

2 Zodiac Drive, Alkimos

Development Application Sustainability Report

NCC 2019 Section J

Date: 07 December 2023

Prepared by: Aida Leon

Ref: 301251501



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Revision

Revision	Date	Comment	Prepared By	Approved By
001	07/12/2023	Development Application Issue	AL	PDS

Disclaimer

The following qualifications apply to this report:

- Information has been based on our understanding of the proposed buildings and documentation provided, as noted.
- This report is preliminary, and no modelling has been completed.
- This report provides high level guidance about feasibility of sustainability initiatives to be included in the project at design stage.
- No guarantee or warrantee of building performance and operational savings in practice can be based on this preliminary advice.

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Appendix A NatHERS Simulation Results

Appendix B Preliminary Insulation Markup

Appendix C Building Fabrics Calculations

File Records

Drawing Number	Drawing Name	Received
1161-GA-100	Basement - Floor Plan	05/12/2023
1161-GA-101	Ground Floor Plan	05/12/2023
1161-GA-101	First Floor Plan	05/12/2023
1161-GA-101	Second Floor Plan	05/12/2023

1. Executive Summary

This Sustainability Report has been prepared in support of an application for Development Approval (DA) for the proposed residential development located at 2 Zodiac Drive.

A preliminary assessment of the project's potential to achieve the following has been undertaken:

- NCC 2019 Section J compliance
 - DTS for Commercial areas
 - Sample NatHERS ratings for Residential areas

To comply with the NCC 2019 Volume One Section J NatHERS requirements, residential Class 2 SOUs must:

- Collectively achieve an average NatHERS rating of not less than 6 stars across the development; and
- Each individually achieve a minimum of 5-star NatHERS rating, using an accredited house energy rating software.

Under the Building Amendment Regulations (No. 2) 2020, Class 2 SOUs in Western Australia are not required to comply with the separate heating and cooling load limits detailed in J0.2.

A sample of apartments have been assessed, demonstrating that the project has the potential of achieving compliance against Section J, if the building specification recommended in this report are implemented at Design Stage.



2. NCC Section J Compliance

Preliminary assessment of the proposed development against the NCC (2019) Section J Requirements has been completed. It is planned to utilise the following methodology:

- Part J3 – Deemed-to-Satisfy Prescriptive requirements for common areas.
- Nationwide House Energy Rating Scheme (NatHERS) for residential areas

This assessment has been done in a very early stage and building fabric requirements will be coordinated during future detailed design stages. Building performance and compliance will be confirmed once these requirements are coordinated.

2.1 Building Fabric

Construction Thermal Performance

Overall thermal performance of the proposed building fabric is shown below.

Table 1: Building fabric thermal performance requirements.

Roof Type	Cavity Type	Total R-value (m ² K/W)	Frame Material Allowance	Frame Percentage Allowance (%)	Thermal Break Included	Thermal Break R-value (m ² K/W)	Minimum Typical Insulation (m ² K/W)	Example insulation requirement
Suspended Concrete Slab		Min. R4.0	-	-	No	-	R4.2	175mm Anticon Faced Glasswool Blanket

Note: Roof solar absorptance must be equal to or less than 0.45, i.e. light coloured. Similar performance has been assumed for the purposes of NatHERS modelling in Class 2 SOUs.

External Wall Type	Cavity Type	Total R-value (m ² K/W)	Frame Material Allowance	Frame Percentage Allowance (%)	Thermal Break Included	Thermal Break R-value (m ² K/W)	Minimum Typical Insulation (m ² K/W)	Example insulation requirement
External wall double brick (common areas)	Airspace reflective/ventilated	Min. Total R1.4*	-	-	-	-	R1.75	40mm rigid board
External wall double brick	Airspace reflective/ventilated	R2.8	-	-	-	-	R1.75	40mm rigid board

*Commercial/common areas total R values to include impact of thermal bridging.



Floor Type	In-slab / Screed system	Total Floor R-Value (m2K/W)	Typical Insulation R-value (m2K/W)	Example insulation requirement
Suspended Floor Slab	No in-slab heating or cooling	Min. Total R2.0	R2.05	50mm Rigid Soffit Board Insulation

When selecting insulation types, the fire properties of the product shall comply with the NCC Deemed-to-Satisfy Provisions for fire hazard properties and a non-combustible material, as required and as nominated by the Building Surveyor.

