PROPOSED SCHOOL ADMIN / LEARNING BLOCK AND CAR PARK DEVELOPMENT

75 Lansell Road, Toorak

SUSTAINABLE MANAGEMENT PLAN

FOR

ST KEVINS COLLEGE, GLENDALOUGH

17 December 2020

File 1433A

ark resources

CONTENTS

APPENDICES

Issue	Date	Prepared	Approved	Status
A	21 October 2019	MR	JT	Draft
B	28 October 2019	MR	JT	Draft
C	6 November 2019	MR	JT	TP issue
D	3 April 2020	MR	JT	ESD referral response
E	7 April 2020	MR	JT	ESD referral response
F	17 December 2020	MR	JT	TP Resubmission

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1. Executive Summary

The proposed school administration / learning block and car park development at St Kelvins Glendalough Campus on 75 Lansell Road, Toorak has been designed to meet the objectives of the City of Stonnington's ESD Policy (Clause 22.05 of the Stonnington Planning Scheme).

This report confirms that a combination of sustainable building management practices, design initiatives, fixtures, systems, appliances, materials and finishes will be integrated into the building in order to attain a 4 star *Green Star Design & As Built* performance standard. The standard achieved is defined as *Australian Best Practice* in terms of environmental design.

The development also meets the *Best Practice* standard for Urban Stormwater Quality and is therefore also consistent with the City of Stonnington's Stormwater Management objectives (set out in Clause 22.18 of the Planning Scheme) – see separate WSUD report by Ark Resources.

The performance outcomes achieved by the proposed development demonstrate that the proposed development meets the sustainable design objectives of Clause 22.05 of the Stonnington Planning Scheme.

2. Introduction

Ark Resources has been engaged by St Kevins College, Glendalough to provide advice in relation to environmentally sustainable development outcomes from the proposed new administration / learning building and car park development at 75 Lansell Road, Toorak.

This report contains a summary of:

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

Performance outcomes in this report are based on:

- Correspondence and discussion with:
  - Sophie Jordan, Sophie Jordan Consulting
  - Matt Robertson, Fontic Project Management
  - Loris Rebeschini, Project Architect, Chandler Architecture
- Architectural plans prepared Chandler Architecture listed below.

Description	Drawing No.	Revision	Date
Aerial View	TP00	C	27 August 2019
Locality Plan	TP01	C	27 August 2019
Site Context Plan	TP02	C	27 August 2019
DD03 Setback	TP03	C	27 August 2019
Site survey Plan	TP04	C	27 August 2019
Existing Site - Demolition Plan	TP05	C	27 August 2019
Ground Floor - Demolition Plan	TP06	C	27 August 2019
First Floor - Demolition Plan	TP07	C	27 August 2019
Streetscape Elevations	TP08	C	27 August 2019
Site Plan – Design Response	TP09	D	27 August 2019
Design Response Diagrams	TP10	C	27 August 2019
Staging Plan	TP11	C	27 August 2019
Proposed Ground Floor Plan	TP12	C	27 August 2019
Proposed First Floor Plan	TP13	C	27 August 2019
Proposed Roof Plan	TP14	C	27 August 2019
Proposed Lower Ground Plan	TP15	D	27 August 2019
Drop Off Zone	TP16	D	27 August 2019
Proposed Playground	TP17	D	27 August 2019
Proposed Elevations Building	TP18	C	27 August 2019
Proposed Elevations Car Park	TP19	C	27 August 2019

Description	Drawing No.	Revision	Date
Propose Sections Building & Carpark	TP20	C	27 August 2019
Material Schedule	TP21	C	27 August 2019
Visual Impact Assessment	TP22A	C	27 August 2019
Visual Impact Assessment	TP22B	C	27 August 2019
Shadow Diagrams	TP23A	C	27 August 2019
Shadow Diagrams	TP23B	C	27 August 2019
Proposed Fencing Plan	TP24	D	27 August 2019
Tree Protection Site Plan	TP25	C	27 August 2019

3. Site Description

The proposed development comprises:

- New administration / learning block
- New concealed car park for 137 cars with new playing area above

The site is located within the City of Stonnington.

