



# NCC 2022 Section J J1V3 for Part J4 Compliance Design Report

Cumberland Country Golf Club  
248 Old Prospect Road, Greystanes, NSW 2145

Project No. P00472  
Revision 01  
Issued 15 March 2024  
Client Partier Pty Ltd

**E-LAB Consulting**

Where science and engineering inspire design.

# Document QA and Revisions

ISSUE	DATE	COMMENTS	ENGINEER	REVIEWER
1	15/03/2024	For DA	BC	CM
2				
3				
4				

**Qualifications:**

Information has been based on E-LAB’s understanding of the documented development within the information provided. This report outlines the compliance requirements for NCC2022 Section J J1V3 for Part J4 compliance only.

The project design and construction team are required to review and consider the implications of these recommendations on their design for the project.

The design team shall coordinate with any specific condensation, acoustic, wind, structural, safety, constructability, maintenance or Architectural Design requirements for a particular project.

Insulation values are whole of system values. The impact of framing can significantly derate performance and must be accounted for in the building’s design.

**Confidentiality:**

*This document contains commercial information which has been prepared exclusively for the use by The Principal. The document in entirety is confidential. No information contained in this document may be released in part or whole to any third party without the approval of the Author or The Principal.*

**Authorised by:**

Engineering Lab NSW Pty Ltd



Alex Kobler | Director



# Table of Contents

<b><u>1</u></b>	<b><u>INTRODUCTION</u></b>	<b><u>7</u></b>
1.1	PURPOSE	7
1.2	SITE LOCATION	7
1.3	PROJECT OVERVIEW	8
<b><u>2</u></b>	<b><u>METHOD OF COMPLIANCE</u></b>	<b><u>10</u></b>
2.1	ASSESSMENT PROCESS	10
2.2	WEATHER DATA	10
2.3	MODELLED INPUTS	10
2.4	SOFTWARE	11
2.5	GREENHOUSE GAS FACTORS	11
<b><u>3</u></b>	<b><u>BUILDING ENVELOPE REQUIREMENTS</u></b>	<b><u>12</u></b>
3.1	GOLF CLUBHOUSE	12
3.2	AGED CARE	12
<b><u>4</u></b>	<b><u>RESULTS</u></b>	<b><u>14</u></b>
4.1	GOLF CLUBHOUSE J1V3	14
<b><u>APPENDIX A</u></b>	<b><u>DTS FAÇADE CALCULATOR</u></b>	<b><u>15</u></b>
<b><u>APPENDIX B</u></b>	<b><u>INSULATION SPACES MARKUPS</u></b>	<b><u>16</u></b>
<b><u>APPENDIX C</u></b>	<b><u>PROFILES AND PERFORMANCE INPUTS</u></b>	<b><u>17</u></b>
<b><u>APPENDIX D</u></b>	<b><u>APPLICABLE CLAUSES</u></b>	<b><u>18</u></b>



# Executive Summary

E-LAB Consulting are engaged by RAAD to provide Section J J1V3 Consultancy for a Cumberland Country Golf Club development located at 248 Old Prospect Road, Greystanes, NSW 2145. The intent of the assessment is to confirm the minimum performance requirements to satisfy Section J, Part J4 – Building Fabric of the NCC 2022.

**E-LAB have assessed the development and confirm the design complies with NCC2022 Section J for Part J4 Building Fabric using the J1V3 Performance Verification method for the Golf Clubhouse and Deemed to Satisfy Assessment for the Aged Care Cent, provided the stated thermal performance requirements are met within this report.**

This assessment is made by comparing the energy consumption of a modelled building using actual performance criteria for the design and comparing its annual energy consumption to that of an equivalent, minimum Deemed-to-Satisfy (DtS) compliant building. The proposed building envelope has matched the DtS building envelop regarding energy consumption. The key results are summarised below:

The key façade performance requirements to demonstrate compliance are outlined in the table below. Deviation from these values may impact the compliance of the development for Section J J1V3.

### Golf Clubhouse Glazed Elements:

ELEMENT	PROPOSED PERFORMANCE*
Glazed Windows & Doors (All Spaces – Ground, Level 1-2)	Total System U-Value = 3.3; Total System SHGC = 0.4

\*The values are whole of system values, including the impact of framing.

### Golf Clubhouse Opaque Elements:

ELEMENT	PERFORMANCE**
Roofs/Ceilings Exposed to Outside Air (Heat Flow Upward)	R <sub>T</sub> -Value = 3.2 (solar absorptance ≥ 0.45)
Internal Ceiling Construction (Separating Conditioned and Unconditioned Spaces)	R <sub>T</sub> -Value = 2.0
Exposed Suspended Floor Slab	R <sub>T</sub> -Value = 2.0
Concrete Slab on Ground (with no in-slab heating or cooling system presented) (Heat Flow Downward)	No additional thermal insulation requirement as per clause J4D7(2)
External Wall Construction	R <sub>T</sub> -Value = 1.0
Internal Wall Construction	R <sub>T</sub> -Value = 1.0

\*\*R-Value represents whole system, including thermal breaks, air gaps, bulk insulation and metal-on-metal contact.



**Aged Care Glazed Elements:**

ELEMENT	PROPOSED PERFORMANCE*
Glazed Windows & Doors (All Spaces – Ground, Level 1-2)	Total System U-Value = 1.68; Total System SHGC = 0.19

\*The values are whole of system values, including the impact of framing.

**Aged Care Opaque Elements:**

ELEMENT	PERFORMANCE**
Roofs/Ceilings Exposed to Outside Air (Heat Flow Upward)	R <sub>T</sub> -Value = 3.2 (solar absorptance ≥ 0.45)
Internal Ceiling Construction (Separating Conditioned and Unconditioned Spaces)	R <sub>T</sub> -Value = 2.0
Exposed Suspended Floor Slab	R <sub>T</sub> -Value = 2.0
Concrete Slab on Ground (with no in-slab heating or cooling system presented) (Heat Flow Downward)	No additional thermal insulation requirement as per clause J4D7(2)
External Wall Construction	R <sub>T</sub> -Value = 1.4
Internal Wall Construction	R <sub>T</sub> -Value = 1.4

Refer to insulation markups in Appendix B for additional details for local differences and specific insulation placement.

It is noted that the proposed building envelope must continue to demonstrate Deemed-To-Satisfy design compliance against the other parts of Section J not specifically addressed in this report, including but not limited to in Part J4, generally Part J4D3 for general thermal construction, Part J4D7(2) and Part J4D7(3) for floor edge insulation if relevant, Part J5 for building sealing, Part J9 for electric vehicle charging equipment and facilities for solar photovoltaic and battery systems and the like. Refer to Appendix D for the applicable clauses.

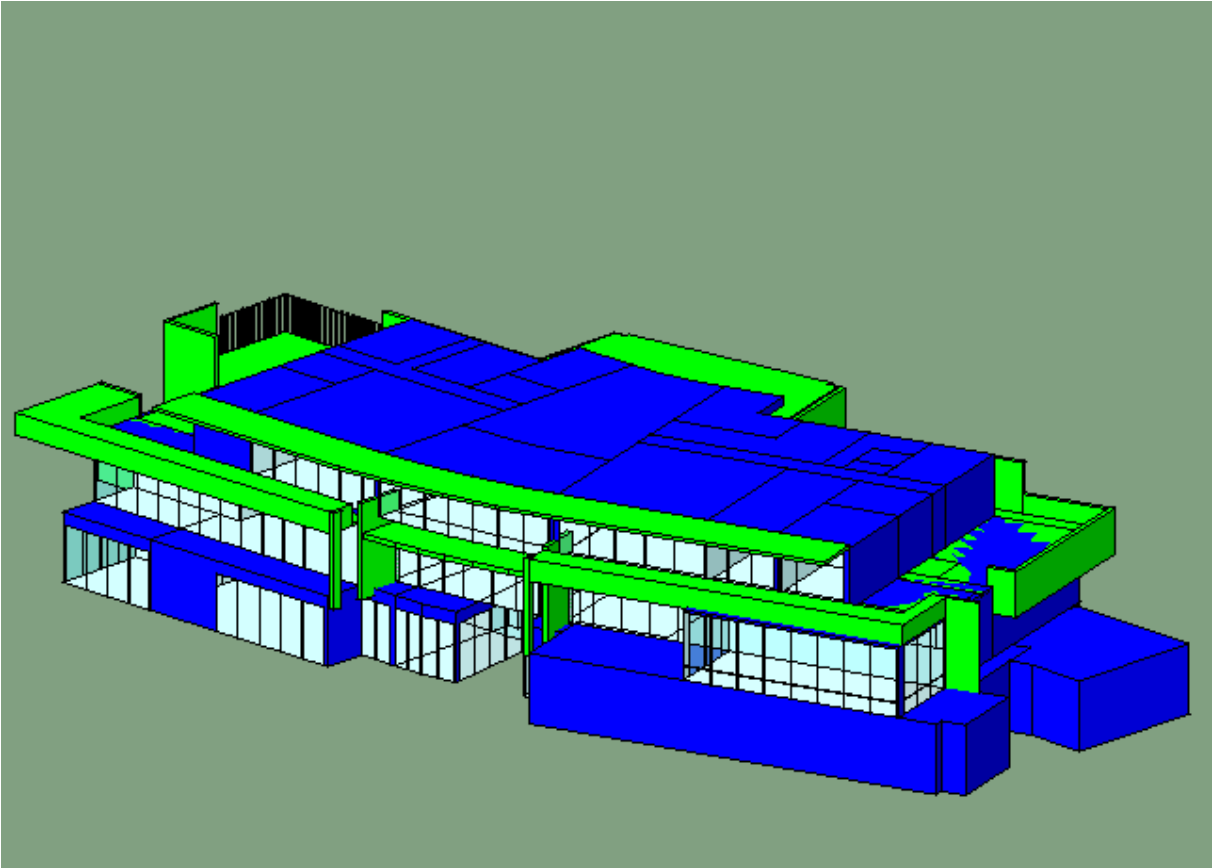
The building services elements (Part J6, Part J7, Part J8 and Part J9) of the NCC2022 Section J are required to meet DtS provisions, or compliance shall be demonstrated by the relevant services consultants through an alternate/performance pathway. This report does not relieve any other party of their duties, and certification is subject to the performance targets in this report being met.

*Note: This report provides certification for the design of the building fabric only against NCC 2022 Section J for Part J4. This does not certify the installation, nor other parts of Section J such as services, air tightness or energy monitoring.*



The below images depict the 'proposed' model constructed in IESVE 2023 that has been used for analysis.

**Golf Clubhouse IES Geometry**



# 1 INTRODUCTION

## 1.1 PURPOSE

This report has been prepared by E-LAB Consulting (E-LAB) at the request of Partier. Its purpose is to demonstrate compliance with the NCC 2022 Volume 1, Section J requirements for Part J4. It also highlights the steps undertaken to demonstrate compliance, documents the results and highlights the required performance for the building as a whole.