Building Fabric Notes:

- Internal walls refer to walls separating conditioned and non-conditioned internal zones.
- The Total R-value shall be calculated, including allowance for thermal bridging, in accordance with:
 - AS/NZS 4859.2 for a roof or floor.
 - AS/NZS 4859.2 for wall components or Specification J1.5b (NCC 2019 Volume One) for spandrel panels.
- The Total R-value calculation must consider individual component layers in a composite element including any building material, insulating material, airspace and associated surface resistances.

Table 3: Glazing thermal performance requirements.

Window Type	Location	U-value (W/m ² K)	SHGC
High Performance Double Glazing (Applicable to all areas)	All windows	3.48	0.43

Glazing Notes:

- Performance values states are whole-of-system, inclusive of framing and glass, and in accordance with Australian Fenestration Rating Council (AFRC) requirements.
- Area-weighted average glazing performance must achieve the above values, allowing variation in window types and performance.

2.2 NatHERS ratings

To comply with the NCC 2019 Volume One Section J NatHERS requirements, residential Class 2 SOUs must:

- Collectively achieve an average NatHERS rating of not less than 6 stars across the development; and
- Each individually achieve a minimum of 5-star NatHERS rating, using an accredited house energy rating software.

Refer to Appendix A for sample results and predicted overall rating.



3. Conclusion

Subject to the conditions and requirements noted in this report, the building's Class 2 SOU spaces and common areas have the ability to demonstrate compliance with the NCC 2019 Volume One Section J requirements via a DTS NatHERS solution.

The residential sole-occupancy units have been modelled using a house energy rating software in accordance with J0.2(a) with results demonstrating design compliance with the respective NatHERS star rating requirements.

Professional Engineer



Aida Leon

for **Stantec Australia Pty Ltd**

Date: 7/12/2023



Appendix A NatHERS Simulation Results

AVERAGE ENERGY INTENSITY (MJ/m ²)	AVERAGE STAR RATING	MINIMUM STAR RATING	CLIMATE ZONE	NO. OF RATED APARTMENTS
22.8	7.7	5.6	52	32

APT TYPE	A/C AREA (M2)	NON-A/C AREA (M2)	BED	ADJUSTED HEATING	ADJUSTED COOLING	TOTAL ENERGY (MJ/m ²)	STAR RATING
G01	83.1	4.5	2	8.9	9.6	18.5	8.2
G02	76.2	4.4	2	16.3	4.2	20.5	7.9
G03	76.2	4.4	2	16.3	4.2	20.5	7.9
G04	44.3	5.4	1	3.3	13.1	16.4	8.4
G05	44.3	5.4	1	3.3	13.1	16.4	8.4
G06	44.3	5.4	1	3.3	13.1	16.4	8.4
G07	44.3	5.4	1	3.3	13.1	16.4	8.4
G08	83.1	4.5	2	8.9	9.6	18.5	7.6
G08	66.9	3.7	2	15.6	7.9	23.5	7.6
G09	66.9	3.7	2	15.6	7.9	23.5	7.6
G10	66.9	3.7	2	15.6	7.9	23.5	7.6
G11	66.9	3.7	2	15.6	7.9	23.5	7.6
G12	66.9	3.7	2	15.6	7.9	23.5	7.6
G13	66.9	3.7	2	15.6	7.9	23.5	7.6
G14	66.9	3.7	2	15.6	7.9	23.5	7.6
101	82.9	4.3	2	5.8	7	12.8	8.8
102	82.9	4.3	2	5.8	7	12.8	8.8
103	82.9	4.3	2	5.8	7	12.8	8.8
104	82.9	4.3	2	5.8	7	12.8	8.8
105	82.9	4.3	2	5.8	7	12.8	8.8
106	82.9	4.3	2	5.8	7	12.8	8.8
107	82.9	4.3	2	5.8	7	12.8	8.8
108	82.9	4.3	2	5.8	7	12.8	8.8
109	82.9	4.3	2	5.8	7	12.8	8.8
110	82.9	4.3	2	5.8	7	12.8	8.8
201	170.5	2.2	3	7	32.2	39.2	5.9
202	144.2	1.9	3	22.2	19.4	41.6	5.8
203	144.2	1.9	3	22.2	19.4	41.6	5.8
204	144.2	1.9	3	6.5	37.5	44	5.6
205	144.2	1.9	3	6.5	37.5	44	5.6
206	144.2	1.9	3	6.5	37.5	44	5.6
207	170.5	2.2	3	7	32.2	39.2	5.9



