



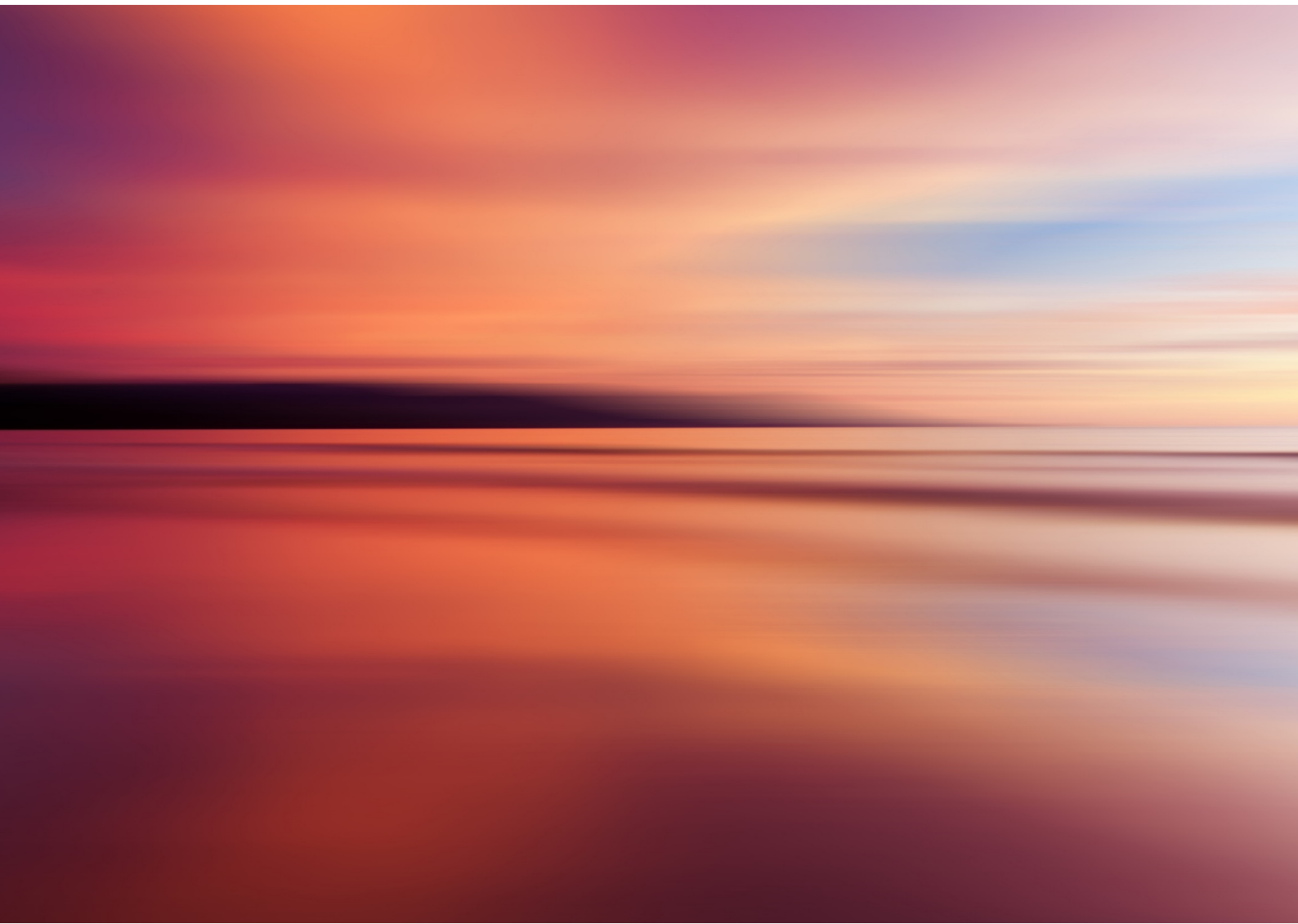
# Section J Compliance



## Tenambit Community Centre

Maitland City Council

09 May 2024

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# 1. Introduction

This report provides an assessment of compliance of the proposed concept design of the Tenambit Community Centre, NSW, in accordance with the Deemed to Satisfy Solution requirements of Section J Energy Efficiency of the National Construction Code (NCC) 2022 Building Code of Australia – Volume 1.