**The design of the development has been assessed using the J1V3 Alternative Verification Modelling Assessment for the Golf Clubhouse and the Deemed to Satisfy Assessment for the Aged Care Centre. Both have been found to comply with the Performance Requirements of Part J4 of the NCC 2022.**

## 1.2 SITE LOCATION

The project is located at 54-68 248 Old Prospect Road, Greystanes, NSW 2145. The site is located within Cumberland LGA, approximately 25km west of the Sydney CBD and 5km west of the Parramatta CBD. The nearest train station is Pendle Hill, 2km to the north. The site is bounded by the Old Prospect Road to the north, Kootingal Street & Vernon Street to the east, the Whalans Road to the south, and Brighton Road to the west. To the north, land use around the development is primarily residential, industrial to the south, and the Prospect Reservoir lies 3km away to the west. The site's current operations are recreational.

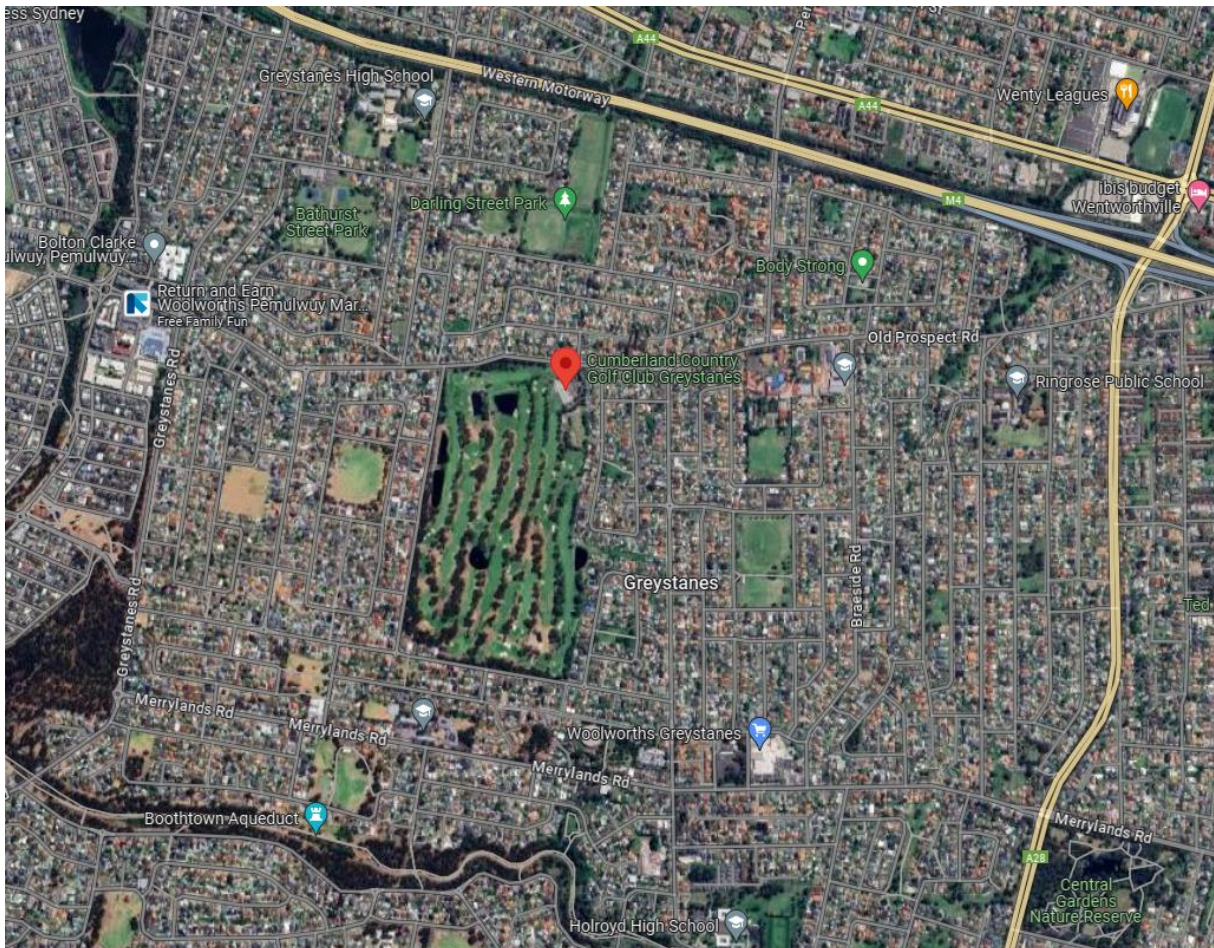


Figure 1: Site Location (source: Google Maps)

### 1.3 PROJECT OVERVIEW

The proposed development at 248 Old Prospect Road, Greystanes, NSW 2145 is a multi-building development at Cumberland Golf Course. The redevelopment area is approximately 3.8ha on the northern portion of the site. The project consists of the following:

- Subdivision, proposing 4x lots, consolidating the golf course onto 1 lot, seniors housing (2x lots) and golf club facilities (1x lot).
- Site preparation and excavation works, including demolition of the clubhouse and remediation works.
- Construction of a new golf clubhouse and ancillary facilities, retention of the existing carpark as well as reconfiguration of the existing golf course to maintain an 18-hole course.
- Construction of a seniors housing development comprising approximately 231 independent living units, ancillary wellness facilities, a residential -care facility (accommodating 38 beds and ancillary café, health, wellness and consulting rooms).
- Construction of a temporary display/sales suite and signage.
- Construction of new internal roads and parking.



Figure 2. Proposed development site plan (Source: Marchese Partners).

The development is located in a region classified as Climate Zone 6 – Mild Temperate. The Golf Clubhouse is classified as a Class 6 – Restaurant and the Aged Care Centre is classified as a Class 9c.



## 2 METHOD OF COMPLIANCE

### 2.1 ASSESSMENT PROCESS

Clause A2G1 (2) of Volume One of the NCC 2022 describes the following assessment methods, or combination of them, can be used to determine that a building solution complies with the performance requirements:

- Evidence of suitability in accordance with Part A5 that shows the use of a material, product, plumbing and drainage product, form of construction or design meets a Performance Requirement or a Deemed-to-Satisfy Provision as described in A2G2 and A2G3 respectively
- Verification Methods such as the Verification Methods in the NCC; or such other Verification Methods as the appropriate authority accepts for determining compliance with the Performance Requirements — Expert judgement
- Comparison with the Deemed-to-Satisfy provisions

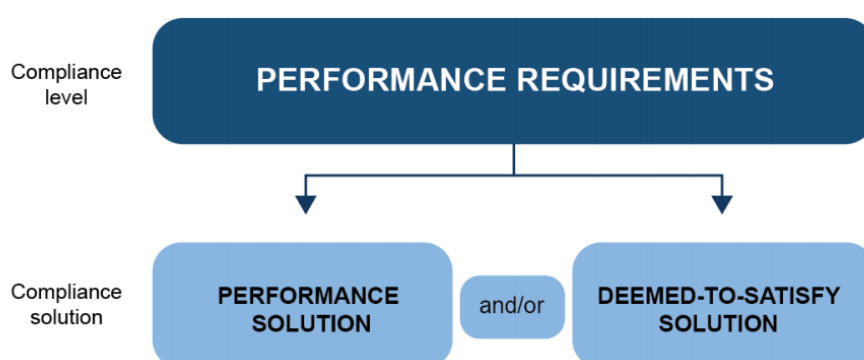


Figure 3: Assessment Flowchart (Source: ABCB)

This development demonstrates compliance with the Performance Requirement J1P1 Energy Use by a combination of methods 2 and 3 above:

- Part J4: Applying Verification Method J1V3. Determining that the annual greenhouse gas emissions of the Proposed Building are not more than the annual greenhouse gas emissions of the Reference Building.
- Comparison with Deemed-to-Satisfy provisions

### 2.2 WEATHER DATA

The weather file used for the modelling is the Typical Meteorological Year (TMY) as it was deemed to be most appropriate. The annual weather data utilised is from Sydney Olympic Park Station, which is the closest appropriate weather file to Cumberland (the development location), As the project is located in Cumberland NSW, Climate Zone 6 was identified within the NCC climate zone map.

### 2.3 MODELLED INPUTS

Modelled inputs are per the NCC2022 Section J Specification 34 – Modelling parameters for J1V3 and Specification 35 – Modelling profiles for J1V3 as required for the Verification Method J1V3. These inputs are outlined in Appendix C.

## 2.4 SOFTWARE

The design of the development has been assessed utilising IES Virtual Environment energy modelling software. This software includes a suite of tools, including ModellIT, SunCast, Apache, Vista and.

This software package is designed to performing dynamic thermal simulations and has been tested in accordance with ANSI/ASHRAE Standard 140-2004. 'Building envelope and fabric load tests performed on ApacheSim in accordance with ANSI/ASHRAE Standard 140-2004' and 'HVAC load tests performed on ApacheSim in accordance with ANSI/ASHRAE Standard 140-2004'

The version of the tool used within this modelling report was IES Virtual Environment (VE) 2023.

## 2.5 GREENHOUSE GAS FACTORS

Section J 2022 reports the energy use in kgCO<sub>2</sub>e. This allows the normalisation of inputs between energy sources. The conversions are outlined in Specification 34, Table S34C3. In NSW, these are:

ENERGY SOURCE	GHG EMISSION FACTOR (KGCO <sub>2</sub> -E /GJ)
Grid Electricity	236



### 3 BUILDING ENVELOPE REQUIREMENTS

#### 3.1 GOLF CLUBHOUSE

##### 3.1.1 GLAZING

The following outlines the glazing performance modelled in the J1V3 Proposed model. This is the minimum performance required to Section J. Any relaxation of these values will need to be confirmed for compliance in writing by the Section J Certifying consultant.

The below values are whole of system values, including the impact of framing.

ELEMENT	PROPOSED PERFORMANCE*
Glazed Windows & Doors (All Retail Spaces – Level 0, 1, 2)	Total System U-Value = 3.3; Total System SHGC = 0.4

\*The values are whole of system values, including the impact of framing.

##### 3.1.2 BUILDING FABRIC

The following outlines the building fabric performance requirements as modelled in the J1V3 Proposed model. This is the minimum performance required to Section J. Any relaxation of these values will need to be confirmed for compliance in writing by the Section J Certifying consultant.

Refer to the insulation markups in the appendix for a detailed breakdown of the insulation performance.

ELEMENT	PERFORMANCE**
Roofs/Ceilings Exposed to Outside Air (Heat Flow Upward)	R <sub>T</sub> -Value = 3.2 (solar absorptance ≥ 0.45)
Internal Ceiling Construction (Separating Conditioned and Unconditioned Spaces)	R <sub>T</sub> -Value = 2.0
Exposed Suspended Floor Slab	R <sub>T</sub> -Value = 2.0
Concrete Slab on Ground (with no in-slab heating or cooling system presented) (Heat Flow Downward)	No additional thermal insulation requirement as per clause J4D7(2)
External Wall Construction	R <sub>T</sub> -Value = 1.0
Internal Wall Construction	R <sub>T</sub> -Value = 1.0

\*\*R-Value represents whole system, including thermal breaks, air gaps, bulk insulation and metal-on-metal contact.

