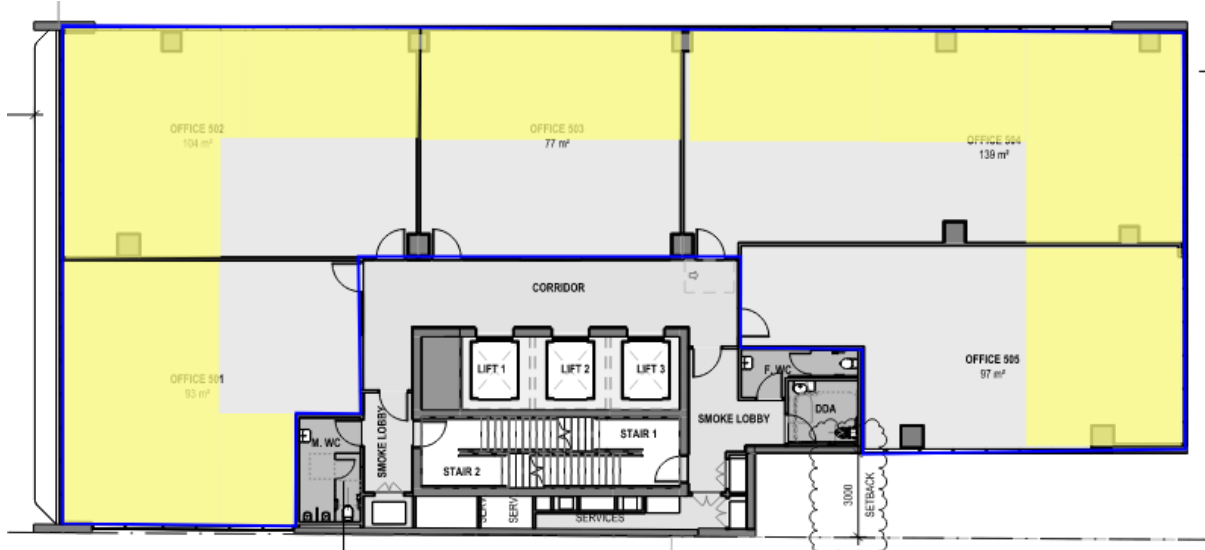


Figure 8 Office daylight hand calculations for level 5 – level 7

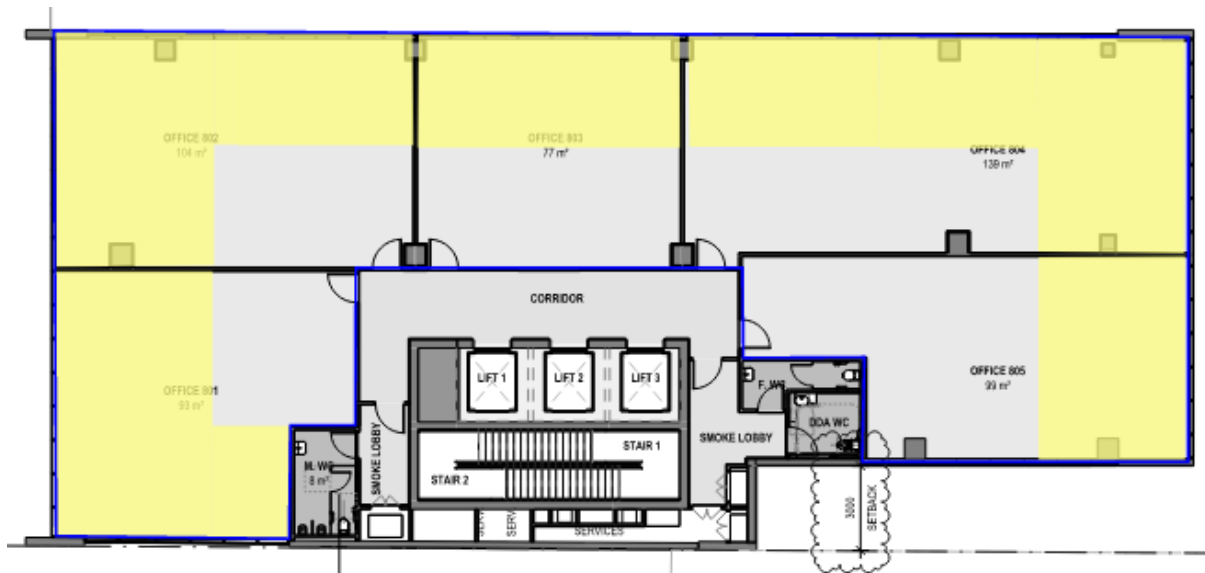


Figure 9 Office daylight hand calculations for level 8

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- Legend
- Daylight Compliant Area
 - Nominated Floor Area