Appendix B Preliminary Insulation Markup



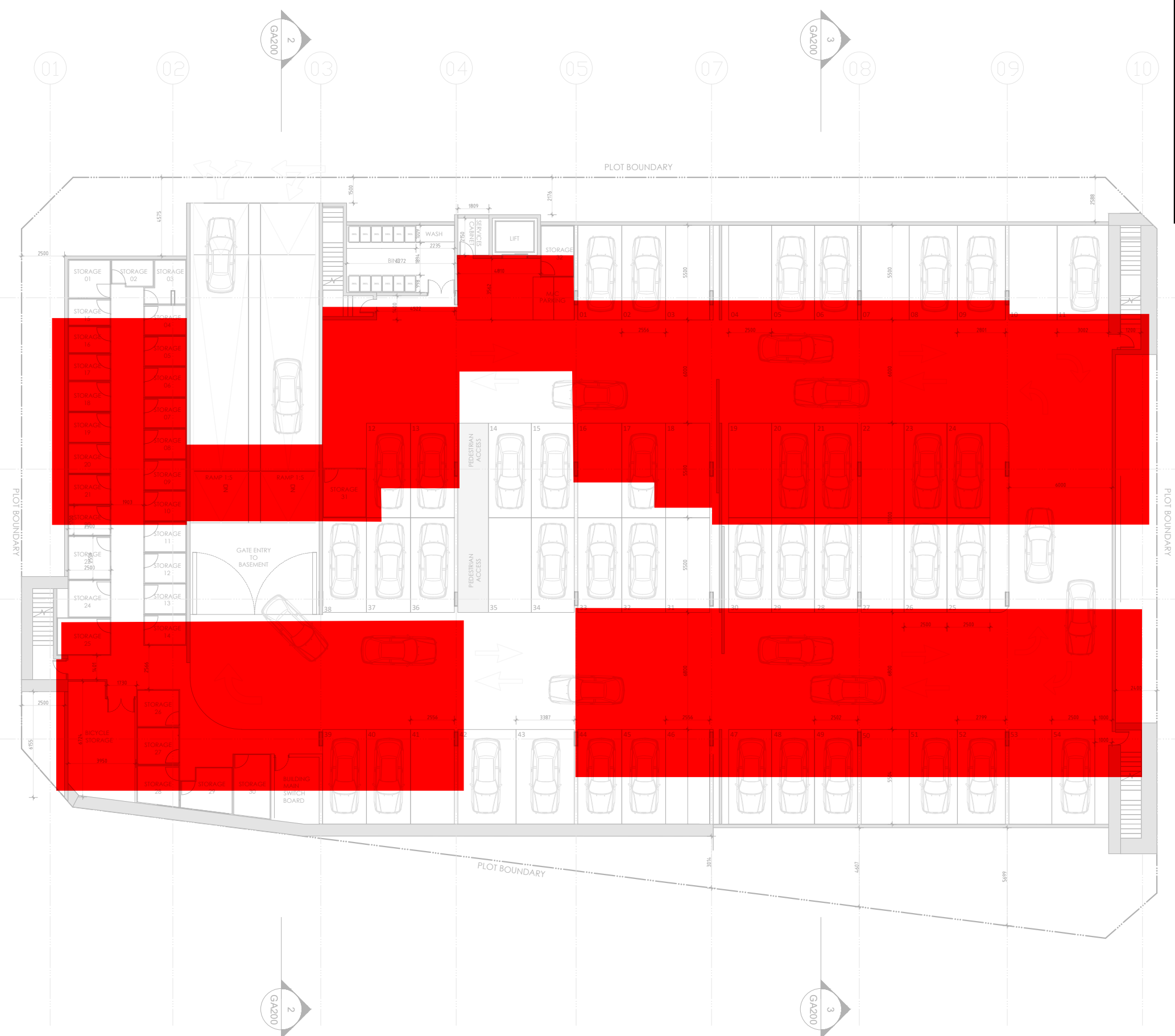
Legend

Insulation Requirements:

- External Walls - Min R2.8 Total System
- Roof/Ceiling - Min R4.0 Total System
- Internal Walls - Min R1.8 Total System
- Soffit - Min R2.0 Total System
- Min. R1.4 Total (R2.5 added to External Envelope Walls)

*Note: Markup is preliminary in nature. Pending further modeling & coordination. Performance values may increase.