#### 3.2 AGED CARE

##### 3.2.1 GLAZING

The following outlines the glazing performance requirements as calculated in the Deemed to Satisfy Assessment. This is the minimum performance required to Section J. Any relaxation of these values will need to be confirmed for compliance in writing by the Section J Certifying consultant.



The below values are whole of system values, including the impact of framing.

ELEMENT	PROPOSED PERFORMANCE*
Glazed Windows & Doors (All Retail Spaces – Level 0, 1, 2)	Total System U-Value = 1.68; Total System SHGC = 0.19

\*The values are whole of system values, including the impact of framing.

### 3.2.2 BUILDING FABRIC

The following outlines the building fabric requirements as calculated in the Deemed to Satisfy Assessment. This is the minimum performance required to Section J. Any relaxation of these values will need to be confirmed for compliance in writing by the Section J Certifying consultant.

Refer to the insulation markups in the appendix for a detailed breakdown of the insulation performance.

ELEMENT	PERFORMANCE**
Roofs/Ceilings Exposed to Outside Air (Heat Flow Upward)	R <sub>T</sub> -Value = 3.2 (solar absorptance ≥ 0.45)
Internal Ceiling Construction (Separating Conditioned and Unconditioned Spaces)	R <sub>T</sub> -Value = 2.0
Exposed Suspended Floor Slab	R <sub>T</sub> -Value = 2.0
Concrete Slab on Ground (with no in-slab heating or cooling system presented) (Heat Flow Downward)	No additional thermal insulation requirement as per clause J4D7(2)
External Wall Construction	R <sub>T</sub> -Value = 1.4
Internal Wall Construction	R <sub>T</sub> -Value = 1.4

# 4 RESULTS

## 4.1 GOLF CLUBHOUSE J1V3

A J1V3 Assessment has been completed in accordance with the requirements of NCC2022 Section J J1V3. This included:

- Modelling a reference building with reference services, using DtS Provisions for as outlined in Specification J1V3 and Part J4, J5, J6 and J7 of the code.
- Modelling a proposed building fabric with reference services, using the proposed constructions for the fabric and glazing, and DtS provisions for part J5, J6 and J7.

**The Annual Greenhouse Gas Emissions equivalency of each scenario has been modelled using appropriate software and methods. The study has found the design of the development complies with NCC 2022 Section J for Part J4, using the J1V3 Performance Solution pathway.**

The following results demonstrate that the proposed building envelope design matches the DtS design for energy use. The modelled results are per the below table and graph;

MODEL	HEATING (KGCO <sub>2</sub> E/ANNUM)	COOLING (KGCO <sub>2</sub> E/ANNUM)	LIGHTS & EQUIPMENT (KGCO <sub>2</sub> E/ANNUM)	TOTAL (KGCO <sub>2</sub> E/ANNUM)
REFERENCE	20,174	125,661	163,096	308,931
PROPOSED	21,148	124,677	163,096	308,920
REDUCTION				<b>0.0036%</b>
OUTCOME				Compliant

It is noted that the proposed building envelope must continue to demonstrate Deemed-To-Satisfy design compliance against the other parts of Section J not specifically addressed in this report, including but not limited to in Part J4, generally Part J4D3 for general thermal construction, Part J4D7(2) and Part J4D7(3) for floor edge insulation if relevant, Part J5 for building sealing, Part J9 for electric vehicle charging equipment and facilities for solar photovoltaic and battery systems and the like. Refer to Appendix D for the applicable clauses.

The building services elements (Part J6, Part J7, Part J8 and Part J9) of the NCC2022 Section J are required to meet DtS provisions, or compliance shall be demonstrated by the relevant services consultants through an alternate/performance pathway. This report does not relieve any other party of their duties, and certification is subject to the performance targets in this report being met.



## Appendix A **DTS Façade Calculator**





# Façade

Report



Calculator

## Project Summary

**Date**  
15/03/2024

**Name**  
Blake Crowley

**Company**  
E-LAB

**Position**  
Graduate Sustainability Engineer

**Building Name / Address**  
Cumberland Country Golf Club  
248 Old Prospect Road, Greystanes

**Building State**

NSW

**Climate Zone**  
Climate Zone 6 - Mild  
temperate

**Building Classification**  
Class 6 - restaurants, cafes,  
bars

**Stores Above Ground**  
3

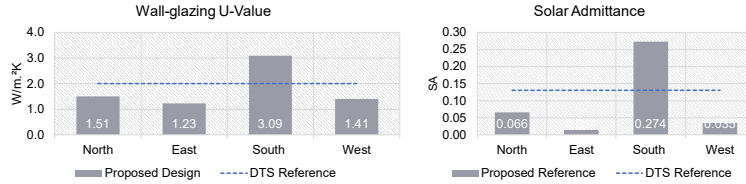
**Tool Version**  
1.2 (June 2020)

The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

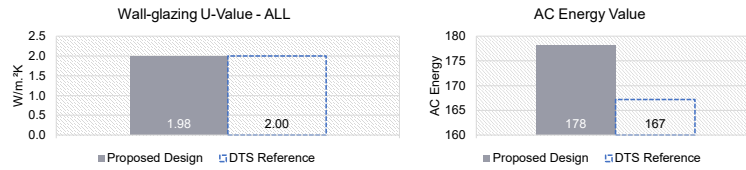
Compliant Solution =    
Non-Compliant Solution =  

	North	East	Method 1 South	West	Method 2 All
<b>Wall-glazing U-Value (W/m².K)</b>	1.51	1.23	3.09	1.41	1.98
<b>Solar Admittance</b>	0.07	0.01	0.27	0.04	
<b>AC Energy Value</b>					178

**Method 1**



**Method 2**



## Project Details

	North	East	South	West
<b>Glazing Area (m²)</b>	87.764	24.255	407.106	41.937
<b>Glazing to Façade Ratio</b>	22%	10%	91%	18%
<b>Glazing References</b>	GL01 GL02 GL03	GL01	GL01 GL02 GL03 GL04 GL05 GL06 GL07	GL01 GL02 GL03
<b>Glazing System Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Glass Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Frame Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Average Glazing U-Value (W/m².K)</b>	3.30	3.30	3.30	3.30
<b>Average Glazing SHGC</b>	0.40	0.40	0.40	0.40
<b>Shading Systems</b>	Horizontal Device	Horizontal Device	Horizontal Device	Horizontal Device
<b>Wall Area (m²)</b>	307.123	213.709	41.654	192.453
<b>Wall Types</b>	Wall	Wall	Wall	Wall
<b>Methodology</b>	Wall			
<b>Wall Construction</b>	DIS Wall	DIS Wall	DIS Wall	DIS Wall
<b>Wall Thickness</b>	100	100	100	100
<b>Average Wall R-value (m².K/W)</b>	1.00	1.00	1.00	1.00
<b>Solar Absorptance</b>	0.6	0.6	0.6	0.6



# Façade

Report



Calculator

## Project Summary

**Date**  
15/03/2024

**Name**  
Blake Crowley

**Company**  
E-LAB

**Position**  
Graduate Sustainability Engineer

**Building Name / Address**  
Cumberland Country Golf Club  
248 Old Prospect Road, Greystanes

**Building State**

NSW

**Climate Zone**  
Climate Zone 6 - Mild temperate

**Building Classification**  
Class 6 - restaurants, cafes, bars

**Stores Above Ground**  
3

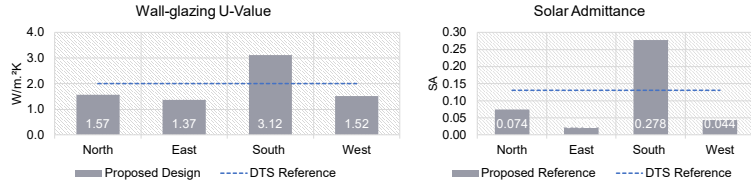
**Tool Version**  
1.2 (June 2020)

The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

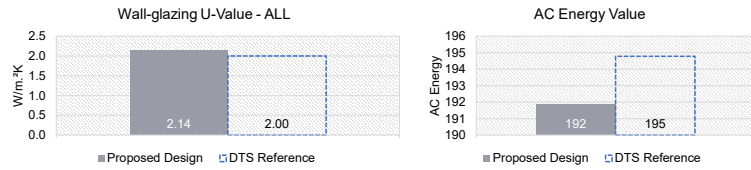
Compliant Solution =    
Non-Compliant Solution =  

	North	East	Method 1 South	West	Method 2 All
<b>Wall-glazing U-Value (W/m².K)</b>	1.57	1.37	3.12	1.52	2.14
<b>Solar Admittance</b>	0.07	0.02	0.28	0.04	
<b>AC Energy Value</b>					192

### Method 1



### Method 2



## Project Details

	North	East	South	West
<b>Glazing Area (m²)</b>	87.764	24.255	407.106	41.937
<b>Glazing to Façade Ratio</b>	25%	16%	92%	23%
<b>Glazing References</b>	GL01 GL02 GL03	GL01	GL01 GL02 GL03 GL04 GL05 GL06 GL07	GL01 GL02 GL03
<b>Glazing System Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Glass Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Frame Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Average Glazing U-Value (W/m².K)</b>	3.30	3.30	3.30	3.30
<b>Average Glazing SHGC</b>	0.40	0.40	0.40	0.40
<b>Shading Systems</b>	Horizontal Device	Horizontal Device	Horizontal Device	Horizontal Device
<b>Wall Area (m²)</b>	264.136	127.293	34.439	144.163
<b>Wall Types</b>	Wall	Wall	Wall	Wall
<b>Methodology</b>	Wall			
<b>Wall Construction</b>	DIS Wall	DIS Wall	DIS Wall	DIS Wall
<b>Wall Thickness</b>	100	100	100	100
<b>Average Wall R-value (m².K/W)</b>	1.00	1.00	1.00	1.00
<b>Solar Absorptance</b>	0.6	0.6	0.6	0.6



# Façade

Report



Calculator

## Project Summary

**Date**  
15/03/2024

**Name**  
Blake Crowley

**Company**  
E-LAB

**Position**  
Graduate Sustainability Engineer

**Building Name / Address**  
Cumberland Aged Care  
248 OLD PROSPECT RD, GREYSTANES

**Building State**

NSW

**Climate Zone**  
Climate Zone 6 - Mild temperate

**Building Classification**

Class 9c - aged care building

**Stores Above Ground**

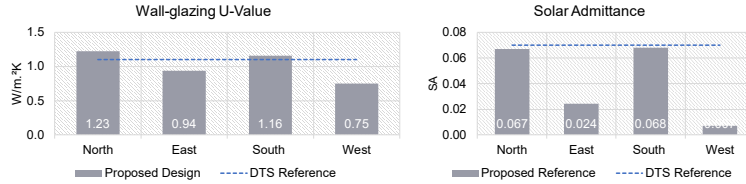
3  
**Tool Version**  
1.2 (June 2020)