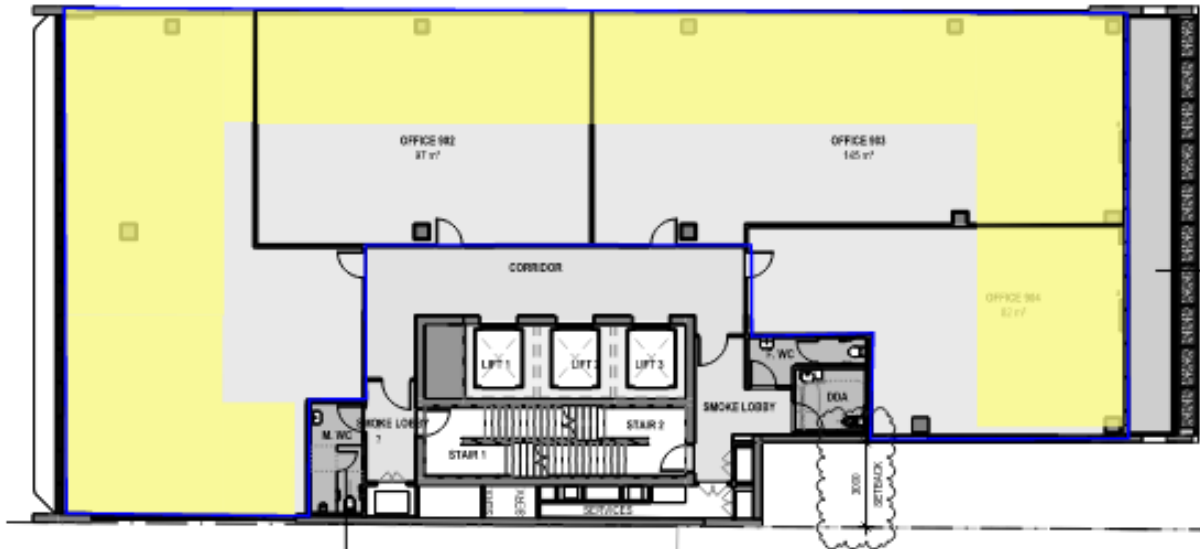


Figure 10 Office daylight hand calculations for level 9

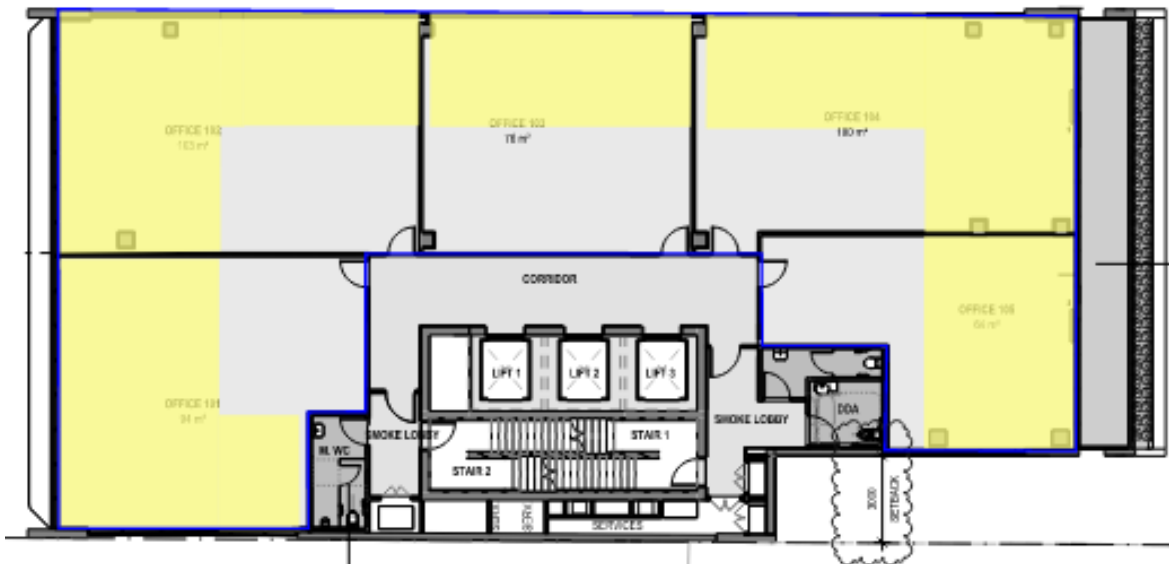


Figure 11 Office daylight hand calculations for level 10

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Legend

- Daylight Compliant Area
- Nominated Floor Area

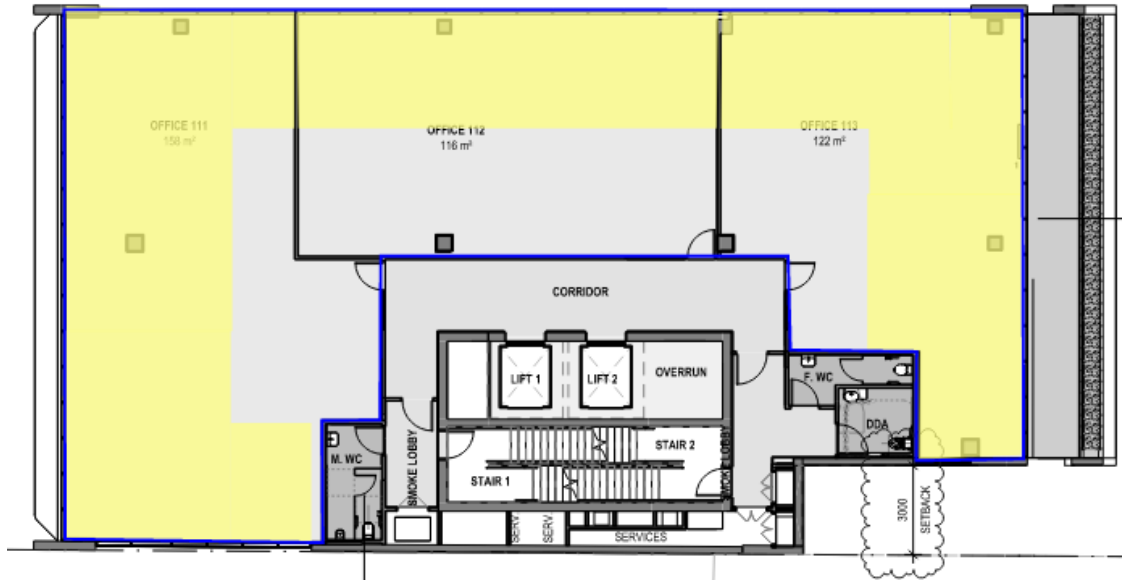


Figure 12 Office daylight hand calculations for level 11

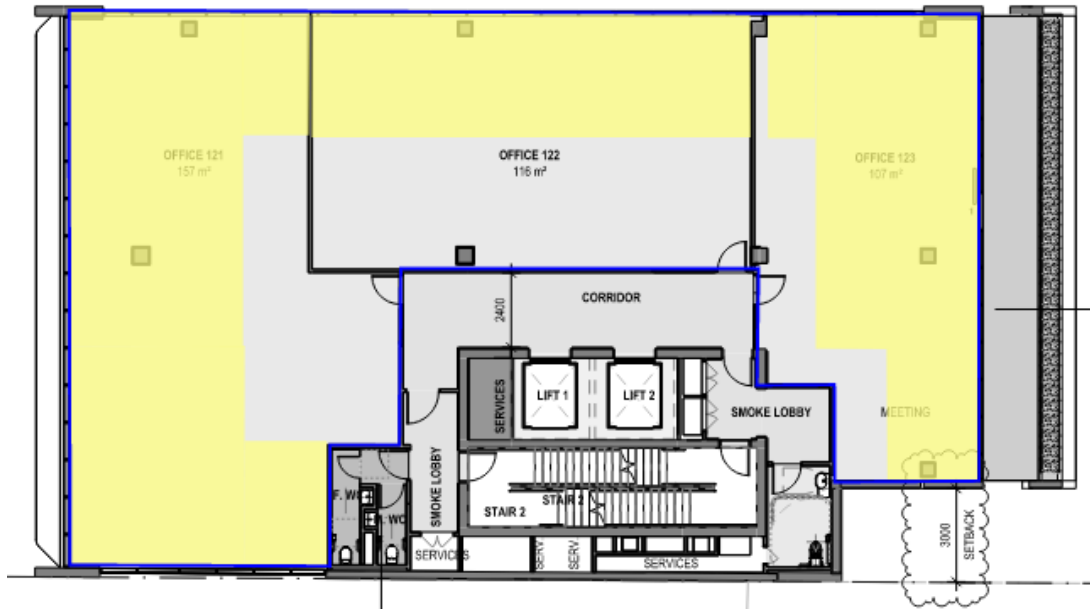


Figure 13 Office daylight hand calculations for level 12

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Legend

- Daylight Compliant Area
- Nominated Floor Area

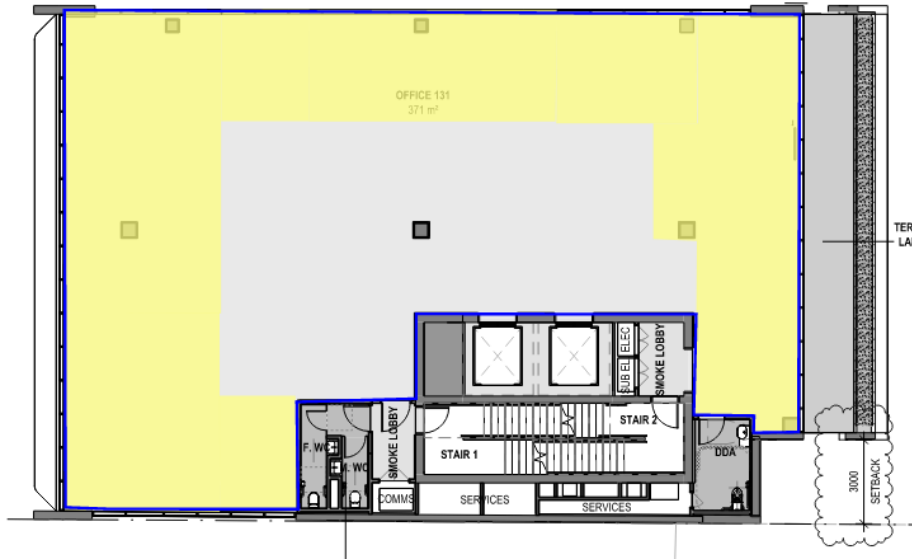


Figure 14 Office daylight hand calculations for level 13

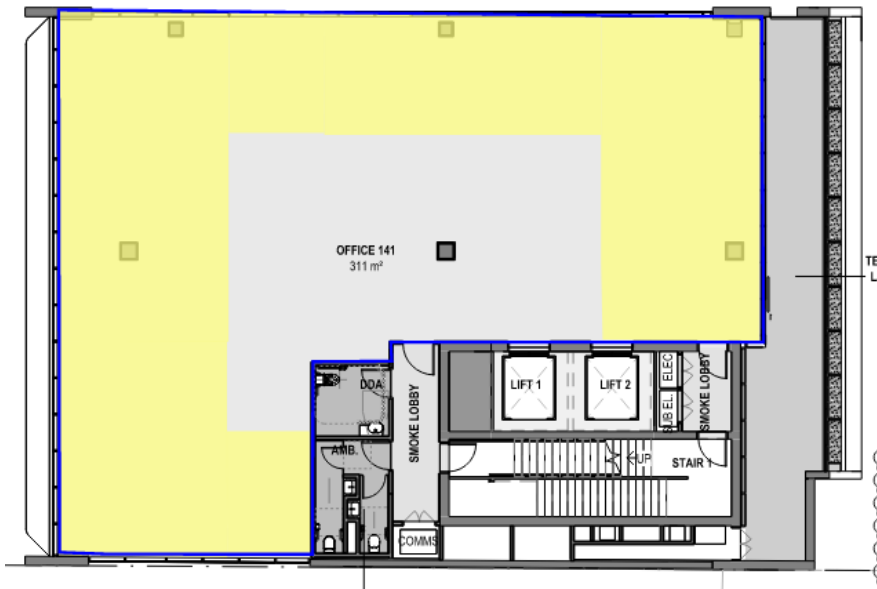


Figure 15 Office daylight hand calculations for level 14

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APPENDIX C – STORMWATER ASSESSMENT

OVERVIEW

Under clause 53.18 of the City of Whitehorse Planning Scheme, “Stormwater Management (Water Sensitive Urban Design)”, the proposed development is required to demonstrate, as part of its town planning application, its ability to meet the water quality performance objectives as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victorian Stormwater Committee 1999.

In response to this, the Water Sensitive Urban Design Response proposed for this development has been assessed using the InSite software.

The preliminary stormwater treatment proposed for this development achieves best practice performance objectives outlined in the Urban Stormwater Best Practice Environmental Management Guidelines (CSIRO 1999) to achieve the objectives of the State Environment Protection Policy (Water of Victoria).

General considerations and potential maintenance activities for the proposed WSUD response have been outlined in this report. The final detailing of the systems will be agreed with the civil, landscape and hydraulic design consultants during the design development phase.

General measures to be considered by the building contractor to minimise stormwater pollution during construction have also been included.

BASIS OF ASSESSMENT

Clause 53.18 of the City of Whitehorse Planning Scheme aims to achieve improved stormwater quality. The policy is based on the best practice performance objectives outlined in the Urban Stormwater Best Practice Environmental Management Guidelines (CSIRO 1999) to achieve the objectives of the State Environment Protection Policy (Water of Victoria). These performance objectives are:

- Suspended solids - 80% retention of typical urban annual load
- Total Nitrogen – 45% retention of typical urban annual load
- Total Phosphorus – 45% retention of typical urban annual load
- Litter – 70% reduction of typical urban annual load.

The policy also aims to promote use of Water Sensitive Urban Design (WSUD) strategies as well as stormwater re-use, minimise peak stormwater flows and pollutants, and mitigate the detrimental effect of development on downstream waterways.

In accordance with the requirements outlined in Clause 53.18-4, the application must address the following:

- Site layout plan showing location of proposed stormwater treatment measures;
- A report outlining how the application achieves the objectives of the policy;
- Design details, such as cross sections, to assess the technical effectiveness of the proposed stormwater treatment measures;

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- A Site Management Plan which details how the site will be managed through construction; and
- A maintenance programme setting out future operational and maintenance arrangements.

PERFORMANCE MEASUREMENT TOOL

The Water Sensitive Urban Design Response proposed for this development has been assessed using the InSite software.

DEVELOPMENT RESPONSE – WSUD

A summary of the development's WSUD response is presented below:

CATCHMENT AREA	AREA	TREATMENT TYPE
Roof Area	409m ²	10kL RWT (RWT-1) re-use to toilets from ground floor to level 6.
Terrace Area	516m ²	10kL RWT (RWT-2) re-use to irrigation throughout the site.
Planter Area	102m ²	No treatment
Other Impervious Area	92m ²	No treatment

We have considered the sections located on the outermost borders of the roof and terrace areas that may not be directly served by the drainage system on the current floor and have considered them to be part of the next lower catchment.

Legend

- Planter Area
- Roof Area
- Terrace Area

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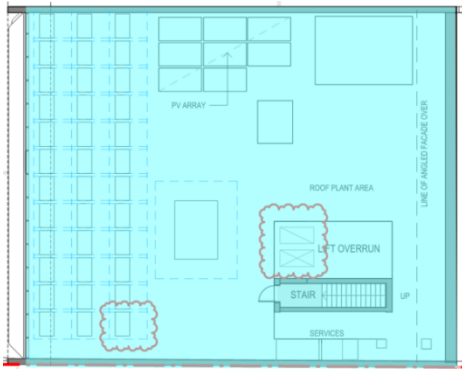


Figure 16 Proposed rainwater catchment area of roof plan



Figure 17 Proposed rainwater catchment area for level 14



Figure 18 Proposed rainwater catchment area for level 13

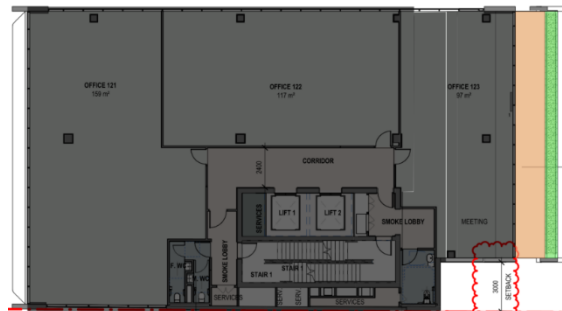


Figure 19 Proposed rainwater catchment area for level 12



Figure 20 Proposed rainwater catchment area for level 11

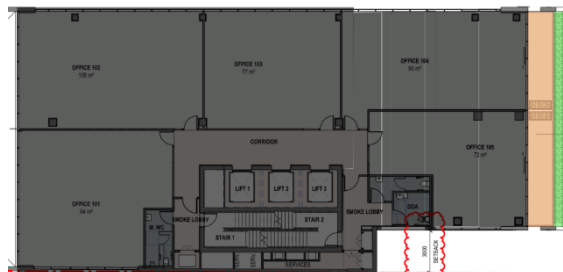


Figure 21 Proposed rainwater catchment area for level 10

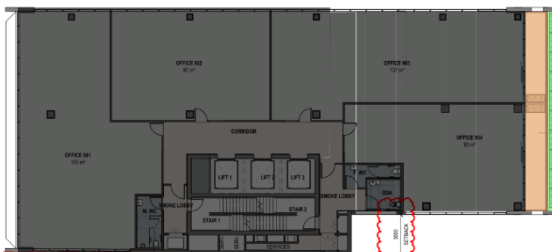


Figure 22 Proposed rainwater catchment area for level 09

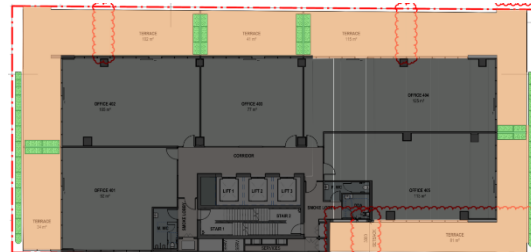


Figure 23 Proposed rainwater catchment area for level 04

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STORM ASSESSMENT RESULTS

Based on the stormwater treatment details described above, the development achieves a STORM score of 121%.

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Stormwater Calculations





Report for Whitehorse

Date report printed: 19/12/2024

Project Details

Project Name	23384 69 Carrington Road, Box Hill		
InSite User Email	admin@wrapengineering.com.au		
Web files link			
Site Area (m2)	1119	Project ID	3836
Planning number			
Development type	Non-residential development		
Existing site details	Residential >750m2 per dwelling		
Street address	69 Carrington Road, Box Hill VIC, Australia		

Results

 VOLUME	 FLOW	 QUALITY	 EFFICIENCY
Objective: Reduce annual average runoff volume by harvesting or infiltrating stormwater	Objective: Control peak discharge flow (litres per second) with adequate on site detention	Objective: Improve stormwater runoff water quality (Equivalent to STORM score)	Objective: Increase drought resilience
Target: No increase in pre-development annual average runoff volume (Up to a 10% increase is allowed to account for uncertainties)	Target: less than or equal to zero. If greater than zero this is the additional Site Storage Requirement (SSR) volume required	Target: Achieve a score of 100 or more This corresponds to a 45% reduction in nitrogen runoff	Target: Achieve greater than 25% potable water use reduction
VOLUME RESULT 13.0 % change in annual average volume	FLOW RESULT 11.5 m ³ of additional site storage required	QUALITY RESULT 121 Pollution reduction score (out of 100)	EFFICIENCY RESULT 32.3 % water saving
VOLUME FAILS	FLOW FAILS	QUALITY PASSES	EFFICIENCY PASSES

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Design Criteria

The items on this page must be reflected on other project plans, specifications and engineering drawings. The development must be designed and constructed in accordance with the following:

Rainwater Tank Specifications

Total rainwater tank volume (L)	20000	*This is the rainwater tank volume retention + detention	
Total rainwater retention* tank volume (L)	20000	*This is the rainwater tank volume that is available for reuse	
Total rainwater detention* tank volume (L)	0	*This is the rainwater tank volume that is reserved for slow release to stormwater	
Roof connected to rainwater tank (m ²)	925.0		
Rainwater tanks connected to	Toilet , Irrigation		
Other rainwater tank end uses (L/day)		Irrigated Garden Area (m ²)	110
% building rainwater end uses connected (to rainwater tanks)	100	First Flush Device?	0
Additional* Site Storage (L)		*Site storage added adjacent to the legal point of discharge for peak flow detention or volume infiltration	
Recycled water source (Yes/No)			
Water tank reliability %	84.9		
Rainwater tank overflow %	40.3	*Note if this number is under 25%, then 30% of the tank's retention volume will be counted toward the detention volume	

Water Efficiency Specifications

Basin WELS star rating	> 6 Star WELS rating
Toilet WELS rating	> 4 Star WELS rating
Bath WELS star rating	Not Applicable
Washing Machine WELS star rating	Not Applicable
Kitchen Taps WELS rating	> 6 Star WELS rating
Urinal WELS rating	> 4 Star WELS rating
Shower WELS star rating	3 Star WELS (> 7.5 but <= 9.0) (minimum requirement)
Dishwasher WELS star rating	> 3 Star WELS rating

11520 litres of additional Site Storage Requirement (SSR) (in addition to the combined rainwater / detention tanks) which is provided by litres of additional site storage adjacent to the legal point of discharge.

