

PROPOSED SES FACILITY
45 Hutton St, Taroom, QLD 4420

NCC 2019 Building Code of Australia – Volume
1 Amendment 1

ENERGY EFFICIENCY REPORT

Client:	AMF Building Design
Project Number:	23-048
Revision:	1
Date:	19/05/2023
Purpose:	Approval

Cushway Blackford & Associates Pty Ltd
ABN 23 010 522 988

P 07 3896 1100

E reception@cushway.com.au

5 Trafalgar Street, Woolloongabba QLD 4102
PO Box 1517, Coorparoo DC QLD 4151

Table of Contents

1. Executive Summary	3
1.1 Building Fabric Thermal Performance Requirements	3
2. Introduction	4
2.1 Building classification	4
2.2 Climate zone	4
3. Part J1 Building Fabric	4
3.1 J1.2 Thermal construction – general	4
3.2 J1.3 Roof and ceiling construction	4
3.3 J1.4 Roof lights	4
3.4 J1.5 Walls and glazing	4
3.5 J1.6 Floors	5
4. Part J3 Building Sealing	6
4.1 J3.4 Windows and doors	6
4.2 J3.5 Exhaust fans	6
4.3 J3.6 Construction of ceilings, walls and floors	6
4.4 J3.7 Evaporative coolers	6
Appendix 1 – J1.3 Proposed Ceiling Construction	7
Appendix 2 – Building Envelope Walls	8
Appendix 3 – Façade Calculator Results	8

1. Executive Summary

This Energy Efficiency Report has been prepared for the proposed new SES Facility at 45 Hutton ST, Taroom, QLD 4420.

The following are minimum thermal performance values for the building fabric to meet the NCC 2019 Deemed to Satisfy (DTS) energy efficiency requirements.

1.1 Building Fabric Thermal Performance Requirements

The proposed building fabric thermal performance requirements are as follows;

Roof and Ceiling (R_t3.7)

- Colorbond roof sheet (surfmist or similar finish with a solar absorptance of less than or equal to 0.45)
- Aircell foil faced blanket with a material R-value of **R_m0.15** and reflective foil downward facing (emittance 0.05)
- 100mm glasswool insulation blanket with a material R-value of **R_m2.5**
- Plasterboard Ceiling

External Walls (R_t1.4)

- 60mm Glasswool Insulation batts (**R_m1.5**) to external walls

Glazing performance

- External glazing – Total System Performance U-Value 5.8 SHGC 0.81

Floors

- No Insulation Required

2. Introduction

This report outlines the Deemed to Satisfy (DTS) requirements for the proposed new SES facility at 45 Hutton St, Taroom, QLD 4420, with respect to Section J of the National Construction Code (NCC) 2019 Building Code of Australia.

2.1 Building classification

The building is expected to be Class 5.

2.2 Climate zone

The building is in Taroom, Queensland which falls within NCC climate zone 3.

3. Part J1 Building Fabric

The following describes the minimum requirements for the building components including the ceiling, walls, glazing and floors that form part of the building envelope of the new works (i.e., the parts of the building fabric that separates conditioned and non-conditioned spaces)

3.1 J1.2 Thermal construction – general

These are general construction requirements and detail issues.

3.2 J1.3 Roof and ceiling construction

The roof and ceiling construction that forms part of the building envelope must achieve a minimum Total R-Value of $R_{t3.7}$ and must have a roof sheet solar absorptance of no more than 0.45.

Proposed:

- Colorbond roof sheet (surfmist or similar finish with a solar absorptance of less than or equal to 0.45)
- Kingspan Aircell Foil Faced Insulation Blanket with a material R-value of **R_m0.15** and an emittance of **0.05**
- Purlins
- Air Space
- 100mm Bulk Insulation (Glasswool or similar) with a material R-value of **R_m2.5**
- 13mm plasterboard ceiling

The proposed roof achieves a Total R-Value of $R_{t3.7}$ to meet the requirements of the NCC. (Refer to Appendix 1)

3.3 J1.4 Roof lights

There are no roof lights that form part of the building envelope.