The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

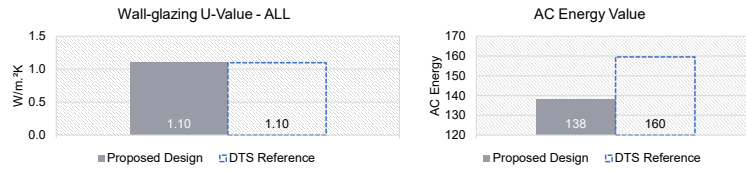
Compliant Solution =    
Non-Compliant Solution =  

	North	East	Method 1 South	West	Method 2 All
<b>Wall-glazing U-Value (W/m<sup>2</sup>.K)</b>	1.23	0.94	1.16	0.75	1.10
<b>Solar Admittance</b>	0.07	0.02	0.07	0.01	
<b>AC Energy Value</b>					138

Method 1



Method 2



## Project Details

	North	East	South	West
<b>Glazing Area (m<sup>2</sup>)</b>	411.058	67.115	334.866	10.8
<b>Glazing to Façade Ratio</b>	53%	23%	46%	4%
<b>Glazing References</b>	GL01 GL02 GL03 GL04 GL06 GL07 GL08 GL10 GL11 GL12	GL01 GL02	GL01 GL02 GL03 GL04 GL05 GL06 GL07 GL08 GL09	GL01
<b>Glazing System Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Glass Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Frame Types</b>	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
<b>Average Glazing U-Value (W/m<sup>2</sup>.K)</b>	1.68	1.68	1.68	1.68
<b>Average Glazing SHGC</b>	0.19	0.19	0.19	0.19
<b>Shading Systems</b>	Horizontal	Horizontal	Horizontal	Horizontal
<b>Wall Area (m<sup>2</sup>)</b>	365.248	222.723	393.9	274.078
<b>Wall Types</b>	Wall	Wall	Wall	Wall
<b>Methodology</b>	Wall			
<b>Wall Construction</b>	DIS Wall	DIS Wall	DIS Wall	DIS Wall
<b>Wall Thickness</b>	100	100	100	100
<b>Average Wall R-value (m<sup>2</sup>.K/W)</b>	1.40	1.40	1.40	1.40
<b>Solar Absorptance</b>	0.6	0.6	0.6	0.6



# Façade

Report



Calculator

## Project Summary

Date  
15/03/2024

Name  
Blake Crowley

Company  
E-LAB

Position  
Graduate Sustainability Engineer

Building Name / Address  
Cumberland Aged Care  
248 OLD PROSPECT RD, GREYSTANES

Building State  
NSW

Climate Zone  
Climate Zone 6 - Mild  
temperate

Building Classification  
Class 9c - aged care building

Stores Above Ground  
3

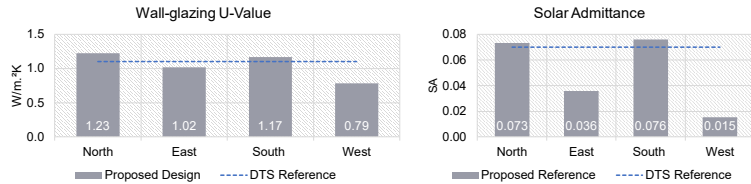
Tool Version  
1.2 (June 2020)

The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

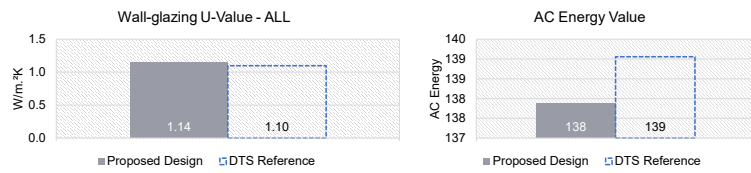
Compliant Solution =   
Non-Compliant Solution =

	North	East	Method 1 South	West	Method 2 All
Wall-glazing U-Value (W/m <sup>2</sup> .K)	1.23	1.02	1.17	0.79	1.14
Solar Admittance	0.07	0.04	0.08	0.02	
AC Energy Value					138

Method 1



Method 2



## Project Details

	North	East	South	West
Glazing Area (m <sup>2</sup> )	411.058	67.115	334.866	10.8
Glazing to Façade Ratio	58%	34%	51%	8%
Glazing References	GL01 GL02 GL03 GL04 GL06 GL07 GL08 GL10 GL11 GL12	GL01 GL02	GL01 GL02 GL03 GL04 GL05 GL06 GL07 GL08 GL09	GL01
Glazing System Types	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
Glass Types	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
Frame Types	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)	DEFAULTS (GENERIC)
Average Glazing U-Value (W/m <sup>2</sup> .K)	1.60	1.60	1.60	1.60
Average Glazing SHGC	0.19	0.19	0.19	0.19
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m <sup>2</sup> )	300.888	129.255	318.17	122.17
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	DIS Wall	DIS Wall	DIS Wall	DIS Wall
Wall Thickness	100	100	100	100
Average Wall R-value (m <sup>2</sup> .K/W)	1.40	1.40	1.40	1.40
Solar Absorptance	0.6	0.6	0.6	0.6

## Appendix B    **Insulation Spaces Markups**



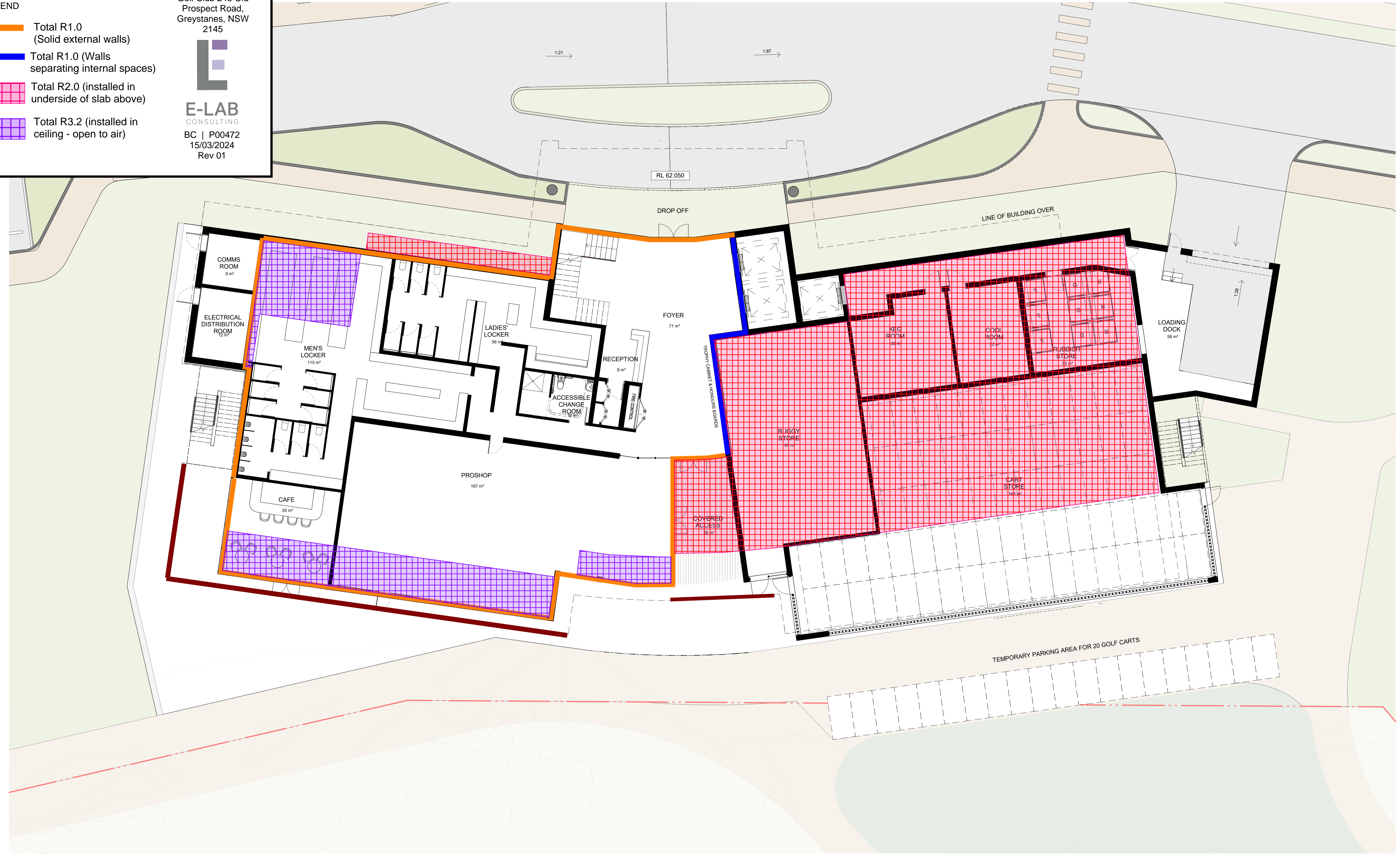
# Insulation Mark-ups

- LEGEND**
- Total R1.0 (Solid external walls)
  - Total R1.0 (Walls separating internal spaces)
  - Total R2.0 (installed in underside of slab above)
  - Total R3.2 (installed in ceiling - open to air)

Cumberland Country Golf Club 248 Old Prospect Road, Greystanes, NSW 2145



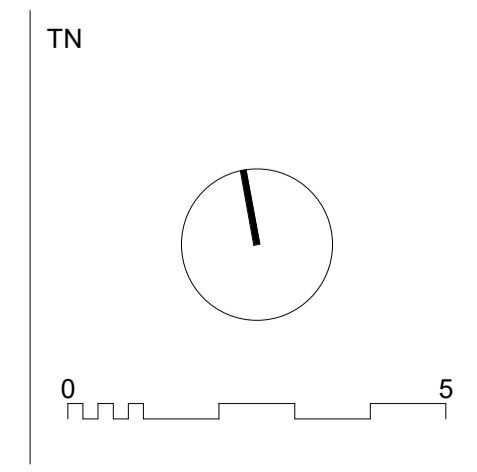
**E-LAB**  
CONSULTING  
BC | P00472  
15/03/2024  
Rev 01



**IMPORTANT NOTES**  
Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Larger scale drawings and written dimensions take preference. This drawing is copyright and the property of the author, and must not be retained, copied or used without the express authority of MARCHESE PARTNERS INTERNATIONAL PTY. LTD.