An image of the site and the surrounding locale is shown below.

Image ©Google Maps™ (accessed October 2019)

4. Summary of Key ESD Initiatives

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

- Rainwater harvesting system for toilet flushing and irrigation;
- High-performance glazing and energy efficient building services, appliances and fixtures; and
- Environmentally preferable internal finishes.
- 20kW of rooftop solar photovoltaic panels as indicated on architectural roof plan.

An assessment of sustainable design outcomes of the proposed development has been undertaken with Green Star Design & As Built and MUSIC benchmarking tools based on the proposed architectural design and building services initiatives considered feasible at this stage of the design process.

The information presented in this report demonstrates that:

- the development will achieve a 4 star Green Star Design & As Built rating;

The development also meets the *Best Practice* standard for stormwater quality. Refer to separate WSUD report by Ark Resources.

5. Green Star

The Green Star Design & As Built (Version 1.2) tool has been used as a benchmarking framework for the proposed scheme and demonstrates that the development has the preliminary design potential to achieve a 4 star standard[1].

A detailed Green Star assessment has been undertaken to confirm the credits achievable by the proposed scheme.

Please note that this analysis is based on the best information currently available in relation to the technical and commercial feasibility of the initiatives proposed. Further investigation will be undertaken during design development which may result in change to the package of initiatives specified in order to meet the 4 star Green Star standard.

The initiatives which contribute to the 4 star Green Star rating are detailed in Section 5.1 below.

[1] Note that a minimum of 45 points must be achieved for a 4 star Green Star rating to be achieved. The development will attain a 4 star Green Star standard however certification of the rating with the Green Building Council will not be undertaken.

5.1. Green Star Criteria

The key design elements and processes which underpin the preliminary Green Star rating are summarised in the table below. The design attributes will be incorporated into the design in accordance with the technical criteria for each credit set out in the Green Star Design & As Built v1.2 Technical Manual.

Further information in relation to key performance outcomes is provided in the Appendices to this report as referenced in the right hand column of the table.

Green Star Element	Design Attribute	Reference
Management	• **Design Intent Report prepared** • **Provide floor-by-floor metering; plus independent metering for all loads >5% of annual building energy use or 100kW; and metering for common water use consuming 10% of development's water use** • **Comprehensive project-specific environmental management plan implemented during construction**	**Conditional Requirements**
	• Green Star Accredited Professional involved • Design Intent Report prepared • Commissioning plan in accordance with CIBSE Commissioning Code M • Climate Adaptation Plan prepared • Detailed Operations and Maintenance Manual prepared • Detailed guide to building systems provided to residents • Measurement and reporting of building performance metrics by school • Monitoring systems in accordance with CIBSE TM39 • Accessible storage areas for waste streams for general waste, paper, glass, plastic and at least one other type	
Indoor Environmental Quality	• **Lighting systems comprise flicker free luminaires and a Colour Rendering Index (CRI) greater than 80** • **Strategies to reduce glare incorporated into the design**	**Conditional Requirements**
	• Ventilation systems to comply with ASHRAE 62.1, and pre-cleaned prior to handover • Exhaust systems vented directly outside • Lighting systems designed for task lighting and brightness control • Views maintained for at least 60% of spaces (>8m to neighbouring building) • Specification of low VOC paints, adhesives, sealants and carpets • Specification of low formaldehyde engineered wood products	
Energy	• **DTS performance requirements of NCC J1 & J2 exceeded by at least 5%.**	**Conditional Requirement**

Green Star Element	Design Attribute	Reference

	• Energy-efficient building envelope 10% better than NCC
	• Energy efficient lighting systems with 10% improvement on NCC requirements
	• Energy-efficient HVAC system components
	• Instantaneous electric heaters
	• 20kW of rooftop solar PV with 15kW inverter:
	  ○ alternating east-west orientation at 15° tilt to maximise self-consumption and packing factor
	  ○ modules to be from a manufacturer ranked above average in the current SVTC Solar Scorecard for embodied impacts.
	  ○ PV module efficiency to be at least 20% in order to reduce embodied impacts via dematerialisation	

Transport	• A total of 7 networked electric vehicle (EV) chargers (minimum 7kW capacity) incorporating load-balancing and demand reduction linked to local distribution board and site capacity constraint monitoring. • Racks for 16 bikes provided within proposed new car park.	