Stormwater management measures selected are

This includes all impervious areas in the site connected to Council or Stormwater Authority drains. This excludes pervious areas like garden, gravel, and lawn areas)

- For the 409m² roof area Clean Tank, Raintank Volume = 10000 litres connected to 409m² of roof
- For the 516m² roof area RWT-2, Raintank Volume = 10000 litres connected to 516m² of roof
- 92m² of Other Untreated

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Building Occupancy Calculations

Building Spaces

- 1395m² of Shop, restaurant or retail - BCA Class 6 with an average occupancy of 41.9 people
- 3249m² of Office - BCA Class 5 with an average occupancy of 103.8 people

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Estimated Total Building Occupancy	145.7
------------------------------------	-------

Stormwater VOLUME Calculations

Site Area (m ²)	1119
Post development total impervious area (m ²)	1017.0
Rainwater Tank Overflow (kL/annum)	320.6
Pre-development Volume (kL/annum)	346.7
Post-development Volume (kL/annum)	391.9
Change in volume %	13.0

Stormwater QUALITY Calculations

Rainwater Tank Runoff reduction (%)	59.7
Rainwater Tank(s) Total Nitrogen (TN) reduction	1227.2
Total Nitrogen (TN) % reduction	54.3
Equivalent STORM Score	121

Water EFFICIENCY Calculations

Benchmark water use (kL/year)	7570.5		
Predicted potable water use (kL/year)	5123.5		
Predicted potable water use (L/person/day)	105.3		
Water savings from tank (kL/year)	475.6		
Water saving from efficiency (kL/year)	1971.40		
Total water saving % (efficiency + tank + recycled water)	32.3	Water saving (kL/year)	2447.0

Stormwater FLOW Calculations - Swinburne Method

This section outlines rational method calculations for On Site Detention (OSD) and Site Storage Requirements (SSR)

Permissible Site Discharge (PSD) Calculations

Calculated PSD	9.4
PSD Override Value Used	

Site Storage Calculations

Preliminary On Site Detention (OSD) tank size required estimate (m ³)	11.52	Swinburne Method Tank formula
OSD and storages* provided (m ³)	0.0	Includes storages: rainwater tank retention allowance, rainwater tank detention, and additional added storage volumes
Additional detention / retention volume required (m ³)	11.5	
Base case (pre-development) fraction impervious (ratio)	0.40	
Base case runoff coefficient	0.45	
Post development total impervious area (in hectares)	0.1017	
Post development fraction impervious (ratio)	0.91	
Post development runoff coefficient	0.833	
Pre-development design storm	20% AEP (~1 in 5 year ARI) - default residential	
Post development detention required	10% AEP (~1 in 10 ARI) - default residential	
Critical Storm Duration - the Catchment time of concentration – Tc(catchment) in minutes	20	
Rainfall Depth (mm) for Critical Storm Duration - Tc(catchment)	15.00	
Rainfall intensity - i at Tc(catchment) (mm/h)	45.000	
Travel time from discharge point to catchment outlet (min) - Tcs	20.0	
Rainfall Depth (mm) for Tcs - (IFD at Tcs)	18.99	
Rainfall intensity - i at tc(site) (mm/h)	56.97	

OSD tank flow restrictor orifice diameter = 67 mm

Detention Calculator - Site Storage Requirement (SSR)

Storm Duration (mins)	Rainfall Depth (mm)	Stored Volume (m ³)
5		
7.5		
10		
12.5		
15		
20		
30		
40		
60		

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About In-Site Water

This report is generated by user inputs from the toolkit at InSite Water. In-Site water is an online Integrated Water Management tool designed for use on smaller sites (less than 2 hectares) in Australia that need quick and accurate stormwater engineering answers. InSite water is simple to use but provides robust stormwater design and engineering answers.

This report includes outputs from the InSite tool that has investigated:

- water tank sizing
- detention tank sizing
- water savings through efficiency
- water WSUD treatments such as raingardens

For enquiries, contact us through www.insitewater.com.au

Disclaimer

This guide is of a general nature only. Advice from a suitably qualified professional should be sought for your particular circumstances. Depending on each unique situation, there may be occasions where compliance is not achieved.

This report does not provide a detailed design and layout for the piping and general drainage system in your development, which should be prepared by a suitably qualified professional. In addition, InSite Water does not consider compliance for slope stability or foundation / slab / footing protection, which needs to come from a qualified geotechnical or structural engineer.

The following is outside the scope of InSite Water, however it is critical that all designers consider the following in drainage design and in using Water Sensitive Urban Design (WSUD) devices and approaches:

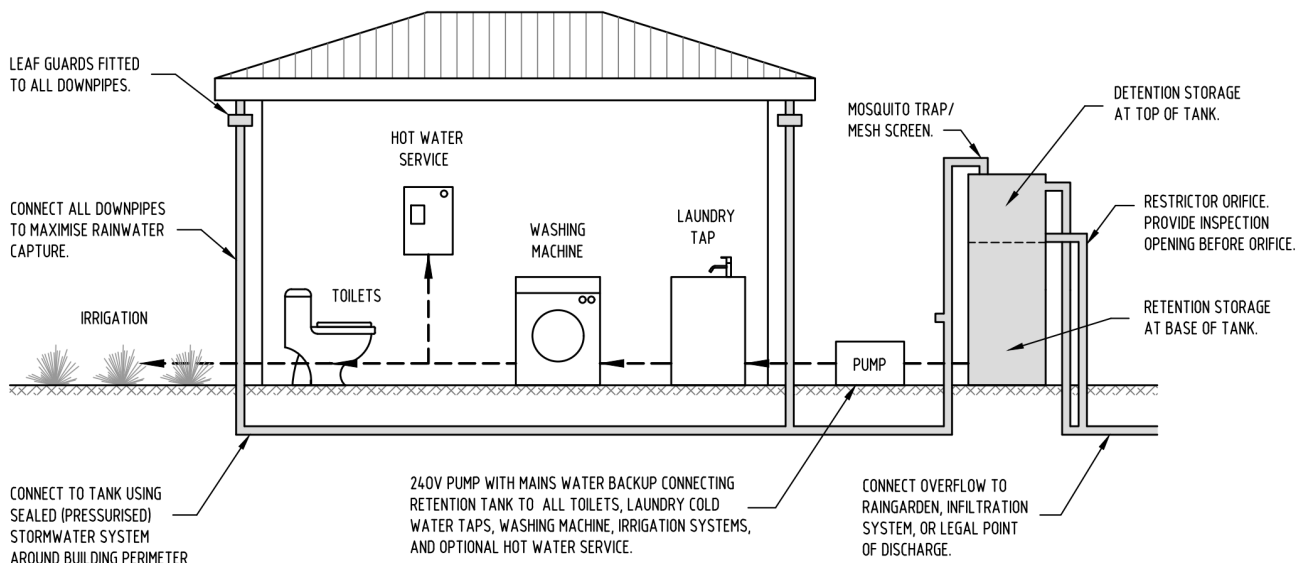
- *Manage expectations and risks around occasional surface water and ponding.*
- *Ensure that uncontrolled stormwater does not flow over property boundaries or otherwise cause a nuisance.*
- *Plan for major flood pathways – locate buildings away from, adapt (raise floors above predicted flood levels) and defend buildings against potential major flooding.*
- *Seek professional advice to reduce damage and safety risks.*
- *Design for local conditions such as vegetation, topography and soils (soil type, reactivity, permeability, water table level, salinity, dispersiveness, acid sulphate soils, contaminated land etc).*
- *Ensure that soil moisture and building clearance is considered in areas of reactive clays or where varying soil moisture levels could damage buildings or other infrastructure.*
- *For steeper sites, ensure the design includes geotechnical considerations such as slope stability with varying soil saturation levels.*
- *Ensure that a Stormwater Risk Assessment and Environmental Management Plan is undertaken for sites that pose a pollution risk.*
- *Ensure that a Construction Environmental Management Plan (CEMP) is implemented to control sediments and reduce stormwater pollution during construction.*
- *Compliance with ARR 2019, Australian Rainfall and Runoff: A Guide to Flood Estimation <http://arr.ga.gov.au/>*
- *Compliance with NCC plumbing and building standards.*
- *Compliance with AS/NZS 3500.*
- *Compliance with EPA and other environmental regulations.*
- *Compliance with other relevant Australian Standards, regulations and Council requirements.*

Legal Disclaimer

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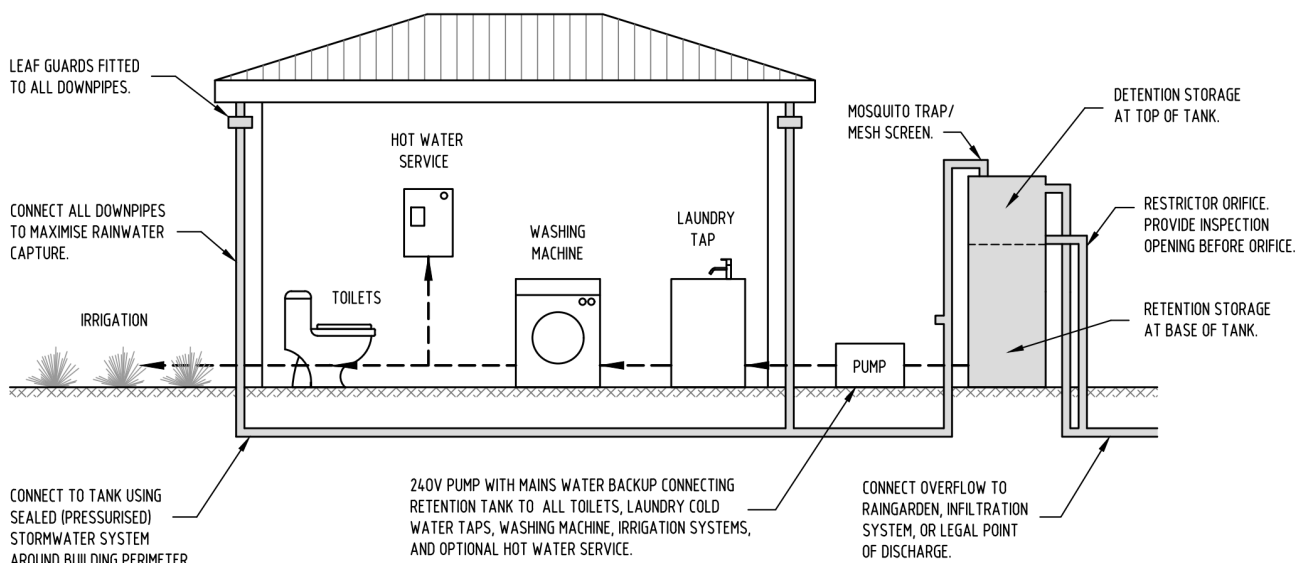
Appendix A: attach further details for this project (if applicable):



RETENTION TANK RETICULATION DETAIL

N.T.S.
 NOTE: THE DESIGN AND INSTALLATION OF ALL STORMWATER SYSTEMS SHALL COMPLY WITH AS/NZS 3500.3:2018 "STORMWATER DRAINAGE".

Above: Clean Tank treatment drawing (draft for planning approvals only: not for construction, not to scale)



RETENTION TANK RETICULATION DETAIL

N.T.S.
 NOTE: THE DESIGN AND INSTALLATION OF ALL STORMWATER SYSTEMS SHALL COMPLY WITH AS/NZS 3500.3:2018 "STORMWATER DRAINAGE".

Above: RWT-2 treatment drawing (draft for planning approvals only: not for construction, not to scale)

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RAINWATER TANK DESIGN & INSTALLATION CONSIDERATIONS

Rainwater tanks provide flow retention capacity and storage for reuse. They reduce stormwater run-off, decrease the demand of potable water and allow particle settlement within the tank, thus treating rainwater. General considerations for rainwater tank systems design and potential maintenance activities include:

- Incorporating a first flush device to the rainwater collection system. First flush devices divert the initial most polluted portion of water runoff.
- Automated switches to divert water supply from the tank to mains need to be incorporated.
- Connection to toilets ensure water tanks are run down on a daily basis, leaving spare capacity for new rainwater collection.

STORMWATER RUNOFF TREATMENT DURING THE CONSTRUCTION STAGE

Stormwater management in the construction stage will be required to minimise the likelihood of contaminating stormwater discharge from the site and reducing the velocity of the flows generated from the development as it is being constructed.

Stormwater management will form a part of the contractor's EMP, and it will need to specifically address the following objectives:

1. Prevent discharge of contaminated stormwater;
2. Prevent impact on offsite surface or groundwater due to construction works; and
3. Slow down stormwater flows during heavy rainfall.

The EMP should consider the following specific items in relation to stormwater management:

- Storage of materials, chemicals and construction waste must be well clear of site drainage lines or other infrastructure;
- Immediate clean-up of chemical spills;
- Soil and dust containment;
- Regular cleaning of roadways and other impervious surfaces;
- Install sediment or silt traps around stormwater drain points;
- Prevent stormwater from adjacent properties entering the site;
- Capping/bunding of piles of contaminated materials or soil;
- Inspect and clean all sediment filters and traps after heavy rains; and
- Regularly evaluate site stormwater management systems for effectiveness.

More information is available from Melbourne Water booklet "*Keeping Our Stormwater Clean – A Builder's Guide*".