## 1.1 Referenced standards

This report has been undertaken with reference to the following:

- The National Construction Code 2022
- NCC 2022 Volume One Façade Calculator
- AS4859.2-2018 and NSZ4214-2006 where applicable as per NCC (Amendment 1) Section J
- CIBSE Guide A where applicable

## 1.2 Referenced site information.

Architectural DA drawing set issued 23.04.2024

## 1.3 Purpose of this report

This report is intended to provide a clause-by-clause analysis of the documented building design issued for DA for compliance in relation to our interpretation of the Performance Requirements J1P1 of Section J of the NCC 2022. Project will seek following the Deemed-To-Satisfy provisions. Where not possible the J1V3 verification method will be used.

## 1.4 Scope and limitations

This report: has been prepared by GHD for Maitland City Council and may only be used and relied on by Maitland City Council for the purpose agreed between GHD and Maitland City Council as set out in Section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than Maitland City Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

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At the time of preparing this report, the design was in the early stages therefore all section J requirements are not fully resolved or documented yet. This document summarises the intent of the design team. All nominated proposed solutions require further design development and will need to be incorporated into detailed design. This report should not be used to obtain construction certificate. The report will need to be updated during subsequent design phases.

## 2. Definitions and classifications

### 2.1 Definitions

The following applicable definitions and classifications apply:

**Conditioned Space** means a space within a building including ceiling or under-floor supply air plenum or return air plenum, where the environment is likely by the intended use of the space to have temperature controlled by air conditioning.

**Envelope** for the purposes of Section J, the building envelope means the parts of the building fabric that separate a conditioned space from the exterior of a building or a non-conditioned space.

**Habitable Room** means a room used for normal domestic activities.

**Thermal Envelope** refers to the building fabric separating a conditioned space (a space likely, due to its intended use, to have its temperature controlled by air conditioning) or habitable room from the exterior of the building or an unconditioned space. The accepted thermal envelope is marked up in Appendix A.

### 2.2 NCC Building classification

The proposed building is classified as Class 9B (assembly building) under NCC.

### 2.3 NCC Climate zone classification

The proposed building is located in Climate Zone 5 (warm temperature) as per NCC climate zone maps.

### 2.4 Assessment method

The compliance assessment method applied is outlined below:

- Section J Part J4 requires a comparison of the proposed building fabric against DTS provisions.
- Section J Part J5 requires the appropriate sealing of relevant building elements to restrict air infiltration.
- Section J Parts J6 to J9 will be include in this report for Construction certificates.

## 3. Clause by clause analysis

### 3.1 J2 – Energy efficiency

#### 3.1.1 J2D1 – Deemed to satisfy provisions

The building will comply with J1P1 to J1P4 by complying with deemed to satisfy provisions of the relevant Section J clauses within the NCC 2022. These requirements are assessed below.

#### 3.1.2 J2D2 – Application of Section J

**(1) For a Class 2 to 9 building, other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, Performance Requirement J1P1 is satisfied by complying with—**

- Part J4, for the building fabric
- Part J5, for building sealing
- Part J6, for air-conditioning and ventilation
- Part J7, for artificial lighting and power
- Part J8, for heated water supply and swimming pool and spa pool plant
- J9D3, for facilities for energy monitoring

**(2) For a sole-occupancy unit of a Class 2 building or a Class 4 part of a building**

Not applicable for this class of building.

### 3.2 J4 – Building fabric

#### 3.2.1 J4D2 – Application of part

The deemed to satisfy provisions of this part apply to the thermal envelope of the building as defined in Appendix A: Mark up of the building envelope.

#### 3.2.2 J4D3 – Thermal construction-general

The building must be provided with insulation where required, complied with AS/NZS 4859.1, installed with the appropriate overlaps, airspaces and positioned to ensure it performs at the stated R-Value.

Thermal bridges are included in the calculation of R-values and system U-values in accordance with:

- Roof and floors: AS/NZS 4859.2 for roof and floor
- Wall-glazing: Specification J1.5a

Calculations within this report have included the effects of thermal bridging as required, and the drawings/specifications adequately specify the need to meet installation requirements.