**PRELIMINARY**  
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
P1	22/12/2023	TERMS OF ASSESSMENT SUBMISSION	DZ
P2	29/02/2024	ISSUED FOR CONSULTANTS	DZ



**marchesepartners** Life<sup>3A</sup>

Marchese Partners International Pty Ltd  
Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia  
P +61 2 9922 4375 E info@marchesepartners.com W www.marchesepartners.com

CLIENT  
**PARITER**

PROJECT  
**CUMBERLAND COUNTRY GOLF CLUB**  
248 OLD PROSPECT RD, GREYSTANES

DRAWING TITLE		SCALE		DATE	DRAWN	CHECKED
GOLF CLUB - GROUND LEVEL		1:100 @A1	1:200 @A3	29/02/2024	DZ	MS
20082	DA5.00					REVISION
						P2

DATE STAMP: 29/02/2024 4:23:16 PM

# Insulation Mark-ups

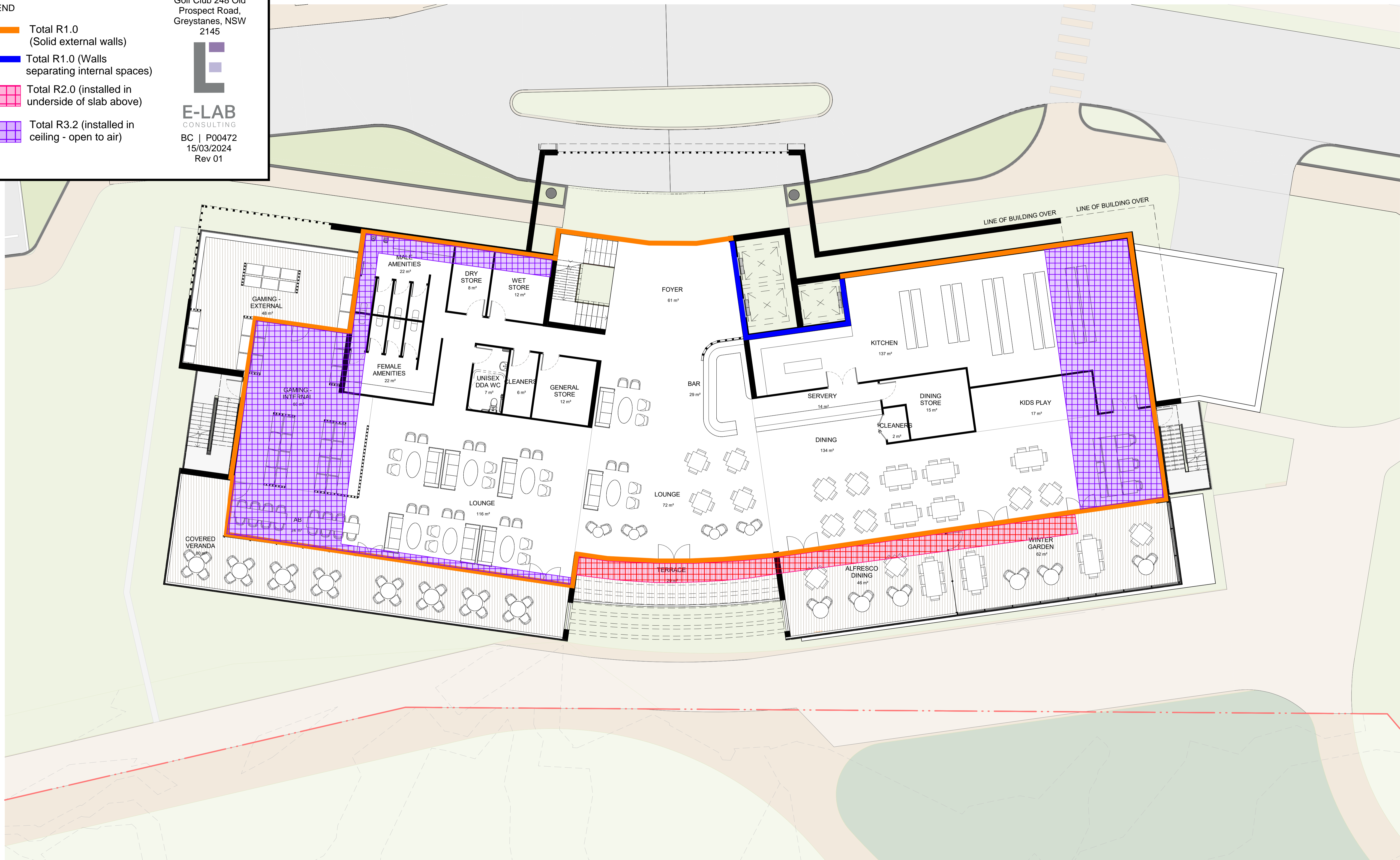
## LEGEND

- Total R1.0 (Solid external walls)
- Total R1.0 (Walls separating internal spaces)
- Total R2.0 (installed in underside of slab above)
- Total R3.2 (installed in ceiling - open to air)

Cumberland Country  
Golf Club 248 Old  
Prospect Road,  
Greystanes, NSW  
2145



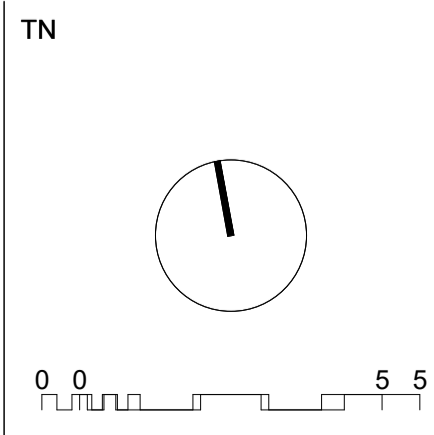
**E-LAB**  
CONSULTING  
BC | P00472  
15/03/2024  
Rev 01



**IMPORTANT NOTES**  
Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Larger scale drawings and written dimensions take preference. This drawing is copyright and the property of the author, and must not be retained, copied or used without the express authority of MARCHESE PARTNERS INTERNATIONAL PTY. LTD.

REV	DATE	DESCRIPTION	BY
P1	22/12/2023	TERMS OF ASSESSMENT SUBMISSION	DZ
P2	29/02/2024	ISSUED FOR CONSULTANTS	DZ

**PRELIMINARY**  
NOT FOR CONSTRUCTION



**marchesepartners** Life<sup>3A</sup>

Marchese Partners International Pty Ltd  
Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia  
P +61 2 9922 4375 E info@marchesepartners.com W www.marchesepartners.com

CLIENT  
**PARITER**

PROJECT  
**CUMBERLAND COUNTRY GOLF CLUB**  
248 OLD PROSPECT RD, GREYSTANES

DRAWING TITLE  
**GOLF CLUB - LEVEL 1**

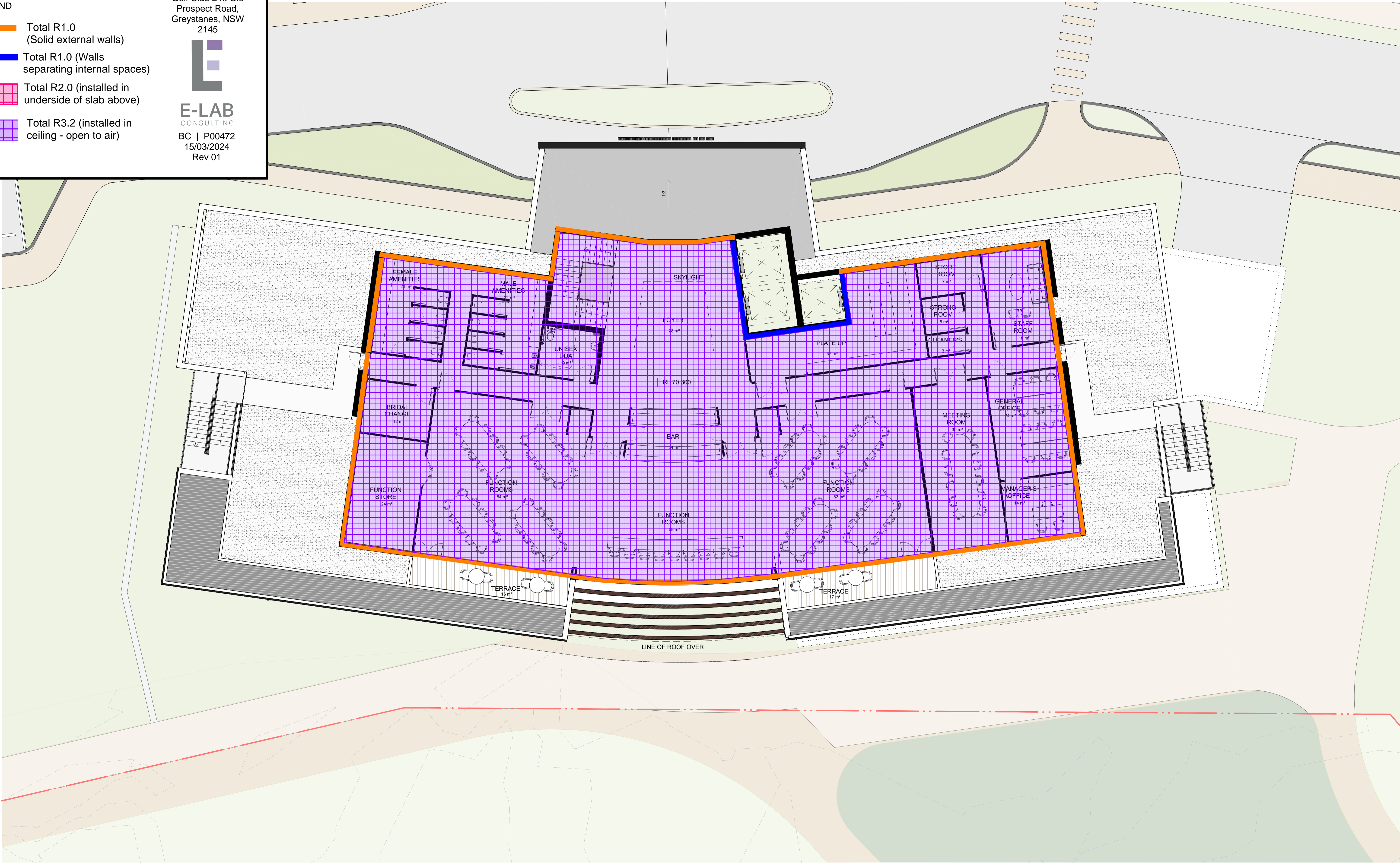
SCALE	DATE	DRAWN	CHECKED
1:100 @A1	29/02/2024	DZ	MS
1:200 @A3			REVISION
JOB <b>20082</b>	DRAWING <b>DA5.01</b>		<b>P2</b>

DATE STAMP: 29/02/2024 4:23:33 PM

# Insulation Mark-ups

- LEGEND**
- █ Total R1.0 (Solid external walls)
  - █ Total R1.0 (Walls separating internal spaces)
  - █ Total R2.0 (installed in underside of slab above)
  - █ Total R3.2 (installed in ceiling - open to air)

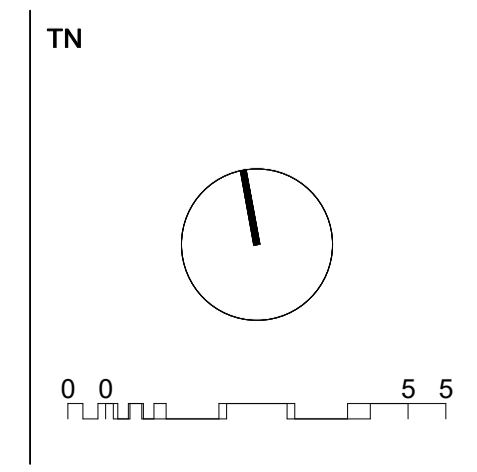
Cumberland Country Golf Club 248 Old Prospect Road, Greystanes, NSW 2145



**IMPORTANT NOTES**  
Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Larger scale drawings and written dimensions take preference. This drawing is copyright and the property of the author, and must not be retained, copied or used without the express authority of MARCHESE PARTNERS INTERNATIONAL PTY. LTD.