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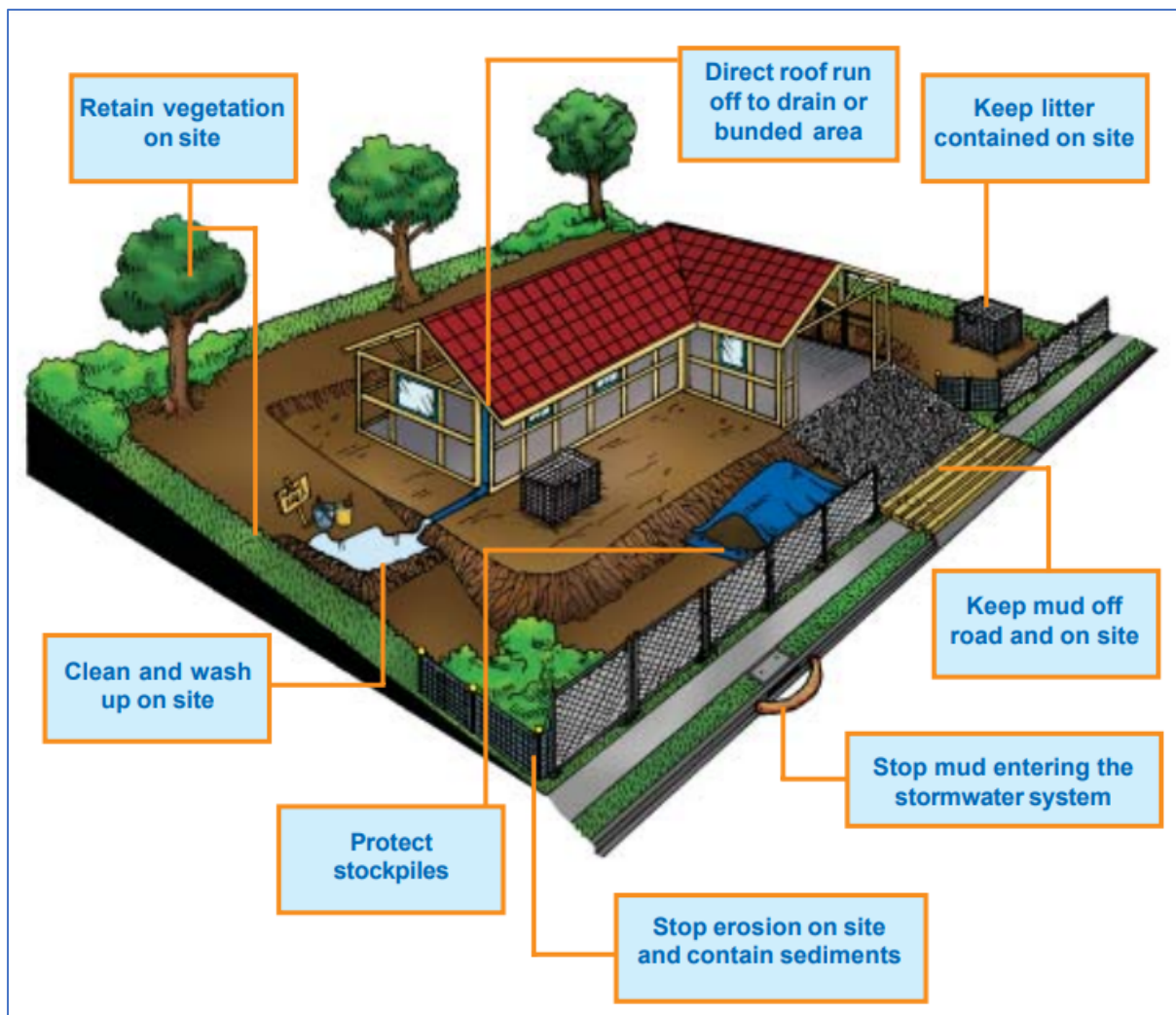


Figure 24: Site stormwater management considerations. Source: Melbourne Water – Keeping Our Stormwater Clean: A Builder's Guide

RAINWATER HARVESTING SYSTEM MAINTENANCE PROGRAMME

The proposed rainwater harvesting system will be maintained in accordance with the manufacturer's requirements. The building owner, body corporate or facility manager will be responsible for undertaking the routine maintenance and ensuring that the system is operating as designed.

The following specific maintenance activities will be required as a minimum:

- Roof and other rainfall collection areas are to be inspected regularly, at minimum every 3 months, to ensure they are kept free of pollutants, leaves and other debris;
- First flush devices should be cleaned at least every 6 months; and
- Routine maintenance as specified by the manufacturers for the hardware; pumps, tanks and filters.

Sludge layers and biofilms can be formed in the tank's walls. If water colour and smell become an issue, professional tank cleaners should be engaged.

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APPENDIX D – NCC SECTION J PRELIMINARY ASSESSMENT

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DESIGN MEMORANDUM

PROJECT: 69 Carrington Road, Box Hill
PROJECT NO: 23384 **DM NO:** 02 Rev03
FROM: Patrick Kiploks **DATE:** 16/12/2024

ATTENTION: Pragma Gupta **COMPANY:** Gray Puksand **EMAIL:** pgupta@graypuksand.com.au

NCC SECTION J PRELIMINARY ASSESSMENT

INTRODUCTION

This Design Memorandum (DM) provides a summary of the preliminary NCC 2019 Section J assessment which has been completed for 69 Carrington Road, Box Hill.

NCC SCOPE

This assessment addresses the following parts of the NCC only:

- Part J1 – Building Fabric
- Part J3 – Building Sealing

CLASSIFICATIONS

This assessment assumes the following:

- NCC 2019
- Building Class 5- Office building
- Building Class 6 - Retail
- Climate Zone 6

SOURCES OF INFORMATION

The following sources of information were used in the assessment:

- Architectural plans, elevations, and section view drawings dated 06/12/2024.

BUILDING ENVELOPE

This assessment applies to all building elements that form the envelopes of the building, specifically those that separate a conditioned space or habitable room from the exterior of the building or from an adjacent non-conditioned space such as a car park, plant room or similar.

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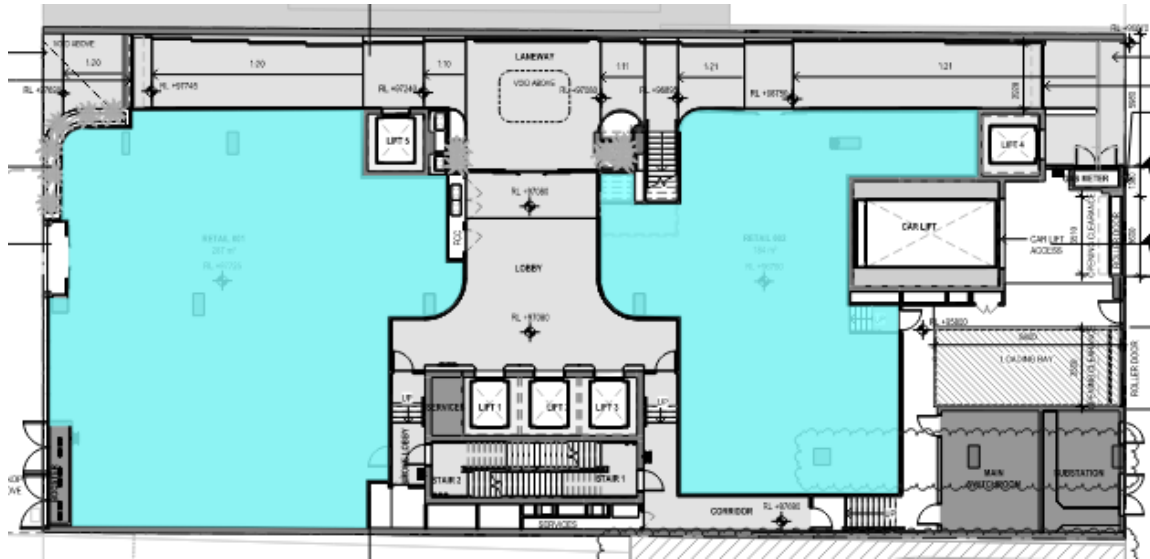


Figure 1 Conditioned space for ground floor retail.

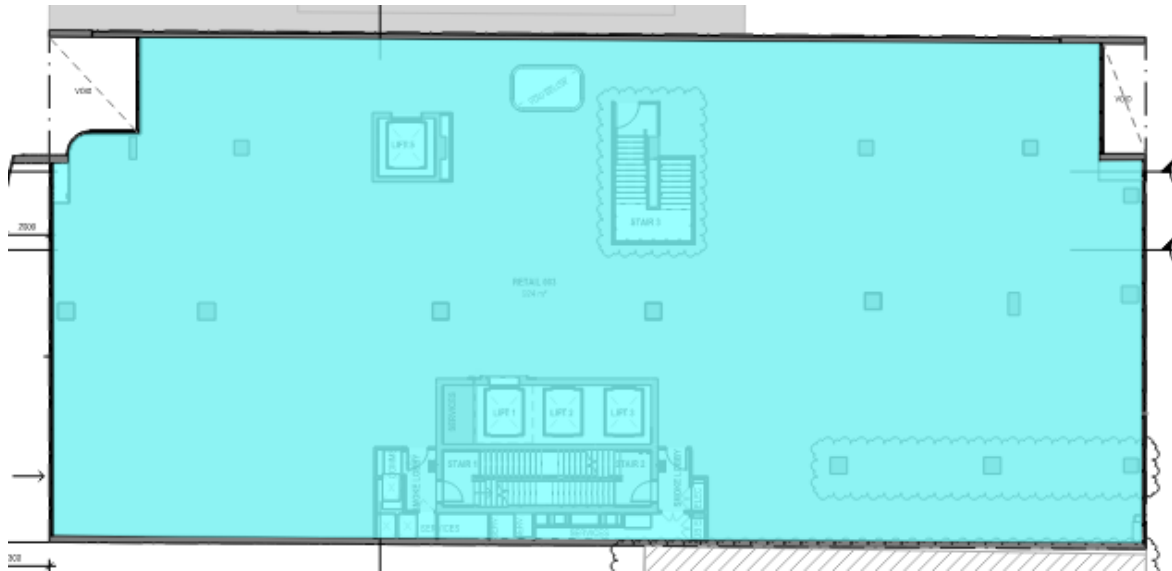


Figure 2 Conditioned space for level 1 retail.

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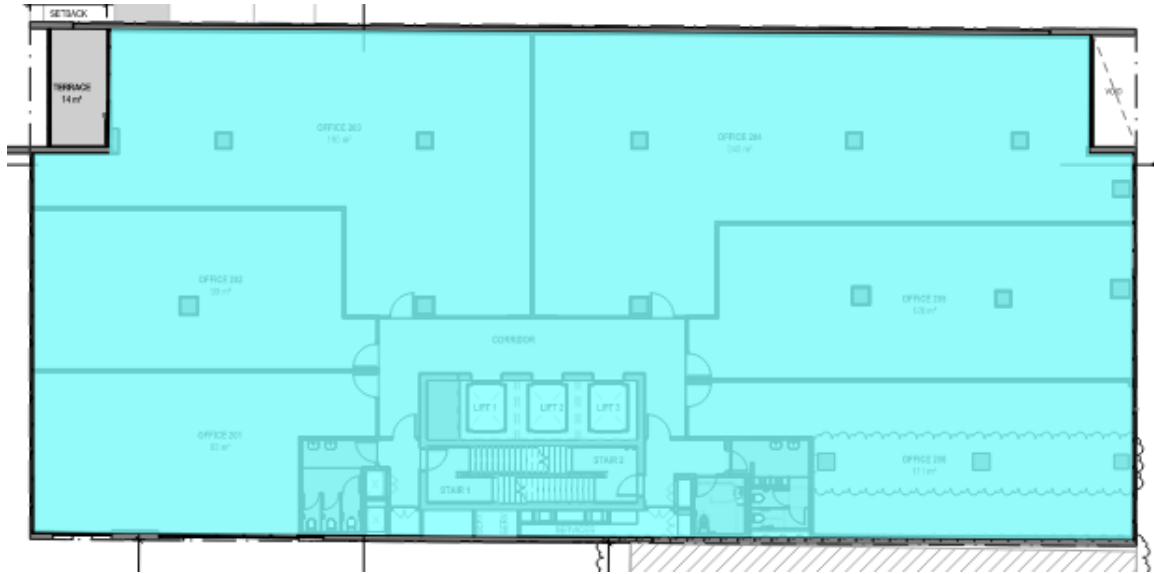


Figure 3 Conditioned space for level 2 – level 3 offices.

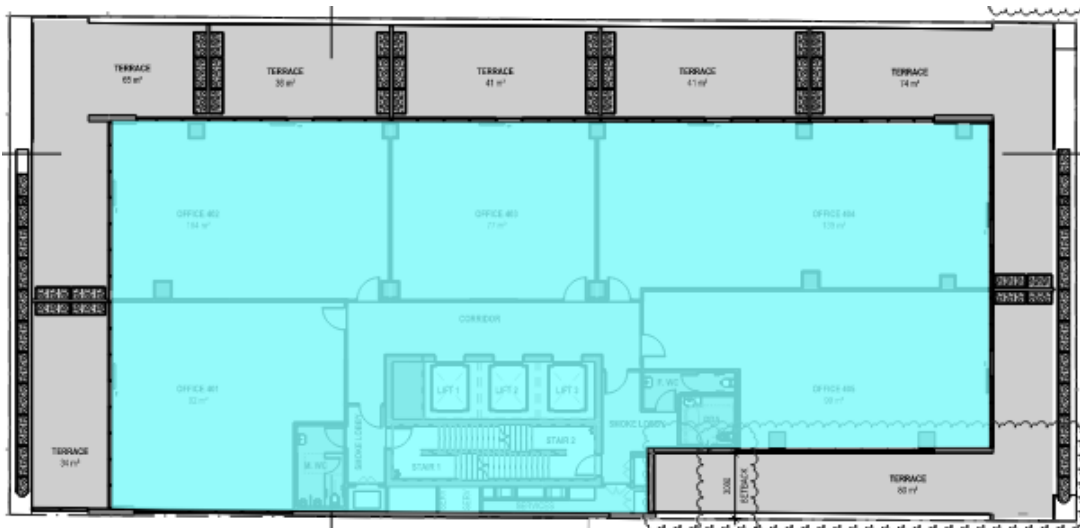


Figure 4 Conditioned space for level 4 offices.

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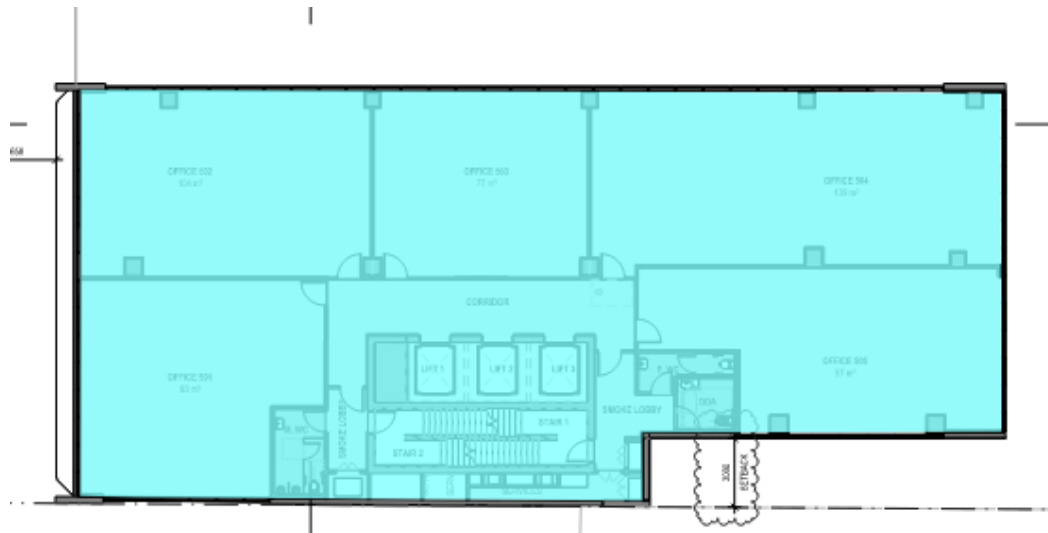


Figure 5 Conditioned space for level 5 – level 7 offices.