#### 3.2.3 J4D4 – Roof and ceiling construction

##### General requirements

The roof is required to meet a thermal performance of R3.7 downwards and must have a roof solar absorptance of 0.45 or less.

### Proposed Roof Performance

A roof build up comprising of R2.5 ceiling insulation, air cavity, roof insulation R2.5 and steel roof sheeting will achieve this R value. Further roof make up information will be provided at detailed design stage.

The proposed ZINCALUME roof sheeting proposed is classified as medium coloured ( $0.46 < SA < 0.7$ ) and does not comply with the solar absorptance (SA) value  $< 0.45$  (Light coloured). To demonstrate compliance with section J, energy modelling will be carried out using the J1V3 verification method at detailed design stage. In the absence of exact value the modelling will be based on the conservative value of 0.7.

Summary of roof compliance can be found in Table 3.1.

Table 3.1 Summary of roof compliance

Roof/Roof SA	Required R-Value/SA	Achieved R-Value/SA	Compliance?	Recommended Action(s)
Roof	R3.7	R3.7	Y	Detailed roof construction R-values to be confirmed during detailed design.
SA-Value	$< 0.45$	Between 0.46 and 0.7	N	J1V3 Verification method – performance based modelled solution to verify Zincalume does not result in more energy used than a DTS reference building

### 3.2.4 J4D5– Roof lights

There are no roof lights in the proposed design, and as such this clause is not applicable.

### 3.2.5 J4D6 – Walls and glazing

#### Wall general requirements

The minimum performance for the combined wall and glazing construction (both internally and externally) must meet or exceed R0.5. In addition to this requirement, the wall portion of the construction must meet a minimum R value determined by whether the total area of all walls for a given façade orientation makes up 80% or more of the total wall/glazing area of that orientation. The wall percentages and associated minimum wall performances are listed in Table 3.2 below.

Table 3.2 Minimum wall performance requirements (internal & external)

Orientation	Percent glazing Western building	Minimum required R value Western building	Percent glazing Eastern building	Minimum required R value Eastern building
North	12.2%	R1	23.2%	R1.4
East	21.8%	R1.4	26.9%	R1.4
South	11.9%	R1	22.6%	R1.4
West	23.8%	R1.4	15%	R1
Whole building (Method 2)	13.1%	R1.4	18.2%	R1.4

#### Proposed walls Performance

Stud wall type construction with external cladding and internal plaster board will meet the required R-values with R2.5 insulation installed between studs/structural elements and thermal break tape installed between stud and

internal and external finishes. Further wall make up information will be provided at detailed design stage to confirm achieved R values.

Table 3.3 provides a summary thermal boundary wall performance:

**Table 3.3** Walls R value compliance

Wall Type	Required R-Value Both buildings	Achieved R-Value Both Buildings	Comply?
All orientation Western Building (Method 2)	1.4	1.4	Y
All orientation Eastern Building (Method 2)	1.4	1.4	Y

### Glazing general performance requirement

For the wall thermal performance achieved, the glazing total system performance (i.e.: glass + frame) must perform at  $U < 5.8 \text{ W/m}^2\text{K}$  and  $\text{SHGC} < 0.81$ . This will be documented during Detailed Design.

Glazing calculator outputs demonstrating compliance with method 2 can be found in Appendix B.

### Proposed glazing performance

The proposed glazing will meet DTS requirement provided it achieves the glazing performance requirements in Table 3.4.

**Table 3.4** Summary of glazing compliance

Glazing performance	Required U-Value/SHGC Western Building	Required U-Value/SHGC Eastern Building
U-Value (inc. frame)	$< 5.8 \text{ W/m}^2\text{K}$	$< 5.8 \text{ W/m}^2\text{K}$
SHGC (inc. frame)	$< 0.68$	$< 0.62$

## 3.2.6 J4D7 – Floors

### Floor performance required

The floor must have a minimum total performance of R2.0.

### Proposed floor performance

A slab on ground that does not have in-slab cooling or heating is considered to achieve a total R value of R2.0 in our climate zone without insulation as per section J4D7(2).