**PRELIMINARY**  
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
P1	22/12/2023	TERMS OF ASSESSMENT SUBMISSION	DZ
P2	29/02/2024	ISSUED FOR CONSULTANTS	DZ



**marchesepartners** Life<sup>3A</sup>  
Marchese Partners International Pty Ltd  
Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia  
P +61 2 9922 4375 E info@marchesepartners.com W www.marchesepartners.com

CLIENT  
**PARITER**  
PROJECT  
**CUMBERLAND COUNTRY GOLF CLUB**  
248 OLD PROSPECT RD, GREYSTANES

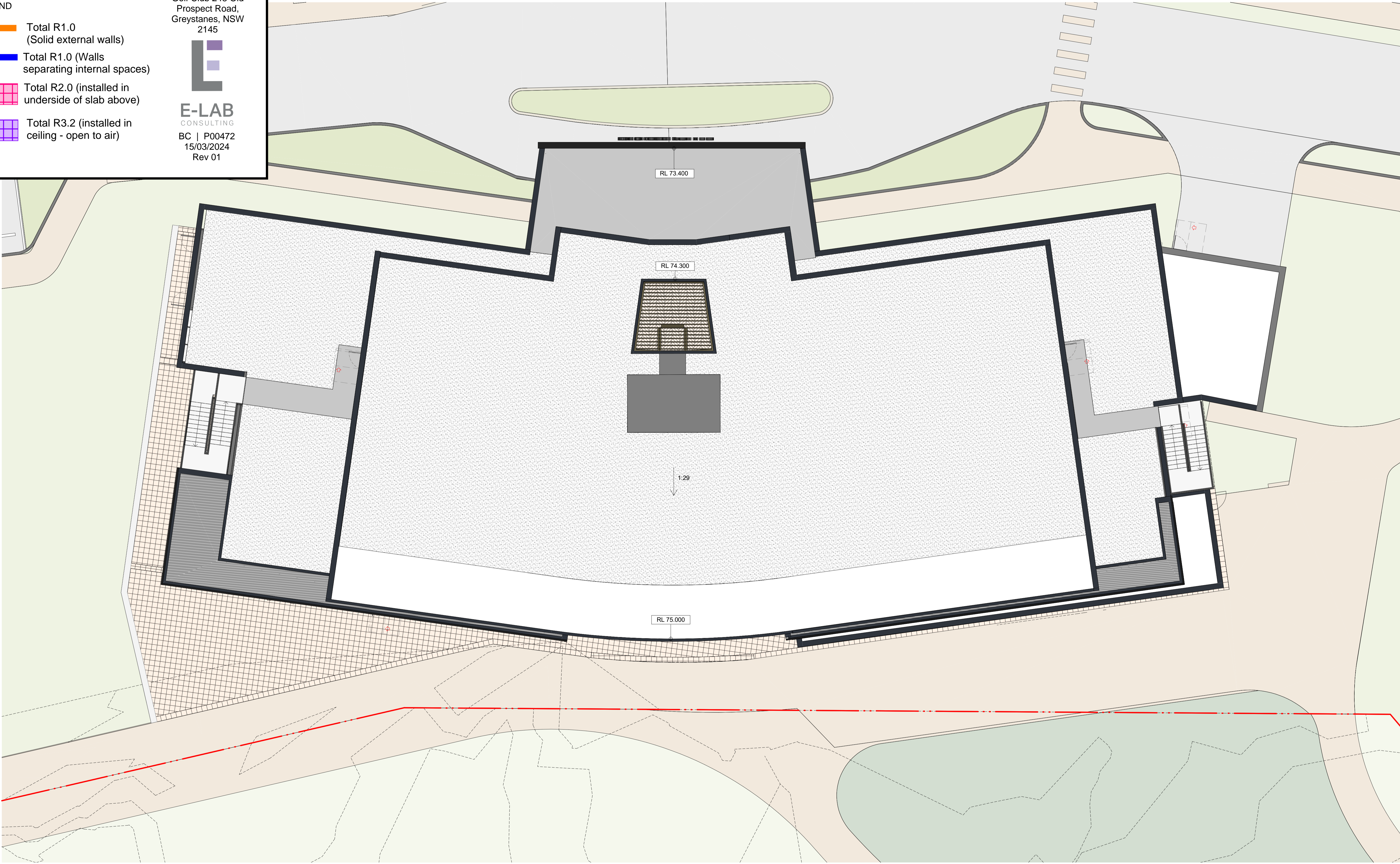
DRAWING TITLE		SCALE		DATE		DRAWN		CHECKED	
GOLF CLUB - LEVEL 2		1:100 @A1 1:200 @A3		29/02/2024		DZ		MS	
20082		DA5.02						REVISION P2	

DATE STAMP: 29/02/2024 4:23:52 PM

**Insulation Mark-ups**

- LEGEND**
- Total R1.0 (Solid external walls)
  - Total R1.0 (Walls separating internal spaces)
  - Total R2.0 (installed in underside of slab above)
  - Total R3.2 (installed in ceiling - open to air)

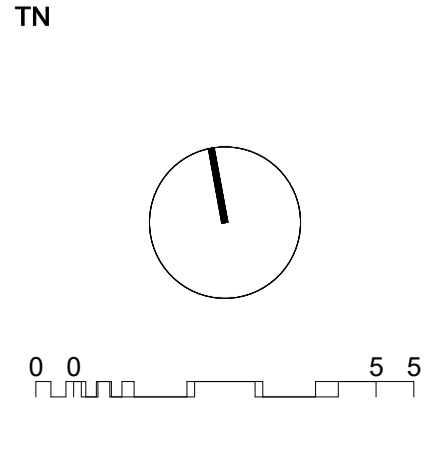
Cumberland Country Golf Club 248 Old Prospect Road, Greystanes, NSW 2145



**IMPORTANT NOTES**  
Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Larger scale drawings and written dimensions take preference. This drawing is copyright and the property of the author, and must not be retained, copied or used without the express authority of MARCHESE PARTNERS INTERNATIONAL PTY. LTD.

REV	DATE	DESCRIPTION	BY
P1	22/12/2023	TERMS OF ASSESSMENT SUBMISSION	DZ
P2	29/02/2024	ISSUED FOR CONSULTANTS	DZ

**PRELIMINARY**  
NOT FOR CONSTRUCTION



**marchesepartners** Life<sup>3A</sup>  
Marchese Partners International Pty Ltd  
Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia  
P +61 2 9922 4375 E info@marchesepartners.com W www.marchesepartners.com

CLIENT  
**PARITER**  
PROJECT  
**CUMBERLAND COUNTRY GOLF CLUB**  
248 OLD PROSPECT RD, GREYSTANES

DRAWING TITLE			
<b>GOLF CLUB - ROOF LEVEL</b>			
SCALE	DATE	DRAWN	CHECKED
1:100 @A1	29/02/2024	DZ	MS
1:200 @A3			
JOB	DRAWING		REVISION
20082	DA5.03		P2

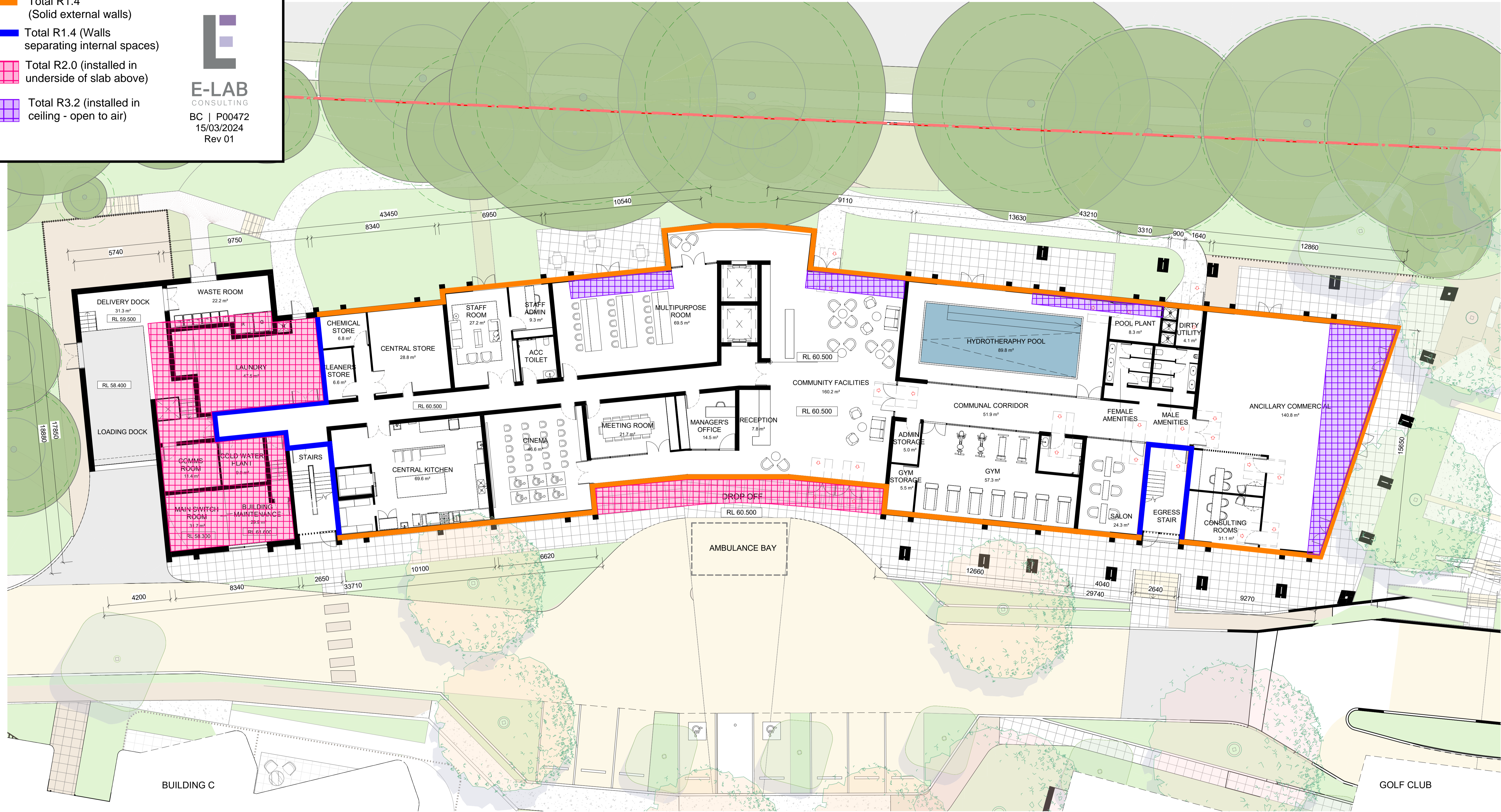
DATE STAMP: 29/02/2024 4:24:13 PM

# Insulation Mark-ups

Cumberland Care Hub  
248 Old Prospect  
Road, Greystanes,  
NSW 2145



- LEGEND**
- █ Total R1.4 (Solid external walls)
  - █ Total R1.4 (Walls separating internal spaces)
  - █ Total R2.0 (installed in underside of slab above)
  - █ Total R3.2 (installed in ceiling - open to air)

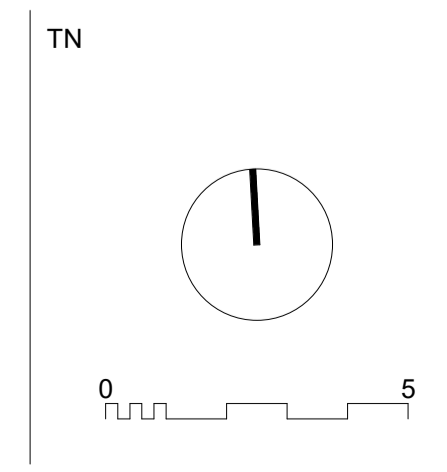


DATE STAMP: 11/03/2024 5:40:02 PM

**IMPORTANT NOTES**  
Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Larger scale drawings and written dimensions take preference. This drawing is copyright and the property of the author, and must not be retained, copied or used without the express authority of MARCHESE PARTNERS INTERNATIONAL PTY. LTD.