Water	• Water efficient fixtures and appliances with WELS ratings:
	  ○ Taps 5 star
	  ○ Urinals 5 star
	  ○ Toilets 4 star
	• Rainwater harvesting from new roof area (total catchment area approx. 200m^2)
	  ○ Tank 1 - 4kLrainwater tank for re-use of water for toilet flushing to adjacent existing facilities.
	• Rainwater harvesting from new playground area (total catchment area approx. 650m^2
	  ○ Tank 2 – 20kL rainwater tank for re-use of water for irrigation.
	• Cooling towers not used
	• Water efficient sub-soil drip irrigation system with moisture sensors and timers using harvested rainwater
	• Fire test system water storage and re-use
		Refer to separate WSUD report by Ark Resources

Green Star Element	Design Attribute	Reference
Materials	• Concrete mixes to incorporate reclaimed water • Environmentally responsible steel design and procurement • Specification of sustainable sourced timber (FSC or PEFC) • Specification of common use PVC products that meet Best Practice Guidelines for PVC in the Built Environment • Documentation provided on product sustainability credentials • Divert 90% of demolition and construction waste from landfill	
Land Use & Ecology	• **No endangered or vulnerable species on site at time of purchase** • **Site does not contain old growth forest or wetland of High National Importance**	**Conditional Requirements**
	• Native planting used on at least 2½% of the site • At least 75% of the building area comprises building or landscaping elements that reduce impact of heat island effect.	
Emissions	• **All outdoor lighting to comply with AS4282:1997 for light spill to inhabited boundaries.**	**Conditional Requirement**
	• Achieves best-practice levels of stormwater pollutant reductions • Design to have an upward light output ratio <5% • Strategies to minimise Legionella impacts from cooling systems implemented	
Innovation	• Smart load balancing systems for networked EV charging • 50% of internal paints to be ultra-low VOC type (<5g/litre) • Air-tightness testing of representative spaces • Good practice air permeability levels	

5.2. Green Star Preliminary Design Rating

Based on the design attributes and performance outcomes set out above, the following Green Star pathway has been prepared which confirms that the development has the preliminary design potential to achieve a 4 star Green Star standard.

Green Star - Design & As Built v1.2

Project:	St. Kevins College, Glendalough, Toorak
Targeted Rating:	4 Star - Best Practice

ESD referral response 13/03/20

Points Available	Total Score Targeted
100	48.0

CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	Points Available	Target pathway
Management				14	
Green Star Accredited Professional	To recognise appointment and active involvement of Green Star AP to ensure rating tool is applied effectively and as intended.	1.0	Accredited Professional	1	1
		2.0	Environmental Performance Targets	-	Complies
		2.1	Services and Maintainability Review	1	1
Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.2	Building Commissioning	1	1
		2.3	Building Systems Tuning	1	1
		2.4	Independent Commissioning Agent	1	
Adaptation and Resilience	Resilient to impacts of changing climate & natural disasters.	3.1	Implementation of a Climate Adaptation Plan	2	2
Building Information	Facilitating understanding of systems, O&M requirements & targets to optimise performance.	4.1	Building Information	1	1
Commitment to Performance	Practices encouraging building owners, building occupants and FM teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1	1
		5.2	End of Life Waste Performance	1	
Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-	Complies
		6.1	Monitoring Systems	1	1
Responsible Building Practices	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Complies
		7.1	Formalised Environmental Management System	1	
		7.2	High Quality Staff Support	1	
Operational Waste	Prescriptive Pathway	8A	Performance Pathway - Specialist Plan	-	
		8B	Prescriptive Pathway - Facilities	-	1
Total				13	10