Were slab is suspended, a 180mm RC slab insulated to R 1.8 with XPS or EPS boards, installed under slab will be compliant. Further floor make up information will be provided at detailed design stage.

Summary of floor compliance can be found in Table 3.5 below:

**Table 3.5** Summary of floor compliance

Glazing performance	Required R-Value	Achieved R-Value	Compliance?
Lower Ground floor R-Value	R2	R2	Y



### **3.3 J5 – Building sealing.**

#### **3.3.1 J5D2 – Application of part**

The deemed to satisfy provisions of this part apply to the thermal envelope of the building.

#### **3.3.2 J5D3 – Chimneys and flues**

The thermal envelope does not contain any open, solid fuel burning appliances and as such this clause does not apply.

#### **3.3.3 J5D4 – Roof Lights**

The thermal envelope does not contain any roof lights.

#### **3.3.4 J5D5 - Windows and doors**

##### **General requirements**

This clause requires a seal to restrict air infiltration to be fitted to each edge of all new doors, openable windows and the like. This applies to internal and external doors. This must consist of a foam or rubber compressible strip, fibrous seal or equivalent to achieve compliance, and for the bottom edge of a door must be a draft stop.

These requirements do not extend to fire or smoke doors, roller shutter doors, roller shutter grilles or other security doors or devices installed only for out of hours use. Windows complying with AS2047 are also exempt from compliance.

Entrances to the building that lead to a conditioned space will have self-closing doors.

#### **3.3.5 J5D6 – Exhaust fans**

Any new or modified exhaust fans serving a conditioned or habitable space must be fitted with a sealing device such as a self-closing damper or the like. For exhaust fans added to such spaces, this requirement will apply and be met by the mechanical design.

#### **3.3.6 J5D7 – Construction of roof, walls and floors**

The building fabric forming part of the thermal envelope or external fabric of a habitable room must be adequately sealed using expanding foam, rubber compressible strip, caulking skirting and cornices to minimise air leakage. Alternatively, the space may be enclosed by an internal lining system fitting closely at the ceiling, wall and floor junctions. This does not apply to openings, grilles or similar needed for smoke management.

The specification document and drawings show good practice construction, reference the need to install materials in line with manufacturer recommendations, and generally appear to reflect and specify adequately sealed construction. On this basis the design is deemed to be compliant with requirements of this clause.

#### **3.3.7 J5D8 – Evaporative coolers**

There are no evaporative coolers in the new design and as such this clause is not relevant.