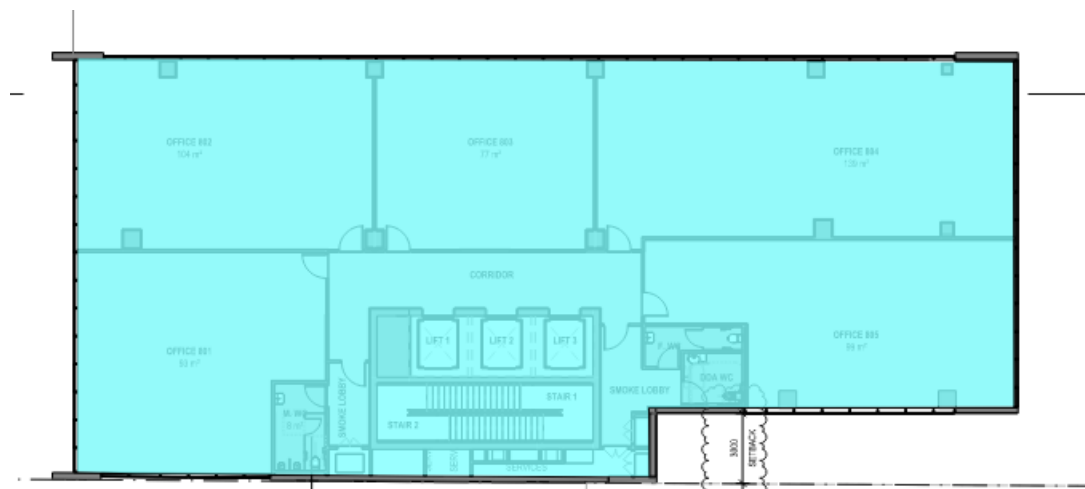


Figure 6 Conditioned space for level 8 offices.

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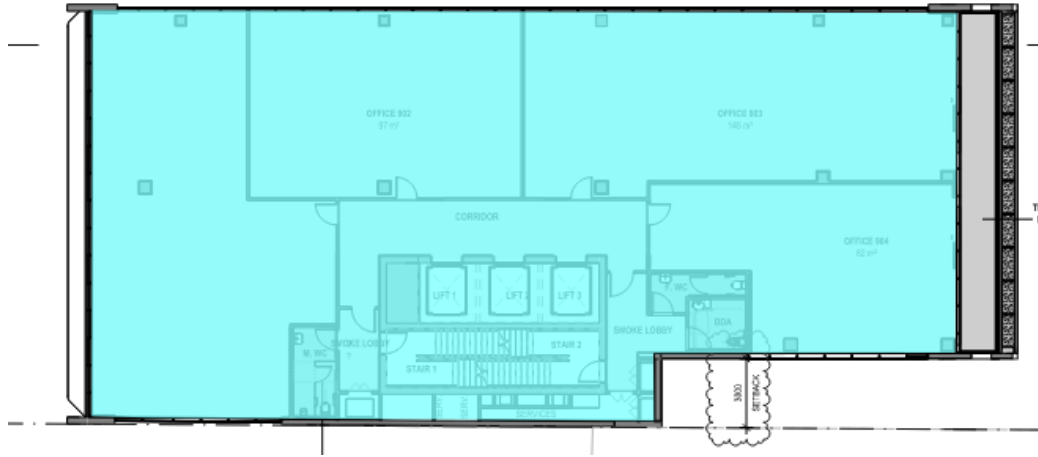


Figure 7 Conditioned space for level 9 offices.

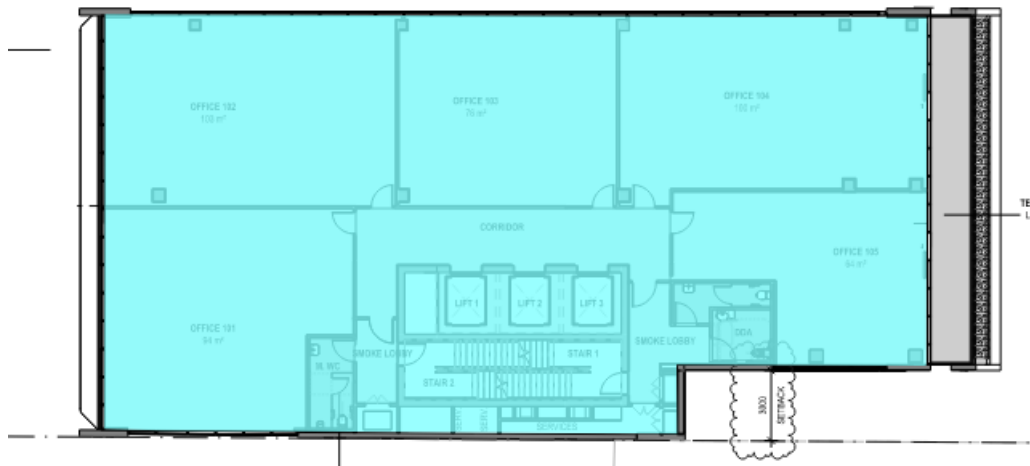


Figure 8 Conditioned space for level 10 offices.

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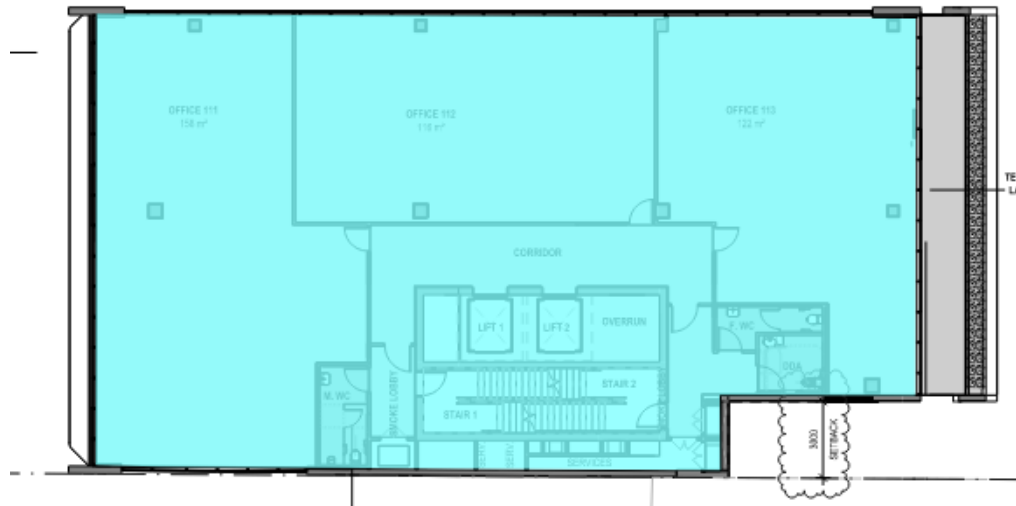


Figure 9 Conditioned space for level 11 offices.

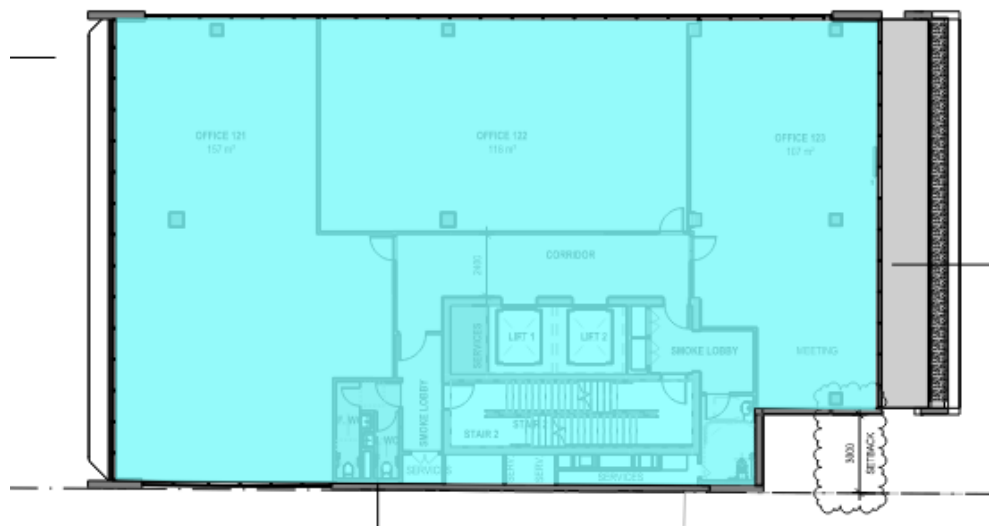


Figure 10 Conditioned space for level 12 offices.

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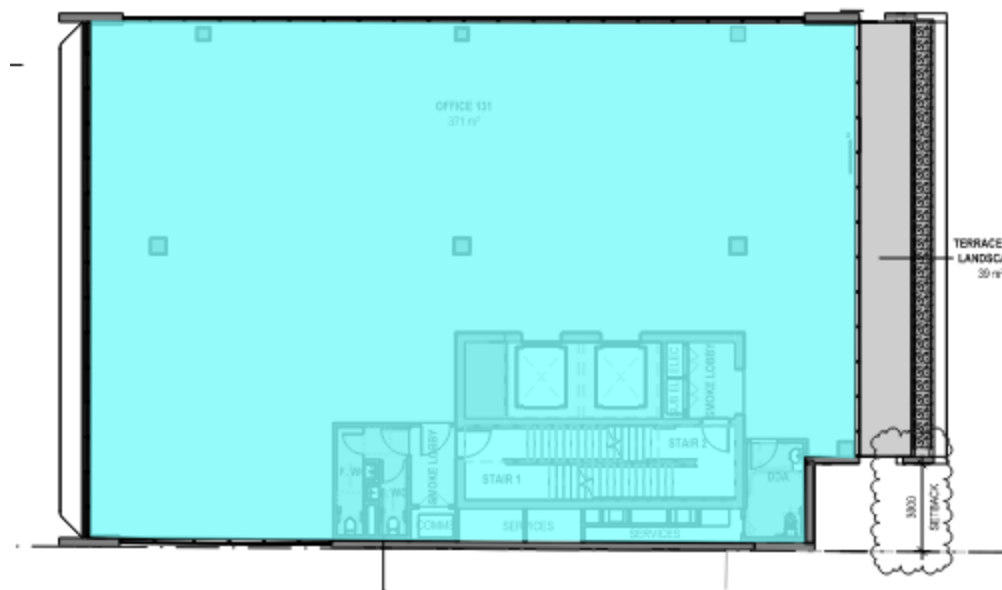


Figure 11 Conditioned space for level 13 offices.



Figure 12 Conditioned space for level 14

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DISCLAIMER

This assessment is only a review against the minimum regulatory energy efficiency requirements as stipulated in the National Construction Code. It has not taken into consideration any related design or construction criteria or considerations such as operational energy efficiency, capital costs, construction detailing, thermal comfort, condensation, mechanical services design, or acoustic performance.

USE OF THIS MEMORANDUM

The following notes apply in relation to the acceptable use of this document:

1. For the building permit submission, all thermal performance and construction details must be explicitly documented within the architectural documentation. It is not acceptable for the architectural drawings, schedules, or specifications to include notes such as “refer to ESD/energy/Section J report” or similar.
2. This document is not to be used by contractors or suppliers for the purpose of tendering, quoting, or pricing.

PART J1 – BUILDING FABRIC

Table 1 provides a summary of the construction details and minimum thermal insulation requirements for the façade elements within the building. It is the responsibility of the architect to document these and the contractor to ensure that the final design constructed in accordance with these requirements.

Table 1: Part J1 construction and insulation requirements

ITEM	ELEMENT	NCC JV3 REQUIREMENTS
J1.2	Thermal Constructions	<p>General Insulation: Must comply with AS/NZS 4859.1 and be installed so that it—</p> <ol style="list-style-type: none"> (i) abuts or overlaps adjoining insulation other than at supporting members such as studs, noggings, joists, furring channels and the like where the insulation must be against the member; and (ii) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and (iii) does not affect the safe or effective operation of a service or fitting. <p>Reflective Insulation: Must be installed with—</p> <ol style="list-style-type: none"> (i) the necessary airspace to achieve the required R-Value between a reflective side of the reflective insulation and a building lining or cladding; and (ii) the reflective insulation closely fitted against any penetration, door or window opening; and (iii) the reflective insulation adequately supported by framing members; and each adjoining sheet of roll membrane being— (A) overlapped not less than 50 mm; or

ITEM	ELEMENT	NCC JV3 REQUIREMENTS
		<p>(B) taped together.</p> <p>Bulk Insulation: Must be installed so that—</p> <ul style="list-style-type: none"> (i) it maintains its position and thickness, other than where it is compressed between cladding and supporting members, water pipes, electrical cabling, or the like; and (ii) in a ceiling, where there is no bulk insulation or reflective insulation in the wall beneath, it overlaps the wall by not less than 50 mm. <p>The above requirements must be explicitly stated in the architectural documentation/specification.</p> <p>Thermal Bridging: Part J1.2.e of NCC 2019 introduces a requirement to calculate the impact of thermal bridging on the building envelope performance. We have included the impacts of thermal bridging when determining the minimum fabric performance levels outlined in the report.</p>
J1.3	Roofs	<p>Roof:</p> <ul style="list-style-type: none"> • Minimum added insulation R-Value R_M3.5. This includes any ceilings with terraces above. • External roof material External roof material solar absorptance must be ≤ 0.45.
J1.4	Roof Lights	Not Applicable
J1.5	Walls and Glazing	<p>External Walls:</p> <ul style="list-style-type: none"> • Minimum added insulation R-Value R_M2.5. • Steel studs in external walls will require a thermal break strip such as Vulcan DCT between the stud and precast panel/wall cladding. • Insulation must extend from the floor up to the roof and make a continuous boundary with the roof insulation. <p>Refer to insulation mark up at the end of this document for the thermal boundary.</p> <p>Spandrel Panels:</p> <p>Thermally broken frames and R_M1.5 insulation. Spandrel panels must utilise the same external glazing as below.</p>

ITEM	ELEMENT	NCC JV3 REQUIREMENTS
		External Glazed Windows and Doors: Fixed Windows and Sliding Doors: Total U-Value (U_w) ≤ 3.2 W/m ² , SHGC ($SHGC_w$) ≤ 0.26
J1.6	Floors	Exposed sections of floor: Minimum added insulation R-Value R_M 2.0 to exposed floors or those above unconditioned spaces including the car park. Refer to the mark ups at the end of this document for exact locations.