**PRELIMINARY**  
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
A	11/03/2024	DA SUBMISSION	DZ



**marchesepartners** Life<sup>3A</sup>

Marchese Partners International Pty Ltd  
Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia  
P +61 2 9922 4375 E info@marchesepartners.com W www.marchesepartners.com

CLIENT  
**PARITER**

PROJECT  
**CUMBERLAND COUNTRY GOLF CLUB**  
248 OLD PROSPECT RD, GREYSTANES

DRAWING TITLE  
**CARE HUB - GROUND LEVEL**

SCALE  
1:125 @A1  
1:250 @A3  
JOB  
**20082**

DATE  
11/03/2024

DRAWN  
DZ

CHECKED  
MS

REVISION  
A

DRAWING  
DA5.10

# Insulation Mark-ups

Cumberland Care Hub  
248 Old Prospect  
Road, Greystanes,  
NSW 2145



BC | P00472  
15/03/2024  
Rev 01

- LEGEND**
- █ Total R1.4 (Solid external walls)
  - █ Total R1.4 (Walls separating internal spaces)
  - █ Total R2.0 (installed in underside of slab above)
  - █ Total R3.2 (installed in ceiling - open to air)



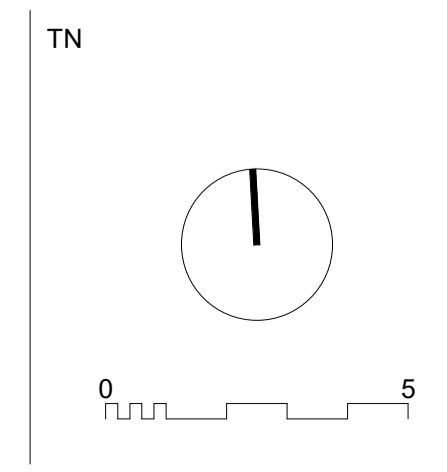
BUILDING C

GOLF CLUB

**IMPORTANT NOTES**  
Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Larger scale drawings and written dimensions take preference. This drawing is copyright and the property of the author, and must not be retained, copied or used without the express authority of MARCHESE PARTNERS INTERNATIONAL PTY. LTD.

**PRELIMINARY**  
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
A	11/03/2024	DA SUBMISSION	DZ



**marchesepartners** Life<sup>3A</sup>  
Marchese Partners International Pty Ltd  
Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia  
P +61 2 9922 4375 E info@marchesepartners.com W www.marchesepartners.com

CLIENT  
**PARITER**  
PROJECT  
**CUMBERLAND COUNTRY GOLF CLUB**  
248 OLD PROSPECT RD, GREYSTANES

DRAWING TITLE		SCALE		DATE	DRAWN	CHECKED
CARE HUB - LEVEL 01		1:125 @A1	1:250 @A3	11/03/2024	DZ	MS
JOB		20082		DRAWING	DA5.11	REVISION
						A

DATE STAMP: 11/03/2024 5:03:34 PM

# Insulation Mark-ups

Cumberland Care Hub  
248 Old Prospect  
Road, Greystanes,  
NSW 2145



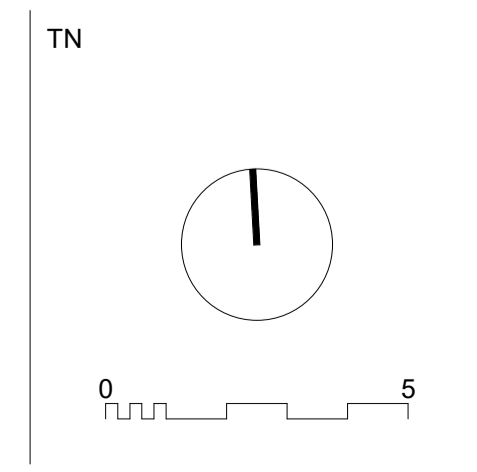
- LEGEND**
- █ Total R1.4 (Solid external walls)
  - █ Total R1.4 (Walls separating internal spaces)
  - █ Total R2.0 (installed in underside of slab above)
  - █ Total R3.2 (installed in ceiling - open to air)



**IMPORTANT NOTES**  
Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Larger scale drawings and written dimensions take preference. This drawing is copyright and the property of the author, and must not be retained, copied or used without the express authority of MARCHESE PARTNERS INTERNATIONAL PTY. LTD.

**PRELIMINARY**  
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
A	11/03/2024	DA SUBMISSION	DZ



**marchesepartners** Life<sup>3A</sup>  
Marchese Partners International Pty Ltd  
Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia  
P +61 2 9922 4375 E info@marchesepartners.com W www.marchesepartners.com

CLIENT  
**PARITER**  
PROJECT  
**CUMBERLAND COUNTRY GOLF CLUB**  
248 OLD PROSPECT RD, GREYSTANES

DRAWING TITLE		SCALE	DATE	DRAWN	CHECKED
CARE HUB - LEVEL 02		1:125 @A1 1:250 @A3	11/03/2024	DZ	MS
JOB		20082	DRAWING	DA5.12	REVISION
					A

DATE STAMP: 11/03/2024 5:41:05 PM

# Insulation Mark-ups

Cumberland Care Hub  
248 Old Prospect  
Road, Greystanes,  
NSW 2145



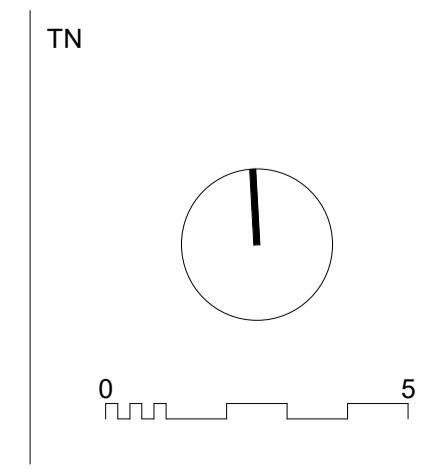
- LEGEND**
- Total R1.4 (Solid external walls)
  - Total R1.4 (Walls separating internal spaces)
  - Total R2.0 (installed in underside of slab above)
  - Total R3.2 (installed in ceiling - open to air)



**IMPORTANT NOTES**  
Do not scale from drawings. All dimensions to be checked on site before commencement of work. All discrepancies to be brought to the attention of the Architect. Larger scale drawings and written dimensions take preference. This drawing is copyright and the property of the author, and must not be retained, copied or used without the express authority of MARCHESE PARTNERS INTERNATIONAL PTY. LTD.

**PRELIMINARY**  
NOT FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY
A	11/03/2024	DA SUBMISSION	DZ



**marchesepartners** Life<sup>3A</sup>

Marchese Partners International Pty Ltd  
Level 1, 53 Walker Street, North Sydney, NSW 2060 Australia  
P +61 2 9922 4375 E info@marchesepartners.com W www.marchesepartners.com

CLIENT  
**PARITER**

PROJECT  
**CUMBERLAND COUNTRY GOLF CLUB**  
248 OLD PROSPECT RD, GREYSTANES

DRAWING TITLE			
<b>CARE HUB - ROOF LEVEL</b>			
SCALE	DATE	DRAWN	CHECKED
1:125 @A1	11/03/2024	DZ	MS
1:250 @A3			REVISION
JOB	DRAWING		A
20082	DA5.13		

## Appendix C Profiles and Performance Inputs

INPUT	REFERENCE	PROPOSED
Climate Zone (Weather File)	Climate Zone 6 - AUS_NSW_Sydney.Olympic.Park.Archery.Centre.957650_TMYx.2007-2021.epw	
Geometry	To match the proposed	As per the design
Profiles	As outlined in Specification 35 and detailed in this appendix	
Lighting Levels	Per Part J7 Table J7D3a Maximum illumination Power Density	
Occupant Density	Per NCC2022 Part D Table D2D18: Area per person according to use	
Internal Heat Gains	As outlined in Specification 35 - Table S35C2I	
Construction Thermal Performance	Per Part J4	As per proposed outlined in Section 3
Glazing Suite Performance	Per Part J4 Dts Façade Calculator, documented in Appendix A	As Per proposed outlined in Section 3
Building Services Design	VRF Systems for Heating and Cooling	
Cooling COP	2.9	2.9
Heating COP	0.9	0.9
Cooling Fuel	Grid Electricity	Grid Electricity
Heating Fuel	Natural Gas	Natural Gas
Space Temperature Range	21 – 24 °C	21 – 24 °C
Outdoor Air Rate	In line with code minimum for Part F6D6 Modelled at 7.5L/s/person	
Infiltration Air Change Rate	Per Specification 34, S34C2(d): 0.7 ACH when plant is not operating 0.35 ACH when plant is operating	



## Appendix D Applicable Clauses

### Part J1 Energy efficiency performance requirements

#### J1V3 Verification using a reference building

[2019: JV3]

- (1) For a Class 3, 5, 6, 7, 8 or 9 building or common area of a Class 2 building, compliance with J1P1 is verified when—
  - (a) it is determined that the *annual greenhouse gas emissions* of the proposed building are not more than the *annual greenhouse gas emissions* of a *reference building* when—
    - (i) the proposed building is modelled with the proposed *services*; and
    - (ii) the proposed building is modelled with the same *services* as the *reference building*; and
  - (b) in the proposed building, a *thermal comfort level* of between a *Predicted Mean Vote* of -1 to +1 is achieved across not less than 95% of the *floor area* of all occupied zones for not less than 98% of the annual *hours of operation* of the building; and
  - (c) the building complies with the additional requirements in *Specification 33*.
- (2) The *annual greenhouse gas emissions* of the proposed building may be offset by—
  - (a) *renewable energy* generated and used on *site*; and
  - (b) another process such as reclaimed energy, used on *site*.
- (3) The calculation method used for (1) and (2) must comply with—
  - (a) ANSI/ASHRAE Standard 140; and
  - (b) *Specification 34*.