### **3.4 J6 – Air-conditioning and ventilation**

To be addressed by services engineers at detailed design stage

### **3.5 J7 – Artificial lighting and power**

To be addressed by services engineers at detailed design stage

### **3.6 J8 – Heated water supply**

To be addressed by services engineers at detailed design stage

### **3.7 J9 – Energy monitoring and on site distributed energy resources.**

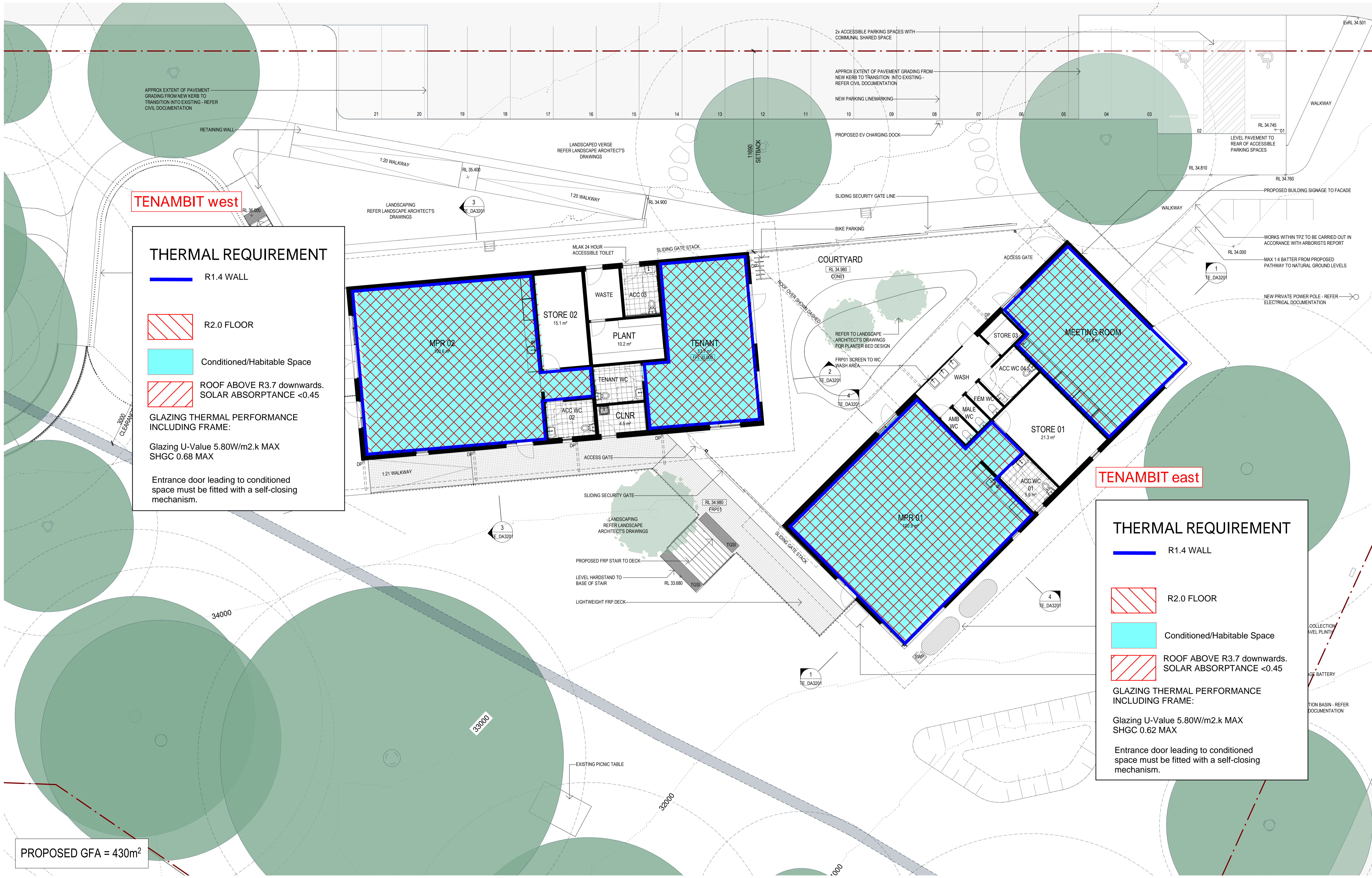
To be addressed by services engineers at detailed design stage

# Appendices

# **Appendix A**

**Thermal boundary**

PUBLISH DATE: 20/04/2024 10:52:59 AM  
 THE CONTENT OF THIS DRAWING MUST BE UNDERSTOOD IN THE CONTEXT OF THE SHEET STATUS AND BEING IN CONJUNCTION WITH THE GENERAL NOTES FOUND ON THE COVER PAGE OF THIS DOCUMENT SET. DO NOT USE THE CONTENT OF THIS DRAWING FOR CONSTRUCTION UNLESS THE DIMENSIONS AND BEING IN CONJUNCTION WITH THE GENERAL NOTES FOUND ON THE COVER PAGE OF THIS DOCUMENT SET. DO NOT USE THE CONTENT OF THIS DRAWING FOR CONSTRUCTION UNLESS THE DIMENSIONS AND BEING IN CONJUNCTION WITH THE GENERAL NOTES FOUND ON THE COVER PAGE OF THIS DOCUMENT SET.



**TENAMBIT west**

**THERMAL REQUIREMENT**

- R1.4 WALL
- R2.0 FLOOR
- Conditioned/Habitable Space
- ROOF ABOVE R3.7 downwards. SOLAR ABSORPTANCE <0.45

**GLAZING THERMAL PERFORMANCE INCLUDING FRAME:**

Glazing U-Value 5.80W/m2.k MAX  
SHGC 0.68 MAX

Entrance door leading to conditioned space must be fitted with a self-closing mechanism.