Notes:

- R_T is the total R-Value of the building element, including cladding, internal finishes, air gaps and air films.
- R_M is the R-Value of the added insulation material.
- U_w is total U-Value of the window element, including glazing and frame.
- The calculation of the required total R-Value (R_T) and total system U-Value (U_w) has considered thermal bridging as per NCC requirements. Therefore, the required added insulation R-Value (R_M) can be considerably higher than the total construction R-Value (R_T).
- The required concrete wall R_T value allows for the thermal bridge created by the uninsulated slab edge.

Please refer to the mark-ups at the end of this document showing the above details.

PART J3 – BUILDING SEALING

Table 2 provides a summary of the design and construction provisions required to meet the NCC deemed-to-satisfy requirements for building sealing. These requirements must be included in the documentation.

Table 2: Part J3 building sealing requirements.

ITEM	ELEMENT	NCC DEEMED-TO-SATISFY REQUIREMENTS
J3.4	Windows and Doors	<ul style="list-style-type: none"> • Glazed windows and doors must comply with AS2047. • All external doors must have self-closing mechanisms. • Any solid external doors must have rubber perimeter seals and bottom mounted draft stopping seals.
J3.5	Exhaust Fans	Exhaust fans must be fitted with a self-closing damper.
J3.6	Ceilings, Walls, and Floors	Must be constructed to minimise air leakage, using internal lining systems that are close fitting or by using sealants, caulking, skirting, architraves, and the like.

DISCUSSION

The results presented above provide an indication of the minimum thermal performance requirements of the 2019 NCC Section J, Parts J1 and J3, based on the currently assessed architectural documentation.

INSULATION

The insulation requirements described in this DM reflect the minimum requirements for the project to comply with NCC Section J. To improve the energy efficiency of the building and the thermal comfort of building users, we recommend that the specified insulation details should exceed these values where possible, particularly in respect to roof insulation.

NEXT STEPS

The next steps in the design and documentation process are recommended as follows:

1. Review this advice carefully and ensure that all relevant parties understand the requirements and implications for the design and construction specifications.
2. Prepare the project's construction, insulation, window and glazing specifications in accordance with the thermal performance parameters noted in this advice. If you are unsure of specific details, we recommend that you liaise with your preferred insulation, window or glazing supplier to confirm compliant product specifications. For the tender documentation, it is a requirement that all thermal performance and construction details must be explicitly documented within the architectural documentation. It is not acceptable for the architectural drawings, schedules, or specifications to include notes such as "refer to ESD/energy/Section J report" or similar.

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BUILDING FABRIC DETAILS

Mark-ups detailing insulation requirements for each level have been provided on the upcoming pages.

Legend

- Soffit Insulation R2.0
- Soffit Insulation R3.5
- Wall Insulation R2.5

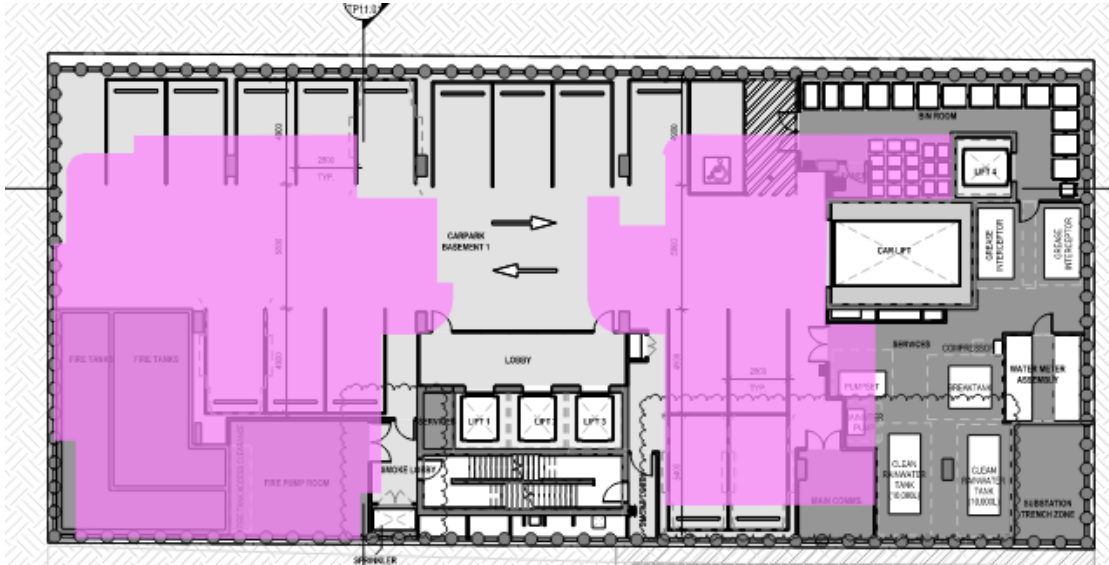


Figure 13 Insulation markups for basement 1 (RCP).

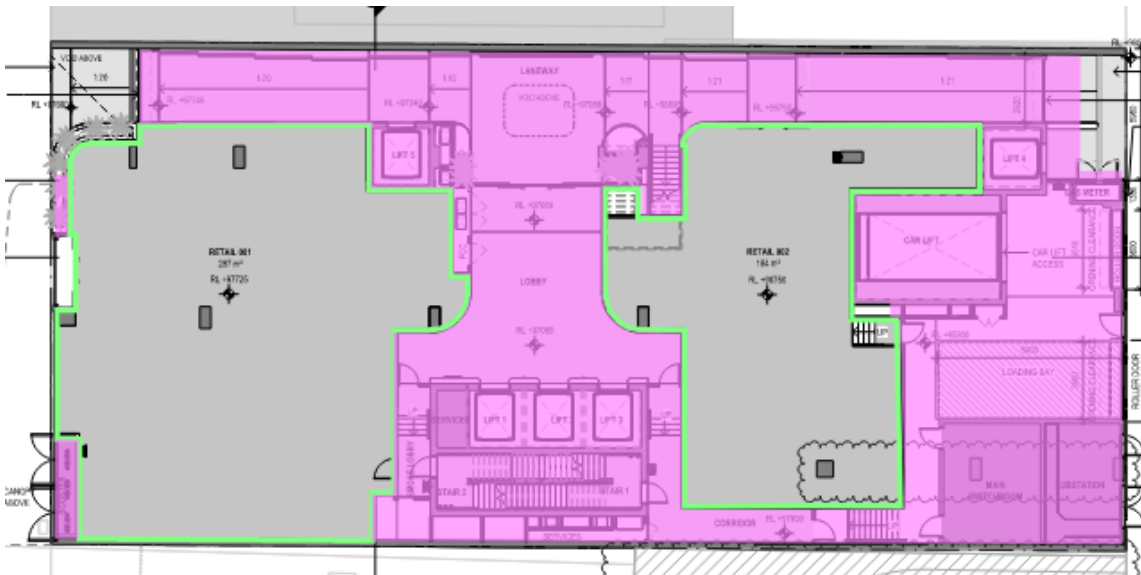


Figure 14 Insulation markups for ground floor (RCP).

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Legend

- Soffit Insulation R2.0
- Soffit Insulation R3.5
- Wall Insulation R2.5

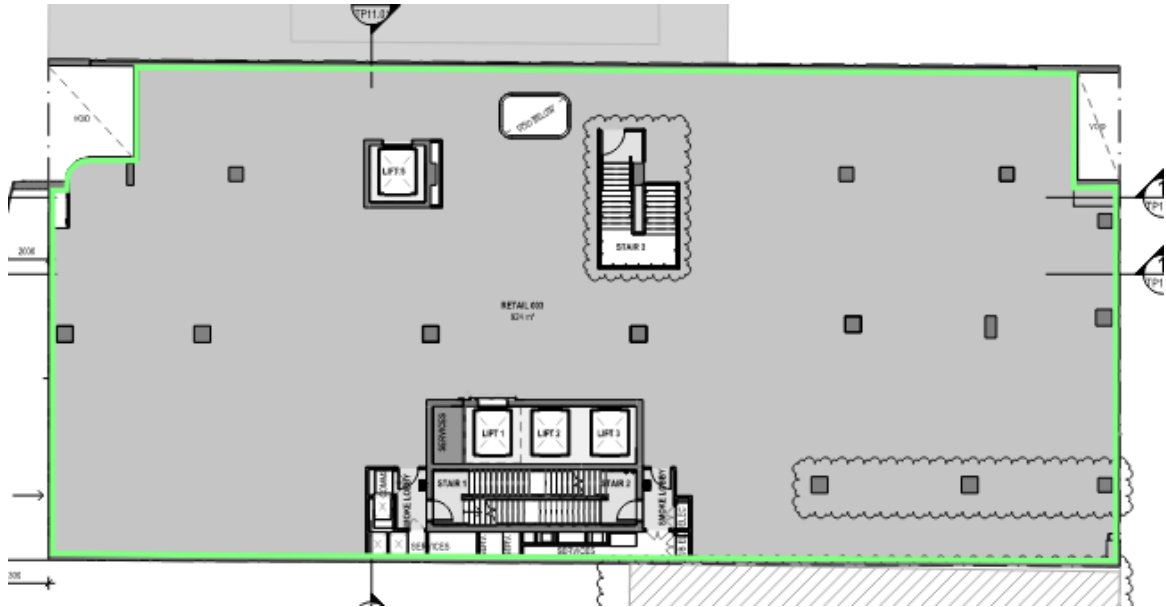


Figure 15 Insulation markups for level 1 and level 2 (RCP).

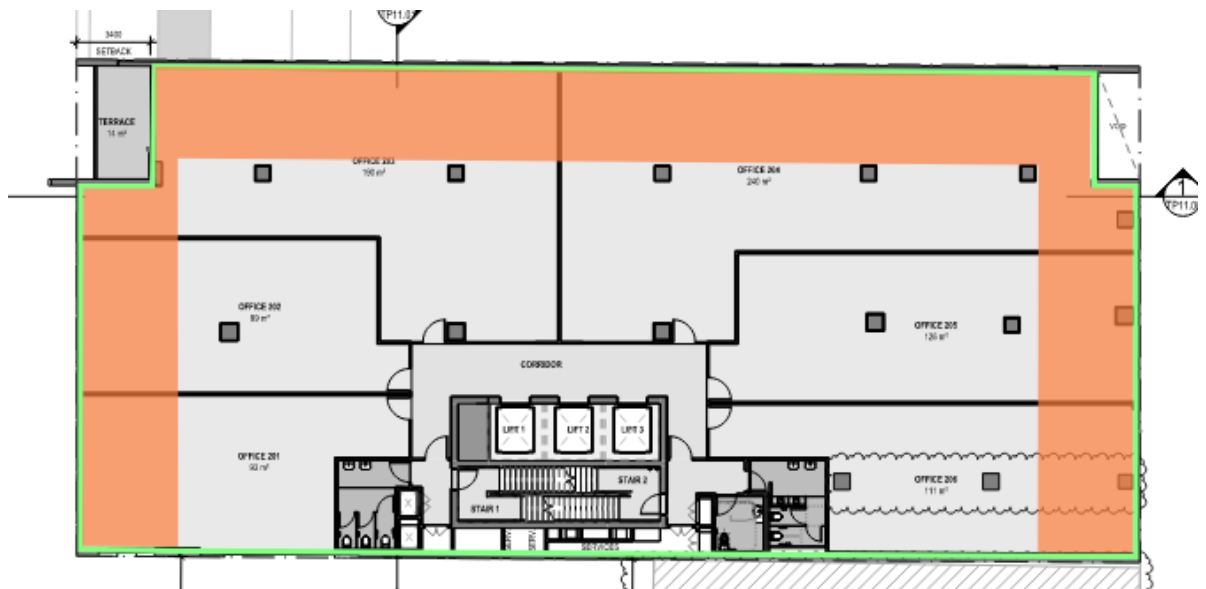


Figure 16 Insulation markups for level 3 (RCP).