### Specification 33 Additional requirements

#### S33C1 Scope

[2019: Spec JV a: 1]

This Specification contains requirements that must be complied with in addition to the modelling requirements of J1V1, J1V2, J1V3 and J1V5.

#### S33C2 Additional requirements — general

[2019: Spec JV a: 2]

In addition to the modelling requirements for J1V1, J1V2, J1V3 and J1V5, a building must comply with—

- (a) for general thermal construction, J4D3; and
- (b) for floor edge insulation, J4D7(2) and J4D7(3); and
- (c) for building sealing, J1V4 or J5; and



## J4D3 Thermal construction — general

[2019: J1.2]

- (1) Where *required*, insulation must comply with AS/NZS 4859.1 and be installed so that it—
  - (a) 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
  - (b) forms a continuous barrier with ceilings, walls, bulkheads, floors or the like that inherently contribute to the thermal barrier; and
  - (c) does not affect the safe or effective operation of a *service* or fitting.
- (2) Where *required*, *reflective insulation* must be installed with—
  - (a) the necessary airspace to achieve the *required R-Value* between a reflective side of the *reflective insulation* and a building lining or cladding; and
  - (b) the *reflective insulation* closely fitted against any penetration, door or *window* opening; and
  - (c) the *reflective insulation* adequately supported by framing members; and
  - (d) each adjoining sheet of roll membrane being—
    - (i) overlapped not less than 50 mm; or
    - (ii) taped together.
- (3) Where *required*, bulk insulation must be installed so that—
  - (a) 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
  - (b) 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.
- (4) Roof, ceiling, wall and floor materials, and associated surfaces are deemed to have the thermal properties listed in *Specification 36*.
- (5) The *required Total R-Value* and *Total System U-Value*, including allowance for thermal bridging, must be—
  - (a) calculated in accordance with AS/NZS 4859.2 for a roof or floor; or
  - (b) determined in accordance with *Specification 37* for *wall-glazing construction*; or
  - (c) determined in accordance with *Specification 39* or Section 3.5 of CIBSE Guide A for soil or sub-floor spaces.

## J4D7 Floors

[2019: J1.6]

- (2) For the purposes of (1), a slab-on-ground that does not have an in-slab heating or cooling system is considered to achieve a *Total R-Value* of R2.0, except—
  - (a) in *climate zone 8*; or
  - (b) a Class 3, Class 9a *ward area* or Class 9b building in *climate zone 7* that has a *floor area* to floor perimeter ratio of less than or equal to 2.
- (3) A floor must be insulated around the vertical edge of its perimeter with insulation having an *R-Value* greater than or equal to 1.0 when the floor—
  - (a) is a concrete slab-on-ground in *climate zone 8*; or
  - (b) has an in-slab or in-screed heating or cooling system, except where used solely in a bathroom, amenity area or the like.



## Part J5 Building sealing

### Deemed-to-Satisfy Provisions

#### J5D1 Deemed-to-Satisfy Provisions

[2019: J3.0]

NSW J5D1(1)

- (1) Where a *Deemed-to-Satisfy Solution* is proposed, *Performance Requirements* J1P1 to J1P4 are satisfied by complying with—
  - (a) J2D2; and
  - (b) J3D2 to J3D15; and
  - (c) J4D2 to J4D7; and
  - (d) J5D2 to J5D8; and
  - (e) J6D2 to J6D13; and
  - (f) J7D2 to J7D9; and
  
  - (g) J8D2 to J8D4; and
  - (h) J9D2 to J9D5.
- (2) Where a *Performance Solution* is proposed, the relevant *Performance Requirements* must be determined in accordance with A2G2(3) and A2G4(3) as applicable.

NSW J5D2

#### J5D2 Application of Part

[2019: J3.1]

The *Deemed-to-Satisfy Provisions* of this Part apply to elements forming the *envelope* of a Class 2 to 9 building, other than—

- (a) a building in *climate zones* 1, 2, 3 and 5 where the only means of *air-conditioning* is by using an evaporative cooler; or
- (b) a permanent building opening, in a space where a gas appliance is located, that is necessary for the safe operation of a gas appliance; or
- (c) a building or space where the mechanical ventilation *required* by Part F6 provides sufficient pressurisation to prevent infiltration.

#### J5D3 Chimneys and flues

[2019: J3.2]

The chimney or flue of an open solid-fuel burning appliance must be provided with a damper or flap that can be closed to seal the chimney or flue.

#### J5D4 Roof lights

[2019: J3.3]

- (1) A *roof light* must be sealed, or capable of being sealed, when serving—
  - (a) a *conditioned space*; or
  - (b) a *habitable room* in *climate zones* 4, 5, 6, 7 or 8.
- (2) A *roof light required* by (1) to be sealed, or capable of being sealed, must be constructed with—
  - (a) an imperforate ceiling diffuser or the like installed at the ceiling or internal lining level; or
  - (b) a weatherproof seal; or
  - (c) a shutter system readily operated either manually, mechanically or electronically by the occupant.



**J5D5 Windows and doors**

[2019: J3.4]

- (1) A door, openable *window* or the like must be sealed—
  - (a) when forming part of the *envelope*; or
  - (b) in *climate zones* 4, 5, 6, 7 or 8.
- (2) The requirements of (1) do not apply to—
  - (a) a *window* complying with AS 2047; or
  - (b) a fire door or smoke door; or
  - (c) a roller shutter door, roller shutter grille or other security door or device installed only for out-of-hours security.
- (3) A seal to restrict air infiltration—
  - (a) for the bottom edge of a door, must be a draft protection device; and
  - (b) for the other edges of a door or the edges of an openable *window* or other such opening, may be a foam or rubber compression strip, fibrous seal or the like.
- (4) An entrance to a building, if leading to a *conditioned space* must have an airlock, *self-closing door*, *rapid roller door*, revolving door or the like, other than—
  - (a) where the *conditioned space* has a *floor area* of not more than 50 m<sup>2</sup>; or
  - (b) where a café, restaurant, open front shop or the like has—
    - (i) a 3 m deep un-conditioned zone between the main entrance, including an open front, and the *conditioned space*; and
    - (ii) at all other entrances to the café, restaurant, open front shop or the like, *self-closing doors*.
- (5) A loading dock entrance, if leading to a *conditioned space*, must be fitted with a *rapid roller door* or the like.

**J5D6 Exhaust fans**

[2019: J3.5]

An exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving—

- (a) a *conditioned space*; or
- (b) a *habitable room* in *climate zones* 4, 5, 6, 7 or 8.

**J5D7 Construction of ceilings, walls and floors**

[2019: J3.6]

- (1) Ceilings, walls, floors and any opening such as a *window* frame, door frame, *roof light* frame or the like must be constructed to minimise air leakage in accordance with (2)—
  - (a) when forming part of the *envelope*; or
  - (b) in *climate zones* 4, 5, 6, 7 or 8.
- (2) Construction *required* by (1) must be—
  - (a) enclosed by internal lining systems that are close fitting at ceiling, wall and floor junctions; or
  - (b) sealed at junctions and penetrations with—
    - (i) close fitting architrave, skirting or cornice; or
    - (ii) expanding foam, rubber compressible strip, caulking or the like.
- (3) The requirements of (1) do not apply to openings, grilles or the like *required* for smoke hazard management.

**J5D8 Evaporative coolers**

[2019: J3.7]

An evaporative cooler must be fitted with a self-closing damper or the like—

- (a) when serving a heated space; or
- (b) in *climate zones* 4, 5, 6, 7 or 8.



## Part J9 Energy monitoring and on-site distributed energy resources

### J9D4 Facilities for electric vehicle charging equipment

[New for 2022]

- (1) Subject to (2), a *carpark* associated with a Class 2, 3, 5, 6, 7b, 8 or 9 building must be provided with electrical distribution boards dedicated to electric vehicle charging—
  - (a) in accordance with Table J9D4 in each *storey* of the *carpark*; and
  - (b) labelled to indicate use for electric vehicle charging equipment.
- (2) Electrical distribution boards dedicated to serving electric vehicle charging in a *carpark* must—
  - (a) be fitted with a charging control system with the ability to manage and schedule charging of electric vehicles in response to total building demand; and
  - (b) when associated with a Class 2 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 11:00 pm to 7:00 am daily; and
  - (c) when associated with a Class 5 to 9 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 12 kWh from 9:00 am to 5:00 pm daily; and
  - (d) when associated with a Class 3 building, have capacity for each circuit to support an electric vehicle charger able to deliver a minimum of 48 kWh from 11:00 pm to 7:00 am daily; and
  - (e) be sized to support the future installation of a 7 kW (32 A) type 2 electric vehicle charger in—
    - (i) 100% of the car parking spaces associated with a Class 2 building; or
    - (ii) 10% of car parking spaces associated with a Class 5 or 6 building; or
    - (iii) 20% of car parking spaces associated with a Class 3, 7b, 8 or 9 building; and
  - (f) contain space of at least 36 mm width of DIN rail per outgoing circuit for individual sub-circuit electricity metering to record electricity use of electric vehicle charging equipment; and
  - (g) be labelled to indicate the use of the space *required* by (f) is for the future installation of metering equipment.

#### Limitations

J9D4 does not apply to a stand-alone Class 7a building.

Table J9D4: Electric vehicle distribution board requirement for each storey of a carpark

<i>Carpark</i> spaces per <i>storey</i> for electric vehicles	Electrical distribution boards for electric vehicle charging per <i>storey</i>
0 - 9	0
10 - 24	1
25 - 48	2
49 - 72	3
73 - 96	4
97 - 120	5
121 - 144	6
145 - 168	7

#### Table Notes

Where there are more than 168 *carpark* spaces per *storey*, one additional distribution board must be provided for each additional 24 spaces or part thereof.



## J9D5

## Facilities for solar photovoltaic and battery systems

[New for 2022]

- (1) The main electrical switchboard of a building must—
  - (a) contain at least two empty three-phase circuit breaker slots and four DIN rail spaces labelled to indicate the use of each space for—
    - (i) a solar photovoltaic system; and
    - (ii) a *battery system*; and
  - (b) be sized to accommodate the installation of solar photovoltaic panels producing their maximum electrical output on at least 20% of the building roof area.
- (2) At least 20% of the roof area of a building must be left clear for the installation of solar photovoltaic panels, except for buildings—
  - (a) with installed solar photovoltaic panels on—
    - (i) at least 20% of the roof area; or
    - (ii) an equivalent generation capacity elsewhere on-site; or
  - (b) where 100% of the roof area is shaded for more than 70% of daylight hours; or
  - (c) with a roof area of not more than 55 m<sup>2</sup>; or
  - (d) where more than 50% of the roof area is used as a terrace, *carpark*, roof garden, *roof light* or the like.

### Limitations

- (1) The requirements of J9D5(1)(a)(i) and (b) do not apply to a building with solar photovoltaic panels installed on at least 20% of the roof area.
- (2) The requirements of J9D5(1)(a)(ii) and (b) do not apply to a building with *battery systems* installed.