**TENAMBIT east**

**THERMAL REQUIREMENT**

- R1.4 WALL
- R2.0 FLOOR
- Conditioned/Habitable Space
- ROOF ABOVE R3.7 downwards. SOLAR ABSORPTANCE <0.45

**GLAZING THERMAL PERFORMANCE INCLUDING FRAME:**

Glazing U-Value 5.80W/m2.k MAX  
SHGC 0.62 MAX

Entrance door leading to conditioned space must be fitted with a self-closing mechanism.

PROPOSED GFA = 430m<sup>2</sup>

# **Appendix B**

**Facade calculator report**

# NCC 2022 Section J4 Compliance Summary



Project Name	
Class Type	Daytime Operation (Class: 2 common areas; 5; 6; 7; 8; 9b; 9a non-ward areas)
Climate Zone	5
Prepared By	Caitlin Newall
QA'd By	Sylvie Mathian

## Facade Area Summary

Façade	Wall Total Area (m <sup>2</sup> )	Glazing Total Area (m <sup>2</sup> )	Glazing Proportion
North	64.56	8.99	12.2%
East	41.51	11.56	21.8%
South	69.56	9.37	11.9%
West	40.73	12.70	23.8%
Internal	66.40	0.00	0.0%
<u>Whole Building</u>	282.75	42.62	13.1%

## Façade R/U-value Summary

Façade	Wall R-Value (W/m <sup>2</sup> k)	Glazing U-Value (W/m <sup>2</sup> k)	Overall U-Value (W/m <sup>2</sup> k)
North	1.40	5.80	1.34
East	1.40	5.80	1.82
South	1.40	5.80	1.32
West	1.40	5.80	1.92
Internal	1.40	0.00	0.71
<u>Whole Building</u>	1.40	5.80	1.38

## Façade Solar Admittance Summary

Façade	Average SHGC	Shading Factor	Solar Admittance / AC Value
North	0.68	0.68	0.06
East	0.68	0.67	0.10
South	0.68	0.96	0.08
West	0.68	0.97	0.16
Internal	Not Applicable		
<u>Whole Building</u>	0.68	0.83	23.86

## J1.5 Compliance Summary

Façade	METHOD 1
North	Compliance Met With Method 2
East	Compliance Met With Method 2
South	Compliance Met With Method 2
West	Compliance Met With Method 2
Internal	Compliance Met With Method 2
Whole Building	METHOD 2
	Yes

# NCC 2022 Section J4 Compliance Summary



Project Name	
Class Type	Daytime Operation (Class: 2 common areas; 5; 6; 7; 8; 9b; 9a non-ward areas)
Climate Zone	5
Prepared By	Caitlin Newall
QA'd By	Sylvie Mathian

## Facade Area Summary

Façade	Wall Total Area (m <sup>2</sup> )	Glazing Total Area (m <sup>2</sup> )	Glazing Proportion
North	40.44	12.22	23.2%
East	70.08	25.75	26.9%
South	40.28	11.76	22.6%
West	67.05	11.83	15.0%
Internal	59.33	0.00	0.0%
<u>Whole Building</u>	277.18	61.56	18.2%

## Façade R/U-value Summary

Façade	Wall R-Value (W/m <sup>2</sup> k)	Glazing U-Value (W/m <sup>2</sup> k)	Overall U-Value (W/m <sup>2</sup> k)
North	1.40	5.80	1.89
East	1.40	5.80	2.08
South	1.40	5.80	1.86
West	1.40	5.80	1.48
Internal	1.40	0.00	0.71
<u>Whole Building</u>	1.40	5.80	1.64

## Façade Solar Admittance Summary

Façade	Average SHGC	Shading Factor	Solar Admittance / AC Value
North	0.62	0.89	0.13
East	0.62	0.78	0.13
South	0.62	0.89	0.12
West	0.62	0.94	0.09
Internal	Not Applicable		
<u>Whole Building</u>	0.62	0.85	43.19

## J1.5 Compliance Summary

Façade	METHOD 1
North	Compliance Met With Method 2
East	Compliance Met With Method 2
South	Compliance Met With Method 2
West	Compliance Met With Method 2
Internal	Compliance Met With Method 2
Whole Building	METHOD 2
	Yes





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