3.4 J1.5 Walls and glazing

The external envelope walls consist of metal cladding, purlins, steel stud with insulation, and internally lined with plasterboard.

The internal envelope wall consists of plasterboard, steel stud, and plasterboard.

Refer to Appendix 2 for the locations of the building envelope walls.

The NCC façade calculator has been used to model the wall and glazing construction.

The following inputs into the façade calculator outline the minimum required wall and glazing construction to satisfy Section J of the National Construction Code (NCC) 2019 Building Code of Australia;

External Walls (R_t1.4);

- Metal Cladding
- Unventilated Airgap (Purlins)
- 75mm stud wall with;
 - 60mm glass-wool insulation (R_M1.5)
- 13mm plasterboard

Internal Walls (R_t0.6)

- 13mm plasterboard
- Unventilated Airgap (Stud)
- 13mm Plasterboard

Glazing

Dimensions – as per architectural plans no. BA/05, BA/11, BA/12

Type – Clear Glass (total system performance of U-Value 5.8, SHGC 0.81)

Shading

As per architectural plan no. BA/11, BA/12

Requirement:

Method 1 - To pass method 1, each façade must meet minimum solar admittance (SA) and maximum U-value performance coefficients of SA 0.13 and U-value 2.0

Method 2 – To pass method 2 the combined proposed facades must use less AC energy than the DTS reference.

The proposed buildings pass methods 1 & 2 (refer Appendix 3)

3.5 J1.6 Floors

The required minimum Total R-Value for a slab-on-ground construction in climate zone 3 is R2.0.

NCC 2022 which has been adopted on 01 May 2023 has eliminated the need to insulate slab-on-ground in climate zone 3. In the official commentary of the NCC changes, it was noted that the application of Table 2b (R-Value of soil in contact with a floor) brought about an unexpected consequence for buildings with low floor area to perimeter ratio of commonly requiring insulation to meet DTS, but that the added insulation was not justifiable. We would therefore consider that this building would be exempt from requiring floor insulation on this basis.

4. Part J3 Building Sealing

4.1 J3.4 Windows and doors

Seals to restrict air infiltration must be fitted to each edge of a door, openable window or the like forming part of the envelope of a conditioned space.

The main entrance to each building must be self-closing or automatic.

4.2 J3.5 Exhaust fans

There are no exhaust fans serving the conditioned space in the project.