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Legend

- Soffit Insulation R2.0
- Soffit Insulation R3.5
- Wall Insulation R2.5

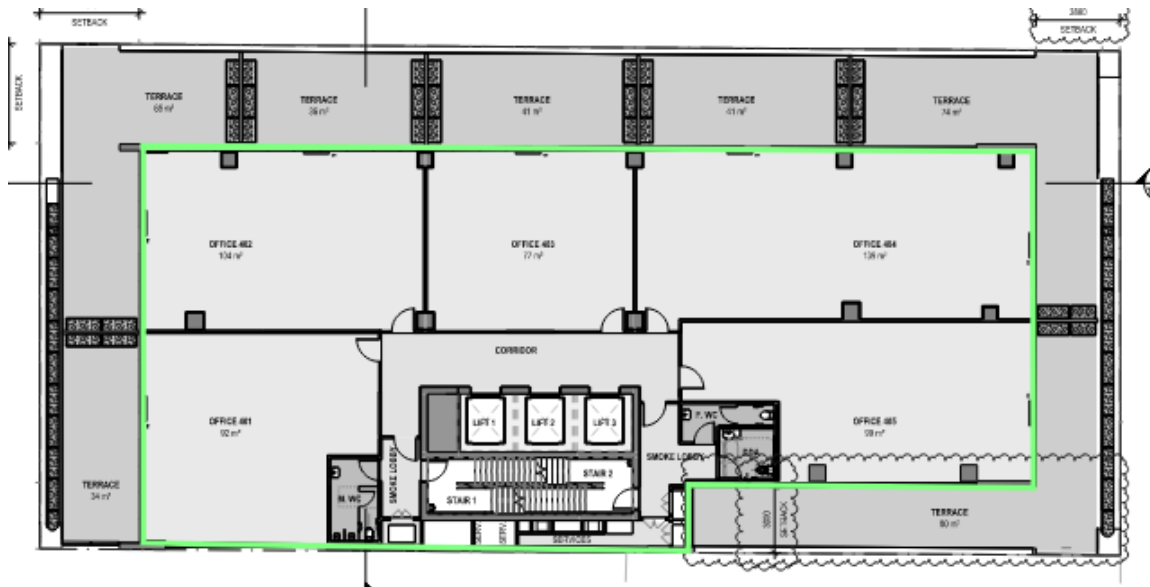


Figure 17 Insulation markups for level 4 (RCP).

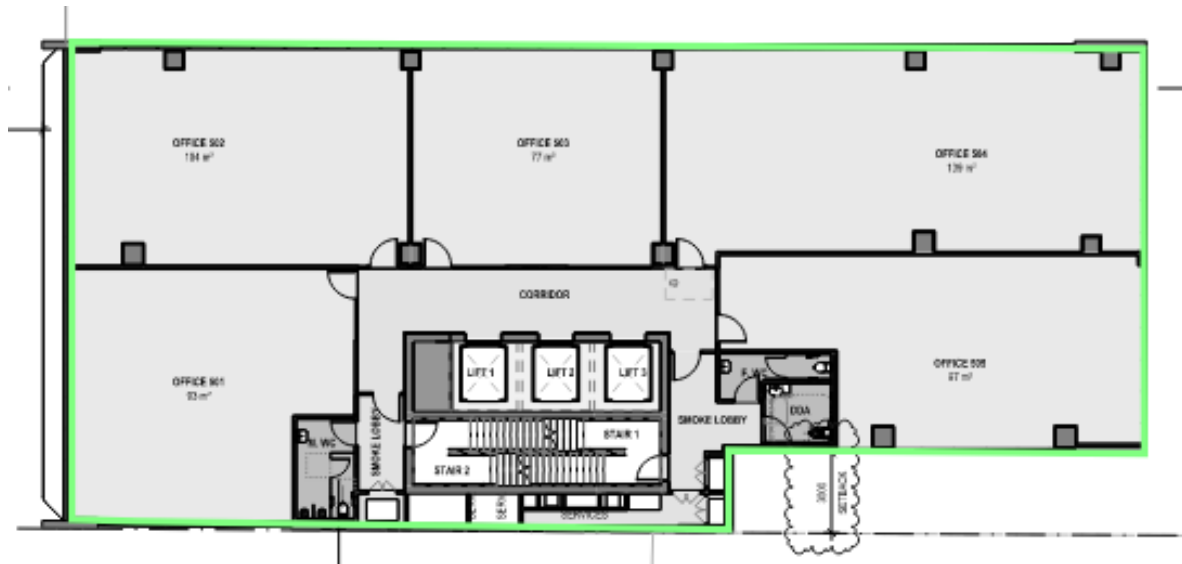


Figure 18 Insulation markups for level 5 - level 7.

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Legend

- Soffit Insulation R2.0
- Soffit Insulation R3.5
- Wall Insulation R2.5

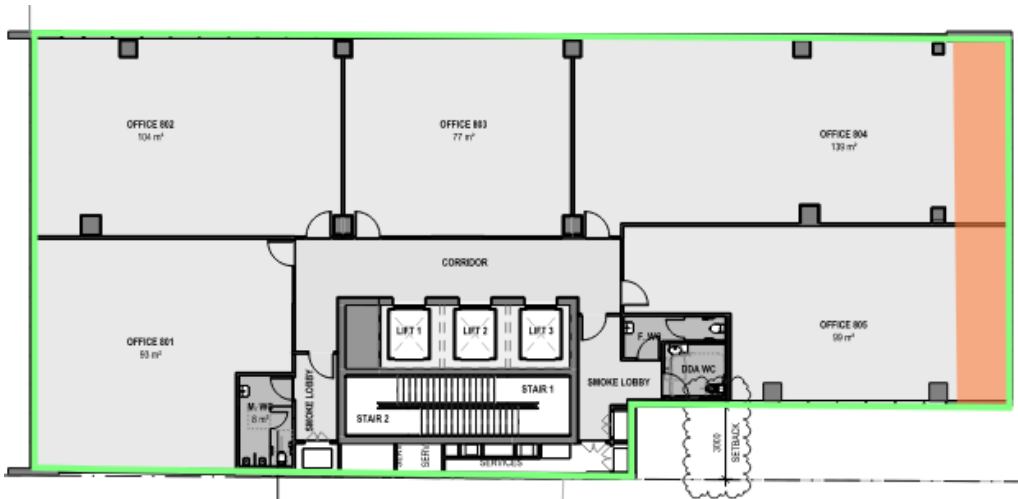


Figure 19 Insulation markups for level 8 (RCP).

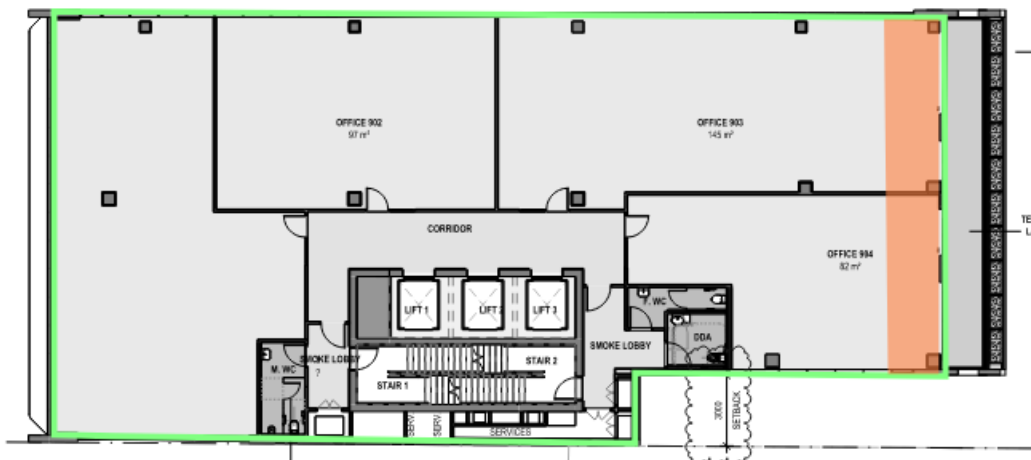


Figure 20 Insulation markups for level 9 (RCP).

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Legend

- Soffit Insulation R2.0
- Soffit Insulation R3.5
- Wall Insulation R2.5

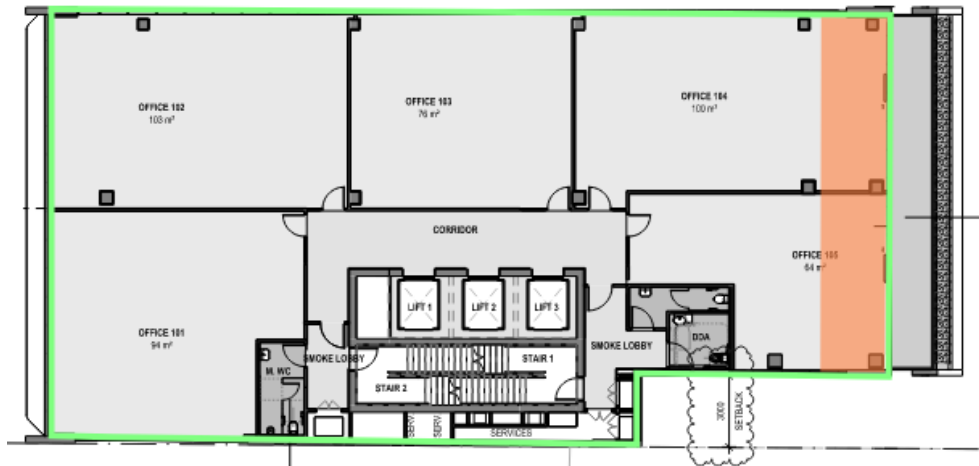


Figure 21 Insulation markups for level 10 (RCP).

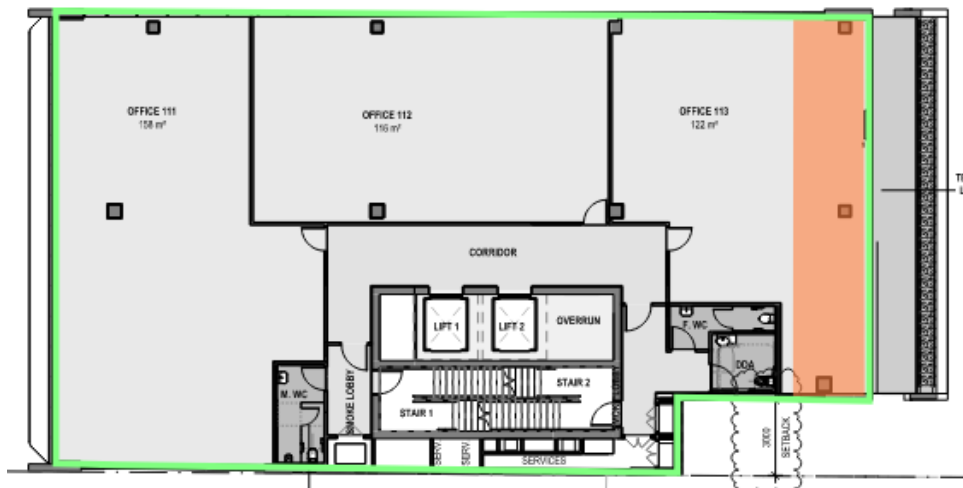


Figure 22 Insulation markups for level 11 (RCP).

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Legend

- Soffit Insulation R2.0
- Soffit Insulation R3.5
- Wall Insulation R2.5

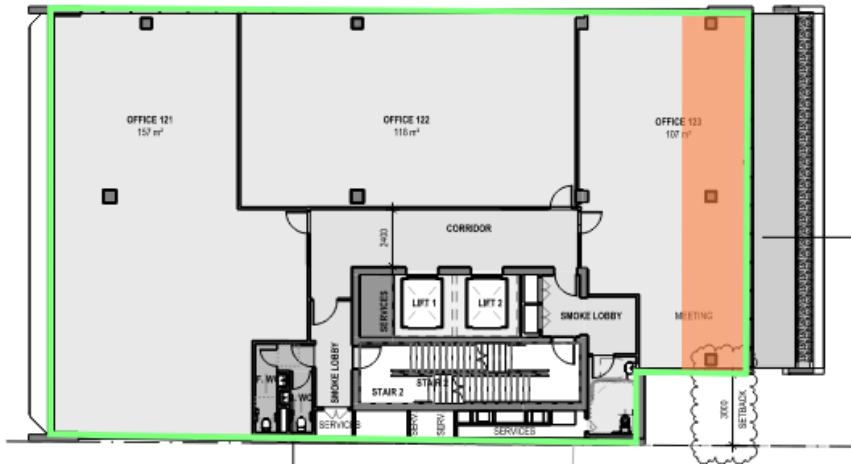


Figure 23 Insulation markups for level 12 (RCP).



Figure 24 Insulation markups for level 13 (RCP).

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Legend

- Soffit Insulation R2.0
- Soffit Insulation R3.5
- Wall Insulation R2.5



Figure 25 Insulation markups for level 14 (RCP).

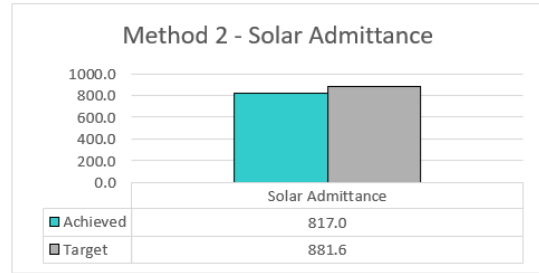
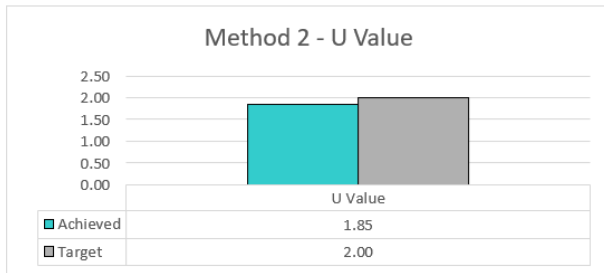
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GLAZING CALCULATIONS

The preliminary J1.5 calculations are presented below:

METHOD 2

	Target	Achieved	Compliant?
Façade U Value	2.00	1.85	Yes
Façade SA	881.6	817.0	Yes
Façade U Value	2.00	1.85	Yes
Compliance			Yes



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— End of Design Memorandum

APPENDIX E – BESS ASSESSMENT

Please refer to the BESS Report attached on the following pages.