Indoor Environment Quality				17	
Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1
		9.2	Provision of Outdoor Air	2	1
		9.3	Exhaust or Elimination of Pollutants	1	1
Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1	
		10.2	Reverberation	1	
		10.3	Acoustic Separation	1	
Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	Complies
		11.1	General Illuminance and Glare Reduction	1	1
		11.2	Surface Illuminance	1	1
		11.3	Localised Lighting Control	1	1
Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	-	Complies
		12.1	Daylight	2	1
		12.2	Views	1	1
Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1	Paints, Adhesives, Sealants and Carpets	1	1
		13.2	Engineered Wood Products	1	1
Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	1
		14.2	Advanced Thermal Comfort	1	
Total				**17**	**11**

Energy					
Greenhouse Gas Emissions		15A.0	Conditional Requirement: Prescriptive Pathway	-	Complies
		15A.1	Building Envelope		
		15A.2	Glazing	1	
		15A.3	Lighting	1	1
		15A.4	Ventilation and Air-conditioning	1	1
		15A.5	Domestic Hot Water Systems	1	
		15A.6	Accredited GreenPower	5	
		15E.0	Conditional Requirement: Reference Building Pathway	-	Complies
		15E.1	Comparison to a Reference Building Pathway	20	
Peak Electricity Demand Reduction	Performance Pathway	16A	Prescriptive Pathway - On-site Energy Generation	-	
		16B	Performance Pathway - Reference Building	-	1
Total				10	5

Transport					
				10	
Sustainable Transport	Prescriptive Pathway	17A.1	Performance Pathway	0	
		17B.1	Access by Public Transport	3	1
		17B.2	Reduced Car Parking Provision	1	
		17B.3	Low Emission Vehicle Infrastructure	1	1
		17B.4	Active Transport Facilities	1	
		17B.5	Walkable Neighbourhoods	1	
Total				7	2

Water					12	
Potable Water	Prescriptive Pathway	18A.1	Potable Water - Performance Pathway		0	
		18B.1	Sanitary Fixture Efficiency		1	1
		18B.2	Rainwater Reuse		0	
		18B.3	Heat Rejection		2	2
		18B.4	Landscape Irrigation		1	1
		18B.5	Fire System Test Water		1	1
Total					5	5

Materials					14	
Life Cycle Impacts Points from operational energy reductions capped at 3 out of the 6 points available for 19A.1.	Prescriptive Pathway - Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment		0	
		19A.2	Additional Life Cycle Impact Reporting			
		19B.1	Concrete		3	0.5
		19B.2	Steel		1	1
		19B.3	Building Reuse		1	
		19B.4	Structural Timber		1	
Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel		1	1
		20.2	Timber Products		1	1
		20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables		1	1
Sustainable Products	To encourage sustainability and transparency in product specification.	21.1	Product Transparency and Sustainability		3	
Construction and Demolition Waste	Fixed Benchmark	22A	Fixed Benchmark		1	1
		22B	Percentage Benchmark		-	
Total					14	5.5

Land Use & Ecology					
Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-	Complies
		23.1	Ecological Value	3	1
Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and remediate contaminate land.	24.0	Conditional Requirement	-	Complies
		24.1	Reuse of Land	1	
		24.2	Contamination and Hazardous Materials	1	
Heat Island Effect	Reduce contribution of project site to heat island effect.	25.0	Heat Island Effect Reduction	1	1
Total				6	2

Emissions					
Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge	1	
		26.2	Stormwater Pollution Targets	1	
Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-	Complies
		27.1	Light Pollution to Night Sky	1	1
Microbial Control	Minimise impacts associated with harmful microbes in building systems.	28.0	Legionella Impacts from Cooling Systems	1	1
Refrigerant Impacts	Operational practices that minimise environmental impacts of refrigeration equipment.	29.0	Refrigerants Impacts	1	
Total				5	2

Innovation				10	
Innovative Technology or Process	Meets aims of existing credit using technology or process considered innovative in Australia or the world.	30A	Innovative Technology or Process		
Market Transformation	Sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation		1
		30B	Market Transformation		
Improving on Green Star Benchmarks	Where full points achieved in Green Star credit and demonstrates substantial improvement on benchmark.	30C	Improving on Green Star Benchmarks	10	1
		30C	Improving on Green Star Benchmarks		
		30C	Improving on Green Star Benchmarks		1
Innovation Challenge	Addresses sustainability issue not included within existing Credits.	30D	Innovation Challenge		2
Global Sustainability	Credit from a Global Green Building Rating tool addressing sustainability issue outside scope of this Green Star rating tool.	30E	Global Sustainability		
Total				10	5

	Target pathway
TOTAL SCORE TARGETED	48.0
Green Star rating	4 Star

6. Conclusion

This report provides details of a comprehensive package of sustainable design features which will be integrated into the design and specification of the proposed development in order to improve environmental outcomes during occupation.