4.3 J3.6 Construction of ceilings, walls and floors

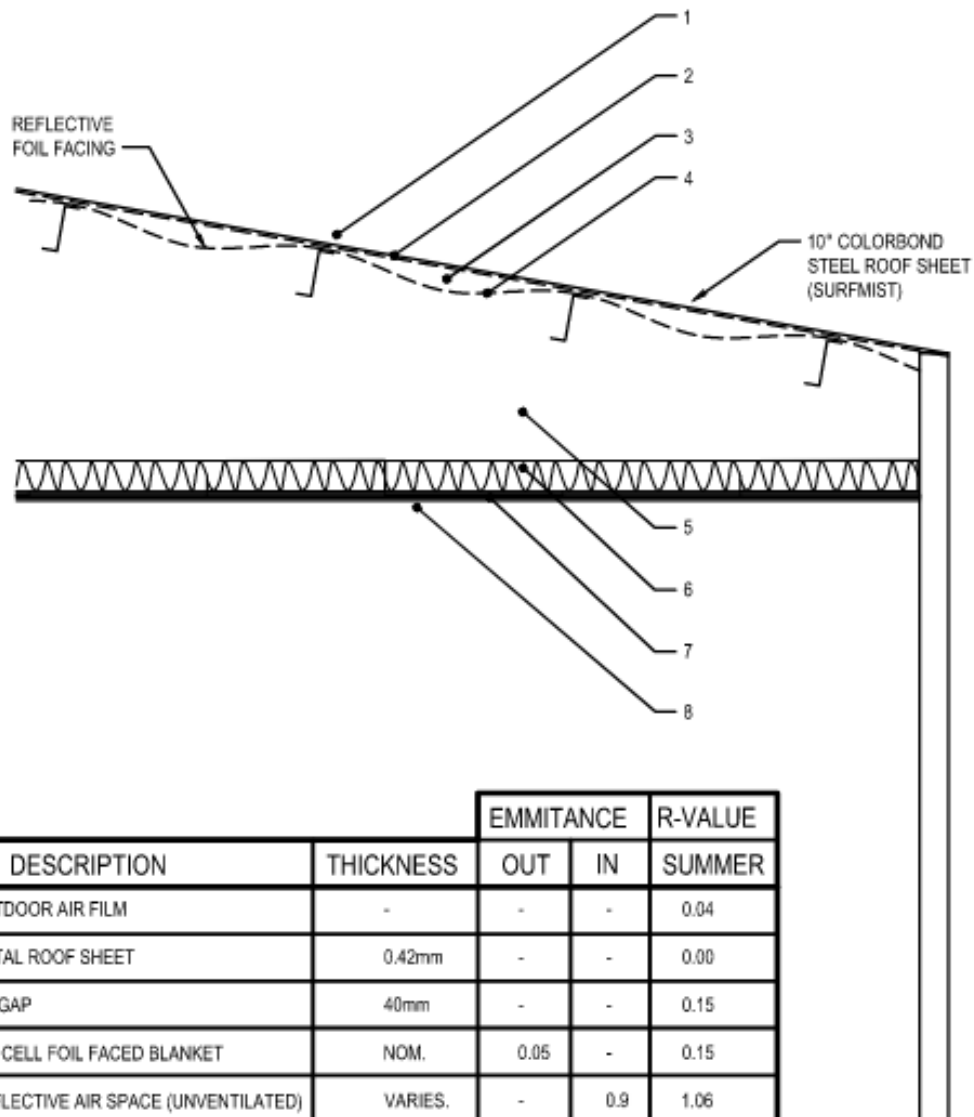
Construction of roofs, external walls and any openings such as windows and doors must be constructed to minimise air leakage. These are general construction requirements and detail issues.

4.4 J3.7 Evaporative coolers

There are no evaporative coolers in the project.