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BESS Report

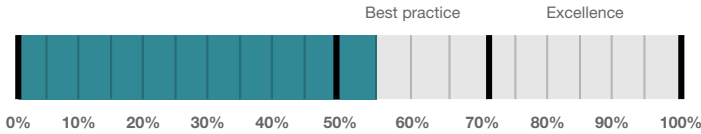
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 69 Carrington Rd Box Hill Victoria 3128. 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 Whitehorse 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



54%

Project details

Name 69 Carrington Rd, Box Hill VIC 3128, Australia
Address 69 Carrington Rd Box Hill Victoria 3128
Project ID 565805CD-R8
BESS Version BESS-7

Site type Non-residential development
Account admin@wrapengineering.com.au
Application no.
Site area 1,119 m²
Building floor area 8,033 m²
Date 19 December 2024
Software version 2.0.1-B.574

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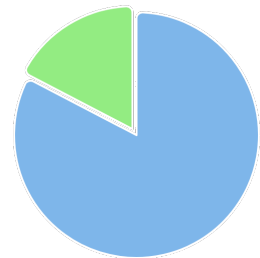


Performance by category

● This project ● Maximum available

Category	Weight	Score	Pass	Visual
Management	5%	50%	●	[Bar chart showing 50% completion]
Water	9%	57%	✓	[Bar chart showing 57% completion]
Energy	28%	54%	✓	[Bar chart showing 54% completion]
Stormwater	14%	100%	✓	[Bar chart showing 100% completion]
IEQ	17%	56%	✓	[Bar chart showing 56% completion]
Transport	9%	50%	●	[Bar chart showing 50% completion]
Waste	6%	66%	●	[Bar chart showing 66% completion]
Urban Ecology	6%	25%	●	[Bar chart showing 25% completion]
Innovation	9%	0%	●	[Bar chart showing 0% completion]

Project composition



● Office ● Shop

Buildings

Name	Height	Footprint	% of total footprint
Building 1	15	1,119 m ²	100%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Office				
Offices L7-L14	1	3,388 m ²	Building 1	42%
Offices L2-L6	1	3,249 m ²	Building 1	40%
Total	2	6,637 m²	82%	
Shop				
Retail	1	1,396 m ²	Building 1	17%
Total	1	1,396 m²	17%	

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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		-
Stormwater 1.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
Transport 1.4	Location of non-residential bicycle parking spaces		-
Transport 1.5	Location of non-residential visitor bicycle parking spaces		-
Transport 1.6	Location of showers, change rooms and lockers as nominated		-
Waste 2.1	Location of food and garden waste facilities		-
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		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.7	Average lighting power density and lighting type(s) to be used		-
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%

		50%
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		50%
3.2 Metering - Non-Residential		100%
3.3 Metering - Common Areas		100%
4.1 Building Users Guide		100%

Water Overall contribution 9.0%

		Minimum required 50%	57%	✓ Pass
1.1 Potable Water Use Reduction		40%		
3.1 Water Efficient Landscaping		100%		
4.1 Building Systems Water Use Reduction		100%		

Energy Overall contribution 27.5%

		Minimum required 50%	54%	✓ Pass
1.1 Thermal Performance Rating - Non-Residential		37%		
2.1 Greenhouse Gas Emissions		100%		
2.2 Peak Demand		100%		
2.3 Electricity Consumption		100%		
2.4 Gas Consumption		100%		
2.6 Electrification		0%	⊘ Disabled	
Credit is available when project is declared to have no gas connection.				
3.1 Carpark Ventilation		0%		
3.2 Hot Water		100%		
3.7 Internal Lighting - Non-Residential		100%		
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	⚡ Scoped Out	
No cogeneration or trigeneration system in use.				
4.2 Renewable Energy Systems - Solar		0%		
4.4 Renewable Energy Systems - Other		0%	⊘ Disabled	
No other (non-solar PV) renewable energy is in use.				

Stormwater Overall contribution 13.5%

		Minimum required 100%	100%	✓ Pass
1.1 Stormwater Treatment		100%		

IEQ Overall contribution 16.5%

		Minimum required 50%	56%	✓ Pass
1.4 Daylight Access - Non-Residential			41%	✓ Achieved
2.3 Ventilation - Non-Residential			66%	✓ Achieved
3.4 Thermal comfort - Shading - Non-Residential			69%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential			0%	
4.1 Air Quality - Non-Residential			100%	

Transport Overall contribution 9.0%

			50%	
1.4 Bicycle Parking - Non-Residential			100%	
1.5 Bicycle Parking - Non-Residential Visitor			100%	
1.6 End of Trip Facilities - Non-Residential			100%	
2.1 Electric Vehicle Infrastructure			0%	
2.2 Car Share Scheme			0%	
2.3 Motorbikes / Mopeds			0%	

Waste Overall contribution 5.5%

			66%	
1.1 - Construction Waste - Building Re-Use			0%	
2.1 - Operational Waste - Food & Garden Waste			100%	
2.2 - Operational Waste - Convenience of Recycling			100%	

Urban Ecology Overall contribution 5.5%

			25%	
1.1 Communal Spaces			0%	
2.1 Vegetation			50%	
2.2 Green Roofs			0%	
2.3 Green Walls and Facades			0%	
3.2 Food Production - Non-Residential			0%	

Innovation Overall contribution 9.0%

			0%	
1.1 Innovation			0%	

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Credit breakdown

Management Overall contribution 4.5%

	50%
--	-----

1.1 Pre-Application Meeting	0%
------------------------------------	----

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	No

2.3 Thermal Performance Modelling - Non-Residential	50%
--	-----

Score Contribution	This credit contributes 25% towards the category score.
--------------------	---

Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?
Question	Criteria Achieved ?
Office	Yes
Shop	Yes

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Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Office	No
Shop	No

3.2 Metering - Non-Residential	100%
---------------------------------------	------

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

3.3 Metering - Common Areas	100%
------------------------------------	------

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

4.1 Building Users Guide	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

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Water Overall contribution 9.0%

		Minimum required 50%	57% ✔ Pass
--	--	-----------------------------	--

Water Approach	
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
Fixtures, fittings & connections profile	
Showerhead: All	4 Star WELS (>= 4.5 but <= 6.0)
Bath: All	Scope out
Kitchen Taps: All	>= 4 Star WELS rating
Bathroom Taps: All	>= 4 Star WELS rating
Dishwashers: All	>= 5 Star WELS rating
WC: All	>= 4 Star WELS rating
Urinals: All	>= 5 Star WELS rating
Washing Machine Water Efficiency: All	Scope out
Which non-potable water source is the dwelling/space connected to?:	
Retail	RWT-1
Offices L2-L6	
Offices L7-L14	-1
Non-potable water source connected to Toilets:	
Retail	Yes
Offices L2-L6	
Offices L7-L14	No
Non-potable water source connected to Laundry (washing machine): All	
	No
Non-potable water source connected to Hot Water System: All	
	No
Rainwater tank profile	
What is the total roof area connected to the rainwater tank?:	
RWT-1	409 m ²
RWT-2	516 m ²
Tank Size:	
RWT-1	10,000 Litres
RWT-2	10,000 Litres
Irrigation area connected to tank:	
RWT-1	0.0 m ²
RWT-2	102 m ²
Is connected irrigation area a water efficient garden?:	
RWT-1	No
RWT-2	No

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Other external water demand connected to tank?:	
RWT-1	-
RWT-2	-
1.1 Potable Water Use Reduction	40%
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	13742 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	10490 kL
Output	Proposed (including rainwater and recycled water use)
Project	10109 kL
Output	% Reduction in Potable Water Consumption
Project	26 %
Output	% of connected demand met by rainwater
Project	24 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	3367 kL
3.1 Water Efficient Landscaping	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	Yes
4.1 Building Systems Water Use Reduction	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

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Energy Overall contribution 27.5%

		Minimum required 50%	54% ✔ Pass
--	--	----------------------	---

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 a minimum 10% improvement in required NCC2019 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2019 facade calculator (or better than the total allowance)?:	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
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes
Are you installing a cogeneration or trigeneration system?:	No

Solar Photovoltaic system profile

System Size (lesser of inverter and panel capacity):	PV 1	4.5 kW peak
Orientation (which way is the system facing)?:	PV 1	North
Inclination (angle from horizontal):	PV 1	8.9 Angle (degrees)
Which Building Class does this apply to?:	PV 1	Office

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1.1 Thermal Performance Rating - Non-Residential		37%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?	
2.1 Greenhouse Gas Emissions		100%
Score Contribution	This credit contributes 8.3% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	
2.2 Peak Demand		100%
Score Contribution	This credit contributes 4.2% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	
2.3 Electricity Consumption		100%
Score Contribution	This credit contributes 8.3% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
2.4 Gas Consumption		100%

Score Contribution	This credit contributes 8.3% towards the category score.
Criteria	What is the % reduction in annual gas consumption against the benchmark?
2.6 Electrification	0% <input checked="" type="checkbox"/> Disabled
Credit is available when project is declared to have no gas connection.	
This credit is disabled	Credit is available when project is declared to have no gas connection.
3.1 Carpark Ventilation	0%
Score Contribution	This credit contributes 8.3% 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	No
3.2 Hot Water	100%
Score Contribution	This credit contributes 4.2% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?
3.7 Internal Lighting - Non-Residential	100%
Score Contribution	This credit contributes 8.3% 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 J6.2a of the NCC 2019 Vol 1?
Question	Criteria Achieved ?
Office	Yes
Shop	Yes
4.1 Combined Heat and Power (cogeneration / trigeneration)	N/A <input checked="" type="checkbox"/> Scoped Out
No cogeneration or trigeneration system in use.	
This credit was scoped out	No cogeneration or trigeneration system in use.
4.2 Renewable Energy Systems - Solar	0%
Score Contribution	This credit contributes 4.2% 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
Office	5,371 kWh
Output	% of Building's Energy
Office	2 %
4.4 Renewable Energy Systems - Other	0% <input checked="" type="checkbox"/> Disabled
No other (non-solar PV) renewable energy is in use.	
This credit is disabled	No other (non-solar PV) renewable energy is in use.

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Stormwater Overall contribution 13.5%

	Minimum required 100%	100%	✔ Pass
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Which stormwater modelling are you using?:		Melbourne Water STORM tool
1.1 Stormwater Treatment		100%
Score Contribution	This credit contributes 100% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	STORM score achieved	
Project	121	
Output	Min STORM Score	
Project	100	

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IEQ Overall contribution 16.5%

		Minimum required 50%	56% ✔ Pass
--	--	-----------------------------	---

1.4 Daylight Access - Non-Residential		41%	✔ 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	50 %
Shop	30 %

2.3 Ventilation - Non-Residential		66%	✔ 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	0 %
Shop	0 %

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	50 %
Shop	50 %


Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?
Question	Value
Office	800 ppm
Shop	800 ppm

3.4 Thermal comfort - Shading - Non-Residential		69%	
--	--	-----	--

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	50 %
Shop	76 %

3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
---	--	----	--

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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	0 %	
Shop	0 %	
4.1 Air Quality - Non-Residential		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	
Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?	
Question	Criteria Achieved ?	
Office	Yes	
Shop	No carpet	
Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?	
Question	Criteria Achieved ?	
Office	Yes	
Shop	Yes	

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Transport Overall contribution 9.0%

			50%
--	--	--	-----

1.4 Bicycle Parking - Non-Residential		100%
--	--	------

Score Contribution	This credit contributes 25% 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	Yes
Shop	Yes
Question	Bicycle Spaces Provided ?
Office	24
Shop	16

1.5 Bicycle Parking - Non-Residential Visitor		100%
--	--	------

Score Contribution	This credit contributes 12.5% 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	Yes
Shop	Yes
Question	Bicycle Spaces Provided ?
Office	5
Shop	5

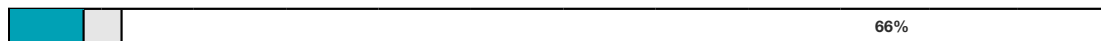
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1.6 End of Trip Facilities - Non-Residential		100%
---	--	------

Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Where adequate bicycle parking has been provided. Is there also: * 1 shower for the first 5 employee bicycle spaces plus 1 to each 10 employee bicycles spaces thereafter, * changing facilities adjacent to showers, and * one secure locker per employee bicycle space in the vicinity of the changing / shower facilities?
Question	Number of showers provided ?
Office	3
Shop	3
Question	Number of lockers provided ?
Office	30
Shop	30
Output	Min Showers Required
Office	1
Shop	1
Output	Min Lockers Required
Office	24
Shop	16

2.1 Electric Vehicle Infrastructure		0%
Score Contribution	This credit contributes 25% towards the category score.	
Criteria	Are facilities provided for the charging of electric vehicles?	
Question	Criteria Achieved ?	
Project	No	
2.2 Car Share Scheme		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Has a formal car sharing scheme been integrated into the development?	
Question	Criteria Achieved ?	
Project	No	
2.3 Motorbikes / Mopeds		0%
Score Contribution	This credit contributes 12.5% 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	No	

Waste Overall contribution 5.5%



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1.1 - Construction Waste - Building Re-Use		0%
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	No	
2.1 - Operational Waste - Food & Garden Waste		100%
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	Yes	
2.2 - Operational Waste - Convenience of Recycling		100%
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%

			25%
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			0%
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1.1 Communal Spaces		0%
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 : * 1m ² for each of the first 50 occupants * Additional 0.5m ² for each occupant between 51 and 250 * Additional 0.25m ² for each occupant above 251?	
Question	Common space provided	
Office	-	
Shop	-	
Output	Minimum Common Space Required	
Office	270 m ²	
Shop	94 m ²	

			50%
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2.1 Vegetation		50%
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	10 %	

			0%
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2.2 Green Roofs		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	

			0%
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2.3 Green Walls and Facades		0%
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	No	

			0%
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3.2 Food Production - Non-Residential		0%
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	-	
Output	Min Food Production Area	
Office	133 m ²	
Shop	35 m ²	

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Innovation Overall contribution 9.0%

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

Disclaimer

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