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

- attain a 4 star Green Star standard based on the Design & As Built v1.2 rating tool;
- attain the *Best Practice* standard for urban stormwater quality;

Accordingly, the performance outcomes achieved by the proposed development considered to be appropriate for a development of this scale and are consistent with the objectives set out in Clauses 22.05 and 22.18 of the City of Stonnington Planning Scheme.

Jan Talacko
Director

Appendix 1: Daylight modelling

This report provides a summary of internal daylight levels within multi-purpose learning areas, educational support areas, offices and library within the proposed multi-purpose learning development at St. Kevin's College, Glendalough.

Green Star

A specified proportion of the nominated area must be shown to have a Daylight Factor (DF) of at least 2.0% at finished floor level (FFL), or at 720mm above FFL) under either a CIE overcast sky or a CIE uniform sky.

Up to 2 points are available where a percentage of the nominated area receives high levels of daylight:

- 40% of the nominated area – 1 point
- 60% of the nominated area – 2 points

Multi-Purpose Learning:

Room	Level	DF % > 2	Area (m²)
MPL 01 & 02	Ground	25.2	179
MPL 03	1	45.9	83
MPL 04	1	45.6	83
MPL 05	1	54.9	79
MPL 06 & 07	1	66.4	170

Educational Support:

Room	Level	DF % > 2	Area (m²)
ES 01	1	39.0	82
ES 02	1	99.6	43
ES 03	1	36.9	40
ES 04	1	58.2	43

Offices:

Room	Level	DF % > 2	Area (m²)
DD of G	Ground	37.4	22
D of G	Ground	24.3	26
Staff	Ground	0	14
ESC	1	0	20

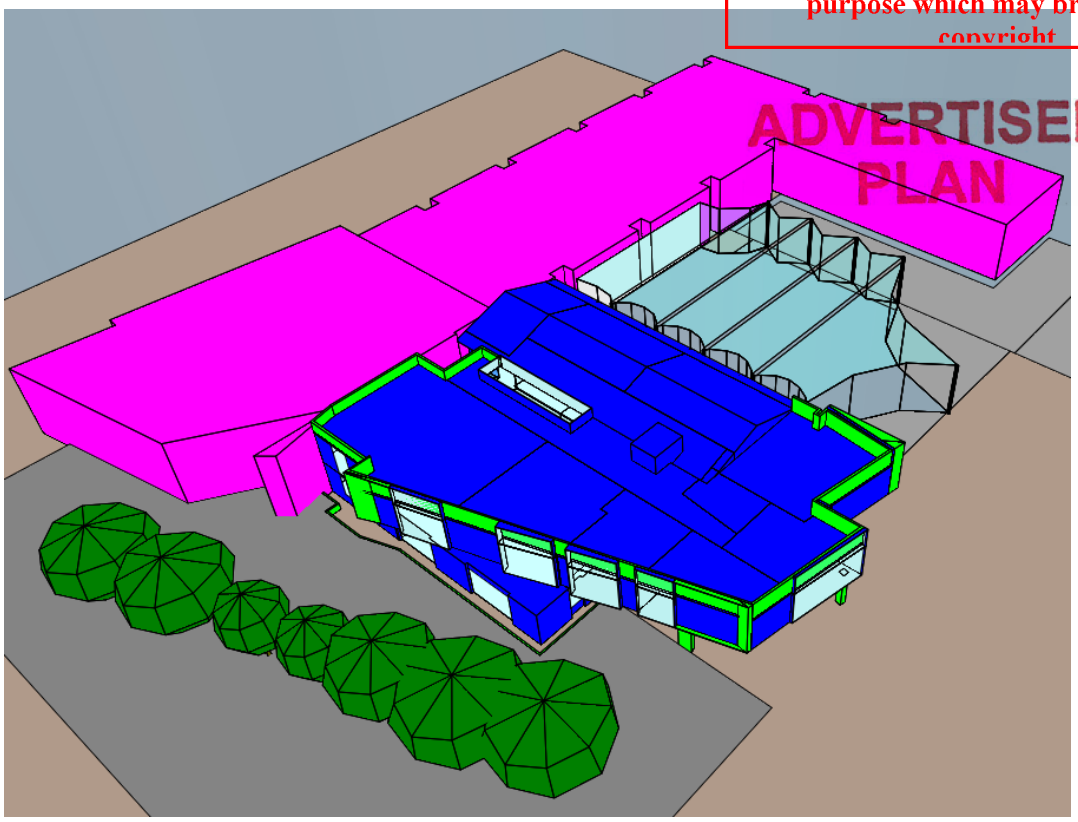
Library:

Room	Level	DF % > 2	Area (m²)
Library	Ground	9	97

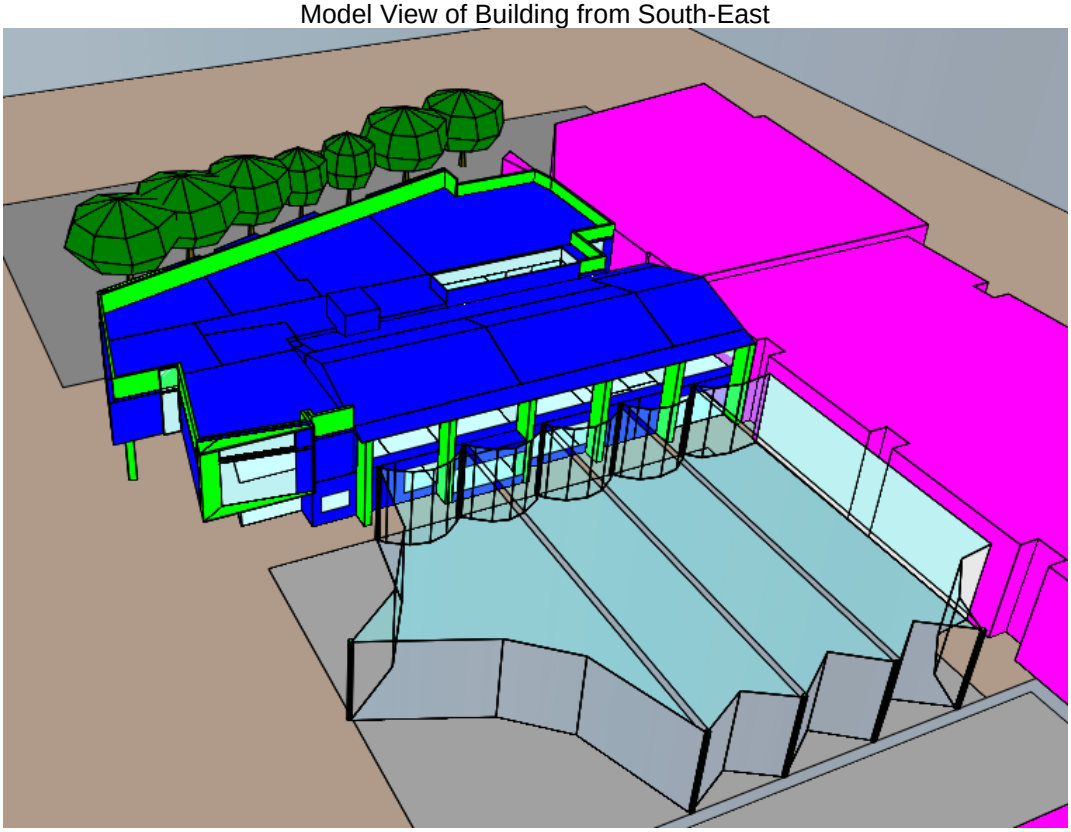
Combined:

Weighted Average	DF % > 2	Compliant (Yes/No)
Weighted Average	42.3	Yes

Model Images

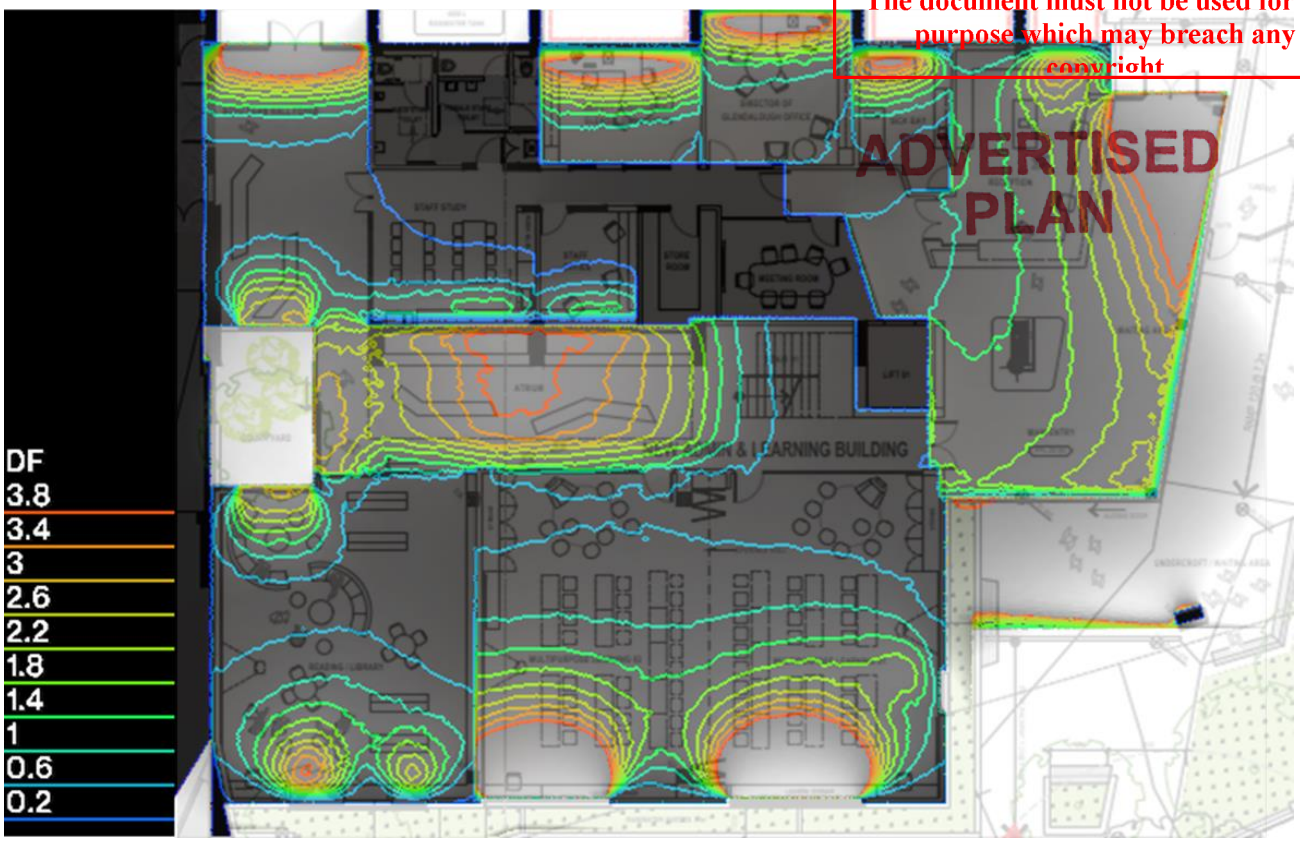


Model View of Building from South-East

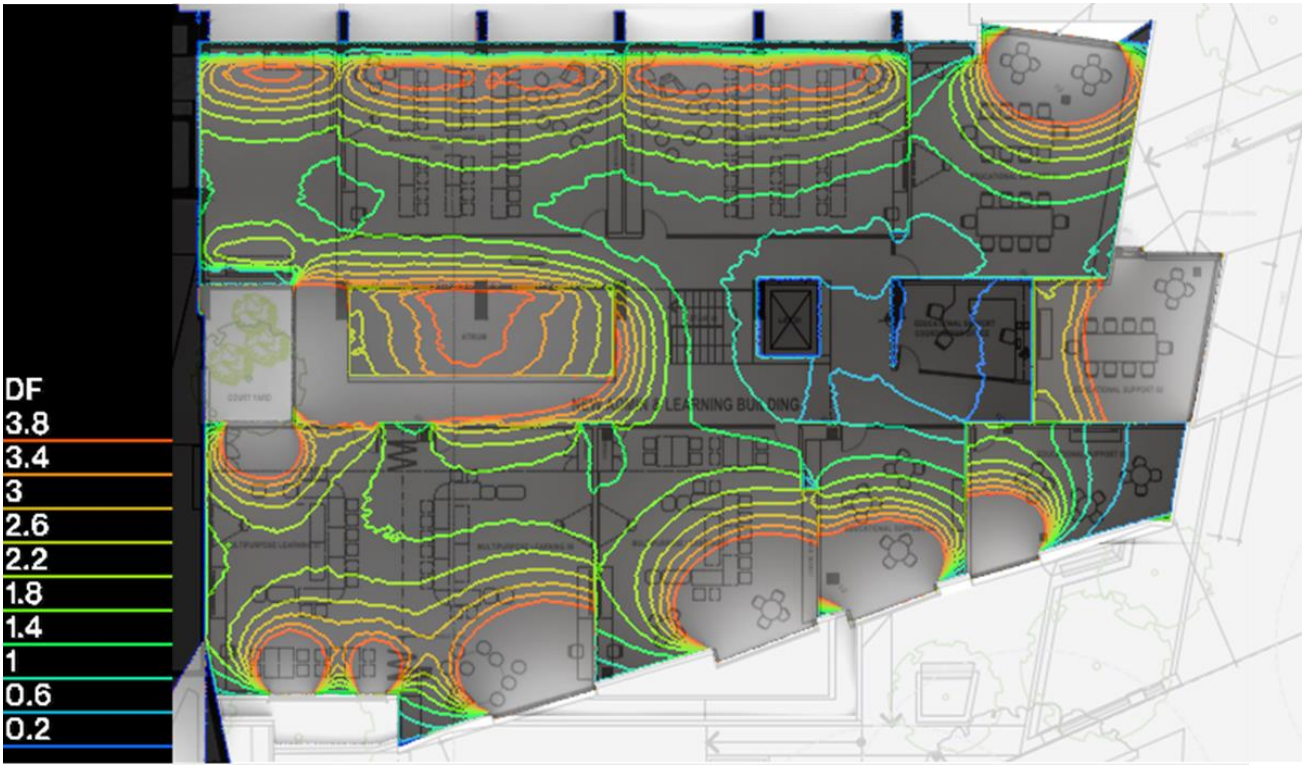


Model View of Building from North-East

Daylight Contour Plots



Ground Floor Combined Contour Plot



Level 1 Combined Contour Plot

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	50
Internal Glazing	90
Rooflight	25
Shade Cloth Canopy	15

ASSUMED SURFACE REFLECTANCES

Construction Element	Reflectance (%)	Description
Floors	10	Assumes a dark carpeted surface
Internal Walls	50	Assumes white paint + miscellaneous posters/boards
Ceilings	80	Assumes white paint
External Walls	50	Assumes light-coloured prefabricated cement cladding
External Ground 1	10	Assumes asphalt
External Ground 2	30	Assumes grass/astroturf
Adjacent Buildings 1	50	Assumes light-coloured concrete
Adjacent Buildings 2	10	Assumes dark-grey paint
Adjacent Buildings (Roof)	60	Assumes metal cladding
Operable Horizontal Louvres 1	10	Assumes black-coloured steel
Operable Horizontal Louvres 2	50	Assumes white-coloured steel
Vertical Shading	40	Assumes red brick