Appendix 1 – J1.3 Proposed Ceiling Construction

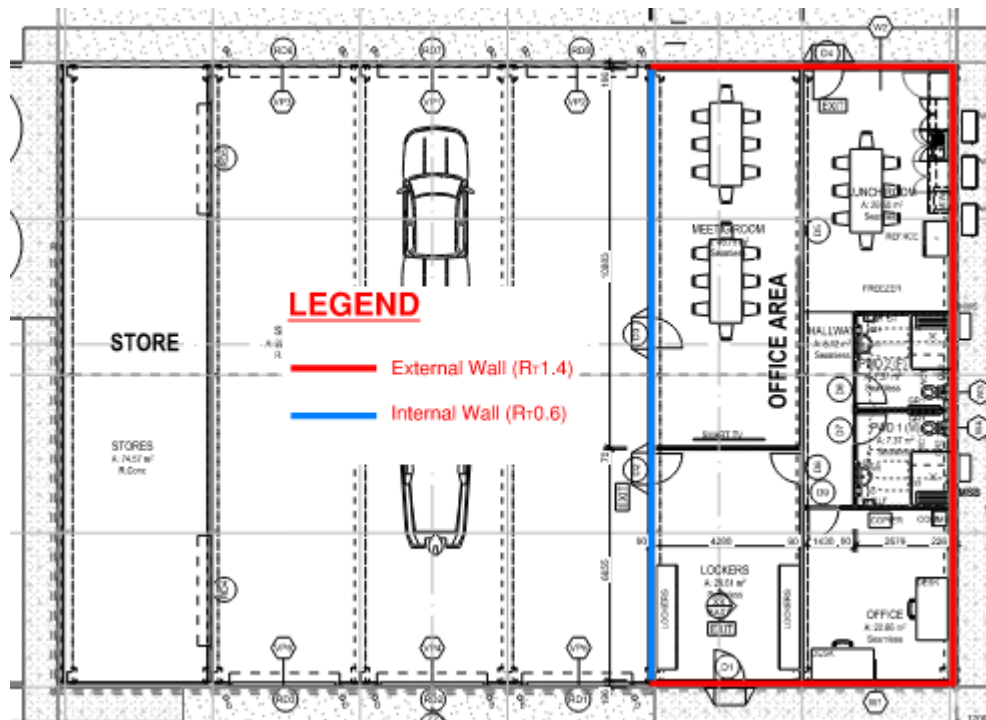
J1.3 ROOF AND CEILING CONSTRUCTION NTS



DESCRIPTION		THICKNESS	EMMITANCE		R-VALUE
			OUT	IN	SUMMER
1	OUTDOOR AIR FILM	-	-	-	0.04
2	METAL ROOF SHEET	0.42mm	-	-	0.00
3	AIRGAP	40mm	-	-	0.15
4	AIR CELL FOIL FACED BLANKET	NOM.	0.05	-	0.15
5	REFLECTIVE AIR SPACE (UNVENTILATED)	VARIES.	-	0.9	1.06
6	CEILING INSULATION (85% EFFECTIVE)	100mm	-	-	2.125
7	PLASTERBOARD CEILING	-	-	-	0.07
8	INDOOR AIR FILM				0.16
TOTAL R-VALUE					3.75

THE REQUIRED R-VALUE FOR THE ROOF & CEILING CONSTRUCTION IS R3.7

Appendix 2 – Building Envelope Walls



Appendix 3 – Façade Calculator Results

Project Summary

Date
17/05/2023

Name
Liam Plumpton

Company
Cushway Blackford

Position
Engineer

Building Name / Address
45 Hutton St, Taroom
0

Building State
QLD

Climate Zone
Climate Zone 3 - Hot dry
summer, warm winter

Building Classification
Class 5 - office building

Storeys Above Ground
1

Tool Version
1.2 (June 2020)

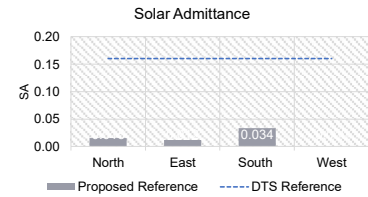
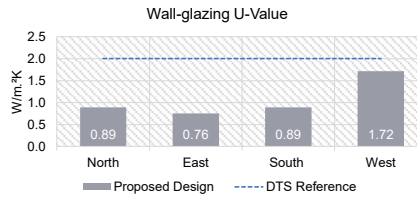
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

Compliant Solution =
Non-Compliant Solution =

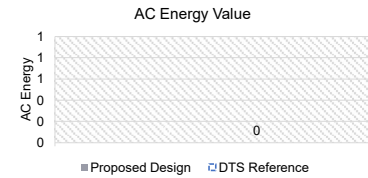
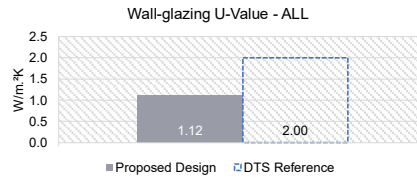
	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	0.89	0.76	0.89	1.72	1.12
Solar Admittance	0.02	0.01	0.03		

AC Energy Value 0

Method 1



Method 2



Project Details

	North	East	South	West
Glazing Area (m²)	1.0033	0.72	1.0033	0
Glazing to Façade Ratio	4%	1%	4%	0%
Glazing References	North Window	East Window	South Window	
Glazing System Types	Fixed	Fixed	Fixed	
Glass Types	LP	LP	LP	
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)	5.80	5.80	5.80	
Average Glazing SHGC	0.81	0.81	0.81	0.00
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	23.0672	48.2985	23.0672	49.0185
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	DTS Wall	DTS Wall	DTS Wall	DTS Wall
Wall Thickness	0	0	0	0
Average Wall R-value (m².K/W)	1.47	1.47	1.47	0.58
Solar Absorptance	0.45	0.45	0.45	0.45