Stantec PROJECT: (NC) 2 Zodiac Drive Alkimos
 PROJECT NUMBER: 301251501
 SKETCH TITLE: Insulation Markup
 AUTHOR: PN
 DATE: 25/10/2023



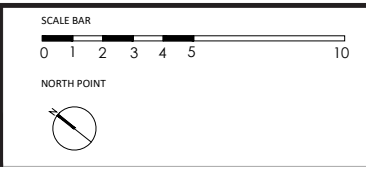
BASEMENT FLOOR PLAN
SCALE 1:250

NOT FOR CONSTRUCTION

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ISSUE	AMENDMENT	DATE

PROJECT	02 ZODIAC DRIVE ALKIMOS RESIDENTIAL DEVELOPMENT
DRAWING NO	1161-GA-100
REVISION	A

CLIENT	SHOREHAVEN BEACH APARTMENTS
CHECKED	FH
DRAWN	VG
SCALE	1:250
DATE	05/12/2023

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Legend

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- Roof/Ceiling - Min R4.0 Total System
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 10 X 2 BED

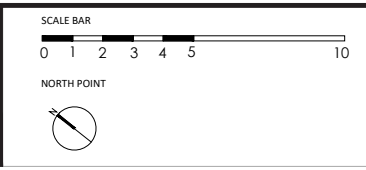
GROUND FLOOR PLAN
 SCALE 1:250

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DRAWING NO	1161-GA-101
ISSUE	A

CLIENT	SHOREHAVEN BEACH APARTMENTS
CHECKED	FH
DRAWN	VG
SCALE	1:250
DATE	05/12/2023

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Legend

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 4 X 3 BED

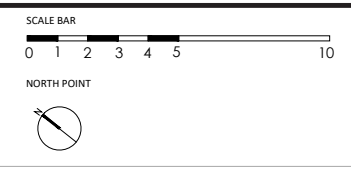
FIRST FLOOR PLAN
 SCALE 1:250

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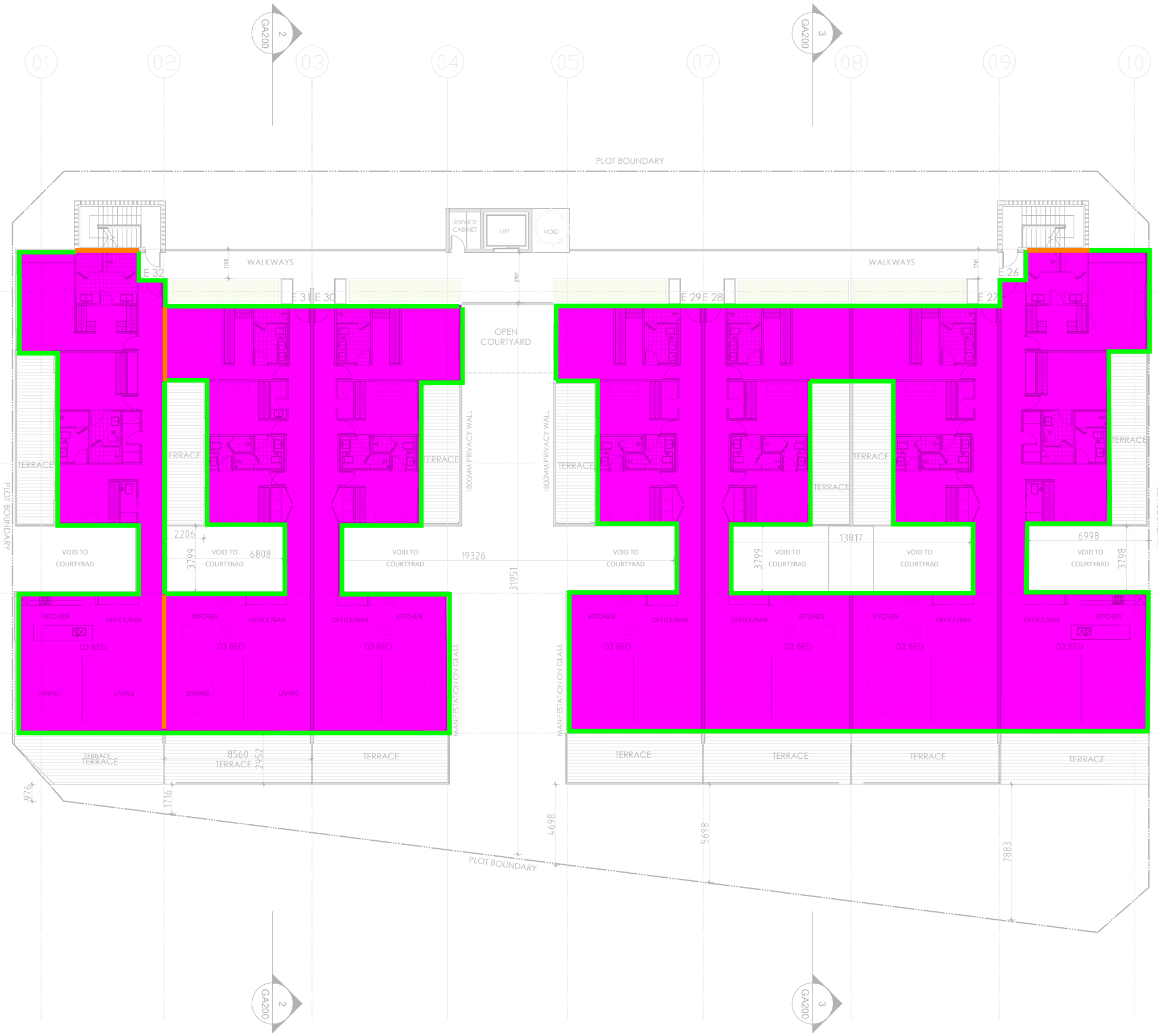
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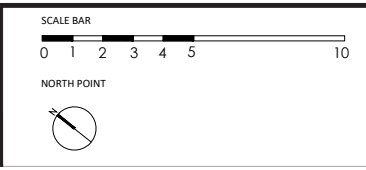
SECOND FLOOR PLAN
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ISSUE	A

CLIENT	SHOREHAVEN BEACH APARTMENTS
CHECKED	FH
DRAWN	VG
SCALE	1:250
DATE	05/12/2023

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Appendix C Building Fabric Calculations

Roof - Concrete with Ceiling								
Item	Item Description	Construction Thickness (mm)	Installed thickness (mm)	Framing	Frame percentage	Thermal break R-value	Overlap (% of total)	Effective R-Value (m ² K/W)
1	Outdoor Air Film (7m/s)	N/A						0.03
2	Concrete (upper surface solar absorptance ≤0.45)	200	200					0.14
3	Bradford Anticon Faced Glasswool Blanket	165	165	-	0%			4.80
4	Airspace (0.9 reflective/unventilated, flat roof)	0	0	No	0%			
5	Plasterboard Gypsum	13	13					0.08
6	Indoor Air Film (Still Air) - Horizontal	N/A						0.16
Total Thickness			378	Calculated Overall R-Value for Construction				5.21
NCC VOLUME ONE Section J Compliant								Yes



Description		External Wall – Double Brick Cavity						
Item	Item Description	Construction Thickness (mm)	Installed thickness (mm)	Framing	Frame percentage	Thermal break R-value	Overlap (% of total)	Effective R-Value (m ² K/W)
1	Outdoor Air Film (7m/s)	N/A						0.03
2	Cement render (1 cement: 4 sand)	0						0.00
3	Claybrick – 3.75 kg	110						0.06
4	Airspace (0.05 reflective/ventilated)	40		No	0%			
5	Kingspan Kooltherm K8 Cavity Board	40	40		0%			2.23
6	Claybrick – 3.75 kg	110						0.14
7	Airspace (non-reflective/ventilated)	50						0.14
8	Plasterboard Gypsum	13						0.08
9	Indoor Air Film (Still Air) - Horizontal	N/A						0.12
Total Thickness			203	Calculated Overall R-Value for Construction				2.80
NCC VOLUME ONE Section J Compliant								Yes

Description		Exposed Suspended Floor without Ceiling					
Item	Item Description	Construction Thickness (mm)	Installed thickness (mm)	Framing	Frame percentage	Thermal break R-value	Effective R-Value (m ² K/W)
1	Indoor Air Film (Still Air) - Horizontal	N/A					0.04
2	Solid Concrete	200	200				0.14
3	R2.05 Rigid Board Insulation	50	50	-	0%		2.30
4	Outdoor Air Film (<3m/s)	N/A					0.04
Total Thickness			250	Calculated Overall R-Value for Construction			2.52
NCC VOLUME ONE Section J Compliant							Yes

Note: All Building Fabric calculations are examples only and will need to be coordinated at Design Development Stage.



Design with
community in mind

Ground Floor
226 Adelaide Terrace
Perth WA 6000
Tel +61 8 6222 7000

For more information please visit
www.stantec.com

